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Enabling digital development: A multiple case study of Norwegian companies

Master's thesis

NTNU

Norwegian University of
Science and Technology

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Summary

Advancements in digital technologies offer companies unprecedented opportunities for changing and improving their businesses, and companies around the world are trying to initiate their digital development in order to reap the benefit of these opportunities. In this thesis, we identified a lack of practical insight for "how" organizations can navigate as they are developing digitally. To answer "how" organizations are developing digitally, we studied strategic decisions associated with the organizations' ability to initiate and succeed with their digital development. The guiding research question is: "*How are Norwegian organizations enabling their digital development?*" To answer this research question, we conducted a literature review, followed by an empirical data collection through semi-structured interviews with chief executives. The case companies were companies which have been and are developing digitally. The interview question guide was based on a literature review on how organizations can digitally develop, and the collected data resulted in the identification of seven strategic decisions. Following a framework which considered the relationship between the strategic decision and the outcome of the decision lead to three decisions which we considered as an enabler for organizations to initiate and succeed with their digital development. Thus, answering the research question on how Norwegian organizations are enabling their digital development, and providing insight on "how" organizations can digitally develop. Additionally, we linked these three strategic decisions to "what" digital transformation is – providing a framework for digital development in organizations. The thesis concludes by considering the implication of the three decisions, and to how these decisions relate to other companies. Based on the insight, we believe companies can make more knowledge-driven decisions - potentially speeding up their digital development. Finally, due to the exploratory nature of our thesis, suggestions for future research are identified and presented.

Preface

This thesis was submitted as a final deliverable for a degree of Master of Science in Project Management at the Norwegian University of Science and Technology. The thesis was conducted under the supervision of Bassam Hussein, Associate Professor at the Department of Mechanical and Industrial Engineering Faculty of Engineering NTNU.

Trondheim, 18.06.2019

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Acknowledgment

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1 Introduction

In this chapter, an introduction to the thesis is provided. Section 1.1 begins by introducing an overview of the information relevant to digital development and showing how the research scope was narrowed. Then in section 1.2, the academic foundation needed for establishing research objectives is presented. After that, in sections 1.3, the intention and the research scope of the thesis are demonstrated. Then, based on the background and motivation, section 1.4 introduces the research statement, the purpose of the thesis, and the research questions. Lastly, the structure of the report is presented.

1.1 Background

In recent years there was a substantial growth of discussions around digital technologies as a catalyst for major changes in organizations. Scientific publications in the field of digital transformation have significantly increased since 2010, for example, the number of publications in Google Scholar that contain the phrase "digital transformation" jumped from 551 in 2010 to 6650 in 2017. Likewise, the interest in digital transformation is notable in general web searches. This is presented in Figure 1, which illustrates, in percentages, the relative popularity of the search terms "digitization," "digitalization," and "digital transformation" for the google trend search using the search criteria "global search" and the period from 2004 to 2018.
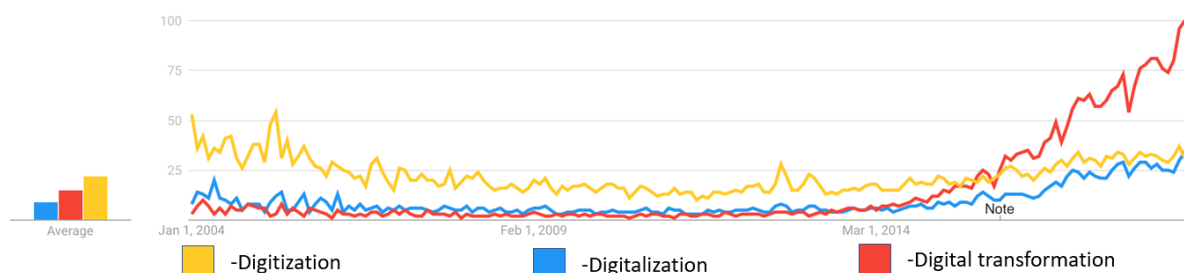
Figure 1 - Statistics of google searches related to Digitization, Digitalization, and Digital transformation

A similar tendency is the growing recognition of digital technologies that can be seen in businesses. In the past decade, firms in almost all industries have conducted initiatives to explore new digital technologies, and to exploit their potential benefits (Matt et al., 2015). Similarly, a global survey investigating executive's view on digital technologies showed that 76% of the respondents noted the importance of digital technologies for their organization, and almost 92% consider digital technologies to be critical for their business in the next three years (Kane et al., 2015).

Researchers suggest that there exists a certain level of confusion and a lack of a shared understanding around the topic of digital development in the organizations. This viewpoint is supported in articles written by Gray and Rumpe (2017) and Ebert and Duarte (2016), where they mention that the words related to digital development such as "digital transformation" and "digitalization" are often used as buzzwords, meaning that they are used without a deep understanding of the words. The literature review by Henriette et al.

(2015) further reinforces this idea by demonstrating that there exists a discrepancy in how different authors describe terms digitization, digitalization, and digital transformation.

Researchers investigating the state of the art in digital transformation literature indicate that researchers predominantly focus on the digital technologies and do not provide a lot of practical information related to how to manage the organizations' digital transformation. Reis et al. (2018) confirm this trend in their literature review, by presenting that the most covered research area (34%) in the articles they reviewed is the Information Systems science, while one of the least covered research areas (4%) is the Management science. They further prove that there is a high focus on technologies among the researchers when they argue that the most cited articles in the field revolve around the challenges that innovative technologies bring to the business. A similar phenomenon of giving high attention to technologies was observed in the businesses as well when Kane et al. (2015) revealed in their survey that during the decision making for digital transformation executives were giving the highest focus to the technologies. Another literature review which shows that there is a need for practical information for managing digital transformation was written by Henriette et al. (2015), who indicated the lack of guidelines regarding the realization of digital transformation. Fitzgerald et al. (2014) support that view by presenting that a significant majority of companies have not developed the management and technology skills needed to realize the potential of digital transformation.

Our literature indicates that like many other emerging scientific trends, digital transformation can suffer from insufficient information in the literature. Based on the information above, we identify that in the academic literature, there is a lack of a practical guide for managing digital transformation. Another problem that can be observed in the field is the lack of clarity.

1.1.1 The terminology

In the academic literature, the changes which are induced by digitalization are usually referred to as digital transformation. Although, the literature lacks any agreed upon descriptions for the term digital transformation. And to make matters worse, the term is accompanied with and also confused with the term digitization and digitalization. At this point of time the terms digitization, digitalization and digital transformation are sometimes used synonymously resulting in blurry boundaries and a lack of clarity (Collin et al., 2015), (Gimpel and Röglinger, 2015), (Kane et al., 2015), (Henriette et al., 2015), (Parviainen et al., 2017), (Westerman et al., 2014), (Gobble, 2018). To complicate matters El Sawy et al. (2016) note that "*digitalization is the North American term for digital transformation,*"; and some authors also tend to quantify the amount of change, such as McDonald and Rowsell-Jones (2012), who defined digital transformation as "*... going beyond digitizing.*" All in all, the terms are often used, but rarely defined (Michael, 2015), (Henriette et al., 2015), (Parviainen et al., 2017), (Westerman et al., 2014), (Gobble, 2018) resulting in blurry boundaries and a lack of clarity. To complicate matters (El Sawy et al., 2016) note that "*digitalization is the North American term for digital transformation,*"; and some authors also tend to quantify the amount of change, such as (McDonald and Rowsell-Jones, 2012), who defined digital transformation as "*... going beyond digitizing.*" All in all, the terms are often used, but rarely defined (Michael, 2015).

Furthermore, much focus is given to "what" digital transformation is, and to a lesser extent "how" organizations digitally transform. As a point of departure, we refer to the collection of digital transformation descriptions presented in Table 1. These descriptions are the result

of our literature review and will be used as a point of reference when decomposing the complexity of what digital transformation is.

Table 1 - Digital Transformation Definitions

Author	Definition	Year
(Stolterman and Fors, 2004)	Digital transformation is the changes that digital technology causes or influences in all aspects of human life.	2004
(Martin, 2008)	Digital transformation is now commonly interpreted as such usage of Information and Communication Technology, when not trivial automation is performed, but fundamentally new capabilities are created in business, public government, and in people's and society life	2008
(Fitzgerald et al., 2014)	The use of new digital technologies (social media, mobile, analytics or embedded devices)	2013
(Solis et al., 2014)	Digital transformation is much more than the sum of its parts. It's more than investing in digital technologies and adapting to a digital economy. It represents an opportunity for companies to modernize business and operational models to stay competitive. Entailing an enterprise-wide, cross-functional endeavor	2014
(Mazzone, 2014)	Digital transformation is the deliberate and ongoing digital evolution of a company, business model, idea process, or methodology, both strategically and tactically	2014
(Michael, 2015)	Digital business transformation is Organizational Change through the use of digital technologies and Business Models to Improve Performance	2015
(Henriette et al., 2016)	A disruptive or incremental change process. It starts with the adoption and use of digital technologies, then evolving into an implicit holistic transformation of an organization, or deliberate to pursue value creation	2016
(Parviainen et al., 2017)	Changes in ways of working, roles, and business offering caused by adoption of digital technologies in an organization, or in the operation environment of the organization	2017
(Reis et al., 2018)	The use of new digital technologies that enables major business improvements and influences all aspects of customers' life	2018
(Wiesboeck, 2018)	Digitalization concerns the adoption, adaption, development, and management of innovative digital technologies within organizations. This involves the process of digitization which refers to the transformation of primarily physical or analog products, services or processes into primarily digital ones	2018
(Wiesboeck, 2018)	Digital transformation describes the organizational change induced by digital technologies. This can relate to products, processes, or business models, and heavily affect strategies, infrastructures or governance structures	2018

1.1.2 Levels of analysis

From the descriptions presented in Table 1, one can observe that the authors are not referring to the same perspective when describing the term digital transformation. We see this from authors such as Ismail et al. (2017) who reviewed perspectives used in the digital transformation literature resulting in the following areas: "*individuals, companies, network dynamics, industry, and the economy*" (Ismail et al., 2017). Similarly, Parviainen et al. (2017) introduced four levels of digitalization: the process level, organizational level, business domain level and societal level, which has some similarities with the areas mentioned by Ismail et al. (2017). Moreover, authors are considering perspectives ranging from the impact on individuals to the society, similar to the specter of a micro and macro level of analysis. The perspectives and levels of analysis are presented in one can observe that the authors are not referring to the same perspective when describing the term digital transformation. We see this from authors such as Ismail et al. (2017) who reviewed perspectives used in the digital transformation literature resulting in the following areas: "*individuals, companies, network dynamics, industry, and the economy*" (Ismail et al., 2017). Similarly, Parviainen et al. (2017) introduced four levels of digitalization: the process level, organizational level, business domain level and societal level, which has some similarities with the areas mentioned by Ismail et al. (2017). Moreover, authors are considering perspectives ranging from the impact on individuals to the society, similar to the specter of a micro and macro level of analysis. The perspectives and levels of analysis are presented in Figure 2.

Considering the perspectives presented by Ismail et al. (2017), Parviainen et al. (2017), we focus our attention towards the organizational level which corresponds to a meso level analysis – a meso-level analysis indicating a population size that falls between the micro- and macro-levels, such as a community or an organization (WikipediaContributors, 2019). The descriptions in Considering the perspectives presented by Ismail et al. (2017), Parviainen et al. (2017) and the delimitation of the study, we focus our attention towards the organizational level which corresponds to a meso level analysis – a meso-level analysis indicating a population size that falls between the micro- and macro-levels, such as a community or an organization (WikipediaContributors, 2019). The descriptions in Table 1 are meant to describe the term digital transformation, although, it is evident from the descriptions that the authors reference several levels of analysis, be it without defining the spectrum of analysis and their chosen level of analysis. Hence, in this report, we are limiting our level of analysis to individual organizations. That is, describing digital transformation considering the perspective of individual organizations, and how these organizations can digitally transform.

Figure 2- Perspectives of analysis in a micro-meso-macro perspective

1.1.3 Transformation

From the descriptions of digital transformation presented in Table 1, we observe that the terms "change", and "transformation" are used when describing the term digital transformation, although, without defining what the authors mean by "change" or "transformation". This is similar to the challenge presented in section 1.1.2, where the lack of a common point of reference and spectrum makes the descriptions hard to generalize. Departing from the descriptions presented in Table 1, in this section we introduce the state of the art of literature on the topic of transformation to define a point of reference to use in this report when referring to transformation.

As argued by Ashkenas (2015) there has been, and still is, a lot of confusion surrounding the difference between change and transformation; stating that "*the two terms are sometimes used interchangeably by industry, yet they are very different in reality*" (Ashkenas, 2015). This can be observed in Table 1 as the term "change" is often used to describe the transformation.

Some authors are also referring to different magnitudes of change, without establishing a point of reference. We know from authors such as Purchase et al. (2011), that the change management literature has long tried to distinguish different levels of magnitude of change – highlighting perspectives such as "realignment" versus "transformation"; "incremental" versus "radical"; and "incremental change" versus "reinvention". Purchase et al. (2011) bring up an important point by considering several perspectives to change and also providing a dimension of time. An example of the use of such perspectives can be seen in Table 1, where Henriette et al. (2016) emphasize the "incremental" and "radical" nature of change when describing the term digital transformation.

Lastly, the term "transformation" itself can have several meanings as can be seen from Anthony (2016) as he differentiates between three fundamentally different categories of transformation. The first being *operational*, i.e., doing what you are currently doing, better, faster, or cheaper. The second category is the *operational model*, i.e., doing what you are currently doing in a fundamentally different way. The third is *strategic*, i.e., changing the very essence of a company, e.g., "*liquid to gas, lead to gold, Apple from computers to consumer gadgets, Google from advertising to driverless cars, Amazon.com* from retail to cloud computing… (Anthony, 2016)".

If we refer to the descriptions of digital transformation as presented in Table 1, considering the descriptions of transformation as presented by Anthony (2016), we can make two observations. Firstly, it becomes apparent that the different descriptions, to some extent, fall within the different levels presented by Anthony (2016). Secondly, we can see that at the same time, none of them consider all of the levels, or whether or not all levels are related or necessary when describing the digital transformation. When comparing the descriptions presented in Table 1 with the categories as described by Anthony (2016), we see that descriptions by authors such as Solis et al. (2014) and Michael (2015) are resembling the operational level, while Mazzone (2014), Parviainen et al. (2017), Reis et al. (2018), and Wiesboeck (2018) seems to cover both the operational and operational model level, and lastly, Henriette et al. (2016), who describes digital transformation as a process starting from an operational level and evolving towards a strategic level. These examples illustrate the importance of defining a point of reference when describing the term digital transformation. We also observe that most authors writing about digital transformation focus on what digital transformation is, and do not consider a specter of different levels as described by Anthony (2016).

Thus, as we see from the descriptions of digital transformation in Table 1, as well as the authors highlighted above – an important distinction can be drawn from already existing literature by referring to the descriptions of transformation.

1.2 Academic foundation for deriving thesis objectives

As introduced in subsection "*1.1.1 The terminology*" the terms digitization, digitalization, and digital transformation are sometimes used synonymously. In this section, we decompose the descriptions presented in Table 1 and introduce a description of the process of digitalization and reflect on how digitalization compares to the term digital transformation. To do so, we begin by describing the term digitization in section 1.2.1; furthermore, we introduce a description of the process of digitalization using two components: "D*igital technologies*" presented in section 1.2.2 and "Digitalization impact areas" presented in section 1.2.3. The result is a description of the process of digitalization which we use to explain the term digital transformation.

From the descriptions presented in Table 1, we can distinguish between the digital transformation of, e.g., an organization, as well as the digitalization of processes and products. I.e., a distinction between the process of digitalization, and the transformation of an organization enabled by digitalization. Supporting such a distinction is Wiesboeck (2018) who distinguish between the transition from an abstract digital technology, to a concrete digital solution, and likewise how digital solutions can lead to the development of digital business concepts. Similarly, Martin (2008) refers to digital transformation as "fundamentally new capabilities," or Fitzgerald et al. (2014) and Reis et al. (2018), who describe digital transformation as "major business improvements." Furthermore, authors such as Solis et al. (2014) referred to digital transformation as being "*more than the sum of its parts,*" supporting a distinction between the digital transformation of the organization's business, and separate initiatives enabled by digital technologies. Henriette et al. (2016) further support such a distinction by stating that digital transformation is "*a change process starting with the adoption and use of digital technologies, then evolving into an implicit holistic transformation of an organization.*"

Unlike the rest of the authors presented in Table 1, Wiesboeck (2018) is the only one to deliberately distinguish between digitalization and digital transformation describing digitalization as "*the adoption, adaption, development, and management of innovative*

digital technologies within organizations, including the process of digitizing." Furthermore, Wiesboeck (2018) describe digital transformation as "*the organizational change induced by digital technologies. This can relate to products, processes, or business models and heavily affect strategies, infrastructures, or governance structures* (Wiesboeck, 2018)."

1.2.1 Digitization

As was introduced in section "*1.1.1 The terminology*" the terms digitization, digitalization, and digital transformation are sometimes used synonymously. The Oxford Dictionary defines the noun "digitization" as "*The conversion of text, pictures, or sound into a digital form that can be processed by a computer*" (OxfordDictionaries, 2018a), and the verb "digitize" as "*Convert (pictures or sound) into a digital form that can be processed by a computer*" (OxfordDictionaries, 2018b). Dictionary.com define the verb "digitize" as *[Def 1] "to convert (data) to digital form for use in a computer"; and [Def 2] "to convert (analogous physical measurements) to digital form (Dictionary.com, 2018)"*. Similarly, Collinsdictionary.com define the verb "digitize" as follows, "*To digitize information means to turn it into a form that can be read easily by a computer*" (collinsdictionary.com, 2018). Merriam-Webster defined the verb "digitize" as follows, "*to convert (something, such as data or an image) to digital form*," Merriam-Webster also claims that the first known use of the definition was in 1953 (merriam-webster.com, 2018). Lastly, Yoo et al. (2010) defined digitization as "*the encoding of analog information into digital format.*" The process of digitizing is illustrated in Figure 3 – representing the conversion of analog signals and physical objects into its digital form. Examples of digitization are scanning of documents/photos/3D objects, audio/video recording, or the conversion of a signal into a digital format. The outcome of the digitization would, therefore, be the representation of a document, image, object, sound, signal, or measurement as digital data. Considering the general agreement on the definition of the term digitization, we consider digitization as a defined term and follow the definition as provided by Yoo et al. (2010): "*the encoding of analog information into digital format.*" In the next

Figure 3 - Digitization: " *the encoding of analog information into digital format*"

section, the main enabler for digital transformation is described – digital technologies.

1.2.2 Digital Technologies

From Table 1 we can see that several of the authors are referring to some kind of "digital enabler" or "digital technology" such as Martin (2008) referring to the "…usage of Information and Communication Technology…," or Fitzgerald et al. (2014) referring to "The use of new digital technologies (social media, mobile, analytics or embedded devices)," or Michael (2015), Henriette et al. (2016), Parviainen et al. (2017), Reis et al. (2018), and Wiesboeck (2018) referring to "digital technologies". Furthermore, Sebastian et al. (2017) state that "*most authors reference some type of 'digital technologies'.*" Similarly, Sebastian et al. (2017) and Corver and Elkhuizen (2014) emphasize "digital enablers" rather than technologies. Sebastian et al. (2017) introduced the acronym SMACIT (social, mobile, analytics, cloud, and Internet of things [IoT]) to cover the entire set of powerful, readily accessible digital technologies we have today. Although Sebastian et al. (2017) stated that there are more digital technologies than implied by this acronym, including artificial intelligence, blockchain, robotics, and virtual reality. Similarly, Henriette

et al. (2016) stated that "*the digital transformation, as its name suggests, is primarily a transformation stemming from the evolution of new technologies (Henriette et al., 2016).*" From their literature review, Henriette et al. (2015) observed and categorized three main technologies: "*internet technologies, analytical technologies, and mobile technologies.*" Taking a different perspective, Schallmo et al. (2017) introduced four categories of "digital enablers", "*digital data, automation, digital customer access, and networking*", rather than specific technologies.

Lastly, authors such as Corver and Elkhuizen (2014) refer to "digital enablers," and categorize them by the following impact areas - customer experience, products, operations, and the organization. Examples are the analysis of digitally generated data such as network traffic, or physical products which can digitize information and connect to a network. For operations, digital enablers such as big data analytics, cloud computing, and mobile platforms are identified. Lastly, the authors denote that these digital enablers can contribute to organizational changes like improvements in the value chain (Corver and Elkhuizen, 2014).

As illustrated above some authors emphasize digital technologies (Sebastian et al., 2017), while others focus on the enablers (Schallmo et al., 2017), or impact areas (Corver and Elkhuizen, 2014). As the name suggests, the "digital enablers" usually enable the use of "digital technologies," and as we observe from the literature the common denominator for 'digital enablers,' and 'digital technologies' is that they enable the changes we are studying; therefore, we refer to "digital technologies" throughout this thesis. Lastly, it is important to note that "digital technologies" includes existing technologies as well as emerging technologies, as was implied by Sebastian et al. (2017). The purpose of this categorization is to introduce a single term which describes existing and future digital technologies.

1.2.3 Digitalization impact areas

The next question which emerges is, "*what should organizations digitalize?*" and, "*where should they focus their digitalization initiatives?*". When reviewing the literature, some authors take a much broader approach than others, while others narrow in on certain topics. From the broader view, we have authors such as Westerman et al. (2014) and Wiesboeck (2018), who emphasize how organizations can digitalize their products or services, operations, and business models. Similarly, Corver and Elkhuizen (2014), Ross et al. (2016), and Deloitte (2018) emphasize products and services, as well as operations. Furthermore, authors such as Reis et al. (2018) and Michael (2015) emphasize operations and business models. A full overview of the categories covered by the authors is illustrated in **Error! Reference source not found.**.

Table 2 - Overview of the categories covered by the reviewed authors

Products/Services	Operations	Business Model
(Westerman et al., 2012)	(Westerman et al., 2012)	(Westerman et al., 2012)
(Westerman et al., 2014)	(Westerman et al., 2014)	(Westerman et al., 2014)
(Wiesboeck, 2018)	(Wiesboeck, 2018)	(Wiesboeck, 2018)
(Corver and Elkhuizen, 2014)	(Corver and Elkhuizen, 2014)	
(Ross et al., 2016)	(Ross et al., 2016)	
(Deloitte, 2018)	(Deloitte, 2018)	
	(Reis et al., 2018)	(Reis et al., 2018)
	(Michael, 2015)	(Michael, 2015)
	(Parviainen et al., 2017)	
(Henriette et al., 2016)		

As noted at the beginning of this chapter, the literature review is governed by the key search phrase "digital transformation," i.e., we would not search specifically for any of the mentioned categories, rather, we only included literature which emerged when searching for "digital transformation," and hence, we view this distribution as a good representation of the literature which is being conducted on digital transformation.

The three categories are based on the categories introduced by Westerman et al. (2014) and Wiesboeck (2018) because they include all the categories. Note, Westerman et al. (2014), does not refer directly to products and services, rather they refer to the customer experience, and how digital technologies can enable a better customer experience in the products and services; similarly, Wiesboeck (2018) refers to products, processes, and business models. These categories are similar to the "components of a business model" as presented by De Wit (2017); De Wit (2017) refer to three components: The Resource Base (stock of assets), Activity System (Value Chain), and Product Offering (Value Proposition) the latter two being quite similar to the operations and product/services, as for the resource base it covers a lot of important topics, but does not emerge naturally as a category from the reviewed literature. We, therefore, describe these three areas as the digitalization focus areas, i.e., the areas where organizations should focus their digitalization initiatives; the groups are illustrated in Figure 4.

Digitalization Impact Areas

Products/ Services   Operations/ Processes   Business Model

Figure 4 – Digitalization focus areas, i.e., the areas where organizations can focus their digitalization initiatives.

1.2.4 Digitalization

We began section **Error! Reference source not found.** by introducing the distinction between digitalization and digital transformation. Similarly to section 1.1, we began by excluding the term digitization due to it being well defined. Furthermore, we decomposed

the process of digitalization intro two components: "Digital technologies" and "Digitalization impact areas".

Building on the argumentation and observations made from the literature, we propose a clear distinction between the terms digitalization and digital transformation. Building on the description as provided by Wiesboeck (2018), we describe the process of digitalization based on our description of "Digital technologies," as described in section 1.2.2, and "digitalization impact areas" as presented in section 1.2.3. Hence, we describe digitalization as "*The process of changing, or creating any product/service, operation, or business model enabled by digital technologies.*" The process of digitalization as derived by the authors is illustrated in Figure 5.

Figure 5 **–** The process of improving or inventing a product/service, operation, or business model enabled by digital technologies.

1.2.5 Digital transformation

To review, in section 1.1.2, we introduced the different perspectives in which it is possible to analyze digital transformation and showed where some authors had focused their research. Furthermore, we delimited the focus of the empirical part of this study to the organizational/company perspective. In the following section, we reviewed different perspectives on transformation and introduced three fundamentally different levels of transformation. Both the perspectives of analysis and the perspectives on transformation are related to digital transformation but are described using literature which is not directly related to digital transformation. Departing from the description provided for the process of digitalization, we can now see that the term digital transformation will depend on the perspective of analysis as well as the perspective on what digital transformation is. Therefore, throughout this thesis, we will refer to *organizational development* rather than digital transformation.

1.2.6 Conceptual framework to what of digital development

We now introduce our conceptual framework for digital development. The conceptual framework is presented in Figure 6, and comprise two main components - the "what" and "how" of digital development. From section 1.2, we have focused on "what" digital transformation is, and as a result, we have presented three digitalization areas where organizations are focusing their digitalization initiatives. Furthermore, we note that the enabler for organizations digital development is digital technologies. Lastly, as depicted in figure 6, we show the objective of this thesis – researching the "how" of digital development.
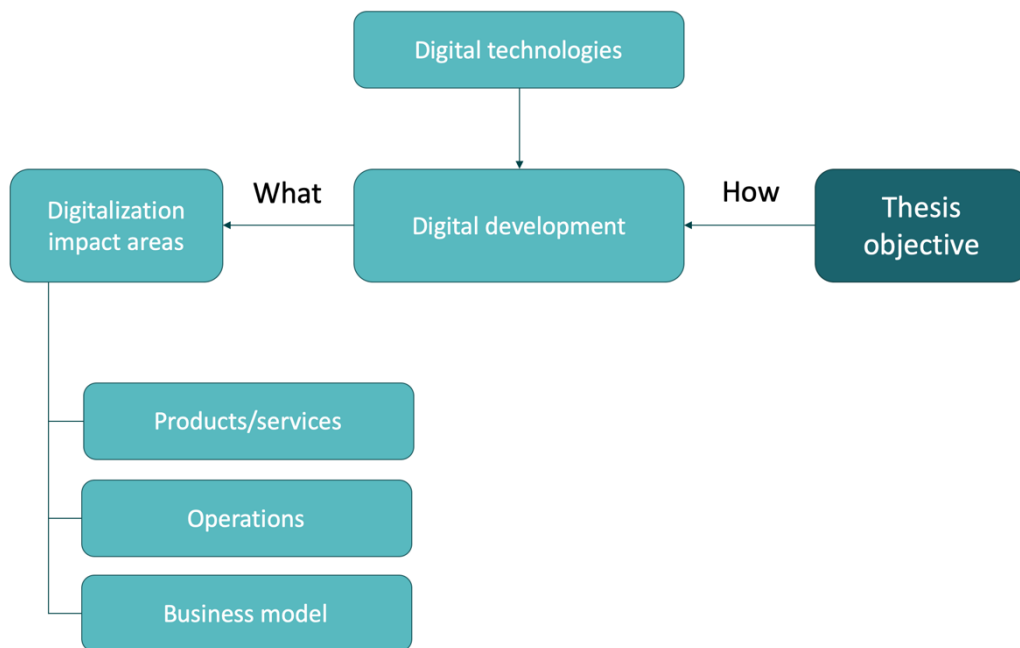
Figure 6 - Conceptual framework of digital development in the organizations

1.3 Motivation

In this thesis, we intend to address and contribute to a research gap which we observed in the literature on digital transformation. From the literature on digital transformation, we identified a lack of literature focusing on "how" organizations can digitally develop. Furthermore, we identified a lack of practical information for how organizations can navigate as they are digitally developing. Furthermore, some of the literature which we have reviewed provide insight for organizations on how they can navigate through their digital development, although, we recognized two issues with the available literature. The first issue is that the academic papers which are providing guidelines for how organizations can develop digitally are either not very specific – or suitable only for particular business sectors, the second issue is that some of the available literature published are business or consultancy papers which are not peer-reviewed and can be biased. In order to avoid these issues, we have chosen to investigate companies who have been and are developing their organizations digitally to study the actions they have performed in their digital development and then to analyze these actions through the observed academic literature.

1.4 Research statement and objective

In section 1.2, we introduced a conceptual framework for digital development in organizations comprising of two components, the "what," and the "how" of digital development. The objective of this thesis is to complete the conceptual framework by studying "how" organizations can develop digitally. The purpose of deriving the conceptual framework is to demystify and lower the complexity for academia and future research, as well as providing the industry with a framework which can be understood and used by both technical and managerial users. In section 1.2, we introduced the "what" of digital development, and in chapter 2, we conduct a literature review on "how" organizations can develop digitally. Furthermore, we use this literature review to design the interview question guide, which is used to guide our empirical data collection. From the empirical

data, we analyze and present our findings in the form of strategic decisions which are facing organizations as they are developing digitally and consider several perspectives to these decisions. Guided by the framework as will be presented in Figure 9, on p.17, we further consider three of these decisions due to their connection between the decision, and the outcome of the organizations' digital development. The thesis concludes by considering the implication of the three decisions, and to what extent these decisions are generalizable for other companies. Based on the insight, we believe companies can make more knowledge-driven decisions, and potentially speed up their digital development. Lastly, due to the exploratory nature of our thesis, suggestions for future research on the topic are identified and presented. The research question which has been guiding the study is as follows:

RQ: How are Norwegian organizations enabling their digital development?

1.5 Structure

After this chapter, the thesis was arranged as follows: (2) Literature review, (3) Research methodology, (4) Findings, (5) Discussions, (6) Conclusion. Firstly, the Literature review chapter provides an analysis of the state of the art of researches in the field of enablers for digital development in organizations and expands the "How" part of our conceptual framework based on the literature. Then, the Research methodology chapter presents insights into the empirical research that was conducted for the thesis. After that, the Findings chapter introduces the results obtained from empirical research. Furthermore, the Discussion chapter demonstrates an analysis of the findings using available literature on the subject and gives an overview of the limitation of the thesis and possible future research directions. Finally, the Conclusion chapter reflects on the work done in the thesis and gives a summary of the research.

2 Literature Review

2.1 Enablers for digital development in organizations

In this chapter, we present the outcome of our literature review, where we identified focus areas for how organizations are enabling their digital development. The findings are presented in groups based on the similarity between the focus areas and are only used to present the findings in a structured manner. The purpose of this section is to review what researchers in the field perceive as strategic decisions that enable digital development in organizations. This section is structured as follows: Each category of enablers is presented in subsection with a general introduction of the category as well as some insight into the perspectives and views given by the corresponding authors.

Based on the literature review, we have identified four areas where we expect strategic decisions to emerge. An overview of these four areas is presented in Figure 7.
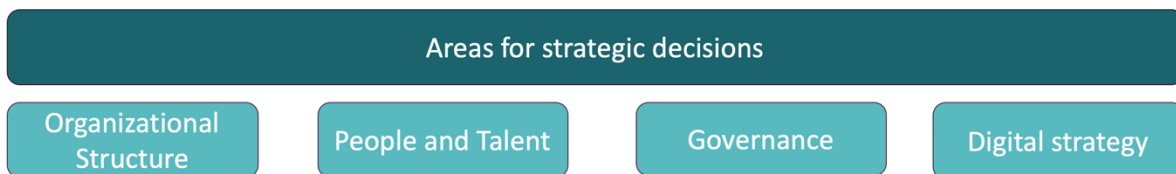
Figure 7 – Areas for strategic decisions identified in the literature review

2.1.1 People and talent

One of the categories which emerges from the literature on how organizations can develop digitally is the importance of developing the talent and people in organizations. That is, the need for organizations to invest in their employees by upskilling, reskilling, or acquiring new talents. Buvat et al. (2018) point to two main enablers for organizations to succeed with their digital development, that is to identify the organization's current needs as well as future needs, and to establish programs for re-educating current employees as well as recruiting new employees. Likewise, Michael (2015) point out the importance of being aware of current and future needs and highlight the importance of hiring "digital-savvy" employees and leaders, while also retraining existing staff.

Moreover, Deloitte (2018) highlight organizational and cultural development as one of five key components for measuring digital maturity and emphasize the importance of having defined processes and governance structures supporting the people and talent development. Another topic which is closely related is the engagement of people and the methods that organizations use to raise the interest and commitment of employees in a transformation, which is illustrated by Westerman et al. (2014) who in their book on digital transformation highlight engagement as a crucial enabler for the digital development of organizations. Furthermore, Westerman et al. (2014) note that technologies can be used to engage people, and a lot of the development in an organization will come from the people in the organization, i.e., bottom-up, and thus failing to engage the people in the organization will be detrimental. Based on the outcome of the literature review People and

Talent will be considered further as an enabler for organizations as they are developing digitally.

2.1.2 Digital Strategy

Another category which emerged from the literature is the importance of having a dedicated digital strategy. Having a digital strategy is in itself crucial, but as Ismail et al. (2017) state, having a digital strategy by itself is not enough, it is also crucial that the digital strategy is aligned with the organizations overall strategy – ensuring that the strategy is anchored at the highest level in the organization and that the organization is committed to the strategy. Further on, as we have described in the previous section where we discussed the focus on digital technologies and the digitalization impact areas, Ismail et al. (2017) emphasize the need for having a digital strategy that goes beyond implementing technologies and focus on measures like organizational development. Supporting the same arguments is Kane et al. (2015) who also emphasize the importance of having a well anchored digital strategy, but also point out that less digitally mature organizations tend to focus on individual technologies and have a digital strategy which more operationally focused, while more digitally mature organizations are focusing on transforming the business. Lastly, similarly to the division between digitalization focus areas and the digital organizational development, Matt et al. (2015) introduced two perspectives on digital transformation, one focusing on the elements of digital transformation strategies, and the other focusing on the procedural aspect related to digital transformation strategies, i.e., how to execute the strategy. Furthermore, Matt et al. (2015) build the first perspective on the use of technologies, changes in value creation, structural changes, and financial aspects, and the second perspective mostly related to the governance of the strategy. Based on this literature, digital strategy is considered as an essential enabler for organizations' digital development.

2.1.3 Governance

Another category which emerges from the literature is governance. Governance concerns how organizations can provide sufficient levels of coordination and information sharing in terms of their digital initiatives. It also provides the connection of such initiatives with the company's structure, culture, and strategic priorities (Westerman et al., 2014). Furthermore, authors such as Henriette et al. (2016), and Matt et al. (2015) discuss the importance of aligning the responsibility at the right level in the organization, and both mention how some organizations choose to allocate this responsibility to a dedicated position such as a chief digital officer of a chief transformation officer. Based on this literature, governance is considered as an essential enabler for organizations' digital development.

2.1.4 Organizational structure

Another category of enablers which emerges from the literature is the question of whether or not the structure of organizations acts as an enabler, or an inhibitor for organizations as they are digitally transforming. Organizational structure is associated with the need to change how the company is organized in order to suit requirements of a digital transformation, as well as the establishment of new units, partnerships and decision-making methods related to digitalization (Ross et al., 2016).

Ross et al. (2016) also argue for the importance of building a "digital service backbone" in the organization, i.e., "*the set of technology and business capabilities that serve as a base for rapid development and implementation of digital innovations*."

Furthermore, Ross et al. (2016) note that based on their studies, the majority of case companies had introduced a separate "digital unit" which took on responsibility for digital innovation, speed, and agility. Similarly, Michael (2015) argues that despite the differences among companies, there is one capability which organizations need to develop to transform digitally, which they refer to as "digital business agility." I.e., the capability to recognize and actively analyze future trends and information that will impact the organization, and the ability to respond by quickly execute and implement necessary changes (Michael, 2015).

Furthermore, as such digital units will possess most the digital talent in an organization, a related challenge which emerges is the alignment of the people with digital skills and the people responsible for business development (Westerman et al., 2012). Moreover, as stated by Kane et al. (2015), less mature organizations tend to focus on individual business needs, while more mature organizations focus more on the transformation of the organization. Similarly, Westerman et al. (2012) point out that while some organizations only will focus on digital technologies, others will manage to align business development with digital development.

2.2 Summary of literature review

As it was mentioned in the introduction chapter, the thesis is concerned about the question "*How should organizations enable their digitalization?*". We can see that the answer to that question can be found within the four areas for strategic decisions that we have found in the literature review. Using the findings from the literature review, we can complete the "How" part of our conceptual framework.
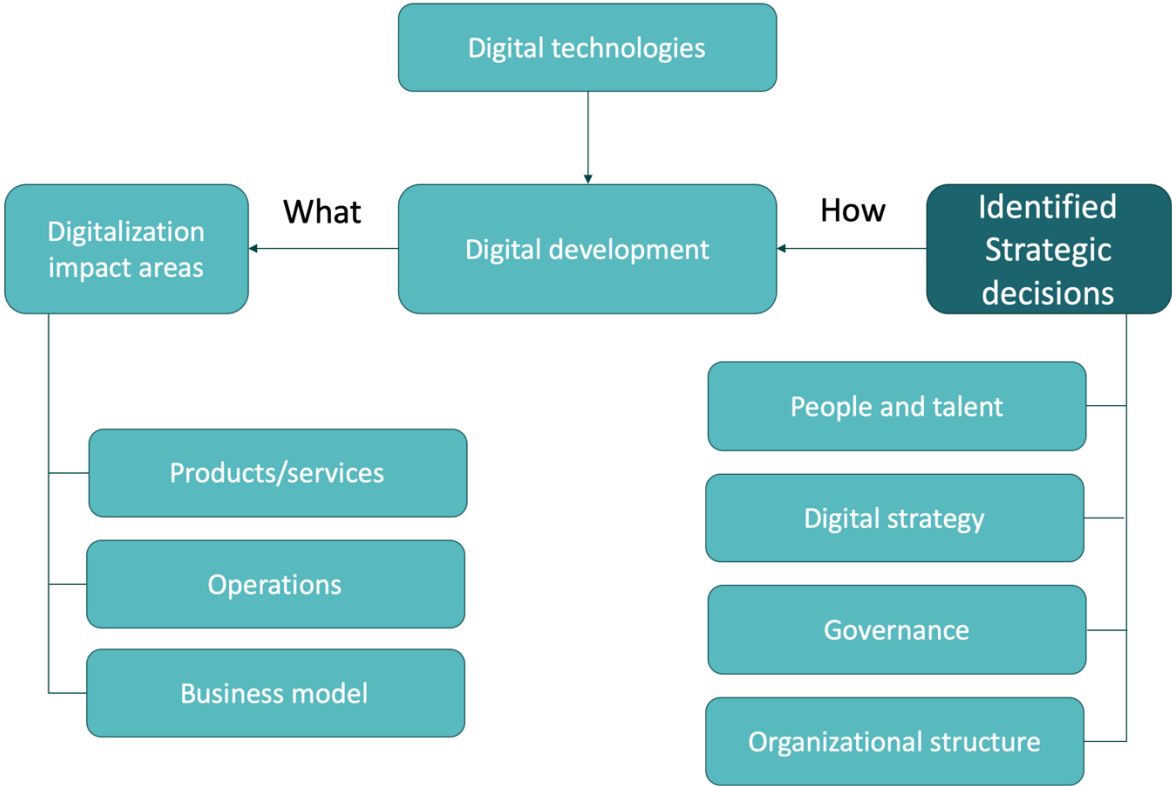

Figure 8 - Conceptual framework of digital development in organizations with the identified areas for strategic decisions

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3 Methodology

This chapter presents the research methodology that we used in the thesis to acquire empirical data. We commence by explaining the research design and the reasons for choosing qualitative and exploratory research strategies. We further present how the case study was designed. Subsequently, we describe how data collection was conducted. Then at the end of the chapter, we present in what framework collected data was acquired.

3.1 Research strategy

As it was indicated in the introduction chapter, the thesis is concerned with the digital development of Norwegian organizations. In the literature review chapter, we have identified four general categories of enablers that were covered by the researchers in the field. Our research was established to acquire further empirical data regarding how organizations in the Norwegian market enable their digital development. Based on the guidelines described by Thornhill et al. (2009), we have found that an exploratory research approach is the most appropriate for the scope of this thesis. They indicated in their work that exploratory research approach is used when the research aims to acquire new insights related to cases which lack certainty in the nature of the observed phenomena.

Due to the exploratory approach of the research, types of empirical data we were interested in were characteristics and attributes related to digital development in the organization. Thus, in accordance with Thornhill et al. (2009), our research was focusing on qualitative data analysis. Additionally, the qualitative approach is also suitable for the purposes of this thesis because the key advantage of the qualitative research approach is to explore unanticipated issues as they emerge in the process of the research (Ritchie et al., 2013).

In the introduction, we have indicated that the purpose of the thesis was to observe what is the real-life situation in the Norwegian companies in relation to digital development. Due to that, we have chosen to use the case study, as it is a well-used strategy when researchers want to examine a contemporary phenomenon in its context (Yin, 2003). This choice is also supported by Thornhill et al. (2009), when they indicate that case studies are especially suitable when research is asking questions such as 'why?', 'what?' and 'how?' in the scope of a specific context. Moreover, our intention was to observe difference and similarities between the digital development of different Norwegian organizations, thus based on Yin (2003), our choice was to have multiple case studies.

One of the most common information recording methods for case studies is the interview (Creswell, 2007). In terms of the data collection method, we have chosen to use face-to-face semi-structured interviews. The reason being that during semi-structured interviews, researchers use a list of themes and questions that they are going to cover, but in the same time, the method allows to change the order or content of the questions and add or even omit some of the questions (Thornhill et al., 2009). The flexibility in the collection of data allowed us to start interviews with the open questions and then further ask additional questions to get more information on the topics that may seem interesting as they were emerging during the conversation. It also gave us the opportunity to revise and change the interview questions after every interview.

3.2 Design of interview guide

In the literature review chapter, we presented the state of the art of literature on the topic of enablers for digital development. The reviewed literature was categorized into four groups: people and talent, digital strategy, governance, and organizational structure. To answer the research questions, we designed an interview guide based on the identified categories. The questions were designed following the framework, as presented in Figure 9. The purpose of the framework in Figure 9 is to identify relationships between certain enablers and the outcome of the enabler. Following this framework means that we were able to steer the interview in a direction so that the interview participants were reflecting on the relationship between specific decisions and their outcome. The interview question guide is attached in the Appendix on page 44.
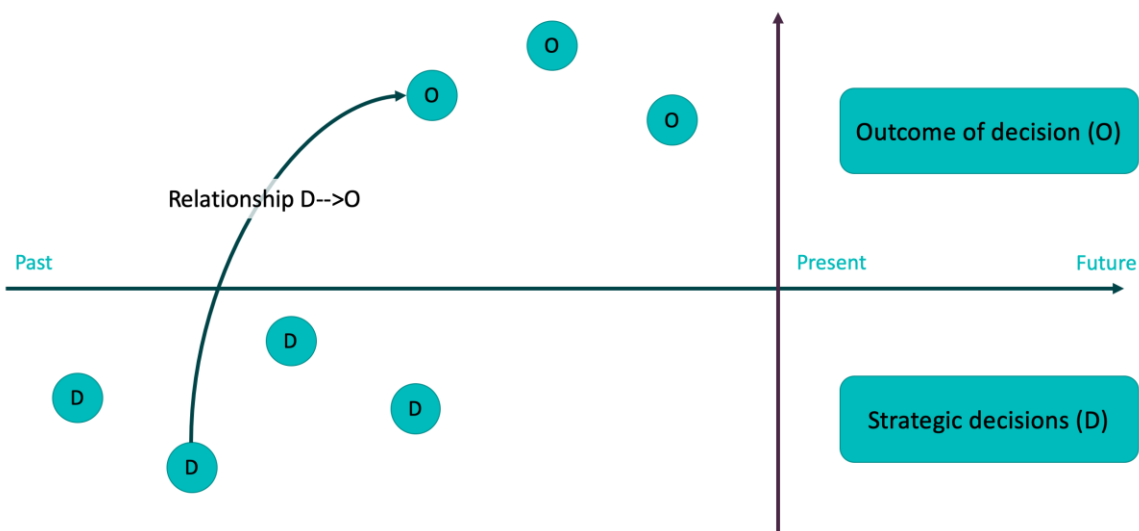
Figure 9 – Relationship between strategic decisions and the outcome of the decision

3.3 Selection of case companies and Data collection procedures

Considering the sampling techniques for the research described by Thornhill et al. (2009), we have selected heterogeneous sampling method. Through that method, researchers use a sample of a small size that consists of cases that are different from each other, so detected patterns could be of more representative. In the research for this thesis, we have chosen to research companies who have been and are currently developing digitally and who are not operating in the same industry. We have decided to have one company per industry.

Our intention was to obtain a holistic view of the strategic decisions in companies. Therefore, we have chosen to interview the C-level executives in the companies. We commenced the search for the interview participant by exploring companies that have been

involved in digital development. After screening and identifying appropriate case companies, we started to search for individuals who can be suitable candidates for the interview. The search for suitable individuals was performed through "word-of-mouth", phone calls, and contacting through emails. At the end of this process, we have ended up with the sample size of four cases, which, according to Eisenhardt (1989), is within the range of sample size that is usually suitable for a case study.

Once selected candidates expressed their willingness to participate in the interview, we sent them an email where we attached the letter with information about the research and the agenda for the interview meeting. The text of the information letter and agenda for the interview are attached in the Appendix on pages 46 and 48.

All the interviews were held in the period from March to April 2019. Agreed location for all of the interviews were meeting rooms in interviewees' companies. Interviews were conducted within the time span of 1 hour with the opportunity for the interviewee to give their feedback in the end. Interview conversations were recorded on the computer provided by NTNU and transcribed after the interview. The analysis of the collected data was performed iteratively after every interview to improve the interview guide. After each interview, we have been analyzing similarities and differences between each interview.

3.4 Quality of the data

The quality of research can be evaluated by considering its validity, forms of bias, and reliability of the research (Thornhill et al., 2009).

3.4.1 Validity

The validity of the research is characterized by the degree to which researchers are measuring what they were supposed to measure. This question often seems challenging when conducting qualitative studies (Bryman and Bell, 2011). One of the ways to increase the validity of the data for the semi-structured interview is ensuring that interviewee's answers are as honest as it is possible. In order to achieve that we established anonymity of the interview participants by replacing all the interviewees' and companies' names as well as avoiding any information that can directly point at them.

3.4.2 Forms of bias

In order to decrease the level of biasedness, we tried to decrease the effect of our verbal or non-verbal behavior on the interviewee's response to the questions. Therefore, all the questions were designed without any predisposition towards a specific answer, also they were asked in a neutral tone with no emphasis on particular words.

3.4.3 Reliability

Reliability of the data is associated with the level to which alternative researches would reveal similar information if they follow the same approach (Easterby-Smith et al., 2012). Establishing reliability in a qualitative semi-structured interview study can often be challenging (Thornhill et al., 2009). It becomes even harder to ensure reliability due to the anonymity of the research participants. In order to increase the reliability of the work, we have followed the suggestion from Thornhill et al. (2009) and attached all documents that have been used in the interviews.

3.5 Methodology for the analysis of the data

In chapter 4, the analyzed findings are presented, and the method for the analysis is presented now. Working with the final transcribed data, we manually reviewed all the data by comparing each of the questions while also labeling similar themes. As we analyzed the data the findings emerged as seven strategic decisions, which can be expected due to the framework which was followed when designing and conducting the interviews; we refer to these decisions as "strategic decisions" because they are decisions which are made by top managers to develop their organizations digitally. An important part of the analysis is to determine to what extent these strategic decisions are related to the outcomes which are presented by the interview participants. And the way we are determining the significance of these strategic decisions is by considering the degree to which there is a link between the decision and the outcome of the decision.

After analyzing all the strategic decisions, only three are considered to have a significant relationship between the decision and its outcome. In chapter 4, we present all seven strategic decisions, three of which are considered as having a significant link to the decision and the outcome of the decision.

4 Findings

This chapter presents the results of the data analysis. The first section gives a short introduction of the case companies' profiles. Then section 4.2 examines strategic decisions which case companies faced as they were developing digitally.

4.1 Case companies' profiles

This section provides brief descriptions of the companies used in the empirical research based on public information and information from interviews.

Company #1: (Energy company)

Company #1 is a global engineering company with the headquarter in Oslo. Company has more than 50 years of experience on the market. Company #1 is a project driven organization with a business built around delivering projects in the energy sector. It is working in accordance with EPCI (Engineering Procurement Construction and Installation) contracting arrangement.

Company #2 (Shipping company)

Company#2 is a shipowner, operator, and leading service provider in the global shipping industry with more than 60-year history. Company's headquarter is located in Oslo. Company has four main businesses areas: combination carriers, container vessels, dry bulks, and cloud-based services for logistics, performance, and platform management.

Company #3 (Consultancy company)

Company #3 is one of Scandinavia's leading consulting engineering companies. It was established around 60 years ago and has headquartered outside Norway. Company has multidisciplinary projects, in Norway company is specialized around projects in energy, building, infrastructure, environment, and urban water management.

Company #4 (Railways company)

Company#4 is a government-owned railways company. Company is relatively young and was established around 20 years ago. The business of Company #4 is providing services in the sector of passenger rail transportation. Even though it is a government-owned company, it is fully commercial, and it does not rely on subsidies from the state.

4.2 Strategic decisions

From the empirical studies, we have identified seven strategic decisions that were enabling digital development for the case companies. An overview of these strategic decisions is illustrated in Figure 10. Each of these strategic choices is described further in the section with the inclusion of appropriate quotes from the interviews.
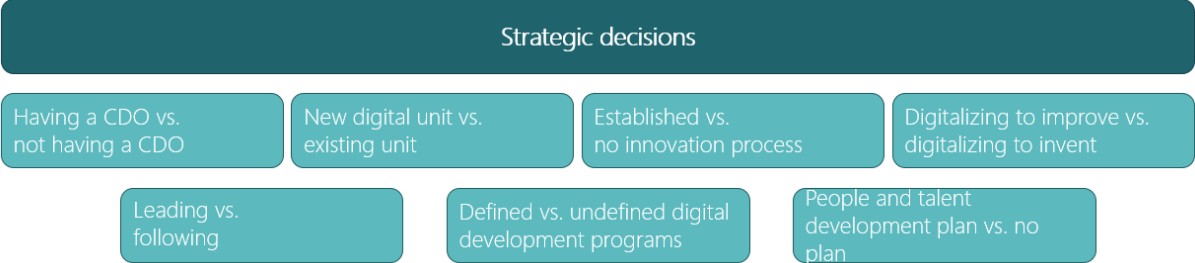
Figure 10 – Strategic decisions identified from interviews

4.2.1 Having a CDO vs. not having a CDO

From the interviews, several views emerged on how digital developments are led. That is, having a dedicated leader with the responsibility for the organizations' digital development. From the interviews, we observed how all organizations had been faced with the choice between appointing a dedicated leader such as a Chief Digital Officer or to focus on developing the existing management team to succeed in the digital development.

For stance, we observe from Company #3, that respondent #3 argued against the position stating the following "*[Company #3] has decided not to hire a c-level executive responsible for digitalization because the management team of [Company #3] believe doing so would cause challenges on the highest level.*" Stating that "The problems would arise as a result of the digitalization director not being able to know all the business areas (paraphrased)." indicating that the introduction of a CDO is not necessarily suitable for all organization, or, that the value of having a CDO is not properly understood.

Considering an opposing scenario, we learned from respondent #1 that the introduction of a CDO was one of the starting points for Company #1 's digital development, contributing to developments such as the decision to create 'Company #1 Digital' – a separate business unit. Referring to the latter development, respondent #1 pointed out that "*…the CDO started before anchoring everything with the board of directors. The CDO's role was to really create and initiate all this.*" suggesting that the CDO played an important part in mobilizing Company #1 on their digital journey.

Similarly to Company #1, we learned from respondent #2 that it's not the CDO position itself which enables the digital development but rather the role; this was illustrated by respondent #2 who acted out the role of the CDO while being the CEO. Similarly to Company #1, respondent #2 was the key driver to change the course of the organization and anchoring the digital development at the top of the agenda in Company #2.

Lastly, from Company #4, we observed how a CIO could act out the role as a CDO. Although, it is worth mentioning that the digital development in Company #4 was not initiated by the CIO alone; instead, their digital development was anchored and begun as a result of introducing a new Commercial Director who had a lot of experience with digitalization. This new director then supported and collaborated with the CIO.

Together these findings indicate that the function of a CDO might act as an enabler for organizations to transform digitally, but that it is important to focus on the function of the CDO, and whether having a CDO is suitable in all situations. Also, we observe that strong anchoring in top management is a reoccurring requirement for most organizations.

4.2.2 New digital unit vs. existing unit

From the interviews, we discovered that the common decision that case companies were facing during their digital development was to choose between creating a new external unit for digitalization or using an already existing unit to drive digitalization in the company. For the sake of simplicity, these new units will be referred to as "digital units". Digital units in the case companies were innovation business units defined by objectives directly related to digitalization and competencies that contrast with the rest of the company.

Based on the interview, we can say that Company #1 has started its digital unit in order to pursue new value creation by analyzing and developing digital solutions for its clients. Examples of digital solutions, as defined by respondent #1, can be digital twins and digital ways of operating. It is notable that unlike other units in Company #1, the digital unit consists mainly of software developers. It is evident that Company #1 focuses on developing a unit with specific technical skills to provide new products and services for their clients. While speculating about the future of digital unit respondent #1 said that "*there is going to be their own profit and loss, and maybe their own delivery center,*" meaning that respondent #1 expects it to become more independent.

Another example of a business that created a separate digital unit was case company #2. There the digital unit was also established to improve existing business and to create new products and services. Respondent #2 mentioned that the digital unit's strategic objective is to develop "*… into company delivering the most useful and intuitive digital services*", more specifically developing cloud-based services on logistics, performance and platform management. Respondent #2 described the company's digital unit as "business in its own right", specifying that it has its separate ownership structure, contracts, and data infrastructure. Thus, in a similar manner to Company #1, Company #2's digital unit primary goal is to create new business propositions.

On the contrary, Company #3 have specifically chosen not to establish the digital unit. The reason for such decision given by respondent #3 was to put "*the responsibility of digitalization to our ordinary consultants.*" That suggests that the concern of respondent #3 is that the creation of a digital unit can hinder the involvement of other employees in digital changes.

Finally, the interview indicates that case company #4 has chosen to develop the necessary digital forces in the already existing IT department. In the past, many IT operations of Company #4 were outsourced, but now it was agreed that IT retains more control over IT systems and architecture of the company. Respondent #4 mentioned that the focus of IT department is still on supporting the existing business proposition, as it was described in an interview: "*[Company #4] doesn't do IT because of IT sake, [Company #4] does IT for business.*". That indicates the company is concerned about adding value for the current business.

Based on the interview data, we can observe that choice, whether to create a new digital unit or not to a large extent defined by the company's vision of further development. Findings suggest that digital units are associated with the creation of new types of products

and services. On the other hand, the decision for developing forces for digitalization in existing units relates to more gradual changes of an existing value proposition.

4.2.3 Established vs. no innovation process

Interview data suggest that during digital transformation for case companies, it became specifically valuable to build an appropriate process of experimenting over digitalization ideas emerging in the company. Even though companies took a different direction to tackle that goal, we can outline the common steps taken by each of the case companies in their experimentation process. Figure 11 illustrates the model for experimentation process observed from the interviews, it consists of 3 common stages of the idea and two steps. The first stage starts with an idea proposed by some employee in the company. In the second stage company experiments over ideas and makes the idea more refined. Then in the third stage, if the developed idea has sufficient potential to bring value through commercialization or implementation, the company becomes committed to investing in it.
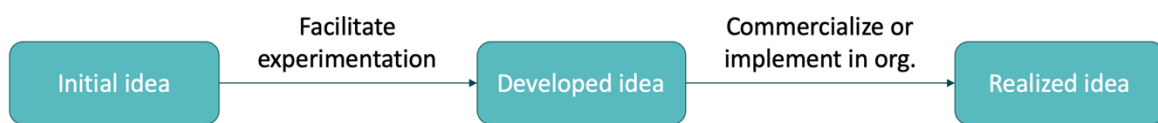
Figure 11 - Model for the experimentation process

In the case of Company #2, experimentation plays a vital role in digital development. One of the changes in work process according to respondent #3 was the switch from long-term projects bounded by clear goals to a period of 2-week experiments with further adjustment of project direction. At the first step of the experimentation process Company #2's digital unit tests the validity of some idea and develop them. Then during the second step, the developed ideas are incorporated in the rest of the company. It is notable that the separation between digitally enabled improvements and digitally enabled invention and re-invention discussed in section 4.2.4 influenced the framework for prioritization of digitalization initiatives. Thus, initiatives for invention and re-invention are measured by their potential to increase the number of customers and the potential to expand the revenue per customer, while initiatives for digitally enabled improvements are evaluated by their feasibility and the value of the problem they solve. That illustrates how Company #2 designed a structured and clear plan for pursuing emerging digital initiatives.

For case company #1 there was one year when the company had a more exploratory attitude towards experimentation, then the next year company switched to a more practical approach to experimentation. Respondent #1 described it as such: "… *if you actually decided about the initiative, it has to be implemented in the project*." In terms of experiments, Company #1 relies on its separate digital unit. According to respondent #1, the problem for the company is not to find solutions through experiments, but rather implementing these solutions in the projects or work processes. That suggests that in the model described by Figure 11, Company #1 has significantly more challenges in step two. It is possible to observe that Company #1 is determined to have a more pragmatic approach in dealing with ideas developing from the employees.

Company #3 does not have a separate digital unit to run the experiments, so experimentation is done entirely internally. According to respondent #3 currently, there is high freedom for experiments in the company. In the past, employees were sending applications with their ideas, and then the company was allowing them to work half of their work time on the idea. But recently they changed that process. Respondent #3 described

the new process as follows: "*We give you 200K and we are not going to ask any questions. Come back when you have spent that money the wisest way you think and show us what you have done and then you can ask for more*." So, from the perspective of our generalized experimentation model, the approach of the company is to provide a small amount of funding for the experiments at step one, then experimenters need to find interested customers to acquire more funds at step two.

More passive approach for experimentation was chosen in Company #4, as respondent #4 said because of the high focus on operations, there is not much time for innovation. There is a person from the IT group who is responsible for innovation in Company #4. Taking the perspective of our model, at the first step, this innovation manager monitors the ideas emerging in the company. Then at the second step, respondent #4 is responsible for approving funding for them. There are no incentives for employees to send ideas for innovation, and according to the interview. It was admitted in the interview that some people in Company #4 consider that process being not fast enough. Based on the interview, it can be said that in comparison to other case companies Company #4 pay the least attention to the digital experiments.

Interview data indicate that the process for governing experimentation is considered to be of high importance for case companies in their digital transformation journey. We summarized the general approach for experimentation based on case companies and noticed that the differences between them could be observed in the way how they facilitate initial experimentations and tackle commercialization or implementation in the organization. These observations show that the process for governing experimentation is a valuable enabler in the company's digital development.

4.2.4 Digitalizing to improve vs. digitalizing to invent
From the literature, we observe that digital technologies can enable value creation in organizations' products and services, their operations, and business models. Digital technologies have the potential to not only enable improvements but also enabling organizations to re-invent and invent new products/services, operations, and business models. We observe two options facing organizations when digitalizing - to improve or to invent. That is, both ways of digitalizing require innovation, although as one improves existing areas of the organization, the other re-invents or invent new ways of creating value in the organization.

Company #3 is an example of an organization who utilize digital technologies to make improvements in their organization, rather than re-inventing and inventing new business, as was stated by respondent #3 saying that "*digitalization will be more a tool, bot to get a better overview of what should be done and also what can we do, and how to do it more efficiently*." It is worth noting that Company #3 have identified and are working with several digitalization projects and that Company #3 are facilitating for employees to pursue innovative ideas through Company #3 's innovation process.

Similarly to Company #3, Company #4 are also primarily focusing on improving their business rather than re-inventing it. In Company #4, digitalization is the key to achieve several of its strategic objectives, and as respondent #4 explained, "*… digitalization is to [respondent #4] about putting IT into the core of everything [Company #4] does and using that to drive business. Which is a change from before when [Company #4] would simply automate the processes and did the same things as usual*." It is important to note that Company #4 is in a competitive industry, and as they are competing with very similar

value propositions, providing the best service does to a larger extent depend on their ability to improve and stay competitive rather than trying to re-invent their business.

On the contrary, Company #1 and #2 are making digitally enabled improvements as well as re-inventing and inventing new products and services, operations, and business models. To explain this, using the wording of respondent #2, "*to me, there is a big difference between trying to make new revenue and reduce costs. 99 out of 100 in shipping think about how to reduce costs.*" This statement explained how Company #2 differentiate themselves from other shipping companies when it comes to digitalization, and also acts as an example for the two perspectives on digitalization.

Likewise, respondent #1 explained that Company #1 is working on improving existing services and operations as well as creating new services and products. Furthermore, both Company #1 and #2 created a new business unit focusing on digital development, which both became independent business units, as is discussed in subsection 4.2.2. Even though Company #1 and #2 focused more on re-invention and invention of new business opportunities, the findings indicate that following such an approach could be equally feasible for the different industries. Although, based on the actions and improvements seen in Company #3 the researchers observed that there might be untapped potential and possibilities for more re-invention and invention in Company #3, but as it was noted, the perspective which is governing Company #3 is primarily focused on utilizing digitalization as a tool to improve business.

Regardless of the underlying enablers or unknown potential present in these industries, the findings indicate two perspectives. That is, the option to pursue digitally enabled improvements and to invent new business opportunities. Hence, having more knowledge and a better understanding of the options facing organizations could enable them to pursue the right path in their digital development.

4.2.5 Leading vs. following
From the interviews, we observe that the organizations are taking different approaches when it comes to their digital transformation strategies, but a distinction can be made between the companies who categorize themselves as fast followers and leaders. That is, some companies are driving their digital development while others deliberately choose to focus on quickly adapting to the latest developments. From the interviews, we observed factors ranging from the organizations' financial situation, their size, and their market situation impacting their choices of leading or following.

An example can be taken from Company #2, who presents themselves as a leader who drives changes in their industry - digitalization being rather new in their industry. Digital development was started in Company #2 purely because of self-interest, and digitalization is considered as an opportunity rather than as a threat. Lastly, respondent #2 thinks that digitalization will not be a threat in the next nine years. Similarly, Company #1 considers themselves as a leader, and digitalization has allowed Company #1 to improve and invent new products, services, and ways of operating.

On the contrary, Company #3 perceive themselves somewhere in the middle stating that "*there is no sense of burning platform in the organization*.," as well as stating that, "*It's not an outside push, and clients are not pushing us either, but I would love to have a little bit more of a burning platform sensation internally.*" So, when considering whether or not organizations are leaders or followers, we also see from respondent #3 's answer that the

role of a leader or follower to some extent might depend on the current market pressure to digitally transform, as well as the overall digital maturity in the industry.

In the case of Company #4, digital development is associated more with following. Based on the interview, it is possible for us to see that Company #4 is operating in a somewhat saturated market environment. In the same time, we indicated that market pressure for digitalization is rather low for Company #4.

Regardless of the organizations market situation and availability of resources, we perceive leading and following as a strategic decision, and hence an important decision to be familiar with.

4.2.6 Defined vs. undefined digital development programs

From the interviews, we observed some apparent differences in how the organizations are defining their digital transformations. Company #4 is an example for how a defined program can benefit the organization in their digital development as can be seen from respondent #4 in describing the changes resulting from the introduction of their digitalization program "*…for a long time it was single business needs which were driving what Company #4 was doing. In 2014 [Company #4] created a program for digitalization.*" Suggesting that the defined program has been important to anchor and define the purpose of the digital transformation. Similarly, Company #1 has several programs such as innovation programs, improvement programs, and a separate digital business unit. While some of the programs focus on group one from fig. X, Company #2 has a talent development program suggesting that they are also focusing on developing the second group from fig. X, as well as a separate digital business unit. Company #3 says that "*It's defined as a program and it has a budget, and we are filling in with activities, and we have a review every year of which activates should be revised to continue next year.*" Suggesting that Company #3 is benefiting from a defined program. Company #3 took the approach of changing an existing innovation program into the digitalization program.

Although all organizations are structuring their digital initiatives following some program management practices, we also observe that the role these programs play in the organizations depends on their perspective, size, and whether or not they solved their digital transformation through developing a separate digital business unit, or in existing units. Because most of these initiatives, to some extent, are defined and managed as programs, it is interesting to further investigate to what extent the organizations' program management capabilities influence the organizations' success when developing digitally.

4.2.7 People and talent development plan vs. no plan

The data following from the questions related to talent and people show that the approaches taken by the case vary quite a lot.

Case company #2 was an example of a company which reported that it was doing a lot in terms of hiring employees with new skills and reeducating the current employees. Firstly, when asked the awareness of current and future need in terms of people skills respondent #2 answered: "*For us to catch what we need in the future is impossible, the only thing we know is that it is more data, analytics, and understanding on how we can use the technology in our business*." The statement made by respondent #2 suggests that despite an uncertain future, the only certain action which can be taken is to develop and acquire new talents. Furthermore, Company #2 also seems to be quite aware of its current needs in terms of digital skills. This can be seen as respondent #2 mentioned that the company

is actively employing people with new digital skills, such as AI, data science, and data analytics. In addition, Company #2 has established a re-education program for its employees, which is essentially an online platform that provides participants with education and mentorship regarding data analytics. Furthermore, respondent #2 refers to Company #2 's plan of "*making a huge investment in building that competence on existing people.*" In terms of engagement of the employees, respondent #2 said: "*We are willing to invest in them, it is all for free, we even say that they are allowed to sit there in the middle of the day, but if you are not able to make that leap and show that you are able to make change in business there is no future for you here*". Thus, their policy can be described as a mixture of carrot and stick, meaning that they provide the opportunity for developing new skills and penalize those not willing to be part of digital development.

On the contrary, the interviews with the rest of the case companies did not report to be taking such a proactive approach to their development of people and talent. According to respondent #1, there is an awareness of needed digital skills in Company #1 but note that not enough actions are made for obtaining these skills. Furthermore, respondent #1 explained how respondent #1 have been hosting presentations and giving workshops to engage employees in digital development, although, noting that these were voluntary initiatives, and not systemized.

Case company #3 seemed to be taking an even less proactive approach than Company #1 and #2. As presented by respondent #3, "*I have a vision to use the turnover of the company to hire more digitally skilled workers*," although, this had proved difficult as industry skills still seem to be valued over digital skills. Furthermore, Company #3 has a talent and people program for acquiring graduates, although, as noted by respondent #3, they are currently not aiming for graduates with digital skills.

Lastly, when answering how the talent pool in the organization has developed over the given period respondent #4 answered that "*when we are getting new people in, we are making sure they have a really digital understanding*." Furthermore, respondent #4 elaborated on the question emphasizing that they had recently hired a new position in digital marketing, respondent #4 also point out that they had hired a service designer, was looking for a position in digital marketing, introduced an innovation officer, and developed the IT department into becoming solution architects. When asked to what extent Company #4 has been, and are aware of their current and future needs, as well as how they will act on these needs, respondent #4 answered by saying that "*it is mentioned in the strategy*," indicating that Company #4 is aware of future needs on a company level. Furthermore, respondent #4 explained that "*Being such a small company the management team will together discuss the needs and who to hire, so we will have a common agreement for where the company is headed, and then follow that path*," and further elaborated on their ability to govern the hiring process due to the management team. On the other hand, when it comes to up-skilling and re-skilling, respondent #4 acknowledge that Company #4 should have been more systematic, but note that, in respondent #4 's department they have regular talks about what should be focused on for the future.

Based on these findings it seems to be quite a divided view on the importance of the people and talent development, but based on the answers provided by Company #2 and #4, in combination with the literature, we will further consider people and talent as an enabler for organizations to develop digitally.

5 Discussion

In this chapter, the discussion of both research questions are presented, as well as the limitations of the study and future research. In the first section, we address research question, "How are Norwegian organizations enabling their digital development," by discussing the three strategic decisions which were identified as most significant based on the findings and analysis chapter, i.e., "to have a CDO vs. not having a CDO", "External versus internal digital units" and "People and Talent". We begin by discussing the function of the CDO, as well as when it is appropriate to have a CDO, the difference between the CIO and CDO, and how one- or more people can perform the function of the CDO. Furthermore, we discuss the purpose of having a digital unit, when it is more appropriate to have a separate unit, and what are their advantages and disadvantages. After that, we provide a discussion on how people and talent development plan having can enable digital development. Lastly, based on the discussion, the limitations and future research avenues are presented.

5.1 How are Norwegian organizations enabling their digital development?

5.1.1 Having a CDO vs. not having a CDO

From the findings chapter, we identified the strategic decision of "having a CDO or not having a CDO" to have a strong relationship between the strategic decision and its outcome. Although, only three of the four case companies supported the decision to have a CDO, thus raising the question whether or not all organizations should have a CDO and when it is appropriate to have a CDO. Furthermore, we see that the organizations who are the biggest advocates for the CDO function are the two largest organizations, Company #1 and #2. Furthermore, Company #4 does not have one person responsible for the function of the CDO, rather two of the executives collectively acting out the function of the CDO, one of them being the CIO. Throughout the discussion, we make the assumption that all organizations are making the right decisions for their given situation, hence suggesting that Company #3 is equally right in their decision not to have a CDO.

It is important to note that this enabler was not specifically a part of the interview questions and that it emerged as a topic from the following questions: 1.b, 2, 4.a, and 6 (or: from the opening, strategy, and governance questions). Furthermore, from the literature review, the role of the CDO was not identified as a reoccurring topic and thus was not included in the interview question guide. Although, upon re-investigation of the literature we found mentions of the CDO role such as: "To date, there is no clear answer to which senior manager should be in charge of a digital transformation strategy. In addition to CIOs or even CEOs, potential candidates include dedicated business transformation managers or the fairly new role of the Chief Digital Officer (CDO) (Matt et al., 2015)."

From the findings, we see that the CDO position in Company #1 was established with the purpose to initiate the organization's digital development and was responsible for passing big decisions such as developing a separate digital unit. Similarly to Company #1, in Company #2, the CEO was also responsible for initiating and leading the organization's digital development - also leading to the establishment of a separate digital unit.

Furthermore, we see from the findings that the CIO and Commercial director in Company #4 was responsible for anchoring and establishing the organization's digital development program - acting out a similar function as the abovementioned CDOs. Although, unlike the other case companies, Company #3 deliberately decided not to introduce a CDO in their executive team on the basis of a potential misalignment between the current executives and a potential CDO.

The authors Horlacher and Hess (2016) are two of the pioneering authors researching the topic of CDO. The authors describe CDOs as the roles which are being established to proactively drive the companies' cross-functional digital transformation (Horlacher and Hess, 2016). The authors furthermore describe the role of the CDO as: "*the ones taking on (1) the strategic aspects of the digital transformation, devising and implementing digital strategies as entrepreneurs and (2) the communicational aspects, countering cultural resistance in their companies as spokespersons and leaders (Horlacher and Hess, 2016).*" In their proceeding work, the authors identified three main types of roles the CDO play— the Entrepreneur, the Digital Evangelist, and the cross-functional Coordinator (Singh and Hess, 2017). The entrepreneurial CDO is characterized by having the freedom to explore and work with the rapid changes happening in the market. The digital evangelist is characterized by their role in inspiring, communicating, and engaging the organization as a whole – often requiring a corporate cultural shift, working across all levels and boundaries, and training. Moreover, lastly, the cross-functional coordinator – as the name suggests – focuses specifically on coordination across silos and functions requiring the CDO to inspire and stimulate the changes while aligning the executives (Singh and Hess, 2017).

Based on the findings and the literature presented above, we see some resemblance in the CDO from Company #1 with the entrepreneurial, or digital evangelist as presented by Singh and Hess (2017). Furthermore, the CDO in Company #2, which was the CEO, was responsible for initiating and anchoring the digital shift in the organization having some resemblance to the digital evangelist. As a note, the CEO of Company #2 acted out the function of the CDO, but a full-time CDO was later hired and is leading the digital unit. In Company #4, the CIO was acting out the function of a digital evangelist and would for several years work with and mature the executive team to become more digital. Although, it was not until the new commercial executive joined the team when the digital development in the organization was anchored. Following this change, the findings suggest that the role of the CIO changed into resembling more of a cross-functional coordinator, based on the description presented by Singh and Hess (2017). Lastly, based on the description of the CIO in Company #4, we see that to some extent, the CIO is required to take on the responsibilities of the CDO. Horlacher and Hess (2016) highlight this development of the CIOs responsibilities and argues that the roles are symbiotic and interdependent and that the CIO usually take care of the technical aspect of the transformation.

The comparison of the classifications of different CDOs provided by Singh and Hess (2017) and the findings from the case companies show that despite the role and position of the person responsible for the organizations' digital development, it is more important that the function of the CDO is present in the organization. Company #4 is an excellent example of how two executives can fulfill the function of the CDO.

In the findings, we presented Company #3 as the only organization deliberately deciding not to have a CDO, and as argued by respondent #3 rather focused on upskilling the existing management team. The deliberate decision of not having a CDO raise the question

of when and why organizations should acquire a CDO, and whether or not having a CDO is appropriate for all organizations. In their 2017 paper, Singh and Hess (2017) identified two main factors that drove the establishment of the CDO positions — represented in a two-axis system. The x-axis is representing the level of market pressure to digitally transform, and the y-axis is representing the level of inherent complexity when coordinating transformation activities across the company (Singh and Hess, 2017). The conclusion suggests that given high market pressure and internal complexity will benefit from having a CDO, while organizations with low market pressure and low internal complexity do not require a CDO. Utilizing the framework as presented by Singh and Hess (2017), we evaluate the CDO functions of all the case companies, as illustrated in Figure 12. Due to the low market pressure and high agility as described by Company #3, we can see that the characteristics of Company #3 are similar to having a low level of market pressure as well as low level of internal complexity. Likewise, from Company #4, we know that the CIO can extend its function, while also collaborating to fulfill the function of the CDO. We also know from the findings that Company #4 perceives themselves as quite flexible, and as having low market pressure. Based on this information, we place Company #4 in the middle category. Furthermore, as stated by Company #2, there is a low degree of market pressure in their industry, but there is quite some complexity to maneuver a digital development in their organization. Lastly, as Company #1 stated, they have high complexity with lots of bureaucracy, as well as a high market pressure. Thus, based the classification as provided by Singh and Hess (2017), suggest that all the organizations are taking the appropriate approach in their decision of whether or not to have a CDO.

On the one hand, even though the positioning and functions present in the case companies are in line with the literature as presented, the findings suggest that although the organizations seem to be making the optimal decisions given their situations their organizations are not perceived to be aware of exactly how they are fulfilling the role of a CDO. Furthermore, the example in Company #2 raises the question of whether or not the same results could have been achieved by directly hiring a CDO. That being said, we know from Company #3 that it was the CEO alone who initiated the digital development. Similarly, as presented in the findings, respondent #4 was acting as an evangelist in Company #4 and argued that it would be highly unlikely that it would be possible to upskill a management team – indicating that there needs to be a certain level of maturity in the top management before such a decision would have any effect. If that is the case, then having a CDO seems to require a certain maturity in the executive team for the organization to benefit from a CDO. Lastly, we note that one of the arguments provided by Company #3 against having a CDO was because they needed executives who know their specific field, suggesting that a CDO would cause trouble in the executive team as the CDO could not know all the competency areas well enough. The argumentation given by Company #3 is to some extent contradicting the purpose of the CDO role as it was described by Horlacher and Hess (2016) and Singh and Hess (2017). However, despite the reasoning against having a CDO Company #3 seems to have chosen an appropriate executive team, although with an alternate explanation.
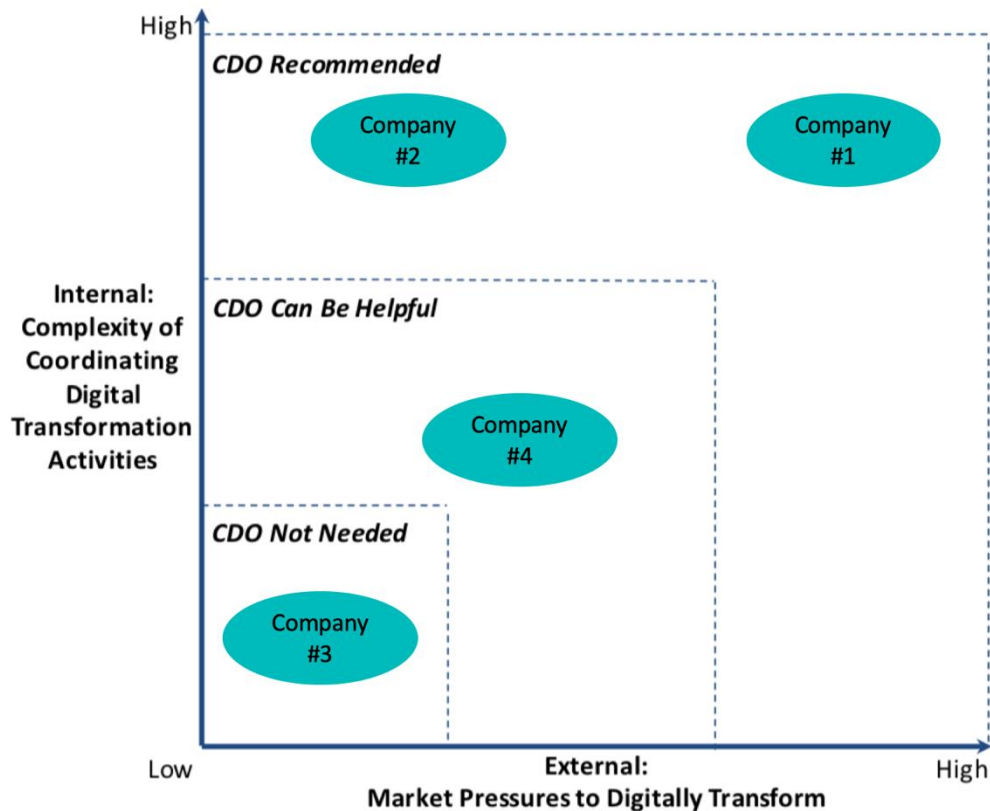
Figure 12 - Relevance of Chief Digital Officers (Singh and Hess, 2017)

Summing up, from the findings we observe that three out of the four companies have a shared view on the role on the CDO, although, they all have their individual approach to it, the common denominator is that the responsibilities and actions performed can be described as the role of the CDO. Furthermore, one out of the four case companies is deliberately avoiding the introduction of a CDO, although, the decision to do so is in line with Singh and Hess (2017). In addition, it seems that the introduction of the CDO function requires a certain level of maturity in the organization. Lastly, the only common denominator for all organizations is the fact that the initiation of the organizations come from senior management and executive team, which is a confirmation of, e.g., Westerman et al. (2014) who argue that a digital transformation must start from the top-down, thus, being an important enabler for organizations digital development.

5.1.2 New digital unit vs. existing unit

As it was mentioned in the findings chapter, a reoccurring decision which all case companies faced in their digital development was the strategic decision to choose whether or not to establish a new business unit for digital development or drive digital development through existing business units. The topic emerged from interview question 8, which is related to strategic decisions related to the organizational structure of companies (p. 14). These digital business units have different names, such as innovation centers, digital business, software centers, etc. (Ross et al., 2016), although as argued by Westerman et al. (2014) even though such units can vary in size or role, they have a common goal of driving digital development in the organizations. From the interview, we observed that case companies #1 and #2 have chosen to establish digital units, while Companies #3 and #4 have chosen to drive digital development through their existing business units. Under the assumption that case companies are making the most optimal decision, we discuss

when it is appropriate for an organization to drive their digital development through a digital business unit versus their existing business.

Because of the way both Company #1 and #2 developed, we include a short description of the organizational structure of the companies here. We begin by noting the difference between a company and a business unit. A company can consist of one or more business unit, such as e.g., a digital business unit. Furthermore, when discussing whether or not to have a digital business unit, we note that Company #2's digital business unit turned into a subsidiary of Company #2. Although, despite being a subsidiary, it still acts as the digital business unit for Company #2. The reason for turning it into a subsidiary was because it collaborates with other companies similar to Company #2. Similarly, respondent #1 was expecting Company #1's digital business unit to become a subsidiary at some point. Thus, we will refer to Company #2's subsidiary as Company #2's digital business unit.

From the interview, we have observed a difference in the companies who are following the strategic decision to improve and invent (p. 24). Both companies that established digital units were focusing on inventing new products/services, operations, and business models. For example, for Company #2, the core business is revolving around shipping, but the focus of their digital development is providing cloud-based services; similarly, Company #1 is mainly focusing on software development – which is quite different from the work done in their other business units. At the same time for companies #3 and #4, digital development was conducted within their existing business units, while Companies #3 and #4 were adding digital solutions on top of the services that they were doing before. Furthermore, the work done in the digital unit of Company #1 and #2 seems to be deviating more away from their existing business units and is focusing on inventing in the digitalization impact areas, while Companies #3 and #4 are focusing on making improvements in their digitalization focus areas (p. 8). The idea of the digital units being related to inventing rather than improvement was also indicated by Ismail. Hence, companies which are following the strategic decision to improve have a tendency to focus on improving the current business and not to have a digital unit, while companies who follow the strategic decision to invent tend to deviate from their business and have a digital unit.

Furthermore, as several business units might require the same digital capabilities, centralizing these skills in one business unit might contribute to lowering the complexity of the organization's digital development. Both case company #1 and case company #2 mentioned in their interviews that their organizations' digital units are predominantly filled with employees possessing skillsets that are vastly different from the rest of the organization. In particular, they indicated skills like programming, software development, and data analytics, which is in line with Westerman et al. (2014) who argue that a digital unit is a place where the company should host new digital skill. Therefore, we believe that one reason companies introduce a digital unit is because the skills and capabilities needed to digitalize are deviates from the current skills and capabilities found in the existing business units. Furthermore, we see that Companies #1 and #2 have more business units than Companies #3 and #4, we also see that Companies #1 and #2 are the ones who have digital units. Hence suggesting that as several business units are needing the same digital capabilities, companies can introduce a digital unit to centralize the digital capabilities.

Lastly, from section 4.2.3 (p. 23), we learned that all the companies have some kind of innovation and commercialization process, either through their digital unit or other

business units. If we consider when a company would need a digital unit, we see that an apparent difference between the companies with digital business units is that the objectives of the digital units expand beyond the objectives of the other business units.

Company #3 as an example, Company #3 are facilitating for the employees to innovate, and they are using external consultants to find new potential. Although, in Company #3's case having a digital unit would be more similar to having a unit with such consultants working solely on digitalizing rather than leaving it to the employees. Furthermore, Company #2 is a good example of this as the people who are working in the digital business unit are working to support the business in the rest of the organization, as well as developing the business in new directions. Although, the people working in Company #2's digital business unit, as well as the rest of the organization, has the same abilities to innovate as the people in Company #3. The same goes for Company #1 who have a different objective for the people working in the digital as well as the rest of Company #1, although, they also have the same opportunities to innovate and commercialize ideas as the people in Company #3. Lastly, if we consider Company #4, as we have argued previously, they seem to be in a rather saturated business and is therefore mostly focusing on improving the services they are doing – which requires new digital capabilities but don't require a brand new unit. Lastly, Company #4 and Company #3 have the same ability to innovate and commercialize ideas. Hence, we see that all the companies have similar potential to innovate and commercialize these ideas, although, as the digital units deviate from the other business units with new objectives and new skills – having a digital unit seems appropriate as it would not be a development of the existing units, rather a new and different unit which may support existing units.

Lastly, we see that the size of the companies is related to their agilities suggesting that the complexity increase with their size, and as we see from the discussion above, the drivers for having a digital business unit seems to be related to complexity. Moreover, we see that the argumentation for when it is appropriate to have a digital unit is situational based and will depend on the objectives of the organization. Regardless of the choice, it is important to ensure that there is a real value provided to the organization, instead of being in the situation of "having innovation just for the sake of innovation," which was noted from the case companies stating that their digital units are improving their business current business. The same concern was noted in the book by Gupta (2018), where the author argued that without proper governance a new digital unit might simply end up being unable to affect the business of the organization. Similarly, the book by Greenway et al. (2018) discussed the same problem when innovation units end up being peripheral to the business. This indicates the importance of having a proper strategy and governance mechanism that allow organizations to be able to reap the benefits of the innovation to the full scale, as well as acting according to the market pressure and digital development in the industry.

5.1.3 People and Talent
In chapter 2, we identified four categories which were related to enabling organizations digital development, one of them being "People and talent." The reviewed literature laid the foundation for interview questions 9. – 10., and from the findings, we confirmed the categories as being closely related to the case companies' ability to digitally develop. Based on the literature review, we expected the organizations to be re-skilling and acquiring new talents. Furthermore, we expected the organizations to be aware of current and future needs and to have processes related to the organizations' talent and people development. Although, based on the findings, it seems that factors such as the maturity of the executive team have a great influence on the organizations' ability to succeed with a long-term plan

for people and talent development. Furthermore, the findings suggest that organizations could benefit from taking a more proactive approach to their talent and people development.

From the findings, we identified a difference in the actions taken by the companies and the level of proactiveness seen from the organizations' people and talent initiatives. Company #2 being an example of a company taking a proactive approach to talent and people by actively hiring people with a variety of digital skills, as well as up-skilling their current employees through an up-skilling program. Hence, Company #2 differentiate themselves from Company #1 both up-skilling the organization with new talent and people, while also re-skilling existing personnel. Furthermore, Company #1 seems to be relying heavily on their digital unit, which, as stated by respondent #1, potentially can lead to new silos. We, therefore, differentiate between re-skilling existing personnel and up-skilling the organization by acquiring new talent.

Furthermore, from the findings, we see that Company #2 is quite aware of their current and future needs and made actions accordingly. We note that Company #2 has a digital unit were they, for the most part, are hiring people with digital skills. We, therefore, categorize Company #2 as taking a proactive approach to talent and people – both for their core business, as well as in their digital unit. On the contrary, the findings suggest that Company #1 is taking a less proactive approach when it comes to talent and people, and it seems that Company #1 to some extent is solving their talent development by moving the development of digital skills and capabilities to their digital unit, and by not developing other business units digitally.

For the smaller companies Company #4 comes across as taking the most proactive approach by up-skilling the organization by expanding their talent pool with new positions, making sure that new hires have a really good digital understanding, and processing new hires through the management team. These actions allow Company #4 to govern the talent and people development as well as the development of the organization. Although Company #4 acknowledge that they do not have a systematic process for re-skilling employees.

On the contrary, Company #3 comes across as being less proactive, and while they talk of the possibilities of hiring new digital talents, the current governance structures seem to favor traditional industry skills. The reasoning for not hiring new digital talents seems to be due to the management team of Company #3 being less digitally mature, and hence, long term digital development plans are not well anchored in the top management.

Furthermore, from Company #3 and #4, we see a big difference in Company #4 having a shared vision for the digital development of the organization, while Company #3 seems to be more divided – being aware, but not acting to the same extent as, e.g., Company #4.

Based on the findings and literature we perceive talent and people to be an important enabler for organizations digital development, referring to Company #2 as a prime example of an organization which is taking a proactive approach – both in their core business as well as in their digital unit, focusing on both up-skilling and re-skilling. Furthermore, we have observed that the people and talent development is perceived as a challenge for all case companies due to the unforeseeable future. We, therefore, see value in the proactiveness of companies such as Company #2 which have clearly defined processes and governance structures in place to excel their digital people and talent development – regardless of their knowledge of the future. Furthermore, we see that

having a digitally mature management team with a shared vision seems to be important for anchoring the digital initiatives in the organization, and thus, the management team can act as a barrier or a facilitator. Lastly, we note that the case companies are not specifically differentiating between up-skilling in the core business and the digital units; and there seems to be more focus on up-skilling rather than re-skilling, suggesting that the case companies see more potential in getting new talent, rather than re-skilling existing people and talent. Based on the variety seen from the case companies, we, therefore, believe that talent and people is an enabler with much potential, but which do not receive the attention it deserves. Furthermore, if we consider the literature and our findings, we view people and talent as being a critical enabler for organizations as they are developing digitally.

5.1.4 Completed conceptual framework for digital development

As it was mentioned in the introduction chapter, the objective of this thesis was to complete the conceptual framework for digital development by assessing what, and how organizations can digitally develop. Furthermore, as we introduced, the main objective of the thesis was to contribute to the literature gap on "how" organizations can digitally develop. Thus, referring to the conceptual framework presented in section 2.2 on page 15, we finalize complete the conceptual framework by highlight three strategic decisions which are closely related to the decision, and the outcome of the decision. Thus, based on the academic foundation on what digital development is, together with the empirical findings on how organizations can digitally develop, we believe that we have contributed to filling the identified research gap on how organizations can digitally develop. In addition, we intend for the framework presented in Figure 13 to contribute to conceptualizing the complexity associated with digital development in organizations.
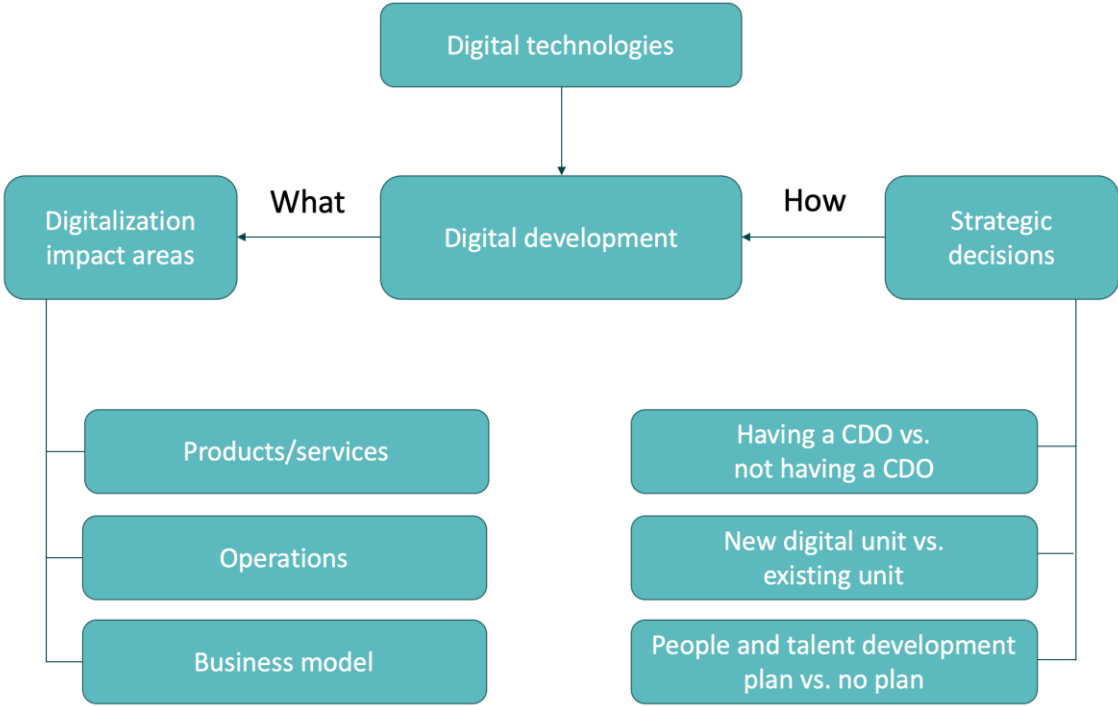

Figure 13 - Conceptual framework for digital development

5.2 Limitations of the study

In order to provide a more extensive overview of the conducted research, it is essential to address the limitations of our research. Naturally, this research was conducted with some limitations that are related to the chosen research methodology as well as with factors existing beyond methodology.

According to Thornhill et al. (2009), the sample size is commonly associated with the limitation of the research studies. As it was introduced in the methodology on page 17, in this thesis, we decided to interview executives in organizations who have been and are currently developing digitally. We did not have a list of interview participants before the research, so all of the interview participants were acquired while writing the thesis. Therefore, we had a limited timeframe between having a clear description of the project until we had to stop conducting interviews. This limitation in time has influenced our ability to acquire more interview participants, and our final sample size was four case companies.

In addition to the sample size, time was a limiting factor for the number of research papers that were included in the literature review. In the literature review, we commenced by analyzing the most cited papers revolving around the topic of digital development with the goal to design our research question guide. Although, as mentioned above, we were limited to the time period between starting the research and having a clear description of the project, and thus, we acknowledge that the literature review could have been more extensive.

We decided to have a face-to-face interview approach, as it allowed us to acquire more detailed information than a Skype or phone interview (Ritchie et al., 2013). Therefore, another limitation that we faced in this research was the geographical area, which is considered by Thornhill et al. (2009) as a typical problem for face-to-face research interviews. Since we are living in Oslo and do not have funding to move to different cities for the interview, we were able only to interview companies that are located in Oslo. Hence, the geographical limitation has affected the final sample size for the case study.

Another limiting factor can be associated with the validity of the empirical data (Thornhill et al., 2009). This limitation comes from the nature of qualitative researches and semi-structured interviews. Even though we attempted to increase the likelihood of getting honest responses by establishing anonymity of the interview candidates, there still could have been possibilities to get responses that are not fully trustworthy. In order to find such unreliable responses, we have been monitoring interviewees' answers for any inconsistencies. Once such inconsistencies have been detected, we have been noting them and attempting to ask more questions to get a more reliable response. A possible way to tackle that problem for future researches can be to interview several people from each company.

5.3 Further Research

Throughout the work of this thesis, we have identified four topics for further research. The first is related to the relationship between an organizations program management capabilities and their ability to digitally develop; second, the role of people and talent considering external digital units as well as internal development; further investigate when it is appropriate for organizations to consider a digital unit; and lastly, the possibilities for influencing the early phase of an organizations digital development by introducing an external CDO.

The relationship between an organizations program management capabilities and their ability to digitally develop: In section 4.2.6 the strategic decision to manage the digital development as a program was presented. From the findings, we observed that most of the digital initiatives in the case companies, to some extent, were defined and managed as programs. Hence, we raise the question to what extent the organizations' program management capabilities are related to the organizations' ability to succeed with their digital development. Furthermore, in section 1.1.3, we learned that a digital transformation in many ways is similar to any other transformation. In addition, building on the strategic decisions presented in the findings chapter we raise the question: to what extent does a digital transformation program differ from any other transformation program – and what is particular for a digital transformation program.

The role of people and talent development when having external digital units as well as internal development: In section 4.2.2 we presented the findings for the strategic decision of having an external digital unit versus developing internally, and further discussed in section 5.1.2. And in the discussion for section 5.1.3, we noted that we perceive talent and people to be an important enabler for organizations as they are development digitally. Furthermore, we referred to Company #2 as a prime example of an organization which has been taking a proactive approach – both in their core business as well as in their digital unit. On the other hand, Company #1 seemed to neglect the digital development of people in the core business and put all the focus on the new digital unit. Hence, we propose to investigate the effects of people and talent development in a digital unit versus developing the core business.

Furthermore, in section 5.1.2 we discussed when companies should have a digital unit and presented some insight providing some insight to when it appropriate to have a digital unit, although, when searching for supporting literature we identified a lack of literature covering the topic. Hence, we propose to conduct further research to better understand when to have a digital unit and how to benefit from it.

Possibilities for influencing the early phase of an organization's digital development by introducing an external CDO. From the discussion on whether or not to have a CDO, we learned that the market pressure and complexity to transform in the organization could help to determine the appropriateness of having a CDO. We also learned that it is not about the role of the CDO, but rather the function of the CDO. Lastly, from the literature, it is clear that digital transformations must be initiated top-down, which became apparent from the discussion on people and talent as having immature top management was identified as one of the barriers for anchoring and succeeding with the digital development. We, therefore, suggest to further study when it is appropriate to have a CDO, and to what extent a CDO can speed up the digital development in an organization.

6 Conclusions

In this thesis, we studied strategic decisions associated with organizations ability to initiate and succeed with their digital development. To answer the research question "*How are Norwegian organizations enabling their digital development?*", we conducted a literature review, followed by an empirical data collection through semi-structured interviews with chief executives. The data collection resulted in the identification of seven strategic decisions. Following the framework as presented in the methodology in Figure 9 on page 17, we highlighted three of the strategic decisions which we categorized as having a direct relation to the organizations' ability to initiate and succeed with their digital development, and thus providing insight on "how" organizations can digitally develop. Lastly, we linked these three strategic decisions to the "how" component of the conceptual framework for digital development.

The first of the three strategic decision was the *decision of whether or not to have a CDO* (p. 21) to initiate and drive the digital development of the organization. From the interviews, we observed that Company #1, #2, and #4 initiated their digital development top-down and that it was initiated by one or more executives. Regardless of the role of these executives, we identified that these executives were performing the function of a CDO, leading to the conclusion that it is not the role of the CDO, rather the function of the CDO which matters, and that this function can be performed by more than one executive. On the contrary Company #3 deliberately decided not to have a CDO, although based on the framework presented by Singh and Hess (2017), we concluded that all case companies have made the appropriate choice of whether or not to have a CDO. Although, the case companies' reasoning for whether or not *to have a CDO* was not clear – suggesting that the decision to implement a CDO has the potential to be more knowledge-driven. Hence, the findings provide evidence that the strategic decision of whether or not to have a CDO is related to enabling an organization's digital development, and suggest that the strategic decision can be more knowledge-driven.

The second strategic decision highlighted was the strategic decision of *whether or not to have a digital business unit* (p. 22). From the findings, we observed that all case companies had an *innovation and commercialization process* (p. 23), i.e., all the case companies were facilitating for innovation, and had governance structures in place to support this process. Although, we observed that the case companies who had a digital unit focused on inventing in the *digitalization focus areas* (p. 9), while the case companies without digital units were focusing on improvements. Lastly, we observed that as companies focused on inventing in their digitalization focus areas, they naturally deviated from their business, which we identify as a driver for initiating a separate digital business unit due to the unit resembling a new business unit rather than a digitally developed business unit.

Furthermore, the findings and literature suggested that the digital units usually comprised of skills and capabilities which are particular for digital units, suggesting that digital units are related to new business, rather than improving an existing business. Likewise, we also identified the need for centralizing these digital skills as several business units might require the same digital capabilities. Furthermore, we also note that the case companies with digital units were the larger companies – suggesting that there is a link between the size of the company and the need for a digital unit.

Therefore, we arrived at the conclusion that the strategic decision of *whether or not to have a digital unit* will depend on the company's strategic objectives, i.e., their decision of whether or not to focus on inventing or improving in their digitalization impact areas. Although, at the same time, we also observed that the decision is related to the companies' needs in terms of size and the benefits related to centralization. The latter suggesting that large companies focusing on improvements also would benefit from having a digital unit.

The third and last strategic decision which we studied was the importance of having a people and talent development plan vs. not having a plan. From the literature, we identified people and talent as being an enabler, which is very closely related to the organization's ability to initiate and succeed with their digital development. Although, we observed that people and talent was not highlighted as being one of the most critical enablers from the case companies despite the literature review highlighting people and talent as being a critical enabler. Furthermore, we observed that the case companies are not clearly differentiating between re-skilling existing personnel and up-skilling the organization by acquiring new talent. Likewise, the case companies were not differentiating between up/re-skilling in the core business and the digital unit. This became especially apparent in cases such as Company #1, where they seem to solve their people and talent development by developing their digital unit, rather than re-skilling all their employees – suggesting that organizations could overlook the need for re-skilling as they acquire a digital unit. Lastly, we identified the top management as being either an enabler or an inhibitor for organizations success as they were digitally developing. This became especially apparent in Company #3, which we identified as being in the least mature industry with the least mature management team. Based on the observations made from the findings and literature review, we, therefore, view people and talent as being one of three strategic decisions which enable organizations to initiate and develop digitally. Hence, we suggest that the organizations could benefit from taking a more proactive approach to their talent and people development by defining a strategy and governance system for up-skilling, re-skilling, and collaborating with digital units.

Thus, we have identified three strategic decisions which we identified as a strong relationship between the decision and the outcome of the decisions. Furthermore, we suggest that these decisions have potential to be more knowledge-driven, and thus speed up, or help organizations which are trying to initiate their digital development, or which are in the process of developing digitally.

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Appendices

Appendix A: Interview Question Guide

Appendix B: Information letter

Appendix C: Agenda for the interview

Interview Question Guide

Opening

1. Business

    a. Could you briefly explain the business of your organization?

    b. Could you briefly explain how digitalization has impacted your organization?

2. Role

    a. Could you explain your role in the organization?

3. Map the most important milestones related to the organization's digital development:

    a. Digitalization initiatives;

        i. Does there exist any defined programs related to digital development?

    b. Enabling capabilities.

Digital strategy

4. Could you, in a few sentences, introduce us to your organization's strategic objectives?

    a. Can you explain whether or not there is a link between your digital development and your overall strategy?

    b. What was the outcome of incorporating 'digital development' as part of your strategic objectives?

    c. What enabled the organization to do so?

Governance

5. Can you explain how top management has influenced the digital development in the organization over the given period?

    a. How has the digital benefit realization been governed in the organization?

6. Could you explain how your organization has managed the balancing of 'day to day operations' and 'exploring new opportunities' over the given period?

    a. To what extent does your organization facilitate experiments for digital initiatives?

        i. How has your organization been governing the implementation of digital initiatives?

        ii. Did you have to make organizational changes to be able to govern the scaling and implementation of digital intiatives/experiments?

Organizational Structure

7. Can you explain how the role of the IT department or IT-related capabilities has developed in the organization over the given period?

8. Could you briefly explain how the organizational structure has developed over the given period?

   a. Can you explain how, e.g., units, departments, decision-making methods, partnerships, and working across silos/'cross-functional teams' has influenced the digital development over the given period?

Talent and people

9. Can you describe how the talent pool in the organization has developed over the given period?

   a. To what extent were you aware, and are you aware, of your future needs and how to act on these needs?

10. In relation to the previous questions, how has the organization been working to involve and engage the employees in the digital development?

Self-assessment

11. *On a scale from 1-5: "How would you rate your organizations digital maturity?"*

12. On a scale from 1-5: *"How would you rate your organizational agility or ability to sense, seize, and act upon digital developments in your business?"*

13. *Is there anything you would like to add?*

Invitation to participate in a research project

We hereby invite you to participate in our research project. The objective of the research is to identify the relationship between organizational capabilities and the organizations' ability to succeed in their digital developments. We, therefore, want to investigate what organizations have been, are, and will be doing - in terms of digital initiatives and organizational development. The research is conducted as part of our master thesis at, The Department of Mechanical and Industrial Engineering Faculty of Engineering NTNU.

EVRY AS is a collaborative third-party providing guidance and supervision for the research project.

Why are we inviting you to participate?
We are reaching out to organizations who are in the process of developing digitally, and who are able to reflect on past digital initiatives and outcomes.

What does it mean for you to participate?
- Interviews will be conducted Face-to-Face by Håvard Blø and Talgat Ospanov. All interviews will be conducted at the respondent's preferred location. The interview will take roughly one hour. We plan to record the interview for transcription (pending permission from the respondents).
- The interviews will be conducted in English, but we can also conduct the interviews fully, or partially in Norwegian.
- The interview will revolve around the organizations past, present and future digital initiatives – from an organizational perspective. Therefore, digital initiatives and their relation to the overall business strategy and organizational development will be in focus.
- We promise full anonymity. All transcripts will be anonymized, and the participants may receive the recordings on request as well as the transcribed key findings from the interview with the option to confirm, withdraw, or add information.
- If you accept to participate, you are free to withdraw your participation at any time.

Data protection – how we store and process information.
We will only use the information you provide according to the guidelines as presented in this document. We shall manage your data with confidentiality and in accordance with the data protection regulations. Only Håvard Blø and Talgat Ospanov – the researchers will have access to the collected data. Neither EVRY AS, nor our supervisor at NTNU Bassam Hussein will have access to the collected data.

To protect the data, we are using recording equipment and computers provided by the Norwegian University of Science and Technology – NTNU – Department of Mechanical and Industrial Engineering Faculty of Engineering. All data collected will be stored locally on a personal computer.
- In regards to personal information, we will use codenames, and the coded personal information will be stored separately from the device we are using to process the data.

- The participants and their organizations will not be recognizable in the publication, and we will only present extracts of the anonymized findings from the interviews.

What happens to your data and information after the research project?
The project will end mid-June, and we will store the data until the end of June 2019. I.e., the information will be deleted from the computer and returned to the research institution responsible for the research project - Norwegian University of Science and Technology – NTNU – Department of Mechanical and Industrial Engineering Faculty of Engineering.

Your Rights
As long as you can be identified in the data material, you have the right to:
- Insight in the personal information which is registered about you,
- have your personal information corrected,
- Have your information deleted,
- Obtain a copy of your personal information (data portability), and
- To send a complaint to NTNU's Data protection officer (personvernsombud), or The Norwegian Data Protection Authority (Datatilsynet) regarding the handling of your personal information.

What gives us the right to handle your personal information?
We handle your personal information base on your consent.

On the assignment from the Norwegian University of Science and Technology – NTNU – Department of Mechanical and Industrial Engineering Faculty of Engineering, NSD – Norske senter for forskningsdata AS (the Norwegian center for research data) has assessed that the handling of personal information in this project is in accordance with the GDPR.

Best regards,

Bassam Hussein	Håvard Blø	Talgat Ospanov
Project owner/ Supervisor	M.Sc. student	M.Sc. student

I have read and understood the information about project "Organizational Capabilities as an Enabler for Digital Transforming," and have been given the opportunity to ask questions. I consent to:

☐ To participate in the interview.

I consent to my information being handled until the project end at the end of June.

(Date, project participant signature)

Invitation to participate in the research project

Intention

As part of the research project "Enabling digital development in Norwegian: A multiple case study of Norwegian companies," the researchers Håvard Blø and Talgat Ospanov (M.Sc. in Project Management, NTNU) are searching for interview objects. Your participation will contribute to the empirical data collection for the research. The objective of the research is to investigate the relationship between organizational capabilities and the organizations' ability to succeed in their digital developments.

Desired Outcome

The interview follows a semi-structured interview guide. To provide the desired outcome, the interview object should be able to share insight on the organization's digital initiatives as well as the organizational development which has enabled the initiatives.

Given consent from the interview object, the interview will be recorded. The procedure for data handling complies with GDPR and is approved by NSD – Norsk Senter for Forskningsdata AS. Please refer to the attached information letter for further information.

Agenda
- (5min) Introduction of researchers and the research design.
- (50min) Interview – following the research guide.
- (5min) Contingency

Roles

The interview will be conducted by both researchers Håvard Blø and Talgat Ospanov. For a successful interview, we will need one hour of uninterrupted time with the interview object.

Rules

We will follow the agenda, and the interviewers will steer the conversation to cover all themes. The transcript will be sent to the participant

Time

The duration of the interview will be approximately 1hour with the interview taking approximately 50 minutes. The researchers will need 10-15 minutes to prepare beforehand.