Handelshøyskolen BI

GRA 19703 Master Thesis

Thesis Master of Science 100% - W

Predefinert informasjon

Startdato:	09-01-2023 09:00 CET	**Termin:**	202310
Sluttdato:	03-07-2023 12:00 CEST	**Vurderingsform:**	Norsk 6-trinns skala (A-F)
Eksamensform:	T		
Flowkode:	202310||11184||IN00||W||T		
Intern sensor:	(Anonymisert)		

Deltaker

Navn:	Seline Standahl Johannessen

Informasjon fra deltaker

Tittel *:	How to Transform Large Organizations From a Legacy Way of Organizing and Working to Be Agile and Centered Around Autonomous Teams
Navn på veileder *:	Jan Terje Karlsen

Inneholder besvarelsen konfidensielt materiale?:	Nei	**Kan besvarelsen offentliggjøres?:**	Ja

---

Gruppe

Gruppenavn:	(Anonymisert)
Gruppenummer:	22
Andre medlemmer i gruppen:	Deltakeren har innlevert i en enkeltmannsgruppe

Master Thesis

BI Norwegian Business School

How to Transform Large Organizations From a Legacy Way of Organizing and Working to Be Agile and Centered Around Autonomous Teams

Acknowledgments

First and foremost, I want to thank my supervisor, Jan Terje Karlsen, for his guidance, support, and insightful feedback and for providing his time throughout all stages of the research for this thesis.

Secondly, I would like to thank Ketil Johannessen for his invaluable time, enlightening discussions, and generous sharing of knowledge.

I would also like to extend my gratitude to all the participants involved in this study, who provided their time, shared their insights, and expressed their enthusiasm about the study. Without their contributions, the realization of this thesis would not have been possible.

Finally, I am deeply thankful for my family. Their support and patience allowed me to focus completely on the thesis.

Thank you!

Abstract

Purpose: This thesis aims to explore how to structure an organization to be more agile in the context of digitalization and find the common success factors and challenges the organizations face to transform. Hence, this thesis focuses on organization structure, digital transformation, agility, and autonomous teams.

Design/ methodology/ approach: A qualitative multiple-case study of the IT departments in FINN.no and Statnett has been conducted. Data were collected through in-depth individual interviews with 12 participants.

Subject: How to design an organization to be more agile in the context of digitalization, identify the common success factors, and identify the challenges that organizations encounter when undergoing transformation.

Findings: Findings show that leadership, the establishment of autonomous teams, legacy systems, organizational change, and time to business were common challenges but differed slightly across the two companies. Common critical success factors like inclusive leadership, autonomous teams, trust, transition to a modular architecture, organizational change, and proof of concept consistently emerged.

Research limitations/implications: Future research should further investigate the transformation in IT departments across diverse sectors and larger samples to validate these findings and investigate the impact of organizational structures.

Originality/ value: The study contributes to practice and an increased understanding of organizing business and technology teams for fast flow. The analysis and discussions of various empirical findings shed light on the success factors and challenges of digital transformation, which many organizations are currently dealing with or will probably be dealing with soon. The types of organizational structure and how this impact the agility in an organization has yet to be thoroughly studied.

Keywords: Organizational change, Digital transformation, Agility, Autonomous teams, Organization structure, Change Management.

Table of Contents

1.0 Introduction

This thesis is about digital transformation. Large-scale changes are occurring quickly due to the widespread digitalization that is taking place throughout our entire society (Deloitte, n.d.). The fourth industrial revolution, known as "industry 4.0," is characterized by the integration of advanced technologies and digitalization in the manufacturing and industrial sectors (McKinsey, 2022). This means that organizations and businesses must be ready to adapt and be agile to meet the changes (Aghina et al., 2018). The energy domain in Europe is undergoing huge transformations and investments in the next 10 to 20 years due to the de-carbonization of energy consumption (Statnett, 2022). New complex functionality is required, as well as an increase in coordination between the system and the market and with the network partners in the European transmission network (50Hertz, 2023). These challenges require significant IT investments to innovate new solutions to maintain IT software applications and to cope with the increasing demand for change (European Commission, 2022). At the same time, there is currently a lack of IT professionals in the western world (Engler, 2020), whereby organizations in the energy domain need to adapt and become much more effective in executing IT development projects. The increased entropy resulting from this transformation is causing great demands on change management (Shuiabi et al., 2005). Increased entropy means that you must be agile to adapt to unexpected changes, so both the organization and technology must be in alignment with respect to agility; one cannot be static (Shuiabi et al., 2005).

In addition, the de-carbonization leads to an increased demand for electrical energy, and a more complex operation of the power grid requires the use of advanced analysis, as well as AI and machine learning tools to operate the power grid. Agility in technology and organizations is required to support future needs (Forsgren et al., 2018). Project managers and engineers must find new and better ways to collaborate and reduce lead time to meet business demand and consistently deliver value (Project Management Institute, 2017). As a result, the industry needs to adapt to an agile delivery model, which promises greater efficiency, collaboration, quality, and speed (Knowit, 2020). As mentioned by Torbjørn Larsen in the podcast "Smidigpodden," businesses must be competent in

IT and digitalization and not think that this can only be bought – "you cannot outsource a changeover" (Falkberger & Kjær, 2021).

Software development is an ever-changing, collaborative process. As a consequence of Conway`s Law (Conway, 1968), for a business to successfully transform, it cannot just change digitally, but it also must change organizationally (Skelton & Pais, 2019). Organizational structures must become much more dynamic to cope with industry 4.0 (Bailey et al., 2019). Thus, digital transformation requires a close connection between technology, organization, and people (Andersen et al., 2016). However, seventy percent of all major transformation projects fail (Mckinsey, 2019). More and more companies have jumped on the bandwagon of agile teams, yet approximately half of them still struggle to implement these teams (Clark, 2022). Clark (2022) suggests that while agile processes and tools offer support, the success of agile teams primarily hinges on the dialogic process of team interaction.

Osmundsen et al. (2018) reported that there is a need for more empirical studies on the role of digital transformation. In addition, many empirical studies are single-case studies but within a limited selection of industries (Karimi & Walter, 2015; Mocker & Fonstad, 2017; Mihailescu et al., 2017; Mueller & Renken, 2017; Petrikina et al., 2017; Yeow et al., 2017). Osmundsen et al. (2018) conclude that comparative case studies from a broader range of businesses and sectors should be included in research on digital transformation in the future. According to Fichman et al. (2014), the concept may be too broad to be examined within a single theory or framework. Bilgeri et al. (2017) conducted an in-depth case study, arguing that digital transformation affects large manufacturing companies` organizational structure, where "one of the critical barriers is the unsuitability of current organizational structures to execute digital strategies and to develop and market Internet of Things, IoT, solutions" (Bilgeri et al., 2017, p. 2). They also reported a lack of practitioner-oriented publications describing how large manufacturing firms deal with organizational challenges unique to the IoT in practice. According to Dikert et al. (2016), organizations that already had agile-inspired structures in place found the transformation to be less challenging.

Thus, this study aims to investigate how large organizations can accomplish a digital transformation by structuring the organization to be more agile in the context of digitalization. Hence, the following research question is sought answered: How to transform large organizations from a legacy way of organizing and working to be agile and centered around autonomous teams. What are the common success factors and challenges the organizations face in the initiation phase of the transformation process? I want to investigate how a Norwegian state-owned enterprise operating in the energy sector can leverage the experiences gained from the digital transformation of a prominent Norwegian online marketplace company and how to accomplish a digital transformation. A qualitative study with a case study design has been conducted to answer this research question. The primary data collection has been in-depth individual interviews, where this study examines the IT departments of both organizations.

2.0 Theoretical Background

This chapter aims to introduce theories, models, and previous research relevant to the research question. The terms agility, organizational change, transformation, and change management are defined, and previous studies of how the organizational structure and work processes were changed to support the transformation. This section will also introduce the concept of "Team Topologies" and previous research on autonomous cross-functional teams.

2.1 Organizational change and transformation

Organizational change can be defined as a process where an organization changes its structure, strategy, processes, technology, or culture in order to adapt to changing circumstances or increase its efficiency and profitability (Stobierski, 2020). It can also be a response to internal or external challenges or opportunities (Burke & Litwin, 1992).

The Burke & Litwin Model, also known as the Causal Model of Organizational Performance and Change, proposes linkages that hypothesize how internal and external factors affect performance (Burke & Litwin, 1992). It provides a framework to assess and analyze the drivers of organizational change. The causal model connects what is understood in practice to what is known in research and theory. The model identifies twelve key factors that influence organizational change and transformation, and these factors are divided into transformational factors and transactional factors. The Burke & Litwin Model provides a comprehensive framework for understanding the complex interplay of factors influencing organizational change and transformation. It can be used to identify areas for improvement, develop strategies for change, and evaluate the impact of change initiatives over time (Burke & Litwin, 1992).

According to Stobierski (2020), organizational changes can be divided into two types: adaptive changes and transformational changes. Adaptive changes are minor, incremental changes that organizations make to address changing needs. Transformational changes are larger in scale and scope than adaptive changes. They often include a simultaneous shift in mission and strategy, company or team structure, people and organizational performance, or business processes. Because

of their size, these changes frequently require significant implementation time and effort (Stobierski, 2020).

Ashkenas (2015) argues that despite the widespread use of the terms "change" and "transformation" in organizational literature and practice, there is still confusion around their meanings and implications. Ashkenas (2015) points out two leading causes of the confusion. First, there is a lack of clarity surrounding the terms' precise definitions because they are frequently used inconsistently or interchangeably in different contexts (Ashkenas, 2015). Second, rather than being based on a clear understanding of their differences, the terms are frequently used to describe various initiatives or efforts within an organization (Ashkenas, 2015). Further, Ashkenas (2015) suggests that while change and transformation may be closely related, they represent distinct types of organizational shifts. Thus, Ashkenas (2015) defines change as a process of making incremental improvements to an existing system, while transformation involves a more radical and comprehensive shift that fundamentally alters the organization's purpose, strategy, structure, or culture and is much more unpredictable. In addition, understanding the difference between change and transformation is critical for organizational leaders to determine the appropriate approach to their initiatives and to manage expectations around the level of disruption and impact on the organization (Ashkenas, 2015). This distinction between change and transformation, as defined here, will form the foundation upon which the ensuing discussions and arguments in this paper are based.

There is currently no definitive definition of the term "digital transformation" (Osmundsen et al., 2018). However, researchers typically define digital transformation as a significant organizational change that modifies how business is conducted and is supported, enabled, or driven by digital technology (Bilgeri, Wortmann, & Fleisch, 2017; Haffke et al., 2016, 2017; Hartl & Hess, 2017; Heilig, Schwarze, & Voß, 2017; Mueller & Renken, 2017). «Digital transformation is characterized by changes and transformation which are driven and built on a foundation of technologies" (Nwankpa & Roumani, 2016, p. 2).

According to Osmundsen et al. (2018), a company needs to integrate the changes with its strategies to implement a digital transformation successfully. The need to

combine the Information System strategy with the business strategy into what is known as a digital business strategy has been acknowledged by several organizations (Osmundsen et al., 2018). A digital business strategy can support an organization's transformation and achieve its desired objectives by focusing on digital leadership skills, agile and scalable digital operations, digitalized customer experiences, and emerging digital innovations (Leischnig et al., 2017). A digital transformation is also required to achieve the goals of a digital business strategy (Nwankpa & Roumani, 2016). The study by Nwankpa & Roumani (2016) reported how digital transformation plays a role in the connection between IT capability and firm performance, which gives it a more complex function. Businesses need to understand the value of digital transformation and how to take advantage of IT capability's impact on generating and enhancing firm performance (Nwankpa & Roumani, 2016).

Bilgeri et al. (2017) conducted a case study on four large manufacturing companies to understand how digital transformation affects their organizational structure. The authors found that digital transformation led to changes in the companies` structure, including a shift towards decentralized decision-making, increased collaboration between departments, and more cross-functional teams. Additionally, the companies became more customer-focused and developed closer relationships with their suppliers. The study also identified challenges that arise during digital transformation, such as the need to develop new skills and manage the increasing complexity of data generated by the use of sensors, IoT devices, and other digital technologies (Bilgeri et al., 2017). In addition, they argue that a significant challenge in implementing digital strategies and IoT solutions is the unsuitability of existing organizational structures to execute these initiatives effectively. Bilgeri et al. (2017) conclude that digital transformation requires a holistic approach that considers the impact on the entire organization, from strategy to culture to organizational structure.

2.2 Agile methodology

Agile is "the ability to create and respond to change. It is a way of dealing with, and ultimately succeeding in, an uncertain and turbulent environment" (Agile Alliance, 2015). According to Macheridis (2009), "agility refers to the ability of

organizations to cope with a complex environment and with unexpected changes and to take advantage of changes as opportunities" (Macheridis, 2009, p.1).

The idea of agile comes from the software world and is often said to have its basis in the Agile Manifesto (Agile Manifesto, 2001). Agile management is a methodology that helps teams in an evolving collaborative process based on effective communication throughout the team while focusing on efficiency and business value (Agile Alliance, 2015). The term "agile software development" refers to a collection of frameworks and practices based on the values and principles expressed in the Manifesto for Agile Software. Modern software development is all about agility and speed, and it is not just the technology that is getting faster. Markets, in general, are experiencing an increase in entropy and becoming more nuanced – for example, within medicine, where treatment is becoming more personalized (Falkberger & Kjær, 2021).

In today`s business world, the ever-changing landscape of business requirements, drivers, and needs presents significant challenges for project management (Salameh, 2014). Projects are now required to address complex organizational structures, including partnerships, alliances with strategic suppliers, outsourcing vendors, various types of customers, and even competitors (Salameh, 2014). The need for an agile and adaptable approach to project delivery has never been more pressing (Salameh, 2014; Macheridis, 2009; Shenhar, 2004). This approach is necessary to ensure that projects, products, and services can be delivered quickly to meet market demands and satisfy customers' needs (Salameh, 2014). The ability to adapt to these challenges will be critical to achieving success in today's dynamic business environment (Macheridis, 2009). Shenhar (2004) emphasizes the importance of flexibility and adaptability in strategic project management. He argues that project managers must be willing to adjust their approach as new information emerges and be able to respond quickly to changes in the project environment (Shenhar, 2004).

One feature distinguishing Agile from other software development approaches is the emphasis on the people doing the work and how they collaborate. Collaboration between self-organizing cross-functional teams using appropriate practices for their context leads to the development of solutions (Skelton & Pais,

2019). The Agile software development community highly values collaboration and the self-organizing team. An agile organization is not only about new working methods and interdisciplinary collaboration but also about how the entire organization is structured to ensure faster adaptation to changes in the market (Stensaker, 2022).

Forsgren et al. (2018) highlight the importance of agility in technology and organizational practices such as continuous integration and delivery, automated testing, and cross-functional collaboration to support faster delivery of high-quality software products. Salameh (2014) has done a comparison between Agile project management and traditional project management methods. This research study reports that Agile project management "has proven to provide better productivity, higher quality, more efficient decision making, as well as lower overall project costs and faster time to market, due to its framework based on frequent customer interaction and frequent and quick delivery cycles" (Salameh, 2014, p. 1).

2.3 Change management

According to Cummings and Worley (2014), change management refers to the process of planning, implementing, and monitoring changes within an organization to ensure they are effectively and efficiently executed. Where change management involves managing the human and organizational factors that can influence the success or failure of a change initiative (Cummings & Worley, 2014). This includes understanding the reasons for change, creating a vision for change, communicating the need for change, engaging stakeholders, building a coalition of supporters, designing, and implementing change interventions, and evaluating the impact of change.

Cummings and Worley (2014) argue that change management is considered as a critical element to successfully implement an organizational change. This is because change initiatives can often encounter resistance from individuals and groups within an organization, and effective change management strategies can help to mitigate this resistance and increase the likelihood of success (Cummings & Worley, 2014). Change management is a process that aims to ensure that

changes within an organization are consistent with the organization's strategic goals and objectives and to implement changes in a manner that minimizes negative impacts while maximizing benefits to the organization (Cummings & Worley, 2014). Thus, effective change management is crucial to the success of organizational change initiatives and achieving the desired outcomes.

One of the most well-known models for change management is Kotter's eight-stage process for implementing a significant change (Pollack & Pollack, 2015). John Kotter's Eight-Step Model is a framework for leading organizational change (Kotter, 1996). The model is designed to help leaders plan, implement, and sustain change initiatives effectively. The eight steps are as follows; establish a sense of urgency, form a powerful coalition, create a vision for change, communicate the vision, empower others to act on the vision, create short-term wins, consolidate gains and produce more change, and anchor new approaches in the organization's culture. The Eight-Step Model provides a comprehensive framework for leading successful organizational change initiatives (Kotter, 1996). By following the steps, leaders can create a sense of urgency, build momentum, and sustain change over the long term (Kotter, 1996). The model has been widely used and adapted to various contexts and has been effective in various industries and sectors (Pollack & Pollack, 2015).

However, Pollack and Pollack (2015) reported that the change team discovered that in order to implement the organizational change, engagement at many levels of the organization was required. Typically, the change process is shown as a linear series of steps (Kotter, 1996). The complexity of the necessary action was discovered to be underrepresented by this representation of the change process (Pollack & Pollack, 2015). To re-create change that was locally relevant to change process participants, the change team had to facilitate and manage multiple instances of Kotter's process throughout the organization (Pollack & Pollack, 2015).

Stouten et al. (2018) argue that while there is a wealth of research on organizational change, practitioners often struggle to apply these findings in real-world contexts. Thus, Stouten et al. (2018) have developed ten principles of evidence-based change management that are essential for initiating and

maintaining successful organizational change. These principles have been derived from the synthesis of seven prominent change management models and academic research on organizational change (Stouten et al., 2018). The steps are as follows: (1) Get facts regarding the nature of the problem, where gathering facts to assist in a diagnosis of whether change is needed. (2) Assess and address the organization's readiness for change by looking at the capacity of the organization and previous change history. (3) Solution identification and implement evidence-based change interventions. (4) Develop effective change leadership throughout the organization by using a multi-level approach. (5) Develop and communicate a compelling change vision. (6) Work with social networks and tap their influence. (7) Use enabling practices to support implementation with goal setting and provide the tools and processes for delivering and capturing knowledge about the change at all organizational levels, sharing information and gathering feedback, using a fair procedure in making decisions, and treating people respectfully. (8) Promote micro-processes and experimentation by implementing small-scale or micro-process change interventions and allow for failure and learning. (9) Assess change progress and outcomes over time. (10) Institutionalize the change to sustain its effectiveness, where sustaining change means integrating it into the organization's larger systems, such as its culture and management systems.

Further, Stouten et al. (2018) emphasize the importance of taking a holistic approach to organizational change and highlight the need to address both technical and social factors that may influence the success of change initiatives. In addition, the importance of effective leadership, communication, and stakeholder engagement in driving successful change (Stouten et al., 2018).

Armenakis et al. (1993) explore the concept of organizational change readiness and proposes a model for creating organizational readiness. The article is based on a review of existing literature and empirical research conducted with managers from several organizations. Armenakis et al. (1993) argue that successful organizational change requires more than a well-designed change initiative. It also requires a level of readiness within the organization - a willingness and ability to accept and adapt to the changes being introduced. The authors propose a four-stage model for creating readiness, which includes creating a culture of trust and support, developing a shared vision, communicating the need for change, building

capability and commitment. Armenakis et al. (1993) conclude that creating readiness for change is a complex and ongoing process that requires a combination of leadership, communication, and management practices. By understanding the factors contributing to organizational change readiness and following a structured approach to creating readiness, organizations can improve the likelihood of success for their change initiatives (Armenakis et al., 1993).

2.4 Organizational structure and autonomous cross-functional teams

Organizational structure and agile methodology are closely linked together, as the structure of an organization can significantly impact the success of agile methods (Dikert et al., 2016). "In large-scale agile software development, many teams work together to achieve overarching project goals" (Berntzen et al., 2023, p. 1). Thus, the need for coordination increases as the number of teams increases (Berntzen et al., 2023). According to Berntzen et al. (2023), despite the growing popularity of large-scale agile, inter-team coordination is challenging to study and implement. Inter-team coordination issues can be due to a lack of shared knowledge about goals and priorities, ineffective communication, and poor management of dependencies across teams (Berntzen et al., 2023).

Agile methodologies prioritize adaptability, collaboration, and iterative development; these principles are easier to uphold in organizations with a flatter organizational structure (Sochova, 2020). In a traditional hierarchical organizational structure, decision-making power and responsibility are concentrated at the top, with little room for input or feedback from employees (Sochova, 2020). This can make it difficult to implement agile methodologies, as these methodologies require teams to work collaboratively and make decisions together in order to adapt to changing circumstances and deliver products quickly, thus flatter organizational structures (Agile Alliance, 2015).

Svorstøl (2020) emphasizes that a flat organizational structure with self-organized teams can enhance autonomy among team members, which makes them feel responsible and accountable for their work outcomes. In addition, a flat hierarchy can promote more transparent communication since the information has to pass through fewer layers before reaching the frontline (Svorstøl, 2020). This can also

lead to faster decision-making. In flatter organizations, team members are often more engaged in the decision-making process, resulting in a stronger commitment, which can increase motivation among individuals (Karlsen, 2017).

According to Aghina et al. (2018), agile organizations are characterized by flat organizational structures, a scalable network of teams, customer-centricity, experimentation, rapid decision-making, and a willingness to embrace change and uncertainty. Further, Agina et al. (2018) emphasize that building agile organizations require autonomy and clear roles in the teams to enable efficient and accountable cross-functional interactions and avoid delays caused by ambiguous or redundant roles and managerial approvals.). Therefore, agile organizations` fundamental building block is a team, which creates cooperative, creative, and adaptive networks (Agile Alliance, 2015).

According to Edmondson (2018, p. xiv), "for knowledge work to flourish, the workplace must be one where people feel able to share their knowledge, this means sharing concerns, questions, mistakes, and half-formed ideas". Edmondson (2018) describes something she calls psychological safety when she was studying the effects of teamwork. According to Edmondson (2018, p. xvi), psychological safety can be defined as "a climate in which people are comfortable expressing and being themselves". This means that people are comfortable "sharing concerns and mistakes without fear of embarrassment or retribution" (Edmondson, 2018, p. xvi). Edmondson's study found that teams with high effectiveness, marked by mutual respect, strong cooperation, high satisfaction, and strong belief in their abilities, reported ten times more errors than less effective teams (Edmondson, 2018). These effective teams promoted an open culture where risks and failures were freely discussed, leading to more error reporting (Edmondson, 2018). Furthermore, the study found that teams with low psychological safety exhibited behaviours which had a negative impact on creativity and innovation, such as withholding ideas, avoiding critique of others' ideas, hesitating to challenge established norms, refraining from asking questions and admitting mistakes (Edmondson, 2018).

Moe and Stray (2020) reported the importance of leadership and team dynamics in enabling and sustaining autonomous agile teams, the challenges of implementing such teams in traditional organizational structures, and the need for a clear understanding of the roles and responsibilities of team members.

Skelton and Pais (2019) describe the concept of Team Topologies, which FINN, Statnett, and many other organizations, such as NAV, have been inspired by. The book presents how to build an effective team organization. It describes a practical, step-by-step, adaptive organizational design and team interaction model based on four fundamental team types and three team interaction patterns. Team Topologies is an adaptive model for organizing business and technology teams and how they should communicate and interact with each other to achieve the best possible flow and value creation (Skelton & Pais, 2019). This way of organizing teams reduces the need for coordination and communication across teams. According to this concept, the team is empowered with autonomy and creates trust among the team members. In addition, defined areas of responsibility among teams, where the team has ownership of the software it works with. In contrast, several areas of responsibility can pull the team in several directions and make prioritization difficult.

A systematic review of large-scale agile transformations by Dikert et al. (2016) reports that organizations that already had structures in place similar to agile made the transformation smoother. "For instance, a previous organizational model based on small and autonomous teams strongly aided the adoption" (Dikert et al., 2016, p. 101). This systematic review also found that team autonomy was one of the critical success factors in transformation. Berntzen et al. (2023) also report that "the notion of autonomous teams lies at the core of agile software development." (Berntzen et al., 2023, p.3). However, because there is a greater need for coordination and alignment between the system, the organization, and the product in large-scale agile, team autonomy must be balanced with the larger organizational structures (Berntzen et al., 2023).

Dingsøyr et al. (2018) reported coordination challenges in large-scale software development projects. They argue that traditional approaches to coordination, such as hierarchical structures and strict processes, are inadequate for managing

the complexity and uncertainty of modern software development projects (Dingsøyr et al., 2018). Thus, Dingsøyr et al. (2018) proposes a new framework based on three key concepts: collaborative work, interaction spaces, and coordination mechanisms. Collaborative work refers to the need for cross-functional teams to work together to achieve project goals. Interaction spaces are the physical and virtual environments in which team members interact and communicate. Coordination mechanisms are the processes and tools used to facilitate communication and collaboration. Further, they mention that this can be applied in practice by including the use of agile methodologies (Dingsøyr et al., 2018).

3.0 Research Methodology

This section provides an overview of the research methodology applied in this study. First, this section presents the research design and then outlines the selected cases studied. It also discusses the process of gathering data and how the cases were analyzed. Additionally, it evaluates the research methodology. Lastly, it highlights the ethical aspects that were considered during the study.

3.1 Research Design

A qualitative research method with a case study design was chosen to investigate this study's research question. A qualitative research approach is appropriate when seeking to answer a research question that asks why or how something works (Yin, 2018). Thus, a qualitative case study design was suited to answer the research question and to gain in-depth knowledge of events, opinions, assessments, arguments, decisions, measures, or developmental features (Maxwell, 2013), where the research question aimed to investigate which common success factors and challenges the organizations faced in the initiation phase of the transformation process. In addition, the qualitative research approach is suitable for exploring complex social phenomena in-depth and understanding the subjective experiences, perceptions, and meanings of individuals or groups (Bryman & Bell, 2015).

The decision to adopt a case study approach in this research stemmed from the need to delve deeply into the mechanisms of coordination within a real-life setting. As Yin (2018) explains, case studies allow an intensive examination of a particular topic or event in its natural environment. This approach is particularly beneficial for this thesis, where the context plays a crucial role. Case studies are beneficial for inquiries that demand detailed exploration, especially when the distinction between the research subject and its context is unclear (Yin, 2018). Such an approach is well-suited for probing "why" and "how" questions that require nuanced understanding (Ralph et al., 2020; Walsham, 2006).

A multiple-case study design with two cases was chosen to strengthen the data and get a more comprehensive view of the research topic (Yin, 2018). "The multiple case study design is a valuable qualitative research tool in studying the links between the personal, social, behavioral, psychological, organizational, cultural, and environmental factors that guide organizational and leadership development. Case study research is essential for in-depth study of participants` perspectives on the phenomenon within its natural context." (Halkais et al., 2022, p. 1). In addition, a multiple-case study design allows us to look at the differences and similarities between the cases and provide a more in-depth understanding of the research topic, which helps make the results more applicable to other situations (Yin, 2018).

3.2 Case selection

The cases in this thesis were selected using purposeful sampling, a qualitative sampling strategy that emphasizes the in-depth selection of information-rich cases relevant to the research question (Maxwell, 2013). According to Maxwell (2013, p. 235), "purposeful sampling can be used to establish particular comparisons to illuminate the reasons for differences between settings or individuals, a common strategy in multi-case qualitative studies". While the purposeful sampling strategy increases the depth of the information obtained, it also limits the generalizability of the findings (Maxwell, 2013). However, in qualitative case studies like this study, the goal is not to generalize but to provide an in-depth understanding of a specific phenomenon (Bryman & Bell, 2015). Thus, it is believed that the benefits of purposeful sampling outweigh the potential limitations.

The case organizations selected for this study were primarily chosen based on their relevance to the research question. Importantly, we sought out two cases that stemmed from different industries or sectors and housed IT departments. The first case required an organization that had already completed such a transformation, while the second case needed to be an organization currently immersed in a digital transformation process. This meant that both cases were IT departments at different stages of a digital transformation, ensuring that the collected data would be diverse, appropriate, and relevant to the study's aims. Another criterion was the accessibility of the organization for data collection. The organizations needed to provide access to necessary data, documents, and key individuals involved in the transformation process. In addition, to ensure a comprehensive view of the digital transformation process, the cases were selected to include organizations from different sectors and types of organizations to provide a broad understanding of the common success factors and challenges in the initiation phase of the transformation process across industries.

3.3 Description of Cases

3.3.1 Company A – FINN.no

FINN.no AS, Norway's largest online marketplace, was established in March 2000 (FINN.no, n.d.). FINN.no specializes in advertisements and services for buying and selling among individuals and small and large businesses. At the moment, FINN.no has approximately 500 employees, of which 200 of them are IT developers (Opsal, 2022). However, a recent change in customer needs demanded a more differentiated user experience within business areas, more closely tailored to specific selling and buying scenarios (Opsal, 2022). For instance, various search experiences required distinct adaptations within the business areas. This led to a situation where the business areas no longer had the exact needs, and conflicting priorities caused bottlenecks. Each team could only work on one or two tasks simultaneously, leading to team-wide stress as everyone awaited their output. As a result, they concluded that the current organization was no longer scalable (Opsal, 2022).

In the winter of 2020-21, FINN.no chose to transition to a platform model where they changed the organizational structure by implementing autonomous teams (Opsal, 2022). According to Opsal (2022), a platform model is "a curated set of services and tools used to create numerous services" — an approach that allows developers to avoid starting from scratch. This decision was influenced by the "Team Topologies" concept and other successful practices of similar companies (Opsal, 2022). They shifted to a product platform, ensuring differentiated business areas for distinct user experiences. The transition led to the implementation of various autonomous teams, causing an organizational shift in their work approach and collaboration methods.

3.3.2 Company B – Statnett

Statnett SF is a state-owned enterprise in Norway with a workforce of over 1,300 individuals (Statnett group presentation, 2017). The enterprise's primary mandate involves the central power grid's design, ownership, and management to ensure a stable balance between the country's energy demand and production (Statnett group presentation, 2017). In addition, Statnett acts as both a system manager within the Norwegian power system and a plant owner. Furthermore, Statnett assumes responsibility for the interconnections with other nations, including Sweden, Finland, Russia, Denmark, and the Netherlands (Statnett group presentation, 2017). The IT department, now the "Transformation & Digitalization," is responsible for driving necessary transformation, change, and digitalization throughout the corporation (internal document from Statnett). This involves responsibility for enabling transformation through new ways of working and delivering solutions. IT Operations deals with IT infrastructure, such as servers, and data centers, providing platform services to internal IT teams (internal document from Statnett). The Digital Development subdivision is responsible for IT development, with 212 employees (internal document from Statnett).

The EMS (Energy Management System) manages the power grid, consisting of members from system operations and transformation & digitalization (internal document from Statnett). The EMS solution is responsible for supervising and controlling the power grid in Norway and therefore is one of Norway's most important IT solutions (internal document from Statnett). It requires 24/7

operations (internal document from Statnett). The EMS solution at Statnett is based on standard off-the-shelf software that was made for a power grid based on traditional energy sources and not the new unpredictable renewable energy sources.

Statnett intends to invest 60–100 billion NOK in Norway by 2030 due to the de-carbonization of energy consumption, and a large part of that will be IT investments (Hovland, 2021). This requires new complex functionality, enhanced coordination between the system and market, and collaboration with network partners in the European transmission network (50Hertz, 2023). To manage these challenges and meet the growing demand for change, substantial investments in IT are required for the innovation and maintenance of IT software applications (European Commission, 2022). These changes reflect the organization's evolving focus from traditional IT towards a broader mandate involving digital transformation and innovation.

3.4 Data Collection

This study's primary data collection method is individual semi-structured open-ended interviews with informants, such as employees and leaders, from both cases to better understand the effect and possible challenges and opportunities. A total of 12 semi-structured in-depth interviews were carried out. Semi-structured interviews are a common tool in qualitative research. They allow flexibility, enabling the interviewee to guide the conversation and "allow respondents to express themselves fully in their own terms" (Stokes & Wall, 2014, p. 136). Furthermore, semi-structured interviews allow the researcher to delve deeper into certain aspects that arise during the interview (Stokes & Wall, 2014).

Before conducting the interviews, an interview guide was developed where the questions were designed to reveal common success factors and challenges. The interview guide consisted of open-ended questions, encouraging the participants to share detailed insights about their personal experiences, feelings, and attitudes toward the initiation phase of the transformation process in their organization. In addition, flexibility was key in the interviews to adapt to participants' responses (Bryman & Bell, 2015). The complexity of the topic and varied individual

understandings necessitated a degree of freedom during the conversations. Additionally, we used minimal probing in follow-up questions, enabling interviewees to elaborate for a more detailed understanding if needed. The phases in the interview process were preparation, conducting the interview, and then complementary work (transcribing interviews) and analyzing the answers. The interviews were conducted in Norwegian, the mother language of all informants. Bryman & Bell (2015) highlighted that informants, when speaking in their native language, can offer more detailed responses by including metaphors and idioms. The interview was conducted face-to-face or virtually via video conference tools like Teams and Zoom. The interview questions were sent to the interviewee prior to the interview. The interviews lasted approximately 1-1,5 hours. The informants allowed the interview to be recorded. Email correspondence was continued to clarify any data that was ambiguous.

3.4.1 Informants

The participants in this study were suggested by their organization's members and not chosen by us. Further, the informants for this study were chosen by selected criteria, such as they could provide information about how they were organized, the history of the transformation, and their position in the process. This approach ensured that the selected individuals would most likely contribute valuable and relevant insights to the research (Tongco & Dolores, 2007). The informants were contacted via LinkedIn or email. This study includes a sample of 12 informants, six from case A and six from case B. After completing the 10th interview, no further unique themes or information surfaced. Thus, it was determined that the data collection had achieved a saturation point (Guest et al., 2006). Detailed information about the informants and the conducted interviews are presented in Tables 1 and 2.

Table 1

Interviewees in case A

Informant	Position	Date	Length	Type of Interview
A1	Engineering Director	March 24th	1.5 hours	Virtual
A2	Chief Architect	March 22nd	1.5 hours	In-person
A3	Architect	March 21st	1.5 hours	In-person
A4	Engineering Manager	March 21st	1 hour	Virtual
A5	IT developer	March 22nd	1 hour	Virtual
A6	Tech COO	March 29th	1 hour	In-person

Table 2

Interviewees in case B

Informant	Position	Date	Length	Type of Interview
B1	Chief Architect	March 27th	1.5 hours	Virtual
B2	Project Manager	March 30th	1.5 hours	Virtual
B3	Systems Architect	March 19th	1.5 hours	In-person
B4	Systems Engineer Manager	March 21st	1 hour	In-person
B5	Program Manager	March 28th	1 hour	In-person
B6	Senior Advisor	March 23rd	1 hour	Virtual

3.5 Data Analysis

The recordings of the interviews were transcribed into text, which allowed for a detailed examination of the responses. Interviews conducted in Norwegian were initially transcribed completely before being translated into English. Simultaneously with the data collection, the data were analyzed, and conclusions relevant to the research question were extracted. Methods for analyzing qualitative data included, among other things, the coding of the data material (Grønmo,

2009). Coding refers to the process of assigning keywords (codes) to large or small text elements, capturing the content of each element (Grønmo, 2009). After the transcription of the interviews, the coding technique was applied to pinpoint patterns and themes. This helped draw out insights relevant to the research question and assign meaning to the data (Bryman & Bell, 2015). We further refined the data by either splitting or merging categories. Supplementary data were extracted from organizational documents and reports on the transformation process. This additional information was used to validate the data from different sources (Bryman & Bell, 2015). This process led to a more precise and comprehensive understanding of the transformation process within each organization.

3.6 Evaluation of research methodology

This chapter identified potential errors in the study's research methodology. Despite qualitative methodology's strength in probing issues and suggesting causality, its perceived trustworthiness is often questioned due to "the "soft" nature of data (narratives) that are usually seen as limited (small samples) and subjective" (Halkias et al., 2022, p. 11). According to Halkias et al. (2022, p. 11), "significant concerns are raised regarding the reliability, validity, and representativeness of the collected information, as frequently the methodology is judged in light of and according to quantitative research rules". Lincoln and Guba (1985) formulated a set of four criteria to assess the trustworthiness of qualitative research. These criteria are credibility, transferability, dependability, and confirmability.

Credibility underpins the believability of research findings (Bryman & Bell, 2015). The study involved using additional information to enhance credibility, which means "using more than a single type of data to establish findings" (Stahl & King, 2020, p. 26). This study sampled information about the two organizations to familiarize with the study`s context before the interview. In addition, we had an initial visit to case organization B, but unfortunately, we did not get the opportunity to visit case organization A before the interviews. Furthermore, we adopted honesty-assuring strategies such as providing participants multiple opportunities to choose not to be part of the study, where none of the interviewees

decided to drop out. However, there were two potential participants who did not respond to the invitation email. This practice led to information from informants who were genuinely willing to share information, thus, contributing to the research's credibility (Halkias et al., 2022).

On the other hand, with this approach, this study may only include the most eager participants in the organization who volunteer to participate and may not involve others to get contrasting views (not listening enough data). Thus, this could be a bias in this study. Further, we encouraged informants to provide data without fear of repercussions (Bryman & Bell, 2015), which is crucial in a study aimed at understanding leadership, psychological safety, and top-down/bottom-up processes in the transformation. In addition, we provided clear information about the study`s process and purpose.

Transferability, proposed as an alternative to external validity, refers to the extent to which the findings can be applied to other contexts (Bryman & Bell, 2015). This concept parallels the generalizability aspect of external validity in quantitative research, which relies on representatively collected data to extrapolate findings to the broader population (Lincoln & Guba, 1985). While qualitative research, including this study, may not typically provide a high degree of generalizability, strategies such as randomization and stratification suggested by Lincoln and Guba (1985) can improve transferability (Stahl & King, 2020). This study employed a form of random selection, with participants chose not by us but by managers and employees within the organizations. Though stratification was not achievable, the sample spanned the most significant roles related to the transformation and re-organization within the IT departments. This criterion of transferability, parallel to quantitative research's external validity, assesses the potential applicability of findings to other contexts (Stahl & King, 2020). By offering a comprehensive description of the research context, we aim to facilitate readers in determining the transferability of our findings to their respective scenarios.

The third perspective of trustworthiness is dependability, which is the findings' consistency and potential repeatability (Lincoln & Guba, 1985). It aims to ensure that another researcher could yield similar results under identical conditions and

methodologies but at a different location and time (Stahl & King, 2020). We attained this dependability in our study by providing a clear and detailed description of the research methods and decisions, and careful data handling and processing, such as precise transcription, was facilitated by interview recordings and eliminating potential translation bias.

The last perspective on trustworthiness is confirmability, which ensures that research findings are derived from participant data, untainted by researcher biases. (Lincoln & Gauba, 1985). According to these criteria, data should be freely expressed by participants, not influenced by the researcher's expectations or preferences (Stahl & King, 2020). In this study, we enhanced confirmability by employing multiple data sources and a somewhat randomized sample, effectively reducing investigator bias. Furthermore, we adopted Guba and Lincoln's (1982, p. 248) "confirmability audit strategy", maintaining detailed records of the data and analysis path. This practice allowed us to trace every finding to its originating data through the assigned codes and categories. By ensuring our results could be traced back to specific participant quotes, we upheld a level of objectivity akin to quantitative research.

3.7 Research ethics

This chapter will assess if this study has followed the necessary ethical considerations. Diener and Crandall (1978) define four issues of research ethics: harm to participants, lack of informed consent, invasion of privacy, and deception.

The first one is whether the study could cause any harm to the participants (Diener & Crandall, 1978), where this could be physical harm, mental harm, or potential damage to the future career prospects of the participants (Bryman & Bell, 2015). In this study, the participants could choose a date and time for the interview and decide if they wanted a virtual or in-person interview. In addition, this study did not include anything that could risk causing physical harm to our research informants. We also do not think there is a risk of psychological harm or harm to their future jobs from participating in this study. This is because we made sure the participants knew about the study and could choose if they were okay to take part, and they could also withdraw their participation at any time. In addition, the

informants' identities are anonymous, so their responses could not be linked back to them.

The following ethical consideration is the lack of informed consent (Diener & Crandall, 1978). Informed consent is a critical ethical rule in research, meaning participants should understand the study and freely agree to join (Crow et al., 2006). The participants should also have the right to leave without harm, mainly if they are part of a 'vulnerable' group (Crow et al., 2006). This means it requires providing detailed and understandable information about the project, enabling potential participants to make informed decisions about participation. In this study, the participants were informed about the research project. Furthermore, they were required to read and sign a consent form outlining the project details, their right to withdraw, their anonymity, and the data storage and usage protocol. Thus, we are confident that the participants were adequately informed and consented to participate in the study.

The following ethical consideration is the invasion of privacy (Diener & Crandall, 1978), which is closely associated with informed consent (Bryman & Bell, 2015). In this study, with semi-structured interviews, the participants were allowed to speak openly and tell from their point of view. In addition, the question did not include any personal information, and they could refuse to answer any question. Thus, invasion of privacy was not an issue in this study.

The final ethical consideration is whether any deception has been involved in the study (Diener & Crandall, 1978). According to Bryman and Bell (2015), deception occurs when researchers misrepresent the actual focus of their study other than what it is. In this research project, the participants were informed about the purpose of the project and the research question, and we did not withhold any information about the study. Therefore, we are confident that this research did not involve any deception. In addition, this research project was officially registered and received approval from the Norwegian Agency for Shared Services in Education and Research (Sikt) in February 2023.

4.0 Case Analysis and Findings

This chapter dives into the case analysis with challenges and critical success factors for both cases. Quotes from the interviews will be utilized to support the authenticity of the original data and ensure that the descriptions are not solely based on interpretation. Lastly, the chapter presents a cross-case comparison that examines the challenges and critical success factors that cut across both companies.

4.1 Case A – FINN.no

4.1.1 Challenges

Technological transition and legacy systems

The interviewees in the study revealed several challenges related to the use of monolithic architecture, which is a type of software architecture (A1, A2, A3, A4, A5, A6). The Chief architect explained that a monolith means *we put the code in the same place, make changes in the same place, and everything is connected – which can cause unwanted effects elsewhere* (A2). This structure worked when the company was smaller, with fewer employees, but it began to reveal its drawbacks as the company grew (A1). A common issue was an unexpected system breakdown in unrelated areas due to interdependencies in the code (A1). The engineering director explains that e*rrors could be fixed in one place related to the 'travel' category, and then it collapsed on the property because things were connected that not everyone had oversight over* (A1). Another informant highlighted the difficulty in maintaining and updating this system, as it required extensive knowledge to code in and limited them to only four releases per year (A3).

Addressing the inefficiencies of the monolithic architecture, the engineering manager underscored the importance of being agile and adaptable (A4). The interviewee believed that using agile methodologies could enable teams to quickly turn and find solutions independently (A1, A2, A3, A4, A5, A6). Another informant stated that *one cannot be fast and agile if one cannot change priorities quickly - one needs processes to support that (A5)*. However, the limitations of the outdated legacy systems became clear when they made it difficult to support new

business models or ideas (A1). The engineering director explained that *if teams are to deploy when they want, they must be independent […] it is closely linked to gaining speed, keeping up with the times, and not getting stuck in legacy systems that prevent one from supporting new business models or ideas* (A1).

Leadership

One of the respondents commented that Finn.no never practiced a top-down culture, but instead, they encouraged strong opinions and high engagement from their employees (A5). Another informant highlighted that *Finn.no has never had a top-down culture. We have hired people with strong opinions and a lot of energy, and Finn.no rarely overrides others […] but this was also a challenge when it came to decision-making* (A3). This democratic approach, while promoting collective decision-making, made it difficult to reach a consensus in the organization (A3).

Another respondent further revealed the difficulty in shielding teams during the initial phase of the transition (A1). The engineering director mentioned that a year was spent educating Finn.no leaders on the platform-based approach (A1). As the informant explained, *it was difficult to shield the teams at the beginning. We spent a year teaching some leaders in Finn.no about the 'platform thinking', and we had to teach them again as there are many new people who do not understand it* (A1). Another significant challenge was the complete replacement of the leadership team at one point during the initial phase of the transformation, where this abrupt change caused some disruption and resistance within the organization (A3).

Organizational change and restructuring

According to the interviewees, there were some challenges regarding organizational change and restructuring (A1, A2, A3, A4). One of the informants noted that some of the employees were initially skeptical, largely because they felt unfamiliar with the new concept and felt they did not understand, leading to a shift in attitudes among the employees (A1). Introducing different types of autonomous teams involved a shift in code ownership (A1). The informant commented that *it was probably a bit scary for some when we started talking about outcome teams and platform teams. It took a long time before everyone understood it because it*

also meant changing code ownership (A1). The informant further elaborated that the concept of autonomous teams taking ownership into their teams was met with some resistance, as no one wanted to take over more code from others (A1). However, the motivation behind this change was to increase the pace of operations and foster independence (A1). The engineering director clarified: *the reason for doing it is to become faster, stop waiting, and thus become more independent. The idea that others do it for you was perhaps the first thing people thought of and therefore were unwilling to take over* (A1).

The establishment of autonomous teams

The interviewees mentioned they faced some challenges related to the establishment of autonomous teams in the organization (A1, A2, A3, A4, A6). The respondents had different interpretations of what it means to have an autonomous team (A1, A2, A3, A4, A5, A6). While one of the respondents saw it as teams making code changes independently (A1), others viewed autonomy as having the authority to make all decisions or choose technology themselves (A5). For example, the engineering director stated, *I think that an autonomous team means being independent code-wise, for example making their code changes independent of other teams* (A1). Another informant discussed that being autonomous means being completely independent and that it is necessary to reduce cognitive load (A6).

The engineering director mentioned that in the early stages of this transition, there was significant frustration among teams not accustomed to autonomy (A1). The informant highlighted the difficulties teams faced when expected to manage their own backlogs and coming up with the solution themselves (A1). Thus, trust-building was crucial in the early stages, with teams initially fearful of being interrupted mid-task (A1). The informant stated that *teams had to show they could complete tasks to maintain trust [...] in the beginning, the teams were very busy, they were perhaps afraid to start something they saw as important because they were afraid of being interrupted in the middle, and then they probably had a system with two variants - since they didn't have time to complete* (A1). Another challenge that the informant commented on was that some of the teams had to be involved in all the changes, where there was a very large queue with tasks to do,

and ultimately, this did not scale well, where they could only make one significant change at a time (A1).

Time to business is too long

All the respondents agreed that the time to business was too long, meaning they could only make big changes a few times a year (only deploy code four times a year) (A1, A2, A3, A4, A5, A6). One of the interviewees explained that the team was composed of experts in various areas such as databases, Java, and front-end (A1). However, this structure proved to be a challenge as there was a lot of handovers between teams when dealing with specific user issues or user stories (A2). A1 mentioned, *If you had a specific user problem or user story, there was a lot of handovers where the time it took to deliver new functionality was very long due to all the teams you had to go through*.

The architect highlighted that the company used to work project-oriented, involving heavy administration and processes (A3). This led to a significant waste of time and effort spent on preparations before working on solutions (A3). The engineering director observed that simply having an agile process did not help if the system did not support an agile process (A1). The informant stated, *We gradually saw that it does not help to just have an agile process if the system does not support an agile process* (A1). Another respondent highlighted that "*There was pain in the organization - it took too long to implement technology changes! Management will almost always think it takes too long to implement technology changes, sometimes because they do not understand what it requires* (A3). The architect pointed out that the long timeframe for technological changes was not always due to slow progress but often due to a misunderstanding of what these changes required (A3).

Prioritization

Some of the respondents commented on the difficulty in establishing priorities, especially given the pressure to decide what was most important, according to their goal and strategy (A1, A2, A3). One of the informants explained that *the challenge is where technology has said that if we are going to do it in a way to do it quickly, then we do it so that it does not scale for next time. There has been a tug-of-war between speed, quality, and scalability* (A1). In addition, it was a

challenge to establish clearer business development strategies for the various marketplaces (A1). The architect highlighted that the management could be a bit too concerned with the details, where the leadership group discussed and made the priorities (A3). The informant explained that *the challenge was that if you prioritize too many things in parallel, it will always go slower. You must relate to a few priorities and deliver on them, and then rather prioritize again when you have delivered* (A3).

Table 3:

Summary of challenges in company A

Challenges	Stated by
Technological transition and legacy systems	A1, A2, A3, A4, A5, A6
Leadership	A1, A2, A3
Organizational change and restructuring	A1, A2, A3, A4
The establishment of autonomous teams	A1, A2, A3, A4, A6
Time to business is too long	A1, A2, A3, A4, A5, A6
Prioritization	A1, A2, A3

4.1.2 Critical success factors

Inclusive leadership and top-down support

All the informants emphasized the importance of inclusive leadership and top-down support in their organization (A1, A2, A3, A4, A5, A6). The engineering director discussed the leader's role in organizing everyday tasks and supporting the team as critical in this transformation, stating, *as a leader, it's about helping and sorting out the everyday and finding out what is most important now* (A1). The tech COO also highlighted the necessity of clear communication on priorities, *we have to be clear about what we prioritize and what is not going to be prioritized* (A6). In addition, the informant also indicated that top-down support was an important factor in the transformation and making priorities, where the informant said: *as an organization, you have to experience this, where the*

management team today works more at a strategic level and sets one or two priorities for what we are going to achieve - not details, because it is up to the organization itself to deliver. People must understand their role based on their level in the organization, and trust their employees and allow them to decide within their mandates (A1). The interviewees also mentioned how important it was to send the management to attend courses on agile methodologies, emphasizing the need for a lot of information and training to facilitate a smooth process (A1, A2, A3, A4, A6).

The need for change came from a bottom-up approach, where the informants mentioned that it was critical to have inclusive leaders who listened to the employees (A1, A2, A3, A4, A5, A6). The architect mentioned that the developers themselves noticed that the existing situation was not sustainable and that the development process was slowing down (A3). The informant said: *it was the developers who had read up on Scrum and Agile and suggested that the management should attend a course with Mary Poppendieck. The experience was described as an "awakening" and a moment of realization about the problem in their organization and a convincing solution* (A3). Another one of the participants discussed how important it is with a flat organizational structure and top-down support to share ideas and experiment (A5). One interviewee mentioned specifically the interplay between the employees and management with informal information structures, which led to increased knowledge sharing and support for the transformation (A2).

Trust and open communication

All the interviewees highlighted trust, open communication, and a bottom-up approach as critical aspects of their successful transformation (A1, A2, A3, A4, A5, A6). They emphasized the importance of listening to employees, who are often more skilled(A1, A2, A3, A4, A5, A6). In addition, this can transform the organization from the inside to deliver the desired value to users (A1, A2, A3, A4, A5, A6). The tech COO argued that *most good leaders will be aware that the employees are more skilled, and must definitely be responsive to what comes from the organization [...] one must change from the inside to be able to deliver what one wants out* (A6).

Another informant discussed the transition to agile, explaining that it has profound effects, starting from the bottom of the organization (A2). According to the architect, Finn.no has evolved into a strategy-oriented company(A3). The informant explained *it changed since 2005 because decision-making power has been pushed further down the organization* (A3). Thus, a critical aspect of this change was facilitated by pushing decision-making power further down the organization (A3).

Shifting from a monolithic technology to a modular and team-based structure

All the participants discussed the shift from a monolithic architecture to a more modular and team-based structure, supported by technology that enabled agile methodology, was a critical success factor (A1, A2, A3, A4, A5, A6). The chief architect explained: *Before, there were large changes, but now Finn.no consists of many separate services that are developed as 'stand-alone' services that can deploy independently of each other. This is much more agile and flexible!* (A2). The architect also stated how agile methodology heavily depends on supportive technology (A3). This was also a part of their IT strategy to break up the monolith (A2). When a separate service is established, agile methods can be employed within that service, enabling developers to take ownership of their work (A3). The informant argued that *it is very difficult to implement agile methodology if you don't have technology that allows it. You're almost dependent on it, and that's what we made IT strategy for, to break up the monolith* (A3).

Organizational change and restructuring

Restructuring the organization into independent teams, maintaining a balance between tech and business organizations, and focusing on strategic issues were key to the successful organizational change (A1, A2, A3, A4, A5, A6). One of the informants brought up the principles of 'Conway's Law', which played a key role in the transformation (A2). In FINN.no they realized how the technology a company develops is shaped by the organization responsible for creating it (A2). The architect elaborated that *we saw that the technology we had was a consequence of the organization we had [...] we had to be able to break the monolith technically* (A3). The informant further highlighted that *we realized that we had to create an organization that mirrored the technology we wanted to have*

[…] if we are to have independent modules, we must similarly have independent teams (A3).

Another interviewee recognized that the implications of Conway's Law led to an 'awakening' and the establishment of independent teams owning different parts of the solution (A4). However, it required maintaining a balance between the objectives of the tech and business organizations (A1). The engineering director stated that *it requires that Finn.no must find a balance […] not just look for the latest 'product 4.0', but what the technology must do to keep up* (A1). The architect highlighted it was a critical shift in the leadership approach from being detail-oriented to focusing on larger strategic issues in the organization (A3). This included moving away from micro-managing and over-prioritizing details to concentrating on fewer priorities at a time to ensure efficient delivery (A3).

The establishment of autonomous teams

In the transformation process, the establishment of autonomous teams emerged as a critical success factor, according to all the informants (A1, A2, A3, A4, A5, A6). The tech COO described a significant organizational change: *One of our larger organizational changes was that we said all the teams would be full-stack autonomous and functionally organized. That is, they took ownership of the functionality from top to bottom within a team* (A6). When defining autonomy, most of the interviewees described autonomy as not absolute (since the teams, in the end, is somehow dependent on other teams), but the teams can make their own decisions (including handling daily tasks and responsibilities) and minimum interactions with other teams (A1, A3, A5, A6).

According to all interviewees, this shift resulted in increased efficiency, ownership, and speed in decision-making and release of new codes (A1, A2, A3, A4, A5, A6). The tech COO explained this: *The fact that the teams are autonomous means that they also have ownership of the running solution that is out in production – this ownership, among other things, results in much higher quality and less downtime on our solution* (A6). However, A1 and A4 emphasized that for such transformation to succeed, clear communication and alignment of objectives across teams are essential.

All the participants commented that Finn.no took inspiration from the concept 'Team Topologies', where this concept describes different team types with autonomy that work in different ways (A1, A2, A3, A4, A5, A6). In Finn.no, they realized that they had all the different team types in the organization, but they needed to adapt them to how it suited them (A3).

Culture of learning

A central theme among the interviewees was adopting a learning culture within the organization to change and continually improve the organization to face future challenges (A1, A2, A3, A4, A5, A6). All the participants commented that the organization embraced a culture that learns from failure (A1, A2, A3, A4, A5, A6). The chief architect discussed the importance of learning from failure, with post-mortem analyses and iterative improvements becoming a norm, leading to constant improvement and innovation (A2). The engineering director also mentioned this and stated that *we have changed many times. We have, as a 'hobby', to reorganize ourselves [...] It is about being a company that follows the lean principle, meaning continuous improvement* (A1).

The IT developer discussed how the level of autonomy and psychological safety impacted their culture of learning (A5). *We, for example, do not have an extremely strict recipe for how teams self-organize (autonomous teams), but we have some guidelines on what we want to achieve* (A5). The engineering director also mentioned this and elaborated that this gives teams the flexibility to adapt and learn in ways that best suit their working style, reinforcing the 'lean principles' (A1). The engineering manager mentioned that the culture of learning in Finn.no, which is characterized by embracing failures, continuous improvements, team autonomy, and a penchant for testing and experimentation, was seen as significant in the successful transformation (A4).

Proof of concept

The organization saw early successes, which aided the transformation process (A2). One of the informants commented that *when you start to understand what you are trying to achieve, people become more willing, so there was a lot of information work in the beginning* (A1). Another respondent highlighted that *we succeeded in reaping benefits early on. 'Finn-reise' was built a bit on the side of*

the others and was not as difficult to modularize and being able to see that 'finn-reise' maintained a higher development pace than the rest of the organization (A3). In addition, there were ambitious people in the organization who set themselves the goal of reducing the time to put out new releases (A3).

Table 4:

Summary of CSFs in Company A

Critical Success Factors	**Stated by**
Inclusive leadership and top-down support	A1, A2, A3, A4, A5, A6
Trust and open communication	A1, A2, A3, A4, A5, A6
Shifting from a monolithic technology to a modular and team-based structure	A1, A2, A3, A4, A5, A6
Organizational change and restructuring	A1, A2, A3, A4, A5, A6
The establishment of autonomous teams	A1, A2, A3, A4, A5, A6
Culture of learning	A1, A2, A3, A4, A5, A6
Proof of concept	A1, A2, A3, A4, A5, A6

4.2 Case B – Statnett

4.2.1 Challenges

Technological transition and legacy systems

All the informants voiced concern regarding the limitations of a monolithic architecture (B1, B2, B3, B4, B5, B6). Monolithic architecture means that you are unable to divide the system into smaller modules that can evolve independently of the rest of the solution (B4). For example, the systems architect said: *if one part of the system requires frequent updates, such as weekly, but another part can only be updated quarterly, the overall system can only be updated quarterly. This restricts the possibility of independently deploying business-prioritized changes without being affected by the rest of the system* (B3). Monolithic architecture prevents the

ability to introduce frequent changes to parts of the system, slowing down the entire delivery process.

Time to business (need for dramatic improvement)

All the informants expressed several challenges related to the business delivery time in their operations (B1, B2, B3, B4, B5, B6). One informant said: *[...] we need to deliver more frequently to the business. This indicates that current delivery timelines may not meet the business's rapidly changing needs and expectations* (B4). The chief architect also raised concerns about the rate of change in recent years, particularly with the growing emphasis on renewable energy sources, where the informant said: *External factors like the shift to greener solutions are setting the pace, and the traditional ways of working cannot keep up [...] Given this accelerated pace of change, a project might even become outdated by the time it is completed* (B1). This means that the backlog of change requests from the business side grows continuously, and the delivery pipeline is unable to deliver at the same pace (B3). Again, this complicates the process of prioritizing between change requests and identifying dependencies in time for implementing the ones prioritized (B3). Thus, this creates a spiral of gradually more complex coordination needs, especially when something unprecedented happens and makes it to the highest priority (B3).

The supplier

All the interviewees discussed an important issue related to software delivery schedules (B1, B2, B3, B4, B5, B6). The systems architect stated *the current process with our supplier involves the release of a new version every four weeks, but this version typically contains errors, which prevents it from being deployed into production. Consequently, production can only be updated four times a year - a process that lacks agility* (B3). Several of the informants also support this and mention how the suppliers are not meeting their needs (B1, B2, B3, B4, B5, B6). Another of the informants commented that *the deliveries' inadequacies necessitate a shift in the current work methodologies and system solutions* (B2). This highlights a critical need to reassess relationships with suppliers and potentially explore alternative solutions to better meet the organization's needs (B2).

<u>Leadership and top-down support</u>

All the informants mentioned that within their organization, there was a lack of clarity between the 'product-centric delivery' and project-centric (B1, B2, B3, B4, B5, B6). 'Product-centric delivery' is characterized by *continuously working to ensure that the product delivers benefits and meets the user's expectations* (B3). When leadership is introduced to the concept of 'product as a delivery form', their initial response is often about control and responsibility rather than focusing on how it could enhance the organization's performance (B1, B3, B5, B6). B3 believes the biggest challenge lies in getting leadership to accept a shift from micro-management to guiding and trusting teams to do the right things. *This requires a need for a transformation in the leadership approach, focusing more on setting overarching principles and less on micromanagement* (B3).

Informant B5 explains this by addressing the need for a significant culture shift. *In the new fast-paced and agile environment, leaders are required to work differently and delegate responsibilities. This is a profound shift from traditional practices where leaders are used to making all the decisions. Trust and the evolution of leadership roles are central to this shift* (B5). Informant B6 also mentioned this, where the informant emphasized that a leader's willingness to listen is closely linked with trust (B3). *An environment should be created where team members feel confident enough to express their ideas and thoughts, further underlining the need to change leadership styles and foster a culture of openness* (B6).

Another informant also commented that Statnett, a bureaucratic, hierarchical organization and engineering-heavy company, is deeply ingrained with a project model fitting for physical construction (B5). However, when it comes to agile methodologies, rapid adjustments, and closer collaboration with developers for mutual understanding, it proves beneficial in the organization (B5). The program manager elaborated that *half of the initiatives in our portfolio are resolved using a product delivery form, but there is no top-down endorsement of this method within Statnett* (B5).

In addition, several informants discussed the significant challenge of getting leadership support for these changes. They stressed that trust is essential, and

trialing a new method without certainty of its success could have severe consequences and risks. Some respondents mentioned that their management trusts external suppliers more than their own professionals (BI, B3). Thus, it is challenging to get support from the top management (B1, B3).

Organizational change and restructuring

Informants B1, B3, B5, and B6 stressed the importance of adaptability to constantly shifting goals in their rapidly evolving sector. For example, B3 said: *we are used to working in a world where the scope and premises are firmly defined and do not change along the way. While the challenge going forward in the power grid is that goals and assumptions will change all the time. For example, the premise is that we should invest in offshore wind according to a long-term market analysis from Statnett, but when we reach 2040 we may have ended up with nuclear power. It will require completely different IT solutions, processes and organization than if the premises do not change*. Another one of the respondents supported this and explained that 'traditional project management', focused on predictable outcomes, struggles to remain suitable in the volatile and innovative world of software development (B1). The systems architect explained that *software creation's adaptive and dynamic nature challenges the predefined scope, schedule, and cost model, suggesting a need for more flexible approaches* (B3). In addition, as the world changes dynamically, so must the project goals, a concept that does not align with traditional project methodology (B1, B3, B5, B6).

Further, informant B5 emphasized the need for a holistic understanding of business and IT: *We have to come to a common understanding that it is not about business or IT, but that if we are actually going to supply light in the lamp, we need those who know electricity and those who are good at digital technology - we supply balancing. It's a huge change of mind* (B5). Lastly, B3 pointed out that architecture and major changes often get deprioritized, where the informant said: *Unfortunately, when it comes to IT architecture and major changes, it often ends up further back in the queue than the immediate needs* (B3).

The establishment of autonomous teams

Informant B5 highlighted the challenges of establishing autonomous teams, particularly in gathering leadership support. The program manager explained:

When leaders are introduced to the concept of product delivery, their first concern is often about how to maintain control and responsibility rather than considering how it could improve the organization (B5). Informants B1, B2, B3, and B6 had the same opinion. Further, the Program Manager emphasized that it is important to understand that teams cannot operate autonomously without their leaders providing close guidance and direction (B5). In addition, the informant said: *belief in the process and previous experience are crucial. This implies that leaders may need to make uncomfortable decisions and accept certain compromises in the journey toward establishing autonomous teams* (B5). In addition, while agile work methodology, quick adjustments, and close cooperation with developers are beneficial, this approach is yet to be fully embraced at the top levels of their organization (B5).

Table 5:

Summary of challenges in Company B

Challenges	**Stated by**
Technological transition and legacy systems	B1, B2, B3, B4, B5, B6
Supplier	B1, B2, B3, B4, B5, B6
Organizational change and restructuring	B1, B3, B4, B5, B6
The establishment of autonomous teams	B1, B2, B3, B5, B6
Leadership and top-down support	B1, B2, B3, B4, B5, B6
Time to business is too long (need for dramatic improvement)	B1, B2, B3, B4, B5, B6

4.2.2 Critical success factors

Leadership and top-down support

The importance of leadership and top-down support emerged as major critical success factors among most of the interviewees (B1, B3, B5, B6). Interviewee B3 argued that a crucial success factor was the willingness of top management to

embrace the risks associated with long-term strategies, despite their inherent uncertainty and the difficulty of quantifying their benefits. The systems architect stated that *it is essential for top leadership to focus on daily operations and dedicate resources and commitment to being visionary and setting a direction. If not, improvement will never occur, and one will continue on the same path* (B3).

Another critical success factor, stated by the program manager, was the necessity for leaders to be intimately involved with their teams (B5). The informant further explained that without close contact, hierarchical organizations risk distancing themselves from the concept of autonomous teams (B5). Another one of the informants emphasized the importance of understanding that each team operates independently and has minimum coordination with other teams (B6). The program manager was aligned with this and mentioned that *the goal should be to enable the team to work as efficiently as possible* (B5). Consequently, one of the biggest changes necessary is a shift from hierarchical structures to a network mentality (B5). The informant further explained *I believe that is the most painful change is figuring out who is in charge and responsible* (B5). Further, the informant commented that the traditional leadership model, where the leader makes all the decisions, needs to change (B5). Another informant discussed how the modern work environment demands a quicker, more flexible approach, and leaders must learn to delegate responsibility (B6). This constitutes a considerable cultural shift and involves a recalibration of the leader's role (B6).

The establishment of autonomous teams

Another critical success factor that was addressed by all the informants was to establish autonomous teams (B1, B2, B3, B4, B5, B6). The chief architect stated: *the teams must be dynamic, where you can change the composition and size along the way* (B1). The systems architect discussed that for a team to effectively exercise its responsibility, it must have the authority to decide how a product should be made, what it should look like, and how it should evolve over time (B3).

Additionally, the respondent mentioned on inter-team communication, suggesting that teams should have a minimum need for coordination to avoid cognitive overload (B3). A well-defined product or service scope, presented clearly to other

teams, creates a mutual understanding of what is expected (B3). The informant mentioned that these products or services work as a contract between teams and can significantly reduce the need for coordination, such as meetings and emails (B3). Similarly, another informant highlighted the importance of teams understanding their purpose, targets, benefits, and results within the bigger picture (B6). An autonomous team should know what and how it aims to achieve (B6). Thus, the leader is responsible for ensuring that the team knows what they should deliver and then leaves it to the team to figure out how to accomplish it. (B6)

Trust

Several of the participants discussed how important trust is between the top management and the employees, and they explained that this is also an important part of establishing autonomous teams and being able to initiate the transformation (B1, B2, B3, B5, B6). The program manager highlighted that *the leader must trust the team […] Trust is earned and can easily be broken, and if the team doesn't understand this, trust dissipates, and it is natural to tighten the control* (B5). The systems architect pointed out a critical need for a shift in leadership style, saying that *leadership needs to change from centralized control of approval to supervised autonomy* (B3). This implies that leadership should set a direction and trust their teams to follow it (B3). The program manager and the senior advisor both supported this and commented that trust, being fragile, cannot be taken for granted, especially when testing new methods with potentially significant risks (B5, B6). According to the program manager, a leader's role is not to step back entirely but to remain closely connected with their teams, providing guidance and ensuring that teams understand what is needed to deliver (B5).

Shifting from a monolithic technology to a modular and team-based structure

All the participants highlighted the critical need to shift from a monolithic technology and hierarchical organization to a more modular and team-based approach (B1, B2, B3, B4, B5, B6). According to informants B1, B2, B3, and B4, there were two separate IT systems and organizations in the past. These two units functioned as isolated silos, but now the barriers between them are breaking down, leading to a more cross-functional approach with value chains operating horizontally (B3). The informant explained that to shift to a modular-based

technological structure the people working on the incremental deliveries need to form an autonomous team, where the team is focused on the product that they are delivering (B3). The chief architect explained that one of the advantages of this structure is that it allows for independent work without the need to coordinate extensively with others (B1). Further, this enables more frequent production deployment (possibly daily or weekly) (B3).

Organizational change and restructuring

Several of the interviewees highlighted the importance to shift from a project-based to product-centric approach, emphasizing the importance of agility over rigid planning. The systems architect stated Dwight D. Eisenhower's phrase: *Plans are nothing. Planning is everything* (B3). According to the informant, this means that reality often deviates from the initial plans, necessitating a continuous re-planning process (B3). Therefore, it is critical that the organization is able to change rapidly in line with the unpredictable surroundings (B3).

The systems engineer manager highlighted the limitations of the project model compared to the product model (B4). The systems architect explained that making dramatic changes in a project model is rare, and the mandate is hardly ever altered (B3). On the other hand, a product team can gradually adjust as they are responsible for the effect rather than the project's objective (B3). The program manager mentioned the strength of the 'Team Topologies' thinking within Agile methods (B5). The respondent also acknowledged the challenges of implementing these ideas within a bureaucratic and hierarchical organization, which often is more inclined to deliver projects (B5). The interviewees highlighted that a critical success factor is to change the organization and restructure to be able to overcome the challenges (B1, B2, B3, B4, B5, B6). This means moving from a hierarchical structure to a modular and team-based structure (B5).

Organizational alignment

Some of the informants mentioned a significant need for shared understanding within Statnett about the product-centric delivery model (B3, B5, B6). The program manager stated that *there is a different understanding in Statnett [...] one must understand what a product-centric delivery model is. If the leader does not understand it, then you will not get anywhere* (B5). This highlights the need for

leaders, particularly those not from the IT side, to grasp this concept for meaningful progress (B5).

One of the respondents discussed that it is not just about business or IT but about combining expertise in electrical power with digital technology to effectively deliver their services (B5). The informant stated: *we deliver balancing (the process of balancing power production vs power consumption in realtime). It's a huge paradigm shift* (B5). Another informant explained that the various departments, groups, and individuals within Statnett need to work towards the same goals, with the same understanding of what those goals are and the means to achieve them (B6).

Proof of concept

Some interviewees commented on the necessity of a phase dedicated to experimentation to induce a new mindset within the organization (B3, B5, B6). The systems architect stated: *We need to reach a phase where we can experiment more. Deliver expected value early. This can force a new mindset, where we dare to experiment and have social security to think differently and accept the unknown* (B3). Another informant supported this and underlined the importance of demonstrating success and tangible value (B6). The informants further argued that the impact of a successful demonstration diminishes over time, thus needing to be showcased quickly in the initiating phase (B3, B5, B6). One informant stated: *It will be important going forward to show that it works and adds value* (B5). However, the informant further argued that *if we can't keep up along the way because we get too busy or lose focus and take a hit, then we go back to the start* (B5). Thus, any significant setback could lead to a reset, emphasizing the 'proof of concept' (B5).

New form of contract with the supplier

All the informants emphasized the need for a new form of contract with the supplier, moving away from the traditional waterfall contract model, which involves a long negotiation phase (B1, B2, B3, B4, B5, B6). Instead, some of the informants advocate for a model where the supplier allocates resources to them, which would serve as a principle to start working agile (B1, B2, B3, B4). According to the systems architect, this approach allows them to streamline the

entire development process, thereby fostering closer cooperation between the supplier with their expert, an IT developer, and the Statnett expert at the National Control Center (B3). The informant explains: *this enables them to start delivering incrementally, accelerating production rollout, and making it easier to correct errors.* Therefore, insisting on a fixed-price contract with a standard product would be a mistake (B3). Instead, they argued for full flexibility and agility in organization and processes, the ability to scale up multiple teams, and the necessity of dividing the IT solution into small modules that can be independently modified by different teams but still function as a whole (B1, B3, B5).

Table 6:

Summary of CSFs in Company B

Critical Success Factors	**Stated by**
Inclusive leadership and top-down support	B1, B3, B5, B6
The establishment of autonomous teams	B1, B3, B5, B6
Trust and open communication	B1, B2, B3, B5, B6
Shifting from a monolithic technology and organization to a modular and team-based structure	B1, B2, B3, B4, B5, B6
Organizational change and restructuring	B1, B2, B3, B4, B5, B6
Organizational alignment	B3, B5, B6
Proof of concept	B3, B5, B6
New form of contract with the supplier	B1, B2, B3, B4, B5, B6

4.3 Key findings through a cross-case comparison

4.3.1 Challenges across companies

Table 7 shows the most prominent challenges for each company.

Table 7:

The presence of the most prominent challenges in each company

Challenges	Case A	Case B
Leadership and top-down support		●
Leadership	●	
The establishment of autonomous teams	●	●
Technological transition and legacy systems	●	●
Organizational change and restructuring	●	●
Prioritization	●	
The supplier		●
Time to business is too long	●	●

Leadership

Leadership was stated as a challenge in both companies (A1-3, B1-6), but in company B the top-down support was also mentioned as a challenge when it came to leadership.

The establishment of autonomous teams

This was stated as a challenge in both companies (A1-4, A6, B1-3, B5-6). However, in company A, the challenge was frustration among teams, but in company B it was particularly in gathering leadership support to give autonomy to the teams. In both companies, the interviewees had different interpretations of what it means to have an autonomous team.

Technological transition and legacy systems

This was stated in both companies as one of the biggest challenges (A1-6, B1-6). Both companies struggled with monolithic architecture and old systems where the monolithic architecture made them unable to divide the system into smaller modules, which slowed down the entire delivery process.

Organizational change and restructuring

This was stated in both companies A and B (A1-4, B1, B3-6). In Company A, they mentioned some resistance because some were unfamiliar with the new concept. In Company B, they focused on the challenge to quickly adapt as the world changes dynamically and go from project-centric to a product-centric delivery model approach.

Time to business is too long

This was stated in both companies A and B (A1-6, B1-6), where this issue was mainly because of the legacy system and how they were organized.

4.3.2 Critical success factors across companies

Table 8 shows the most prominent critical success factors for each company.

Table 8:

The presence of the most prominent CSFs in each company

CFS	Case A	Case B
Inclusive leadership and top-down support	●	●
The establishment of autonomous teams	●	●
Trust and open communication	●	●
From a monolithic architecture to a modular and team-based structure	●	●
Organizational change and restructuring	●	●
Organizational alignment		●
Proof of concept	●	●
New form of contract with the supplier		●

Culture of learning	●	

Inclusive leadership and top-down support

Both companies stated it was critical to have inclusive leadership to successfully change (A1-6, B1-6). Company A already had a very supportive top management, but in Company B, the organization was more hierarchical, where top-down support was a critical success factor in the initial phase of the transformation.

The establishment of autonomous teams

This CFS was stated in both companies (A1-6, B1, B3, B5-6), where the teams are dynamic, and it is critical that it is clear communication and alignment of objectives across teams.

Trust and open communication

This was stated as a CSF in both companies to ensure autonomy in the teams and inclusive leadership with top management support (A1-6, B1-3, B5.6).

From a monolithic architecture to a modular and team-based structure

This was identified as a CSF in both companies for delivering promptly to the business and adapting to future changes (A1-6, B1-6).

Organizational change and restructuring

This CFS was stated in both companies with the critical shift from a project-centric approach to a product-centric delivery model, where they discussed how the technology that a company creates is shaped by the organization that is responsible for its development, following the 'principle of Conway's Law' (A1-6, B1-6).

Proof of concept

Both companies stated this as a CSF (A1-6, B3, B5-6).

5.0 Discussion

This chapter combines the theory from Chapter 2.0 with the empirical findings from the interviews to address the research question. The case analysis revealed leadership, creating autonomous teams, legacy systems, time to business, and organizational change as common challenges. Inclusive leadership, autonomous teams, trust, a team-based structure, organizational change, and proof of concept were seen as key success factors in both companies. This chapter is divided into sections, where this structure focuses on the key themes: the impact of agile adoption, the technological and organizational changes, and the influence of leadership and support in driving change.

Adoption of agile methodologies

Results from the study show that both companies agreed that it took too long for changes to happen in their business. For example, both companies could only make big changes a few times annually. This was mainly because of the monolithic architecture and how they had structured their organization and processes. In addition, both companies mentioned some challenges with their project-centric approach, where one of the critical success factors was to shift to a product-centric delivery model. With the project-centric approach, this meant a lot of time was spent on administrative work before they could start working on solutions. Simply using an agile process didn't help much if the system was not built for it.

Both companies also recognize the lack of understanding of the dependencies linked to the changes as one of the key reasons for the low progress rate. As mentioned in the introduction, the rapidly and ever-changing environment in today's world means that there is a continuous and accelerating evolution in the surroundings, and organizations need to be agile in order to keep up with these changes (Aghina et al., 2018). Thus, this can make project management difficult. Projects now must work with complex organizational structures and respond quickly to changes (Salameh, 2014). A study by Salameh (2014) supports this. The study compared agile project management with traditional methods and found that the agile approach leads to better productivity, higher quality, quicker decisions, lower costs, and faster time to market in Company A. This is because it encourages frequent interactions with customers and fast delivery cycles. This

aligns with the need to shift from a project-oriented approach to a product-centric delivery model, a common view across companies A and B.

Technological and organizational change

Across cases A and B, findings show how the software architecture structure that a company develops mirrors the communication structure within the organization. This is also aligned with Conway's Law (1968), which states that the system design reflects the organization that designs it (Skelton & Pais, 2019). Both organizations saw the need to introduce agile and break the monolithic structure into smaller, independent modules, even though it was a painful and time-consuming process that took several years in Finn.no.

The findings show that the two companies differed slightly when it came to organizational change. In Company B, there was a tendency to maintain the status quo in both mindset and ways of working, and some interviewees mentioned it was resistance to trying new work methods. In contrast, in Company A, the data shows that some employees were skeptical and lacked understanding of the new approach. However, findings show that both companies highlighted that focusing on becoming a self-improvement and learning organization at all levels was critical. Company B had a hierarchical organizational structure, whereas Company A had a much flatter structure with informal communication lines. This may indicate why it was somehow easier to implement changes in company A contra company B. Dikert et al. (2016) discuss the organization's structure and agile methodologies as closely connected and where the organizational structure can really make a difference to how well the agile methods work. They further argue that for organizations with agile-inspired structures before a transformation, they found it the transformation to be less challenging (Dikert et al., 2016).

Another research that supports this finding argues that in a classic top-down hierarchic organization, the power to make decisions and responsibility mostly rests with the top management, leaving little space for contributions or responses from the employees further down in the organization (Sochova, 2020). The findings in this thesis indicates that flatter organizational structure can promote a more transparent communication and faster decision-making.

Furthermore, the findings indicate that the need for organizational change began in response to a demand for greater agility and efficiency in the face of rapidly changing market conditions and technological advancements. A legacy technology infrastructure and organizational structure hindered both companies' ability to react rapidly to support future needs. Thus, the transformation was a response to both internal and external challenges. The Burke-Litwin Model specifies a range of factors affecting performance and change (Burke & Litwin, 1992). The model suggests that these factors are interconnected, influencing each other and that changes in certain factors will have a greater impact on the organization than changes in others (Burke & Litwin, 1992). Results from the study show that it was critical for both companies to change their organization's structure to accomplish digital transformation. Burke and Litwin's model (1992) support this, where Burke and Litwin (1992) argue that the organizational structure is a 'transactional factor', which means it is an element of an organization that can easily be changed. However, the model highlights that this factor is important, but it is more likely to be a temporary change if the 'transformational factors' (such as leadership, culture, and mission) do not support the change. This is aligned with Bilgeri et al. (2017) which propose a holistic approach to accomplish a digital transformation, including factors like culture, organizational structure, and strategy.

Another finding that cut across both companies was the proof of concept, where both organizations describe it as critical to show early success to gain trust from both top management and skeptical employees. According to John Kotter's Eight-Step model, an organization needs to create short-term wins to accomplish a transformation. Kotter explains that one of the pitfalls why a transformation fail is that "without short-term wins, too many people give up or actively join the ranks of those people who have been resisting change" (Kotter, 1996).

Inclusive leadership and top-down support
A critical finding from our research was the important role of inclusive leadership and top management's support in effecting organizational change. Both at the strategic and operational levels, leadership commitment, proved vital to the transformation process. Leaders setting clear directions and priorities and participating actively in the decision-making process were deemed essential in the

case analysis. This reflects the consensus that any transformational efforts demand complete support from the top management (Bourke & Titus, 2020). Moreover, the findings indicate that the quality and leadership style were significant influencers of the change process, either pushed forward or held back digital transformation in the companies studied. This corresponds to the Burke-Litwin Model (1992), which asserts leadership as a transformative factor and a primary driver for change.

In addition, open communication and trust were also notable aspects that emerged from the study. According to Burke-Litwin's model, this relates to the 'work unit climate' and 'individual and organizational performance'. Further, this shows how these factors influenced digital transformation on how the absence of top management support can affect transformational and transactional factors and subsequently lead to organizational change (Burke & Litwin, 1992).

The data also revealed that in both companies, the change initiatives in the examined cases were more bottom-up, deviating from Kotter's eight-step model, which is traditionally top-led (Kotter, 1996). This discovery suggests that engagement at multiple organizational levels is necessary for implementing organizational change, highlighting a potential need for more research on managing transformations when initiatives originate from lower-level employees.

Further reinforcing the value of inclusive leadership, research by Bourke and Titus (2020) demonstrated that leaders' words and actions contribute up to 70% to whether an individual feels included. Inclusive leadership practices foster a climate where employees feel encouraged to speak up, collaborate, and go the extra mile, all of which uplift overall organizational performance (Bourke & Titus, 2020). Key traits of inclusive leaders include promoting effective collaboration, ensuring diversity of thinking, and psychological safety.

As Kotter (2007) explains, for any transformation to be successful, around 75% of a company's management should firmly believe that the status quo is unacceptable. Kotter explained "When is the urgency rate high enough? From what I have seen, the answer is when about 75% of a company's management is honestly convinced that business as usual is totally unacceptable. Anything less

can produce very serious problems later on in the process" (Kotter, 2007, p.6). The journey to create this sense of urgency often involves penetrating multiple leadership layers, each requiring significant effort to be heard, seen, and understood. This is a challenging feat but one that is critical to leadership's acknowledgement and reaction to change.

<u>Autonomous teams</u>

The findings from the case analysis show the importance of combining technology and human resources to successfully change and transform. This aligns with the Team Topologies concept (Skelton & Pais, 2019), which argues that the organization's structure greatly influences how its software systems are designed and communicated. Both companies realized that this could significantly change how teams are structured, leading to improved communication and collaboration. The goal should be to have the systems reflect the broader needs and objectives of the organization (Skelton & Pais, 2019). This is something company A described as an awaking for the management in the organization, where they realized they already were organizing the different types of teams in line with the concept of Team Topologies. The findings highlight that breaking the organization into autonomous teams with clear goals and defined limits led to quicker decision-making and a greater sense of ownership, reducing the need for coordination. However, the findings also revealed that such a structure faced challenges with older IT systems, which were often not flexible enough to support new business models or ideas. If teams are to work independently, they must be allowed to operate freely.

Despite the clear benefits of autonomous teams, getting the necessary support from leadership was a challenge in company B. Leaders often worried about losing control and responsibility when introducing product delivery rather than considering how it could improve the organization. If teams are to operate autonomously, their leaders needed to trust the team and guide them closely (Moe & Stray, 2020). Also, leadership should have faith in the process and be open to making tough decisions and compromises to establish autonomous teams. Embracing an agile work methodology, quick adjustments and close cooperation with developers is yet to be fully accepted at the top levels of the organization. According to Edmondson (2018) it is crucial to create a psychologically safe

environment where it is okay to make mistakes and experiment. The more global and complex companies become, the more their work will be team-based (Edmondson, 2018). This means more communication and trust between team members are required. The findings support this and reveal that this was a common critical success factor among both companies, where they argued that trust and open communication had a critical impact on establishing autonomous teams where the teams own the functionality from top to bottom. The shift to autonomous teams increased efficiency, ownership, and faster decision-making and decreased the time to business. However, the findings show that for such a transformation to succeed, clear communication and alignment of objectives across teams are essential.

6.0 Implications, Limitations, Future Research, and Conclusion

The final chapter reveals the study's practical and theoretical implications. It acknowledges the study's limitations and suggests potential directions for future research. Finally, the chapter concludes by providing comprehensive answers to the research questions outlined in this thesis.

6.1 Practical and theoretical implications

This study has contributed to this field of research by identifying that theory and research often have a lot of focus on how managers should get the rest of the organization involved in a transformation process, for example, the well-known change model by Kotter (1996), which focuses on leadership and change as linear steps. This study shows the opposite, the importance of inclusive and receptive leadership that supports the employees. In addition, the study shows that change is often non-linear and can be chaotic. As such, Kotter's model may not work well in changes that require flexibility and rapid adjustments.

This study contributes significantly by highlighting the common challenges and critical success factors identified in the initial phase of the digital transformation of both companies A and B. Data revealed that leadership, the establishment of autonomous teams, legacy systems, organizational change, and time to business were common challenges but differed slightly probably due to specific nuances within each case, for example different culture, leaders, and organizational structure. Our findings show that inclusive leadership and top-down support, the establishment of autonomous teams, fostering of trust and open communication, the transition to a modular, team-based structure, organizational change, and proof of concept emerged as critical success factors. Regardless of the distinct organizational structures of the two entities, these factors maintained their significance.

Data revealed that while the challenges differed slightly, the solutions tended to align. For instance, top-down support was a notable challenge in Company B, while it was a well-established mechanism in company A. Similarly, while Company A faced the challenge of team frustration, Company B was grappling to gather leadership support for team autonomy. However, establishing autonomous

teams was a common critical success factor in both cases. These findings underscore the complex and nuanced interplay of challenges and success factors in digital transformation initiatives.

This study has contributed to highlighting the importance of leadership in a transformation. Company B can learn from Company A's transformation journey, which emphasizes the need for management to support the transformation, understand the issues at hand, and be 'sponsors' of the transformation. In addition, the study illuminates the significance of organizing autonomous teams for streamlining and achieving fast flow. The study also reveals that it's important to continuously evaluate whether the team composition is appropriate or needs to be adapted/changed along the way. Moreover, it highlights common challenges faced by both organizations, such as difficulties with a monolithic IT architecture that they found to hinder developing rapidly enough for the market. It also indicates a relationship between technology and organization to achieve fast flow.

6.2 Limitations and future research

The study focuses on the IT departments of two organizations in Norway: one in the energy domain sector and the other in the online marketplace. It included semi-structured interviews with 12 informants and supplementary data, such as internal documents. The relatively small yet consistent sample size enhances the credibility of the findings. However, the study may be biased towards positive views, as the participants were closely involved with the transformation. Also, the selection of informants may lean towards those eager to participate, possibly excluding contrasting perspectives from less involved members. This selection bias could impact the study's findings, as it might not represent the entire population.

Moreover, the research was conducted within a limited timeframe and was constrained by resource restrictions. Thus, it may have affected the depth of data collected and the comprehensiveness of the analysis. Furthermore, the exclusive focus on Norwegian organizations may restrict the applicability of the findings to other geographical regions. Methodological constraints also exist, as the study relied on semi-structured interviews and secondary data, which could introduce

potential biases or inaccuracies. The dependency of these data collection methods on the participants' subjective perspectives and the accuracy of existing data could influence the reliability of the results.

Future research should investigate other companies operating within different sectors to generalize the findings. Future research should also include a larger sample and keep in mind to include participants with different views and backgrounds. This study has also identified a few results that could benefit further research. In particular, how organizational structures impact the agility of the organization and the effect of leadership support in the initiation phase of a transformation. Another potential area for future research could be exploring how digital transformation is achieved when lower-level employees lack support from top management and how this affects organizational change.

6.3 Conclusion

Through a multiple-case study, this thesis has investigated two organizations' IT departments in the initiation phase of a digital transformation. The study has investigated the research question: How to transform large organizations from a legacy way of organizing and working to be agile and centered around autonomous teams.

The study looked closely at the initial phase of a digital transformation of two companies - A and B. Data revealed some challenges that differed slightly, where company A highlighted team frustration and establishing priorities, whereas company B had challenges with their supplier and top-down support. The study also shows some differences in critical success factors where company A mentioned it was critical to have a culture of learning to continually improve their organization, whereas company B highlighted it was critical to get a new form of contract with their supplier to get full flexibility and agility in the organization.

However, both companies faced similar challenges like issues with leadership, difficulties in forming autonomous teams, challenges with legacy IT systems, changes within the organization, and a too long time to business due to these issues. Despite these challenges, common critical success factors emerged, including inclusive leadership, the establishment of autonomous teams, trust and

open communication, transition to a modular structure, organizational change, and proof of concept. These findings emphasize that while digital transformation may present diverse challenges based on unique organizational structures and cultures, the critical factors for success largely resonate across different companies. This highlights the potential of these critical success factors to guide future digital transformation initiatives, regardless of specific organizational challenges.

References

50Hertz. (2023). *MCCS NEXTGEN: Market Sounding SCAD/EMS - White Paper: Detailed evaluation and key learnings*. https://www.50hertz.com/xspProxy/api/staticfiles/50hertz-client/dokumente/netz/mccsng_me_white_paper.pdf

Andersen, E. S., Grude, K. V., & Haug, T. (2016). *Målrettet prosjektstyring* (7th ed.). NKI.

Agile Alliance. (2015, June 29). *What is Agile Software Development?*. https://www.agilealliance.org/agile101/

Agile Manifesto. (2001). *Manifesto for Agile Software Development*. https://agilemanifesto.org/

Aghina, W., Ahlback, K., De Smet, A., Lackey, G., Lurie, M., Murarka, M., & Handscomb, C. (2018, January 22). *The five trademarks of agile organizations*. McKinsey. https://www.mckinsey.com/capabilities/people-and-organizational-performance/our-insights/the-five-trademarks-of-agile-organizations

Armenakis, A. A., Harris, S. G., & Mossholder, K. W. (1993). Creating Readiness for Organizational Change. *Human Relations*, 46(6), 681–703. https://doi.org/10.1177/001872679304600601

Ashkenas, R. (2015, January 15). We Still Don't Know the Difference Between Change and Transformation. *Harvard Business Review*. https://hbr.org/2015/01/we-still-dont-know-the-difference-between-change-and-transformation

Bailey, A., Bhalla, V., Strack, R., Dosik, D., & Oh, J. (2019, September 16). *Organizing for the Future with Tech, Talent, and Purpose*. BCG Global. https://www.bcg.com/publications/2019/organizing-future-tech-talent-purpose

Berntzen, M., Hoda, R., Moe, N. B., & Stray, V. (2023). A Taxonomy of Inter-Team Coordination Mechanisms in Large-Scale Agile. *IEEE Transactions on Software Engineering*, 49(2), 699–718. https://doi.org/10.1109/TSE.2022.3160873

Bilgeri, D., Wortmann, F., & Fleisch, E. (2017). How Digital Transformation Affects Large Manufacturing Companies' Organization. In *ICIS 2017 Proceedings* (pp. 1–9).

Bourke, J., & Titus, A. (2020, March 6). The Key to Inclusive Leadership. *Harvard Business Review*. https://hbr.org/2020/03/the-key-to-inclusive-leadership

Bryman, A., & Bell, E. (2015). *Business Research Methods* (4 ed.). Oxford: Oxford University Press.

Burke, W. W., & Litwin, G. H. (1992). A Causal Model of Organizational Performance and Change. *Journal of Management*, *18*(3), 523–545. https://doi.org/10.1177/014920639201800306

Clark, T. R. (2022, February 21). Agile Doesn't Work Without Psychological Safety. *Harvard Business Review*. https://hbr.org/2022/02/agile-doesnt-work-without-psychological-safety

Conway, M. E. (1968). *How Do Committees Invent?*. Datamation. https://www.melconway.com/Home/pdf/committees.pdf

Crow, G., Wiles, R., Heath, S., & Charles, V. (2006). Research Ethics and Data Quality: The Implications of Informed Consent. *International Journal of Social Research Methodology*, *9*(2), 83–95. https://doi.org/10.1080/13645570600595231

Cummings, T. G., & Worley, C. G. (2014). *Organization development and change*. Cengage Learning.

Deloitte. (n.d.). *Den fjerde industrielle revolusjon er her*. Retrieved February 1, 2023, from https://www2.deloitte.com/no/no/pages/strategy-operations/articles/den-fjerde-industrielle-revolusjon-er-her.html

Diener, E., & Crandall, R. (1978). *Ethics in Social and Behavioral Research*. Chicago Press.

Dikert, K., Paasivaara, M., & Lassenius, C. (2016). Challenges and success factors for large-scale agile transformations: A systematic literature review. *Journal of Systems and Software*, 119, 87–108. https://doi.org/10.1016/j.jss.2016.06.013

Dingsøyr, T., Bjørnson, F. O., Moe, N. B., Rolland, K., & Seim, E. A. (2018). Rethinking coordination in large-scale software development. *Proceedings of the 11th International Workshop on Cooperative and Human Aspects of Software Engineering*, 91–92. https://doi.org/10.1145/3195836.3195850

Edmondson, A. C. (2018). *The fearless organization: Creating psychological safety in the workplace for learning, innovation, and growth*. John Wiley & Sons.

Engler, S. (2020, January 7). *Lack of Skills Threatens Digital Transformation*. Gartner. https://www.gartner.com/smarterwithgartner/lack-of-skills-threatens-digital-transformation

European Commission. (2022). European Climate, Infrastructure and Environment Executive Agency. *Digitalization in urban energy systems: Outlook 2025, 2030 and 2040*. Publications Office. https://data.europa.eu/doi/10.2926/070630

Falkberger, T., & Kjær, I. (2021, March 21.). *Digitalisering og smidig i store organisasjoner med Torbjørn Larsen tidligere CIO i NAV, CTO i Mestergruppen og nå Executive Director i Sopra Steria* (No. 43) [Audio]. https://smidigpodden.no/episode/43-digitalisering-og-smidig-i-store-organisasjoner-med-torbjorn-larsen-tidligere-cio-i-nav-cto-i-mestergruppen-og-na-executive-director-i-sopra-steria/

Fichman, R. G., Dos Santos, B. L., & Zheng, Z. (Eric). (2014). Digital Innovation as a Fundamental and Powerful Concept in the Information Systems Curriculum. *MIS Quarterly*, 38(2), 329–353.

FINN.no. (n.d.). *FINN.no—Om oss*. Retrieved May 29, 2023, from

http://www.finn.no/finn/article/finn_about_us?template=templates/static_templat.j

sp

Forsgren, N., Humble, J., & Kim, G. (2018). *Accelerate: The science behind DevOps:*

building and scaling high performing technology organizations (First edition). IT

Revolution.

Grønmo, S. (2009). Kvalitativ metode. In *Store norske leksikon*.

http://snl.no/kvalitativ_metode

Guest, G., Bunce, A., & Johnson, L. (2006). How Many Interviews Are Enough?: An

Experiment with Data Saturation and Variability. *Field Methods*, 18(1), 59–82.

https://doi.org/10.1177/1525822X05279903

Haffke, I., Kalgovas, B., & Benlian, A. (2016). The Role of the CIO and the CDO in an

Organization's Digital Transformation. In *ICIS 2016 Proceedings* (pp. 1–20).

Halkias, D., Neubert, M., Thurman, P. W., & Harkiolakis, N. (2022). *The Multiple*

Case Study Design. Taylor and Francis. https://doi.org/10.4324/9781003244936

Hartl, E., & Hess, T. (2017). The Role of Cultural Values for Digital Transformation:

Insights from a Delphi Study. In *AMCIS 2017 Proceedings* (pp. 1–10). Retrieved

from http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1369&context=amcis2017

Heilig, L., Schwarze, S., & Voß, S. (2017). An Analysis of Digital Transformation in

the History and Future of Modern Ports. In *HICSS 2017 Proceedings* (pp. 1341–

1350). https://doi.org/10.24251/HICSS.2017.160

Hovland, K. M. (2021, September 30). Statnett vil bruke 60-100 mrd. på kraftnettet:

Venter kraftig økt strømforbruk. *E24*. https://e24.no/i/lVOJdo

Karimi, J., & Walter, Z. (2015). The role of dynamic capabilities in responding to

digital disruption: A factor-based study of the newspaper industry. *Journal of*

Management Information Systems, 32(1), 39–81.

https://doi.org/10.1080/07421222.2015.1029380

Karlsen, J. T. (2017). *Prosjektledelse* (4th ed.). Universitetsforlaget.

Kotter, J. P. (1996). *Leading Change*. Harvard Business School Press, Boston.

Kotter, J. P. (2007). Leading Change: Why Transformation Efforts Fail. *Harvard Business Review*, 73, 59-67.

Kjær, E. (2020, May 11). *Er det agile teamet rigget for suksess?*. Knowit.

https://blogg.knowit.no/insight-no/agile-teamet-rigget-for-suksess

Lincoln, Y.S., & Guba, E.G. (1985). Naturalistic inquiry. Sage.

https://doi.org/10.1016/0147-1767(85)90062-8

Macheridis, N. (2009). 'Agility in Entrepreneurial Projects' Working Paper Series 2009/3, *Lund Institute of Economic Research: School of Economics and Management*, Sweden.

Maxwell, J. A. (2013). *Qualitative Research Design: An Interactive Approach* (3 ed.). Thousand Oaks, CA: Sage Publications.

McKinsey. (2019, July 10). *Why do most transformations fail? A conversation with Harry Robinson*. https://www.mckinsey.com/capabilities/transformation/our-insights/why-do-most-transformations-fail-a-conversation-with-harry-robinson

McKinsey. (2022, August 17). *What is industry 4.0 and the Fourth Industrial Revolution?*. https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-are-industry-4-0-the-fourth-industrial-revolution-and-4ir

Mihailescu, M., & Mihailescu, D. (2017). Understanding Healthcare Digitalization : A Critical Realist Approach. In *ICIS 2017 Proceedings* (pp. 1–12).

Mocker, M., & Fonstad, N. O. (2017). Driving Digitization at Audi. In *ICIS 2017 Proceedings* (pp. 1–15).

Moe, N. B., & Stray, V. (2020). A Decade of Research on Autonomous Agile Teams: A Summary of the Third International Workshop. *SINTEF*.

Mueller, B., & Renken, U. (2017). Helping Employees to be Digital Transformers – the Olympus . connect Case. In *ICIS 2017 Proceedings* (pp. 1–19).

Nwankpa, J. K., & Roumani, Y. (2016). IT Capability and Digital Transformation : A Firm Performance Perspective. In *ICIS 2016 Proceedings* (pp. 1–16).

Osmundsen, K., Iden, J., & Bygstad, B. (2018). Digital transformation: Drivers, success factors, and implications. *MCIS 2018 Proceedings*. 37. https://aisel.aisnet.org/mcis2018/37

Opsal, V. (2022, September 30). *5 mistakes we made transforming to Platform teams in FINN.no - Vilde Opsal - NDC Oslo 2022* [Video]. YouTube. https://www.youtube.com/watch?v=RdLV5yjDB0M

Petrikina, J., Krieger, M., Schirmer, I., Stoeckler, N., Saxe, S., & Baldauf, U. (2017). Improving the readiness for change – Addressing information concerns of internal stakeholders in the smartPORT Hamburg. In *AMCIS 2017 Proceedings* (pp. 1–10).

Pollack, J., & Pollack, R. (2015). Using Kotter's Eight Stage Process to Manage an Organisational Change Program: Presentation and Practice. *Systemic Practice and Action Research*, 28(1), 51–66. https://doi.org/10.1007/s11213-014-9317-0

Project Management Institute. (2017). *Agile practice guide*. Project Management Institute.

Ralph, P., Baltes, S., Bianculli, D., Dittrich, Y., Felderer, M., Feldt, R., ... & Vegas, S. (2020). ACM SIGSOFT empirical standards.

Salameh, H. (2014). What, when, why, and how? A comparison between agile project management and traditional project management methods. *International Journal of Business and Management Review*, 2(5), 52-74.

Shenhar, A. J. (2004). Strategic Project Leadership Toward a strategic approach to project management. *R&d Management*, 34(5), 569-578.

Shuiabi, E., Thomson, V., & Bhuiyan, N. (2005). Entropy as a measure of operational flexibility. *European Journal of Operational Research*, 165(3), 696–707. https://doi.org/10.1016/j.ejor.2004.01.033

Skelton, M., & Pais, M. (2019). *Team topologies: Organizing business and technology teams for fast flow* (First edition). IT Revolution.

Sochova, Z. (2020, April 1). Hierarchy – Agile and Scrum Blog. Agile-Scrum. https://agile-scrum.com/2020/04/01/hierarchy/

Stahl, N. A., & King, J. R. (2020). Understanding and Using Trustworthiness in Qualitative Research. *Journal of Developmental Education*, 44(1).

Statnett. (2022, May 19). *Et fossilfritt energisystem trenger mer effekt*. https://www.statnett.no/om-statnett/nyheter-og-pressemeldinger/nyhetsarkiv-2022/et-fossilfritt-energisystem-trenger-mer-effekt/

Stenberg, I. G. (2022, June 10). Fra agile team til agile organisasjoner i finansbransjen. *Magma*. https://nye.econa.no/faglig-oppdatering/medlemsbladet-magma/4-2022/fra-agile-team-til-agile-organisasjoner-i-finansbransjen/

Stobierski, T. (2020, January 21). Organizational Change Management: What it is & why it is important. *Harvard Business School*. https://online.hbs.edu/blog/post/organizational-change-management

Stokes, P., & Wall, T. (2014). *Research methods*. Palgrave Macmillan.

Stouten, J., Rousseau, D. M. & De Cremer, D. (2018). Successful organizational change: Integrating the management practice and scholarly literatures. *Academy of Management Annals*12(2): 752–788.

Sverdrup, T. (2020, March 22). «Smidige team»: Pass opp for disse vanlige feilene.

    NHH Bulletin. https://www.nhh.no/nhh-bulletin/artikkelarkiv/2022/mars/smidige-

    team-pass-opp-for-disse-vanlige-feilene/

Svorstøl, S.-O. (2020, November 6). Slik reorganiserer vi Capra | Capra Consulting.

    https://www.capraconsulting.no/blogg/slik-reorganiserer-vi-capra

Tongco, C., Dolores, M. (2007). Purposive sampling as a tool for informant selection.

    Ethnobotany Research & Applications.

Yeow, A., Soh, C., & Hansen, R. (2017). Aligning with new digital strategy: A

    dynamic capabilities approach. *Journal of Strategic Information Systems,*

    (September), 0–1. https://doi.org/10.1016/j.jsis.2017.09.001

Yin, R. K. (2018). *Case Study Research: Design and Methods* (5th ed.). Los Angeles,

    California: SAGE.

Walsham, G. (2006). Doing interpretive research. *European Journal of Information*

    Systems, 15(3), 320–330. https://doi.org/10.1057/palgrave.ejis.3000589

Appendix

Appendix 1: Interview guide (in Norwegian)

<u>Company A:</u>

Utfordringer

1. Hvilke utfordringer og problemer så dere fra IT-siden som gjorde at dere så nødvendigheten av å endre måten man jobbet på?
2. Hvordan mener du at man burde vært organisert og jobbet?

Beslutningsprosessen

3. Hvordan var prosessen fra man innså at man hadde et problem som krevde store endringer, til man hadde identifisert hva man skulle gjøre det og tatt beslutning om dette?
4. Hvordan tok man avgjørelsen om hva som skulle gjøres? Var det vanskelig å få forankret dette i ledelsen?
5. Hvor er dere i dag i denne prosessen?
6. Har dere et bevisst forhold til å eksperimentere eller teste ut ulike metoder og hypoteser?

Organisering med autonome team – situasjonen nå vs fremtiden

7. Hvordan var teamorganiseringen før? Hvilke team har dere i dag og hvordan er de organisert i dag?
8. Hvilke endringer i team struktur og endringer ser dere for dere i fremtiden?
9. Hvordan definerer du et autonomt team? Og hva tenker du er de største utfordringene ved oppstart av autonome team?

Erfaring med ny organisasjonsstruktur

10. Hva er erfaringene dere har gjort dere med å jobbe på den nye måten og med ny organisering?
11. Hva ville dere gjort annerledes?

<u>Company B:</u>

Utfordringer

1. Hvilke utfordringer og problemer så dere fra IT-siden som gjorde at dere så nødvendigheten av å endre måten man jobbet på?
2. Hvordan var prosjektet organisert da?

Beslutningsprosessen

3. Hvordan var prosessen fra man innså at man hadde et problem som krevde store endringer, til man hadde identifisert hva man skulle gjøre det og tatt beslutning om dette?
4. Hvordan tok man avgjørelsen om hva som skulle gjøres? Var det vanskelig å få forankret dette i ledelsen?

5. Hvordan fant dere ut i hvilken retning dere måtte gå med organisasjonen og prosessene?
6. Har dere et bevisst forhold til å eksperimentere eller teste ut ulike metoder og hypoteser?

Organisering med autonome team – situasjonen nå vs fremtiden

7. Hvilke team har dere i dag og hvordan er de organisert i dag?
8. Hvilke endringer i team struktur og endringer ser dere for dere i fremtiden?
9. Hvordan definerer du et autonomt team? Og hva tenker du er de største utfordringene ved oppstart av autonome team?