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Enabling Agile Capabilities in Large Firms

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Abstract

The need for firms to develop and hone agile capabilities are becoming ever more important in an increasingly competitive global market marked by growing uncertainty. This trend has only been increased by the high uncertainty resulting from COVID-19. Thus, the need for understanding what enables agile capabilities in large firms has also been increased. The study uses a multiple-case approach, applying semi-structured interviewing of managers responsible for the COVID-19 projects in Denmark at Grundfos and LEGO. It combines within-case analysis with cross-case comparison and cross-case synthesis, to identify patterns that might indicate factors enabling agile capabilities in large firms. Evidence suggests two main factors: innovation and leadership. The three most prominent patterns between the two cases are the importance of R&D capabilities, decision-based empowerment, and creating a strong *why*. Based on the two cases, evidence suggests a positive link between innovation and agility in large firms, as strong R&D capabilities played a key role in enabling agility in both cases. Furthermore, decision-based empowerment and a clear *why* were also found to be fundamental for the success of the project teams. Possibly, linking a positive connection between leadership tools such as formulating and communicating a strong vision, storytelling, and empowerment, are all enabling factors for agile capabilities in large firms.

Keywords: *organizational agility*, *innovation*, *leadership, business models, empowerment*

Contents

Chapter 1: Introduction

In December 2019, the WHO's country office in the Peoples Republic of China became aware of a novel respiratory disease discovered in the Wuhan province of China (WHO, 2020). On January 30th, 2020, the Director-General of WHO sounded the highest level of alarm available, declaring this virus outbreak 'a public health emergency of international concern' (ibid). No one was prepared for how quickly the novel coronavirus (COVID-19) would spread, and within two months the virus was classified as a global pandemic (WHO, 2020).

COVID-19 introduces high uncertainty to existing markets; a virus of unfamiliar scale in the post-modern world, which had tremendous economic effects that spread worldwide in tandem with the virus itself (Næss-Schmidt, 2020). It heralds not only a global health crisis, but also a global economic and social crisis (United Nations, 2020). In just a couple of weeks the demand for personal protection equipment[1] (PPE) as well as medical equipment[2] exploded (European Commission, 2020). This surge in demand meant that it became even more challenging to acquire these products from abroad (Friis, Mortensen, and Klitgaard, 2020). This resulted in nations competing against and outbidding each other while trying to secure enough PPE for their population. At the same time, manufacturers were unable to produce PPE and medical equipment fast enough to meet the sudden global shortage (Pedersen, 2020). Furthermore, the majority of the worldwide PPE supply is made in Asian countries such as China and Malaysia, and since most air traffic was shut down around this time, it became difficult to ship PPE (Friis et al., 2020).

By March 9th, 2020 Danish healthcare authorities became aware of potential supply chain challenges with PPE and other vital medical equipment (Lægemiddelstyrelsen, 2020a). They observed that global supply chains were under immense pressure, as production facilities were shut down and air traffic put on hold, making it hard to get supplies from abroad. This could potentially result in a PPE shortage within the Danish healthcare system (Lægemiddelstyrelsen, 2020b). It was soon evident to authorities, that the healthcare system would eventually run out of vital equipment such as PPE and COVID-19 tests if this shortage was not dealt with immediately (ibid.). By March 22nd, the Danish healthcare agency, Lægemiddelstyrelsen, announced a nationwide decree that due to dwindling

[1] Personal protection equipment or PPE, includes equipment such as facemasks, visors, gloves, coats, bandages, rubbing alcohol, and insulation suits (Lægemiddelstyrelsen, 2020d).
[2] Particularly respiratory equipment such as rebreathers and respirators (European Commission, 2020).

stocks, everyone should use PPE as sparingly as possible and only when necessary (Lægemiddelstyrelsen, 2020c). To mitigate these challenges, Danish authorities began to work closely together to reduce potential disruptions in the supply chain of not only PPE, but also medical devices and medicines resulting from the COVID-19 outbreak (Lægemiddelstyrelsen, 2020a). Consequently, the Danish healthcare authorities began to consider the capabilities of Danish businesses to produce PPE locally (Friis et al., 2020).

By March 23rd, together with the Danish interest organizations MedTech Denmark, Confederation of Danish Industry, and the Danish Chamber of Commerce, the Danish Medicines Agency established a new collaboration to divert sectors of Danish industrial production to the production of PPE (Lægemiddelstyrelsen, 2020d). Within 24 hours, the Danish Medicines Agency was contacted by more than 500 Danish businesses, all volunteering to help with the immediate PPE shortage (Udenrigsministeriet, 2020). In under a week, the number grew to over 1,000 (Lægemiddelstyrelsen, 2020e). These volunteers included companies of every size, from startups to global leaders (Udenrigsministeriet, 2020). Among these were large Danish businesses such as LEGO, Carlsberg, Novo Nordisk, and Grundfos (Friis et al., 2020).

Robotics expert Malene Grouleff stated that many Danish companies were able to help alleviate the PPE problem because the Danish robotics industry had developed robots for automated production, which facilitates flexible and agile production (Udenrigsministeriet, 2020). Within the Danish plastic industry alone, over 20 businesses were able to help due to their automated production facilities (ibid.). Two of these were LEGO and Grundfos, the cases of which will be the focus of this thesis. In the face of the ongoing COVID-19 crisis, they displayed the capacity to react rapidly to a crisis, using existing capabilities such as production facilities and know-how, to produce different types of PPE and medical equipment (Sørensen and Fischer, 2020).

1.1 Research scope

For this case, the focus will be on two Danish businesses that rose to the challenge in the face of COVID-19 by producing PPE for the greater good: LEGO and Grundfos. What these two cases have in common is that they seemingly managed to leverage existing capabilities such as equipment, facilities, knowledge, and know-how, to design, produce, and distribute PPE incredibly fast.

What makes the cases of LEGO and Grundfos particularly interesting is that they are examples of large firms showing a capacity for organizational agility in reacting to rapidly changing

circumstances. In the literature, *organizational agility* is often described as difficult to achieve for larger firms, due to their incumbent nature (Lehn, 2018). However, during the first wave of coronavirus in Denmark, MNEs[3] such as Grundfos and LEGO, displayed a remarkable capability to shift daily operations and go through the phases of design, creation, and production of PPEs in record time. Is this a special case, under special circumstances, or could it be indicative of agile business model innovation? If so, what could be learned from these cases in regards to broadening the understanding of business models and organizational agility? These questions will be the focus of this research.

1.2 Problem statement

In the literature, parallels are being drawn between competitive advantage, business models, and agile capabilities (Kotter, 2007; Doz and Kosonen, 2010). Over time, established business models become increasingly rigid and entrenched due to an increased search for optimization (Doz and Kosonen, 2010). This rigidity leaves businesses vulnerable to disruption. A solution to this is the development of agile capabilities, thus becoming less entrenched and reducing vulnerability to change (ibid.). As stated by Osterwalder, Etiembe, and Smith (2020): "To stay ahead of everybody else and beat disruption you need to constantly reinvent yourself. Business models expire faster than ever before (…) Invincible companies constantly reinvent who they are and where and how they compete in order to stay relevant and ahead" (p. 7). Agile capabilities enable firms to adapt existing competencies to continuously changing environments, leveraging continuous renewal and reconfiguration of themselves to secure long-term survival (Agarwal and Helfat, 2009). This enables agile firms to successfully adapt to change, become more resistant to disruption, and be nimbler in execution (Wilson and Doz, 2011; Franken and Thomsett, 2013). This highlights the importance of continuous renewal and transformation of existing business models for agility and thus the significance of understanding key capabilities that enable these actions (Bock, Opsahl, George, and Gann, 2012). Today, agile capabilities are imperative for large firms to adapt and overcome growing uncertainty (Birkinshaw, Girod, and Prange, 2021). Successful development of agile capabilities in large firms are linked to increased productivity, employee engagement, faster product feature releases, and increased innovation rates (Freeland, Danoesastro, and Rehberg, 2018). Consequently, application of agile principles is spreading from industry to industry, throughout departments, and growingly companywide too (ibid.). However, developing agile capabilities has proven to incredibly

[3] MNEs: Multi National Enterprises. Also referred to as MNCs (multinational corporations)

challenging. It requires organization-wide changes, affecting both strategy, structure, and leadership (Birkinshaw et al., 2021). It requires organizations to rethink organizational structure as well as culture to support agile principles and fundamentally change ways of working (Freeland et al., 2018). Doz and Kosonen (2010) highlights the importance of the role that top management plays, in that it requires trust, a collective commitment to process, enablement, and a willingness to take risk. However, leaders struggle with building strong agility capabilities (Birkinshaw et al., 2021). Many firms attempt to incorporate agility but fail, which serves only to worsen the situation (Freeland et al., 2018). Common pitfalls or "traps" include the failure to implement agile principles company-wide, resistance to change, and agile principles applied in name only (ibid.). Many people like the status quo, and thus fear change and try to resist it (Kotter, 2007). Some firms fall into the trap of only applying some agile principles, or only within some specific areas of the organization (Freeland et al., 2018). Another reason behind the failed efforts to build agile capabilities is a disconnection between how popular agility is and how well-understood the concept and enabling factors are (Birkinshaw et al., 2021).

Agile capabilities are becoming ever more necessary in an increasingly competitive global market. It is becoming an increasingly necessary but difficult to achieve capability (Doz and Kosonen, 2008). Thus, interest in this topic has steadily grown over the years, which has only been amplified by COVID-19 (Birkinshaw et al., 2021). While the literature suggests some factors that are necessary for enabling agility in large firms, it is still an underdeveloped area of scientific inquiry (ibid.). As the need for agile capabilities grow, so does the need for understanding the factors that enable agile capabilities in large firms.

1.3 Research question

How can large companies develop agile capabilities in order to innovate their business model?

1.3.1 Sub-questions

- What factors enabled Grundfos and LEGO to demonstrate agile capabilities?
- Are there any patterns that might reveal more about what makes a business model agile in large companies?
- Are there signs of organizational agility or business model innovation in the two cases?

1.4 Thesis structure

This thesis is structured into nine chapters, with chapters 8 and 9 being dedicated to bibliography and appendices respectively. Chapter 1 is focused on introducing the reader to the theme of the thesis, as well as the describing the underlying foundation and presenting the setting in which the cases took place. This leads into the problem statement and research questions directing the research.

Chapter 2 presents the theoretical starting point for this thesis. This was done by reviewing literature on business model innovation and organizational agility, looking into the theoretical foundations of each theme and concluding with an operationalization of the theory, creating a framework for analyzing the two cases. Chapter 3 is devoted to describing ultimate presumptions on philosophy of science and methodology, and how the chosen paradigm affected each choice made for the research design – from the methodology to the research methods, and the chosen data gathering techniques.

In chapter 4 the reader is presented with a description of the two case organizations. This includes a brief description of each firm and the manager leading the PPE teams, followed by a summary of how each organization expects to be impacted by COVID-19. The units of analysis are the two Danish MNE's, LEGO, and Grundfos.

Chapter 5 is dedicated to the analysis of the two cases. The analysis is divided into two parts. The first part focuses on the two cases individually, using interviews of the two managers in charge of the LEGO and Grundfos COVID-19 projects based in Denmark to conduct an 'within-case analysis' of the transcripts. This allows for a view inside the two cases from the perspective of the managers in charge of the PPE teams. The analysis will follow the framework developed for this very purpose (see section 2.4). The second part of the analysis is based on a cross-case comparison of the two cases, using a modified combination of approaches described in *methodology*. The second part of the analysis begins with the central characteristics for each case, which were created in the first part of the analysis. Then thorough cross-case comparison is used to determine similarities and differences between the Grundfos and LEGO case. Then, cross-case synthesis is applied to identify patterns between the two cases that might indicate what enabled agile capabilities in these two cases. Based on their relevance for agile capabilities in large firms, the patterns are then divided into categories of relevant, non-relevant, and possibly relevant.

In chapter 6 the findings are presented, and the main themes discussed in relation to existing literature. The first part of the discussion is centered around the three most prominent patterns and how these findings stand up to existing literature on innovation, management, and leadership. Then the discussion moves on to discuss differences between the two cases. The discussion also touches upon the relevance of the findings and conflicting findings, before presenting two propositions developed from the evidence and the supporting theory. Following this are recommendations for further research, limitations, and methodological reflections. The findings are then summarized, and the conclusion reached in chapter 7.

Chapter 2: Literature review

The topic for this study is *agile business models*, specifically the apparently agile business model innovations performed by Danish businesses as a response to the COVID-19 pandemic of 2020. This topic was chosen because of two main reasons; the relevance and importance of the topic, as well as a personal interest in the subject. Though it has been over a year since the COVID-19 virus evolved into a global pandemic, the world is still highly affected by the virus (OECD, 2021). Some countries that saw success in dealing with the first wave of the virus are now experiencing a severe second wave (Menon, 2021). Other countries are still dealing with the first wave, while trying to stimulate the economy and keep businesses floating as many have already filed for insolvency, and many more are expected to be in danger of such as government support programs taper off (Uttamchandani, Muro, and Bertens, 2021). Consequently, the importance of identifying possible ways for businesses to adopt more agile business models – necessary for handling a global crisis – should not be neglected. This is why the research is not only relevant, but also important.

This project builds upon past research on business models and organizational agility. Previous research has linked organizational agility to business model innovation, describing agility as essential for creating new business models, preparing existing business models for unforeseen challenges, and enabling market-driven innovation capabilities (Xu and Koivumäki, 2018). In a study on agility in entrepreneurial venture creation, Xu and Koivumäki (2018) combines *business model innovation* together with *organizational agility* and *effectuation*[4]. The researchers sought an agile approach to

[4] Effectuation: "Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means" (Sarasvathy, 2001, p. 245).

digital business model innovation by studying three different approaches to creating new business models: *causation*[5], *effectuation*, and *lean startup*[6]. While their focus was on entrepreneurship (in this case, startups), the study does explore and seek a bridge between agility and business creation (i.e., between organizational agility and business models innovation).

The potential main concepts and theories relevant for this research are primarily *business models* and *organizational agility*. To discuss business models (BMs), it would be relevant to outline a generally recognized definition of the concept. In that regard, when discussing BMs, it can be useful to apply a framework to solidify the different aspects of a BM. Several frameworks have been presented over the years, each with their own definition and particular focus on different areas of a business model (Wirts et al., 2016). The term *agile* or *agility*, is a widely applied term that appears across varied fields of study such as *IT*, *manufacturing*, *corporations*, and *strategy* (Dingsøyr, Nerur, Balijepally, and Moe, 2012; Potdar, Routroy, and Behera, 2017; Lehn, 2018; Doz and Kosonen, 2010).

2.1 Business Model Innovation

Since pre-classical times (800-500 BCE), business models have played a fundamental role in how people have done business (Teece, 2010). For the longest time, firms would usually subscribe to the same underlying logic regarding their modus operandi, resulting in the prevalence of similar business model archetypes (e.g. 'the industrial firm') (ibid.). This did not change until the mid-1990's, where new disruptive business models appeared with the internet boom, and later resulting in the dot com bubble (Teece, Peteraf, and Leih, 2016). The evolution of the literature on business models begins with the first application of the business model concept by researchers Bellman, Clark, Malcolm, Craft, and Ricciardi in 1957 (Bellman et al., 1957 in Osterwalder, Pigneur, and Tucci, 2005). Other synonyms have been used instead of business models, the most common being *business idea*, *revenue model*, and *business concept* (Magretta, 2002).

For a long time, the BM concept was primarily used in relation to information systems, and only later gained traction as a management tool (Wirtz, Pistoia, Ullrich, and Göttel, 2016). From 2000 onwards, the business model literature has seen a drastic growth, with a particular increase in research dealing

[5] Causation: "Causation processes take a particular effect as given and focus on selecting between means to create that effect (Sarasvathy, 2001, p. 245).
[6] Lean startup (from investopedia): "A *lean startup* is a method used to found a new company or introduce a new product on behalf of an existing company. The *lean startup* method advocates developing products that consumers have already demonstrated they desire so that a market will already exist as soon as the product is launched". retrieved from: https://www.investopedia.com/terms/l/lean-startup.asp

with the strategic perspective of business models (Massa and Tucci, 2013; Wirts et al., 2016). From 2004 and onwards there has been growth in practice-oriented publications. This includes several practice-oriented frameworks to help managers visualize, analyze, and innovate upon, such as the business model canvas, the values-based canvas, and the alignment squared framework (Osterwalder and Pigneur, 2010; Breuer and Lüdeke-Freund, 2017; Ritter, 2014). The BM concept has also received growing interest from scholars studying BMs that are not designed around economic gain, such as non-profit organizations. This has sparked an increase in research on business models designed around goals other than traditional economic gain, such as dealing with social problems or sustainability (Massa and Tucci, 2013).

In the early stages of business model research, there were a tendency to focus on specific areas of a business model. However, recent years have seen a shift away from this, and since 2015 a broader focus has been prevalent (Wirts et al., 2016). This broader perspective includes both internal and external factors (cf. Osterwalder and Pigneur, 2010). However, the broad perspective is still less prevalent in the literature as of 2015. An analysis of the business model literature reveals that in 2015, the broad perspective accounts for only approximately 30 % of the approaches examined by Wirts et al., (2016).

2.1.1 Business model components

In the literature, the content and function of a BM is often described with some underlying components (Wirts et al., 2016). A classic example of this is the 'business model canvas' framework, where the BM is portrayed by 9 elements or 'building blocks' describing the core functions of a BM and serving as a visual reference tool to explain the interactions between the building blocks (Osterwalder and Pigneur, 2010). Wirts et al., (2016) also proposes 9 core components, based on a meta-analysis of the various approaches to BMs found in the literature. The values-based business model canvas is another framework that also seeks to explain a business model with 9 core elements (Breuer and Lüdeke-Freund, 2017).

Table 1: Comparison of suggested BM components

Osterwalder and Pigneur (2010)	Wirts et al., (2016)	Breuer and Lüdeke-Freund (2017)

Key partners	Network	Partners
Key activities	Strategy	Values
Key resources	Resources	Stakeholder segments
Value propositions	Value proposition	Value proposition
Customer relationships	Procurement	Touchpoints
Channels	Service (activities, processes)	Distribution
Customer segments	Customers	Capabilities
Cost structure	Financial component	Cost structure
Revenue streams	Revenue model	Revenue model

While the various component-based views share some convergence regarding central characteristics, they are often biased towards one component or another. In the literature, particularly infrequent consideration is given to the components regarding revenue and procurement, especially compared to other components (Wirts et al., 2016). The same literary analysis shows however, that the diverse, multidiscipline definitions of BMs are gradually converging into a general consensus, a trend that started to gain momentum in 2014 and onwards (ibid.). Business models should be considered from a holistic approach, including internal and external factors (Breuer and Lüdeke-Freund, 2017). The business model concept describes the customer, the value proposition, how revenue is generated, and how value is delivered to the customer (Magretta, 2002; Massa and Tucci, 2013). It describes the value producing and delivering activities of the firm (Demil and Lecocq, 2010). The value network should also be considered, including suppliers, partners, and distribution channels (Osterwalder and Pigneur, 2010; Massa and Tucci, 2013). However, as noted by Taran et al., (2016) and Osterwalder et al., (2020), businesses rarely consist of a single BM, but more often than not contain several BMs. Consequently, businesses should not be viewed as consisting of a single BM, but several intertwined ones. Frameworks for considering these 'layered' or 'intertwined' BMs includes the concept of 'value drivers' put forth by Taran et al., (2016), and the 'business model portfolio' suggested by Osterwalder et al., (2020).

2.1.2 Business Model Innovation

As with the concept of business models, the literature offers many different views on business model innovation (BMI) (Wirts et al., 2016). However, as with business models, there is some convergence in the literature on business model innovation. It is generally accepted that BMI constitutes any

change of the components of a business model (Wirts et al., 2016; Taran et al., 2016; Osterwalder et al., 2020).

Furthermore, it is also generally accepted that changes of a business model, or BMI, can be divided into different types of innovation (ibid.). The primary difference in innovation of business models is between *incremental innovation* and *radical innovation* (Taran et al., 2016). Incremental BMI is characterized by continuous changes to the existing BM, typically made in order to improve activities while preserving the core of the BM (Kotter, 2007; Taran et al., 2016). Radical BMI is constituted by radical changes to a business model, such as changing the existing BM to an entirely 'new to the firm' BM (ibid.).

Another general distinction in the literature of BMI is between changes made to existing business models (e.g., radical or incremental) and the creation of new business models, often referred to as 'business model design' (Amit and Zott, 2001; Osterwalder and Pigneur, 2010; Massa and Tucci, 2013). Massa and Tucci (2013) argues that BMI can be divided into two distinct activities: designing new business models (i.e. 'business model design') and reconfiguring existing business models (i.e. 'business model reconfiguration'). Other words often used for business model reconfiguration includes 'shifts' and 'pivots', or 'pivoting' (Osterwalder et al., 2020). According to Massa and Tucci (2013, p. 2), reconfiguring a business model (BMR) refers to changing the BM of an existing firm to a new BM. As such, in their view, both incremental and radical changes of existing BMs would qualify 'reconfiguration'. On the other hand, creating new business models (BMD) can in many instances be regarded as a radical change, whereas continuous reconfiguration of existing business models would be considered incremental innovation. However, BMR can be both radical, as in a radical change of one BM to a whole new BM, or incremental, as in changes in the different elements or components of the BM (Osterwalder et al., 2020).

2.1.3 Why do firms change their business models?

To stay competitive, a business should be engaged in both incremental innovation activities and radical innovation activities (Kotter, 2007; Christensen, Bartman, and Bever, 2016; Osterwalder et al., 2020). This is also true for business models. Kotter (2007) states that the key to success is to continuously improve the existing business model through incremental innovations, while searching for new business model opportunities, which implies radical change and the conscious design and testing of new business models. According to Christensen et al., (2016) leveraging both incremental

and radical innovation of business models is key to staying competitive. Incremental innovations are generally made in pursuit of increased effectiveness (ibid.). On the other hand, radical innovations are typically executed as a reaction to a crisis, to reach out into new markets, to reach for a predicted potential for growth, or to bring a new product or technology to the market (Osterwalder and Pigneur, 2010). According to Osterwalder and Pigneur (2010), the creation of new business models is typically the result of one out of four goals set by an organization to:

(1) Meet existing, yet unsatisfied market demands
(2) Bring new technologies, products, or services to market
(3) Improve, disrupt, or transform an existing market with a better business model
(4) Create a new market

Because of the scope of this research, which aims to discover whether there has been made conscious change to existing business models of the two case organizations, or if their business models have preexisting conditions that facilitate agile business models, this review will focus on BMI as a conscious process of design (i.e., BMD). To identify instances of deliberate BMI, this research leans on the definition provided by Osterwalder and Pigneur (2010) of BMI as a process with 5 distinct phases: *mobilization*, *understanding*, *design*, *implementation*, and *control*.

2.2 Organizational Agility

Agility is a widely used term with a broad application across management (Doz and Kosonen, 2010), software development (Dingsøyr et al., 2012) and manufacturing literature (Potdar et al., 2017). The focus of this literature review is on the organizational aspect, or *organizational agility*. The concept has been inconsistently described in the literature, and consequently there is no coherent typology describing the meaning and significance of the concept (Sing, Sharma, Hill, and Schnackenberg, 2013). It should also be acknowledged that in management literature, as well as in private business practice, the terms *flexibility* and *adaptability* have been used with similar, though not identical meaning (Teece et al., 2016). However, it should be noted that some of the earliest literature about flexibility and adaptability insists on a clear distinction between the two concepts (Stigler, 1939). As such, this review starts at the very roots, beginning with the definition of flexibility and how decades of research have led to the general definition of organizational agility that will form part of the theoretic basis for this research.

The term *flexibility* is perhaps the earliest definition to resonate with the general concept of organizational agility. The term was first described in the 1930's by the Nobel Laureate economist George Stigler as the organizational capability of a production plant to manage uncertainties in demand (Stigler, 1939). In 1982 Brown and Agnew (1982) defines *corporate agility* as, "the capacity to react quickly to rapidly changing circumstances" (p. 1). This builds upon Stigler's (1939) notion of managing demand uncertainties, while adding a more general description of flexibility within the corporation to the agility concept. The general term *agility* has often since been used by organization theorists with a similar meaning (Kidd, 1994; Zhang and Sharifi, 2000; Xu and Koivumäki, 2018), while others have used the terminology *adaptability* or *adaptive* interchangeably (Sorensen, 2003; Reeves and Daimler, 2011; Weigelt and Sarkar, 2012).

In the AMA dictionary of Business and Management (Kurian, 2013), *agility* is defined as "Organizational ability to respond with flexibility and speed, as a source of competitive advantage (…)" (p. 21). The other term, *adaptability* or *adaptive management,* is defined as "Style of management that is flexible and supple in modifying a company's goals and plans to take advantage of changing environments and market conditions" (ibid., p. 9). Finally, *flexibility* is defined as "Ability to adapt to change, maneuver in troubled waters, and take advantage of new opportunities quickly" (Kurian, 2013, p. 116). One could argue that these different terminologies are essentially describing the same capabilities and capacity to handle unforeseen events. However, within the literature agility is described as having an element of flexibility as well as an element of speed (Doz and Kosonen, 2008; Lewis, Andriopoulos, and Smith, 2014). This separates it from *adaptability* and *flexibility.* The table below (table 2) summarizes the three concepts as defined in the AMA dictionary (Kurian, 2013).

Table 2: Organizational agility, adaptive management, and flexibility based on the AMA dictionary (Kurian, 2013).

Organizational agility	Adaptive management	Flexibility
"Organizational ability to respond with flexibility and speed, as a source of competitive advantage"	"Style of management that is flexible and supple in modifying a company's goals and plans to take advantage of changing environments and market conditions"	"Ability to adapt to change, maneuver in troubled waters, and take advantage of new opportunities quickly"

According to Freeland et al., (2018) the basics of being agile is to implement cross-functional teams and to adopt a "try-and-fail" culture where employees are not afraid of trying and failing (Freeland et al., 2018). Agile organizations can demonstrate a high degree of flexibility and speed, especially in order to sense changes and react instantly and appropriately (Weber and Tarba, 2014). In large companies, agility requires leveling the leadership hierarchy and engaging employees to drive innovation (Freeland et al., 2018). Primarily focused on the role of top management in relation to organizational agility, Doz and Kosonen (2010) suggests three primary organizational capabilities that enhance agility: strategic sensitivity, leadership unity, and resource fluidity. In essence, Doz and Kosonen (2010) describe these capabilities of management as:

(1) To perceive, be aware of, and attentive to strategic developments
(2) Their capability of bold and fast decision making
(3) Internal capability to rapidly reconfigure and reassign resources

Building upon that general description, Teece et al., (2016) more explicitly defines *organizational agility* as: "The capacity of an organization to efficiently and effectively redeploy/redirect its resources to value creating and value protecting (and capturing) higher-yield activities as internal and external circumstances warrant" (p. 17). Doing so includes Stigler's definition of 'flexibility' and concept of managing demand uncertainties (i.e. 'demand shocks'), while adding the idea of managing supply-side uncertainty and flexible situational adjustments of strategy. This builds upon the existing body of literature on organizational agility, effectively combining the concept of flexibility with the early definition of corporate agility, and updating it for the 21st century.

2.2.1 Use of agile terminology

The concept of agility is not only widely applied terminology across different science communities, but also throughout the private sector (Danfoss, 2018), the world of consulting (Freeland et al., 2018) and in the public sector (Erhvervsstyrelsen, 2018). Increasingly the term is thrown around as a positive adjective, a constant state of being that businesses should strive for (Brown and Agnew, 1982; Teece et al., 2016). Indeed, it has been applied far and wide to a degree that, to some, it has become part of a culture of empty consultant jargon (Brinkman, 2020).

2.2.2 Agility costs

A common viewpoint in management literature is that due to increased global competition, many organizations are facing fundamental challenges and disruption threats (Christensen and Bower,

1996). Consequently, the argument is that organizations need to continuously rethink and reinvent their business models (Hamel and Valikanges, 2003). This is a common argument that can be found in both innovation management literature (Breuer and Lüdeke-Freund, 2017) and business model theory (Doz and Kosonen, 2010). Seeking increased efficiency is beneficial in situations with low uncertainty, where risk can be predicted and managed, or during rapid growth where it is critical to efficiently and reliably scale up operations (Sarasvathy, 2008; Doz and Kosonen, 2010).

However, firms that focus on efficiency will naturally develop increasingly more stable and rigid business models, thus becoming increasingly entrenched in their position (Doz and Kosonen, 2010). While stability is required for efficiency, focusing too hard on efficiency is likely to constrain strategic flexibility (ibid.). By being too focused on optimization and efficiency, firms risk becoming too rigid and entrenched in their position, thereby becoming vulnerable to rapid changes in the environment (Brown and Agnew, 1982). As a consequence, many of these firms fail because of the inflexibility of their rigid business models (Doz and Kosonen, 2010).

The popular American phrase, "*if it aint broke, don't fix it*"[7] warns us of unnecessary changes to something that works just fine as is. However, just because something truly worked fine yesterday does not mean the same will be necessarily true for tomorrow. As stated by Bower and Christensen (1995), "One of the most consistent patterns in business is the failure of leading companies to stay at the top of their industries when technologies or markets change" (p. 43). Or as Tushman and O'Reilly (1996) puts it, "The forces of inertia in companies are strong. The legions of once successful firms that have fallen on hard times or gone out of business underscore how hard it is to break out of a rut, especially a comfortable, profitable rut" (p. 81). The moral here is that we should not aim to fix something that does not need fixing, but rather become aware of becoming too rigid and closed to external input. In short, while seeking increased efficiency and predictability can be critical in some situations, organizational agility is equally critical to secure long term success.

However, it should also be noted that organizational agility comes at a cost (Teece et al., 2016). To highlight that, Teece et al., (2016) makes two counterpoints to the notion of treating agility as unilaterally beneficial for all businesses. The first counterpoint is that transformations are not always necessary or even possible. Secondly, even essential transformations necessarily come at a cost

[7] Popular American phrase, possibly originating from southern USA in the 1930s. From https://www.phrases.org.uk/meanings/if-it-aint-broke-dont-fix-it.html

(ibid.). The second counterpoint originates from the generally accepted duality of business management, where businesses must leverage and participate in both 'exploration' and 'exploitation' activities and that this duality creates constant tradeoff between the benefits and costs of each activity (Tushman and O'Reilly, 1996). Businesses that manage to effectively conduct both activities simultaneously are considered 'ambidextrous', meaning that they are capable of efficiently operating each activity and simultaneously knowing when to apply which one (ibid.). In short, organizations face a tradeoff and need to decide where to focus their resources. In the context of organizational agility, this theory can be translated to the organization essentially having to choose between efficiency or flexibility, that is, between optimizing current operations, or initiating change and increasing preparedness for possible threats (Teece et al., 2016).

2.4 Summary and operationalization of the theory

By reviewing the literature, it has become clear that there are strong and still-growing interests in agility and agile capabilities from a variety of scientific fields. However, the literature on how firms develop agile capabilities or which factors enable agile capabilities in large firms are sparse. Therefore, the focus of this research is to create a deeper understanding on what factors enable agile capabilities in large firms, and how they do so.

In order to create a framework for the research, an operationalization of the theory was made. That meant developing a framework for the data collection process, based on the insights from reviewing the literature. Following the research question, there are two main themes to be uncovered: *organizational agility* and *business model innovation*. The first goal is to determine if there are signs of organizational agility or business model innovation in the two cases. The second, and more specific goal, is to create knowledge on possible patterns across the two cases that can shed light on what makes a business model agile in large companies. To prod into these themes, a set of questions have been developed based on relevant literature on each subject. For organizational agility, a four-step process of organizational agility (Table 3) was created, based on the definition by Teece et al., (2016). Incorporating the different elements of organizational agility, this framework is created to share light on which capabilities that enabled the two cases to react in a seemingly agile response to the crisis. In this view, resources include equipment, facilities, knowhow, personnel, and knowledge.

For business model innovation, the operationalization relies on the definition reached in the literature review. To create a framework for detecting possible BMI in the two cases, the BMI process was

divided into 5 phases (Table 4) developed from the definition by Osterwalder and Pigneur (2010) and Osterwalder et al., (2020). These two frameworks formed the basis for the interview questions, exemplified by the interview guide. The interview guide can be found in the appendix (Appendix 3). For codification and analysis of data, codes were assigned to each framework in accordance with the processes of each.

Table 3: Four step ladder of organizational agility based on the definition by Teece et al., 2016

The process of organizational agility segmented by four distinct characteristics	
A1.	Redirect or redeploy resources within the organization
A2.	Efficiently and effectively
A3.	To create, capture or protect value
A4.	Due to internal and external circumstances

Table 4: The five phases of the business model innovation process developed from Osterwalder and Pigneur (2010)

Five phases of business model innovation	
B1.	Mobilize resources and efforts
B2.	Understand the problem/create common understanding
B3.	Design new business model (creative process)
B4.	Implement change
B5.	Control

Chapter 3: Methodology

Methodology is both a mode of acting and a mode of thinking (Abnor and Bjerke, 2012). Consequently, describing the methodology means giving a description of one's actions and the reasoning behind them. The following sections describe the approach taken in the research, the choices made regarding methods and techniques, and the reasoning behind them.

3.1 Philosophy of Science in Business Research

The philosophy of science acts as a double edged sword; on one hand it can contribute by increasing the scope and clarity in discussions about fundamental issues and the nature of science (Fuglsang,

Olsen, and Rasborg, 2014). However, it can also create gridlock and increase the divide between opposing paradigms (ibid.).

3.1.1 Paradigms

In the book *The Structure of Scientific Revolutions* (1962), Thomas Kuhn advocates for the idea that the philosophy of science develops and grows within *paradigms*. Paradigms are a concept that can be seen as a bridge between 'ultimate presumptions' (Abnor and Bjerke, 2012, p. 12). Namely, a bridge between philosophical presumptions on the nature of knowledge (e.g. what is knowledge) on one side, and presumptions on methodology (e.g. how to best conduct science/create knowledge) on the other side (ibid.). These ultimate presumptions influence how knowledge is created by the practitioner (Abnor and Bjerke, 2012 p.15). Every step in the research process is affected by the ultimate presumptions held by the researcher; from formulating the research problem, to which methods to apply, and how data is handled (ibid.). Given this, the paradigm concept is used to describe the relationship between the philosophical assumptions of science, held by the practitioner, and how this affects the research (Abnor & Bjerke, 2012 p.16). They are the dominant views that characterize different scientific disciplines (Kuhn, 1962). In Kuhn's (1962) view, these different paradigms are non-compatible; meaning that there cannot be any productive scientific discussions across the different paradigms. Furthermore, in this view, paradigms can be seen as revolutionary in that new paradigms replace the old (Abnor & Bjerke, 2012). Opposing Kuhn's view, Popper and Notturno (1994) argues that, while it can be difficult to achieve a rational discussion across different paradigms, the history of science is littered with cases where this was in fact achieved. They believe the most important thing is how we formulate our views into words, which makes it possible to criticize them, thereby fostering debate. However, it should be noted that Kuhn hails from a field in the natural sciences, which differs from the social sciences. In social sciences, old paradigms are not being replaced, rather, they often continue to exist alongside the new paradigms (Abnor & Bjerke, 2012). As such, paradigms in the social sciences are more similar to how Törnebohm (1974) describes them: as evolutionary rather than revolutionary (Abnor & Bjerke, 2012). Here paradigms are described as consisting of four elements (Törnebohm, 1974; Abnor & Bjerke, 2012 p.15):

(1) Conception of reality
(2) Conception of science
(3) Scientific ideal
(4) Ethical/aesthetical aspects

3.1.2 Constructivism and Positivism

In the social sciences, tensions have been growing between opposing views on philosophy of science, resulting in two main camps; that of *positivism* and *constructionism* (Fuglsang et al., 2014). Uncompromising subscribers to each ideal refuse to enter into dialogue with the other camp. Regrettably, this often leads to a loss of productive exchange of opinions (ibid.).

Social constructionists hold to the view that there are no objective truths or facts, neither in the social sciences or the natural sciences. What some might consider as the objective truth or a true fact is actually always the result of selection, thereby making it a social construct (Fuglsang et al., 2014). Positivists like Sokal and Bricmont (1998) criticize social constructionism for considering any viewpoint to be equally good. In their view, since there are no objective truths, social constructionism leads to relativism in that "anything goes" (ibid.). As Fuglsang et al., (2014) points out, the positivistic and constructionistic camps are both missing the point of the other, resulting in very caricatured positions. This was also pointed out by Kuhn (1962) when describing the non-compatibility between opposing paradigms in the philosophy of science. However, adopting a more nuanced approach to philosophy of science reveals a continuum of positions between the two extremes of positivism and constructionism (Fuglsang et al., 2014). Hacking (1999) also argues for more nuance in the debate, pointing out that the age-old dispute between positivism and constructivism is not going to move anywhere as long as it is considered as an either/or situation. Instead, he suggests a more nuanced approach, pointing out that there are some fundamental differences in the sciences, and that the researcher has the opportunity to navigate through this discussion and adapt their own position (ibid.). To mitigate these tensions and build a bridge between the two camps, Fuglsang et al., (2014) proposes a more pragmatic view on the different approaches. To counteract this tendency of polarization between the social sciences, one must foster cross-paradigmatic discussions and open gateways between the single disciplines (ibid.).

3.2 Paradigmatic delimitation - Organizing

This thesis applies an organizing approach to philosophy of science. This means that for this thesis, organizing should be understood from the perspective of the participants. As such, the focus is on the perspective of people that participated in the two cases, what sense they made of their efforts, success, and what this means for enabling agile capabilities in large firms. The following sections describe more about the roots of this paradigm, the core principles of it, and the connection between the paradigm and scientific research.

Organizing has developed from its early inception in the 1970s to become one of the most dominant methods in organizational sociology (Olsen, 2014). It differs from other organizational theories by the theoretical basis of science, which was developed during the 1970s, where especially Silverman (1971) and Weick (e.g. 1979; 1995) contributed to that development based on a break with what they saw as the naivety of rational thinking. Other prominent researchers that have contributed to the development of the theory include Knorr-Cetina (1981; 2000), Collins (1981), and Christensen & Kreiner (1991). Since the latter used the organizational analysis perspective to qualify the general understanding of project management, the theory has seen heavy use in debates on learning, management, processes, and trust (Olsen, 2014).

The principal issues within organizing center around the symbiosis of participants and leaders; how they organize, create results, and the processes involved (Olsen, 2014). Organizing is viewed as a process of continuous activity, where the participants continuously create the organization by participating in the process (ibid.). Organizations are defined as active collectives, where participants can reduce the uncertainty of their world by subscribing to constructs and theories about the present and the future (Olsen, 2014). As with team sports, the collective action processes of organizations are both at the same time unpredictable and recognizable. The actions are impossible to predict, but the patterns are recognizable. This is why it is important to understand the micro-situations in society and organizations; it is here that participants make sense, form meaning, and act together with other participants (ibid.). Furthermore, to understand how participants within organizations create routines, stability, and change, it is necessary to understand the cognitive processes of the participants. Sensemaking is another central concept to the paradigm. At the core, sensemaking is a result of action. It decrees that information is the result of conscious and reflective construction; that all relevant information is constructed by the user in their own image, formed by their idea of self, and that knowledge is structured by the collective of participants that use it (Olsen, 2014 p. 387).

Organizing draws its philosophic roots from *phenomenology*, *hermeneutics*, *sociologic pragmatism,* and *microsociology* (Olsen, 2014, p. 377). The epistemological roots of phenomenology can be seen in that action and knowledge is considered the same. As the researcher works with knowledge based on the experiences of the participants, they become part of constructing the interpretation of those processes (ibid). Consequently, knowledge is considered a result of social interpretation. Foundations in the philosophical hermeneutics reveal themselves in the focus on how individuals create meaning in relation to each other, which is the fundamental activity in a society (Olsen, 2014). Finally, the

roots from sociological pragmatism and microsociology reveal themselves, in that historically, the process of organizing is viewed as a process that should be described through the contexts and meaning given to them by the participants. Or as Olsen summarizes, the starting point of organizing is when the participants involved in the organization develop their knowledge and worldviews through creation of meaning about their practical reality (Olsen, 2014 p. 377).

3.2.1 Ontology

In a scientific context, ontology defines the 'subject field' (Fuglsang et al., 2014). The ontological perspective of organizing is centered around *meaning* and *sensemaking* (Olsen, 2014). That is, how people form their meaning, understand their world and idea of self, based on past actions and in conjunction with participating in organizing processes and micro-situations in society (Olsen, 2014). Actions and organization are results of these constructs of meaning (Weick, 1995). The ontological position on organization is that it is a process where participants participate to reduce uncertainty (Olsen, p. 379). Consequently, organization is rarely solely a process of strategy and planning. More often than not, organization is about operating in the present to prevent new and unforeseen problems (ibid., p. 379). As such, strategy can be considered to be how participants collectively react to the processes they are participating in (Olsen, 2014 p. 383).

3.2.2 Epistemology

From a scientific perspective, epistemology concerns fundamental assumptions about how to approach research in a subject field (Fulgsang, 2014). In organizing, the standpoint on knowledge is that the use and production of knowledge can be divided into three elements: *enactment*, *selection*, and *retention* (Olsen, 2014). The only kind of knowledge is experience-based knowledge, that is, looking back at past actions. Additionally, knowledge is the sense that people make of a situation and how it relates to other situations. This knowledge is gained from how people make sense (i.e. sensemaking) of their current situation, based on past experiences (Weick, 1995). As such, knowledge is retrospective (Olsen, 2014, p. 384). Sensemaking lays the foundation, from which new actions are formed. However, this foundation also affects how we make sense of the world around us and understand the situations and processes that we participate in (Weick, 1995). From a research perspective, this means that research on organizations are based on the principle that all knowledge is created through interaction, is retrospective, and is based on experiences (Olsen, 2014).

3.2.3 Enactment, selection, retention

Enactment, selection, and retention are mutually codependent processes; they develop and evolve as a result of actions, and how these actions are experienced (Olsen, 2014). Enactment is the result of outside input requiring the participant to act, either actively or passively (i.e., consciously or unconsciously) (Weick, 1995). In response to any situation, a person can either do something 'automatic' or something 'wild' (Olsen, 2014). 'Automatic actions' happen when the situation can be recognized as a repeated pattern; that is, when the situation is something that has been experienced in the past and to which the individual has already built an automatic response to (ibid.). Olsen (2014) provides the excellent example, that if a person drops an object, the automatic response is to immediately try to grab it. Or if someone calls on the phone, the choice is to either pick it up or to not pick it up; to act actively or passively. Automatic selection is the unconscious process of making sense of a situation and how to deal with it, based on recognizable patterns (ibid.). Wild selection is the opposite decision process to that of the automatic response. According to Weick & Westley (1996) wild selection happens when an individual encounters something that is experienced as a novel, contradictory, or an experimental situation. Retention is the unconscious process of storing the compacted meaning derived from the selection and enactment processes (Olsen, 2014). The stored knowledge frames how we make sense of a situation – it is both "knowing" and "knowing what I mean" (Weick, 1979, pp. 133;155).

3.2.4 Organizing and scientific research

From a research perspective, the epistemological approach of organizing studies is based on the principle that all knowledge is: (a) based on experiences, and (b) developed through interaction (Olsen, 2014). Accordingly, from this perspective, all knowledge is both social and context dependent. Organizations are phenomena of organizing processes, and a phenomenon can only be understood in the context of experience (ibid). However, there can be different or even conflicting perspectives on a situation and what actions to take. Subsequently, organizational problem solving is a collective action that requires both the situation and the plan of action, to be described and understood (Olsen, 2014). Following the organization paradigm, the main objective is to describe how people act within organizations; to understand the organization by describing the actions of participants (the employees, managers, and other affected participants) (ibid).

According to Olsen (2014), the paradigm favors types of reasoning that are well-suited for developing a description and explanation of concrete research problems. Consequently, the most common types of reasoning applied in organizing studies are induction and abduction (Olsen, 2014 p. 390). The view

on methods is that both organizations and societies can only be understood in the light of micro-situations; to understand an organization is to understand how the participants act in situations (Olsen, 2014). As such, qualitative methods and techniques that enable the researcher to create meaning around the experiences of the participants of a phenomenon are ideal (ibid).

To ensure the reliability of knowledge, the researcher must pay attention to processes and participants; interactions, intention, and the knowledge available to them (Olsen, 2014). The criteria for validity, or what is the "truth", is *plausibility* (ibid). Something is considered to be true if it is relatively substantiated or real to the people experiencing it (Olsen, 2014).

3.3 Research Design

In the following sections, the research design and methodological choices made for this are described and explained. Yin (2009) describes the research design as the essential link between the research questions and the data that is to be collected (Yin, 2009 p. 24). Therefore, the research design includes a description of how the research questions have guided the choices made, not only for the research method, but also techniques for data creation and data analysis. The figure below summarizes the methodological choices made for the research design. The figure should be understood as a top-down hierarchical order, with the topmost step affecting each subsequent choice made.

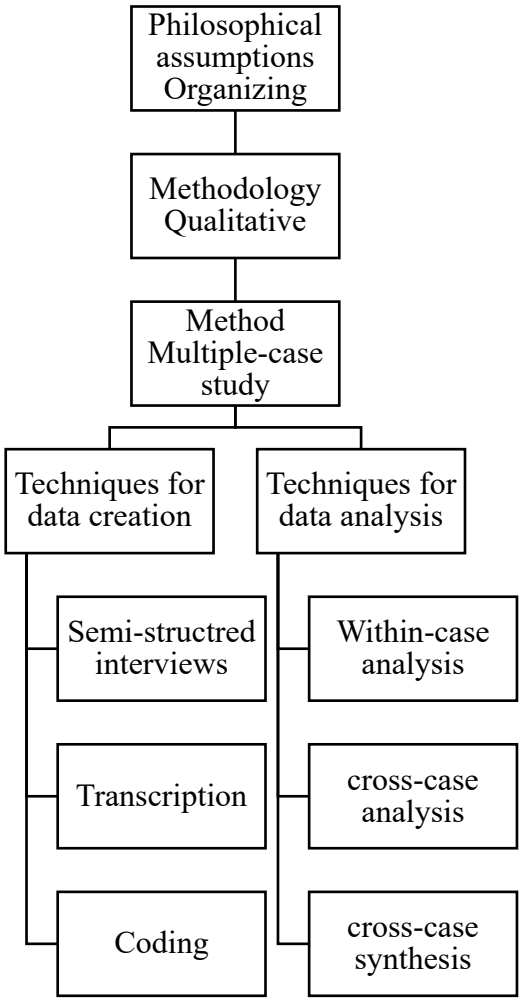

Figure 1: Research design

3.3.1 Summary

Given the paradigmatic delimitation, a qualitative research design was selected. This choice was made because qualitative research methods are centered around asking questions and identifying problems (Abnor and Bjerke, 2012 p.18). Due to the nature of the research questions, the use of a case study approach was chosen, as the case study is uniquely adequate at creating insights into specific events and studying a specific phenomenon in-depth (Yin, 2009). Specifics about the type of case study and what this means for the research are explained in *the case study* (section 3.3.3). The research design chosen for this particular research is a multiple-case study. Though there are several good reasons for using a single-case design, the project does not immediately meet any of the five justifications set by Yin (2009). The chosen technique for data creation is the semi-structured qualitative interview. This included creating an interview guide (Appendix C) and transcribing the recorded interviews. For analyzing the data, I chose to design an analysis strategy that combined

within-case analysis (Eisenhardt, 1989) with cross-case comparison and cross-case synthesis (Eisenhardt, 1989; Yin, 2009). The first analytical step, however, involved codifying the transcribed data. For this, two set of codes were created (see tables 6 and 7), based on the framework (section 2.4).

3.3.2 Qualitative research methods

Contrary to quantitative research, where one must know what to measure, the unknown plays an important role in qualitative research (Dahler-Larsen, 2010). Quite often, the most important factors are unknown at the beginning of the research. In fact, qualitative methods should be chosen when the important factors in the research are unknown (ibid., p.18). By reviewing the literature, it has become evident that there are important factors within the field of organizational agility that remain undisclosed. This is why the present method is particularly useful for answering the relevant research questions. The research questions lean towards adopting an exploratory approach, where important factors are discovered and developed as part of the research (Dahler-Larsen, 2010). Qualitative methods should be chosen when the researcher has some knowledge about a theme, but may lack particulars in a specific case (Dahler-Larsen, 2010). This is exactly the case in this thesis. Furthermore, though the research design has been created from the beginning as recommended by Yin (2009), it was also created with a degree of flexibility that allowed for the research questions and research design to evolve and change as the research progressed, as recommended by Dahler-Larsen (2010).

3.3.3 The case study

Case studies are often thought of as synonymous with qualitative research (Eisenhardt, 1989), however, the research design actually contains a number of different philosophical assumptions regarding scientific research (Yin, 2009). As such, the data can be qualitative, quantitative, or a combination of both (Eisenhardt, 1989; Yin, 2009). The case study is commonly applied to probe and examine events in-depth, gain new insight and perspective, broaden the understanding of phenomenon, and allow understanding of the how and why of events (Yin, 2009). The method emphasizes in-depth studying of organizations, individuals, events, or phenomenon (Easterby-Smith, Thorpe, Jackson, and Jaspersen, 2018). The research design can include a single case or multiple cases (Eisenhardt, 1989), numerous levels of analysis within a single study (Yin, 2009), and commonly involves a longitudinal aspect (Easterby-Smith et al., 2018). Furthermore, as a research design, the case study can effectively be used to realize descriptive research, generate a new theory,

or test existing theories (Eisenhardt, 1989). This affords the research some flexibility. Taking these points into consideration, it was evident that the case study would be an excellent fit for answering the research question. However, there are different approaches to the case study and a choice had to be made between these different approaches. The section below briefly describes the different approaches, and the choice made for this thesis.

Single-case or multiple-case study

The case study is not a unilateral approach; there are different approaches to conducting case studies, and as such, different types of case studies (Yin, 2009). The main difference lies between single-case studies and multiple-case studies. The difference between a single-case study and a multiple case study is that a multiple-case study simply consists of more than one case (Yin, 2009). The strengths and weaknesses of multiple-case designs are distinct from those of single-case designs. In general, multiple-case studies are considered stronger, and the evidence more compelling (Herriot & Firestone, 1983). According to Yin (2009), the research designs of multiple case studies are generally stronger compared to single-case designs (p.24). As such, even a two-case design is in most cases stronger than a single-case study. However, conducting multiple-case studies can exhaust both resources and time, and should not be taken lightly (Yin, 2009). Furthermore, there are instances where the single case study is a stronger design compared to the multiple-case design. From a business and management perspective, the literature is split between advocates of single case studies and advocates of multiple case studies (Easterby-Smith et al., 2018). This is largely due to opposing views on epistemology; constructionists generally favor the single cases, while the multiple case designs typically come from a positivist standpoint. However, there are some that suggest an intermediate position between the constructionist and positivist approaches (Eisenhardt, 1989; Eisenhardt and Graebner, 2007). Drawing from both positivist and constructivist standpoints, the suggested compromise is widely popular and extensively used by researchers (ibid.). Eisenhardt (1989) suggests that researchers establish their designs at the very beginning, but also stresses that the researcher should keep a flexible approach, use multiple data collection methods, and combine within-case analysis with cross-case analysis.

To decide on which design should be followed for this project, the pros and cons of both designs have been reviewed. For that, Yin (2009) provides five scenarios for when it would be appropriate to choose a single case study over a multiple case design: (A) critical case for hypothesis testing; (B) extreme or unique case; (C) representative case; (D) revelatory case; and (E) longitudinal case. To

elaborate on this and explain the justification for the methodological choices made in this study, a condensed description of each scenario will follow. Firstly, critical single-case studies can be used to test a theory (ibid.). In other words, the right case can be used to either accept or deny a hypothesis or test a theory. In this way, single case studies can make significant contributions to both "knowledge and theory building" (Yin, 2009 p. 47). The single-case study is also appropriate if it represents either an extreme or unique case (ibid). An example where this approach is often applied is in clinical psychology, where rare syndromes represent a good opportunity for using the single-case study to study the precise details of a syndrome (Yin, 2009). On the other hand, the single-case study is also a valid option when studying a typical or representative case (ibid., p. 48). The case could for example be a typical urban neighborhood or an organization that is representative for a typical organization of its kind. By studying representative cases in a single-case study, it is possible to create knowledge based on the experiences of the average person, organization, et cetera (Yin, 2009). The fourth rationale is revelatory cases, that is, when a researcher has a novel opportunity to study "a phenomenon previously inaccessible to social science inquiry" (ibid., p. 48). In those type of cases, the in-depth scrutiny of the single-case study approach is also beneficial. The fifth and final rationale is the longitudinal case: studying a single case over a period of time. The single-case design is particularly suitable for studying the same case over several points in time (Yin, 2009). However, the single-case designs are vulnerable to misrepresentation in that a chosen case might turn out as expected (ibid.). Thus, it is important to carefully investigate a potential case before committing to a single-case study.

Considering this, a multiple-case study was favored. While it should be acknowledged that there is a constructionist tradition of favoring single-case studies (Easterby-Smith et al., 2018), and that the chosen philosophy of science, organizing, is leaning towards constructionism (Olsen, 2014), I also acknowledge the advice of researchers that favor a nuanced approach (Fuglsang et al., 2014; Eisenhardt and Graebner, 2007). Furthermore, as pointed out by Yin (2009), even a multiple-case study of two cases is generally considered stronger than a single-case study.

3.3.4 Data sampling

Guided by the chosen paradigm, which advocates for a strong focus on the personal experiences of the individuals participating in the organization, it was decided to follow a 'qualitative research' approach. Qualitative data are non-numeric data often created through a process of interaction and interpretation (Dahler-Larsen, 2010). As such, the researcher plays a key role in the development of

qualitative data. Common types of data include audio recordings, transcripts, written observations, field notes, images, and videos. It can also be in the form of company reports, internal documents, and correspondence (Easterby-Smith et al., 2018). While there are no designated methods for collecting and analyzing data in case studies, commonly applied data collection methods include interviews, observations, archives, and observations (Eisenhardt, 1989). In fact, a very common means of collecting qualitative data is through interviews (Yin, 2009).

Qualitative interviewing

Qualitative interviews are a form of directed conversations centered around a set of questions (Charmaz, 2014). The role of the interviewer is to guide the conversation with different types of questions, recording the interviewees perspective and narrative. The questions are centered around a theme or particular subject (Lofland and Lofland, 1984). The data gathered is rich and detailed, which is why the method is popularly used where the researcher seeks to explore a topic or experience in-depth (Charmaz, 2014). Though interviews are typically associated with the survey method, it is also "one of the most important sources of case study information" (Yin, 2009 p. 106). With this in mind, I decided to use qualitative interviews as my main data gathering technique. However, there are different approaches to conducting qualitative interviews, mainly varying in the degree of openness (Easterby-Smith et al., 2018). The openness of an interview is determined by the degree of structure. In general, the different approaches can be grouped into three categories: (1) non-structured, non-directed, open interview forms; (2) highly-structured, entirely directed, scripted interviews; and (3) semi-structured interviews, a flexible in-between approach (Easterby-Smith et al., 2018). Some interviewers follow a very formal and structured approach (i.e., highly structured interviews). Highly structured interviews follow a detailed list of questions, posed in a predefined sequence (e.g., question x-y). This type of qualitative interviews is common in market research (ibid.). In a case study context, the highly structured interviews are commonly applied in surveys (Yin, 2009). Consequently, a highly structured interview would not be a good fit with the research design. On the other end of the spectrum are open interviews or non-directed interviews, where questions are much more exploratory in nature and the goal in posing them is not to get a specific answer to a specific question. Rather, the goal is to stimulate the conversation, not to guide/direct it into completely following the interviewees narrative (Easterby-Smith et al., 2018). In-between those two extremes lies the semi-structured interview (ibid.). This approach typically follows a list of questions in the form of an interview guide, but in contrast to the highly structured interview, the questions do not follow a predefined order of questioning and leaves room for the researcher to follow the narrative of the interviewee while still

having some structure in the form of predefined questions (Andersen, 2014). The semi-structured interview is therefore more flexible than the structured interview, while still following some structure in the form of the interview guide. The semi-structured interview fosters an open and personal approach while still having a framework (the interview guide) to fall back on (ibid.). The approach is also excellent for gathering inside knowledge about an organization from trustworthy sources (Andersen, 2014).

Applied interview approach

Proponents of the case study method recommend using interviews as guided conversations, rather than the structured queries of surveys (Yin, 2009 p. 106). Furthermore, according to Easterby-Smith et al., (2018), less structured interview methods such as the semi-structured and non-directed (open) interview should be favored when:

- The researcher seeks to uncover the constructs that form the respondent's opinions and beliefs
- When the researcher seeks to understand the respondent's 'world', so that it might be influenced
- To develop an understanding of the processes around a situation or event
- The confidentiality of a one-to-one interview is needed for the respondent to be either able or willing to be truthful
- Or when "*the subject matter is highly confidential or commercially sensitive*." (ibid., p. 185).

Given the above, in combination with considering the research design and underlying philosophy of science, it was decided to follow a semi-structured interview method. To facilitate the interview, an interview guide was created. The interview guide can be found in the appendix (Appendix 3).

Due to the current circumstances and development of the COVID-19 pandemic, it was decided to rely on remote interviewing as the primary data gathering technique. The approach allowing for more flexibility while also being more suited to the pandemic situation. An added benefit of remote interviews are that managers can feel less pressured, as they are not obliged to act as host (Easterby-Smith et al., 2018). Remote interviewing has downsides, however, as this type of interview fails to catch the "*immediate contextualization, depth and non-verbal communication*" of 'face-to-face' interviews (Easterby-Smith et al., 2018, p.180). To mitigate this disadvantage, remote interviews

were conducted over a free software-based VoIP[8] telephone service with a video feature, which made remote interviewing possible while also catching the presence-based elements mentioned by Easterby-Smith et al., (2018).

The applied data gathering technique was a semi-structured qualitative interview, conducted using the remote interviewing approach. The interview was conducted in Danish, the native language of the participants. With permission from the participants, the interviews were recorded and transcribed. The transcripts can be found in appendix (Appendix A; Appendix B).

3.3.5 Analyzing qualitative data

To enhance the clarity of the research design, and thus the validity of the study (Yin, 2009) and reliability of the findings (Dahler-Larsen, 2010), the research design includes a description of the strategies applied to create a link between data and propositions (Yin, 2009).

According to Lecompte and Schensul (1999), analysis can be defined as the process of reducing data to a story and interpretation. Patton (1987) describes it as a process of organizing the collected data, using summarization and categorization to reduce the data, then identifying and linking patterns and themes found in the data. Though this way of describing the process might suggest a linear process, this is far from the reality. Data analysis is a circular process, the researcher repeatedly going back and forth between their data, concepts, description, and interpretation (Merriam, 1998). Qualitative data analysis should begin already while data are being collected in the field (in-field analysis) and again when back from the field (off-field) (LeCompte and Schensul, 1999). In this thesis, the in-field analysis consisted of taking notes during the interviewing, as well as recording and transcribing the interviews. The first step in the off-field analysis was to codify the transcriptions.

Coding

Considering Patton's (1987) definition of qualitative analysis, coding can be understood as a way of using summarization and categorization to reduce large quantities of data, by adding codes to segments of text. These codes can then be applied to search for patterns and themes in an interview transcript. However, to codify the transcripts, an approach to coding had to be chosen. Boyatziz (1998) describes three different approaches to coding: *theory driven* coding, *research driven* coding, and *data driven* coding. Theory driven coding is centered around a theory held by the researcher.

[8] Voice over internet protocol (VoIP), also called IP telephony, is a method and group of technologies for the delivery of voice communications and multimedia sessions over internet protocol (IP) networks, such as the internet.

That theory forms the basis for the codes, as well as what could be potential evidence supporting the theory (ibid). However, the codes can also be based on previous research. If the coding is based on codes previously used by other researchers, it should be considered "research driven code" (Boyatziz, 1998). The coding process can also follow an inductive approach, where the data is derived from the data collected during the research. That approach is defined as data driven coding, as the data forms the foundation for developing the codes (ibid). Because the applied framework is developed around previous research on the themes of organizational agility and business model innovation, research driven coding was the chosen approach to coding the interviews.

With the approach in place, the next step was to create a set of codes based on the developed framework (section 2.4). According to Boyatzis (1998), a good code should contain five basic elements regardless of the approach to the coding process: label, definition, identification, qualification criteria, and some good or bad examples to limit errors. Taking these into consideration, the code was developed around an adaptation of the same elements (table 6).

Table 5: Adaptation of proposed elements by Boyatzis (1998).

Element	Description
Label	The reference code or name given to each code. For the codes applied in this research, labels A1 through A4 were used for the codes revolving around organizational agility (OA), and B1 through B5 for the codes relating to business model innovation (BMI).
Definition	A concise description of the theme of the code and how it relates to either OA or BMI. The definition of both the OA and BMI codes are based on the previously mentioned frameworks for OA and BMI (section 2.4).
Identification	A description of how to identify segments of text relevant for a given code.
Qualifications/ disqualifications	For the BMI codes, it is central whether there really are made changes in the BM, or if existing capabilities were simply used in a different way. For OA, specific keywords and descriptions of events that fit with the OA framework. A general principle for both the OA and BMI codes were to go through the two lists and see if it qualified or not.
Examples	Lastly, some of the codes were listed with examples of either good and/or bad examples. This was done in order to hinder errors, while increasing transparency of the qualification process.

Then to facilitate the coding process, two tables were created (table 7 and 8) based on the previously mentioned framework (section 2.4). The tables list the label of each code as well as a concise description, explaining how the codes are defined and how to identify segments of text that fit with that code. Furthermore, the codes also include a qualification criterion and an example to increase validity for each code given, as well as the color assigned to each code. The color coding was part of the codification process, where the entire transcript was analyzed and codified. Applying a dedicated color for each code created a better overview through easy identification of different coded segments of text. The color-coded transcripts are available upon request.

Table 6: Codes related to organizational agility.

Label	Definition	Identification	Qualifications	Examples	Color
A1	Redirection or redeployment of resources within the organization	The redistribution of resources from one place in the organization to another in order to support PPE efforts	It qualifies if directly related to the development or production of PPEs.	Personnel moved to PPE/COVID-19 related departments or workgroups. Equipment redistribution. Financing/funds.	Yellow
A2	Efficiency and effectually: signs of efficient and/or effectual implementation	Does the interviewee mentioning buzzwords related to: effectiveness, efficiency, success	Must be related to the context of: organizational structure; reaction to COVID-19, development of PPEs	Interviewee sharing opinion on the effectiveness of the overall response to the crisis. Interviewee mentioning how the organizational structure facilitated a successful action.	Bright-green
A3	Goals: to create, capture, or protect value	Underlying goals behind the COVID-19 response/ development of PPEs	Was the goal to either: (a) create value; (b) capture value; or (c) protect value?	Gain value through developing new capabilities. Protect value through public relations. Capture value by moving into new PPE related markets.	Turquoise

A4	Internal and external circumstances	Changes as a reaction to either internal or external circumstances	Was the change a consequence of or resulting from internal or external circumstances?	Changes (ex.: in codes A1 through A3) directly related to COVID-19 (external circumstances).	Pink

Table 7: Codes related to business model innovation.

Label	Definition	Identification	Qualification	Example	Color
B1	Mobilization of resources and efforts towards BMI	Does the interviewee mention any mobilization of resources or efforts?	Is it related to (or with the goal of) change in the business model?	Pooling of resources or efforts designated for new business unit or development thereof	Blue
B2	Vision: understanding the problem/create common understanding	Either/both: (a) Efforts towards creating a common understanding among employees about the problem ahead; or (b) Employees already sharing a general understanding of the problem.	How is it expressed by the interviewee? Is it a general perception, or the interviewee's own perception?	Interviewee mentioning efforts to create a common understanding. Expressions that the employees involved share a common understanding of the problem/challenge	Red
B3	Design of new business model(s)	Employees engaging in creative activities related to designing new business models	Is it specifically related to designing a new business model?	Employees directly engaged in designing new business models (ex. using the business model canvas)	Teal
B4	Implement change	Implementation of change; direct actions towards change	The change(s) are related to the business model(s) as understood by the 9-component framework (canvas)	Executed changes in one of the 9 components such (e.g. 'value proposition' or 'distribution channels')	Purple
B5	Control	Managing (control of; oversight with)	Are the management	Interviewee mentioning how	Grey

		activities related to codes B1 through B4	efforts related to codes B1-B4?	the processes/efforts was managed.	

3.3.6 Applied techniques for analyzing case study data

Researchers have pointed out the potential dangers that follows with the amount of data collected in case studies, going so far as to compare it to "death by asphyxiation" (Pettigrew, 1988 in Eisenhardt, 1989, p. 540). According to Eisenhardt (1989), the researcher can avoid "drowning in data" by leveraging cross-case analysis in combination with within-case analysis. Particularly 'within-case analysis' is helpful in dealing with the typically massive amount of gathered data, while cross-case analysis adjusts for researcher bias (ibid.). Yin (2009) several analytic techniques intended to develop internal and external validity in case study research, of which cross-case synthesis was chosen to as part of the analysis strategy for this thesis. As such, a clear analysis strategy serves two purposes: to address the issue of data richness and vastness (Eisenhardt, 1989), and to increase internal as well as external validity (Yin, 2009). Considering the benefits and drawbacks of each technique, it was decided to combine within-case analysis with a combination of cross-case analysis and synthesis. This means that the analysis will focus on searching for differences between a pair of cases, those cases being Grundfos and LEGO. For the analysis, word tables will be applied to represent factors for each case and facilitate a comparison between the two cases to identify commonalities as well as differences. The final analysis strategy developed for this thesis twofold. The first part of the analysis is centered around a within-case analysis of each of the two cases (Eisenhardt, 1989). The second part of the analysis is a combination of cross-case comparison (Eisenhardt, 1989) and cross-case synthesis (Yin, 2009).

In the following section, these different approaches to analyzing case studies suggested by Eisenhardt (1989) and Yin (2009) are presented. The section concludes with a summary of the three chosen analysis strategies and an explanation for the choices made.

Within-case analysis

The first case-specific analytic technique to be applied in this research is the within-case analysis suggested by Eisenhardt (1989). Though the within-case analysis has no standard format, it generally involves a detailed description of a case (Eisenhardt, 1989). The benefits of a detailed description are twofold. Firstly, these detailed descriptions are essential to forming insights about the case(s) in the early stages of analysis (Eisenhardt, 1989). Secondly, it assists in becoming "intimately familiar"

with the case, making it easier to identify unique patterns in the data (Eisenhardt, 1989). This technique was chosen because both results are desirable for answering my research question. Furthermore, Eisenhardt (1989) points at the within-case analysis as beneficial strengthening for cross-case analysis (ibid.).

Cross-case comparison

Eisenhardt (1989) suggest three different approaches to cross-case analysis: (A) selecting dimensions; (B) listing similarities and differences; and (C) dividing data by data source (Eisenhardt, 1989). The first strategy centers around creating categories or dimensions, guided by either the research problem, existing literature, or something likewise. The researcher can then use these categories or dimensions to identify "within-group similarities" coupled with "intergroup differences" (Eisenhardt, 1989). Another strategy is to divide cases into pairs, listing significant features for each case, and then searching for similarities and differences between each pair (Eisenhardt, 1989). This method forces the researcher to search for subtle similarities or differences between each pair of cases. By forced comparison of superficially similar cases, the researcher may be able to find unanticipated differences. Correspondingly, forced comparison of different cases in search for similarities can also lead to a better understanding of a subject. In summary, forced comparisons can facilitate increased understanding and assist in identifying unforeseen patterns or themes (ibid.). The third and final strategy suggested by Eisenhardt (1989) is dividing the data by source, thereby utilizing the unique insights generated by different data collection methods. Eisenhardt (1980) gives the example of three researchers working together, where one researcher focuses on observational data, another evaluates interview data, and the third goes through the results of a questionnaire. Each data source is unique and different patterns are likely to emerge, but having a pattern that is supported by more than one data source makes it both strong and well-grounded (ibid.). Conflict of evidence between the data sources indicates opportunity for deeper probing into what these differences could mean. Furthermore, through conflict of evidence, it is possible to reveal random patterns or researcher bias (Eisenhardt, 1989). This ultimately increases the validity of the findings. In summary, the point of applying these different strategies is to forego initial impressions, and through application of structure and viewing the data through different lenses, enhance the probability of capturing novel findings hidden in the data.

Considering the approaches to cross-case analysis suggested by Eisenhardt (1989), the correct one must be chosen for this specific case study. The "categories/dimensions" approach could very well be a relevant strategy to apply. However, this approach excels when dealing with huge data sets. This

makes this particular strategy less relevant for the research at hand, as the data sets are relatively small by design. On the other hand, 'dividing data by data source' is dependent on having access to sufficient capabilities and resources in order to truly excel. In Eisenhardt's (1989) example, this includes at least three researchers, each focusing on their own data collection method. However, that is not the case in this specific research. Being limited as a single researcher, trying to make this analysis strategy fit is not an effective use of time. Consequently, the chosen approach was to search for similarities and differences between the two cases, building upon the findings from the within-case analysis.

Cross-case synthesis

Yin (2009) recommends five analysis strategies to link data to propositions, from which cross-case synthesis was chosen because it was the best fit for answering the research question. The cross-case synthesis is specifically targets analyzing multiple-case studies (Yin, 2009). As such, the minimum requirement is two cases, with additional cases only further strengthening the findings. The analysis is similar to the 'cross-case analysis' strategy proposed by Eisenhardt (1989), in that it focuses on identifying possible patterns in the form of shared similarities between cases. The essence in cross-case synthesis is to collect data from different cases and compare the results from each case, seeing if any patterns emerge (Yin, 2009). Data from each case should be summarized into specific features that are significant for that case. For cross-case analysis, Yin (2009) suggests creating word tables to display data from each individual case according to a chosen framework. By using word tables, it is possible to go beyond the features of a single case, and instead consider a set of features across several cases (ibid.). This facilitates the cross-case comparison, easing the process of identifying differences and commonalities. These word tables should display significant features from each individual case side-by-side with the data from the other cases (Yin, 2009 p. 156). However, it requires a uniform framework applied across the cases such as the one developed for this thesis (section 2.4). When using cross-case synthesis, one should be aware of the possible pitfalls, the main issue being that analyzing word tables for possible cross-case patterns relies on argumentative interpretation (Yin, 2009). To mitigate this weakness, I have sought to develop arguments that are both strong, plausible, and fair, and directly derived from and supported by the data.

Chapter 4: Presentation of the case firms

According to Yin (2009), it is imperative to be conscious of the unit(s) of analysis. Thus, before analyzing the data, the two cases are described and introduced. The units of analysis are the two Danish MNE's, LEGO and Grundfos. The following text includes a brief description of each, followed by a summary of how each organization expects to be impacted by COVID-19.

4.1 LEGO

LEGO is a family-owned business, founded in 1932 by Ole Kirk Kristiansen in Billund, Denmark where the HQ is still located today (LEGO, 2020b). Internationally known for their iconic LEGO bricks, they are one of the leading toy manufacturers in the world (LEGO, 2021). The LEGO Group employs over 18,800 people, working across 570 LEGO branded stores, 37 regional sales offices, 4 regional hubs, and 5 manufacturing sites located in Denmark, China, the Czech Republic, Mexico, and Hungary (LEGO, 2020b). The famous LEGO bricks are distributed in over 130 countries (ibid.). Their main activities include the "development, production, marketing and sale of play materials" (LEGO, 2020b, p. 8). According to the LEGO Group, innovation is critical for their success, with new products making up approximately 60% of the product portfolio (ibid.). Furthermore, the group states that: "R&D activities include developing new technologies to enable learning through play, trend spotting, anthropological studies, and collaborating with educational institutions to deepen our understanding of children's development" (LEGO, 2020b p. 8).

4.1.1 COVID-19 impact

Due to high demand, LEGO achieved growth in the double digits during the first half of 2020 (LEGO, 2020a). Consequently, LEGO saw an increase in consumer sales, leading to increased revenue, profit, and market shares (ibid). While the toy industry as a whole did see a trend of growth during lockdown periods, LEGO's market shares in the larger markets[9] increased at an above average rate. According to LEGO, they were capable of dealing with the consequences of COVID-19 due to previous strategic investments. Comparing the first half of 2020 to that of 2019 shows how the increased demand affected LEGO: Consumer sales grew by 15 per cent, revenue grew by 7 per cent (DKK 15,7 billion), and profits grew by 11 per cent (DKK 3,9 billion). At the same time, significant investments were

[9] North- and South America, Western Europe, Asia, and China (LEGO, 2020a).

made in long-term growth initiatives. Negative impacts of the COVID-19 crisis included increased shipping costs, as production facilities in Mexico and China were temporarily closed. Furthermore, despite the growth and improved operation profit, LEGO failed to deliver improvement on the bottom line (Bitsch, 2020).

4.1.2 Summary of the course of the PPE projects LEGO

The manager leading LEGO's PPE project team was Hanne Træholt Odegaard. Hanne has been employed at LEGO for 27 years, where she has been working with product development and fringe business areas. The common factor between all her projects were that they were new, challenging, and unique tasks. Now she works at LEGO engineering, where she has been the manager in charge since December 2019. In her current position, she manages the molding analytics center, a type of R&D foundry. They have 24 casting machines and their own workshop and storage for molds. They are working on qualifying new sustainable materials as part of LEGOs ambition to become sustainable and drop oil-based plastics company by 2032 (Appendix B, l. 64-67).

Many things were going on in the organization when the pandemic hit Denmark. Being a new department, employees had to find their place within an unfamiliar setting, getting to learn their new co-workers and managers. People did not know each other and were not used to working together. However, Hanne saw this project as something that actually helped bring them together (Appendix B, l. 363-367).

The LEGO team worked with two projects related to the pandemic in Denmark. The first was a facial PPE project where they designed and produced a visor. The second project was a component for COVID-19 testing used at biolabs (Appendix B, pp. 4-5). However, it should be noted that the component project is treated with some degree of confidentiality, so the LEGO source was more inclined to elaborate on the first track (ibid., lines number 103-104). The visor project began when an engineer from the 'engineering' department contacted the vice president of 'engineering', John Hansen, asking if LEGO would consider producing PPEs to assist with the impending shortage. The engineers were willing to work on developing a prototype for a facial PPE (i.e., facial visor) in his spare time (Appendix B, l. 76-82). Being married to a nurse, the engineer knew that healthcare providers was in dire need of PPEs. Using his wife as a focus group, he came up with several designs. With the designs in place, they needed to find out where to produce them. After some back and forth, the production was assigned to the LEGO production facilities in Denmark, where it was reassigned

to the engineering department because the atypical product was interfering with the production department's output.

The component project sprouted from LEGO's cooperation with the national crisis staff, NOST[10]. This project did not require them to start from scratch, as the design was licensed to them via a third party (Appendix B, pp. 4-5). While the goal of the first PPE project was to develop visors for healthcare personnel, the second project was to supply biolab testing facilities with a vital component they needed for COVID-19 tests (ibid.). Both projects were treated by LEGO as donations (Appendix B, l. 138-140).

4.2 Grundfos

Established in 1945, Grundfos is one of the leading water technology companies in the world (Grundfos, 2021). With headquarters in Denmark, they are the largest pump manufacturer in the world, employing over 19,000 worldwide. On a global scale, Grundfos is represented by more than 100 companies, spanning over more than 60 countries (ibid). Grundfos's stated purpose is: "to pioneer solutions to the world's water and climate challenges and to improve the quality of life for people." (Grundfos, 2020a p.4). According to the CEO, R&D activities are critical for Grundfos and a vital part of their 2025 strategy (Grundfos, 2020a). As stated in the Grundfos Group's 2019 annual report (ibid., p.4), their goal is to: "innovate to differentiate, as differentiation is our primary source of competitiveness". The R&D functions are primarily located at the Grundfos headquarters in Bjerringbro, Denmark, with some R&D teams located in 'key markets' such as Hungary, United States, and China (ibid., p. 5).These activities include research into: "materials, product development, production technologies and methodologies etc." (Grundfos, 2020a, p. 5). Furthermore, Grundfos "partners with universities and public and private partners, supporting research activities and applying technology in practice" (ibid., p. 5).

4.2.1 COVID-19 impact

Grundfos had a record-breaking year in 2019 in terms of record earnings, cash flow, employee motivation, and employee satisfaction (Grundfos, 2020a, p. 4). However, because of the ongoing pandemic, CEO Mads Nipper stated that they expected a 'flat' or 'meager negative' sales growth for

[10] Den Nationale Operative Stab (NOST) assemble during large scale crisis or events in Denmark. They are to secure cooperation and coordination between authorities during such events. From: politi.dk/samarbejde/den-nationale-operative-stab-nost

2020, compared to that of 2019 (ibid.). On the Chinese market, sales have been so critically hit that the leadership deems it impossible to regain those losses in the remaining year (Stenvei, 2020). As a consequence, Grundfos expects "significant negative impacts on both the demand and the supply side" (Grundfos, 2020a, p. 5).

4.2.2 Summary of the course of the PPE projects Grundfos

Through their participation in the taskforce setup by Dansk Industri (DI), Grundfos was requested by the Danish Medicines Agency to help with the immediate PPE shortage (Appendix A, l. 63-64). Only 36 hours after being contacted by the Danish health authorities, the Grundfos team had created a prototype for a plastic visor, a specific type of PPE mainly used by medical professionals (Grundfos, 2020a).

The team applied 3D printing technology to create the prototypes (Appendix A, pp. 3-4). However, the 3D printing process was not suitable for mass-production, and so the final product could be manufactured with injection mold technology more suitable for mass-production (ibid.). By Friday April 3rd the final product was ready to be produced in a traditional plastic production tool, and full-scale production commenced with a production capacity of 5,000 units/day (Grundfos, 2020a).

Leading the PPE team was Torben Buch Rasmussen. Torben has been with Grundfos for 20 years, and throughout this period had been working in management in different positions. Since 2008, he was a manager for the technology center and everything belonging to the Grundfos technology center. In 2019, he took on responsibility for Grundfos' partnerships in 'Advanced Manufacturer Engineering'. The department is a R&D type of facility where, among other things, they work with designing and producing production equipment. This meant that they had access important resources such as casting tools, high-quality 3D printers, and different automation tools.

The PPE project team from Grundfos worked on two projects. First, they designed and produced a facial visor for healthcare professionals (Appendix A). Then, when the Danish serum institute was in acute need of reservoirs for COVID-19 testing, they began production of those too (ibid.).

Grundfos did not only distribute the PPEs within Denmark, but in every country where Grundfos had production facilities (Appendix A, p. 4). As a globally oriented company, Grundfos Denmark began to receive requests for PPE from hotspots such as Italy and France (ibid., l. 121-125). After providing the Danish healthcare services with approximately 100,000 visors, Grundfos was able to obtain the

same type of dispensations for the visors from local authorities in France (Appendix A, l. 131-133). They then began to send these visors to communities around the world through the local departments of the Grundfos Group (ibid., l. 135-136). For instance, a facility in France delivered 2,500 visors to a local hospital (Grundfos, 2020a). After being contacted by Doctors Without Borders[11], they were able to obtain a dispensation to supply third world countries and quickly improved the existing design, so that the foil of the visors did not have to be replaced, but simply sanitized between uses (Appendix A, l. 142-144). They supplied Doctors Without Borders with approximately 30,000 units of this improved visor design.

Chapter 5: Analysis

5.1 Analysis part 1: Within-case analysis

The first part of the analysis is focused on the two individual cases, using interviews of the managers in charge to conduct a 'within-case analysis' of the transcripts. This provides a view inside the two cases from the perspective of the managers in charge of the PPE teams. The analysis will follow the framework developed for this very purpose, as described in *methodology* (section 3.3.6).

Following the framework, the analysis starts off by seeking to answer the research questions in several steps. The first step involves seeking answers to the first two underlying questions: (A) are there signs of organizational agility, and (B) are there signs of business model innovation. Then, going a step further, the analysis also seeks to create knowledge around possible patterns that could indicate capabilities that enable agile business model innovation in large firms. Identifying organizational agility following the framework meant seeking to identify movement, type of resources, efficiency, goals, and the effects of internal and external factors. For identifying business model innovation, it meant to search for instances that could be indicative of one of the four phases of the BMI process suggested by Osterwalder and Pigneur (2010). The analysis will first be presenting the themes related to organizational agility (codes A1-A4 in the framework), and following that, the themes related to business model innovation (codes B1-B5).

[11] An independent, global movement providing medical aid where it's needed most https://www.doctorswithoutborders.org/who-we-are

5.1.1 Grundfos

The following are the results of the within-case analysis of Grundfos, using the framework developed for this research (section 2.4). The findings are listed in accordance with the developed framework. The first part goes over the themes related to organizational agility (resources, efficiency, goals, and internal/external factors). Then the findings are summarized before presenting a sub-conclusion on the (1) signs of organizational agility; and (2) signs of business model innovation.

Resources

Analyzing the interview reveals four types of resources that were fundamental for the success of the Grundfos case: (1) Personnel solely dedicated to the PPE project team; (2) equipment and tools for design and development (R&D); (3) empowerment from top management; and (4) funding.

(1) Personnel solely dedicated to the PPE project team

The team included 6-7 people who were solely dedicated to this team. The manager in charge, Torben, allocated the people for his team based on his knowledge about their skills and the capabilities needed to complete the task: "So we were 6-7 people that were able to get this developed, tested, get the tools running and make all these agreements" (Appendix A, l. 160-162). Because of his in-depth knowledge about the organization and the people working within it, Torben knew exactly who to hand-pick for his team. Furthermore, the people assigned to this team were solely dedicated to this project. Any tasks they were currently working on were put on hold: "They basically threw everything they had in their hands, to work on this 100 percent" (ibid., l. 282-283). They, as human resources, were moved from their previous tasks throughout the department to only work on the COVID-19 team. Torben mentions this specifically as being key to their fast and highly efficient results: "(…) it is 100% an advantage if you need something to go fast. The thing about having only one man 10% of the time and then you have to share him with 7 other projects, that is… That definitely affects the speed" (Appendix A, l. 283-286).

(2) Equipment and tools for design and development (R&D)

Through their department, an R&D type department, the team had access to existing resources in the form of casting tools, top of the line 3D printers, and various automation tools. These resources were key to creating the prototypes for the visors. These resources were part of the department's existing resources, meaning the team already had access to these resources, it was actually how these resources

was leveraged to solve a completely different task (PPE projects) than their daily activities that indicate agile use of their resources.

(3) Empowerment from top management

Another important factor was the empowerment that was handed to the project team. They were given freedom to make the decisions they needed in order to get things going, thereby eliminating unnecessary bureaucracy and speeding up the whole process. As Torben described it, the team received: "(…) maximum backup from our management to do this" (Appendix A, l. 232). Resources in the form of funding came from the Grundfos Fund, from which they received a budget of DKK 2 million. For the team, that meant they did not have to worry about the economic aspect (ibid., p. 8). They had the funding, and they did not have to worry about profit margins because: "It's not something we have to go out and make money on" (Appendix A, l. 239-240).

(4) Funding

The interview also reveals an indicator for agile movement of resources in a global organization. Having a global presence, Grundfos also has departments in early COVID-19 hotspots such as Italy and France. After supplying the Danish healthcare system with approximately 100,000 visors, Grundfos secured PPE dispensations for France and Italy and supplied their departments there with the PPE developed and produced in Denmark (Appendix A, p. 5).

Efficiency

The best example of efficiency in the Grundfos case is demonstrated by the team's completion of the project within 7 days. As Torben said: "And we actually succeeded to, from the moment we had an idea of what the design should look like, we got it up and running in 7 days. So it was, after all, so much faster than what we were used to" (Appendix A, l. 177-178). This was a process that would usually take several weeks to complete, even for the quickest of projects (ibid., l. 182-183). This was something that Torben referred to as: "a significant paradigm shift in terms of what things usually take time" (Appendix A, l. 186).

With the exception of a few people from the team who were working at the Grundfos laboratories, the rest of the team worked remotely. Yet, through 2-3 daily meetings, they were able to stay updated on the process and still work together efficiently as a team. Torben remarked that this broke with the traditional idea that teams must be physically together in order for things to move quickly. However,

as they quickly realized, that was not the case. By staying in touch 2-3 times a day, the team was able to work remotely from home and still work efficiently as a team (Appendix A, l. 202-211).

Goals

The goal behind the two Grundfos PPE projects was simply to provide help as fast as possible. Or as Torben stated: "to help here and now, because there was no one that supplied these [PPEs] here and now" (Appendix A, l. 343-344). In essence, their efforts were concentrated on the short term goal of providing immediate relief. From the very beginning of the process, it was decided that they did not wish to begin mass-production at a commercial scale: "It was also an emergency product, you could say, so we did not go in and think that we should develop something that was a competitor to those who made a living from making such products" (ibid., l. 346-348). According to Torben, Grundfos had no plans to gain anything from the project, as it was a non-profit project. Furthermore, there were no plans to expand into the PPE market, "so that was clearly our goal in the process as well. That we should not go out and compete and sell this in any way. It was to show community spirit in a critical situation" (Appendix A, l. 350-352). Furthermore, Grundfos was not alone in that opinion: "And that's also what some of these other companies, including LEGO, did. They have also just gone into something and said that we have the competence to help, and we would like to do that. But it should not be made a new business area for us, to make visors or reservoirs for corona-testing" (Appendix A, l. 354-357).

External/internal factors

It is safe to say that external circumstances caused Grundfos to react in this case. As COVID-19 began to interrupt supply chains, there was a rapid increase in demand for medical supplies, including PPE. This resulted in an imminent shortage of PPE worldwide, which could have fatal consequences for healthcare professionals as well as the global population. Grundfos got involved when the Danish healthcare authorities began to reach out to Danish businesses, through the interest organization 'Dansk Industri' (DI)[12]. DI created a coordination taskforce in collaboration with the healthcare authorities, which then contacted Grundfos. CEO Mads Nipper then inquired openly throughout the organization if this was something that Grundfos was able to help with. This included the department that the interviewee was working at, Advanced Engineering: "(…)And [the department] came to the

[12] Dansk Industri (The Confederation of Danish Industry) is the largest and most influential business and employers' organization in Denmark. The organizations cover "manufacturing and service industries such as transport, energy, IT, health, trade and professional services". Retrieved from: https://www.danskindustri.dk/english/about-di/who-are-we/

agreement that we were able to. Because we have some very broad competences regarding production. And we actually also have a lot of people that are able to manufacture our own equipment" (Appendix A, l. 65-68).

5.1.2 Summary of within-case analysis of Grundfos

The within-case analysis of Grundfos revealed the following as possible factors that enable agile capabilities:

- Dedicated personnel
- Equipment and facilities: R&D facility, equipment for designing a product, creating prototypes, and even some production capacity
- Empowerment from top management
- Funding
- Lack of hindrance from displacement (remote work); 2-3 points of contact per day, most of the team worked from home.
- Clear *why* was also fundamental for their engagement

Signs of organizational agility as understood by the proposed framework

Using the codes developed from the framework, there were several passages in the interview that indicated organizational agility. The codes were assigned to these passages in accordance with the approach described in *methodology* under coding (section 3.3.5.). After the first pass, the coded segments of text were further scrutinized, validating each based on the individual qualifications for each code, which were crafted before the coding began in accordance with the guidelines suggested by Yin (2009). After the second pass, it became clear that there was sufficient basis for determining that the Grundfos case showed signs of organizational agility based on the four framework categories (resources; efficiency; goals; internal/external factors). Grundfos successfully managed to redistribute resources from other places in the organization to support and finance an efficient response to the external threat, in the form of the pandemic and immediate shortage of PPE supplies.

Signs of business model innovation as understood by the proposed framework

Based on the framework, some signs were detected, though these were few. It is also important to note that only very few codes were assigned, and several of the codes were never used. These are noticeably the codes that are, arguably, the most significant in regards to deciding whether or not there are signs of business model innovation, specifically codes B3 (design new business model) and

B4 (implement change). It should also be noted that several segments of text that were given the organizational agility code A1 (redirect or redeploy resources within the organization) could also fit business model innovation code B1 (mobilize resources and efforts). There are also overlaps between A4 (internal and external circumstances) and B2 (understand the problem/create common understanding). In this specific case, the overlap between A4 and B2 can be explained by the significance of the ongoing pandemic. This unprecedented external circumstance created a clear *why*[13]. There was a general understanding of the problems and the reason behind the efforts put into the PPE project. As the interviewee himself said: "so in the situation we were in, it was no problem to create a *why*" (Appendix A, l. 230). The interviewee then specifically remarks that no changes have been made in response to the PPE project: "We apply agile project management which you can say that we already did that before corona was a thing. So that wave continues" (ibid., l. 262-263). When asked directly if the project had affected the existing business model in any way, he answered that:" No, because as I said it was already started this agile project management. It is running and is also part of a new strategy we are rolling out, so you can say that it was already started, mentally, before we began on the project" (Appendix A, l. 385-387).

5.1.3 LEGO

The following are the results of the within-case analysis of LEGO, using the frameworks developed for this research (section 2.4). The findings are listed in accordance with the developed framework. The first part goes over the themes related to organizational agility (resources, efficiency, goals, and internal/external factors). Then the findings are summarized before presenting a sub-conclusion on: (1) signs of organizational agility; and (2) signs of business model innovation.

Resources

Based on the interview, it was possible to identify three resources that played a key role in the LEGO case: (1) flexible transferring of team members; (2) funding; and (3) the capability to leverage existing resources.

(1) Flexible transferring of team members

In the LEGO case, the composition of the team working on the PPE project was very flexible. While the manager in charge, Hanne, mainly drew on the department's existing systems and competences,

[13] Simon Sinek presented the importance of having a clear "why" for the first time in a Ted talk. The concept has gained great popularity among managers worldwide. See https://www.ted.com/talks/simon_sinek_how_great_leaders_inspire_action for more.

she also recruited people from many different departments. The processes involved in designing, developing, approving, and producing the visor required a wide variety of expertise, and Hanne continuously considered which competencies were needed to solve the next challenge (Appendix B, l. 166-168). This kept the team very flexible regarding the composition of talents, as members were transferred in or out based on the current challenges in the process. Being able to bring in expertise from different departments appears to be a key resource in the team's ability to overcome obstacles and maintain the high pace of the PPE projects.

(2) Funding

Funding was also fundamental to the success of the PPE team. LEGO funneled capital from their fund to the project, securing the team a budget. Consequently, the team could focus on the PPE, which was a high priority for LEGO management: "We [LEGO] donate a rather large pool of money and people, and is told that this has high priority" (Appendix B, l. 256-257).

(3) Leveraging existing resources

During the pandemic, the demand for famous LEGO bricks were not negatively affected by COVID-19, and LEGO managed to keep production running the whole time. However, due to the pandemic, a factory in Mexico had to shut down, severely affecting production output. But this was where Hanne's department stepped in, realizing they had the equipment and manpower to spare and help boost production (Appendix B, l. 208-218). Production machines and equipment, normally used for R&D, were leveraged to help with the production of other LEGO products while the factory in Mexico was shutdown. While not directly correlated to the PPE project, they did manage to do this while also running the PPE project and keeping up with their regular activities: "We were able to allocate some machines, which we initially thought we were going to use for something else. So, they stood and ran production for 3-4 months, I believe over 10,000 casting [production method] hours over in production, while we also produced PPE's, at the same time that we also did what we were actually put in this world to do, which is to test subjects and qualify new materials" (Appendix B, l. 215-218). This demonstrated a very efficient use of existing resources, as well as a flexible approach to daily operations. They managed to not only complete their necessary tasks but was also able to lend their resources to help with internal circumstances in the form of missing production quotas because of factory shutdowns in Mexico. It is also an excellent example of organizational agility; in that they leveraged their resources and allocated those resources to boost different areas of their business in response to an external threat.

Efficiency

By coding the transcribed interview, several examples indicating efficient use of resources and/or capabilities were revealed. Foremost, it should be noted that the department has been running throughout the pandemic. If a co-worker showed symptoms of COVID-19, they would quickly shut down a shift, clean and sanitize everything, then wait 48 hours before returning to work. That way they were able to keep operations running the whole time (Appendix B, l. 197-200).

The second PPE project was also described as having undergone a very efficient process. As the interviewee said: "We [the department] were contacted on a Friday and then we began construction on a form that Sunday and within a very short time, well within three weeks, we had actually cast the first subjects" (Appendix B, l. 111-113). Another statement that further emphasizes the speed at which they were able to get things done: "Under normal circumstances it would take a few years to develop this construction. And we are talking from, I believe we began sometime in March, and we had an approved subject in June" (Appendix B, l. 297-299).

Another element that played an important role for the team's effectiveness was the flexible way in which members of the team were transferred in and out of the project. They were quick to realize that the initial team of people, who excelled at designing a subject and were knowledgeable on forms and materials, were not the same people the team would need for the following steps. Those steps required people who excelled at creating structures and frameworks for inventory, distribution, master data, and so on (Appendix B, l. 160-165). For example, they quickly had a lawyer join the team to handle contracts and legalities, and another one to be the contact point to the healthcare authorities regarding getting the approvals and exemptions needed to produce the PPEs, as well as manage the master data they got someone from their planning department (ibid., l. 168-171). Consequently, the initial team was different from the final team: "So there are some of the people that were in at the beginning, that are not in the team now" (Appendix B, l. 168-169).

To stay on top of the challenges and effectively manage the two projects, Hanne relied on frequent meetings. They met every morning and often several times a day to check-in, get a status and keep a structure in terms of what to check up on and how to delegate tasks. Again, by ensuring that everyone felt responsible, they would also receive part of the credit. As Hanne saw it, this played an important role in securing overall effectiveness.

Another good example of the effectiveness of the department and the PPE team was when they tried to hand over the production of the visor (first track) to the production department. The initial idea was that being much better equipped to, and more used to mass production, it would be more efficient to let the production department handle production of the visor. However, the PPE team very quickly realized that this was actually disrupting their operations, because the item was so different from their modus operandi. Subsequently, it was decided to move production of the PPE back within their own department (Appendix B, pp. 11-12).

The production department, however, was an excellent example of being so efficient that it suffered in terms of flexibility, due to the rigidity demanded for optimal production efficiency. As Hanne also stated: “The entire backbone of our production is very structuralized” (Appendix B, l. 143-144).

The nature of the department was also worth mentioning. This relates to the equipment and tools mentioned under ‘resources’, however, it goes beyond that, as being a R&D type department meant they had unique capabilities to handle new challenges. As Hanne said: “I also think that… things happen in development departments when you suddenly get something in, that does not resemble what you usually do” (Appendix B, l. 349-350). Their unique capabilities enabled them to tackle the challenges differently, and certainly effectively. And as Hanne said, they were able to: ”So we found solutions where there perhaps was limitations, or perceived limitations, so those limitations are just gone. We had to find ways around them.” (ibid., l. 376-379).

Furthermore, the utilization of equipment, such as machines and production facilities, increased significantly during the experience. By adding more shifts at odd hours, they were able to increase machine utilization and their output (Appendix B, l. 372-375). Overall, the efficiency of the PPE team and the department as a whole is best illustrated in the statement: “We have also improved our output by, I believe around 20 percent in operations. And on top of that, it has been during corona and we have also run production on the side. So that’s something where, if you just look at the numbers alone- if you had told me that just a year ago, then I would have said that it would be impossible to do” (ibid., l. 353-356). One of the ways they managed to accomplish this was by having people working extra and at odd hours: “Well, it has broadly been something that people have been doing on the side. So there has been some double-jobbing, or something like this having the priority that it has, so as I also said, it has really been an extraordinary effort where people have come in during the Easter holiday and in the summer holiday and have been running, well above and beyond what one normally could expect” (Appendix B, l. 176-179).

Finally, it should be highlighted that empowerment played a key role in the success of the two PPE projects. According to Hanne, top management showed a great deal of trust, empowered the team to make decisions, and avoid unnecessary bureaucracy (ibid., l. 234-235). That is, empowering the people that were directly involved, to make decisions as the situation required. Being empowered to make decisions as needed played a major role in being so efficient. This meant that they avoided many formalities regarding asking for permission to do things, or leveraging external partners, because time was short (Appendix B, l. 235-237). As Hanne describes it: "And the thing about us not constantly having to go back for approvals and not constantly have to ask for funding or sit in a committee to make decisions. That has been a giant victory and a huge prerequisite for this to succeed" (ibid., l. 242-244).

Goals

According to Hanne, the goal behind LEGO's two PPE projects was purely humanitarian; both the PPE and the test-equipment projects were treated as donations. Furthermore, for the second project, with both LEGO and the company holding the original patent to the product, these were still treated as donations rather than business opportunities. As Hanne stated: "(…)We did it as a donation, and so we gave it away" (Appendix B, l. 137-138). Furthermore, it was emphasized that management made a conscious effort to not use the LEGO brand in any way or leverage their PPE efforts for marketing purposes (ibid., l. 188-192). This was further underlined by the following quote: "Because that is not what has been the motive behind doing it. It has been like this; we have these competencies, we can do a difference, and we have been allowed to do so" (Appendix B, l. 281-282).

There were, however, two unintended benefits as a result of their PPE projects. The first unintended gain was positive PR and general acknowledgement for their efforts. Despite LEGO's intention to avoid public announcements and use of the LEGO brand, the PPE projects have resulted in wide recognition of their efforts towards making a huge difference for the people involved in fighting COVID-19. The acknowledgement has come from business partners as well as on social media such as Facebook (ibid., l. 188-192). Another unintended result from the PPE efforts, was a significant increase in employee satisfaction and internal goodwill. At the time of the interview, Hanne had just received the results of an employee satisfaction survey. This showed that for LEGO in general, employee satisfaction has never been higher. Their PPE efforts have created what is described as: "A huge internal goodwill" (Appendix B, l. 277). Part of this can be explained by their facing a situation where they managed to succeed in something previously thought of as impossible (ibid., p. 10).

Furthermore, as Hanne states: ”And doing something in a different way than we are used to. And it has been very good for us. And it has been very good for my department, because we found out that we are actually capable of more than we thought possible” (Appendix B, l. 212-214).

External and internal factors

Though there was without a doubt some effects stemming from the ongoing pandemic, the interview revealed more about exactly how external circumstances and internal circumstances resulted in LEGO management taking action. The external pressure of the developing situation during the pandemic and the need for expediency is exemplified in the statement: “(…) Because the time was so critical” (Appendix B, l. 375-376). This led to the establishing of the PPE team and the following two projects they concluded. As previously mentioned, the LEGO PPE team had two projects, or “tracks”; (A) a visor, where one employee acts and asks his boss if he can work on this in his spare time; and (B) the confidential track, where they did not design but did manufacture “something” for the COVID-19 testing labs. The first track resulted from an employee in Hanne’s department, whom, being married to a nurse, was aware of the acute shortage of PPE in the Danish healthcare system. As such, the employee asked for permission to work on a set of visors in his spare time. Consequently, that was how the first PPE project began. The incentive for the other project was the initiative of NOST, whom LEGO had been in contact with through a combined taskforce. Both projects came from immediate problems that needed solving, despite the fact that they were a far from the company’s modus operandi. As Hanne described it: “(…)Something coming in from the right” (ibid., l. 144). That is to say, a curveball; an unforeseen, difficult challenge that suddenly came into being.

5.1.4 Summary of within-case analysis of LEGO

The within-case analysis of LEGO revealed the following enabling factors that made the project possible:

- R&D facility, with equipment allowing for designing, testing, and producing new products
- Flexible transferring of team members
- Funding
- Capability to leverage existing resources, including:
    - Knowledge (who to use) and know-how (skillsets)

Signs of organizational agility as understood by the proposed framework

Based on the applied framework, the case shows signs of organizational agility. This is further underpinned by a statement the interviewee made after being asked about how it was possible for them to achieve such impressive results: ”Well I think that being agile, that is to say; we know what we have right now and we now what we have to do, how do we get it done? And it is then that we have been forced to think creatively, and I actually think that we accomplished that every well” (Appendix B, l. 225-227).

Signs of business model innovation as understood by the proposed framework

In analyzing the interview, it was only possible to identify a few signs of business model innovation (BMI). Of those few, most of the coded text passages were revealed as overlaps between A1 and B1, as well as A4 and B2. This means they could be translated as markers for both organizational agility and BMI, based on the applied framework. Due to the lack of more convincing BMI markers, it is hard to justify these as indications of BMI. This was further cemented by Hanne’s own words: “We have not created a business unit that makes COVID-19 protective equipment” (Appendix B, l. 74-75). In other words, it was never intended as a conscious change in their business model, but as a short-term relief of the PPE supply chain, helping the Danish healthcare system by doing what they could.

5.2 Analysis part 2 - Cross-case comparison

The second part of the analysis is based on a cross-case comparison of the two cases. As mentioned in methodology, this part of the analysis follows a modified combination of approaches from two leading experts on the case method: Yin (2009) and Eisenhardt (1989). The analysis begins with a list of characteristics and themes for each case, then describes the similarities and differences between each case. Following that is an analysis for patterns using Yin’s (2009) approach to cross-case synthesis, then a consideration of whether they were unanticipated or anticipated. The findings are presented in keywords in the table below (table 9).

Table 8: Findings; similarities and differences between the Grundfos and LEGO case.

Similarities	Differences

▪ Significance of R&D capabilities ▪ Leveraging network ▪ Goals ▪ Clear why ▪ Internal funding ▪ Handpicked staff ▪ Empowerment ▪ Global presence ▪ Expediency ▪ In-depth knowledge and familiarity ▪ Frequent meetings and check-ins ▪ Unintentional gains ▪ Internal and external initiatives ▪ Two projects: PPE and component ▪ Additional humanitarian initiatives	▪ Operations and how they were affected by COVID-19 ▪ Meetings and check-ins; practicalities ▪ Teams: dedicated vs split tasks ▪ Global response; differences in ▪ Affected by the pandemic at company level ▪ Level of expediency ▪ Type of gains ▪ Difference in origin of internal initiative

5.2.1 Similarities

Significance of R&D capabilities

In both cases the responsibility for the PPE projects was handed to research and development (R&D) departments. Both departments had resources that included personnel and equipment to ideate, design, and produce prototypes. Furthermore, for both cases, it was evident that these capabilities could also be leveraged to produce the final PPE product. These resources played a key role in the teams' capacity to deal with the posed challenge. Additionally, both Torben and Hanne mentioned that the specific nature of R&D-type departments was special, and that special mentality/approach to problem solving was key to their success. Furthermore, it should not be overlooked that R&D efforts play a major strategic role for both organizations. Being major players – some would even say, market leaders – means they have to stay on top of their game. Consequently, both case firms put significant strategic investments into R&D.

Leveraging networks

A similarity shared between the Grundfos and LEGO cases was that they both needed cleanroom[14] production facilities for producing their secondary projects (equipment for COVID-19 testing). This was not a capability that they were already equipped with. Instead, they ensured this capability by leveraging their business networks to secure adequate levels of cleaning through third parties.

Goals

The two cases were also similar in that the goal behind their PPE projects were to help alleviate the pressure on the Danish healthcare system by providing PPE. Beyond that, the efforts were considered non-profit donations. The motivation behind their actions can therefore be regarded as humanitarian. The manager leading the Grundfos team, Torben, explicitly stated that they had no future plans to enter new markets or challenge existing suppliers. It was merely a means of temporary relief until the incumbent supply chains were up and running again. The manager leading the LEGO team, Hanne, stated that LEGO made conscious efforts to not use the LEGO brand, and to not use their efforts towards PR-gains or any type of marketing. This leads to another thing that the two cases had in similar; that there were no changes in their business models nor any conscious efforts to design new business models around PPEs.

A clear "why"

In their respective interviews, Torben and Hanne both stated that there was a very clear *why* shared by everyone, not only within their teams, but throughout the whole organization. Furthermore, they both believed that this played an important part in the extraordinary effort put into the COVID-19 projects.

Internal funding

Funding for the projects, in both cases, came from internal funneling of liquidity. In the Grundfos case, funding was secured from the Grundfos Foundation (Appendix A), whereas funding in the LEGO case were secured from the LEGO Foundation (Appendix B).

Handpicked staff

[14] A cleanroom or clean room is a facility ordinarily utilized as a part of specialized industrial production or scientific research. Cleanrooms are designed to maintain extremely low levels of particulates, such as dust, airborne organisms, or vaporized particles. From: https://en.wikipedia.org/wiki/Cleanroom

The two cases also share the similarity of team members having been handpicked. There were, however, notable differences in how this was done, and the nature of the teams. These differences are listed in section 5.2.2.

Empowerment

Both interviewees mentioned several times that being empowered by top management played a big role in their success, and particularly in the speed at which they managed to complete the projects. This meant that the people who were knee-deep into the process had the freedom to make calls and act on decisions, thereby avoiding unnecessary bureaucracy.

Global presence

Another similarity is that both LEGO and Grundfos are global organizations that were able to help local branches in different countries. The two cases showed this in different ways. In the Grundfos case, Grundfos Denmark sent PPEs to their facilities in France and Italy. In the LEGO case, major production facilities in Mexico and China were in lockdown, thereby severely damaging their output of LEGO products on a global scale. The R&D department responded by using their production facilities to run on overtime and help boost production.

Expediency

Expediency of the PPE projects was also a common denominator for both cases. In the Grundfos case, they managed to complete a project in 7 days that would usually take several months. For LEGO, they were able to do in a few months what would normally take years to develop, get approved, and start producing.

In-depth knowledge and familiarity

Yet another similarity is that the manager in charge had an in-depth knowledge and familiarity with the organization. In the Grundfos case, the manager Torben had been with the organization for 20 years. This meant that he had the in-depth knowledge that enabled him to know who to pick for the tasks and tailor the perfect team for the job. In the LEGO case, the manager in charge, Hanne, was also a longtime employee of her organization, having been employed there for 27 years with experience across different fields and managing varied tasks. As with the Grundfos case, Hanne's intrinsic knowledge about the organization and the different departments, could have played a significant part in her capability to quickly gather the right competencies and people needed for the task.

Frequent meetings and check-ins

The two cases also shared a similarity in that both projects were managed by combining daily meetings with several daily check-ins to track progress.

Unintentional gains

Participants both gained something from their involvement with the PPE projects. Both managers mentioned that they gained significant experience and knowledge in the form of realizing their true potential. The two managers also mentioned additional benefits that they gained, but here they differ, and as such these have been listed under differences.

Internal and external initiatives

The initiative behind both projects came from both internal and external sources in both cases. Furthermore, for both cases the internal initiative led to the facial PPE project (visor) and the external led to the component for COVID-19 testing lab testing. Additionally, they were also similar in that neither of the departments had the capacity for cleanroom production. Since they lacked the facilities required for cleanroom production, in both cases, they secured help from a third party to sanitize the finished product (testing equipment).

Two projects; PPE and test component

In both cases, the COVID-19 response teams worked with two projects: (A) a facial PPE project; and (B) a component project. For the PPE projects, both the Grundfos and the LEGO teams developed a facial PPE in the form of a visor. For the LEGO case, the second project was heavily protected, and the interviewee was reluctant to reveal too much about it. However, it was assumed to be an essential component that needed by biolabs when conducting COVID-19 testing. But looking at the Grundfos case, where the second project was also a component for COVID-19 testing labs, one might guess that the two essential components share enough commonalities to be somewhat the same item.

Additional humanitarian initiatives

Finally, in both cases the two organizations were similar in that they both launched additional humanitarian initiatives targeted at either helping the fight against COVID-19 or helping those who were most vulnerable to the pandemic. These initiatives included donations (Grundfos, 2020b; LEGO, 2020c), ways for children to learn when schools are shutdown (LEGO, 2020c; Grundfos 2020d), and various third world interventions (Grundfos 2020c).

5.2.2 Differences

Operations

There was a major difference in operations and how the two cases were affected by the lockdown. In the Grundfos case, most of the team members were sent home due to COVID-19 lockdown before the PPE project began. In the LEGO case, employees had not been sent home and they continued their daily activities throughout the pandemic.

Meetings and check-ins

The above also led to a different approach to conducting meetings and their daily check-ins. Though both cases used several daily check-ins and meetings, in the Grundfos case, Torben remarked that it was just as efficient, if not more so, to do them online. In fact, besides a test session where they had to test the design together, it was not at all necessary to do so in-person, which he believed saved time and avoided unnecessary meetings.

The teams

There were also differences in approaches to the PPE projects and the composition of the two teams. At Grundfos, the manager considered what skills the team would need to succeed, and based on his in-depth knowledge of the organization and the employees, handpicked the members for his team. In the LEGO case, the manager relied on being able to efficiently switch team members in/out of the team depending on what was needed for the current challenges.

Leading into next set of differences between the two cases. At Grundfos, the PPE team was a small, fixed team by design, each member handpicked for their individual competencies, expertise, and capabilities. In the other case, the LEGO team took a different approach, where they would transfer employees in or out of the team based what they needed to solve in the here and now. Furthermore, in the Grundfos case, the team members were 100% dedicated to that team only, having been relieved of their usual duties. In contrast, the LEGO team was not solely dedicated to the PPE project. In fact, they were doing it on top of their existing duties, essentially working two jobs at the same time. This relied heavily on the employees ability to put in an extraordinary effort.

Indicators for agile response in global organizations

While both cases showed similarities in that both Grundfos and LEGO are global organizations that demonstrated how different local departments helped the group as a whole, the two cases showed different ways to do so. In the Grundfos case, the finished PPEs developed and produced in Denmark

were sent to Grundfos locations in France and Italy, after acquiring the necessary certifications. LEGO on the other hand, was hit hard when their big production facilities in Mexico and China were shut down, thereby severely limiting their output in a time where they experienced increase in demand for their famous bricks. Hanne's department played a role in alleviating this pressure by leveraging their equipment to bolster production levels. Though these efforts increased shipping costs, it meant that LEGO could limit the impact of facilities being shut down and resulted in increased market shares (LEGO, 2020a). The Grundfos case additionally differentiates, since besides only supplying the Danish healthcare system with PPEs (which they both did), they also sent PPEs to departments in France and Italy and donated pre-assembled visors to the NGO Doctors Without Borders (MSF).

Affected by the pandemic

An especially important distinction between the two cases is how the organizations were affected by the pandemic. For Grundfos, it meant that activities slowed down, the R&D department was sent home during the lockdown, and sales in big markets such as China were down (Stenvei, 2020). On the other hand, LEGO continued production during the pandemic. Activities continued as the demand for LEGO increased, leading to an increase in sales (LEGO, 2020a). Hanne's department alone increased their output by 20% during the pandemic.

Level of expediency

While in both cases the two teams were capable of completing their projects in record speeds, there was a difference in exactly how fast that was. The Grundfos team managed to complete their visor within 7 days, whereas LEGO had their design approved within four weeks.

Type of gains

There was also a difference in the gains described by the two interviewees. In the Grundfos case, Torben explains that though they were already applying agile project management principles, the experience had honed their skills; skills that soon after were leveraged in dealing with a quality case/problem unrelated to the PPE efforts, in order to solve it quickly and efficient. In the LEGO case, Hanne described their gains as being evident in employee satisfaction being at an all-time high, and that the participants having learned that they were capable of much more than they thought possible.

Initiative

Though in both cases the initiative came from internal as well as external sources, they came from specifically different places. In the Grundfos case the internal initiative came from the CEO openly asking within the organization if and how they might possibly help with the oncoming PPE shortage. The external initiative came from their participation in the DI taskforce. In the LEGO case, the internal initiative came from an employee who was married to a nurse, and thus aware of the acute PPE shortage. The external initiative came from their collaboration with the Danish emergency council, NOST.

5.3 Emerging patterns

Following the research design, the following step in the cross-case comparison is to discover patterns by studying the similarities between the two cases, as suggested by Yin (2009) and Eisenhardt (1989). First of all, it should again be noted that the two cases were selected for their superficial similarity, both Grundfos and LEGO being big global organizations with Danish roots, and each being leaders in their respective markets. They were both affected by the pandemic on a local and global scale. They both launched a series of COVID-19 initiatives to help people all over the world. And in particular, they each chose to launch two COVID-19 projects to relieve the pressure on the Danish healthcare system brought by an immediate shortage in PPE and biolab testing equipment. However, upon scratching the surface, it becomes clear that there were many more subtle differences. The biggest difference was in how they were affected by the pandemic. While Grundfos saw a drop in sales in the biggest markets (e.g., China), LEGO saw an increase in demand and gained market shares. Grundfos dedicated a taskforce to be solely focused on the two COVID-19 projects, while LEGO had their employees work their usual day-job and then on top of that work on their two projects. Consequently, it is important to distinguish between relevant and non-relevant similarities. Relevant similarities might indicate a pattern in how they were able to achieve their goals with the COVID-19 projects. Non-relevant are the similarities considered as non-indicative of relevant patterns for this specific case. That is, though there are similarities between the two cases, these are seemingly not relevant in regards to revealing what enabled the projects' success. To get closer to pinpointing factors that enable agile capabilities, there must first be some distinguishing between patterns that were relevant for the success of both cases, and those that were not. Consequently, the patterns are sorted in three categories: (1) relevant patterns; (2) non-relevant patterns; and (3) possibly relevant patterns.

5.3.1 Relevant patterns

R&D departments	The equipment, skills, and maybe most important of all – the special mindset of R&D type departments. As mentioned by Hanne, R&D type departments are special when giving out of the ordinary tasks like these. Perhaps the most important factor, along with empowerment.
Empowerment	Empowerment from top management. Giving the project teams freedom to make decisions and avoiding bureaucracy, is another factor that, according to the managers, played a crucial role.
Clear why	An important factor in the success of the two cases, are the strongly shared understanding of the importance of the tasks undertaken.
Leveraging network	No cleanroom production facilities: needed to leverage networks to secure cleanroom capabilities. In both cases, the teams mobilized help from third parties to sanitize the finished product (testing component). This indicates a capacity and capability to leverage their network. From a business model perspective, it shows a capability to leverage business partners, to remedy the fact that they lacked cleanroom production facilities.
Internal and external initiatives	This similarity indicates a capability to be aware of external factors as well as internal factors, enabling them to react, change and adapt.
Several daily check-ups/ins	A factor that, according to the managers, was important in staying on top of the activities, keeping aware of where they are going, and where they had to go.
Seniority	Having stayed with their respective organizations for a considerate amount of time (Torben 20 years; Hanne 27 years), gives them a unique, in-depth knowledge of the organization, the employees, who to pick, et cetera.
Handpicked teams	Knowing what skills they needed for the tasks ahead. Connected to their seniority; the experience gained by working within their respective organizations as managers. Thus, enabling them to leverage this knowledge to effectively recruit talent as needed for the project teams.
Funding	Securing internal funding. Maybe not so much that it was internal, but at least could be important that the funding was already in place and the two teams could worry less about the financial side of things as described in one of the interviews.

	However, there are no indications of this being relevant for agile capabilities in large firms.

5.3.2 Non-relevant patterns

Other humanitarian initiatives	Both the Grundfos Group and LEGO Group launched several other humanitarian initiatives globally. However, this is not relevant for the scope of this research where the focus is on their PPE and test component projects. And these additional humanitarian initiatives are not related to the COVID-19 projects conducted by the Grundfos and LEGO teams in Denmark.
Two projects	In both cases, the project team was involved with two projects; a facial PPE (visor) and a component for COVID-19 testing (Appendix A; Appendix B). This similarity is remarkable, and indeed an important enabling factor for the cross-comparison of the two cases. However, that they both had a PPE and a test equipment project is not an indicator of factors that enable agile capabilities in large firms in of itself, though it is an important common denominator.
Participant gains	Both managers expressed that their teams had gained some valuable benefits from participating in the PPE projects. One of these was that they felt they had increased their capabilities through the experience. That the people participating in the process, gained experience and improved their skillsets, as a result of the process, does not really reveal anything about factors that enabled those processes. One could argue that skills and experience was an important factor. But that argument could be made for any person doing any task for any amount of time or any reason at all; skills and experience arguably yields good results.
Expediency	Both teams managed to complete their PPE and component projects at record-breaking speed compared to how long such projects would usually take for their departments. However, that the two cases share a similarity in the impressive expediency they managed to finish the projects in does not indicate a pattern of enabling factors. It shows a pattern of success, and while they indicate agile capabilities in the two cases; it does not indicate what those capabilities or factors are.

No change in the BM by design	In both cases, there was no plan to expand existing business models or make any long-term changes in existing ones. In fact, both managers expressively stated that it was a conscious decision to not do so. That similarity between the cases does not reveal anything about possible enabling factors.
Global organization; helping other branches	Had it been in reverse, that other branches in their global organizations had helped the two teams with their challenges, then it could have been an enabling factor. However, as it was the other way around, it cannot be said that them helping other branches of the organization indicates factors that enabled the teams' success.

5.3.3 Possibly relevant patterns

Motivation and goals	In both cases, the goals, as stated by the two managers, were entirely humanitarian and non-profit. This is a shared similarity that might be relevant, in that they could related the clear *why* listed under *relevant patterns*. Although it is hard to tell if it was indeed important for the success of the projects, it is possibly indicative of the importance of a clear *why.* Furthermore, it also relates to the strong feeling of urgency and acute awareness of the situation that was widely shared in the public during the first wave of COVID-19 in Denmark.

5.3.4 Themes and summary

To better clarify which of these patterns might be indicative of factors that enable agile capabilities in large firms, it is necessary to sort the relevant patterns between relevant for the success of the case and relevant for agile capabilities in large firms. Considering the relevant patterns, two main themes emerge: (A) patterns relating to innovation capacity; (B) and patterns relating to leadership. These are presented in the table below (table 10).

Table 9: Two main themes in the created patterns

Innovation capacity	Leadership
Significance of R&D: department, resources, capabilities, culture.	Empowerment, clear why, handpicked teams, seniority, daily check-ups/ins.

The importance of innovation capacity is strong, as the most prominent pattern is the significance of R&D capacity of the firms. This involves resources such as equipment, employees, and facilities. It

also includes cultural aspects, such as the special mindset of R&D departments as mentioned in the LEGO interview. The patterns relating to leadership include handpicked teams, seniority of the two managers, daily check-ups/ins, empowerment, and clear why. Handpicked teams are connected to seniority; the managers knew who to recruit for the teams based on their in-depth knowledge about not only their own departments, but also different departments across the two organizations. Handpicked teams and seniority were indeed relevant to success, but they are seemingly not factors that directly enable agile capabilities. They do however point at a connection between leadership and agile capabilities, which is true for "several daily check-ups/ins" as well. Instead of an enabling factor for agile capabilities, it was a leadership tool that was effectively applied to direct the teams toward success. This once again points to the importance of leadership. The most prominent patterns that relate to leadership are empowerment and clear *why*, both of which were described several times by the managers as being key to their success. Consequently, based on the data, there are three patterns that indicate factors enabling agile capabilities in large firms: significance of R&D, empowerment, and clear why.

Chapter 6: Discussion

The aim of this study is to foster more knowledge about organizational agility and business model innovation. More specifically, looking into the area where the two concepts meet and widening the understanding of what enables agile capabilities in large firms. This will be achieved by studying the two cases of LEGO and Grundfos and their respective PPE and component projects. The research seeks answers to the following questions:

- What is it about these two organizations that enabled them to demonstrate agile capabilities?
- What are the commonalities?
- Are there any patterns that might reveal more about what makes a business model agile?

Following the research design, the two cases were analyzed in a two-step approach. The first step involved an in-depth analysis of Grundfos and LEGO. Based on interviews with the leading manager of the teams behind the PPE and component projects in each case, the in-depth analysis shone light on key characteristics for each case. This also shed light on important factors for the success of each team, as experienced by the two managers in charge. The second step in the analysis was a cross-case comparison of the two cases. This revealed some key similarities and differences between each case.

By using cross-case synthesis between these similarities and differences, it was possible to delineate patterns that repeated themselves in the Grundfos and LEGO case. These patterns were then sorted into relevant, non-relevant and possible relevant patterns. Relevance here specifically refers to what is relevant for discovering factors enabling agility in large firms.

The purpose of this discussion is twofold. Firstly, it aims to look at the three most noticeable patterns and discuss the findings in relevance to the literature. Following that, it delves into the similarities and differences between the two cases and discusses possible explanations and how these findings compare to the literature.

6.1 Patterns

According to the data, the patterns that are seemingly most relevant in regard to agile capabilities in large firms are *significance of R&D departments*, *empowerment*, and *clear why*. These are visualized in the figure below (figure 1). In both the Grundfos and LEGO cases, these factors played an essential role in the firms' capability to run the PPE projects with the degree of success and speed achieved by both teams. Consequently, the discussion is focused around those three patterns and their connection to agile capabilities in large firms.

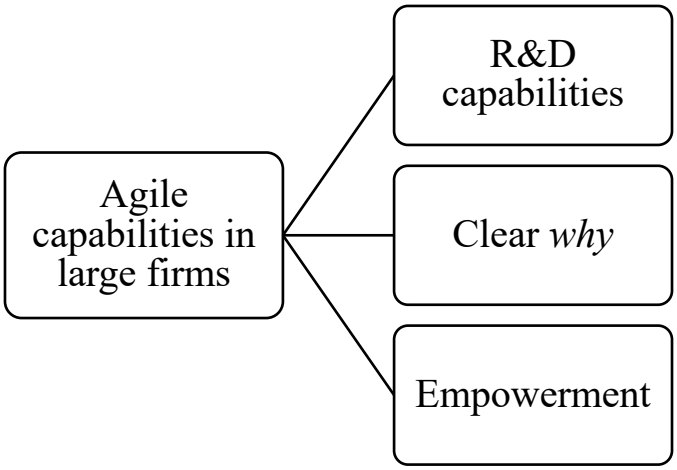

Figure 2: Three enabling factors for agile capabilities in large firms as suggested by the evidence

6.1.1 Innovation capacity and agility (importance of R&D in the two cases)

One of the key findings of this study is the importance of the R&D departments to the success of both cases. Furthermore, both case organizations share the conviction that innovation (e.g., R&D) plays a vital role in securing competitive advantage (Grundfos, 2020a; LEGO, 2020b). For LEGO, that is

exemplified in approximately 60 % of their product catalogue being made up of entirely new products (LEGO, 2020b). Grundfos similarly states in their 2019 financial report that R&D played a vital role in their previous 5-year strategy as well as forming a key component for their current 5-year strategy (Grundfos, 2020a). Or, as phrased by the then CEO of Grundfos, Mads Nipper: "differentiation through innovation" (ibid., p. 5). Furthermore, both organizations have stated that they aim to be market leaders on new innovations in their respective markets (Grundfos, 2020a; LEGO, 2020b). Thus, the importance of R&D in securing competitive advantage is clearly a common denominator for the two cases. Consequently, in both cases, their respective R&D departments had the capabilities as well as the capacity to react to challenges resulting from the pandemic. This is supported by the literature, where innovation capabilities are described as an important source of competitive advantage (Tushman and O'Reilly, 1996; Christensen and Bower, 1996; Teece et al., 2016; Osterwalder et al., 2020), and a capability that should play an integral role in company strategy (Tidd and Bessant, 2017, p. 88).

Can it be said, then, that R&D capabilities are important for agility in large firms? And, what is the connection between organizational agility, innovation (R&D), and business model innovation? The importance of innovation capabilities in the two cases might reveal innovative capabilities as an enabling factor for agile capabilities in large firms. Parallels can be drawn between *organizational agility*, *business model innovation*, and the concept of *ambidexterity*. Ambidexterity describes the art of leveraging both *exploration* and *exploitation* activities (Tushman and O'Reilly, 1996). Exploration covers radical product or process innovations, which involves "leaps" or re-orientations towards new attributes, new ways of doing things, and new knowledge (Rosenkopf and Nerkar, 2001). Contrary to this, exploitation refers to product or process innovations involving improvement of existing activities or products (Levinthal and March, 1993). An organization is ambidextrous if it has the capability to leverage both activities simultaneously (ibid.). Tushman and O'Reilly (1996) perhaps describe the two activities best as: "explore new opportunities even as they [managers] work diligently to exploit existing capabilities" (p. 74). According to Osterwalder et al., (2020) great firms do not prioritize one over the other, instead, they excel at managing both exploring new business opportunities and exploiting existing ones. Indeed, managing exploitation and exploration activities is a central theme in innovation management (March, 1991; Benner and Tushman, 2003). Indeed, Tushman and O'Reilly describe radical innovation and incremental innovation as inseparable from ambidexterity, and as such, core activities for ambidextrous organizations (Tushman and O'Reilly, 1996). In the cases of Grundfos and LEGO, the two firms have integrated both radical and incremental

innovation into their core strategies (Grundfos, 2020a; LEGO, 2020b). The interview data suggest that the two cases have strong R&D capabilities, which includes both product development and product improvement. The data also indicates that both cases have good incremental innovation and exploitation capabilities. However, the strongest evidence is of the two firms' capacity to design, test, produce, and launch a product (PPE as well as test component) at record speed. Here, the data strongly indicates good radical innovation and exploration capabilities. Thus, the evidence supports the two cases as ambidextrous organizations. Similar connections have also been made previously between strategic agility, organizational flexibility, and ambidexterity (Doz and Kosonen, 2008; Weber and Tarba, 2014).

According to the robotics expert Malene Grouleff, an explanation for the quick response of Danish production firms like Grundfos and LEGO was that they had gained *flexibility* and *agility* by incorporating robots and AI into their production (Udenrigsministeriet, 2020). Robots and AI in production is part of what is also known as industry 4.0 (Popkova, 2019). However, the two cases show that this is actually not the case. While equipment and facilities played an important role, it was those of the R&D departments that were essential. On the contrary, in the LEGO case, moving the production of the developed PPE from the R&D department to the production department actually disrupted production, as the product was so different from the main products production was accustomed to. This caused the team to relocate the production of PPE and components back into the R&D department, thus illustrating a department that was so optimized at creating one type of products, that they were unable to handle disruption to the production cycle. Furthermore, it underpins the importance of the R&D capabilities for agility in large firms.

Evidence suggest that innovation capabilities played a key role in both the Grundfos and LEGO case. For a long time, innovation through R&D has played a key strategic role for the Grundfos Group and LEGO group. Consequently, the two firms had strong R&D departments with the necessary equipment and personnel to launch and execute both a PPE project and COVID-19 test component project. This is supported by literature, where the importance of both radical and incremental innovation capabilities is described as both a source for competitive advantage and as vital for the survival of any business (Tushman and O'Reilly, 1996; Christensen et al., 2016; Tidd and Bessant, 2017; Osterwalder et al., 2020). Furthermore, the literature draws parallels between innovation capabilities and ambidexterity (March, 1991; Benner and Tushman, 2003), perhaps connecting agile capabilities with innovation capabilities, which is supported by the ability to simultaneously manage

exploration and exploitation activities. Therefore, the evidence suggests a positive connection between innovation capabilities and agility in large firms. Furthermore, it might point at some activities (exploration and exploitation) as indirect enablers for agile capabilities, as they are directly enabling innovation capabilities.

6.1.2 Leadership and agility

According to Kotter (2007), managing change requires, among other factors, a clearly communicated vision, a shared sense of urgency, and empowerment to act. The data shows that the two cases demonstrate all three factors, in that there was a shared sense of urgency which helped form the clear *why* that management were able to communicate, while empowerment of the PPE project teams meant that they were able to act faster and be more flexible. Furthermore, the data indicates that leadership tools such as empowerment and storytelling might be connected to agility. Leadership has also been indicated as one of the three fundamental factors of strategic agility (Doz and Kosonen, 2008, p. 97). To explore the importance of leadership for agile capabilities in large firms, the following part will delve deeper into the importance of empowerment and a clear *why,* as evidenced in the cases of Grundfos and LEGO. Then, it will discuss the findings as they relate to the literature on leadership, more specifically to empowerment and storytelling.

6.1.3 Empowerment

Data from the two cases reveal that the empowerment of both the Grundfos and LEGO project teams played a notable role in the success of the PPE and component projects. Both managers individually stated several times that empowerment was integral to their ability to achieve fast results. It enabled them to make calls and act on the necessary decisions as obstacles were encountered, bypassing unnecessary bureaucracy and thus increasing the speed at which things could happen.

In the literature, empowerment is described as a broad, multilevel construct (Leach, Wall, and Jackson (2003); Chen, Kirkman, Kanfer, Allen, & Rosen, 2007; Vecchio, Justin, & Pearce, 2010). The concept has been linked to decentralization, the argument being that empowerment involves flattening leadership structures and increasing employee engagement (Kanter, 1977). Leach et al., (2003) define empowerment as a leadership tool where responsibility is being delegated down the leadership hierarchy, thereby increasing the decision-making authority of employees. This in turn enables and strengthens the decision-making capabilities of employees (Vecchio et al., 2010). According to Amundsen and Øyvind (2015), engaging employees and the sharing of power with

employees are central to the empowerment concept, as well as increasing employee freedom and autonomy. While it is a broad construct, some researchers focus on the decision-making dimension of empowerment, referred to as DME (Campbell and Campbell, 2011). In the interviews, it was particularly the freedom to act independently through decision making that was mentioned the most in regard to empowerment from top management. As such, the focus here is on the decision aspect of empowerment (DME). For Grundfos and LEGO teams, the DME meant freedom to make decisions as the teams faced obstacles and was a key enabler of effectiveness in both cases. It meant that the teams were able to bypass unnecessary bureaucracy and instead focus on solving the tasks ahead. This is also supported by the literature where the empowerment of teams to make their own decisions is shown to often increase the effectiveness and productivity of that team (Chen et al., 2007). While empowering a team is often associated with increased effectiveness (Campbell and Campbell, 2011), DME have also been found to promote innovation capabilities in SMEs (Çakar and Ertürk, 2010). This could possibly be linked back into the innovation capabilities mentioned previously, where bottom-up driven innovations are described as needing the right organizational structures and support from management to function (Tidd and Bessant, 2017). Other researchers have been able to make a direct positive link between structural and psychological empowerment and employee driven innovations in medium sized organizations (Echebiri, Amundsen, and Engen, 2020). This is supported by leadership practitioners that highlight encouragement and empowerment from management to be critical for innovation capability (Tidd and Bessant, 2017, p. 86). Thus, the literature shows correlation between innovation capabilities and empowerment in SMEs and larger organizations (Çakar and Ertürk, 2010; Echebiri et al., 2020). Furthermore, this might be true for MNEs as well. The evidence strongly supports this suggestion, as increased DME played a key role in the success for both PPE and component projects in the Grundfos and LEGO case. Perhaps the best example of this is the LEGO PPE project, where a single employee was able to initiate the whole PPE project in a bottom-up approach.

According to Çakar and Ertürk (2010), many firms lack the organizational culture to support increased DME. To support increased DME, the organizational culture must be able to encourage and sustain increased employee involvement, or otherwise risk wasting empowerment efforts (Campbell and Campbell, 2011). Based on the data, both cases demonstrate a culture that was capable of supporting increased DME.

Despite growing literature describing the benefits of empowerment, it has generally been an underused management tool (Campbell and Campbell, 2011). One explanation for this could be the unwillingness of managers to give away power because they are afraid to appear weak in the eyes of their subordinates (ibid.). However, a study on military cadets at the United States Military Academy, West Point, saw that a high degree of DME resulted in: "significantly higher leadership attributions and a greater willingness to work for the manager" (Campbell and Campbell, 2011, p. 154). This is also evident in the LEGO case, where the employees engaged in the PPE and component projects demonstrated an extraordinary effort by essentially working two jobs, as described by the manager in charge (Appendix B, l. 176-179). Perhaps it even played a role in the record high employee satisfaction and engagement recorded by the LEGO Group (ibid., p. 9).

Evidence suggests that empowerment played a key role in the success of both the Grundfos and LEGO case. This is supported by literature, where empowerment is described as increasing team productiveness (Chen et al., 2007), effectiveness (Campbell and Campbell, 2011), promote innovation capabilities (Çakar and Ertürk, 2010), and employee driven innovations (Echebiri et al., 2020).

6.1.4 Significance of having a clear *why*

As previously mentioned, when it comes to managing change, two important factors are to create a sense of urgency and to create and share a vision for the project (Kotter, 2007). The two cases show that there was a shared sense of urgency in that everyone was aware of the pandemic and the immediate shortage of PPEs in public hospitals. Furthermore, management was successful in creating a clear vision behind the COVID-19 projects: that they were part of an important effort towards assisting the public. The managers then succeeded in communicating this shared vision with the participants. According to Sinek (2009), a great manager is capable of inspiring action by creating and communicating a shared sense of purpose, or a vision. The most fundamental part of this vision is the *why*; why does the firm exist? Although a possibly controversial claim, Sinek suggests that most organizations are unable to explain why they exist (ibid.). A clearly communicated vision helps the employee make sense of what, how, and why of a project, and must be well communicated by managers. Therefore, managers should start a project by asking themselves: *why* (Sinek, 2009)? The Grundfos and LEGO case exemplifies how a clear vision (e.g., a strong *why*), can motivate employees to work harder, better, and deliver exceptional results. This is perhaps most evident in the LEGO case, where team members were essentially working two jobs at once, taking extra shifts and working

on public holidays (Appendix B, l. 176-179). Yet, this did not seem to affect employee satisfaction in a negative way. Conversely, employee satisfaction became higher than ever before (ibid., p. 9). In the Grundfos case, the manager in charge of the PPE and component team pointed at a clear why as a being a significant contributor to the speed at which they finished both projects. The manager, Torben, described the importance of having a clear *why* as a learning experience from the project. Through the efforts of the employees, it was evident that a clear why would make people go that extra mile, perhaps with even more speed (Appendix B, l. 219-221).

The concept of *why*, as described by Sinek (2009) can be related to the idea of managers as storytellers posed by scholars in organizational studies such as Weick (Hammer and Høpner, 2015). Weick describes sensemaking, the continuous and unconscious self-act of making sense of one's surroundings based on previous experiences (Weick, 1995). Furthermore, Weick points at managers as playing an important role in the sensemaking of employees (ibid.,), that is, what sense employees make of their job and the importance thereof. Good managers act as storytellers, giving meaning and motivation to the employees through telling the story of why they are doing what they are doing (Hammer and Høpner, 2015). Managers form that meaning by communicating a purpose and vision; in other words, creating a clear *why*. An example could be an assembly line job at a production facility. Failed storytelling or an unclear *why* leaves the employee to make their own sense of that job. They might see it as boring, repetitive, or meaningless. However, a good manager would be able to shape that impression (ibid.) through storytelling, of a clear *why* and the importance of their task. Instead of working a boring, repetitive job, the employee is actually creating life-saving equipment for the medical industry. Data from the two cases suggest that management were successful in creating and communicating a clear *why*. Employees could very well have felt pressured to work extra shifts, having to deal with more pressure in a time where everybody were afraid of the pandemic. However, the interviews suggest that employees understood that they played an important role in combating this deadly pandemic that was threatening public healthcare – literally saving lives, though indirectly, through their extraordinary efforts.

Evidence suggests that creating and communicating a clear *why* is important for the agile capabilities displayed in the Grundfos and LEGO case. It enabled managers to motivate employees to find an extra gear and put in an extraordinary effort. This is supported by literature that highlight the importance of managers in creating and communicating a vision for the employees, thus motivating to work harder (Weick, 1995; Sinek, 2009; Hammer and Høpner, 2015).

6.2 Discussing the differences between the Grundfos and LEGO case

While there are differences between how the two firms handled the PPE projects, this is first and foremost reflective of the two different situations that the firms were in. However, they are also potentially examples of different ways for large firms to demonstrate agile capabilities in responding to external circumstances. Therefore, it could be interesting to look into the differences between the two cases.

During the first wave, Grundfos' Danish facilities were for the most part closed during the first COVID-19 wave (Appendix A). Consequently, most of the employees, including those affiliated with Torben's department, were sent home for remote work. This was in contrast to the LEGO case, where operations continued with only a few intermittent shutdowns caused by personnel affected by COVID-19 (Appendix B). Furthermore, demand for LEGO products actually grew during the pandemic, thus enticing LEGO to keep activities running and production going as fast as possible.

One way in which the circumstantial differences between the two cases are expressed was in the delivery time of the two project teams. While the Grundfos team managed to deliver within 7 days (Appendix A), the LEGO team delivered within 7 weeks (Appendix B). The most likely explanation for this difference is that while Grundfos had a small team that was solely dedicated to the PPE project, the LEGO team were working on the PPE project on top of their other daily activities (Appendix A; Appendix B). This was something Hanne compared to working two jobs at the same time, including working in spare time and over holidays (Appendix B). The reason for the two different approaches can most likely be found in the differences between how the pandemic affected the two firms. While Grundfos sales were down (Grundfos, 2020a), LEGO saw an increase in demand worldwide (LEGO, 2020b). That could have significant impact on how/why the two cases had different approaches to their teams. Common for both cases was that both projects were completed within a fraction of the time the firms would normally require (Appendix A; Appendix B). As such, the two case teams represent two different ways to organize teams for agility. The Grundfos team consisted of a dedicated group of experts, handpicked for the team by the team leader, Torben. A common analogy would be to compare this approach to a special-operations military unit, handpicked experts that each fulfill a specified role to deal with the mission. In the LEGO case a different approach was taken, where the team leader had a large pool of employees she could pick from, choosing the team composition based on the skills needed at the different phases of the project. Maybe it would be more helpful to visualize this approach as a football team, where the manager switches

players (again, experts in their own rights) in and out depending on what are needed for the current obstacles. This could potentially demonstrate two different ways to organize teams for agility.

In the LEGO case, the idea for the PPE (visor) project came from an engineer who contacted the vice president of engineering on his own initiative and asked for permission to develop a PPE, thus initiating a *bottom-up* driven innovation. In literature, bottom-up driven innovations are described as an important innovation capability, where employees can participate through sharing knowledge and be an active part in creating new innovations (Tidd and Bessant, 2017). However, as the head of process excellence at UBS, John Gilbert, states, bottom-up driven innovations require a "clear focus" (ibid., p. 86). Furthermore, "bottom up" innovation capabilities are described as good indicators of organization structure that enable innovation (Tidd and Bressant, 2017, p. 115-116). This is supported by literature suggesting that organizations can gain competitive advantage by leveraging the knowledge and know-how of employees across all levels of the organization (Campbell and Campbell, 2011). Consequently, capacity for bottom-up driven innovations might be a way for large firms to organize for agile capabilities, as seen in the LEGO case. This further underpins the importance of organizational structure and culture that enable and support different types of innovation.

6.3 Relevance of the findings

These findings add value to existing theory in the field of organizational agility by displaying the importance of innovation and leadership for agile capabilities in large firms. Previous research has made connections between competitive advantage, ambidexterity, and innovation (Tushman and O'Reilly, 1996; Christensen et al., 2016; Tid and Bressant, 2017), BMI and competitive advantage (Kotter, 2007; Osterwalder et al., 2020), BMI and flexibility (Doz and Kosonen, 2010; Bock et al., 2010), as well as between BMI, innovation, and agility (Liao et al., 2019). However, the findings of this research draw a positive connection between innovation capabilities, leadership, and agility in large firms. This shows that in the two cases, strong R&D capabilities together with a clear why and empowerment to make decisions was key to the agile response of the two firms as they reacted to the COVID-19 crisis in Denmark in 2020.

6.4 Conflicting findings

Based on very initial impressions of the two cases, one of the initial hypotheses were that the two firms displayed agile business model innovation. However, early in the research it became clear that

there were no changes made in the actual business models in either case. What might superficially seem like innovation of existing business models turned out to be a great display of leveraging agile capabilities through innovation and leadership in response to an external threat.

The impression of MNE's as cumbersome and not being capable of rapidly responding to threats, were also quickly shutdown. The evidence shows that both firms had developed strong R&D capabilities to increase competitiveness. This made them able to respond rapidly to the pandemic and resulting PPE shortage, as they had the capacity to successfully design, produce, and distribute PPE.

In the introduction it was mentioned that a robot expert highlighted the growing application of robots and AI in Danish production firms as the catalyst for agile capabilities in these firms (Udenrigsministeriet, 2020). This was meant to draw a connection between industry 4.0 elements such as robots and AI, and agile capabilities. However, this is contradicted by the evidence that production departments were not playing such a major role. In fact, in the LEGO case, the production department were disrupted by the new task of producing PPEs. Consequently, the introduction of the PPE to production was disturbing their primary functions, thus resulting in the quick decision to move production of the PPE back to the R&D department. Perhaps this could indicate that while industry 4.0 elements might potentially enable agility in production, there are other more important factors that must be in place for it to work. This is supported by management consulting literature, where it is stressed that a common agility "trap" is to only incorporate some agile elements (Freeland et al., 2018). According to that, incorporating some agile elements is not enough in itself. To work, it needs a supporting culture, which includes leveling the leadership hierarchy to facilitate employee engagement and drive innovations (ibid.). This concurs with the findings, where it was found that not only did R&D capabilities play a key role, but also leadership tools in the form of creating a clear why and decision-based empowerment were fundamental for the success.

6.5 Propositions

Based on the analysis and the discussion, I will suggest some generalized propositions to facilitate a deeper understanding of agile capabilities in large firms. The propositions are formulated to act as a guide for further research into this underdeveloped area of inquiry. Therefore, they have been formulated as to describe the relationship between agility and large firms so as to guide future research. However, it should be noted that in qualitative studies, generalizations can rarely be made from the specific case(s) to the general population (Yin, 2009). Unlike a statistical model, the

generalizations made from the two cases here are not directly applicable to a population. Thus it should be noted that the findings are not directly applicable to cases not included in the study, but instead contribute to theory by forming a generalization of propositions for research and testing (Creswell, 2009).

The discussion examined the importance of innovation capabilities and leadership for agile capabilities in large firms, thus discussing the findings and how they related to existing literature on innovation, ambidexterity, storytelling, and creating a clear why. Upon reflecting on the findings and comparing these with the existing literature, I have developed three propositions.

Proposition 1

- *Innovation capacity is positively linked to agile capabilities; strong R&D capabilities enables agile capabilities in large firms.*

Proposition 2

- *Formulating and communicating a strong vision, such as a clear why, is key to enabling agility in large firms.*

Proposition 3

- *Leadership based tools such as decision-based empowerment plays a fundamental part in large firms' ability to leverage agility capabilities.*

The propositions have been developed for the purpose of expanding the field toward further areas of inquiry for researchers. Due to the qualitative and exploratory nature of theoretical propositions, the recommended propositions should form a foundation for further scientific inquiry.

6.6 Limitations

Because of the abovementioned limitations (section 6.5), the propositions should be tested and further developed, using different approaches. Further studies are needed to deepen our collective understanding of agile capabilities in large firms.

Through the study of the Grundfos and LEGO PPE cases, I have created a deeper understanding of enabling factors for agile capabilities in large firms. The most prominent factors were the importance of R&D capabilities, creating a clear why, and decision-based empowerment. However, it should be noted that there could be numerous other factors that can affect agile capabilities in large firms.

Furthermore, it cannot be claimed that these factors are predetermined to guarantee agile capabilities in large firms, but the patterns indicate R&D, clear why, and empowerment, as worth considering in regards to securing agile capabilities in large firms.

Due to the research scope, the focus has been on the cases of the Grundfos and LEGO COVID-19 projects in Denmark. This led to a cooperation with the leading manager of each of those teams in both cases. Consequently, the insights gained through this research are limited to a Danish context. As such, the research does not create any insights into other branches of the Grundfos and LEGO groups or their handling of the COVID-19 pandemic.

6.7 Recommendations for future research

In the process of this qualitative study, I have developed three propositions. In acknowledgement of the beforementioned limitations, I would recommend further scientific inquiry into these propositions. This would serve to further our collective understanding of the importance of R&D, clear why, and empowerment, for agile capabilities in large firms.

Another recommendation for future research originates from one of the first challenges that appeared in the initial stages of this research. In the literature, three concepts are used interchangeably to describe approximately the same basic principle: *agility* (Kidd, 1994; Zhang and Sharifi, 2000; Xu and Koivumäki, 2018, *flexibility* (Stigler, 1939; Teece et al., 2016), and *adaptability* (Sorensen, 2003; Reeves and Deimler, 2011; Weigelt and Sarkar, 2012). As laid out in the literary review, according to the definition of organizational agility by the AMA dictionary, agility contains both flexibility and speed (Kurian, 2013 p. 9). Adaptability also contains flexibility; however, it is not bound by a temporal element (ibid., p. 9). Flexibility is not described as having either agility or adaptability, but it does include speed (p. 116). While this points at differences, other literature points at these concepts being used interchangeably (Teece et al., 2016). In acknowledgement of the confusion this might cause, I propose a meta-study to uncover to what degree they are describing the same concept, the same capabilities, or if they indeed should be considered three separate concepts. Such as study might bring some convergence into the literature describing these concepts and offer benefits to further research into this research area by creating a common language.

Finally, I would recommend further research into the connection between agility and business model innovation. Drawing parallels between ambidexterity and business model innovation as a competitive advantage, one could compare exploration and exploitation to the need for applying radical BMI

(searching for new business model opportunities) and incremental BMI (improving existing BMs) mentioned by Christensen et al., (2016). This is a pairing that has already been made by scholars such as Osterwalder et al., (2020). The research indicates a possible connection between agile business models and business models where R&D play a key role. In the case of Grundfos and LEGO, R&D capabilities certainly play an important role in their business models and the two firms' agile capabilities. While researchers such as Christensen et al., (2016) and Osterwalder et al., (2020) have already delved into this topic, it remains a largely undiscovered area where further research might prove promising. Further research into the connection, perhaps applying analytic tools such as the business model canvas (Osterwalder and Pigneur, 2010) might reveal common elements that enable agility. This would further our understanding of the connection between agility or flexibility, and business model innovation as proposed in the literature (Doz and Kosonen, 2010; Bock et al., 2010; Christensen et al., 2016; Osterwalder et al., 2020).

6.7 Methodological reflections

Qualitative data is based on social interactions and affected by the conditions of other social interactions (ibid.). The researcher plays an active and unavoidable role in producing the data (Dahler-Larsen, 2010 p. 32). As such, data is created from impressions, observations, notes, and statements, which require systematical arranging (ibid.). In acknowledgement of this, efforts have been made towards creating a transparent, systematic arrangement of the data to justify its merits as good scientific work, as recommended by Dahler-Larsen (2010). There are however also some specific methodological challenges associated with qualitative research. It is difficult to structuralize the, often vast amount of gathered data (Eisenhardt, 1989). The studies are by nature easily affected by the cultural context (Yin, 2009). The studies are often front-heavy because too little time is devoted to analysis and drawing clear connections between the data and the analysis (ibid.). All of the above can easily result in a weak or unclear connection between the data and the analysis. Finally, it can be challenging to create and keep a visible chain of argument going from methodology to data, to analysis, and finally conclusion. This weakness can make the research easy to criticize and reject, based on it being difficult to see the links between data, analysis and conclusion (Dahler-Larsen, 2010 p. 18). Therefore, it is the job of the qualitative researcher to create and maintain a clear yet flexible research design, and to systematically structuralize the data to create a clear thread between the gathered data and the conclusion.

This case study is subject to criticism, mainly from researchers with a positivist outlook (Eisenhardt, 1989; Yin, 2009). Though being a proponent for the method, Yin (2009) poses a set of three main criticisms on case studies, commonly posed by positivist researchers: (1) case studies lack rigor in their designs; (2) generalizations can rarely be made from the specific case(s) to the general population; and (3) the huge amount of data generated in case studies means it is possible for the researcher to come to any interpretation based on their own goals and agenda. To mitigate these suggested vulnerabilities, efforts have been made towards creating a clear research design before attempting to collect any data as recommended by Yin (2009). This is intended to increase validity through scientific rigor and transparency. The research design includes the four elements suggested by Yin (2009): (1) research questions/propositions; (2) the unit(s) of analysis; (3) links between data and propositions; and (4) how to analyze and interpret the gathered data.

Yin (2009) suggests that researchers applying case studies can and should increase validity of the study through rigor and logic of comparisons. Accordingly, the research design and justifications for each methodological choice made are explained in chapter 3; *methodology*. This includes creating an operationalization of the theory (section 2.4), and a detailed specification of the codes used in the analysis (table 7; table 8). Creating an operationalization of the theory meant that there was a strong analytical framework to rely on, thus ensuring that the same framework and codes were used to codify the data with the same meaning. To increase transparency, the methodology includes a detailed description for the codes used in the analysis. To further increase internal and external validity, the analysis combined the analytical techniques of cross-case synthesis (Yin, 2009) and cross-case comparison (Eisenhardt, 1989).

The multiple-case study was chosen because the research question did not align with the justifications for using single-case studies provided by Yin (2009). Furthermore, as mentioned in section 3.3.3, multiple-case studies are in general considered stronger and the evidence generated more compelling (Herriot and Firestone, 1983). Thus, it was decided to follow a multiple-case research design with at least two cases. Through a review of the media covering the PPE efforts by Danish firms in collaboration with the authorities, it was possible to identify three large firms that displayed agile capabilities: Carlsberg, LEGO, and Grundfos. It proved difficult to get in touch with the people involved in the PPE projects, with Carlsberg declining the opportunity to participate in the research, and LEGO proving impossible to get in touch with. Contacting Grundfos proved to have far less obstacles and I managed to get in contact with the manager responsible for the PPE and component

projects. It was through this contact that I also managed to get in contact with the corresponding manager at LEGO.

Following the research design, the primary data collection method was interviewing. As explained in *methodology*, the chosen interview approach was qualitative, semi-structured interviews. This meant that it was possible to gain an insight into the two cases from the viewpoint of the two managers that lead the PPE and component project teams. This not only created rich primary data, but also secured access to a unique insider viewpoint. While interviewing provided rich data, it also meant that more time would be devoted to transcribing and coding the created data, and less time for sampling more data.

Chapter 7: Conclusion

The aim of this thesis was to create a deeper understanding of agile capabilities in large firms by studying how Grundfos and LEGO managed to display agile capabilities in their handling of their COVID-19 projects in Denmark. This was attempted through studying what enabled their agile capabilities and searching for commonalities that might reveal patterns of what factors enabled agility in these two large firms.

To answer the research questions, the research design was created as a qualitative case study using two cases in a multi-case design. This included a two-step analysis where the cases would first be analyzed individually in a within-case analysis, then followed by a combination of cross-case comparison and cross-case synthesis to analyze for patterns across the two cases.

The within-case analysis revealed unique features from each case, including factors that played a role in the success of their COVID-19 project teams. Using Cross-case comparison, it was possible to identify differences and similarities between how they handled the PPE and component projects. Then cross-case synthesis was applied to identify patterns that could indicate enabling factors for agile capabilities in large firms. This revealed several patterns that enabled the success of the two teams. Scrutinizing those patterns further, these nine patterns were narrowed down to three. As such, it became evident that R&D capabilities, creating a clear why, and decision-based empowerment was key factors in enabling agile capabilities in the two cases.

Table 10: Factors that enable agile capabilities in large firms.

Factors that enable agile capabilities		
Theme	Innovation	Leadership
Patterns	Significance of R&D capabilities	Empowerment Clear why
Underlying capabilities based on the findings and supported by literature	exploration/exploitation, business model innovation, prioritization in group strategy, structure and culture supporting innovation.	Leadership tools such as storytelling, creating a sense of urgency, a strong vision, clear why, and empowerment of employees to include participation and decision-based freedom.

Both case firms were used to focusing heavily on innovation to drive competitive advantage. As such, both firms had well-equipped and well-managed R&D departments. Consequently, the teams had the equipment, facilities, know-how, and personnel to undertake the challenging tasks. Thus, they were capable of rapidly responding to the PPE shortage, and in record-breaking speed, to design, prototype, test, and produce completely new products. Thus, evidence suggests that strong innovation capabilities enable agility in large firms.

Furthermore, the evidence suggest that leadership also plays an important role for agility. Patterns between the two cases indicate that creating a strong vision, a clear "why", behind the actions was key to ensuring the extraordinary level of engagement and commitment demonstrated by team members. There was among the employees, a strong sense of urgency and shared perception of the importance of the work they were engaged in. This was enhanced further by top management empowering the teams to make the "call" and take decisions as needed, thereby not only avoiding bureaucracy, but also enhancing the employee engagement in the project. Consequently, the gathered evidence suggests that creating a clear why and decision-based empowerment were key enablers for the agile capabilities demonstrated by the two case firms.

Chapter 8: Bibliography

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Chapter 9: Appendix

9.1 Appendix A

9.2 Appendix B

9.3 Appendix C