CHALMERS
UNIVERSITY OF TECHNOLOGY

From Strategy to Practice: How Design Managers in Construction Cope with Digital Transformation

Master's Thesis in Design and Construction Project Management

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CHALMERS UNIVERSITY OF TECHNOLOGY

Gothenburg, Sweden 2025
www.chalmers.se

MASTER'S THESIS 2025

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ABSTRACT

Implementing a digital tool is not just a technical challenge – it is a fundamental human process shaped by interpretation, routines, and organizational dynamics. In the construction industry, digital transformation is often framed as a strategic necessity, aiming to increase efficiency, collaboration, and data-informed decision-making. Yet, success depends less on the technology itself and more on how people interpret and integrate it into their everyday work. This study explores how digital transformation is enacted in practice, focusing on the case of FileMaster, a document management system introduced at NCC Building Sweden. Although the system was intended to streamline project documentation and support broader strategic goals, its implementation revealed a clear gap between strategic intent and operational reality. To examine this, the thesis applies the Strategy-as-Practice (SaP) perspective alongside the coping framework by Sandberg and Tsoukas (2011), highlighting how individual sensemaking, routines, and engagement shape digital outcomes. A qualitative case study approach was used, based on 24 narrative interviews and internal document analysis. The findings show that while strategic ambitions were well-articulated, many employees experienced confusion, resistance, and uneven support, underscoring the importance of aligning strategy with the lived reality of implementation. Despite these challenges, the study also found signs of adaptation, initiative, and gradual acceptance, especially where local support structures and motivated individuals helped translate the strategy into action. Different forms of coping – practical, deliberate, detached, and theoretical – were identified across roles, revealing how digital strategies are enacted differently depending on context, support, and engagement. The study concludes that successful digital transformation requires not only clear strategic direction, but also strong local anchoring, visible leadership, and support systems that enable employees to move from resistance toward meaningful engagement. This thesis contributes to a deeper understanding of the micro-level dynamics that shape digital change in construction and calls for greater attention to the emotional, contextual, and relational dimensions of implementation.

Key words: Digital transformation, Construction industry, Strategy-as-Practice, Coping framework, Employee interpretation, Implementation challenges.

Acknowledgements

This master's thesis marks the end of my studies at Chalmers University of Technology, within the Department of Architecture and Civil Engineering, Division of Construction Management. The thesis was written during the spring of 2025 and has been an exciting and valuable learning journey.

First of all, I would like to express my sincere thanks to my supervisor at Chalmers, Dilek Ulutas Duman. Your support, involvement, and positive energy have meant a lot throughout this journey. Thank you for your motivation, constructive feedback, and for always pushing me to move forward. Your kindness, curiosity, and drive truly inspired me and made the process both enjoyable and rewarding.

I would also like to thank NCC for giving me the opportunity to carry out this thesis within the company. A special thank you to my supervisor at NCC, who contributed with helpful insights, motivation, and engagement. Together, the three of us formed a strong and inspiring team, and I am very grateful for that collaboration. Finally, I want to thank all the interviewees who took the time to share their experiences with me. Your openness, honesty, and reflections have been extremely valuable and are at the heart of this thesis. Thank you for trusting me with your stories.

Tyra Lindh
Gothenburg, June 2025

Glossary

AECO	Architecture, Engineering, Construction, and Operations
AI	Artificial Intelligence
AR	Augmented Reality
BA	Business Area
BCM	Business Change Manager
BIM	Building Information Modelling
BuSe	Building Sweden (Business area within NCC)
CDP	Common Development Plan
CEO	Chief Executive Officer
CPFM	Construction Project File Management
DT	Digital Transformation
FAQ	Frequently Asked Questions
GDPR	General Data Protection Regulation
IoT	Internet of Things
IT	Information Technology
NCC	Nordic Construction Company
PDS	Project Document System
SaP	Strategy-as-Practice
SEK	Swedish Krona
UAT	User Acceptance Testing
VDC	Viritual Design and Construction
VR	Virtual Reality

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1 Introduction

1.1 Background

Digital transformation (DT) is often presented as a strategic need for companies seeking to remain competitive in increasingly digital environments (Matt et al., 2015). In construction, where digitalization has progressed more slowly compared to other industries, transformation efforts tend to focus on adopting digital tools such as Building Information Modelling (BIM), document management systems, and digital planning platforms (Samuelson & Stehn, 2023). However, research shows that the success of these initiatives depends not only on the tools themselves, but on how they are introduced, understood, and integrated into everyday work practices (Samuelson, 2024; Lundberg et al., 2022). DT is not only a technical shift, but a social and organizational one, shaped by the actions, perceptions, and engagement of the people expected to carry it out (Hizam et al., 2023; Frankiewicz & Chamorro-Premuzic, 2020). Despite the strategic projects aiming to drive DT, there is a persistent challenge regarding disconnect between strategy development and practical implementation, particularly in project-based industries like construction, where workflows are fragmented and context-specific (Löwstedt et al., 2018; Hughes & Stehn, 2019).

This master's thesis investigates how such a disconnect unfolds in practice by examining the implementation of *FileMaster*, a document management system introduced as part of NCC's broader digital strategy, with the focus on one of the company's business areas, NCC Building Sweden. Developed under the *Common Development Plan (CDP)*, FileMaster is designed to standardize and streamline file management across NCC's construction projects by introducing metadata logic and shared practices for document categorization and retrieval. The system is expected to reduce administrative burden and establish a foundation for using digital data to support more informed decisions. However, despite these intentions, the implementation has faced resistance from its primary user group, design managers, who must integrate FileMaster into their daily work routines.

To understand this resistance, the study draws on the Strategy-as-Practice (SaP) perspective, which emphasizes strategy as something people do, not just something organizations have (Whittington, 2006; Jarzabkowski et al., 2007). By focusing on the actions, routines, and interpretations of individuals, SaP allows for a closer examination of how digital strategies are enacted in practice and how they are received by different organizational actors (Jarzabkowski et al., 2021). In particular, this study draws on the coping framework developed by Sandberg and Tsoukas (2011), based on Heidegger's (1927) philosophy. This framework distinguishes between four types of coping: *practical, deliberate, detached,* and *theoretical,* each reflecting different ways of relating to work and different levels of awareness. The framework is useful to identify and address sources of friction between those who design strategies and those expected to implement them.

1.2 Aim and Research Questions

This thesis aims to explore how digital transformation strategies are understood and enacted in practice by different organizational actors, and how these interpretations shape the outcomes of strategic initiatives. The empirical work focuses on the implementation of FileMaster at NCC Building Sweden, examining how design managers, the key users of the system, experience and engage with the digital transformation in their everyday work. By focusing on design managers' interpretations and interactions with FileMaster, the thesis offers important insights into how digital strategies are enacted or met with resistance at the operational level. The research is guided by the following questions:

RQ1: How do different organizational actors interpret and engage with FileMaster as part of NCC's digital strategy?

RQ2: What challenges arise during the implementation of FileMaster, particularly in the interaction between strategic planning and implementation?

RQ3: What forms of coping – such as practical, deliberate, detached, or theoretical – can be identified among design managers and strategy developers, and how do these responses influence the realization or resistance of the digital strategy?

By addressing these questions, the study contributes to a deeper understanding of the micro-level processes that shape digital transformation outcomes in the construction sector, and how strategic initiatives can be better aligned with everyday practices to reduce friction and foster meaningful change.

1.3 Limitations

Several limitations should be acknowledged in this study. First, the research is based on a single case study, focusing exclusively on the implementation of the FileMaster system within one business area, NCC Building Sweden. While this focus allows for an in-depth exploration of how digital transformation is enacted in a specific organizational context, it limits the generalizability of the findings to other companies, business areas, or digital tools.

Second, the study was conducted within a limited time frame during the spring of 2025. As digital transformation is an ongoing process, some of the experiences captured may reflect temporary conditions or early reactions rather than long-term outcomes. In addition, because the implementation was still unfolding during the study period, it was not possible to fully assess how adoption and engagement may evolve over time. The limited time also restricted the ability to gather and analyse a broader set of data. While 24 interviews provided valuable insight, a longer research period could have allowed for additional perspectives, follow-up interviews, or deeper triangulation with observational data or internal documentation.

Third, the study is grounded in qualitative interviews, which means the findings are based on individual perspectives and interpretations rather than objective measurements. The analysis draws on the narratives, experiences, and reflections of 24 employees, primarily design managers, who were closely involved in the

implementation. While this provides rich insights into the human side of digital change, the results reflect perceived experiences rather than verified organizational facts.

Lastly, the study focuses on only one digital initiative, FileMaster, and does not compare it to other systems or transformation efforts within NCC or in the broader construction sector. As such, the findings should be understood as context-specific and shaped by the particular tool, timing, and organizational setting studied. Together, these limitations highlight the need for caution when transferring conclusions beyond the studied context, but they also reinforce the value of capturing in-depth, situated perspectives on how digital transformation unfolds in practice.

2 Theoretical Background

2.1 Digital transformation in the construction industry

In recent years, digital transformation (DT) has become a central topic across industries, including construction (Samuelson and Stehn, 2023). While the potential benefits of DT, such as improved efficiency, better data use, and enhanced collaboration, are widely acknowledged, the construction sector has struggled to realize these gains in practice (Adekunle *et al.*, 2024). Compared to other industries, construction has been slower to adopt digital technologies, and transformation efforts are often met with structural, organizational, and cultural challenges. This section introduces the concept of digital transformation, outlines the specific characteristics of the construction industry that affect its ability to change, and reviews how digital transformation is currently addressed in construction practice and research. Together, these subsections provide the foundation for understanding the context in which this study is situated.

2.1.1 Digital transformation

DT has gained significant attention in recent years, not only because of rapid technological advancements, but because organizations increasingly realize that successful digitalization requires more than adopting new tools. It requires a strategic approach that integrates digital technologies with core business processes, goals, and organizational structures (Matt et al., 2015; Kane et al., 2015). In industries such as manufacturing, digitalization has progressed significantly, bringing transformative effects on products, services, processes, business models, and value chains (Nissen, 2018; Parida et al., 2019). This has led to the widespread use of the term *Digital Transformation (DT),* which refers to the fundamental changes that businesses undergo to leverage digital technologies (Matt et al., 2015). Unlike the mere adoption of IT tools, DT involves fundamental structural shifts within firms and industries, reshaping their business ecosystems (Vial, 2019). Vial's systematic review of 282 studies identified several limitations in how digital transformation has been conceptualized in the literature. In response, he proposed a broader and more integrative definition:

> *"a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies."*

Vial (2019) further proposed a theoretical model to illustrate the DT process. This model highlights the role of digital technologies as catalysts for disruption at multiple levels, including the society, industry, and individual levels. These disruptions drive strategic responses, which, in turn, shape how digital technologies are used, creating a continuous feedback loop. Additionally, he suggested that DT influences value creation, value chains, and business models, though these shifts depend on an organization's ability to implement structural changes and overcome organizational barriers.

As highlighted by Samuelson and Stehn (2023), Vial's definition is particularly relevant to construction because it does not solely focus on organizations but extends to their environments and networks. However, they emphasize that Vial's model should not be viewed solely from an organizational perspective but also at individual, industry, and societal levels, an especially relevant approach for the construction sector, given its

project-based nature. Understanding how digital transformation unfolds in this context is critical to identifying the changes needed for successful implementation. While it is important to consider the broader picture and understand how different levels and contexts are interconnected, there is a lack of focus in the literature specifically on the individual level, to get a deeper insight into how individuals experience and influence the digital transformation process in practice.

2.1.2 The nature of the construction industry

DT has gained attention in the construction industry, yet there are few signs of radical change in companies or common industry processes (Samuelson & Stehn, 2023). To understand how DT can be achieved in the construction sector, it is essential to examine the industry's characteristics, as its structure and organization strongly influence companies' ability to implement change at different levels.

A key challenge in construction is its fragmented nature, with numerous companies collaborating in temporary project-based settings (Slaughter, 1998). Each project typically involves a new combination of companies and individuals, making it difficult to transfer knowledge and establish standardized working methods over time (Reichstein et al., 2005; Engwall, 2003). This fragmentation also results in challenges related to stakeholder integration and coordination, as projects involve professionals from various disciplines who work together under complex contractual structures (Nawi et al., 2014).

A defining characteristic of the construction industry, as described by Groak (1994) and Koskela (2003), is the separation of design and production, unlike many other industries where these processes are more integrated. This separation, combined with the persistent fragmentation of actors and processes, limits opportunities for continuous improvement and innovation. Fragmentation refers to the involvement of numerous specialized firms, temporarily assembled for individual projects, and working in loosely connected networks (Hughes & Stehn, 2019). This often goes hand in hand with discontinuity, where responsibility and knowledge are passed between phases and actors, such as from design to construction or between subcontractors, without consistent collaboration or integration. As Hughes and Stehn (2019) note, these disruptions occur both horizontally across project phases and vertically across organizational levels. To manage this complexity, the industry has developed roles, processes, and contractual structures that support coordination. However, these same systems often reinforce fragmentation and discontinuity, making it difficult to transfer knowledge, reduce inefficiencies, and implement broader, systemic changes (Samuelson & Stehn, 2023).

Innovation in construction occurs at different levels: company, project, and industry, each with distinct drivers, barriers, and benefits (Aouad et al., 2010). While project-level innovation is considered crucial for achieving shared goals in temporary project settings (Ozorhon, 2013), knowledge developed in one project is rarely transferred to others in a structured way (Wei & Miraglia, 2017). As a result, learning tends to remain confined within the boundaries of individual projects, and valuable insights are often lost when teams disband and new constellations are formed (Gann & Salter, 2000; Harty, 2005). Several researchers highlight the need to capture learnings at the individual level, since it is often individuals, not organizations, who carry practical

experiences and lessons learned across projects (Styhre et al., 2004; Bresnen et al., 2003). However, this informal transfer of knowledge depends heavily on personal networks and is rarely supported by formal systems (Bresnen et al., 2004). Without deliberate efforts to support learning at both the individual and organizational levels, opportunities for long-term innovation are easily lost in the discontinuous nature of construction work (Gann & Salter, 2000; Harty, 2005).

Another obstacle to transformation is the absence of clear process owners. Although clients have significant control over design and production, they often lack the expertise and resources to drive optimization at an industry level (Samuelson & Stehn, 2023). As Harty (2005) highlights, power distribution in construction is a key characteristic. Even when a main contractor coordinates the work, each participant operates within their own discipline-specific expectations and working methods, making collaboration and alignment complex. Given these conditions, DT requires profound changes in industry structures, processes, and operations (Samuelson & Stehn, 2023).

2.1.3 Digital transformation in construction

DT in construction is seen as an enabler to significantly improve construction processes, leading to enhanced project outcomes and better client satisfaction (Samuelson & Stehn, 2023). The adoption of several technologies, including information, computing, communication, and connectivity tools, plays a key role in this transformation (Adekunle et al., 2024). Various technologies, such as Building Information Modelling (BIM), robotics, drones, artificial intelligence (AI), virtual reality (VR), augmented reality (AR), and the Internet of Things (IoT), are often described as reshaping the construction industry (Chen et al., 2022). These technologies are said to improve efficiency, reduce errors, and address persistent challenges such as low productivity, labour shortages, and safety concerns.

However, despite these technological advancements, the construction sector has been slow to adopt new tools in practice (Samuelson & Stehn, 2023). The actual impact of these technologies remains modest and uneven, partly due to the industry's fragmented structure, regulatory constraints, and the complexity of construction projects (Adekunle et al., 2024; Zulu & Saad, 2023). In particular, BIM is often framed as revolutionary innovation, yet its anticipated transformative impact has not fully materialized. As discussed by Lidelöw et al. (2023), BIM often benefits existing project-based routines, but has limited effect on broader practices or business models. Their study points to a growing gap between the state-of-the-art BIM described in research and how it is actually used in the industry. This gap appears is attributed to unclear client demands, varying maturity levels among actors, and limited incentives to improve the process as a whole. This underlines the need for further research on how to support more practice-oriented and scalable implementation of digital tools like BIM.

Despite the slow adoption of digital technologies in construction, research shows that businesses that proactively embrace these technologies can gain a significant competitive edge (Matt et al., 2015). Digital transformation is not only about improving internal efficiency or streamlining tasks, but it can also lead to entirely new ways of creating value, interacting with customers, and delivering services. As explained by Matt et al. (2015), in some cases, digitalisation may even reshape or replace existing business models altogether. These benefits highlight the importance of developing strategies to accelerate digital adoption, particularly in project-based industries like

construction, where timely execution and efficient resource management are crucial. In the Swedish context, Boverket, the national board of housing, building and planning, emphasises the importance of digital transformation as a means to streamline planning and building processes, improve access to critical information, and ultimately support more sustainable community development (Boverket, 2025). However, Boverket (2025) also notes that accessing and using relevant data remains a challenge, as information is often scattered, inconsistent in quality, and difficult to retrieve. To address these issues, Boverket is working with other authorities to structure and standardise data across the sector. Their aim is to enable more efficient workflows, reduce manual effort, and create the foundation for smarter decision-making throughout the construction process.

Samuelson and Stehn (2023) argue that fostering an environment where innovation is encouraged and where employees feel empowered to experiment with new technologies is key to successful digital transformation. A creative culture can serve as a foundation for encouraging experimentation and risk-taking, which are often necessary when introducing digital technologies into established workflows. In addition, the authors further notes that the emphasis on collective learning within organizations can play a transformative role. When employees across different levels of the organization actively share knowledge, ideas, and lessons learned from digital tools, it can accelerate the adoption process and smooth out potential resistance from different stakeholders (Samuelson & Stehn, 2023).

However, despite the potential benefits, knowledge transfer remains a significant barrier to DT, particularly in construction and other project-based industries. As Wei and Miraglia (2017) note, the lack of capacity to effectively transfer knowledge between projects and back to the company can hinder the long-term impact of digital initiatives. In construction, where projects are often temporary and project teams are frequently reformed, lessons learned, and innovations developed in one project are rarely shared systematically across the organization. This leads to a situation where valuable insights gained during digital implementations are not capitalized on in future projects, slowing the overall digital progress of the company (Samuelson and Stehn, 2023).

Further, Bhattacharya and Momaya (2021) show that in the Architecture, Engineering, Construction, and Operations (AECO) industry, DT is frequently slowed down by what they call “continuity forces.” These include well-established organizational cultures, routines, and delivery processes that are resistant to change. Their research emphasizes that even when companies want to transform, internal traditions and ways of working can hold them back. Lastly, Adekunle et al. (2024) identify a range of structural and organizational issues that further complicate digital transformation efforts in construction. Their study highlights several barriers, including unclear roles and responsibilities, a lack of strategic vision, and the tendency for business units to implement changes independently in isolated silos. Moreover, they point to cultural resistance to change, insufficient leadership capabilities, and various issues related to strategy formulation, support, sponsorship, and implementation.

2.2 Digital transformation and strategy

Digital transformation (DT) is often misunderstood as a purely technological upgrade. However, Rogers (2016) argues that DT is, above all, a strategic issue. In his book *The*

Digital Transformation Playbook, he emphasizes that the core of DT is about rethinking how a company creates value in a fast-changing digital environment. According to Rogers, this includes reconsidering customer needs, business models, and ways of working, areas that belong to the domain of strategic leadership. He stresses that digital initiatives need clear direction from the top, otherwise they risk becoming isolated technical upgrades instead of integrated strategic efforts.

2.2.1 Employee involvement and digital readiness

While clear direction from top management, organizational structures and strategic alignment are essential for successful DT, several studies emphasize that transformation ultimately depends on how employees respond to change. Ivančić et al. (2021) argue that strategy implementation is experienced very differently depending on employees' positions in the hierarchy. Their study shows that lower-level employees, such as frontline managers and operatives, often feel that communication is vague and that their input is not valued. This lack of clarity can make it difficult to carry out daily tasks and contributes to a general disconnect between strategic goals and operational work. The authors emphasize that successful implementation requires participation across all levels, not just top-down decisions. Kane et al. (2015) also emphasize the importance of strategic alignment throughout the organization. They show that even when leadership sets clear digital goals, these can be misunderstood or not acted upon at lower levels, leading to stalled progress. This highlights the importance of not only setting strategic direction but ensuring that it is understood, supported, and translated into practice across departments and roles.

In line with this, Lundberg et al. (2022) highlight that digital transformation in construction is often hindered by misaligned assumptions and expectations about technology among different user groups. These differences shape a fragmented socio-cognitive environment that limits the success of digital initiatives on site. Their findings emphasize the importance of understanding how people perceive and use digital tools in practice, especially in complex, inter-organizational project settings like construction sites. Similarly, Lundberg et al. (2019) highlight that in large construction companies with decentralized structures, innovations may be perceived as more radical in parts of the organization that were not involved in their development. This perception can hinder adoption and implementation. Moreover, the authors emphasize that participation of local actors early in the innovation process increases the likelihood of successful diffusion and long-term use. According to Rogers (2003), innovations are more likely to be sustained if the people affected have been involved in the decision-making.

Building on this, Ullrich et al. (2023) highlight that employee participation is central to successful digital change. However, their study shows that it is not the amount of involvement that matters most, but the quality and timing. Employees need clear information, meaningful roles, and enough time to contribute effectively. When these conditions are not met, participation can feel superficial or forced. This aligns with findings by Tihlarik (2024), who shows that employee perspectives are often missing in the development of new digital tools. Her study highlights that early involvement and co-determination are necessary to ensure that tools meet practical needs. She also finds that employees differ in their expectations and acceptance of technology, even within similar technical environments, making context-specific understanding

important. Employee participation in shaping strategy is also highlighted by Friis and Koch (2015), who show that employees involved in strategy workshops and project groups contributed directly to the development of sub-strategies. Their involvement supported motivation and improved relevance at the operational level. Dougherty (2017) expands on this by describing innovation as a collaborative effort among "professional practitioners" who use their expertise and judgment to solve problems across organizational boundaries.

Further, Gagnon et al. (2008) explain that strategies often fail not because they are poorly designed, but because employees do not understand or trust them. Their study shows that strategic knowledge and belief in the organization are crucial for employee commitment to strategic goals. Additionally, Hizam et al. (2023) argue that DT is not only a technical and managerial issue, but also deeply affects how employees feel, behave, and engage with their work. Their research shows that knowledge sharing, employee mobility, training, and psychological empowerment are key factors influencing engagement in digital workplaces. They also note that many employees experience anxiety and uncertainty about new technology, which can reduce both motivation and productivity if not addressed. Further, Nguyen and Broekhuizen (2022) explain that digital readiness is shaped by individual factors, such as age and personality, as well as organizational factors, such as communication and support. A mismatch between individual and team readiness can lead to frustration, even if the person is skilled and motivated.

Mutambik and Almuqrin (2024) emphasize that employee acceptance of digital tools depends on both internal and external factors. They show that support from management and a clear understanding of the benefits can encourage acceptance, while organizational inertia and complex processes can lead to resistance. The study underlines that management plays a key role, not only by providing resources, but also by creating psychological safety and motivation. A similar point is made by Papadonikolaki and Morgan (2024), who highlight that psychological safety is essential for collaboration in digital project teams. Their research shows that when people feel safe to speak up, take risks, and express themselves, they are more likely to engage with digital tools. They emphasize that strong leadership, open communication, and a culture of learning are needed to build this type of environment. Further, Hewavitharana et al. (2021) show that employee willingness to use digital tools depends on perceived personal benefit. Their study finds that even when technical and organizational structures are in place, digital adoption is unlikely if employees do not see clear advantages for their own work.

Other studies also focus on the role of mindset and attitude. Frankiewicz and Chamorro-Premuzic (2020) argue that DT is not mainly a technology challenge, but a people challenge. They emphasize that successful transformation depends on employees' adaptability, curiosity, and willingness to learn, not just the introduction of new tools. Kocak and Pawlowski (2021) support this view, highlighting that digital transformation cannot succeed without developing both the digital competencies and the digital mindset of employees. Their study shows that beyond technical skills, successful transformation requires traits such as flexibility, openness to learning, and emotional intelligence. They emphasize that these attitudes are essential for employees to adapt to new systems and workflows and that organizations should actively support their development.

Despite this, several studies show that many organizations fall short in engaging employees during digital change. Osmundsen et al. (2018) find that transformation efforts often fail when employees are not involved in decision-making or lack sufficient information. They argue that resistance increases when employees are left out, and that successful DT requires a supportive culture and strong communication. In a similar way, Seletedi et al. (2024) show that many transformation efforts neglect proper communication, inclusive planning, and training, which leaves employees feeling excluded and unsupported. These conditions can generate resistance and frustration even among digitally competent workers. However, the study also shows that many employees demonstrate resilience by relying on informal learning, collaboration, and personal initiative to adapt.

2.2.2 Strategy-as-Practice

As highlighted in previous sections, DT involves not only strategic direction and organizational alignment, but also the interpretations and actions of individuals across the organization. In line with this, the Strategy-as-Practice (SaP) perspective offers a framework for examining strategy as something people do, rather than something an organization has. Whittington (2006) introduced SaP as a shift away from traditional views of strategy that focus on formal plans, high-level goals, and top management decisions. Instead, SaP views strategy as a social and practical activity, carried out by individuals at different levels of the organization through everyday work. Similarly, Jarzabkowski et al. (2007) argue that strategy is socially accomplished through actions, interactions, and situated practices. They introduce the concepts of practitioners (those doing strategy), practices (the routines, tools, and norms used), and praxis (the flow of strategic activities), which together help describe how strategy takes shape in real settings. Building on this, Jarzabkowski et al. (2021) emphasize that strategy is not limited to official decisions or documents but can also be found in the ordinary activities of people across the organization, even when these are not formally labelled as strategic.

In line with this, Kane et al. (2015) highlight that one of the biggest challenges in digital transformation is the gap between what leadership intends and how those intentions are implemented in practice. Their research shows that even if ambitious digital goals are set at the top, these are often not fully understood or acted upon by employees across the organization. They also stress that transformation does not only depend on which technologies are adopted, but on how strategic goals are communicated, understood, and applied in everyday work. Similarly, Kane et al. (2019) argue that the success of DT depends on how well strategic goals are enacted at different organizational levels, not just written down in plans.

This perspective is especially relevant in complex and project-based industries such as construction. Löwstedt et al. (2018) show that in construction projects, strategy often emerges through the actions of project managers and site personnel, who are seen as legitimate strategists due to their practical experience and close involvement in operations. These individuals often shape outcomes through their decisions and actions on the ground. Even if these do not fully follow the original strategic plans, their influence is still significant. Samuelson (2024) emphasizes that without clear roles and responsibilities, leadership engagement, and focus on the change process, digital strategies in construction risk remaining plans on paper rather than becoming real change.

In line with this, Golsorkhi et al. (2018) highlight that SaP research extends beyond top management to include how various organizational members engage in strategizing through reinterpretation. Rouleau and Cloutier (2022) further argue that strategy should not only be seen as a formal process, but as something shaped by local context, tacit knowledge, and the ability to navigate rules, tools, and relationships. They call for attention to how people "do strategy" in specific situations, and how practical knowledge influences what is recognized as strategy. Similarly, Umantsiv et al. (2024) argue that DT involves more than technology. It must be coordinated with corporate strategy, organizational culture, and stakeholder needs. According to their study, digital projects often fail when employees lack the digital mindset, training, or cultural support to take part in the change.

Gagnon et al. (2008) further show that when employees do not fully understand or trust a strategy, they may not support it in their actions. According to their study, strategic misalignment, when employees act in ways that don't support organizational goals, is one of the main reasons why even well-designed strategies can fail. They stress that successful implementation requires both strategic knowledge and trust across all levels of the organization The importance of sensemaking in this process is highlighted by Zulu and Saad (2023), who study how construction employees interpret digital change. They find that past experiences, communication issues, and perceptions of workload influence how employees understand and respond to digitalisation. According to the authors, both leaders and employees shape the meaning and outcome of digital initiatives.

The human experience of strategy is further developed by Du Plessis and Smuts (2021), who argue that even when strategic intentions are clearly formulated, people go through emotional and cognitive responses to change. Their study shows that individuals may experience different phases, such as denial, resistance, or acceptance, depending on how strategic changes affect their roles and identities. As Fenton and Langley (2011) note, narratives and everyday conversations also play an important role in constructing what strategy means and in defining who is seen as a strategist. These micro-level processes, often overlooked in formal planning, shape how strategy is understood and implemented in practice. Parent (2006) highlights that employees respond to change in different ways, some struggle or resist, while others adapt or even thrive. These reactions are not random but influenced by factors such as optimism, perceived support, role clarity, and the level of participation offered. Her research shows that these conditions help explain why some individuals integrate changes successfully while others do not. To build on the Strategy-as-Practice perspective and better understand how individuals deal with the challenges of digital transformation, the next section introduces the concept of coping. This offers a more detailed way to explore how actors manage difficulties and respond to change in their everyday work.

2.2.3 The Coping Framework

Within SaP studies, Sandberg and Tsoukas (2011) focuses on *understanding* different ways individuals engage with strategy depending on their level of awareness and involvement. Their concern is to explain why some actors respond to strategic initiatives with resistance or disengagement, while others adapt or reinterpret them in practice. Drawing on Heidegger's (1927) philosophy, which emphasises that much of human activity is based not on conscious reasoning but on practical engagement with

the world. Rather than starting with abstract plans or rules, people typically act based on embodied knowledge and familiarity with their surroundings. Based on that, the authors identify four different forms of coping**,** each involving a different form of intentionality. These forms reflect how individuals engage with tasks and tools in different ways depending on their role, experience, and context.

Practical coping:
Refers to unreflective, skilful activity based on experience. People operating at this level typically do not consciously think about their actions, but instead rely on routines and tacit knowledge. In construction, this might involve using familiar file structures or naming conventions that have become second nature through repeated use.

Deliberate coping:
Involves a more conscious effort to adapt. Individuals at this level are aware that something needs to change and begin to adjust their behaviour while still focusing on getting the job done. For example, someone might start exploring new ways of organising documents or testing unfamiliar features within a new digital system.

Detached coping:
Occurs when individuals step back to assess their activities with a degree of distance. This could involve assessing how a digital tool is being used across teams, identifying common challenges, or proposing improvements in workflows or support structures.

Theoretical coping:
.Is the most abstract form, where individuals move beyond the immediate context to develop overarching plans, strategies, or conceptual models. This could involve long-term thinking about how tools, processes, and people should work together in the future to support broader organisational goals.

This framework provides a useful lens to examine how individuals within an organization make sense of and respond to strategic initiatives. It also helps explain how misalignment between different forms of coping can create friction during implementation. For example, an organization might decide to adopt a new digital tool to improve information management in projects. However, such a change can face strong resistance if the employees expected to use the system are required to abandon familiar routines and adapt to a completely different logic and way of working. The result can be uncertainty, resistance, or a failure to embed the tool into daily routines. By identifying these forms of coping, the framework helps connect the organization's strategic ambitions with the lived experiences of employees, highlighting how gaps between intention and practice may emerge during implementation. For this reason, the coping framework is used as the theoretical background shaping the empirical analysis in this study.

3 Methodology

3.1 Research approach

This study adopts a qualitative research approach, which is well-suited for investigating complex social phenomena such as digital transformation in the construction industry (Bell et al., 2022). As explained by the authors, in contrast to a quantitative approach, where data is typically collected through numerical data, statistical analysis, and measurable variables, a qualitative method enables a deeper exploration of human behaviour, social contexts, and individual interpretations. This is especially important in the context of digital transformation, where success or failure often depends on interpersonal factors such as leadership, communication, organizational culture, and employee motivation. The empirical data in this study consists of verbal descriptions from interview respondents as well as a document analysis of the company's internal materials.

The study follows an abductive research approach, which allows for an iterative process between theory and empirical findings. Abductive reasoning is particularly suitable for studies where the aim is to gain a deeper understanding of how digital tools are implemented and experienced in practice. Unlike a purely deductive approach, which starts with a fixed hypothesis, or an inductive approach, which builds theory solely from data, the abductive process involves an ongoing interaction between literature and empirical insights (Dubois & Gadde, 2002). This approach is particularly relevant for studying the interpretations and experiences of employees at different levels within a construction company, as it allows for adjustments in the research focus as new themes emerge from the data.

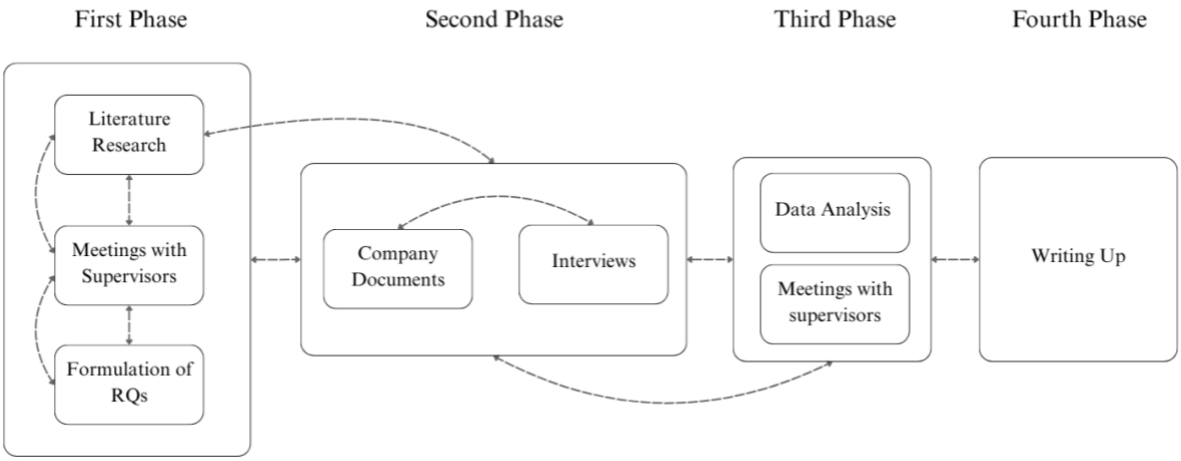

Figure 3.1: The method approach for this thesis.

3.2 Literature review

The thesis work started with a literature review to understand the relevant research on transformation in construction, strategy making connected to digitalization, employee resistance, and technology acceptance. To ensure a rigorous and systematic selection of sources, relevant academic literature has been gathered primarily from Scopus, ResearchGate, and Chalmers Library. The search strategy involved using keywords related to digital transformation, strategy for digitalisation, strategy as practice and employee resistance and acceptance. Additionally, by reviewing the reference lists of key articles, further relevant studies were identified and included to ensure a broader coverage of the existing literature.

In line with the abductive approach, the literature review continued alongside empirical data collection. As new insights from interviews emerged, additional literature was sought to refine the theoretical background and provide deeper explanations for observed patterns. For example, the Strategy-as-Practice perspective was introduced after it became clear that employees' interpretations, actions, and day-to-day practices played a central role in shaping the outcome of the implementation. Similarly, the coping framework was added later in the process, as the interviews revealed clear differences in how individuals approached and experienced the implementation, indicating the need for a concept that could capture these variations. This ongoing interplay between theory and empirical data is the core feature of the abductive approach, enabling the study to remain grounded in existing knowledge while being responsive to insights emerging from the interviews.

3.3 Case study research

This study adopts a qualitative case study methodology as it allows for an in-depth exploration of a current issue within its real-life context (Yin, 2018). The case was selected in collaboration with the company supervisor of this thesis, based on observed challenges and resistance to the tool, particularly among design managers, who are its main users. The chosen case is a specific digital implementation initiative, the *Construction Project File Management* (CPFM) project, which introduces the tool *FileMaster* as part of the company's broader digital transformation efforts. While the study is grounded in a single organization and a single project within its digital transformation strategy, the insights generated can contribute to a broader understanding of digital transformation challenges in construction sector organisations. By identifying patterns and key themes, the findings can be valuable beyond the specific context and inform similar initiatives in other projects or organizations. The details of the case study are described in Chapter 4.1.

3.4 Datan collection

3.4.1 Interview Study

The empirical data for this study is based on qualitative interviews with employees at different levels within NCC Building Sweden, complemented by a document analysis of internal company materials. While several conceptual papers discuss digital transformation in construction, few provide empirical evidence or insights from those directly involved in the implementation process. This gap in the literature made

qualitative interviews an ideal method, enabling a deeper understanding of personal experiences, interpretations, and reactions related to the digital tool and its implementation (Bell et al., 2022). The interview process began with higher-level managers involved in designing, strategizing, and leading the digital transformation, to gain an initial understanding of the strategic and organizational context. Following this, interviews were conducted with project-level employees, specifically design managers, who are expected to adopt and work with FileMaster in their daily tasks. A wide range of design managers across different departments, age groups, and levels of involvement in the FileMaster implementation were interviewed to ensure a diverse set of perspectives.

Participants were selected using a combination of convenience, snowball, and purposive sampling (Etikan et al., 2016; Naderifar et al., 2017). The initial list of design managers involved with FileMaster provided the company supervisor and development team. Additional participants were suggested by early interviewees. During the first round of interviews, it became evident that many respondents were relatively new to the company and younger in age. To achieve a broader representation, later interviews focused on more experienced employees and those from underrepresented departments. In total, 24 interviews were conducted. The interviews were stopped when similar themes started to repeat and no new insights were coming up, suggesting that the main patterns had been captured. Table 3.1. demonstrates the details regarding the interview study.

An interview guide was developed and used throughout the study, with questions tailored slightly to reflect the specific roles and experiences of the interviewees. The guide followed a consistent structure, beginning with general background questions before moving into a more focused discussion on the company's digital transformation efforts, the implementation of FileMaster, and specific reactions and challenges. Each interview concluded with reflective questions about success factors, lessons learned, and future implications. The interview questions are added as Appendix I.

Narrative interviews were conducted to encourage participants to share personal stories and reflections related to the implementation of FileMaster and the broader digital transformation (Hopf, 2004). The interviews followed a flexible structure, allowing participants to guide the conversation while ensuring that key themes were explored. Prompts and follow-up questions were used when needed to support the storytelling and gain deeper insight into specific experiences. All interviews were conducted via Microsoft Teams, recorded with consent, and fully transcribed for analysis. In total, 24 individuals were interviewed, including 18 design managers and 6 higher-level managers or positions involved in digital strategy and implementation. The interviews lasted between 38 and 87 minutes, with an average duration of 58 minutes.

Table 3.1 Interviewees with respectively role, date and time of interview.

Interviewee	Role	Date	Length
1	Senior manager 1*	2025-03-03	1h 20min
2	Senior manager 2*	2025-03-12	1h 13min
3	Design Manager, Super User	2025-03-13	1h
4	Design Manager Coordinator	2025-03-14	51min
5	Design Manager	2025-03-19	38min
6	VDC Leader, Experienced Super User	2025-03-24	1h 3min
7	Design Manager	2025-03-25	57min
8	Design Manager, Group Manager	2025-03-26	1h 2min
9	Design Manager, Super User	2025-03-27	41min
10	Design Manager	2025-03-27	1h 2min
11	Change Agent	2025-03-27	1h
12	Design Manager	2025-03-31	1h 27min
13	Design Manager, Group Manager, Change Agent	2025-04-08	1h 4min
14	Design Manager, Super User	2025-04-08	56min
15	Design Manager, Super User	2025-04-14	52min
16	Design Manager	2025-04-14	53min
17	Design Manager	2025-04-15	41min
18	Design Manager, Super User	2025-04-15	58min
19	Design Manager, Super User	2025-04-17	47min
20	Design Manager, Experienced Super User	2025-04-22	1h 1min
21	Design Manager	2025-04-23	42min
22	Design Manager	2025-04-25	1h 13min
23	Supplier representative	2025-05-01	1h 7min
24	Senior manager 3*	2025-05-07	54min

* The term "senior manager" is used to refer to individuals involved in the strategy development process. To protect anonymity, a common title is applied instead of their specific job titles.

3.4.2 Document study

As a complement to the interviews, a document analysis was conducted to provide additional context and support the understanding of the case. Document analysis is a recognised method within qualitative research and involves the systematic review and interpretation of documents to gain insight into organisational practices, structures, and communication (Bowen, 2009). In this study, the analysis of documents served to strengthen the findings from the interviews by offering a background to the company's digital transformation efforts and the implementation of FileMaster. The documents analysed include internal strategic PowerPoint presentations outlining NCC's broader

digitalisation strategy, where FileMaster is presented as one of several tools being implemented.

3.5 Data analysis

3.5.1 Interview analysis

To analyse the data from the interviews, thematic analysis was applied to identify common patterns in employees' reactions, perceived challenges, and factors influencing acceptance or resistance. Thematic analysis is a flexible and widely used method for analysing qualitative data, particularly suited for identifying, organising, and interpreting themes across large datasets (Braun & Clarke, 2006). It allows the researcher to go beyond surface-level responses and uncover deeper insights into how participants make sense of complex situations – in this case, the implementation of digital transformation in a project-based construction organisation. The analysis followed an iterative and abductive process, where themes were not predefined but developed progressively through close engagement with the empirical material. This approach is consistent with Braun and Clarke's (2006) recommendation to let themes emerge from the data while remaining open to theoretical refinement as understanding deepens.

The interviews were audio-recorded and auto-transcribed. In the first step, the transcripts were corrected manually by listening to the recordings while reading the text to ensure accuracy. Each interview was then read carefully, and key passages were highlighted. As the number of interviews increased, recurring topics and observations started to emerge. These initial insights informed the development of preliminary themes. In the second round of analysis, all transcripts were re-read with the emerging themes in mind. A colour-coding process was used to categorise content according to general themes such as "implementation process," "technical issues," and "leadership." Quotes corresponding to these themes were extracted and compiled into a separate working document. As the process continued, more detailed sub-themes began to surface within the broader categories, such as emotional reactions to change, lack of system support, or unclear role definitions. These sub-themes were noted and used to refine the thematic structure. The full dataset was then re-organised into a comprehensive document where quotes were grouped under themes and sub-themes. Each theme was reviewed to ensure internal consistency, and quotes were occasionally moved or reassigned to better-fitting categories. This constant comparison process (Glaser & Strauss, 1967) supported both within-theme coherence and clear distinctions between themes.

By comparing insights from both managers and project-level employees, the study seeks to uncover potential gaps between strategic planning and practical execution. The process of reviewing and adjusting the thematic structure continued until a coherent and meaningful representation of the material was achieved. Some themes were merged, split, or discarded based on their relevance, depth, and frequency in the dataset. In line with Braun and Clarke's (2019) later guidance on reflexive thematic analysis, the final structure represents not only what was most commonly discussed, but also what appeared most meaningful in relation to the study's research questions and theoretical lens.

3.5.2 Document analysis

Document analysis was used in combination with interview data to improve the understanding of how FileMaster was positioned within the company, how it was communicated internally, and what support materials were available. This method also allowed for cross-checking of statements made in interviews and identifying any gaps or contradictions between formal communication plans and how they were seen or understood by the targeted audience. By analysing both strategic and practical documents, the study could trace how the digital tool was intended to be used and compare this with how it was interpreted and experienced in practice. The first set of documents was provided early in the interview period. These included internal presentations outlining NCC's digital strategy, material describing the Common Development Plan, and documents related to the FileMaster implementation. At this stage, the documents were reviewed with a fresh perspective, as the understanding of the topic was still developing. This allowed for an initial broad interpretation of the organisation's intentions, communication style, and strategic framing. Key messages and patterns were noted, and relevant information was extracted and summarised to support the design of the interview questions and guide early analysis.

After all interviews had been completed, the documents were revisited. In light of the insights gained from the interviews, a more critical reading was applied. With a deeper understanding of the organisation, user experiences, and implementation challenges, new aspects of the documents became relevant, while earlier details were deprioritised or discarded. This second review focused on identifying how the official descriptions aligned with employees' views of how FileMaster was introduced and used, and where gaps or differences in interpretation appeared. Additional documents were also requested and analysed later in the process, including user manuals and onboarding guides for FileMaster. These materials were examined with interviewees' perspectives in mind, comparing formal instructions with reported experiences of support, usability, and system understanding. This comparison helped clarify whether the available resources matched the needs expressed by end users and how effectively the system had been communicated and supported at the operational level.

Together, the document analysis contributed to a richer interpretation of the case, helping to situate individual experiences within a broader organisational and strategic context. The analysis of the documents is presented in Section 4.3 and 4.4.

3.6 Ethical considerations

Ethical considerations are integral to this research to ensure the protection of participants' rights, integrity and data. The study adheres to established ethical principles within qualitative research, as outlined by Bryman and Bell (2011), which include avoiding harm to participants, ensuring informed consent, respecting privacy, and avoiding deception. To uphold these principles, all interviewees received a detailed informed consent document prior to participation, see Appendix II. This document described the purpose of the study, how personal data would be processed, their right to anonymity, and their right to withdraw at any time without consequences. It also clarified that participation was voluntary and that they could choose not to answer any questions. The interviewees provided informed consent either by signing the consent document or by sending written consent of the document via email.

Before each interview, participants were again informed of the purpose of the thesis and explicitly asked for their permission to record the conversation. Recording only began once consent was clearly given. Interviewees were also offered the opportunity to review and approve the transcripts of their interviews to ensure that their perspectives were accurately captured and represented. The anonymity of all participants has been safeguarded by removing names and any identifiable details from the written material. No personal data will be published, and the thesis refers to interviewees in generalized terms to protect confidentiality. These measures encourage honest and open reflections while reducing the risk of participant discomfort or harm. In line with General Data Protection Regulation (GDPR) and Chalmers University of Technology's privacy policy, all collected data, including recordings, transcripts, and notes, has been securely stored in password-protected environments and only accessed by the researcher and two supervisors: one at Chalmers and one at NCC Building Sweden. The data will be used solely for academic purposes.

3.7 Use of AI

In the writing process of this thesis, artificial intelligence (AI) was used as a support tool during the writing process of this report. More specifically, ChatGPT was used to help rephrase sentences, clarify ideas, and improve the overall readability of the text. The purpose was to enhance communication, not to replace independent thinking or analysis. While AI contributed to language and structure, all content has been carefully reviewed to ensure that it reflects the author's own understanding. No arguments or academic points have been generated by AI without critical evaluation. This approach was taken to avoid plagiarism and to make sure that the report remains accurate, trustworthy, and original. Regarding the interview data, no open-source AI tools were used. To protect the anonymity and integrity of the participants, transcription was carried out using the built-in function in Microsoft Teams, followed by manual correction. No personal or sensitive information was shared with external tools. All data handling followed the GDPR. For data sorting and analysis, Microsoft Word and Excel were used instead of AI tools, to ensure full control over the process.

4 Case Study

4.1 Company Overview: NCC and Building Sweden

NCC (Nordic Construction Company) is one of the largest construction companies in the Nordics, operating in Sweden, Norway, Denmark, and Finland. The company employs around 11,800 people and had sales of approximately SEK 62 billion in 2024 (NCC, 2025). NCC is structured into three business segments and six business areas. This case study focuses on NCC Building Sweden, which is responsible for constructing and renovating residential, commercial, and public buildings in Sweden. The business area employs around 2,700 people and accounted for 22% of NCC's net sales in 2024 (NCC, n.d.a).

NCC identifies four strategic focus areas: strengthening corporate culture, working in data-informed way, being proactive with customers, and utilising collective knowledge. Among these, becoming a data-informed company requires significant investment in digital tools and IT infrastructure, along with a transformation of work processes. In this context, the digital transformation is expected to enhance collaboration, efficiency, and competitiveness, and to align operations with sustainability goals. To achieve this, three goals are defined: enhancing interaction with stakeholders, improving internal efficiency, and enabling new business models. Examples of digital tools currently in use include Virtual Design and Construction (VDC), drones, artificial intelligence (AI), and virtual reality (VR). However, it remains unclear how these tools will be integrated into existing systems and processes, or how they will contribute to reshaping current practices (NCC, n.d.b).

4.2 Common development Plan and FileMaster

NCC's transition to a data-informed organization is guided by its *Common Development Plan (CDP)*, which coordinates digital development across the company. According to internal strategy documents, the CDP is described as a strategic, stepwise plan outlining how NCC intends to achieve its digital ambitions. It is one of five core components of the company's digital strategy, alongside Virtual Design and Construction (VDC), Business Analytics, Data Management, and Information Security. Together, these elements aim to structure data, support efficient decision-making, and ensure secure digital operations. According to NCC's strategic documents, the company has made substantial progress in its digitalisation efforts. However, both a clear, step-by-step vision for implementation and the perspective of employees, the ones expected to use the digital tools, remain less visible in strategic documents.

Within the CDP, one of the development projects is the *Construction Project File Management (CPFM)* initiative. As stated in NCC's internal strategy presentations, the purpose of CPFM is to provide a group-wide solution to be used across all business areas involved in the core construction process, including early sales and aftermarket phases. To realise the goals outlined in the CDP, NCC partnered with an external technology supplier, one of the largest international providers of document management systems. Rather than developing a system in-house, NCC chose to adapt an existing platform offered by this supplier. The solution was tailored to fit NCC's construction project needs and was rebranded internally as *NCC FileMaster*.

The implementation of FileMaster serves as the empirical focus of this case study. It provides a concrete example of how digital tools are introduced in practice and how employees engage with these tools in daily operations. NCC FileMaster is explained in the strategy documents as a key initiative designed to streamline file management in construction projects, reduce administrative workloads, and ensure a unified way of working across all projects. As the Head of Operation Development at NCC Building Sweden explains: *"By implementing NCC FileMaster, we introduce a group-wide solution for managing construction project files efficiently. This initiative establishes a common framework and serves as the foundation for other systems, ultimately future-proofing NCC."*

FileMaster is a document management system used during the design and planning phases of projects, spanning from the tender stage to handover. It facilitates a standardized approach to document control and traceability across all projects and employees. The system is intended to support more structured file handling by allowing users to categorize documents with metadata and tags, enabling improved organization and easier retrieval. Its planned integration with other systems is expected to reduce administrative tasks and support the project teams in making use of NCC's collective knowledge and experience. These intended benefits are part of the broader ambition to improve efficiency and consistency in project delivery through digital tools. The following two section describe the findings from the document analysis.

4.3 Communication strategy and training

The strategic materials, along with a brief presentation on the execution of the CPFM project and a separate overview of the FileMaster implementation plan, were primarily directed toward management-level roles. The content focused on the project's purpose, high-level objectives, and expected benefits, while offering limited practical information for employees further down in the organisation. The implementation plan was briefly described and lacked concrete, practical steps or clear guidance on how the tool should be introduced in daily work routines. The communication material related to the project conveyed a consistently positive and optimistic tone, highlighting enthusiastic responses to FileMaster and the perceived benefits of the tool. At the same time, it did not acknowledge any potential concerns, uncertainties, or resistance that employees might face during the implementation. Additional materials included user manuals and an access guide for FileMaster. These documents were short and functional, pointing users to further resources, such as the names of Super Users and available support. However, they lacked in-depth explanations and were not always intuitive or easy to follow from an outside perspective.

The communication material reviewed also included a PowerPoint presentation intended for internal users ahead of the FileMaster launch. The presentation is titled *"NCC FileMaster is here!"* and reflects a confident and solution-oriented tone. Early slides highlight the urgency and rationale for the change, with statements such as *"New projects request to start every day"* and *"No digital construction site without FileMaster!"* suggesting that the tool is positioned as a critical enabler for NCC's broader digital transformation.

According to the material, FileMaster replaces existing storage systems, PDS for documents, the CAD pool for model files, and temporary Teams folders, for all new

projects starting from April 2024. Users are explicitly instructed that no files may be stored outside of FileMaster's SharePoint. The motivation for this shift is that fragmented file storage across various platforms has previously led to inefficiencies, including outdated file versions, lack of mobile access, and difficulty in retrieving documents. FileMaster is described in the presentation as a unified solution that supports long-term document storage through a common cloud-based platform, alongside project-specific SharePoint sites for daily work. The PowerPoint frames the change as essential for becoming more data-driven and mobile on-site. It claims that the new setup will reduce repetitive tasks and improve version control, while still being similar to existing ways of working, saying that *"it's not such a big change compared to today."*

In terms of roles and responsibilities, the material emphasizes that Design Managers play a central role in the implementation of FileMaster. They are responsible for setting up the project-specific SharePoint site and act as owners of the digital workspace, similar to their previous responsibilities in portal-based systems. It is noted in the Power Point that Design Managers will be more directly affected by the change compared to other roles and therefore require extra training. It also states that they are responsible for providing onboarding and support to other project members as new projects are initiated.

Training was structured into three blocks:

- Block 1 provides general information about FileMaster and the SharePoint template, addressing basic questions such as what, why, how, when, and who.
- Block 2A is role-specific, focusing on how individual roles are affected, what users need to know, and where to turn for support.
- Block 2B covers technical training in FileMaster and its associated SharePoint environment.

Training was planned for several target groups. Design Managers and Business Managers were included in the first wave, with training delivered by so called *Super Users* in March 2024 (see explanation in 4.4). According to the communication material, Design Managers are also responsible for educating other project members within their respective construction projects as FileMaster is introduced. While additional groups such as VDC leaders, purchasers, site managers, and project managers are mentioned in the broader training plan, the specific communication reviewed only outlines that their training plans are developed in collaboration with the respective department representative (a so-called *Change Agent,* see explanation in 4.4) and the design manager. Positive feedback is cited in the presentation, with comments such as *"It looks good and is easy to get into"* and *"There's not much difference compared to how we work today,"* reinforcing the message that the tool is familiar and manageable.

While a variety of user guides and manuals were available in NCC's guide portal, it lacked a clear structure for navigating or understanding which guide was relevant for which user group. Several guide titles were either misleading or inconsistent with the content, making it difficult to determine their purpose. For example, the guide on metadata tagging (mislabelled as a FAQ in the portal) consisted of a long, uninterrupted list without segmentation, role-specific instructions, or contextual explanation. There

was no distinction between guides intended for different roles, such as Design Managers, architects, or designers, resulting in a situation where all users were expected to browse through all material, regardless of relevance. The content was also purely instructional, often jumping straight into technical steps without introducing the purpose or benefits of the task. Although many step-by-step video clips were included, they lacked background information and audio narration, limiting their usefulness and making it harder for users to follow the material at their own pace. Overall, the guide portal appeared unstructured and not user-friendly, limiting its effectiveness as a support tool for the implementation of FileMaster.

4.4 Role structure and practices

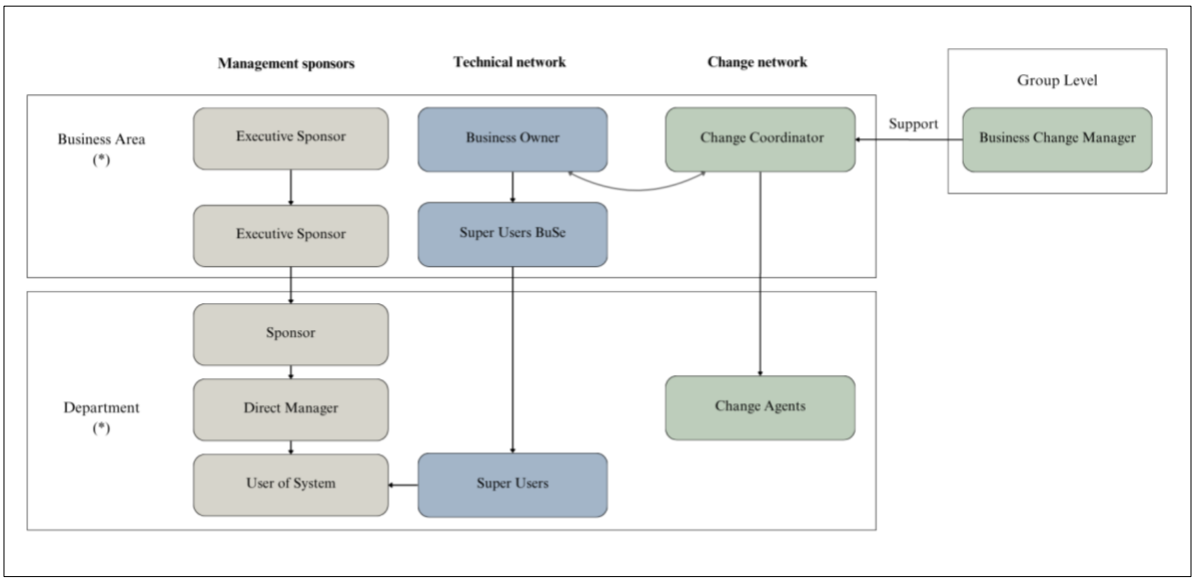

Figure 4.1: Organizational chart over the structure of NCC's networks and roles involved in the implementation of new solutions.

* NCC Building Sweden is organized into four divisions, which are further divided into ten region-based departments.

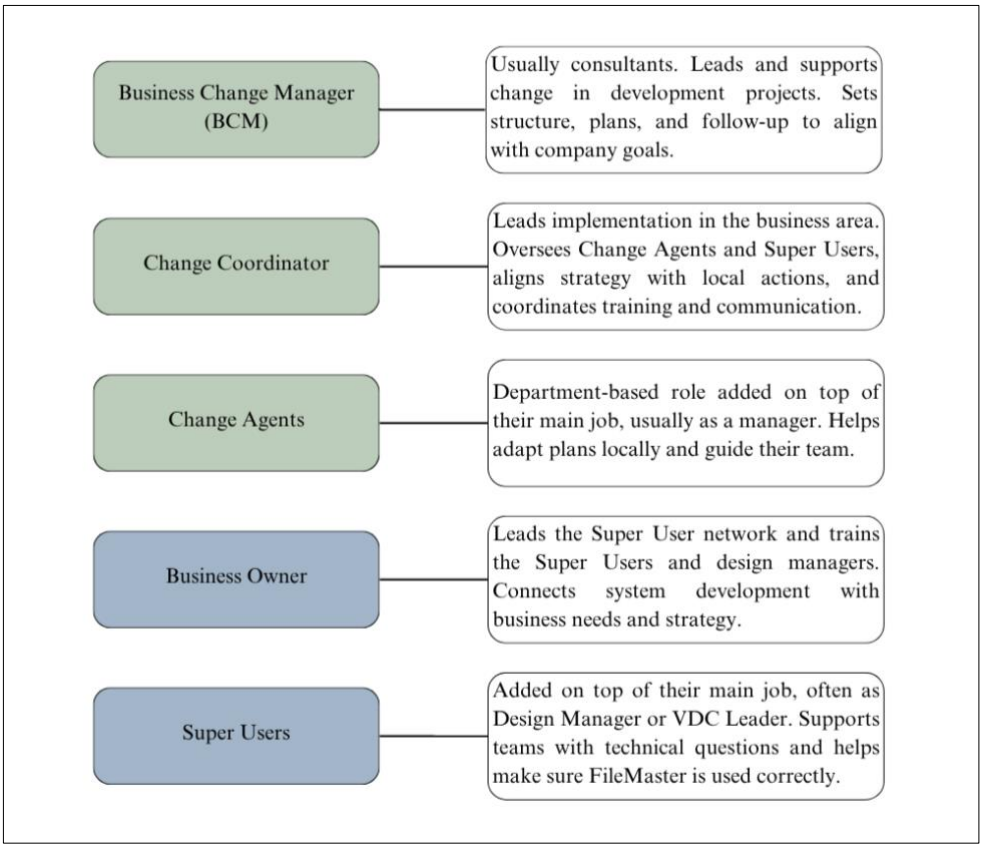

Figure 4.2: Explanation of the roles involved in implementations.

To manage the organizational shift towards becoming a data-informed company, NCC applies a structured change management approach. The includes defining clear roles and responsibilities throughout the organization to guide and support change processes, both at the strategic and operational levels. At the group level, a core Business Change Management team is responsible for overseeing NCC's overall approach to change management. They also support the selection of *Business Change Managers (BCM)*, who are often external consultants operating at the development project level. Within each development project, the designated BCM works alongside the line organization to form a dedicated change team. Their role spans three key phases: preparing for change by developing strategies and sponsorship models, managing change through planning and execution, and reinforcing change by monitoring progress, managing resistance, and applying corrective actions. These managers are also tasked with defining the structure for managing change in individual projects, including determining whether a sponsor is required, assigning *Change Coordinators*, and identifying *Change Agents*. Their work is intended to align each initiative with NCC's broader development goals.

At the BA level, Change Coordinators are appointed to facilitate the local implementation of development projects such as FileMaster. These coordinators are supposed to oversee the work of Change Agents and Super Users, ensuring alignment between the group-level strategy and department-level execution. They are responsible for implementing communication plans, coordinating training efforts and tracking measures such as surveys, assessments, progress reports and performance monitoring. Further, Change Agents operate within individual departments and are selected based

on their involvement in or influence over the areas affected by change. They are often managers or team leads with the authority to guide their teams through transitions. Their responsibilities include local adaptation of the implementation plan, supporting colleagues, and ensuring that change efforts are embedded in day-to-day activities. In certain cases, depending on the size or complexity of a project, Change Agents may also take on the role of Super User.

Super Users are employees out in projects, not unusually design managers, who also got a responsibility to provide technical support and hands-on guidance to colleagues within their departments. The Super User structure is organized in several layers. At the top, the *Business Owner* oversees the technical forum, managing system development and providing strategic direction. This role is supported by the *Super User BuSe* (BA Super User), focused on training and Super User support. Beneath them, department-specific Super Users offer project-level assistance, responding to user needs and ensuring that FileMaster is adopted effectively across teams. Training and knowledge transfer follow a "train-the-trainer" model. Before rollout, BA representatives, the Super User BuSe, participate in training sessions led by the Business Owner. These representatives, together with the Business Owner, then return to their departments to train Design Managers and Super Users. Here, the Business Owner acts as a trainer for the Super Users BuSe, who in turn train become trainers, thereby the name "train-the-trainer". While design managers may not be directly involved in system planning, according to the company documents, their perspectives are represented by colleagues who contribute to the development process and ensure feedback is integrated into system design.

The FileMaster implementation within NCC Building Sweden is supported by two key forums: the technical forum and the implementation forum. The technical forum is the super user network led by the Business Owner and focuses on system development and user support. The implementation forum is led by the Change Coordinator and includes Change Agents who are responsible for deploying the system within departments, ensuring both operational relevance and alignment with the broader digital strategy. According to internal documents, these two roles are intended to support each other across different stages of the implementation.

In the initial rollout period, extra support was explained to be available from the Agile team and IT, ensuring quick response to issues and user feedback. To enable long-term adoption and ownership, four core tactics are used: regular Agile team meetings to track development, continuous follow-up with Super Users, structured training programs, and active engagement with business owners and sponsors. Training materials are being transferred from the Agile team to the Change Coordinators in each BA, who are responsible for distributing knowledge across networks and user groups. English has been selected as the standard language for these materials.

In the explanation of sustainment actions, timelines, and roles, it is evident that not only change coordinators and change agent are the main actors, but also leadership plays a key role. The official sustainment plan outlines a timeline from June 2024 to December 2029 and includes targeted activities to reinforce the change after project closeout. For example, ongoing communication efforts, such as updates on progress, benefit realization, and employee follow-ups, are expected to be led in part by senior managers. Leaders are also identified as responsible for celebrating successes, rewarding

employee engagement, and recognising those impacted by or involved in the change process. Furthermore, performance support is described as relying on visible and continued involvement from managers at various levels, in addition to Super Users, Change Agents, and change coordinators. To support transparency and communication throughout the organization, NCC shares information about ongoing change initiatives via internal platforms, including documentation, presentations, and monthly webinars. These channels are accessible to all employees, from senior management to departmental staff, and are intended to maintain alignment, encourage engagement, and provide continuous updates on progress.

5 Empirical Findings

The interview analysis identified several recurring themes and sub-themes related to the implementation of FileMaster. These themes reflect how individuals interpreted the implementation of digital strategy, coped with challenges, and engaged with the system in practice. The findings are presented in the sections below, structured around the five main thematic areas identified.

5.1 Development and implementation

5.1.1 Development of FileMaster

According to Senior manager 3, the development of FileMaster followed a multi-year planning and selection process. Approximately forty systems were evaluated before selecting the current solution, which was supplemented with a SharePoint structure due to missing functionality. The goal was to create a unified platform that could serve multiple departments and countries, but this ambition caused delays and required several compromises. Aligning business needs across such a large and diverse organization was described as a key challenge. Further, Senior Manager 3 explained that representatives from the operational business side were involved in early requirement workshops, system demos, and user testing. From the perspective of the FileMaster development team, this was viewed as proof that the business was involved in the development process and that input was not limited to IT or developers alone. However, many design managers stated that they had not been involved and felt that their needs were overlooked. While representatives from the business had participated, these were often from higher organizational levels, not from operational roles. Several design managers questioned whether their feedback had been taken into account. Some described early demos as unconvincing and not adapted to project work. Others expressed uncertainty about whether feedback had been used at all.

> *"There was a meeting where we were asked to leave some comments and give our opinions […] What I can remember is that it [FileMaster] looks pretty much like the early version, just like it looks now." – Interviewee 19*

Interviewees also noted limited transparency in how feedback was handled in the development process. For most of them, their feedback about usability were not addressed, and several felt the system had been designed without a clear understanding of operational workflows.

5.1.2 User Acceptance Tests

During the pre-implementation phase of FileMaster, selected representatives from business units were invited to participate in so called User Acceptance Tests (UAT). In NCC Building Sweden, one design manager and one VDC leader were involved in evaluating the system before rollout. According to one of the senior managers, this phase was intended to allow users to test core functionalities and provide feedback. However, the two participants described the UAT process as limited. They acknowledged that the intention was good but felt the testing was constrained and predetermined.

"I experienced that it was very predetermined. And even the things we discovered that we felt, 'these are a bit critical,' I did not really experience that they got solved either." – Interviewee 6

The test environment was described as overly simplified, with one scenario involving around thirty documents, which did not reflect the volume or complexity of real projects, that each can involve thousands of documents.

"The test environment was set up in a way that made everything look great […] When you do these digital test environments, make sure you do it on something that is real and bigger than a fictional environment created just to make you look good." – Interviewee 20

Both interviewees expressed that identified issues were not visibly addressed and that key decisions had already been made prior to testing. They described the session more as a walkthrough and training, than testing the functions in the program, with all features already decided.

5.1.3 FileMaster is coming

According to many interviewees, communication about the upcoming system started early and was sustained over an extended period. While one of the senior managers explained that early visibility was intended to build awareness and readiness, the extended and abstract nature of the messaging had mixed results. Several participants recalled first hearing about the change a year or more ahead of the rollout. General information about the system and the coming digital shift was provided at a strategic level, but detailed demonstrations or walkthroughs of the actual tool were absent during this phase, leaving many with a vague understanding of what FileMaster would entail. Interviewees described that as the months passed, the message that "FileMaster is coming" was repeated so frequently and for so long that it began to feel routine or hollow. As one interviewee summarized:

"I think that they made, in hindsight, maybe a small mistake in that they informed about everything very much and very early […] So, it almost became like crying 'wolf is coming.' And many got tired of it and maybe didn't get the answers they wanted." – Interviewee 8

Also one of the senior managers acknowledged that the awareness phase lasted too long and could have been more closely aligned with actual rollout timelines, but that unplanned delays made it hard to foresee this in advance.

5.1.4 Implementation in practice

A few months before rollout, the two users involved in the UAT were appointed Super Users for Building Sweden and given responsibility for leading training across departments. They stated that no formal plan or structure had been provided, and that they were expected to organize the next phase independently:

"There was no plan. We were the plan […] And they were just celebrating that they had finished with the program. And I know

that [Interviewee 6] and I just looked at each other, and we were like, 'What you've done in three years, that's like a piss in Mississippi. It's NOW it begins.'" – Interviewee 20

At the project level, several design managers reported that the formal implementation of FileMaster began abruptly, with limited preparation. In some cases, users received access to the system just before it became mandatory. One interviewee expressed that while the central team had been working on the initiative for a long time, those working in the projects, away from headquarters and not involved in internal meetings, felt excluded from the process. The interviewee explained that this created a sense of separation, as if there were two different organizations operating within the same company. So despite prior communication, many design managers explained that the rollout felt sudden, especially in departments without prior involvement or pilot experience. As one design manager recalled:

"Suddenly, they presented it about a month before, like, 'From this date, no one can start a new PDS.'" – Interviewee 16

Users involved in new projects started using FileMaster first. Some received support from colleagues with higher system knowledge, while others explained a lack of guidance and encountered technical issues. A few stated that earlier walkthroughs could have reduced confusion, instead of wating until the launch with presenting the program and its features. Many described the rollout as a system deployment rather than a managed change process and interviewees experienced variation in support across departments. In areas with high workload and no time in-between projects starts, the lack of on-site guidance led to frustration. Onboarding was described as minimal, and some users recalled receiving access to FileMaster along with manuals, but without training or direct support:

"Yes, here's the startup, here you have it, and here are the manuals, good luck." – Interviewee 22

Further, interviewees noted a lack of clarity around roles, support structures, and the purpose of the system. Some stated they did not understand how FileMaster connected to NCC's strategic goals or what benefits the tool would bring. While one of the senior managers explained that they believed they had explained the reasons behind the transformation and its benefits, many design managers felt that this explanation had been vague or too abstract. Concepts like "becoming data-driven" or "future-proofing" were seen as disconnected from the practical realities of project work, where daily priorities were focused on delivery, cost, and tight timelines. Additionally, several design managers stated that FileMaster was released before the system was fully developed. The phrase "80 is the new 100" was explained by some interviewees to often be cited in central communication to justify launching the tool before it was fully polished. However, some felt that the delivered version fell far short of even that lowered bar, and disagreed that the system was functioning at 80%, especially during the first year, and saw the early implementation as rushed and damaging.

"Maybe that's not wrong, but then it should damn well be eighty percent, and not twenty percent like it is in FileMaster." – Interviewee 13

From the senior managers perspective, some interviewees expressed overall satisfaction with how the rollout was structured. One pointed to the use of a network-based support model, the "train-the-trainer" approach, and a clearly defined communication strategy as strengths. Another interview from the planning side noted that the overall change management model was designed to integrate people first, and only then start working on processes, and lastly the actual tools. These central actors, while acknowledging reactions, believed the system had been overall successfully developed and implemented in the business area, and that it now was handed over to the departments for further integration.

5.2 Roles and responsibilities

According to an interviewee from the planning side, responsibility for the continued development and support of FileMaster transitioned to an agile team after the initial project phase. This team managed the backlog, coordinated development sprints, and handled ongoing system refinement. To address the complexity of organization-wide implementation, two senior managers interviewed described a multi-layered support structure, with Super Users, Change Agents, and agile development team members, alongside formal communication forums. These were intended to ensure competence-building, shared responsibility, and consistent internal support. As explained by one of the senior managers, the structure was developed during the planning phase by change leaders and business developers. Two networks were established: one for technical deployment and one for communication.

5.2.1 Technical network

The Super User structure was explained to be established to embed local support, collect feedback, and promote FileMaster adoption within departments. According to the senior managers, Super Users were expected to act as first-line support, assist with onboarding, and report issues or experiences to central teams. They also participated in recurring weekly meetings to receive updates, share challenges, and exchange solutions. Interviewees described these forums as helpful for peer learning and issue escalation. The meetings enabled support to flow from departmental Super Users to high-level Super Users, the service desk, and the supplier if needed. However, the functioning of the Super User role varied. One of the experienced Super Users that was supposed to train other Super Users stated they began the role without preparation:

> *"I had no knowledge of FileMaster at all other than that I had tested it in this test environment […] That's very naive." – Interviewee 20*

Most Super Users also held roles such as design manager or VDC leader, and several reported insufficient time to fulfil their additional responsibilities. Some said the role required minimal extra time, while others described missing meetings, lacking capacity to assist colleagues, or falling behind on updates. In some departments, users did not seek help from their Super User due to perceived unavailability or insufficient knowledge. One interviewee explained that they received more help from a colleague outside their department than from their own support structure. This lack of clarity led to inconsistent understanding of responsibilities, particularly in large departments where high workload made internal training difficult. Further, feedback loops in the network were also described as weak. While the forum allowed users to report issues,

some interviewees were unsure whether their input led to any action. Some Super Users explained that they used the meetings primarily for personal help rather than driving improvements within their department. Several said they were unaware they were expected to train others and assumed the role involved attending meetings rather than active teaching.

> *"I hope it's not intended that I should teach others […] I've mostly sat as a listener." – Interviewee 18*

Structural issues were also raised. One Super User noted that forums combined participants from different business areas, which were at varying implementation stages and used FileMaster in different ways. This made the content less relevant for some attendees. In some departments, continuity was lost when Super Users left their roles. One design manager noted that no replacement was assigned, leaving the team without a clear point of contact. Further, several interviewees pointed out that while the network of Super Users was useful, it was not enough for a successful implementation. Instead, they called for clear, visible implementation leaders in each department or project team who could answer questions, guide daily work, and ensure that people stayed on track.

5.2.2 Communication network

Each department within NCC Building Sweden appointed a Change Agent to support the communication and coordination of FileMaster implementation. According to the Senior manager 2, Change Agents were selected early in the planning phase, often being in a managerial position with mandate to make decisions, and trained centrally to deliver standardized messages. Their tasks included communicating updates, supporting local adoption, and coordinating with central roles such as the Senior manager 1 and 2. However, a significant number of interviewees had never heard of the Change Agent role at all. Even among those who had, most could not identify who held the role in their department or explain what the person was meant to do. In cases where the role was identified, interviewees described Change Agents as detached from the implementation. One Super User BuSe described performing the operational work while the Change Agent remained passive:

> *"They [Change Agent] say, 'I have the role, but you're the one doing the work.' But then, the authority of what you're doing kind of disappears." – Interviewee 20*

Some interviewees said the Change Agent in their department had limited system knowledge or misunderstood their task. One noted that the role appeared to be treated as a title without clear contribution:

> *"He comes and says that happily now and then […] I haven't seen the effect of his work directly […] Unclear if he does anything or if he's just happy to be called 'Change Agent.'" – Interviewee 3*

One Change Agent confirmed that they acted mainly as intermediaries and were not involved in system-related issues, relying on Super Users to identify problems, while their own function was to pass on information. In practice, Super Users was often explained to take responsibility for informing teams, handling questions, and resolving

issues, while lacking formal mandate or time. In the Change Agent forum, one participant observed that few peers actively participated, while many remained silent. This raised concerns about the engagement and selection of Change Agents. The Change Agent explained that some appeared to have been assigned due to their position rather than interest or capacity. From a central perspective, however, the network was described as well-structured and planned. According to the Senior manager 2, support roles were defined, training for Change Agents was delivered, and departments had reached a stage of self-reliance after two years.

The emotional framing of communication in the change network also became a point of tension. One Change Agent felt that the internal messaging had been too optimistic, even when real problems persisted. The interviewee explained that the tone used in internal meetings was overly enthusiastic in a way that unintentionally weakened trust in the process, with the person leading the communication often presented an overly positive picture of the situation and seemed unwilling to acknowledge the problems that still existed. They explained that it became difficult to take the messaging seriously when it consistently emphasized how well things were going, even though many users were still facing significant issues.

5.3 Leadership and ownership

5.3.1 Leadership support

Interviewees in different levels emphasized the importance of leadership involvement and clear sponsorship for the implementation of FileMaster. However, several design managers stated that this commitment did not consistently translate into operational leadership within departments. According to the Senior manager 1, the intended model was a cascading structure, where sponsorship flowed through the line organization from top management to project teams. Different leadership levels were expected to deliver different messages: strategic communication from top management and operational expectations and adoption in practice from immediate managers. Several interviewees confirmed that digitalization was clearly prioritized by NCC leadership. Messages from the CEO about becoming a data-informed company were widely referenced and viewed as consistent and clear. However, interviewees frequently described limited visibility and engagement from line managers and a lack of practical involvement. For example, some interviewees described closer managers as occupied with other responsibilities or uninformed about FileMaster and its relevance. One interviewee explained that a manager suggested reverting to older tools when technical issues with FileMaster's SharePoint occurred:

> *"When I came in, SharePoint wasn't working […] one of the managers said quite clearly, 'we're going back to Teams.' It was only then that they [centrally] said 'No, no, you can't do that.'"*
> *– Interviewee 12*

One group manager was explained to be fully engaged in another large project and had minimal involvement, while others were described as not actively included in implementation activities or did not use the system themselves. In some departments, design managers or VDC leaders led implementation without support from project or group managers. Several interviewees noted that their manager had never discussed

FileMaster with them and some stated that FileMaster-related information was communicated informally, rather than through clear leadership channels. Interviewees also pointed to a lack of structured follow-up. Once the system had been introduced, few departments experienced consistent support or review of adoption progress. One design manager explained that issues were addressed only when escalated, but there was no routine for checking if implementation was proceeding as intended.

In some departments, clear communication and anchoring to middle managers had been missing altogether. One group manager described a paradox in the expectation to assign project staff as Super Users while also being held financially accountable for maximizing billable hours. Without formal anchoring or support from higher levels, this created tension between business development expectations and operational realities. In contrast, another group manager felt that their department had taken clear responsibility for the implementation and described it as a matter of professional initiative. They pointed out that in the absence of clear mandate, it is still possible, and necessary, for managers to proactively seek clarity and push for what is needed.

> *"You can't just sit and wait for someone to come and say, 'this is your mandate'... If I don't know something, then I find out."*
> *– Interviewee 13*

Some interviewees also reported positive experiences. In a few departments, immediate managers collected feedback, followed up on implementation, and acted as informed points of contact. However, these cases were described as exceptions rather than the norm. Several interviewees reflected that stronger, more consistent leadership presence would have made the transition to FileMaster more manageable and less dependent on informal initiative.

5.3.2 Ownership of the implementation

Several interviewees noted that FileMaster implementation was largely pushed to the departments without an accompanying structure for ongoing guidance. Messages such as "we are going live, reach out if you have questions" were described as placing the responsibility on each department to figure out the rollout themselves. While tools and materials were made available, the lack of assigned leadership or formal follow-up created uncertainty about who was responsible for leading the change.

> *"That's the most frustrating part, that it was just released like that. So they pushed the responsibility to the projects. But that's how it is in NCC, they push everything to the projects. There's no central administration." – Interviewee 15*

Early adopters explained how the absence of formal ownership meant that they had to explore the system on their own initiative. In several cases, employees started using FileMaster, arranged workshops, or tested the tool without direct support, simply because no one else had taken responsibility for coordinating the change. In several departments, design managers described taking on FileMaster implementation in addition to their core responsibilities. They guided their teams, answered questions, and introduced the tool without formal leadership involvement or decision-making power. Some expressed frustration for being expected to train others without dedicated time:

"Then I'll have to stop being a design manager, and that's just crazy." – Interviewee 15

A group manager reflected that more preparation should have been directed toward equipping line managers. They noted that without strong leadership from the immediate management level, motivation among employees was harder to sustain. Project managers were frequently identified as key to implementation. Interviewees in middle positions described them as central figures for translating strategy into daily routines. One Change Agent pointed out that project managers were the main target of their communication, and even when they were informed, their ability to deliver consistent messaging to their teams varied depending on context and project phase. In departments where interviewees explained managers taking initiative, provided guidance, and supported their teams, implementation was described as smoother. In contrast, departments where leadership was perceived as disengaged or unclear, often relied on informal efforts by Super Users or design managers. One Super User described the difficulty of promoting change without backing:

"We try to sell this: 'Now we have to do this' […] but then you're struggling to convince a site manager and a foreman to change their way of working […] if there hasn't been a clear directive from above." – Interviewee 18

5.4 System and support structures

5.4.1 Technical issues and bugs

Among all the challenges described by interviewees, technical issues stood out as the most consistent and frustrating theme. Users consistently reported issues related to uploading and downloading files, system slowness, failed metadata tagging, and disappearing documents. Delays of several hours or days were common during the early rollout. Some described being unsure whether a file would eventually upload or if they had done something wrong, leading to long waits and growing frustration. Interviewees also described system limitations when handling large file volumes. Uploads failed without explanation, and files often remained unpublished. Several design managers explained that these issues affected critical project deliveries. Especially in projects with tight timelines and high financial stakes, with up to billions-SEK developments, these inefficiencies were felt acutely.

"Basically, there's been a problem with almost every functionality in FileMaster […] right now, it's just really frustrating." – Interviewee 13

Interviewees explained that, over time, many of the critical bugs were resolved. However, the early instability created lasting scepticism. Some stated they continued to back up files in parallel systems or delayed full adoption due to concerns about reliability. From the development and coordination side, these problems were acknowledged. Senior manager 2 and 3 admitted that FileMaster required much more troubleshooting than earlier systems and that rollout had been hindered by the large number of unexpected bugs. In several cases, development had to pause feature updates just to focus on stabilizing the system.

5.4.2 Metadata and new way of working

The transition from a folder-based structure in PDS to metadata-based document handling in FileMaster was explained to result in a major shift in how users were expected to organize and retrieve files. Interviewees described this change as more than technical, since it required a different way of thinking about document management and a big change in their way of working. Several users found the metadata structure difficult to understand. The tagging categories were unfamiliar, and many pointed to the absence of a clear and practical tagging template. As a result, interpretations varied, making it hard for others to locate documents. In larger projects with thousands of files, some interviewees said they had to use multiple search strategies to ensure they found all the necessary material, since they could not rely on the metadata alone.

> *"There's no official template [for how to metadata-tag]. And I think that would at least have been a basic requirement, a hygiene factor for implementing such a system." – Interviewee 19*

Tagging also posed challenges when onboarding external users such as consultants and clients. Design managers described how external stakeholders frequently tagged documents incorrectly, even after startup meetings and repeated instructions. This required continuous oversight and correction, often by the design manager. In larger projects with many external users, design managers said they had to put a lot of time on repeating the same instructions and manually corrected metadata entries.

5.4.3 System usability and structural fit

Several interviewees raised concerns about the usability of FileMaster and it's fit with NCC's daily project work, and many described it as unintuitive and difficult to navigate. The system was seen as misaligned with established workflows, which increased the workload and added administrative tasks. Interviewees explained that FileMaster felt like a tool that NCC had to adjust to, rather than a system built around project needs. Some said that instead of reducing complexity, FileMaster introduced new steps and uncertainties that disrupted existing routines. One user explained that it was easy to make mistakes and difficult to trust the system, which led them to double-check using several methods to avoid missing information. Basic navigation and layout were commonly cited challenges, and users familiar with PDS or traditional folder structures found the interface unclear. The attempt to simulate folders within a metadata-based system was described as confusing. Several interviewees found the layout dense and cluttered, making everyday tasks like uploading and locating documents unnecessarily complicated. Users also explained that if a document was tagged incorrectly, it could be difficult to find again. There was no simple way to view what had been uploaded, and many felt unsure whether files were in the right place. Editing or correcting documents required steps that were not always obvious or accessible. Although the system was described as flexible from one Senior manager, many felt restricted by locked functions or features they did not know how to master.

> *"You have, and that's probably the most notable, taken a system and not thought through our working methods and that this system should fit with this, but rather you've seen it as, 'let's take a system and change our whole way of working to make it fit with the*

system'. […] And that becomes quite heavy for us who are working in it today. Because we still have the same workload otherwise. We need to do the same things otherwise and then you add this on top, it makes it frustrating with this system, and you don't see the benefits, and you don't really see the reason why you should use it, because it doesn't help me in my work today." – Interviewee 13

Interviewees also pointed out that some features were technically available but not usable without specific knowledge or time to learn the system. While the developer explained the idea of FileMaster to be made easy to do right, difficult to do wrong, the system was described from design managers as difficult to do right and easy to do wrong. While some had no issue with digital tools in general, they found FileMaster overly complex and difficult to master without significant effort. Many also said that they struggled to see the system's value. Interviewees noted that FileMaster added administrative work that could not be invoiced, and increased the time needed for routine tasks. Some departments tracked the added hours separately to understand the cost of the inefficiencies. At the strategic level, however, the Senior managers described growing benefits based on usage statistics and financial indicators. From their perspective, system uptake showed positive signs of progress.

Lastly, interviewees also pointed to structural limitations in system administration. It was explained that few individuals within NCC had the rights or knowledge to make changes, even for simple tasks such as adjusting metadata fields or fixing incorrect document tags. As a result, even minor corrections had to be routed through multiple channels. Some were asked to input specific commands or scripts to work around bugs, but did not feel confident doing so or supporting others in the same way. Further, interviewees explained that specific project needs, such as client-required document types or naming standards, could not be quickly implemented without central help. This led to extra coordination and delays in adapting the system to local workflows. Some users, especially those familiar with the previous system (PDS), contrasted the current setup with past experiences where users had more autonomy. While interviewees noted that it may come with certain risks, it also allowed faster handling of routine issues. In FileMaster, they said, the added control had come at the expense of flexibility and speed.

The Senior manager 1 emphasized that implementation is about more than just installing a tool. For the system to deliver value, it must be consistently applied and integrated into structured processes. However, the manager also noted that NCC struggles to connect system use with standardized workflows, as tools, processes, and people are not always aligned. One example described was a meeting that was expected to focus on working methods, but instead centred on system architecture.

"I was early invited to a meeting to talk about processes. I was really happy, […] And then the meeting was about article standards and how information flows between systems. Very important to discuss, but not what I wanted to talk about. Who is affected by it and in what way, and how should we talk to them, and how will their everyday work change? That's far away." – Interviewee 1

5.4.4 External collaboration

As explained in Section 4.2, NCC collaborated with an external technology provider in the development and implementation of FileMaster. Many interviewees expressed frustration with the external supplier responsible for FileMaster. Although most users were not directly involved in the collaboration, they observed delays, limited responsiveness, and unclear communication, resulting in high resource demands on NCC to compensate for supplier shortcomings. Several explained that once an issue was escalated beyond NCC, progress stalled. Even problems that disrupted project work could remain unresolved or receive vague responses.

> *"If we can't solve the problem internally, then we send it to [the supplier], and we often get the answer, 'it's supposed to be like that.' And that's kind of it, you would have liked to have an explanation like 'yes, it works like this because…'" – Interviewee 9*

Users also noted a lack of transparency when reporting bugs or requesting changes. Reports were tracked internally in NCC, but several interviewees said tickets remained open for months without resolution or explanation. Some questioned whether the system had been fully evaluated before procurement, suggesting that its ability to handle NCC's scale may have been overestimated.

From the supplier's perspective, these issues were acknowledged. The supplier representative explained that the project had been affected by multiple internal handovers at the supplier, which delayed progress. With only a limited number of developers per sprint and manual replication required across test, beta, and production environments, delivery times were extended. Further, the supplier operates on quarterly release cycles, which made fast changes difficult. A notable misalignment also involved the definition of priorities. The supplier representative explained that while the supplier treated only full system outages as priority one, NCC experiences serious disruptions even when a single large project is affected. This mismatch in severity definitions delayed responses to what NCC teams considered critical. The supplier representative noted that efforts are ongoing to improve this alignment, but it remains an operational challenge. Additionally, communication issues were also described as a great challenge. One example was how both parties interpreted volume expectations during early discussions. The supplier initially compared NCC to other clients using similar systems but underestimated the scale of daily activity.

> *"And then we realized, 'oh, but hang on, you mean every day in every project? Right. That could be a problem.'" – Interviewee 23*

According to the supplier representative, NCC's workflows were not clearly communicated early in the project. On the supplier side, fragmented responsibility across teams for development, support, and upgrades caused confusion. Both sides noted that emails were often sent to large groups without clear ownership. Over time, contact points and routines improved, but early inefficiencies had lasting effects. Limited resources on the supplier side were explained adding to the challenges. Consultant turnover, leaves, and lack of backup led to inconsistent support and disrupted progress. The supplier also acknowledged that sales teams may have promised functionality based on long-term roadmaps rather than current capabilities.

Senior manager 3 confirmed many of these points. They described how repeated consultant changes led to inconsistent guidance and lost knowledge.

> *"You would want to have the same resources from [the supplier] who implement and guide us how to do things and how to build out the solution from A to Z really, through the whole journey."*
> *– Interviewee 24*

According to the Senior manager 3, greater continuity would have improved progress and reduced rework. They noted that responsiveness has improved recently, but early delays affected implementation. On NCC's side, the developer explained that they could have done more early planning around metadata and document structures before engaging the supplier. Instead, some design decisions were made mid-project, which created unnecessary complexity and slowed progress.

5.4.5 Onboarding and support

A critical and recurring theme across interviews was the lack of sufficient, structured, and accessible support materials during the rollout and early usage of FileMaster. While higher-level interviewees explained that they did develop guides, webinars, and videos, many design managers found these materials to not be enough for proper learning. At the same time, some interviewees openly admitted that they did not rely on the manuals or guidance provided. Instead, they used a trial-and-error approach, clicking around the system to figure things out on their own.

> *"There are some instructions and stuff. But a lot of it is just clicking your way through and, you know, if you're going to assemble an IKEA furniture, you throw away the instructions and just try your way. A bit like that, a lot of trial and error." – Interviewee 16*

Onboarding experiences varied. Some mentioned helpful introductory webinars or test environments, but stated that real understanding came only through hands-on use. Others recalled minimal onboarding, an email, a link, or a short walkthrough, followed by immediate expectations to use the system. Interviewees emphasized the need for practical, pedagogical support. Beyond technical instructions, they asked for materials that explain how FileMaster connects to other systems, the function of metadata, and why the transition matters. Users, especially from departments with bigger projects, requested on-site assistance during project start-up, with someone available to explain processes, answer questions, and provide structured support. Further, several stated that no single person or function appeared responsible for the entire documentation workflow. Instead, support was fragmented across tools, making it difficult to understand how the systems were meant to work together.

Additionally, the long time it took to resolve technical problems was another recurring point. Reports of unresolved items in long Excel lists were common, and some noted that feedback provided weeks or months earlier had yet to be addressed. One user recalled a recent meeting where a list of outstanding issues was reviewed, but none had been solved. The experience left users feeling that problems were being collected without clear resolution. Several users said it was difficult to know whether feedback reached even the development team. When responses were delayed or unclear, it

created a sense of uncertainty and reduced trust in the system's reliability. This contributed to a hesitation to engage fully with FileMaster until improvements became visible.

"It took months to get it to work. And that's such an underachievement, I was speechless." – Interviewee 13

In several departments, users also expressed uncertainty about where to turn when Super Users could not resolve an issue. The boundaries between what Super Users should handle and what should be escalated to the service desk were not always clear. This sometimes led to delays or misrouted issues. Some interviewees noted that the support response varied greatly depending on who was contacted, and in some cases, problems remained unresolved or were redirected multiple times. One user explained that they often did not know whether they had reached the right person, which caused hesitation in reporting new issues. Language barriers were also noted. Since most support materials were in English, some users unfamiliar with technical terminology found it difficult to follow instructions. The lack of Swedish-language resources made onboarding more challenging. In response to user feedback, the developer explained that they now had begun reorganizing and updating the guides, including assigning a student to improve them.

Interviewees across departments also described limited internal control and high dependency on the external supplier as a big challenge. Several users explained that when technical problems occurred or changes were needed, internal teams had little ability to act independently. Instead, issues had to be escalated through multiple layers, often resulting in delays. The typical escalation path began with Super Users, who forwarded issues to central roles such as business developers or system owners. From there, problems were passed to the supplier. Interviewees said this structure caused slow response times that were incompatible with the pace of construction projects, especially when system issues disrupted document delivery or coordination.

5.4.6 Fragmented usage and working methods

Many interviewees described a fragmented implementation of FileMaster and related systems across NCC. While the strategic goal, as explained by several interviewees, was unified digital workflows, users reported that departments, projects, and individuals often developed their own approaches based on local routines, preferences, or project constraints. Design managers shared that technical issues made them stop using certain functions until it was confirmed that the problems had been fixed. One team chose to avoid a specific feature entirely after waiting weeks for coordination between support agents and the global supplier, resulting in temporary workarounds outside the system. Upload failures led to document delays, and some interviewees explained that this forced them to even bypass internal policies by duplicating uploads, using email, or sharing documents through external file services to keep projects moving and to avoid delays. In some cases, documents were uploaded to FileMaster but still shared through other channels to ensure they reached the intended recipients.

Several also explained the absence of clear guidance as a reason why they had to find their own way of working. Some continued using familiar tools such as SharePoint, others relied more heavily on NCC Field, while some avoided it altogether. This

inconsistent use of platforms led to variations in how documents were stored, named, and accessed. Interviewees also described creating their own metadata logic when tagging instructions were unclear. In some departments, local Excel templates were developed to manage classification. While this benefited individual projects, users acknowledged that each team's approach might differ from others, reducing consistency across the company.

> *"When we have documents that we don't know how to tag, we come up with our own way, just to get it uploaded. Is that right or wrong? No idea. We do a bit as we wish. And it feels kind of wrong. 'Now we're supposed to work the same way,' and then we have no idea how to do it." – Interviewee 22*

One interviewee noted that even within the same department, different projects worked in entirely different ways. Others described NCC as functioning like a network of small, independent companies rather than one organization with shared systems. At a broader level, several interviewees reflected that NCC may carry the name and size of a large organization, but internally it functions like a collection of small companies.

5.5 Change experiences

5.5.1 Emotional responses and resistance

The Senior manager 3 observed that, compared to other countries, Sweden's implementation had moved forward relatively smoothly, supported by resources and a generally positive climate. However, many interviewees described strong emotional reactions to the implementation of FileMaster, including frustration, scepticism, and resistance. Many explained that they were expected to change established routines without understanding the benefit or seeing improvements in their daily work. The transition was described as top-down and imposed, particularly since the previous system was still seen by many as sufficient.

> *"I don't like change. But then again, no one does. When you've found a way of working and have a way that you personally work and like, you don't want to change it. And especially not just because someone else says, 'now something's coming here, here's a shit sandwich, but it will be a shrimp sandwich in a few years.'" – Interviewee 15*

Some users said they felt stuck with a system they did not choose and had no real alternative. When bugs or inconsistencies occurred, it reinforced the feeling that the change was unnecessary or poorly managed. Others noted that even if PDS had limitations, users had adapted to it. One interviewee described how, although the old system had many flaws, people had learned to work around them. Now, with FileMaster, some users wished they could go back to PDS, not because it was better, but because it was familiar and manageable. They added that the current implementation had been so poorly handled that it made people long for a tool they previously considered inadequate. From the implementation side, emotional resistance was expected. Interviewees from the FileMaster project team explained how they tried

to support the change through communication and framing, including metaphors and change models. However, this was not seen as a winning concept by all end-users:

> *"That's a funny anecdote: When we were going to get it described to us for the first time, or when it was about to go live, they had hired some change consultant who started the day with a lecture on how people are when change happens, and that almost everyone dislikes change. And then she explained a theory where different types of resistance to change were described as different animals. So you can be the ostrich that sticks its head in the sand, and so on. But I remember, I've talked to so many colleagues, we were sitting there thinking, 'What kind of crap are you trying to sell us now?' when you have to bring in a change consultant to explain that we're an ostrich or a pig if we disagree. And sure enough, a completely unworked-out system came." – Interviewee 16*

The shift to metadata was also described as emotionally difficult. Even users open to digital tools said that the new way of structuring and retrieving information felt unfamiliar and hard to adopt. Combined with technical issues and poor usability, this led to people feeling disappointed and losing confidence in the system. Several said they initially tried to stay positive, but over time lost motivation when promised improvements did not materialize. Another interviewee reflected that some users still judged FileMaster based on early frustrations, even though the system had improved. They believed people were holding onto a negative experience from when things did not work and that those memories continued to shape their attitude, preventing them from seeing what had been fixed. At the same time, several said that the system placed additional stress on already pressured projects. Design managers and Super Users in particular spoke of the emotional burden of having to represent the system to others. They described feeling responsible for promoting a tool they were not fully confident in. Several described the emotional strain of having to stay positive in front of their team, even when they personally shared the same frustrations. In project meetings, they felt expected to show confidence in the system and encourage others, while privately feeling unsure and exhausted from trying to maintain that image.

> *"And then you have to keep a good face to all fifty project planners. 'This is really good. This is the new' because you have to set a good example. And then you go home and cry and feel like you're lying to people's faces. That's how I feel." – Interviewee 22*

5.5.2 Adaptation and gradual acceptance

Despite early frustration and resistance, almost all interviewees described an understanding of why the change was necessary. Several, even those who had previously been critical of the rollout, stated that they were optimistic for the future when technical issues were solved and disrupted routines stabilized. Others explained that while problems remained, their teams had started to adapt. Some design managers said that after months of using the system, they noticed improvements in functionality and user experience. Uploads became more reliable, metadata tagging improved, and onboarding processes were more structured. From the implementation side, this shift

was recognized. The Senior manager 1 emphasized the importance of reflecting on progress made:

> *"I also think it's important to note that we've come a long way, because when you're working with change, you need to stop and look around, like when you're climbing a mountain, you need to stop and see how far down you've come from where you started to realize, yes, it still feels as far to the top, but I've come a long way from where I was, and I think that's really important."*
> *– Interviewee 1*

Interviewees in different levels reflected that change takes time and that resistance often stems from uncertainty or the pressure of project work. Some believed that as teams learned the system and began to see benefits such as improved document traceability, acceptance would continue to grow. Still, interviewees emphasized that this acceptance was cautious, and some remained concerned about potential new bugs and inconsistent support.

5.5.3 Context and personality-based differences

Interviewees described how adaptation to FileMaster varied significantly across individuals and departments, influenced by personality traits, timing, workload, access to support, and local leadership. Some interviewees suggested that younger employees or those more accustomed to digital tools adapted more easily. However, older design managers interviewed sometimes expressed more constructive and adaptive views on the change, while some younger colleagues voiced sharp criticism. Moreover, those who described themselves as proactive, solution-oriented, or interested in digital development tended to frame the change more positively, even when they encountered technical difficulties. One Super User reflected:

> *"I am one of those people who is quite open to new things, I'm unusually open to changing my way of working." – Interviewee 9*

Interviewees who participated in early pilot projects and had direct access to experienced colleagues also described smoother experiences. Further, participants in smaller departments described a better communication and easier access to help. In contrast, interviewees from larger departments, especially those with more pressure, overlapping projects, or fewer support resources reported greater challenges. Especially one big department, with big and high pressure of projects, was consistently described by its interviewees as having experienced high resistance, project stress, and unclear implementation. All interviewees from that department shared critical perspectives. Additionally, while specialists and interviewees with extra technical education generally described a more open view to digital tools, this did not mean they were free from resistance. In fact, some of the interviewees with more critical reflections about FileMaster were deeply engaged in the rollout but became disappointed by inconsistent support, lack of autonomy in the system, or unclear benefits. Further, experience with previous systems also shaped perceptions. Employees who had used PDS for many years generally found the shift to metadata tagging difficult. Those who were new in the industry, joined NCC after FileMaster was introduced, or who had not developed strong habits around older systems, reported fewer problems adapting. Lastly,

interviewees also pointed to broader industry characteristics. Some described the construction sector as generally conservative and sceptical of digital tools. However, they did not identify fixed cultural barriers specific to NCC.

5.5.4 Change overload

Several interviewees described the implementation of FileMaster as one of many concurrent changes introduced at NCC, contributing to a broader sense of change overload. In addition to FileMaster, other digital tools, new processes, and development projects were launched during the same period. This accumulation of parallel initiatives was explained to make it more difficult to focus on or absorb any single change effectively. Interviewees explained that had FileMaster been the only major change, it might have been easier to manage. Instead, they describe it was added to already full schedules, reducing the time and attention available for onboarding. Some users said that multiple changes required learning several tools at once, while continuing to meet ongoing project deadlines. In one project, documentation handling, including FileMaster, was listed as a red-level risk due to the combination of system complexity and the number of simultaneous transformations.

> *"What has happened now is that a lot has come at the same time. […] many development projects that need to be completed and implemented and closed, and the business doesn't always quite keep up." – Interviewee 4*

The Senior manager 1 also highlighted the large number of ongoing implementations across the company as a challenge, describing that when combining several parallel initiatives, the organization risks being overwhelmed. Without cross-functional alignment and coordinated planning, these overlapping efforts, as explained by the manager, reduce focus and make it harder to achieve shared learning or synergy.

6 Discussion

6.1 Experience of digital transformation

RQ1: How do different organizational actors interpret and engage with FileMaster as part of NCC's digital strategy?

The implementation of FileMaster at NCC shows how an intended digital strategy can take on different meanings and outcomes in practice, depending on the actor's role, department, and prior experience. Using the Strategy-as-Practice (SaP) lens (Whittington, 2006; Jarzabkowski et al., 2007), this section explores how digital transformation is enacted through everyday practices and how different groups within the organisation made sense of it.

At the organisational level, FileMaster was framed as a critical step in NCC's transition toward becoming a data-informed company. The system was expected to standardise document management, thereby enable consistent practices and knowledge transfer across projects. Internal presentations and strategic documents described FileMaster as means to "future-proof" how NCC works, by establishing a strong digital base that could support even more innovation later on. In internal PowerPoints, phrases like "*no digital construction site without FileMaster*" were used to show how central the system was meant to be (see Section 4.3). From this top-down perspective, the strategy was well-structured and logical, there was a plan, a rollout model, a guide portal, and clearly defined roles such as Super Users and Change Agents. However, the accounts provided in interviews tell a more complex and nuanced story—one that diverges in notable ways from the narrative presented in official communications.

6.1.1 Silent strategists in practice

As seen in the empirical findings, the receivers of the strategy, design managers, do not describe the system as it is presented in the strategy texts. While the official messaging emphasized simplicity and benefits, many design managers described the tool as unclear, complicated, and burdensome (Section 5.4.3). Instead of seeing the system as a helpful improvement, they often experienced it as something confusing and hard to work with. Rather than resisting the change, several interviewees explained how they had to figure out the system on their own through trial and error. For many, this hands-on exploration became the only way to understand how the system functions in practice. This response shows how strategy becomes meaningful through everyday action, and not through the clear and structured process often portrayed in official documents. In line with Jarzabkowski et al. (2007) and Golsorkhi et al. (2010), strategy is not just something top management decides and passes down, it is shaped and reshaped through the practical engagement of those carrying the work.

Even though the design managers were not formally recognized as strategists in NCC's plan to become a data-informed company, they still played a central role in shaping how FileMaster was used in practice. Several design managers introduced the system to their teams, fixed metadata issues, creating their own guides, and adapted the tool to fit into their daily routines (see Section 5.3.2, 5.4.2 and 5.4.6). These are examples of what the SaP perspective describes as *praxis*, the everyday actions through which strategy making happens (Jarzabkowski et al., 2007). They were not just users of a new

tool but became active interpreters of it, deciding what works, and what does not work, translating unclear instructions, and guiding others through the process. In this sense, the design managers acted as "silent strategists," shaping the strategy from the ground up through their engagement with FileMaster.

The design managers' experiences highlight that strategy is not only about formal roles or written plans, but about how people make sense of and carry out change in real situations. Although they were not formally included in the strategic planning, they still became central to how the strategy was realized in practice. This reflects what Gagnon et al. (2008) describe, that strategy often breaks down not due to poor planning, but because people do not fully understand or trust it. In this case, the individuals expected to drive the shift toward becoming a data-informed company were not meaningfully involved in shaping that shift, yet they were key to making it happen.

6.1.2 Super Users and Change Agents: designed roles, lived realities

Super Users were meant to serve as the bridge between strategic planning and implementation in practice. They were designed as local point of contact and someone close to the team who could offer hands-on help and take feedback upward (See Section 4.4 and 5.2.1). As illustrated in the findings, this worked well in some departments. Super Users who were motivated, informed, and had enough time became central figures in helping design managers in the department learn the system. From a SaP perspective, Super Users can be labelled as the key 'practitioners' who actually carry out strategy enactment (Jarzabkowski, 2007). Their engagement showed how strategy was not only passed down from above but also shaped by those interpreting and applying it on the ground. In departments where this function worked well, Super Users were not only helping others but also learning alongside them, figuring out what worked and adjusting their approach to fit real situations. This reflects how strategy making happens in practice (see Section 5.2.1).

As presented in Section 5.2.2, another important role designed to support the implementation of digitalisation strategy was the Change Agent. According to the internal documents, these individuals were responsible for communication, engagement, and local adaptation of digital transformation projects (see Section 4.4). However, most design managers interviewed either did not know who their Change Agent was or could not point to any specific actions or support from them. One even said their Change Agent seemed more proud of the title than of doing something actively. This is also in line with the practice approach to strategy, which argues that formal roles and structures do not guarantee strategy enactment unless they are grounded in practice (Jarzabkowski et al., 2021). In this case, the role existed on paper but had limited influence in day-to-day work.

6.1.3 Leadership engagement in practice

The written strategy at the organisational level clearly stated that NCC wants to become a data-informed company. As shown in Section 5.3.1, many design managers said they had heard these goals from NCC's top management, saw value in them and appreciated the clear direction for the company. The common emphasis was that it will bring future value to NCC. It appeared that the strategic vision was generally understood and

positively received, connecting to what Rogers (2016) stresses, that clear direction from top management is needed for digital initiatives. Further, the importance of leadership across all levels, especially direct supervisors, is well supported in the literature related to digital transformation (Adekunle et al., 2024; Löwstedt et al., 2018; Mutambik and Almuqrin, 2024; Papadonikolaki and Morgan, 2024; Samuelson, 2024), and NCC's own strategic documents reflect this view. This understanding also came through in interviews with both the Senior manager 1 and a group manager, indicating that awareness of the leadership role does exist within the organisation.

However, how this understanding was put into practice differed greatly depending on the context and the individuals involved. Middle managers, such as department, project and group managers, seemed to interpret the digital strategy in different ways. In some departments, design managers described their immediate managers as actively involved. They gathered feedback, followed up on the implementation, and served as knowledgeable points of contact. However, others seemed disconnected from the strategy in practice. Several design managers said their direct managers never brought up FileMaster in meetings or acted as if they did not understand what the change involved. This mix of engagement suggests that while some middle managers aligned with the strategic vision, others remained passive or unsure of how to act on it. From a SaP perspective, this continues a broader pattern seen throughout this thesis, where formal strategy and everyday practice are not fully aligned (Jarzabkowski et al., 2007; Rouleau & Cloutier, 2022). While some middle managers actively supported the strategy in daily work, others remained passive, contributing to fragmented engagement across the organisation.

6.1.4 How developers and change leaders viewed the strategy

The interviewees in higher-level roles, who were involved in developing NCC's digital transformation strategy tended to describe FileMaster more as a success story (see Section 5.1.4). For them, the system had been launched, usage was increasing and central data showed positive trends. However, this definition of success did not align with how many design managers experienced it in their day-to-day practice. For those working in projects, success meant that the tool works smoothly, saves time, and supports daily tasks. As shown in Section 5.4.3, many design managers still found FileMaster difficult to use. Some even tracked the extra hours they spent using it, to understand how much time the tool was costing them. One design manager pointed out that even if the system had improved, the early frustration still shaped how users felt about it. Interestingly, these critical views and frustrations did not seem to be explained as strongly by the higher-level interviewees. Even though they acknowledged some frustration and technical issues, they did not express the same intensity of reactions as the design managers seemed to show. This does not mean that they were detached or uninvolved. On the contrary, they were highly engaged in shaping the digital strategy and had worked hard on developing and coordinating the implementation. However, their involvement remained at a strategic level, which may have limited their visibility into the everyday challenges faced by project teams during actual use of the tool.

6.1.5 Supplier perspectives and priorities

Another key actor in the strategy implementation was the external supplier hired by NCC to develop the FileMaster. While not part of NCC internally, their role in shaping how the system was introduced and developed made them a central part of the digital transformation strategy. Based on interviews with both the supplier and Senior manager 3, it became clear that the supplier had their own interpretation of work processes, with differing priorities and definitions of success compared to NCC (see Section 5.4.4). The interviewee with the project responsible explained that FileMaster was just one of many systems they supported, and NCC was one of several clients. They appeared to focus more on long-term development cycles, system architecture, and scheduled releases. In contrast, NCC teams, specially design managers, were concerned with urgent project needs and whether the system functioned well in daily use. This disconnect can be understood in light of the construction sector's structural characteristics. As noted in the literature, the industry is highly fragmented, deadline-driven, and organized around temporary, project-based collaborations (Slaughter, 1998; Engwall, 2003; Samuelson & Stehn, 2023). These conditions demand tools that can immediately support coordination and delivery, often leaving little room for long-term system optimization or lengthy rollout cycles. The differing organisational logics shaped how each side engaged with the strategy and reveal that digital transformation is not only shaped by internal roles, but also by how external actors interpret their involvement in it.

6.2 Implementation challenges

RQ2: What challenges arise during the implementation of FileMaster, particularly in the interaction between strategic planning and implementation?

The reactions and challenges explained seemed to differ a lot, mostly between roles depending on position in the organization, but also between design managers. This seemed to be due to both contextual and individual reasons.

6.2.1 When strategy arrives without warning

Although the rollout of FileMaster was communicated well in advance, several design managers said they had no clear idea of what the tool would look like until the day it arrived (Sections 5.1.3 and 5.1.4). Some recalled that the system simply appeared without warning, with no clear onboarding or explanation. Others mentioned being given access but receiving little or no guidance. As a result, many felt left to manage on their own. Even though the change had been discussed for a long time, many felt that the implementation was rushed and that the system was not fully ready. The phrase "80 is the new 100" was often cited in internal communication, but several interviewees argued that FileMaster had not even reached that standard at launch.

The empirical data also shows that while representatives from the business had been involved in the development phase, they were often from higher levels in the organization, not from operational roles. Many design managers stated that they had not been included, and that their feedback had not been reflected in the system's functionality (see Section 5.1.1). Concerns about usability and fit with daily project work were described as ignored or only partially addressed, and early demos were seen as overly abstract. The same applied to the User Acceptance Tests (UAT), which were

perceived by the two involved users as overly predetermined and disconnected from real project complexity, and issues raised during UAT were not visibly resolved (see Section 5.1.2). This highlights another mismatch between the intended strategy and the realized one, a gap between strategic planning and everyday practice, where involvement may have been planned but not experienced as meaningful by end users. As Ullrich et al. (2023) and Tihlarik (2024) argue, the success of digital change depends not only on whether employees are involved, but how and when they are involved. When participation is too late, too limited, or feels symbolic rather than substantive, employees may perceive the change process as superficial or even fake. The situation also reflects what Ivančić et al. (2021) describe: a common gap where lower-level employees feel excluded from strategic decisions and experience unclear communication. Even when the strategic direction is well defined, it doesn't always translate into meaningful action further down in the organization. In this case, design managers were expected to implement the strategy, but were not part of shaping it, which might be one reason that made it harder to trust the process or feel ownership.

Lundberg et al. (2019) further highlight that in decentralized organizations like NCC, innovations can feel especially disruptive in places that were not involved early on. When local actors are not included, change tends to feel imposed. In line with this, Rogers (2003) emphasizes that innovations are more likely to be adopted and sustained when those affected by it have been actively involved in the decision-making process. At NCC, the way FileMaster was introduced without visible involvement of the actual end-users created a disconnect between strategic ambition and local reality, a challenge that shaped how the tool was received across the organization.

6.2.2 Challenges with the Super User role

Although the Super User role had clear intentions and was appreciated by many design managers, several interviewees pointed to challenges in how it worked in practice. Some Super Users said they were unclear on their responsibilities, not given enough time, or did not feel equipped to help others (see Section 5.2.1). One explained that they hoped they were not expected to train colleagues because they barely understood the system themselves. Another, who had only worked with FileMaster in test environments, was expected to train others without ever using the tool in a real project. This inconsistency created an unbalanced situation, where some departments had visible and active support, while others had little or none, leading to unequal conditions for coping with the change. In departments where Super Users were accessible, users were more likely to try the system and begin adjusting their routines. In teams without that support, many got stuck in old habits. In a project-based organisation like NCC, such variation is not surprising. Temporary teams, shifting responsibilities, and weak knowledge transfer, characteristics of the construction industry (Samuelson & Stehn, 2023; Adekunle et al., 2024), could be one reason why consistent support were difficult to obtain.

This case reflects what Ivančić et al. (2021) and Ullrich et al. (2023) highlight: for implementation to work, people need to be clearly informed, supported in their role, and given enough time. It was not that the strategy was missing, but that the support system designed by higher-level managers was not equally performed across departments. As Samuelson and Stehn (2023) point out, project-based settings often face structural barriers that hinder horizontal learning, which means the ability to share

knowledge and experiences across projects and teams. The success of the strategy enactment at NCC seems to be depended heavily on individual motivation and context, making the implementation fragile. It also illustrates what Gagnon et al. (2008) warn about: that strategies can fail if people do not fully understand them or feel capable of acting on them. While the train-the-trainer model made sense in theory, it did not always seem to function as intended in practice. If Super Users themselves were not properly trained, or if others did not bother to reach them, the idea of spreading knowledge through them fell apart. This breakdown seems to reflect what several studies show, that without clear responsibilities, strong communication, and enough time to engage, even well-designed support structures struggle to succeed (Samuelson, 2024; Ullrich et al., 2023; Parent, 2006; Seletedi et al., 2024; Osmundsen et al., 2018).

6.2.3 Change Agents: from strategic design to gaps in practice

In the official strategic planning, the change management structure at NCC, including roles like Change Coordinators and Change Agents, was thoughtfully designed. It aimed to connect strategy to practice through a layered support system, helping departments receive local support while keeping the overall rollout aligned. However, the empirical data shows that, these roles often lacked visibility, clarity, or active engagement. Many design managers were unsure who to turn to, and several said they had never even heard of the Change Agent role (see Section 5.2.2). This highlights a common gap between formal structures and lived experience. This is in line with a SaP's discussion that to understand strategy making, one needs to look more than what written strategy texts says (Jarzabkowski et al., 2007; Rouleau & Cloutier, 2022).

The empirical findings also raise questions about the actual impact of the Change Agent role in NCC's digital transformation. One Change Agent explained that their main task was simply to pass along information, and it seems like they relied more on Super Users to handle practical support (see Section 5.2.2). Another noted that several Change Agents were selected based on position rather than interest or capacity, which seems like a risky approach when the goal is behavioural and cultural change. This raises questions about how roles like these are designed and introduced, and whether they were ever truly anchored in the real conditions of project teams. This seems to reflect what Samuelson (2024) argues, that in construction, transformation efforts often remain fragmented when there is too much focus on the technology itself, and not enough on clarifying responsibilities and adapting processes. Similarly, Adekunle et al. (2024) highlight how unclear responsibilities can hinder digital transformation. In the end, the Change Agent role seems to have existed more in the structural plan than in lived experience. This gap between planned and practiced roles is probably one of many explanations to why strategy did not unfold as intended.

6.2.4 Uneven leadership involvement

While the strategic ambition from top management was clear, as seen in Section 4.1 and 4.2, the findings reveal major inconsistencies in how middle managers, such as department, project, and group managers, supported the rollout of FileMaster. As shown in Section 5.3.1, while some design managers described their closest manager as engaged and supportive, this was not the case for many others. Several said their manager never raised the topic in team meetings or seemed too distant to understand what the change entailed. Some were even encouraged to return to older systems when

problems occurred. This suggests that practical engagement from middle managers often depended on the individual, and not on a clear structure, shared expectations, or follow-ups. This lack of consistency created uncertainty for teams and weakened the link between organisational level strategic goals and everyday practice in different parts of the organisation. As scholars emphasise, leadership involvement at all levels is essential for enabling digital transformation (Adekunle et al., 2024; Löwstedt et al., 2018; Mutambik and Almuqrin, 2024; Papadonikolaki and Morgan, 2024; Samuelson, 2024).

One group manager explained that directives about FileMaster often bypassed them completely and were sent straight to Super Users or design managers networks (see Section 5.3.1). These roles were part of their team, but the group manager was not included in the conversation. This created a sense of tension. The group manager was financially responsible for the team and for holding the project budget, but at the same time, Super Users were told by the development team to spend time helping others. Since the group manager felt they had not been given a formal role in supporting the implementation, this led to unclear expectations and made it difficult to balance responsibilities within the team. Still, another group manager expressed no issue with this setup, explaining that in their department, it was understood that they were responsible for driving the implementation and that, if expectations were unclear, it was up to them to take initiative and clarify their mandate. This contrast shows that leadership engagement in the implementation varied depending on individual managers interpreted their role. As highlighted by Umantsiv et al. (2024) and Parent (2006), clear structures are not enough, people need to understand their role and feel supported in practice. The findings suggest a need for clearer communication, not just about the strategy itself, but about who is responsible for what, and how they will be supported and followed up.

6.2.5 Unclear ownership and informal responsibility

The variation in involvement points to a bigger issue: it was not clear who was actually responsible for leading the change. Some interviewees believed that project managers or group managers should have taken the lead, but in many cases, these managers were not actively involved (see Section 5.3.2). Instead, the responsibility fell on design managers or Super Users, despite some of them not having the mandate or time. This seems to be a central challenge in the implementation of FileMaster, the lack of formal recognition for the role design managers played in carrying out the strategy. Despite their crucial involvement, they were not included in the official strategic plan as actors responsible for shaping the digital transition. As a result, many had to take on extra responsibilities without actual authority, support or guidance. Several interviewees described developing their own routines and materials, often because they could not rely on official documentation or help from Super Users (see Section 5.2.1 and 5.4.6). This created uneven conditions across teams, depending on who had taken the initiative locally.

These gaps point to a misalignment between strategic planning and actual practice: while the strategy expected usage of the tool, it did not clearly plan for how that usage would be supported or facilitated at the team level. From a Strategy-as-Practice perspective, this highlights how strategy is not only about formal documents and roles, but about what people engage with doing of strategy in practice. As Jarzabkowski

(2007) argues, practitioners are central to strategy, they shape outcomes through their actions, often in ways not captured in formal plans. In this case, design managers became key practitioners, bridging the gap between strategy and everyday project work. This also aligns with what Löwstedt et al. (2018) describe: in construction, strategy often emerges through the actions of project managers and site personnel, who are seen as legitimate strategists because of their practical experience and operational insight. Design managers at NCC were in this position, they were deeply involved in delivery and close to the realities of implementation, yet they were not formally recognised as strategists. This lack of recognition made the implementation fragile and contributed to the disconnect between strategic intent and how the system was actually used in practice.

6.2.6 System challenges and usability issues

One of the most common comments from interviewed design managers was the technical issues. As presented in Sections 5.4.1, system slowness, failed uploads, syncing problems, and confusion about document versions caused frustration. In some cases, users did not know whether they had made a mistake or if the system had failed, leading to delays of several hours or even days. These issues were especially problematic in large-scale projects with tight deadlines and high financial stakes. In addition to bugs, the shift from a familiar folder structure to a metadata-based system introduced a new way of thinking (see Section 5.4.2). Many found the tagging logic unclear and lacked guidance or practical templates, which made searching and retrieving documents difficult. External users, like consultants and clients, often tagged files incorrectly, increasing the workload for design managers who had to monitor and correct entries repeatedly.

As further discussed in Section 5.4.3, the usability of FileMaster was a major concern. Many found the system unintuitive and misaligned with established workflows. Instead of supporting project work, FileMaster was described to instead add administrative tasks, increased complexity, and created doubts about whether information was correct or complete. Taken together, these bugs and system challenges created uncertainty and disrupted attempts to build new routines. The construction sector is described in the literature as deadline-driven, fragmented, and highly dependent on coordination and delivery (Samuelson & Stehn, 2023). So, in a high-pressure project environment, this reaction is not surprising. Tools that require time, patience, and training can easily be perceived as risky, especially if they delay progress or require unbillable administrative work (see Section 5.4.3).

As described in Section 5.4.6, many design managers continued using familiar routines, relied on older systems like PDS, and avoided switching fully to FileMaster through workarounds. This was not necessarily due to resistance. Several interviewees explained they were under pressure to meet urgent deadlines and did not feel they had time to invest in learning a system that, in their view, did not function properly (see Section 5.5.1). These reflections echo findings by Bhattacharya and Momaya (2021), who argue that in the AECO sector, digital resistance is often linked to deeply embedded operational routines and organisational culture. In the case of FileMaster, ongoing technical issues, the required mindset shift, and change overload made it difficult for users to change their way of working (see Sections 5.5.1, 5.5.2 and 5.5.4).

This environment created conditions where change was not actively resisted, but were sticking to old systems became the only way to stay on schedule.

Despite the potential benefits with FileMaster, knowledge transfer seems to remain a major challenge in NCC's digital transformation. As Wei and Miraglia (2017) explain, the limited ability to transfer knowledge between projects and back into the organisation can reduce the long-term impact of digital initiatives. In construction, where teams are often temporary and change from project to project, lessons learned and improvements made in one setting are rarely shared systematically across the company (Samuelson & Stehn, 2023). FileMaster was introduced as one way to overcome this challenge. By using metadata instead of traditional folder structures, the system was meant to create a consistent way of saving and organising documents across all projects. This structure would make it easier to collect and reuse information, helping the company learn from each project and improve over time. In theory, this could support better knowledge transfer and long-term learning.

However, the findings show that the technical problems, unclear tagging practices, and inconsistent support made it difficult for users to work in a standardised way. Because of this, the goal of enabling knowledge transfer has not yet been fully reached. Many users created their own ways of using the system, which reduced consistency and made it harder to share information across teams. This shows that while FileMaster has the potential to support learning between projects, the current implementation challenges are limiting that possibility for now.

6.2.7 Supplier challenges and misaligned expectations

It was interesting to see that challenges discussed by interviewees from NCC were acknowledged by the supplier (see Section 5.4.4), and they pointed to resource constraints, communication struggles and misalignment of priorities. The representative of the technology company emphasised that they were not completely aware of the number of the files that needs to be dealt with day-to-day business. Although the empirical data does not show the main reason of this, it seems that clear communication between parties about the nature of construction work, including its pace, complexity, and document intensity, was lacking. This may have contributed to unrealistic assumptions during system development. As seen in the literature, the construction environment is often described as fast-paced, fragmented, and coordination-intensive, with high demands for accuracy and information flow across many actors (Samuelson & Stehn, 2023; Adekunle et al., 2024). Without a strong understanding of this context, it becomes difficult for external technology providers to fully grasp the implications of system performance in daily project work.

Several implementation challenges stemmed from the supplier's external position and differing priorities. As described in Section 5.4.4, internal handovers on the supplier side disrupted continuity, and communication difficulties delayed problem-solving. The empirical data show that bugs considered critical by NCC and affected many projects, were not always seen as urgent by the supplier. These delays created frustration among internal users and highlighted a lack of shared understanding around what needed immediate attention. Even though both parties aimed to make the collaboration work, their organisational differences made alignment difficult. While NCC expected fast responses to operational issues, the supplier remained focused on

broader system development and coordination across clients. This gap between internal urgency and external timelines shows how implementation was not only shaped by internal decisions, but also by assumptions, limitations, and misunderstandings outside the organisation.

6.2.8 Support challenges in the implementation

Several design managers also pointed out that they received access to the system with minimal support. As described in Section 5.1.4, several described being handed a manual and left to figure things out on their own. Training was inconsistent, some did not know who to contact for help, and the available guides were not seen as enough (see Section 5.4.5). These gaps in implementation made it harder for users to feel confident in trying something new and added to the sense of instability around the rollout. Further, the support materials, which was intended to help users learn the system, was frequently mentioned as not helpful enough in practice. When reviewing the portal, the critique expressed by users became easy to understand. It was poorly structured, difficult to navigate, and not tailored to different roles (see Section 4.3). Some guides were mislabelled, and several lacked context or step-by-step instructions. As seen in section 5.4.5, many users admitted that they gave up and resorted to trial and error until they figured things out on their own. This created a situation where trial-and-error became the chosen way to learn, or in some cases even use workarounds instead.

These experiences connect to findings by Seletedi et al. (2024), who show that digital transformation efforts frequently overlook essential support elements such as training and inclusive planning. According to the authors, when employees are not properly supported, they often feel excluded and left to manage on their own. Similarly, Parent (2006) highlights that perceived support is one of the key factors influencing whether individuals adapt to change or struggle with it. Without sufficient support, optimism and engagement decline. Several interviewees said they would have needed someone to visit their project and provide hands-on help, rather than receiving digital guides or group messages (see Section 5.4.5).

Further, the empirical findings also show that the support environment varied widely across departments (see Section 5.2.1 and 5.4.5). In places where Super Users were passive, unclear in their role, or entirely absent, design managers lacked guidance and practical help. Without reliable support, frustration seemed to grow, and people remained uncertain about how to move forward with the system. This suggests that inconsistent support structures made it harder to shift away from old tools and contributed to uneven adoption across the organisation.

Taken together, the combination of technical issues, unclear metadata tagging, low system usability, and insufficient support contributed to inconsistent usage across projects and departments. Instead of creating a unified way of working, these challenges pushed users to find individual solutions, which varied depending on local circumstances and available guidance. This stands in contrast to the main goal of FileMaster, which was to provide one common solution for managing project documents consistently and enabling structured information reuse in future projects. From a SaP perspective, this highlights how strategic intentions, such as creating consistency through FileMaster, are shaped and sometimes challenged by everyday activities and interpretations across the organisation (Whittington, 2006; Jarzabkowski

et al., 2007; Jarzabkowski et al., 2021). Even though the system was developed as part of a broader digital strategy, its practical use seems to depend less on formal decisions and more on how individuals engage with it in their daily work.

6.2.9 Personal, emotional, and contextual factors

The emotional dimension of the implementation challenge was clearly present. As shown in Section 5.5.1, many design managers were not resistant to FileMaster in principle, but they did not feel they could rely on it. With major project responsibilities and tight deadlines, they perceived the risk of disruption as too high. The empirical data suggests that this hesitation was not about unwillingness to change, but rather about uncertainty, lack of trust in the system, and fear of negative consequences.

Even after many technical issues were reportedly solved, some users still held on to the frustration and distrust they experienced during the early phase (see Section 5.5.1). It seems like the first impression left a strong mark. Several interviewees explained that the initial feeling of confusion, stress, and lack of control continued to influence how they viewed the tool. This highlights how important the emotional side of change is, once confidence is lost, it could take a long time to rebuild, even if the technical problems are fixed. These observations align with Parent (2006), who shows that individual reactions to change are shaped by perceived support, role clarity, and emotional response. In this case, the lack of time to stop and learn, especially in departments managing several complex projects, made it difficult to rebuild trust or shift routines. Being expected to stay positive in front of colleagues while feeling unsure or stressed created further emotional strain. Some described feeling "two-faced," as they had to promote something they did not fully believe in. This emotional conflict may have deepened hesitation or, at the very least, made it harder to adapt fully.

Interestingly, even Super Users, those with more training and formal involvement, expressed criticism and described moments of feeling stuck or unsupported (see Section 5.x.x). This highlights that even though training and involvement is important, as explained by Ullrich et al. (2023) and Tihlarik (2024), it does not alone ensure successful participation. It also needs emotional support and a structure that enables users to act on their responsibilities.

Further, variation across individuals and departments was also significant. As seen in section 5.5.3, while generational differences (Nguyen and Broekhuizen, 2022) were occasionally mentioned, personality and local context appeared more influential. Those who described themselves as curious, proactive, or good with technology generally expressed a more positive attitude. Several had participated in early pilots and had close access to support, which seemed to help. In contrast, users who lacked nearby assistance or worked in teams where the general attitude toward FileMaster was negative felt more isolated and uncertain. These differences in response reflect what Parent (2006) highlights: that reactions to change are not random, but shaped by individual characteristics, perceived support, and role clarity. When these conditions are present, people are more likely to adapt, but when they are missing, they may struggle or resist. Additionally, the importance of the social environment was also clear in the findings. In departments where the design managers described the managers to be engaged, Super Users active, and learning shared, users seemed to find it easier to adjust. But in high-pressure environments with unclear leadership and no visible support, even motivated

individuals struggled. In some teams, also the mood in a department seemed to shape the members' overall responses. As seen in Section 5.3.1, one leader with a negative view could influence the whole team, which shows that it might not just be about the system itself, but also about the social environment around it. This aligns with Hizam et al. (2023), who highlight the importance of psychological empowerment and supportive conditions for digital transformation.

Despite these challenges, most interviewees expressed optimism about the system's potential (see Section 5.5.2). Many believed that if FileMaster works as intended, it could bring clear value. Some had already seen improvements and felt that others might not realise how much progress had been made. Others reflected on their own resistance, acknowledging that part of it came from personal habits, but still pointed to flaws in how the rollout was handled.

6.2.10 Different views on success

The difference in how success was defined across the organisation points to a broader challenge in how implementation of digital strategy is evaluated and followed up. While upper management seemed to rely on system usage statistics and centralised indicators to judge progress (see Section 5.4.3), many design managers were still struggling with daily usability issues and workarounds (see Section 5.4.3 and 5.4.6). This disconnect highlights the need to go beyond tracking system usage through numbers alone, and to pay attention to the everyday, qualitative experiences of users. The difference in how success is interpreted connects to the SaP literature's emphasis on lived experience. As argued by Whittington (2006), strategy is not something that happens on slides or in metrics, it happens in how people feel, act, and adapt. One can argue that when strategy makers celebrate progress that strategy doers do not feel, naturally, trust and engagement suffer.

This also relates closely to the findings of Hewavitharana et al. (2021), who show that digital adoption depends heavily on whether employees see clear personal benefits. Even when systems and structures are in place, people may be hesitant to engage with a new tool if they do not understand how it helps them in their specific tasks. In the case of FileMaster, it seems that while upper management saw successful implementation in terms of system uptake, many project-level users still struggled to see how the tool made their jobs easier. This gap between strategic intentions and practical experience appears to be one of the key reasons why the rollout remained uneven and why success, depending on where one sits in the organization, was defined so differently.

6.3 Coping modes in practice

RQ3: What forms of coping – such as practical, deliberate, detached, or theoretical – can be identified among design managers and strategy developers, and how do these responses influence the realization or resistance of the digital strategy?

This section explores how different roles at NCC responded to the implementation of FileMaster using the coping framework by Sandberg and Tsoukas (2011). The

framework offers a way to understand not just what people did during the rollout, but how they made sense of their role in the change. Coping styles such as practical, deliberate, detached, and theoretical were not fixed categories, but appeared to shift depending on factors like individual initiative, level of support, and how the implementation was managed within each department. These coping responses help explain the strong reactions, fragmented engagement, and uneven progress seen across the organisation.

6.3.1 Shifting from practical to deliberate coping

The empirical analysis shows that a large number of design managers appeared to respond the change through practical coping. As described in Section 5.4.6, several continued to rely on established routines and familiar tools and maintained the working methods they were most comfortable with. These behaviours align with Sandberg and Tsoukas' (2011) description of practical coping, where individuals draw on embodied knowledge to navigate uncertainty. On its own, practical coping is not resistance, it could be a reasonable choice when a system feels unstable or unclear. But when people stay in that mode for a long time, it can delay system adoption and make progress difficult. In this case, scepticism toward new practices like metadata tagging and frustration with system usability led many to fall back on what they already knew. Even though several design managers expressed openness to change and saw potential in FileMaster, their way of coping reflected a preference for routines they could trust when the new system felt unreliable.

In the context of construction, where projects are shaped by high pressure, tight deadlines, and fragmented organisation (Samuelson & Stehn, 2023), it becomes clearer why many design managers remained in a mode of practical coping. When every delay has consequences for the project timeline or budget, it is understandable that people tend to stick with familiar methods rather than risk experimenting with a system that feels unreliable or adds to their workload (see Section 5.4.3). From a coping perspective, this was not a matter of unwillingness to change, but a response shaped by conditions. As Sandberg and Tsoukas (2011) emphasise, coping is always embedded in the surrounding structures. In this case, unclear onboarding, weak support, and system instability (see Section 5.4.5 and 5.4.1) made it difficult for people to move beyond practical coping and into more deliberate adaptation. Without the right circumstances in place, even motivated individuals may struggle to shift their approach.

6.3.2 Steps toward deliberate coping

Some design managers, especially those who also were assigned Super Users, seemed to have taken steps toward deliberate coping. Some described how they actively sought to learn the system, helped others, and even created custom guides for their teams (see Section 5.2.1 and 5.4.6). This form of coping involves greater awareness and a more intentional approach, thinking about what you do and making conscious adjustments (Sandberg and Tsoukas, 2011). These individuals seem to have gone beyond just reacting to the change and instead tried to shape how the change was handled locally. This kind of adaptation reflects what Kane et al. (2015) describe as essential for

successful digital transformation: not only setting digital goals but enabling people across the organization to interpret and apply them in practice. However, in contexts where support was weak or absent, practical coping remained the preferred or only viable choice. This suggests that coping does not happen in isolation, it is shaped by the context. When organisational support is uneven or unclear, coping may become less adaptive, which could explain why some departments appeared to resist more than others. In many cases, the issue seemed less about individual attitudes and more about context and the availability of meaningful support.

What is interesting is that Super Users themselves often seemed to operate in a detached coping mode. They were not always deeply involved in other design manager's day-to-day project delivery, but still close enough to observe problems, offer support, and pass feedback upward, a role that ideally bridges strategy and practice (Sandberg & Tsoukas, 2011). In this way, Super Users had the potential to help design managers move from practical to deliberate coping by providing support, modelling new routines, and reducing uncertainty (Hizam et al., 2023; Ullrich et al., 2023). However, the findings also show that this bridging role was not always easy. As shown in Section 5.2.1, some Super Users reported that they had very little time, didn't know what was expected of them, or hadn't used FileMaster in a real project themselves. Others admitted that they just listened in on meetings and hoped they were not expected to train their colleagues. These accounts meant that while some Super Users were able to provide required support, others remained more passive, staying in practical coping themselves or feeling stuck between unclear expectations and limited capacity.

This highlights that also even the one who are demonstrating detached and deliberate coping modes requires supportive conditions to be effective. For example, the empirical analysis shows that when superusers had time, motivation, and clear responsibilities, they were more likely to engage actively and support others, demonstrating a shift from liberate to detached coping. But when these conditions were lacking, Super Users often stayed focused on their main job and did not take on the extra role. This variation reflects what Adekunle et al. (2024) describe as structural barriers to digital transformation, including unclear roles, lack of strategic vision, and isolated implementation efforts. Where Super Users were actively engaged in project teams, design managers working with them were more likely to adopt the system and adjust their routines (see Section 5.2.1). In contrast, in departments where this support was missing, design managers often continued with familiar routines. These findings suggest that deliberate coping did occur, but it was fragile and highly dependent on local support. Having someone nearby to guide, explain, and encourage made a significant difference. In the absence of such support, many users remained in a mode of practical coping, relying on established habits rather than embracing the new system.

6.3.3 Change agents caught between detached and theoretical coping

One of the clearest examples of coping misalignment in the empirical findings concerns the role of the Change Agents. In strategy documents and interviews with senior managers, this role was presented as central to the implementation of FileMaster. Change Agents were expected to support local engagement, communicate updates, and help departments adapt to the new system (see Section 4.4). From the perspective of Sandberg and Tsoukas' (2011) framework, this role aligns with detached coping, remaining slightly removed from the day-to-day work but still close enough to support,

follow up, and translate strategy into action. However, the findings suggest that many Change Agents never fulfilled that role in practice. Instead, their involvement remained largely conceptual, aligning more closely with what Sandberg and Tsoukas (2011) describe as theoretical coping. While they were connected to the strategy at a conceptual level, they appeared disconnected from the everyday challenges faced in ongoing projects. As noted in Section 5.2.2, most design managers interviewed either did not know who their Change Agent was or said the person as inactive. One Change Agent even characterised the role as primarily as passing on information, which seemed to result in relying on others to drive real change.

This points to a conceptual confusion between detached and theoretical coping. Detached coping implies being connected to the implementation without doing the hands-on work, but still offering support (Sandberg and Tsoukas 2011). Theoretical coping, on the other hand, as explained in the literature, involves operating from a distance, too far removed to understand or respond to the realities of practice. This gap seems to reflect broader organisational issues discussed by Adekunle et al. (2024), who identify unclear roles and responsibilities as common barrier to digital transformation in construction. Change Agents were meant to operate in the former, they often ended up in the latter. It was assigned and listed in the rollout plan, but without follow-up or support, it seems it has not created as much impact as expected. The result was that the Change Agents, people who were supposed to help, became invisible, and the responsibility shifted to people without mandate like design managers or Super Users (see Section 5.2.2). This is tricky for the organisation as the lack of effective involvement by Change Agents create additional workload to others, created confusion, and made support uneven across departments. It shows how unclear roles and lack of follow-through can turn even a well-planned strategy into something fragile in practice.

6.3.4 Managers' coping: depends on interpretation and initiative

The empirical findings show that the role of middle and immediate managers, such as department managers, project managers and group managers, in the FileMaster implementation appears ambiguous, and their coping mode is harder to categorise clearly. What stands out is that coping among this group varied significantly between individuals and departments. Some managers were described as actively involved,although not necessarily in the day-to-day use of the system. Instead, they remained slightly removed while still following up, supporting their teams, and translating strategy into local action. This illustrate what Sandberg and Tsoukas (2011) describe as detached coping, maintaining a certain distance from the immediate situation, but still being close enough to observe and guide. These managers took initiative, gathered feedback, and supported their teams through the change (see Section 5.3.1). However, others were described as barely engaged with FileMaster at all, which suggests either continued practical coping in their existing workflows or even a kind of passive detached coping, where the system was acknowledged but not acted upon. As explained in the strategic documents and by the Senior manager 1, these managers were expected to be key actors in leading the change. However, in practice, many design managers said they received no guidance from their managers. As seen in Section 5.3.1, in some departments, managers never mentioned FileMaster in team meetings. One manager even told their team to return to Teams when the SharePoint connected to FileMaster did not work. This unclear anchoring might point to a form of coping that floats somewhere between practical and detached. These managers often did not resist

the change, but neither did they engage with it. Some were fully occupied with other tasks, others may not have felt ownership over the implementation.

Even though the empirical findings show examples of managers who actively supported the change, their engagement appeared to depend more on individual personality and local context than on a coordinated or shared strategy. This variation in leadership involvement relates to Samuelson (2024) research, which points out that while digital tools are increasingly adopted in construction, transformation often remains slow and fragmented. One reason, he argues, is that the focus tends to stay on the technology itself, rather than on responsibilities and changing processes. In her study, a lack of leadership engagement, combined with unclear roles and internal efficiency goals, was seen as a key reason why digital strategies failed to move from planning to action. In line with SaP, this shows how strategy making differs between the top and the individual level (Gagnon et al., 2008). This insight seems highly relevant to NCC's case. Based on the findings, one can argue that without clear expectations or visible follow-up, coping among managers became fragmented, and their potential role as enablers of deliberate coping in others was weakened.

If these managers did not feel responsible for the implementation, their passive coping might have sent the message that FileMaster was optional or not important, which could help explain the fragmented uptake of the system. Without clear leadership signals, people tended to stick to what they knew. The result might not have been open resistance, but a quiet hesitation that slowed everything down. This also raises questions about how implementation roles were communicated and followed up. It could be that when expectations are vague, coping becomes individualised, and so do the results.

6.3.5 Strategic roles without grounding in practice

Another group of actors that seem difficult to place in one single coping category are those positioned centrally in the implementation structure but not at the very top, the Senior manager 1,2 and 3. All three roles appeared to operate somewhere in between theoretical and detached coping, close enough to the operational side to understand its importance but still working at a level that did not fully engage with daily project realities. The technical team and the change management structure at NCC was carefully planned, as seen in internal documents (see Section 4.4). Roles at the top were dedicated with developing and coordinating methods for how change should be handled across different initiatives. Other roles were positioned in NCC Building Sweden and were supposed to bring this structure closer to real projects, adapting the strategy to make it fit the business area's needs.

In the planned strategy, this should have enabled better adaptation and follow-up. However, even with these structures in place, the experience in projects shows that the coping of these actors might have remained rather at the theoretical coping. Interview data suggests that while the Senior managers were aware of the challenges, their involvement seemed focused more on planning, strategy, and communication design than on addressing the problems occurred during implementation. From their perspective, structures like Super User networks, guide portals, and training blocks were implemented, and the conditions for success were set for it to work (see Section 5.1.4). But as seen in Section 5.2.1 and 5.4.5, many design managers described that these structures did not provide the support needed in actual projects. Further,

involvement of business representatives was seen as successful from the top, while many design managers felt left out or that the system functionalities did not represent how they actually work (see Section 5.1.1 and 5.4.6). This shows a potential gap between strategic intent and practical outcomes, a common theme in the SaP research (Jarzabkowski et al., 2007). This might indicate that although these roles were meant to operate with detached coping, supporting change from a step away, they often remained in theoretical coping, where actions are based on assumptions rather than lived experience. As Sandberg and Tsoukas (2011) describe, theoretical coping occurs when strategy is developed through abstract models, without grounding in practical context. Even deliberate coping, as the act of trying to involve the business, if not grounded enough in actual end users' perspective, might miss important inputs.

Overall, these roles were not detached or abstract in a passive sense. They were active, committed, and worked with detailed plans and processes. But their position between top-level strategy and operational reality meant that their coping was often abstract, and sometimes not synchronised with the challenges faced by end users.

6.3.6 Mismatch in coping modes

The analysis highlights a mismatch in how the external technology supplier and NCC's top management approached the implementation of FileMaster. Both operated primarily from a mode of *theoretical coping* (Sandberg & Tsoukas, 2011), engaging with abstract plans, strategic goals, and long-term visions rather than grounding their efforts in the practical realities of daily work. This approach meant that the implementation lacked sufficient connection to how the tool would actually be used by practitioners on the ground. The analysis also reveals significant differences in what is prioritized by the IT sector compared to the construction sector. While the IT supplier focused on functionality, scalability, and digital integration, the construction actors were more concerned with immediate usability, workflow compatibility, and minimizing disruption to ongoing projects.

At the top management level in NCC, FileMaster was described as a key part of the company's digital strategy and a step toward becoming a more data-informed organisation. This vision was frequently repeated in internal communication materials (see Section 4.2 and 4.3). However, as seen in Section 5.4.3, many users said they did not understand how the tool would support their daily work or reduce their workload. While some design managers appreciated the clarity of the strategic vision, many found the practical benefits of the system unclear. This gap between abstract ambition and daily reality suggests that top management may have been engaging in theoretical coping, the mode where people make sense of a situation by focusing on conceptual ideas rather than on direct involvement or experience (Sandberg and Tsoukas, 2011). In this case, the strategy around FileMaster was clearly defined at a high level but lacked grounding in how it would be used in project settings.

For users, this might have made the change feel disconnected or even imposed. The empirical analysis shows that design managers need not only a clear understanding of how the change will benefit them but also sufficient time and support to engage with it. When the overarching narrative does not connect to day-to-day work, engagement becomes more difficult. As shown by Hewavitharana et al. (2021), employee willingness to adopt digital tools depends on perceived personal benefit. Their study

finds that even when technical and organisational structures are in place, adoption is unlikely if employees do not see clear advantages for their own tasks. The empirical analysis presented above shows a clear disconnect in NCC's intention at the higher level and what happens in practice. This disconnect reflects what Samuelson (2024) also describes in the broader construction sector: digital transformation efforts often remain fragmented when they focus too much on technological visions and not enough on changing work processes, roles, and responsibilities. Without visible leadership involvement and clear communication about how a tool like FileMaster supports project delivery, strategic goals risk staying abstract, making it harder for others to engage meaningfully or move beyond their routine zones where they stay in practical coping.

On the supplier side, similar patterns of coping were evident. The technology company appeared to operate from a mode of theoretical coping mode shaped by the characteristics of its own sector, prioritizing system architecture, quarterly release cycles, and balancing priorities across different clients (see Section 5.4.4). This strategic, high-level view kept them at a distance from the everyday realities of project-based work at NCC. Although challenges raised by NCC were acknowledged, the supplier's coping remained rooted in technical and structural frames. This also reflects a theoretical stance as described by Sandberg and Tsoukas (2011), where the supplier engaged with the change through abstract reasoning, rather than hands-on experience. As a result, gaps remained between what the system was designed to do and what users on the ground needed it to support.

Although the supplier and NCC both aimed to make the collaboration work, they appeared to operate within separate logics, one based in IT and system development, the other based in construction project delivery. As a result, assumptions made on both sides were slightly misaligned with the actual needs and workflows of the end users. While strategic alignment may have existed on paper, the lack of shared understanding and sustained communication around day-to-day challenges meant that this alignment remained largely theoretical. From a SaP perspective, this disconnect illustrates that strategy is not merely a matter of formal plans or inter-organizational agreements, but of how individuals interpret and enact strategy in their daily work (Jarzabkowski et al., 2007; Rouleau & Cloutier, 2022). When those responsible for designing and delivering strategy—such as top management and external suppliers—are distanced from the practical realities of implementation, strategy risks becoming detached from lived experience. This mismatch in coping modes likely contributed to the slow and uneven adoption of FileMaster, as the experiential knowledge and everyday concerns of end users were insufficiently integrated into the strategic process.

7 Conclusion

The aim of this thesis was to explore how digital transformation strategies are understood and enacted in practice by different organizational actors in the construction industry. The empirical investigation focused on the implementation of the document management system *FileMaster* at NCC Building Sweden, an important component of NCC's broader digital transformation agenda. The purpose was to develop an understanding of how strategic digital ambitions are experienced, interpreted, and translated into concrete actions within the everyday realities of a project-based organization, and to explore the underlying causes of resistance to such change. To investigate this, three research questions were formulated:

RQ1*: How do different organizational actors interpret and engage with FileMaster as part of NCC's digital strategy?*

RQ2*: What challenges arise during the implementation of FileMaster, particularly in the interaction between strategic planning and implementation?*

RQ3: *What forms of coping – such as practical, deliberate, detached, or theoretical – can be identified among design managers and strategy developers, and how do these responses influence the realization or resistance of the digital strategy?*

To address these questions, a qualitative in-depth case study approach was adopted. The study draws on 24 narrative interviews, primarily with design managers, the main user group, but also with individuals involved in strategy development, support, and coordination. These interviews were complemented by an analysis of internal documents provided by NCC. This approach enabled a rich exploration of subjective experiences, allowing the researcher to identify both systemic patterns and individual variations in how the digital strategy was enacted and received in practice.

RQ1: How do different organizational actors interpret and engage with FileMaster as part of NCC's digital strategy?

The findings show a clear disconnect between how FileMaster was positioned at the strategic level and how it was interpreted by end-users, particularly design managers. From the perspective of top management and strategy developers, FileMaster was seen as a cornerstone of NCC's digital transformation, it was an enabler of data-informed work, consistency, and long-term value. This vision was communicated through internal documents and emphasized in interviews with higher-level actors, who generally described the implementation as successful, citing growing usage and positive trends in data.

However, among design managers and other project-based staff, an alternative narrative emerged, one that did not resonate with the high-level strategic vision. Many design managers expressed confusion about the purpose of FileMaster and found it difficult to see how the tool would improve their day-to-day work. Rather than viewing the system as a helpful solution, it was often experienced as unclear, difficult to navigate, and burdensome. Despite this, several design managers took initiative to explore the tool, support colleagues, and develop new routines. Their engagement was not shaped by

strategic texts but by hands-on learning, troubleshooting, and adaptation in real project contexts.

This divergence illustrates that digital strategy is not simply handed down from the top but is interpreted and shaped differently at various levels of the organization. Design managers, although not formally positioned as strategists, played a crucial role in how the strategy materialized on the ground. Their actions demonstrate the importance of informal agency in digital transformation and align with the Strategy-as-Practice perspective, which sees strategy as something constructed through everyday actions. Ultimately, while strategic alignment may exist in principle, the realization of digital goals depends on how individuals make sense of and engage with new tools in their daily work.

RQ2: What challenges arise during the implementation of FileMaster, particularly in the interaction between strategic planning and implementation?

The implementation of FileMaster at NCC Building Sweden faced several challenges that created a disconnect between the strategic vision and what actually happened in practice in a project-based sector. Although the system was introduced as part of a broader digital transformation strategy, the rollout was experienced by many users as unclear, rushed, and uneven across departments. While higher-level interviewees described the initiative as inclusive and iterative, design managers explained that they had little or no influence over how the system was developed or introduced. Many felt that feedback from pilot users was not acted upon, and that the rollout was driven by deadlines rather than readiness.

A major challenge was the lack of clear roles and responsibilities. Super Users, Change Agents, and middle managers were intended to support the implementation, but their involvement varied widely. Some Super Users were active and helpful, while others lacked training, time, or clarity about their tasks. Change Agents were often unknown to project teams, and middle managers in several departments were not visibly involved. In the absence of clear ownership, many design managers ended up taking responsibility for introducing FileMaster to their teams, even though this was not part of their formal role. This added pressure and created frustration, especially when combined with technical issues and limited support.

Technical challenges further undermined the implementation. Users reported software bugs, system slowness, and confusion about tagging documents. These issues damaged trust in the system, especially in large projects where delays and uncertainty come with high risk. Many continued using older systems or developed individual workarounds, leading to inconsistent usage across the organization. Support mechanism was another weak point. Several users received access to the system without proper training or guidance. The available manuals were seen as generic, hard to navigate, and not tailored to actual project work. As a result, trial and error became the main learning method, which slowed down adoption and increased stress. The role of external system supplier also contributed to implementation challenges. Interview analysis showed a lack of shared understanding between NCC and the supplier regarding the pace and complexity, and constraints of construction projects. Some problems that were urgent for project teams were not prioritized by the supplier, leading to delays and frustration.

Finally, the emotional and contextual dimensions of implementation were highly significant. Many users described feeling overwhelmed, unsupported, and unsure about how to proceed. In high-pressure project environments, the lack of time, trust, and stability made it difficult to engage with the new system. While the strategy may have been well-intentioned, the lack of clear ownership, consistent support, and sensitivity to local working conditions ultimately made it difficult to embed into daily practice.

RQ3: What forms of coping – such as practical, deliberate, detached, or theoretical – can be identified among design managers and strategy developers, and how do these responses influence the realization or resistance of the digital strategy?

The study found that employees at different levels within NCC coped with the implementation of FileMaster in different ways. Drawing on the framework by Sandberg and Tsoukas (2011), several coping responses were identified. The accounts of design managers aligned strongly with *practical coping*, a response characterized by continuing to work as usual using familiar systems and routines. This was often driven by unclear guidance, a lack of trust in FileMaster, and the constant pressure to meet project deadlines. It did not necessarily reflect resistance; rather, many simply could not afford the risk of delays associated with an unfamiliar or unstable tool.

The empirical findings also showed that in departments where support was stronger and local leadership was more engaged, some design managers shifted into *deliberate coping*. They experimented with the system, adjusted their routines, helped colleagues, and developed local solutions. Despite not holding formal implementation roles, these individuals often emerged as informal leaders. Their actions were crucial for pushing the strategy forward in practice. However, this form of coping required motivation, time, and at least a basic level of support, conditions that were not consistently present. In contrast, the accounts of strategy developers and change leaders resonated more with detached or theoretical coping. They spoke about the system in abstract terms and focused on high-level goals like consistency and data use, rather than the practical problems users were facing. Some seemed unaware of the emotional strain, frustration, and technical issues experienced in the projects. This mismatch in perspective contributed to a sense of disconnect between the strategy and everyday work.

Other roles involved in the implementation of FileMaster demonstrated varied coping responses. Some Super Users engaged in deliberate coping by guiding colleagues and tailoring support to local needs. Others, however, felt unprepared and uncertain about their responsibilities, resulting in more passive and reactive behaviour. Change Agents were, in many cases, largely invisible, indicating a more symbolic and theoretical engagement in the implementation process. Middle managers showed a wide range of engagement, from actively bridging the gap between strategy and daily work to remaining passive, with little or no discussion of the system in their teams. The external supplier also appeared to operate primarily through a theoretical lens shaped by the logic of their own sector, prioritizing system development timelines over the day-to-day operational needs of NCC's project environment. These differing interpretations and coping responses across roles and organizational levels further contributed to the fragmented implementation of FileMaster.

To conclude, this thesis has demonstrated that while projects like FileMaster, part of broader digital transformation strategies, may be well-intended and clearly formulated at the strategic level, their success depends heavily on how they are interpreted, supported, and enacted in practice. The three research questions revealed a consistent pattern: digital transformation is shaped not only by systems and plans but also by people, how they cope, the support they receive, and the degree of ownership and trust they experience throughout the process. Organizations in the construction sector must recognize that technologies alone will not transform the industry; successful transformation can only occur when users accept these tools and adapt their routines to integrate them into everyday work.

At NCC Building Sweden, design managers played a central but often unrecognized role in carrying out the strategy. Their engagement was shaped by unclear roles, technical issues, and weak support structures. Despite these obstacles, many took initiative, adjusted routines, and supported colleagues in moving the implementation forward. At the same time, the people working on the strategy and those from the supplier side often saw things differently or stayed in different ways of coping, which made it harder to stay on the same page and sometimes caused delays in solving problems.

These findings highlight that in complex, project-based environments like construction, successful implementation of digitalisation strategies cannot rely on formal structures alone. It requires strong local anchoring, visible and engaged leadership, emotional support, and a realistic understanding of day-to-day project work. When these conditions are in place, individuals seem to be more willing to engage, adapt, and contribute to the intended change. When they are missing, even well-designed strategies risk falling short. This study contributes to a deeper understanding of how digital transformation unfolds in practice and calls for greater attention to the micro-level realities of those expected to bring strategy to life.

7.1 Recommendations

Based on the empirical findings and reflections presented in this study, several suggestions can be made to help future implementations run more smoothly and better support employees in adapting their ways of working. These are not definitive answers, but rather insights grounded in how different individuals at NCC experienced the rollout of FileMaster. The following recommendations are informed by what seemed to work well, what created difficulties, and where stronger or clearer support could have made a positive difference.

- Make user involvement more visible, both in development and rollout. While some user representatives were involved during the development phase, many end users did not feel like part of the process. It might help to involve actual project users more actively, not just their representatives, and make this visible. When people see that their colleagues are part of shaping the tool, they might be more likely to trust it. It is not only about involvement, but also about visibility and inclusion in communication.

- Adapt implementation support based on department conditions It became clear that some departments needed more help than others. Larger departments, or those with heavy project loads, might need closer support and should not be expected to train all external project members themselves. A more tailored rollout plan, where support, time, and training are adapted to actual conditions, might help avoid overload and confusion.

- Make sure there is enough time and space to learn. One of the clearest patterns was that people felt they did not have time to understand FileMaster properly, either during the rollout or between projects. This might suggest that for future implementations, more time needs to be set aside, both within projects and in between them. Departments under high pressure need more support and flexibility, not less. When there is no space to stop and learn, new systems risk being seen as obstacles, no matter how well-designed they are.

- Clarify who is responsible for the implementation, both locally and overall. A lot of responsibility seemed to land randomly, on design managers, super users, or just whoever happened to be most engaged in the team. This might have worked in some departments, but in others, it appears to have created confusion and uneven engagement. It could be helpful to clearly define who is responsible for driving the change, leaders, change agents, or others. If responsibility is pushed down to departments, there might also need to be a more structured way to assign roles and expectations, so it does not depend on chance or individual personality.

- Stronger leadership signals. Several interviewees expressed that no one put down the foot and made sure that everyone changed their way of working. It might be helpful if leaders, especially in the line organisation, are clearer in pointing out that "this is how everyone must work now." When expectations are vague, people tended to return to what they know. A stronger signal from leadership might help reduce uncertainty and support the shift from practical to deliberate coping.

- Look for an optimistic and engaged person and place them close to the team. Departments where there was someone close by, who was motivated, available, and had knowledge about FileMaster, seemed to manage the change better. This person could be a super user, a team leader, or just someone naturally curious and helpful. It might be worth identifying or supporting this kind of role early in each department or project. Having a go-to person who believes in the tool and can answer questions on the spot seems to make a big difference.

- Follow up early and continuously, not just when things go wrong. Some interviewees felt that support only arrived when a project was already struggling. It might help to follow up earlier and more regularly. Checking in on how teams are doing, what they need, and whether people are using the system as intended could make problems easier to catch before they grow. These check-ins do not need to be formal, they could be small conversations or quick observations, but they might show users that the change is supported and that their experience matters.

- Do not assume strategy equals reality, check what actually happens. A few roles in the implementation structure existed clearly in documents but were not visible in everyday work. Change agents, for example, were often unknown to end users. Middle managers is another example, who were not as visible as intended. This shows that just because something is decided at a high level does not mean it reaches the projects. It might help to follow up more actively on what people actually do, not just what has been written or communicated. As seen, reality in projects is often very different from what the rollout plan looks like on paper.

- Improve support materials, make them shorter, simpler and easier to find. Many users gave up on the guide portal because it was hard to navigate and not specific enough. Even when materials existed, they did not always match what users needed. It could help to simplify and structure the guides better, make them more user-friendly, and sort them clearly by role.

- Consider a dedicated implementation leader in each department. Some interviewees suggested that what might have helped was having a dedicated person in the department whose only focus was the implementation. Design managers, super users, change agents, and leaders all had other responsibilities, and often lacked time to properly drive the change. A person without project pressure, who could coordinate support, follow up with the team, and keep focus on implementation, might have made a big difference. Whether this role is truly needed or not could depend on the success of other efforts. If responsibilities, expectations, and follow-ups are clearly defined and well-anchored in the line organisation, maybe it can work without a dedicated person. But if those things continue to be unclear or inconsistent, a dedicated role might be necessary to avoid gaps.

7.2 Future research

This study opens up several opportunities for future research. While it offers a detailed account of how digital transformation was interpreted and enacted in one business area at NCC, future studies could broaden the scope by examining other business areas, companies, or digital tools. Comparative research could help uncover how factors like organizational culture, leadership engagement, or system design influence the success of digital strategy implementation.

Second, because this study was conducted during an ongoing rollout, longitudinal research would be valuable to follow how attitudes, routines, and system usage evolve over time. Such studies could explore whether early frustrations are resolved, how support structures mature, or whether resistance persists. This would offer a more complete picture of the long-term outcome of digital adoption.

Third, a key insight from this study is the substantial variation in how FileMaster was received, not only between roles but also between departments and even individuals. Further research could investigate these differences more systematically to identify patterns behind successful or unsuccessful implementation. For example, what contextual, cultural, or relational factors contributed to higher engagement in certain departments? How did leadership style, team dynamics, or existing digital maturity

shape the experience of the rollout? Exploring these questions could provide actionable insights for tailoring future implementations.

Finally, future studies could build on the approach of this thesis by conducting step-by-step investigations across the organizational hierarchy in more detail, following the line from end users to middle managers, change leaders, system developers, and top management. By interviewing stakeholders at each level, researchers could map how the strategy is interpreted, communicated, and translated into action across the organization. This could help reveal exactly where misunderstandings, assumptions, or gaps in ownership occur, offering a clearer view of where strategic intentions are most at risk of being lost in practice.

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Appendix I

Interview Guideline

Background and role

1. Can you tell me a bit about yourself and your background?

   a) What is your relationship with NCC? When did you start working here?

   b) Can you describe your role as a Design Manager and your main responsibilities and daily tasks?

Digital Transformation at NCC

2. How would you describe NCC's digital transformation from your perspective?

   a) What does digital transformation mean for you in your daily work?

   b) Who do you see as the key roles in this change? What do they do, and how do you collaborate with them?

   c) Why do you think NCC is driving this change? Have you reflected on the purpose behind it?

FileMaster: strategy and implementation

3. Can you tell me how you first heard about FileMaster and how it was introduced into your work?

   a) Can you walk me through the steps of how the implementation process took place?

   b) How has FileMaster changed the way you work?

4. How does the implementation actually work in practice?

   a) Which people and roles are involved, and how do they communicate and collaborate with you?

Challenges and opportunities

5. What do you see as the biggest challenges in digital transformation at NCC, especially in connection to FileMaster?

    a) How did you react to the change? And how did those around you react?

    b) What do you think caused those reactions?

    c) How do you feel NCC is managing these challenges and responses?

    d) Looking back on the whole process, what do you see as positive?

Lessons and improvements

6. Based on your experience with digitalisation projects, what do you think has worked well, and what could be improved?

    - [Possibly ask about Change Agents here]
    - [Possibly ask about leadership or the construction industry being conservative]

Closing

7. Is there anything we haven't talked about that you think is important to mention?

8. If I have follow-up questions after reviewing the transcript, can I contact you by email?

9. Do you have any suggestions for other Design Managers I should interview? Perhaps someone you've heard has strong opinions about digital transformation or FileMaster?

Appendix II

Consent and information about processing of personal data in student thesis

My name is Tyra Lindh, and I am an MSc student at Chalmers University of Technology in Design and Construction Project Management.

For my master thesis, I am carrying out research on digital transformation in practice, specifically focusing on employee's experiences of digital transformation within NCC Building Sweden, that differentiates itself as a data informed company. The empirical research focuses on gathering real-life stories and individual perspectives from employees through interviews. The data will be collected through video or audio-recorded interviews and written transcripts.

If you are willing to be interviewed, you will be asked to participate in an interview of approximately 60 minutes at a time of your choice. During the interview, I will ask questions about your experiences and perspectives on digital transformation at NCC. With your permission, I would like to record and transcribe the interview. Copies of the transcript will be available upon request, and any changes you ask for will be made before inclusion in the thesis. You may choose not to answer any questions, and you are free to withdraw from the study at any time without consequences.

Information

At every stage, your identity will remain confidential. Your name and any identifying information will be removed from the written transcript. The personal data will be processed only by me and shared with my supervisor Dilek Ulutas Duman at Chalmers University and my co-supervisor (Name of Supervisor) at NCC Building Sweden. The data will be securely stored on Microsoft Apps, accessible only by me, and/or on a OneDrive folder shared with the two supervisors.

The data will be used for academic purposes only. No personal data will be published, and all interviewees will be referred to anonymously in the thesis. Copies of any outputs, such as articles or presentation slides, will be available upon request.

Your consent is valid until further notice. You have the right to withdraw your consent at any time. You do this through contacting tyral@chalmers.se or registrator@chalmers.se

If you withdraw your consent, we will cease processing personal data we have collected with the support of your consent. Some information may be saved due to Chalmers obligations under Swedish archive legislation.

Chalmers University of Technology, org. No. 556479-5598 is personal data controller. You can find Chalmers privacy policy at www.chalmers.se.

As a participant you have the right to receive information about how your personal data is processed. You have the right to have incorrect information corrected, redundant data

deleted, request that processing shall be restricted and data transferred to another actor. You also have the right to submit a complaint to the Swedish Authority for Privacy Protection (Integritetsskyddsmyndigheten). Do you have any questions about Chalmers's processing of personal data contact Chalmers's data protection officer at dataskydd@chalmers.se.

Consent form

1. I understand that my participation is entirely voluntary and that I have the right to withdraw from the project any time, and that this will be without detriment.

2. I understand that my personal information will remain confidential to the researcher and her supervisors at the Chalmers University of Technology and NCC Building Sweden, unless my explicit consent is given.

3. I understand that my organization will not be identified either directly or indirectly without my consent.

4. I agree to the arrangements described in the Information Sheet in so far as they relate to my participation.

I agree that Chalmers University of Technology processes personal data about me in accordance with the above.

Place:	Signature
Date:	Name clarification

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