

CONSTRAINTS OF DIGITAL TRANSFORMATION

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Doctoral Dissertation

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To my treasure, Adam, and Celine

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Jwan Khisro
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ABSTRACT

Digital transformation is viewed as instrumental in coping with organizational and societal challenges. In the public sector, these challenges include diverse issues, such as demographic changes, constrained financial resources, increasing complexity, and digital legacy. While there are opportunities for the public sector to benefit from digital transformation, there are also important constraints to consider. The aim of this thesis is to offer insights into these constraints and conceptualize how they impact digital transformation in public sector organizations. To address this aim, I apply a clinical inquiry approach focusing on two specific cases from the Swedish public sector during the period 2019–2021. Both organizations (County Administrative Boards and Sundsvall Municipality) have ongoing digital transformation initiatives with the research endeavor directed at actively supporting these initiatives. The thesis brings together five publications stemming from the clinical inquiries and presents a synthesis of the findings. This thesis contributes to research and practice by identifying and describing three mechanisms related to IT Governance, the funding model, and digital infrastructure that constrain digital transformation in public sector organizations by imposing a biased approach to digital transformation in which short-term goals take precedence over organizations' long-term sustainability.

Keywords: digital transformation, constraints, public sector, organizational ambidexterity, mechanisms

LIST OF PAPERS

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Part 1

CONSTRAINTS OF DIGITAL TRANSFORMATION

CHAPTER 1

INTRODUCTION

Digital transformation has gained significant interest among researchers within information systems (IS), as well as within practice (Legner et al., 2017; Maxwell et al., 2019; Mergel et al., 2019; Vial, 2019; Markus and Rowe, 2021). However, Brunetti et al. (2020) emphasized the importance of understanding and discussing digital transformation because digital transformation is everywhere, and no sector is immune to its effects. Increasing connections among people, objects, devices, and systems alter the conditions under which individuals, businesses, and societies live and work (Hess et al., 2016; Brunetti et al., 2020). Digital transformation has been hailed as a means of reconstructing organizations and having a profound impact on society (Osmani et al., 2012; Omar and Elhaddadeh, 2016; OECD, 2019).

Digital transformation is a never-ending process of redesigning the enterprise through the adoption and use of digital solutions (Chanias et al., 2019; Mergel et al., 2019; Vial, 2019; Warner and Wäger, 2019). It refers to the flexible, ubiquitous configuration of products and services, which create value (Ebert and Duarte, 2016). As such, digital transfor-

mation enables improvements, for instance, streamlining operations and increasing customer satisfaction (Fitzgerald et al., 2014; Parviainen et al., 2017; Reis et al., 2018). Furthermore, Wessel et al. (2021) discussed how digital transformation brings a new identity in contrast to an improved existing identity of the organization. Digital transformation displays dual characteristics: on one hand, the automation and replacement of existing administrative activities and, on the other hand, the innovation and radical redesign of the business purpose, values, and roles (Hinings et al., 2018; Ranerup and Henriksen, 2019). From this perspective, digital transformation inherently involves balancing tensions (Xue et al., 2012; Svahn et al., 2017).

Digital transformation in the public sector is viewed as instrumental in coping with challenges, such as demographic changes, budget difficulties, and the growing complexity and interconnections of information systems legacy (Aichholzer and Schmutzer, 2000; Kokkinakos et al., 2016; Larsson and Teigland, 2019). Digital transformation in the public sector is often perceived as using information technology (IT) solutions to enhance the efficiency of public sector organizations by increasing productivity and decreasing operational cost (Jonathan, 2019; Magnusson et al., 2020a). Public sector actors are striving to anticipate how day-to-day activities are changing and, thus, how to identify and leverage opportunities and tackle challenges (Adger et al., 2003; Andréasson, 2015; Scupola and Zanfei, 2016; De Vries et al., 2016; Chanias et al., 2019). These rapid developments affect the public sector implementation of new digitalized practices (Stolterman and Fors, 2004; Bohnsack et al., 2018; Reis et al., 2018; Vogelsang, 2019; Warner and Wäger, 2019). Consequently, public sector organizations set up large-scale digital transformation initiatives to ignite changes (Legner et al., 2017; Da Rosa and De Almeida, 2018; Allesie et al., 2019). This is also in line with the Swedish digital national agenda to improve digital transformation in public sector organizations and to cope with digital transformation in society (Regeringen, 2020).

There are opportunities for the public sector to benefit from digital transformation, but at the same time, there are also important constraints. In a study of the Social Insurance Agency as an example of Swedish public sector organization, Magnusson et al. (2020a) showed how the current structure i.e., hierarchy, process i.e., top-down decision making, and

relational mechanisms i.e., actors included in governance constrain digital transformation. In addition, Vogelsang et al. (2019) identified change management practices, organizational culture, and leadership and coworker involvement as barriers that slow the process of digital transformation. Other constraining factors related to digital transformation in the public sector include risk-avoidance behavior and a lack of up-to-date knowledge and appropriate skills for different organizational challenges. Consequently, there is a need for continuous governance of digital transformation (Jonathan, 2019; Larsson and Teigland, 2019; Kö and Szabo, 2019; Magnusson et al., 2020a). Recognizing constraining issues is fundamental to deploying countermeasures and enabling digital transformation (Vogelsang et al., 2019; Magnusson et al., 2020a; Magnusson et al., 2021). Despite the ubiquity and increasingly visible opportunities of digital transformation (Li et al., 2017; Svahn et al., 2017; Åkesson et al., 2018), there are to date but a few empirical studies that exploring digital transformation in the setting of public sector organizations (Janssen and van der Voort, 2016; Reis et al., 2018; Jonathan, 2019; Maxwell et al., 2019; Mergel et al., 2019). There is a dearth of research that provides insights into how the public sector is approaching digital transformation in actual practice (Mergel et al., 2019; Larsson and Teigland, 2019).

CHAPTER 2

RESEARCH AIM AND RESEARCH QUESTION

The aim of this thesis is to contribute to three streams of research. First, this research contributes to the Information Systems and e-Government disciplines by addressing the issue of the construct validity of digital transformation. I answer the call from Mergel et al. (2019), who argued for the need to demarcate digital transformation from IT solutions. Furthermore, Markus and Rowe (2021) argued that “Digital transformation is not yet ... well theorized” (p. 275) and pointed to the need for the “Ability to differentiate digital transformation from other phenomena” (p. 278). Second, I contribute to the issue of how digital transformation is constrained in organizations. I answer the call for research on the constraints of digital transformation within the public sector (Magnusson et al., 2020a; Magnusson et al., 2020b). I also respond to Vial’s (2019) call for research on the use of digital transformation in organizations and the need to “overcome barriers that hinder their transformation effort” (p. 5). Third, I contribute to organizational ambidexterity studies by answering the claim of Zimmermann et al. (2018) that organizational ambidexterity is an enact-

ment and the argument of Cannaerts et al. (2019) for a combination of design and enactment. The study was operationalized through an organizational ambidexterity perspective seeing the public sector as constantly facing issues involved in both the exploitation of existing opportunities and the exploration of new opportunities.

This thesis answers the following research question:

How is digital transformation constrained within public sector organizations?

CHAPTER 3

DIGITAL TRANSFORMATION

There have been several previous attempts to understand the notion of digital transformation (Matt et al., 2015; Henriette et al., 2016; Kokkinakos et al., 2016; Gray and Rumpe, 2017; Reis et al., 2018; Mergel et al., 2019; Hanelt et al., 2020). Despite an abundance of initiatives, digital transformation faces more challenges than expected in both the public and private sectors (Zinder and Yunatova, 2016). Even though the wide-ranging, varied studies on digital transformation, the concept still suffers from a lack of common understanding of its meaning (Dufva and Dufva, 2019; Warner and Wäger, 2019; Hanelt et al., 2020; Schallmo et al., 2020; Wessel et al., 2021).

Teece (2014) described transformation as being about “continued renewal” (p. 332). Accordingly, transformation means restructuring or reforming (Wade, 1998). It changes substance, character, or function (Williams, 2000). Gray and Rumpe (2017) described transformation as a process that begins with a starting status and is aimed at improving the situation. Transformation does not reach a stable end; rather, it is a contin-

uous process of development within the target context. Take, for instance, the reconfiguration of business activities using digital technologies (Gray and Rumpe, 2017). Furthermore, transformation requires explicit, continuous support from top management to be successful (Andriole, 2017). Transformation led by digital technologies has strategic value for organizations which means that the use of digital technologies enables exploration and creativity activities in a particular domain, rather than only enhancing and supporting traditional working processes (Henriette et al., 2016).

Yoo et al. (2010) articulated three characteristics of digital technologies that make them unlike other technologies: the digital is programmable, reproducible, and generative. These characteristics facilitate the development of digital products and services as a continuous process (Yoo et al., 2012; Yan et al., 2021). Digital technologies per se do not transform and change the organization; rather, the way the organization works with and uses technologies transforms organizational practices (Dunleavy et al., 2006). Digital technologies are intertwined with human activities and should be looked at not as objects or end points of human actions but as actors in constant communication with each other (Berry, 2016; Dufva and Dufva, 2019). There is an increasing need to grasp what digital transformation holds for both individuals and organizations. Different researchers have defined digital transformation from several viewpoints, showing the various aspects it includes (Vey et al., 2017; Reis et al., 2018; Vial, 2019; Ziyadin et al., 2019; Brunetti et al., 2020) and indicating the increasing complexity of the concept. In this light, Kiron et al. (2016) proposed five categories for dealing with issues of digital transformation. First there are two categories for improvement of 1) customer experience and involvement and 2) business decision making. Then there are two categories for increased 3) efficiency and 4) innovation. Last category 5) deals with radical transformation of business processes and/or business models, see Table 1.

Table 1. Examples of digital transformation viewpoints structured according to the five categories proposed by Kiron et al. (2016).

Category	Example	Reference
Improvement of customer experience and involvement	Digital transformation is defined as the utilization of digital technologies that facilitate business improvement and affect all aspects of customers' experience.	Reis et al. (2018)
Improvement of business decision making	Digital transformation focuses on the improvement of entities through a combination of information, computing, communication, and connectivity technologies.	Vial (2019)
Radical transformation of business processes and/or business models	Digital transformation is about the changes digital technologies can bring to organizations' business models, which result in changing the automation of processes and affect organizational structures.	Hess et al. (2016)
	Digitalization creates potent digital affordances through innovation in business-model which transform organizations economic activities.	Autio et al. (2018)
Increased efficiency	Digital transformation encompasses striving for efficiency through process digitization and digital innovation with a focus on improving products and services with digital capabilities.	Berghaus and Back (2016)
	Digital transformation is about enabling new IS/IT solutions within the organizational context.	Heilig et al. (2017)
	Digital transformation is an incremental change process that begins with the usage and adoption of digital technologies and progresses into a transformation of the organization, often in the pursuit of value creation.	Henriette et al. (2016)
	Digital transformation highlights internal conditions in the organization, such as culture, individual competencies, and mindset, as important aspects for digital transformation.	Mergel et al. (2019)
Increased innovation	" <i>Digital transformation is fundamentally not about technology, but about strategy</i> ". In other words, the need experienced by senior leadership to find and support new, innovative activities to capitalize on new business processes that enhance citizen experiences and needs.	Rogers (2016)

From Table 1, it is clear the concept of digital transformation refers to a complex, disruptive process (Kane, 2019; Tomičić et al., 2020) that involves a wide range of actors (Nambisan et al., 2017). Digital transformation, on one hand, influences society by monitoring and informing human behavior and, on the other hand, enabling and enhancing new practices. Both aspects impact human behavior and, in turn, have consequences for the individual, organizational environment, and society at large (Melville, 2010; Elliot, 2011; Nastjuk et al., 2016). Digital transformation is a continuous process of organizational adaptation to the disruptive changes brought about by digital technologies and affects business activities, practitioners' competencies, leadership, regulations, culture, and even ethics (Brynjolfsson and McAfee, 2011; Matt et al., 2015; Demirkan et al., 2016; Kokkinakos et al., 2016; Gray and Rumpe, 2017; Kane, 2019; Vial, 2019; Hanelt et al., 2020). Liu et al. (2011) described digital transformation as "an organizational transformation that integrates digital technologies and business processes" (p. 1730). Digital transformation leads to organizational change, shifting toward a flexible organizational redesign that enables and facilitates continuous adaptation (Hanelt et al., 2020). As such, Nadler and Tushman (1997) described digital transformation as "configuration[s] of the formal organizational arrangements, including the formal structures, processes, and systems that make up an organization" (p. 48). This continuous process involves the micro-level activities of adaptations emerging from improvisations in internal practices that have progressed and accumulated over time (Weick and Quinn, 1999). These continuous processes spur actions, reactions, and interactions by practitioners, as they aim to develop the organization from its present to its future situation (Pettigrew, 1987).

Organizational change has different internal and external dimensions. The internal dimension contains the culture, structure, and political aspects of change within the organization. The external dimension contains the economic and social aspects of change, such as increased customer demands and intensified competition, which leave the organization in a state of constant flux (Pettigrew, 1987; Benders and Van Veen, 2001). Digital transformation complicates the distinctions between internal and external dimensions because organizational boundaries are increasingly

blurred by digital technologies (El Sawy et al., 2010; Hess et al., 2016; Ziyadin et al., 2019). Consequently, the internal and external aspects of change become increasingly important, and the development of society and the organization come increasingly closer to each other. Consideration of these aspects requires a focus on actors and actions (Armenakis and Bedeian, 1999; Sminia and de Rond, 2012). Digital transformation affects the way in which organizations interact with internal and external processes (Hanelt et al., 2020) and thus radically changes the organization's evolution (Henriette et al., 2016). Singh and Hess (2017) argued that the organization's digital transformation is more than functional thinking; rather, it is considered to be the "comprehensiveness of actions" (p.2) that must be acknowledged to exploit the opportunities and tackle the constraints associated with digital technologies.

CHALLENGES ASSOCIATED WITH DIGITAL TRANSFORMATION

According to Kö et al. (2019) digital transformation is not the "final destination" (p. 374) of organizations. Rather, there is a need for a flexible attitude and a rapid response to change and continuous innovation (Kö et al., 2019) as organizations face important challenges in structure, culture, leadership, and employees' roles and digital skills due to the continuous process of digital transformation (Vial, 2019).

Organizational structure is defined by Melville (2010, p. 7) as the "ways in which an organization divides its labor into distinct tasks and achieves coordination among them." There is a necessity to bridge functional silos and close the gap between, for instance, the organizational strategy and the IS/IT and digital business strategy (Bharadwaj et al., 2013; Bilgeri et al., 2017; Svahn et al., 2017). One crucial issue is existing organizational structures that are unsuitable for implementing digital transformation (Bilgeri et al., 2017). In this regard, Earley (2014) articulated that cross-functional collaboration is a significant benefit of digital transformation. Uncertainty is the core issue facing leadership, particularly where and how to align digital capabilities with the organizational structure (Bilgeri et al., 2017). Therefore, the organization's practitioners, particularly leadership,

need to redesign internal structures, which can be achieved through the decentralization of business entities (Warner and Wäger, 2019).

Digital transformation involves cultural change that occurs in the organization and requires breaking down resistance to digital transformation (Mergel et al., 2019; Brunetti et al., 2020). Consequently, there is a need for organizations and their employees to cultivate a desire to test new ideas, experiment, and dare to take risks (Fehér and Varga, 2017). It is important that top management facilitates a flexible working environment that stimulates a mentality of adaptation and exploration in response to continuous changes (Brunetti et al., 2020). For instance, to improve the organization's integrity, transparency, and customer satisfaction (Nograšek and Vintar, 2014; Mergel et al., 2019), the organization can encourage employees learning through incremental, small, and iterative changes while maintaining its capability to adapt its long-term vision based on the outcomes of such experiments and ongoing changes in its working environment (Jöhnk et al., 2017). The organizations need to have a long-term digital vision and, at the same time, encourage a digital mindset as a robust digitally oriented culture. This encouragement of a digital culture accelerates the organization's digital transformation (Warner and Wäger, 2019).

In addition, improved skills are required to enable practitioners to effectively employ digital technologies and processes to achieve organizational outcomes (Davenport and Westerman, 2018). Due to digital transformation, organizations need structural and cultural changes as digitalization enables automation of some activities and reduces others (Neumeier et al., 2017; Brunetti et al., 2020). Thus, practitioners find themselves stepping outside of their roles and traditional, daily working processes. Consequently, improving practitioners' knowledge and skills, such as developing analytical skills to handle complex problems (Hess et al., 2016; Dremel et al., 2017), is essential to fulfilling the digital transformation process. Otherwise, the organization will be left behind (Dremel et al., 2017; Neumeier et al., 2017). A lack of up-to-date knowledge and proper skills is one of the most substantial obstacles to digital transformation, along with risk-avoiding behavior. Thus, new competencies, skills, and knowledge and learning from mistakes are essential when the organization undertakes digital transformation (Kö and Szabo, 2019; Mergel et al., 2019).

Digital leadership is a group of expertise of various leaders who work with each other to grasp opportunities and overcome challenges constituted by the rapid changes of digital transformation (Tanniru et al., 2018). One of the challenges leaders confront is the strategic paradox, which requires balancing contradictory demands in managing complex situations that are likely to change over time (Warner and Wäger, 2019). Leadership needs to make dynamic decisions, manage conflict, learn actively at different levels, and build commitment to both the overarching vision and agendas for specific goals (Smith et al., 2010). One of the important issues facing leadership is that digital transformation has become a strategic imperative in their agendas in coping with rapid change (Teece, 2007; Hess et al., 2016; Svahn et al., 2017; Singh and Hess, 2017; Warner and Wäger, 2019). In rapidly changing environments, organizational leaders must quickly adapt existing approaches to digital transformation to ensure that their organizations simultaneously enhance their digital mindset and are capable of responding to the disruptions associated with the use of digital technologies. Digital transformation, therefore, is about the leadership changes that are required to redesign management structures (Warner and Wäger, 2019). This could be done, for instance, through the creation of new leadership roles (Haffke et al., 2016), such as Digital Transformation Manager or Chief Digital Officer, having a transverse function of operationalizing digital strategy and act as cross boundaries to improve cross sections collaboration and explore new opportunities (Horlacher et al., 2016; Henriette et al., 2016; Singh et al., 2020). New leadership roles and governance thus facilitate proper digital transformation (Hansen et al., 2011; Benlian and Haffke, 2016) and offer flexible leadership capabilities that enable the organization to establish a culture of continuous process by leveraging updated technologies within the business architecture (Tanniru et al., 2018).

DIGITAL TRANSFORMATION IN THE PUBLIC SECTOR

The public sector is under strict regulations and is typically governed by a political decision-making process. For example, digital transformation projects in the public sector must be discussed and approved by politicians and top management (Gil-García and Pardo, 2005). Public sector organizations have been affected by several waves of digital transformation. The focus has often been on enhancing existing processes without rethinking mission support or redesigning services. Digitization, for example, is intended to contribute to time and resource savings. The first wave focuses on transitioning from analog to digital services and increasing the efficiency and effectiveness of government services. In many cases, organizations are only seeking to increase automation in their processes (Legner et al., 2017). However, Asgarkhani (2005) argued that solely automating existing services is insufficient and does not produce improved results. The second wave focuses on introducing a full review and revision of existing services rather than simply digitizing analog services (Mergel et al., 2018). Similarly, Magnusson et al. (2020b) described three waves of IT Governance evolution within the public sector. The first wave was dominated by decentralized, autonomous governance built on an adhocracy situation. In this wave, technology came to the workplace, and the innovation in this period was the use of systems, in other words, computerization. The challenge that occurred was the increased costs of maintaining and integrating these systems. Thus appeared the need for controlled, centralized governance, in other words, a bureaucratic model. The first wave gave birth to the second wave, which expropriated all the decentralized resources. All IT initiatives had to be under district control and were standardized into an internal procurement process, but the disadvantage of this wave was that IT utilization decreased due to the lengthy process to achieve the needed initiatives. The first and second waves gave birth to the third wave; paradoxically, there is still a need for computerization focused on efficiency logic, and at the same time, there is a need to handle innovation activities (Magnusson et al., 2020b).

Digital transformation in the public sector is understood as the application of IT solutions to enhance the efficiency and accessibility of pub-

lic services. The literature has revealed two main benefits of digital transformation in the public sector (Napitupulu and Sensuse, 2014; Cordella and Tempini, 2015; Janowski, 2015; Anthopoulos et al., 2016). First, it improves organizational efficiency by decreasing costs and increasing productivity. Second, it increases the diversity and quality of services (Jonathan, 2019). According to Gil-García and Pardo (2005), digital transformation in the public sector is a vital endeavor that contributes to public sector organizations' effectiveness and improves democratic values and mechanisms. Digital technologies enable the transformation of public sector organizations to facilitate value creation. It transforms public sector organizations' working processes, challenging the bureaucratic configuration of these working processes (Cordella and Paletti, 2015; Magnusson et al., 2020a). Digital transformation can also facilitate proactive solutions (Jonathan, 2019). Sadler (2000) argued that the bureaucratic character of the public sector cannot be innovative. This nature is based on well-established and defined rules and a hierarchical structure, which makes the public sector slow to react to digital transformation (Janssen and van der Voort, 2016). Furthermore, Mergel et al. (2019) articulated that public sector organizations are required to digitally transform by pressure coming from citizens and politicians i.e., society in general rather than internal factors, such as the organization's own ambition to develop its business process. In the context of public sector organizations, a suitable organizational structure is essential to simplify the engagement of internal and external stakeholders (Legner et al., 2017). Digital transformation in public sector organizations is dominated by approaches at the project level, but Mergel (2017) argued that it needs to take place on a broader level as a transformational approach. Legner et al. (2017) noted that leadership in public sector organizations has not yet recognized the organizational changes needed to fully benefit from digital transformation. Thus, there is a need to understand constraining issues in digital transformation initiatives in public sector organizations.

CONSTRAINTS SPECIFIC TO DIGITAL TRANSFORMATION IN PUBLIC SECTOR ORGANIZATIONS

Leonardi (2011) argued that in human agencies, such as public sector organizations, “a technology either constrains their ability to achieve their goals, or that the technology affords the possibility of achieving new goals” (p. 147). The affordances and constraints of utilizing digital technology depend on workers’ behavior, in other words, how and why they utilize it and in what context. It is also about how workers justify their use of digital technology to fit their goals (Leonardi, 2011).

While public sector organizations have made great improvements in digital transformation, its full benefits are still untapped, and these organizations still struggle to be innovative in economic, social, and political areas. There are challenges regarding the administrative hierarchy, fragmented working processes, and contradictions between legislation and the implementation of digitalization at different levels e.g., central, regional, and local levels; (Alvarenga et al., 2020; Magnusson et al., 2020b). According to Janssen and van der Voort (2016), public sector organizations are facing challenges regarding their legislation, policies, structure, and systems. The main issue is that it is not flexible enough to cope with the pace of digital transformation and development. As Janssen and van der Voort (2016) stated, “these mechanisms were not developed to adapt to changes. The use of the existing mechanisms implies enhancing controls and procedures” (p. 4).

When approaching digital transformation, public sector organizations face challenges that go beyond the automation of existing working processes (Magnusson et al., 2020b). For instance, they must deal with complexities and contradictions (Besson and Rowe, 2012), including a wide range of actors in digital transformation initiatives (Holgersson and Karlsson, 2014). Dealing with digital infrastructure is vital to enable successful digital transformation in public sector organizations (Altameem et al., 2006; Montealegre et al., 2019). Public sector digital transformation initiatives are disrupted for various reasons, such as policies, fragmented working processes, legacy systems, and top-down decision-making (Kokkinakos et al., 2016; Larsson and Teigland, 2019; Magnusson et al., 2020b).

According to Magnusson et al. (2020a) in a study of the Swedish Social Insurance Agency, digital transformation within the public sector is constrained by three major issues. First, there is the question of a structure that is based on hierarchical and functional isolation and dominated by “not invented here.” The second concern is strict processes based on top-down decision-making. Finally, there is a problem with the relational mechanisms, particularly the active collaboration, dialogue, and shared knowledge, that occur between actors included in governance, in other words, the collaboration across business and IT Governance. All these constraining issues lead to governance overload and digital legacy (Magnusson et al., 2020a). In a study by Mergel (2017), it was noted that “innovation can’t happen” (p. 7) in public sector organizations because culture and regulations constrain digital transformation. Mergel (2017) highlighted the importance of public sector organizations abandoning their deeply rooted risk-avoiding behavior. Organizational culture determines, for example, leaders’ and workers’ mindsets, acceptance of failures, adoption of innovative ideas, and willingness to digitally transform public sector organizations (Manimala et al., 2006; Legner et al., 2017; Jonathan, 2019). Exploration activities are associated with ambiguity and uncertainty, which contrasts with the nature of highly stable public sector organizations with well-established functions. Exploration activities, therefore, are often lacking in the public sector due to their response to the status quo (Janssen and van der Voort, 2016; Hong and Lee, 2017; Schirrmacher et al., 2019). “Organizations are all too often focused on running their day-to-day operations and having little mechanisms to be adaptive and to react to changes that might have a disruptive nature” (Janssen and van der Voort, 2016, p. 12). Sadler (2000) found that the following issues typical of the public sector constrain exploration activities. There is a lack of competition and resources, massive regulation and accountability requirements, measurement of inputs rather than outputs, multiplicity, understandability, and ambiguity of goals, risk-aversion tendencies, soft budget constraints, restrictive employee policies, political intrusion into management, and skewed, ineffective rewards.

Public sector organizations spend the lion’s share of their IT budgets on operating and maintaining the existing IT infrastructure, which leaves exploration without enough resources (Mergel et al., 2017). In a study, Kuhlmann and Heuberger (2021) identified the hurdles to digital trans-

formation that constrain the implementation and thus the development of the public sector (Savoldelli et al., 2014; Meijer and Bekkers, 2015). Such hurdles are administrative structures, a lack of skills, resistance to change, policies, investment budgets, governance structures, and technological issues. For instance, the presentation of new technology can create confusion among workers and cause alarm about losing control of processes and related resources. A fear of funding for digital initiatives and legislation also constrains the implementation of digital transformation (Meijer and Bekkers, 2015; Kuhlmann and Heuberger, 2021). Digital transformation can restructure the traditional hierarchies in public sector organizations into a network or a rhizomatic model (Magnusson et al., 2022). However, it is a challenge to overcome public sector practitioners' familiarity with traditional hierarchies. In other words, using digital technology does not transform public sector organizations unless they improve their governance model. Consequently, there is a need to make fundamental reforms to regulations and top management (Asgarkhani, 2005).

CHAPTER 4

ORGANIZATIONAL AMBIDEXTERITY

According to Gibson and Birkinshaw (2004), organizational ambidexterity is “an organization’s ability to pursue two disparate things at the same time” (p. 210). Ambidexterity has a Latin root word that combines the words *ambi* (both) and *dexter* (right, favorable). The organizational ambidexterity concept was used by Duncan (1976), who suggested a dual structure to enable exploitation and support exploration. Ambidexterity is explained as an organization’s ability to simultaneously balance and perform various contradictory activities, such as exploration and exploitation (Simsek et al., 2009). In society, the public and private sectors alike are conducting initiatives to explore and, at the same time, exploit the use of digital technologies. According to Benner and Tushman (2003), exploration is associated with innovation, and exploitation is associated with efficiency. Exploration enables the identification and acquisition of new resources and capabilities to meet future needs. Exploration involves activities such as innovation, risk-taking, flexibility, search, experimentation, and discovery. It is about processes and radical initiatives, including the development of skills and organizational knowledge (Benner and

Tushman, 2003; Xue et al., 2012). It is about exploring new opportunities, such as goal-seeking and creating new services (Magnusson et al., 2020a). In contrast, exploitation enables reaching high efficiency (Fitzgerald et al., 2014; Ross et al., 2016; Reis et al., 2018). Exploitation involves activities such as reduction, production, efficiency, refinement, choice, selection, execution, and implementation. It focuses on incremental improvements of existing activities, building on existing technologies. Efficiency is about seeking to take advantage of improvements to existing opportunities and conditions, such as goal fulfillment, while maintaining existing practices (Magnusson et al., 2020a). Organizations need to balance their abilities to exploit existing opportunities and to explore new ones; in other words, organizations should be ambidextrous. They should fit what March (1991) referred to as being ambidextrous or imbued with the capacity to dynamically balance exploitation and exploration (Luger et al., 2018). Zimmermann et al. (2018) and Cannaerts et al. (2019) stated that successful organizations need to exploit existing opportunities to be efficient and need to explore new opportunities to be innovative (Duncan, 1976; Benner and Tushman, 2003; Raisch and Birkinshaw, 2008; Chi et al., 2017; Warner and Wäger, 2019). According to March (1991), organizations progressively interact with contrasting and conflicting goals, such as incremental versus radical innovation and exploitation versus exploration. For instance, there is a conflict between investments in current and future projects and in low-cost projects and differentiation. Consequently, trade-offs are made continuously. The organizational ambidexterity perspective usually connotes as static. It puts contradictory tensions in opposition to each other, such as exploration versus exploitation, short term versus long term, and stability versus flexibility (March, 1991; Raisch and Birkinshaw, 2008; Lavie et al., 2010). Researchers have developed a view that tensions, such as exploration and exploitation, must be constantly and simultaneously developed as everyday activities (Luger et al., 2018; Zimmermann et al., 2018; Cannaerts et al., 2019; Magnusson et al., 2020a). The tendency to explore more than exploit increases the risk of a “failure trap,” while the tendency to exploit rather than explore increases the risk of a “success trap” (Levinthal and March, 1993). Gupta et al. (2006) stated that “theories about the ease or difficulty with which an organization can pursue both exploration and exploitation depend crucially on whether these two

tasks are treated as competing or complementary aspects of organizational decisions and actions” (p. 693). However, recent research has posited the importance of replacing the competing either/or view of tensions between exploration and exploitation with a complementary both/and view of them (Cram et al., 2016; Smith et al., 2016; Wiener et al., 2016; Magnusson et al., 2020b).

Tushman and O'Reilly (1996) and O'Reilly and Tushman (2004) described three types of organizational ambidexterity: structural ambidexterity, contextual ambidexterity, and temporal ambidexterity. Structural ambidexterity involves creating separate organizations, units, or structures for different types of activities, tasks, goals, and visions. Employees are rewarded based on whether they are aligned with or adaptive to the organization's behavior. It is top management's mission to integrate these units (O'Reilly and Tushman, 2008). Structural ambidexterity needs three requirements to be accomplished: 1) differentiation; 2) integration; and 3) robust leadership. In contextual ambidexterity, employees focus their everyday activities on either exploitation or exploration. It is about “an organizational form that builds a context that encourages individuals to make their own judgements ... [and] divide their time between the conflicting demands for exploitation and exploration” (Gibson and Birkinshaw, 2004, p. 211). Organizations must act more flexibly to permit this, permitting employees to judge for themselves how to split their time between their adaptation- and alignment-oriented activities (Gibson and Birkinshaw, 2004). Temporal ambidexterity is about separating organizations' activities into exploration and exploitation at different points in time. These three types of organizational ambidexterity; structural, contextual, and temporal ambidexterity are good as general approaches but do not reveal the underlying activities that can constrain or enable organizational ambidexterity (Heracleous et al., 2019).

A critical perspective on the mentioned types of organizational ambidexterity is provided by Luger et al. (2018), who noted that organizations are always in a transition mode when balancing exploitation and exploration. According to Stieglitz et al. (2016) and Lee and Puranam (2016), the outside environment changes, i.e., dynamism grows and drops in relation to time, which indicates that the best balancing point is contingent on the dynamic environment. Seen from this point of view, the concept of bal-

ance itself should be changed to the enactment of balancing the tensions between exploitation and exploration (Heracleous et al., 2019; Zimmermann et al., 2018). The core challenge in organizational ambidexterity lies in the contradictory nature of exploration and exploitation (Luger et al., 2018; Zimmermann et al., 2018; Montealegre et al., 2019). Luger et al. (2018) reconceptualized ambidexterity as the capability to dynamically balance exploration and exploitation and, thus, the various tensions that arise within the associated activities. However, dynamically adjusting exploration and exploitation might be difficult. First, managers must harmonize the contradictory requirements of exploration and exploitation. Second, they must resist the impulse to proceed with their current, effective ways for more challenging adjustments. Third, they must preserve their focus on long-term demands for both exploration and exploitation while incidentally aligning and realigning their exercises with environmental requirements (Luger et al., 2018). Simultaneously chasing exploration and exploitation causes contradictory organizational tensions that are hard to manage. At the same time, it is essential to balance short- and long-term performance. These tensions are contradictory because exploration and exploitation require different cultures and structures. On one hand, focusing on exploring new opportunities may improve organizational knowledge. On the other hand, focusing on exploiting existing opportunities may improve short-term activities but, at the same time, also result in a lack of competencies among organizational actors, leading to an inability to respond to change (Zimmermann et al., 2018). The earlier organizational ambidexterity literature was based on the belief that top managers are the essential decision-making actors who manage these tensions and decide the solutions (Gibson and Birkinshaw, 2004; Smith and Tushman, 2005). Other organizational actors, such as frontline managers, solely follow top managers, reactively implementing initiatives, and are not included in the development of organizational ambidexterity strategies. However, Zimmermann et al. (2018) noted that frontline managers have a proactive role in initiating ambidextrous strategies, in other words, they engage in both top-down and bottom-up processes.

ORGANIZATIONAL AMBIDEXTERITY IN THE PUBLIC SECTOR

Public sector organizations constantly face issues regarding activities involved in the exploitation of existing opportunities and the exploration of new opportunities (Smith and Umans, 2015; Mergel, 2018; Tate et al., 2018; Cannaerts et al., 2019; Peng, 2019). Public sector organizations need, on one hand, to both be stable and exploit existing opportunities and, on the other hand, to be innovative (Janssen and van der Voort, 2016). Moreover, to be ambidextrous, public sector organizations need to engage practitioners in the decision-making process (Cannaerts et al., 2019). Public sector organizations refer exploitation tightly to reduction, trying to get the maximum benefit from the available resources to provide the services that users require and to reduce resources, such as assets and workers, while giving the same public services. Other exploitation activities are delivering more public services with the available resources (Gershon, 2004; Bryson et al., 2008). At the same time, public sector organizations strictly view exploration as increasing activities, for instance, discovering new ideas, services, and products and designing new digital platforms to cope with rapid developments in the external environment (Kobarg et al., 2017; Cannaerts et al., 2019).

Bryson et al. (2008) identified conditions for public sector organizations to be successfully ambidextrous by accommodating both deliberate and emergent activities, such as a strong organizational culture, connections to the mission, effective relations with oversight authorities, and a strong planning and decision-making system. Indeed, Bryson et al. (2008) linked organizational ambidexterity to organizational learning, for example, exploitation involves learning from existing workers' experience and technologies, whereas exploration also involves learning but away from existing experience. Smith and Umans (2015) explored how managerial actions and decisions influence ambidexterity as an organizational outcome in a Swedish public sector organization. They argued that public sector organizations need to make small decisions rather than a single or several big, overarching decision. However, Smith and Umans (2015) emphasized that the structure of public sector organizations e.g., their hierarchy and governance is highly influenced by political involvement,

which makes it difficult for them to make their own goals and decisions. This political intervention constrains the ongoing balancing activities in public sector organizations (Choi and Chandler, 2015). Leadership was mentioned in their study as one of the most important factors in public sector organizations' balancing of exploration and exploitation activities (Smith and Umans, 2015). In a study of two public sector organizations in Sweden, Palm and Lilja (2017) identified nine enabling factors to achieving organizational ambidexterity in the public sector, such as a culture that allows mistakes, a budget for exploration and exploitation, and dialogue and focus on implementing innovation. They suggested that through these factors, public sector organizations can more successfully analyze and get insights into their specific conditions and enablers for organizational ambidexterity. Palm and Lilja (2017) emphasized that public sector organizations need more leeway for exploration activities to enable organizational ambidexterity.

Boukamel and Emery (2017) analyzed the implicit challenges of exploration capabilities within public sector organizations. They classified hard challenges, such as organizational structure, bureaucracy, red tape, and procedural and legal frameworks. Other challenges are soft ones, such as organizational culture. However, overcoming these difficulties rely on the synthesis of exploration and exploitation as both compete for the same resources. A heterogeneity of cultures, structures, and silos and a lack of flexibility lead to a failure to balance activities in public sector organizations that involve the tensions produced by heterogeneity (Boukamel and Emery, 2017; Peng, 2019). Cannaerts et al. (2019) stated that instead of a top-down design perspective, research should address issues related to control enactment, and ambidextrous organization is not solely a leadership challenge. The public sector faces challenges from social, environmental, and economic changes, which demand that public sector organizations constantly deal with contradictory tensions. For example, the public sector needs to respond to increasing citizen demands and expectations while, at the same time, slashing costs and being efficient. Constantly balancing exploration and exploitation in an organization, therefore, is vital. Umans et al. (2020) argued that leadership plays a significant role in organizations' ability to constantly be ambidextrous (Cannaerts et al., 2019). This is in line with Yitzhack et al. (2015), who stated that "Understanding leader-

ship in context is crucial for unpacking the conditions in which executives can make an impact and what leadership is required for creating and maintaining an ambidextrous system” (p. 224). Kobarg et al. (2017) argued that the pace of digital transformation puts pressure on public sector organizations to be more explorative to meet the demands to provide new services. However, the challenge lies in the need to simultaneously chase exploration and exploitation activities (Kobarg et al., 2017). Magnusson et al. (2020b) also proposed the necessity of abandoning the static perspective of organizational ambidexterity as a balance and, instead, stressing balancing practices by focusing on enactment as a dynamic perspective on ambidexterity. That means that ambidexterity must be considered as a process that organizations never achieve, rather than a characteristic of organizations. The balancing practices of digital ambidexterity in the public sector include activities oriented toward contradictory tensions, such as exploration and exploitation. Magnusson et al. (2020b) showed that despite the previous recognition of the need for more exploration in the public sector, their practices incline toward increased exploitation. One important reason behind this trend is the remarkable obstacles to exploration activities, such as regulation and governance.

Heracleous et al. (2019) pointed out the importance of history, circumstances, and context in forming organizations’ present. Heracleous et al. (2019) found that organizational ambidexterity constitutes a journey and a process rather than a static, achievable state. That means that organizations must deal with contradictory tensions. For example, they must impose control and simultaneously authorize workers and motivate them to explore new ideas. Aagaard (2011) argued that public sector workers tend to do what their managers want because they do not have decision-making authority. Organizations’ ability to explore and exploit depends on their culture and structure, deeply rooted in their history, which can constrain or enable ambidexterity (Lavie et al., 2010; Heracleous et al., 2019). The complexity of organizational factors, such as balancing reliability and technical excellence with cost control, and the role of external factors, such as the gradual tightening of government funding, affect and challenge organizational ambidexterity in a way that results in unique organizational configurations. Regulation, legacy systems, and culture constrain public sector organizations’ ability to balance various tensions and deliver on-time, high-quality services (Heracleous et al., 2019).

CHAPTER 5

RESEARCH METHOD

PHILOSOPHICAL UNDERPINNING

A fundamental side of information systems research is the underlying technology that enables or constrains information systems within a human agency, i.e., what goes on in organizations, communities, groups, and people (Pacey, 2001; Gregor, 2006; Leonardi, 2011). This is also acknowledged by Orlikowski (2000), who argued that “technology shapes action by facilitating certain outcomes and constraining others” (p. 407). Digital technology has become a part of our everyday activities. As previously mentioned in the Introduction, digitalization is a pervasive movement, transforming society and rapidly disrupting traditional ways of working. This transformation has ramifications for public sector organizations (Mergel, 2019). In this thesis, I explore how digital transformation is constrained within public sector organizations. I argue that the ongoing activities of public sector practitioners either enable or constrain digital transforma-

tion. It is not only an issue of the utilization of digital technologies but also an issue of human agency in the form of attitudes and behaviors related to thinking and working that can either enable or constrain digital transformation (Gregor, 2006).

My choice of methodology was directed by the overall aim of the research, namely, to gain an in-depth understanding on how digital transformation is constrained within public sector organizations. I applied a clinical enquiry approach through two qualitative, interpretive case studies. Interpretive research does not assume that reality can be discovered and replicated by others, as in quantitative studies, where understanding of a phenomenon is gained through statistical measures (Walsham, 1995; Klein and Myers, 1999). This type of knowledge is socially constructed and requires reality to be interpreted to explain the underlying meaning (Guba, 1990; Creswell and Miller, 2000). This viewpoint, supported by clinical inquiry, helped me to understand the actions within the case context (Golafshani, 2003; Babbie, 2020). The advantage of clinical data is in the construction of variables and theoretical models that are built on the dynamic process (Schein, 1987). Thus, I focus on what Berger and Luckmann (1967) labelled as the socially constructed reality of our subjects. Meijer and Bekkers (2015) argued also that an understanding of the attitudes, behavior, and cognitions of workers and social construction, i.e., transformational change is missing. For instance, Meijer and Bekkers (2015) wondered “how (...) new technologies transform our social construction of government?” (p. 243) and “how individuals transform government” (p. 243). To understand better how individual behaviors impact the system of which they are a part; how they impact change, and how individual interests, values, positions, and local and institutional contexts are linked to developments and changes in public sector organizations. This includes the notion that digital transformation is not the means to support change; rather, processes, people, policies, and leadership must be fundamentally changed to transform the public sector digitally and its relation to society. I am an associate researcher at the Swedish Center for Digital Innovation (SCDI), a research center engaging researchers from the University of Gothenburg, Umeå University, and Stockholm School of Economics. This center has a significant number of ongoing and a constant

flow of upcoming projects in Sweden, one of which is Digital Maturity in the Public Sector. As a PhD student, I had the opportunity to engage in several projects. My role as a researcher is an effect of being a social constructivist. As such, my role has not been treated separately or outside the social context. I engage in the social context of the study, which affected the study, the interviews, and the interpretation of the result.

RESEARCH SETTING

The empirical research setting underpinning this thesis is situated in the Swedish Public Sector. Sweden is a parliamentary democracy based on popular sovereignty, parliamentarism, and municipal self-government. Fundamental to public activities are the welfare of the individual, equality between the sexes, protection of the individual's freedoms and rights, and the freedom of ethnic, linguistic, and religious minorities to develop their own culture and social life. The parliament is the country's legislative body, with its 350 representatives to which the government is held responsible. The government is the country's executive body, and it governs the country. The mission of the public administration is to provide a basis for political decisions made by government and parliament and to implement these decisions. The public administration (Swe. *offentlig förvaltning*) is divided into three levels. The central administration, for instance, comprises ministries and agencies. The regional administration can be found in 21 regions covering geographical areas. In each region, there is a regional council (historically, county council) and several municipalities. There are 290 municipalities in the country with strong self-governance. Municipalities and regional councils are governed by assemblies of elected politicians, i.e., the municipal board and the regional board. Together with the regional councils, the municipalities are responsible for many services that will benefit the citizens within their geographical area. The regions are responsible for health care, public transport, and culture, whereas the municipality is responsible for preschool, school, elderly care, health centers, social services, and sanitation (SKR, 2020; Riksdagen, 2021). In addition, the local state administration is responsible for the police, the fire stations, and the Swedish Social Insurance Agency (*försäkringskassan*).

The Swedish government has developed its digital strategy many times since 1990 and formed agencies to support the digital transformation process, the latest being The Agency for Digital Government (DIGG, www.digg.se). Despite this effort, the public sector's implication of digital strategies has been thwarted because of many issues, such as difficulties in motivating the costs and a lack of knowledge and competencies. The Swedish national audit office has criticized the government for poorly designed digital processes and for being too dependent on legacy systems (Riksrevisionen, 2019).

The two cases chosen for this study as a research setting are found at the regional level, i.e., the County Administrative Boards (CAB) and at the local level, i.e., Sundsvall municipality. In both cases, they contacted researchers and asked for help in their digital transformation process. The research rationale behind the cases was the following: The CAB case offered opportunities for making an overall diagnosis and for understanding the pathology of public sector IT Governance. The Sundsvall municipality case paved the way for an in-depth understanding of digital transformation and development at a local level. The municipal project included several sub-projects, such as IT Governance, digitalization strategy, and digital infrastructure and spanned several years, whereas the CAB project was six months. The rationale for selecting the Sundsvall case was two-fold. First, the municipality presented a new initiative regarding digital transformation, with ample allocated resources. Second, the researchers had complete and unfettered access to all aspects of the organization. This permitted a long-term commitment with the organization, which provided invaluable possibilities to access on-going development processes, facilitating rich data collection and, thus, an opportunity to analyze and illustrate public sector practices regarding digital transformation. For additional information on the specifics of each case setting, please see Papers 1-5.

CLINICAL INQUIRY APPROACH

The clinical inquiry approach is typically characterized by an interest in what goes on in organizations, communities, groups, and people, i.e., human agencies, to change the situation and develop the organization

(Schein, 1987). This approach is suitable to my study because it is oriented toward pathology and problem areas that need remedial action for change and the development of human agencies. Therefore, it requires the identification of vital underlying concepts, such as pathology, effectiveness, growth, coping, integration, and innovation. Ultimately, the scope of clinical inquiry is descriptive and normative, and it seeks to decipher the problem situation and focus on certain detailed data concerning this problem. Hence, it is motivated by both organizational development and scientific knowledge (Coghlan, 2000).

From the researcher's perspective, the clinical inquiry approach starts with the mindset of working with and understanding human agencies. The researcher who adopts this approach is called a "clinician." The clinician initiates the study as action research and aims to become an active partner in solving a specific problem (Schein, 1987; Baskerville, 1998). The clinical inquiry premise is that "...one cannot understand a human system without trying to change it" (Schein, 1987, p. 29). The clinician has a "helping role" in intervening with a diagnostic perspective and instigating changes. The intervention happens based on the main goal specified by the organization that asked for help. The clinician intervenes in the context as a problem solver though the intermediate validation that accrues as an improvement, whether solving the problem or developing the situation. Validation is in the dynamic process itself because change is one of the reasons for being presented in the organization. This could lead the clinician to tell the client, "Every time you do this, the following thing will happen." For example, the clinician can explain to the client that every time a new system is added, an old system will be put aside and become part of the system's legacy. Then, the level of tension and resistance in the organization would increase.

I designed the approach and chose the assignment in collaboration with our research group, and I identified the problem in dialogue with the client. Defining the problem was done by oscillating between the theory and practice that was driven by us, i.e., researchers. At the start of the dialogue, there was no assignment for the researcher. I was quite visible in the organization. Specifically, my role as helper was carefully anchored throughout the organizations via seminars championed by the executive

level of the organization, resulting in both front- and backstage legitimacy (Goffman, 1959). Through a contract specifying which issues needed to be solved, substantial efforts were put in place to differentiate my involvement as a researcher from another role for example a IT consultant.

DATA COLLECTION

Steering documents together with semi-structured interviews were chosen as complementary means of secondary and primary data collected (Yin, 2013) for the studies in the appended papers 1–5 covered in this thesis. They provided valuable insight into the organization's everyday activities. One of the clinical inquiry approach advantages is the client's desire to help in the data collection process. It is therefore more likely that important data are revealed, which can help the researcher develop theoretical insights (Coghlan, 2000). However, there is no incentive for the respondents to reveal their problem areas or concerns unless they are in a clinical relationship where they are seeking help (Schein, 1987; Schein, 1995). The clinician should focus on the client's initial problem statement (Schein, 1987), that is, what the named organizations expressed when they first invited our research group to help them understand how to improve digital maturity in public sector organizations. However, to improve, there is a need to first understand how digital transformation is constrained within public sector organizations.

As a clinical researcher, I noticed how data was continuously generated as the change process proceeded. This is in line with Schein (1995), who suggested that when the researcher is present in the organization to be helpful, the data made available is likely to be of a higher quality because it reflects what is really going on in the organization. Launching from the idea that clinicians interpret what they see as a clinical explanation for their observations, the interpretations constitute themes for learning and for further intervention into the ongoing situation. However, in the research process, diagnosis and intervention are simultaneous activities (Schein, 1995).

STEERING DOCUMENTS

I had access to a plethora of secondary data material in the form of Power-Point presentations, project descriptions, and internal steering documents, such as the IT strategy, IT planning process, digitalization strategy, and shared digitalization action plan for Sundsvall municipality (Gemensam handlingsplan digitalisering för Sundsvalls kommunkoncern 2019–2022). The documents were related to the digital agenda and provided a comprehensive understanding of its overarching goal. Moreover, the documents gave useful insights into the respondents' understanding of the notions of exploration and exploitation, which made the conversation in the interviews easier. The reason behind this was to have a comprehensive understanding of the context. (Yin, 2013).

For an overview of choices made in the five peer-reviewed papers regarding the research method, research setting, interviews and data collection period, documents, and publication, see Table 2.

Table 2 Overview of choices made in papers 1-5 included in this thesis.

Paper # Choice	Paper 1	Paper 2	Paper 3	Paper 4	Paper 5
Primary focus	IT Governance	IT Governance	Funding model	Digital infrastructure	Strategizing digital transformation
Research setting	County Administrative Boards of Sweden (CAB)	Municipality of Sundsvall			
Research method	Qualitative, interpretative case study				
Interviews	31 interviews. Spring 2019	19 interviews. Spring/Summer 2019	8 interviews. Winter 2020	21 interviews. Summer 2020	52 interviews. Winter 2021. Interview material of paper 2, 3 and 4 together with another 4 interviews
Steering documents	35 steering documents.	19 steering documents.	None	60 previous interviews.	None
Publication	EGOV-CeDEM-ePart 2020	Transforming Government: People, Process and Policy (TGPPP)	EGOV-CeDEM-ePart 2020	Transforming Government: People, Process and Policy (TGPPP)	Americas Conference on Information Systems AMCIS 2021

SEMI-STRUCTURED INTERVIEWS

I collected the primary data material for both cases through semi-structured interviews with 83 respondents in total (see Table 2). The semi-structured interviews covered a predefined list of questions, while also allowing the interviewer to probe further with follow-up questions. Semi-structured interviews thus possess a more in-depth character and enable the capturing of the respondents' perspective on a situation or event under study (Williamson, 2002). The purpose of the interviews was to understand the respondent's viewpoint and to uncover the 'real' meanings of the interviewees' experiences. Interviews are indispensable when researchers want to gain insight into a practitioner's experiences and opinions regarding a specific problem area (Denscombe, 2017). From the clinical viewpoint, every question asked has the potential to raise previously unconsidered questions and issues in the interviewee's mind (Schein, 1987). The interviewees were required to give examples to explain their answers better (McCracken, 1988). As such, this provided rich and robust insights to understand their digital transformation in practice, which enabled me to go deeper and closer to explain the mechanisms that constrain digital transformation. The respondents were further asked for their consent to use the interviews for continued research.

In the first case study (CAB), 31 respondents out of the 83 total came from the County Administrative Boards of Sweden (CAB) to write the first paper. 24 respondents were interviewed from the IT side, i.e., the Shared Service Center (SSC), such as the IT Controller, Department Manager, Portfolio Controller, and Manager of Infrastructure and Operations, while 7 respondents were interviewed from the business side, such as the Function Manager, Enterprise Architect, and General County Director.

In the second case study of the municipality, 52 respondents came from Sundsvall municipality to write second, third, fourth, and fifth papers. A second paper involved 19 respondents, such as the Chief Financial Officer (CFO), Chief Information Officer (CIO), Head of Innovation, and Director of HR. The third paper involved 8 respondents, such as the Finance administrator, Unit Manager, and Assistant Municipality Chief Executive. The fourth paper included 21 respondents, such as the IT strategist, Municipal commissioner's Senior advisor, and IT-Coordinator Social ser-

vices. In addition, the interview material of the second and third paper was reused as secondary data. The fifth paper reused interview material from the second, third, and fourth papers and another four interviews with the IT-architect, IT-strategist, Municipal commissioners, Senior advisor, and Head of the digitalization were added (see Table 2).

Table 3. Data collection overview

Case	County Administrative Boards (CAB) case Duration: 2019	Sundsvall municipality case Duration: 2019-2021	Total in both cases
Type of data			
Primary data	Semi-structured interviews with 31 respondents.	Semi-structured interviews with 52 respondents.	83 semi-structured interviews. Each interview lasted approximately 45 to 90 minutes.
Secondary data	35 steering documents.	79 steering documents.	114 steering documents.
	- PowerPoint Presentations - Project descriptions	- PowerPoint Presentations - Project descriptions	-

The rationale for selecting interviewees for the studies was developed in collaboration with representatives from the CAB and the Municipality. After discussions with the representatives, it was agreed that interviewees were going to be selected according to their engagement in the digital transformation. Each interview ranged from approximately 45 to 90 minutes and was recorded and then transcribed verbatim. Some interviews were carried out face to face and some were online through the tools Skype and Zoom. Some interviews were conducted in English, and others were held in the local language Swedish and then translated into English. All interviews were handled confidentially.

PAPER OVERVIEW AND AUTHOR INVOLVEMENT

This thesis consists of five papers as illustrated in Table 4.

Table 4. Overview of the interrelation among papers 1–5 and answering of research calls

Research question	Theories	Method	Contribution	Research call Answered
Paper 1: How do current configurations of IT Governance impact organizational ambidexterity?	IT Governance; Organizational ambidexterity.	Qualitative, interpretative case study.	A first step toward understanding how certain configurations may act as deterrents for digital transformation.	Magnusson, Koutsikouri & Päivärinta (2020) and Gregory, Kaganer, Henfridsson & Ruch (2018)
Paper 2: How are configurational practices employed in the enactment of digital ambidexterity?	The enactment of digital ambidexterity; Configurational practices as enactment.		There is a need for enactment rather than design of governance. The enactment of IT governance either geared toward efficiency or innovation.	Zimmermann, Raisch & Cardinal (2018), Magnusson, Koutsikouri & Päivärinta (2020) and Cannaeerts, Segers & Warssen (2019).
Paper 3: How are municipalities utilizing the investment instrument for digital transformation?	Digital Transformation of the Public Sector; The Role of Investments in the Public Sector Digital Transformation.		Investment budget plays a vital role in both short- and long-term strategy.	Memuletiwon et al., (2018) and Vartiainen et al., (2019).
Paper 4: How does digital infrastructuring constrain ambidexterity in public sector organizations?	Digital infrastructure and infrastructuring; Organizational ambidexterity.		Theorizing on how ambidextrous digital infrastructuring should be changed to increase the purposiveness of digital transformation.	Tilson et al. (2010), Henfridsson and Bygstad (2013) as well as Montealegre et al. (2019).
Paper 5 How is digital transformation strategized in a public sector organization?	Digital transformation and strategizing in the public sector; A conceptual framework for strategizing.		Misunderstanding of digital transformation leads the initiative to be dominated by reactivity and short-term activities.	Marabelli and Galliers (2017), Chaniias et al. (2019).

My involvement as co-author in Papers 1 and 2 began with an invitation by the first author as part of the PhD onboarding process. I was deeply involved in the writing process after the first draft as an equivalent author, and I was fully involved in the whole writing process from problem formulation, choice of theory, and analysis to discussion and arriving at the conclusion. In addition, I took charge of responding to journal and conference reviewers' comments. Papers 3 and 5 were written by me alone as a single author; I initiated and planned the papers from the research idea, which was inspired by the project to which I belonged, theory, data collection, transcription, analysis, discussion, and conclusion, including taking conference reviewers' comments into consideration. In Paper 4, I was involved as the first author. My work was to engage in the full writing process. The introduction, theoretical framing, and analysis were done in cooperation with the co-authors Tomas Lindroth and Johan Magnusson, who provided valuable support.

SYNTHESIS

With the intention to explain how digital transformation is constrained within public sector organizations, the synthesis of the contributions of the papers (1-5) was performed in three iterative rounds. I began with re-reading the included papers to prepare myself to make an interpretive analysis (Elliott and Timulak, 2005) of my work and to develop a synthesis to arrive at a generalized understanding of how digital transformation is constrained within public sector organizations. Each of these three 'rounds' led to discovering clues that pointed me toward the findings presented in the paper that followed. For example, the first and second papers covering IT Governance revealed the need to study the funding model, which in turn pointed to the need to study digital infrastructure. I then re-read Henfridsson and Bygstad (2013), which inspired me to explain how digital transformation is constrained within public sector organizations through mechanisms. I did not begin the synthesis by intentionally looking for mechanisms. Rather, I found them through the organizational ambidexterity perspective when I created an overview of the papers' outcomes, and I realized how these mechanisms delineated on one-sided activity. I used the organizational ambidexterity perspective to understand

digital transformation as a dual approach and explain problems of individuals' everyday activities reflected in the empirical findings, i.e., data from the studied cases. The synthesis further revealed and clarified the details in these processes, and the mechanisms identified were named accordingly. Each mechanism was analyzed by identifying its components and illustrating how they are related. Mechanisms are not limited to mechanical science in the form of the push and pull process. It is used in various sciences and wider perspectives, such as social science (Merton, 1936) and information systems (Henfridsson and Bygstad, 2013). Bunge (2004) argues that a mechanism is a process or pathway in a system that makes it what it is. It helps to answer the questions of how does it work and what makes it as it is, i.e., what are its mechanisms? Mechanisms seek to explain how a phenomenon of interest comes about or how some processes and activities work to make changes. These activities shape the transformation, which reflects the dynamic construct of action through social interaction between individuals or between individuals and some social group that yielded situations, products, or services (Schelling, 1998; Machamer et al., 2000; Markus and Rowe, 2018).

The first round was based on the outcome, i.e., contribution and conclusion of the five papers. In this round, I analyzed each paper and grouped them according to their relevance to each other. For example, the first and second papers discussed the pathology and configuration of IT Governance from an organizational ambidexterity perspective, which was good enough to explain how IT Governance is part of constraining digital transformation by dominating exploitation activities that create the sluggishness mechanism. Thus, by synthesizing the contributions from each paper that addressed different aspects, the synthesis emerged. The second round, done by interrelating the results of the papers, distinguished the mechanisms that explain how digital transformation is constrained within public sector organizations as a mechanism IT Governance, the funding model, and digital infrastructure. Wimelius et al. (2021) argued the need for "concrete knowledge about the mechanisms that drive risks and their resolution during renewal initiatives." Each mechanism depends on and leads to other mechanisms. First, I was able to identify Mechanism 1, the sluggishness mechanism in IT Governance, which led to the identification of Mechanism 2, the reactivity mechanism in the funding model, which

in turn helped me identify mechanism 3, the misallocation of resources mechanism in digital infrastructure. In the third round, I dug deeply into the empirical data to identify illustrative quotes for each mechanism. To ensure the validity and reliability, I show evidence that digital transformation is one-sided, i.e., focused on exploitation rather than exploration, which could not have been done without an organizational ambidexterity perspective. I provided direct quotes from my subjects to increase transparency and trust in my findings, reporting, and distinguishing between the participants' views and opinions in my study. The process provided necessary understanding for discussing the research question and arriving at a conclusion. A vital impact on this synthesis was done also in valuable discussion with the discussants in my planning, mid, and final seminars, as well as with my supervisors.

ETHICAL ASPECTS

An inseparable aspect of being a researcher is considering ethics that arise in the relation between the researcher and the research subject. Tensions between individuals and their actions and subjectivities are particularly important. Dahlbom and Mathiassen (1994) emphasized the importance of general professional ethics in the connection between the researcher in the Information Systems field and the user of information systems in the studied organization. They argued that the researcher should work in contiguous collaboration with the practitioners to satisfy them, show them respect, focus on healthy work environments, and protect individuals from harm.

The ethical issues that emerged during the research were carefully addressed. First, I ensured that each respondent consented to participate in the study. Each acceptance was confirmed via email. Then, at the introduction of the interviews, the respondents were all informed of the study's purpose and how long the interview would take. All respondents name was anonymized, only the title used was the respondent's position, which they accepted upon asking (Miller et al., 2012). Respondents were also informed that they could interrupt the interviewer or stop the interview without explanation. Finally, all interviews were recorded, stored with

password protection, and transcribed verbatim to capture the respondents' real answers.

The clinical inquiry approach is characterized by intervention and giving feedback to the client to improve the situation. The approach therefore holds the possibility of causing more harm than other research methods (Schein, 1987). The good side is, however, that the client specifies the problem and sets the goals for a solution. The way the clinician can overcome the dilemma of harm is to commit to the feedback of the decided goal. Thus, the clinician cannot provide feedback in an uncritical and unprofessional fashion.

The clinician's ethical responsibility is to avoid malpractice. Ensuring the respondent remained in focus during the interview was achieved in several ways. First, I made sure to listen carefully to the respondents during the interviews to create shared and accessible knowledge. A healthy working environment was taken into consideration during the interviews, as well. For the onsite interviews, the researcher let the respondent choose the day, place, and time of the interview, while for the online interviews, the interviewer asked if the voice and picture were clear, put a white background to avoid bothering or disturbing the interviewees, and asked them to take a short break whenever they wanted during the interview. I was attentive in averting questions that would risk blame and breaking the respondents' confidentiality (Hennink et al., 2020). One of the last steps for interview ethics is the analysis. Kvale and Brinkmann (2009) discuss how much the researcher can put into the respondents' answer. Here, this question should be answered on a general level: How should the data material be interpreted and how should knowledge be generalized in clinical inquiry research?

CHAPTER 6

RESULTS

In this chapter, I provide a synthesis of the research results reported in the appended papers (1–5). I draw on the organizational ambidexterity perspective to conceptualize three generative mechanisms: sluggishness, reactivity, and the misallocation of resources to understand their role in three corresponding areas, including IT Governance, the funding model, and digital infrastructure. Each mechanism is illustrated as a generative mechanism. As such, the following sections do not introduce new empirical data but ultimately provide an overview of the mechanisms that constrain digital transformation in public sector organizations.

Mechanism 1 – Sluggishness

The first and second papers included in this thesis (Magnusson et al., 2020c; Magnusson et al., 2020d) identify a generative mechanism that explains how IT Governance constrains digital transformation. It denotes the slowdown in decision processes that often appears in relation to IT Governance. IT Governance constrains digital transformation through a generative mechanism that repeats itself in an unending sluggish mecha-

nism. This mechanism refers to activities found in relation to the hierarchical control task with many decision points, implemented in an organizational response by a shared IT Service Center that in turn responds to the supply and demand model, resulting in a slow decision process (see Figure 1). From an organizational ambidexterity perspective, IT Governance is acting as a bias for increased exploitation at the expense of exploration.

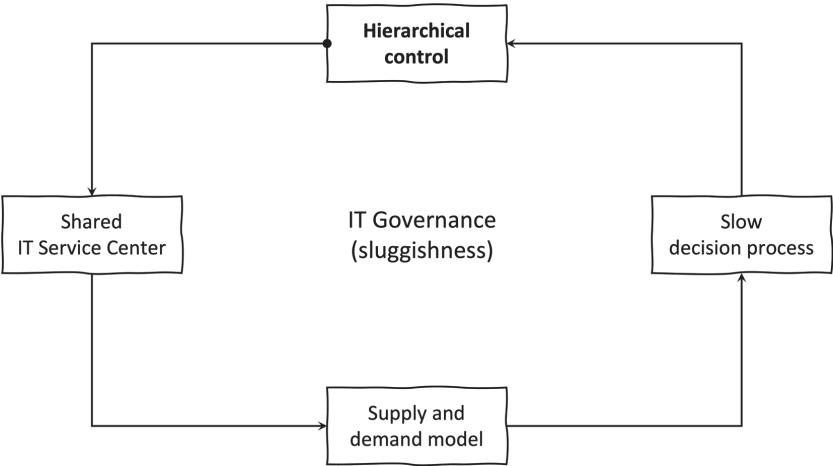


Figure 1. The sluggishness mechanism in IT Governance.

Regarding *hierarchical control*, the synthesis of the two cases, CAB, and the Municipality in this study, showed they are both bureaucratic organizations dominated by top-down management. This implies that every idea must be discussed and approved by all levels and members of top management; otherwise, it could not be implemented. It has well-established processes that are often rigid and characterized by searching for the most important and fast achievable tasks in the short term, i.e., a “low-hanging fruits” approach. The focus is on automating IT administration, data flows, and procedures and replacing manual, i.e., paper and pen, procedures with automation using a system that should be able to assess, for example, the application for a building permit. This became evident in the Municipality case when the new finance system automated several processes. They used System X as the main system, as it functioned well with the other admin-

istrations using other types of finance systems. The other administrations had the same need for automation and had to calculate the cost. Then they needed to do the same work seven times just to automate one process, because there are seven different finance systems. Because the focus was on automating the existing activities, it became costly. In other words, it was evident that digital transformation ideas are often geared toward maintaining and enhancing what previously has been done. The General County Director confirmed this, as he explained the following:

If CAB has a certain need, it is then going to be discussed together with the board members, if all is okay then it will be implemented by the shared IT Service Center, if not or if runs into trouble, then it would be implemented by themselves in their own individual IT environment. It is troublesome to get through any idea that could appear among the employees, and it can be a long and slow decision process. I'm not just talking about innovation. I think it is often based on a fear to decide and to review the consequences. It ends with the need to have both "suspenders and belts" to be on the safe side."

Approved decisions then go to the *shared IT Service Center*, which maintains existing services. The IT Service Center only funds the urgently demanded and needed services concerning IT usage. However, new ideas that lead to new costs and above all risks are not desirable for any of the two studied cases.

Main objectives in the IT service center are, to deliver services, to maintain all existing applications, systems that are used by all CABs ... and the development arch is very small.

Department Manager for Organizational Support

The synthesis of the two cases has also showed that the decision comes after the need appears, i.e., the decision is needs-driven and relies on the *supply and demand model*. When they realize needs and urgent demands within the organization, the supply then occurs to ensure good operations. This results in inertia in the decision-making process because the supply always happens after the need has occurred. The Unit manager described that:

It is very much driven by the needs within our organization to ensure a reliable supply.

The supply and demand model implies that they can save IT costs by only funding the most apparent needs. This is not in line with Sweden's National digitalization strategy, which is in favor of the idea that everything that can be digitalized should be, and digital funds must be used as much as possible. The following two quotes illustrate this:

There is a problem with funding because the CAB is paying for what they get like with the user accounts and workplaces, so you don't really have the money to drive that many innovations.

General County Director

CAB save a lot of money by bringing all the IT together in one department

Controller

The sluggish decision-making emerges because the hierarchical control, which entails several steps, mainly focuses on maintaining and enhancing existing processes and seeking short-term success. The *decision-making process is slow* in the sense that it is assumed the situation is stable, with little consideration of digital transformation development pace. Top management act based on their "to do list," avoiding risks and optimizing efficiency. Thus, IT Governance is dominated by one-sided activities toward maintaining and enhancing existing services and supplying short-term demands rather than exploring new services. In other words, to explore new ideas requires cycling through many stages of agreements from a high level of management to obtain approval. As the CIO commented:

There is a lack of a system to manage innovation And the decision-making process is quite complex because in the county governance are those who make the decisions and maybe they have delegated some rights to make the decisions.

When there is talk about innovation and digitalization, we are rather slow, I mean thinking new. I believe it is not bad to have some resources that shake you up and help you think new and think again. That is very important.

Section Manager

Sluggish decision-making constrains the working process, preventing new initiatives. Within the current IT Governance, it becomes a substantial inhibitor of balancing exploitation and exploration. There is also hesitation to take risks and explore new ideas. This was admitted by the Function Manager for development, CAB

No risks are taken; it should be controlled at all levels. That's often the case.

We want to avoid mistakes ... we are very cautious all the time to minimize risk and lower costs, so innovation does not really fit in. It is all about safety, to play it safe.

IT Strategist

In summary, the sluggishness mechanism reveals the limits of current IT Governance in terms of an emphasis on hierarchical control and slow decision processes, biasing digital transformation toward exploitation.

Mechanism 2 – Reactivity

The third and fourth papers included in this study (Khisro, 2020; Khisro et al., 2021) identify a generative mechanism that explains how the funding model constrains digital transformation. It denotes the short-term demands that often arise in relation to the funding model. The Funding model constrains digital transformation through a generative mechanism that repeats itself in an unending reactive mechanism. This mechanism refers to activities found in relation to the budget control task aimed at funding demands and urgent needs as operating costs, with top management prioritizing, which results in answering mainly short-term demands (see Figure 2). From an organizational ambidexterity perspective, the Funding model is dominated by increasing exploitation at the expense of decreasing exploration.

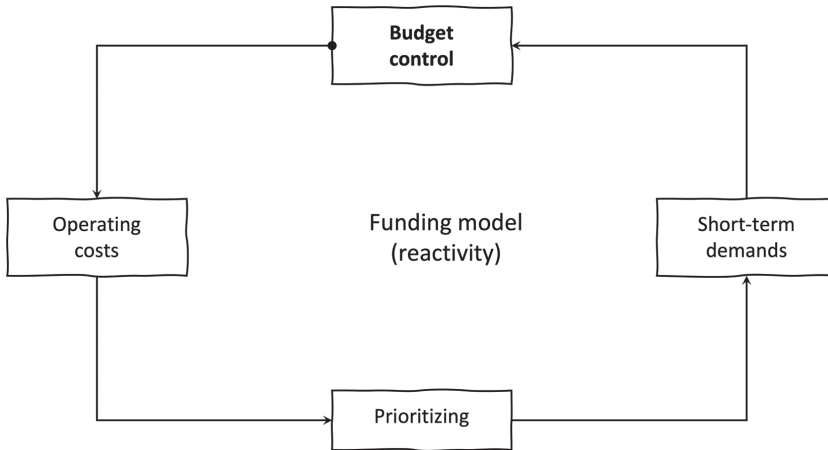


Figure 2. The reactivity mechanism in the Funding model.

The synthesis of the two cases, CAB, and the Municipality, in this thesis showed that the activities of the hierarchical control task in IT Governance have an impact on activities found in relation to the funding model, i.e., the yearly *budget control*, which formulates all IT expenditure as operating costs for supplying needs and urgent demands. For example, if administrations, such as Children and Education and Culture and Leisure, have expressed their needs and the need for funding, such as for new alarm functions in buildings, then the local steering committee decides what is important and what to prioritize. They have a special IT Service Center that works with IT, and there is a digitalization budget, and administrations can apply for funding from them to some extent. If IT Governance is based on a supply and demand model, the ability to treat IT funding as an investment pushes the organization away from a balanced digital transformation.

That what is being called digitalization is not expressed as an investment need. There is an operating budget for digitalization. Digital investments must be treated as any other investment, however that is not the case as long as it is in the operating budget.

Municipality Accountant

Further, an example of IT handled as an *operating cost* and not as an investment comes from the school. In the school, it is all about renting the equipment. If they were to buy 100 computers, they would put them in the balance sheet and then write them off. This is how they get hold of the money. As such, if they want 100 computers, they need to make an order to the IT Service Center and pay them a rent for the time the computers are being used. The budget allocated for digital transformation is used for leasing. Therefore, there is no investment in the traditional sense, as it is for building and streets. The money is there, but they cannot use it for investments. Digitalization is handled with operating funds, not investment funds, and with focus on short-term demands and urgent demands.

The reactivity of this second mechanism emerges as budget control, which is funding demands as operating costs in a cumbersome prioritizing process, mainly resulting in short-term demands. The synthesis also showed that an important factor contributing to the reactive loop is that the funding budget, in contrast to the yearly budget control, is discussed and decided every two years, which is not as rapid as the digital transformation development pace.

We prepare our two-year budget by first making a needs analysis, that is for each administration, we collect the investment needs for what they intend to do during the period.

Municipality Accountant

Top management *prioritizes* after all needs are discussed according to importance. As such, prioritizing is cumbersome because it first requires all needs to be identified and specified. Top managers must then all agree on what to prioritize and classify it as an operating cost and then move forward in the implementation process. Acting reactively after the needs appear means prioritizing focuses on *short-term demands* and neglects long-term demands. For example, politicians pointed out the need to prioritize healthcare, especially elderly care. The municipality then realized that the current digital infrastructure was unsuitable to digitalize. This prioritizing process triggers reactivity in digital transformation.

We have put a stop to all investments to go through all unit needs, those that are still relevant and those which are not. For example, a need highlighted several years ago has been solved and so the issue has grown irrelevant, or a need came up later such as the need for cameras or sensors in the elderly care. Then we realized, there is no WIFI in the elderly care!

Section Manager

A fundamental challenge in both the studied cases is that there are many projects competing for the same resources. Thus, IT costs are kept as low as possible and not used to explore new opportunities, as observed by an IT controller:

Should we work with innovation? Of course. Do we get money to work with innovations? No!

In summary, the reactivity mechanism reveals the limits of the current funding model in terms of emphasis on budget control and response to short-term demands, biasing digital transformation toward exploitation.

Mechanism 3 - Misallocation of resources

The third and fourth papers included in this thesis (Khisro, 2020; Khisro et al., 2021) identify a generative mechanism that explains how digital infrastructure constrains digital transformation. It denotes the short-term demands that often occur in relation to the digital infrastructure. The Digital infrastructure constrains digital transformation through a generative mechanism that repeats itself in an unending misallocation of resources mechanism. This mechanism refers to activities found in relation to demands control tasks aimed at allocating resources are biased toward maintaining existing systems and automating existing organizational activities; adding system after system increases the digital legacy and results in mainly fulfilling short-term demands (see Figure 3). From an organizational ambidexterity perspective, the Digital infrastructure is dominated by increasing exploitation at the expense of decreasing exploration. Exploration and testing of new ideas require long-term perspective, flexibility, and a broader view of what is meant by digital infrastructure.

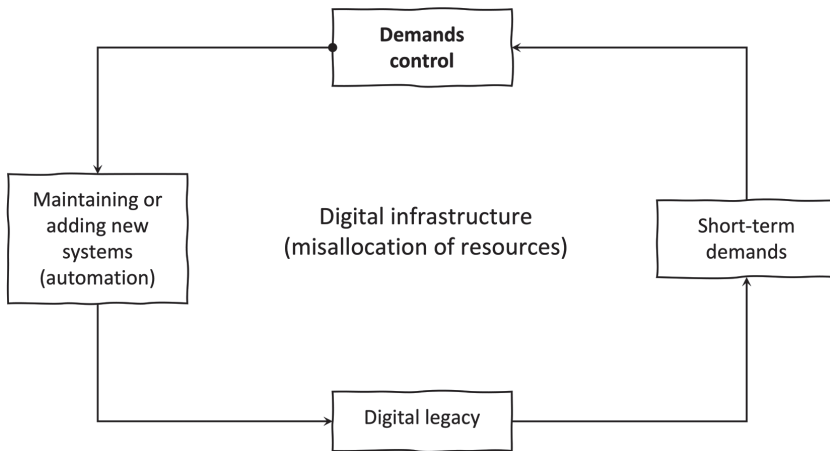


Figure 3. Misallocation of resources mechanism in Digital infrastructure.

The synthesis of the cases in this thesis showed that the utilized funding model, based on the *demands control* of urgent needs, influences how the digital infrastructure is maintained and developed. The way digital initiatives are funded makes the digital infrastructure suffer from a backlog. One of the main reasons for this is digitalization operating as expenses, so there is no investment in digital infrastructure. The issue is that the public sector solves a range of problems by adding systems, which leads to increased costs and complexity that hinders the development process. When the funding model is based on budget control, it leads to managing infrastructures by maintaining existing systems or adding new systems based on these expressed needs. The result of increasing operating costs without increasing value means there is a misallocation of available resources. It also means that the space is reduced for developing new innovative solutions that provide business benefits.

Eighty, ninety percent of every penny we invest in IT, goes to the old systems which leaves a very small amount for the new. Look at our case management systems for instance. We have about ten of them and they require a lot of maintenance. I mean if we had been clever there would only be one such system. Instead, we are maintaining ten. It is like that very often I'm afraid.

IT Service Center Manager

The digital infrastructure development is based on communication and information sharing demands, adding system after system with little attention to the *digital legacy*. The mindset is that the system is going to be a long-life system, as systems have an expiry date, i.e., to be winded up. In other words, systems are built on the idea that the system should handle all steps in a process, such as the financial system. This means the system is designed based on what the process looked like when the system was created. Over time, the processes may change; thus, changes are also made in the system itself. In the long-term, this creates a complex legacy of systems. The digital legacy then becomes a significant obstacle for the development process. The Function Manager insisted that:

The legacy we have is spread among twenty-one different authorities which makes our mission difficult. A very large part of the issue is how do you get them to agree on a way to work?

The digital legacy is hindering activities focusing on a constant balance of exploration and exploitation. For instance, when the municipality needs a new system, they add it. Then, when there is a need for the same system elsewhere in the same municipality, a new system is added with little consideration of what systems already exist. In this way, the costs are increasing over time. Moreover, when a working process changes, they need to add other systems without thinking about winding up the old ones. The consequence is an increasing digital legacy and focus on maintaining existing processes. The IT Service Center Manager expressed:

There is hardly any infrastructure when it comes to innovation. For instance, there is no test environment for employees to use when coming up with innovative ideas.

It is all about responding to *short-term demands*. If the public sector wants to test something quickly, such as a small idea, it is not possible to do so without it turns into a big project that takes several months. The existing digital infrastructure is stable, but there is no flexibility in it, which means that there is a focus on maintaining the existing infrastructure, and little is done to invent something new. The IT Operating Manager commented:

It is definitely stable, we have a safe, stable and fairly secure infrastructure. It is however facing challenges and changes forward to meet what is coming.

Furthermore, the synthesis shows that they understand digital infrastructure for supporting the enterprise in terms of classic hardware, such as computers, servers, hubs, cabling, data storage, data halls, communication networks, WIFI, systems integration, databases, e-mail systems, digital services, and cloud services. The Operations Manager commented on the notion of digital infrastructure and pointed to the importance of well-functioning computers and servers for IT to use in everyday work. This description of digital infrastructure leads to understanding and handling digitalization from a traditional management viewpoint, where control and stability are fundamental. For example, as an IT-architect said:

Steering and how it is affecting me as a decision-maker is very important. Apart from the politicians who have the highest responsibility there is the municipal board and the municipality director. The municipality director has the responsibility to distribute resources and to hand down responsibility to administration managers along with the budget. Next to the municipality director is the IT director with a responsibility for digital investments.

In summary, the misallocation of resources mechanism reveals the limits of the current digital infrastructure in terms of an emphasis on demands control and response to short-term demands, biasing digital transformation toward exploitation.

CHAPTER 7

DISCUSSION

Digital transformation is viewed as instrumental in coping with organizational and societal challenges. In the public sector, these challenges include diverse issues, such as demographic changes, constrained financial resources, increasing complexity, and digital legacy. While there are opportunities for the public sector to benefit from digital transformation, there are also important constraints to consider.

CONSTRAINTS OF DIGITAL TRANSFORMATION

SLUGGISHNESS IN IT GOVERNANCE

IT Governance in public sector organizations is currently dominated by hierarchical control, which decreases the ability to react swiftly to digital transformation and exploration activities (Janssen and van der Voort, 2016; Magnusson et al., 2020a). Public sector organizations are dominated by a low-hanging-fruits approach. The literature covering public

sector organizations has suggested that top-down decision-making and control slow the development process (Kokkinakos et al., 2016; Larsson and Teigland, 2019; Magnusson et al., 2020b). From an organizational ambidexterity perspective, Cannaerts et al. (2019) stated that, instead of a top-down design perspective, research should address issues related to control enactment and ambidextrous organizations because it is not solely a leadership challenge. The results in this thesis also showed that there is a hesitation to take risks in digital transformation. This was confirmed by Mergel (2017) and Sadler (2000), who highlighted the importance for public sector organizations to abandon their deeply rooted risk-avoiding behavior because it is an important factor that constrains digital transformation. My results show that bureaucracy-oriented public sector organizations dominated by top-down management and hierarchical control slow digital transformation. The current design and practice of IT Governance thus directly counteracts Sweden's national digitalization goal. The supply-and-demand model is a reason for an imbalance in everyday activities that decreases the level of exploration and increases the emphasis on exploitation. Along this line, Heracleous et al. (2019) pointed out that organizations must deal with contradictory tensions. For example, they must impose control and simultaneously authorize workers and motivate them to explore new ideas. The insight is that digital transformation is constrained within public sector organizations through the sluggishness in IT Governance.

REACTIVITY MECHANISM IN THE FUNDING MODEL

Public sector organizations are challenged with strained budgets (Meijer and Bekkers, 2015). In line with this, the results of this thesis indicate that, at present, digital transformation is funded as an operating cost, emphasizing short-term rather than long-term demands. If digital initiatives were counted as investments in the future, the development process would benefit from a long-term perspective on capital expenditures. Performing efficiency activities at the expense of innovation activities creates an imbalance that negatively affects digital transformation within public sector organizations. This is in line with Mergel (2017), who found that public sector organizations spend their IT budgets on operating and maintaining

the existing IT infrastructure, which leaves innovation without enough resources. This shifts the focus from benefitting digital transformation toward solving acute problems and managing urgent cost issues in the here and now. For each administration, the consequences of this are a breakdown of the municipality's overall digital transformation and an inability to find synergies between digital initiatives. This is supported by Meijer and Bekkers (2015) and Kuhlmann and Heuberger (2021), who argued that fear of funding digital initiatives constrains the implementation of digital transformation.

Consequently, there is a risk of losing out on long-term perspectives on building and maintaining an appropriate investment. It is common for the public sector to downplay the need for big investments, especially if a municipality is performing well. One of the main barriers to constantly balancing exploitation and exploration is the spending of most public sector funding budget on maintenance and operations rather than development of the digital infrastructure. From an organizational ambidexterity perspective, Palm and Lilja (2017) noted that the budget should be taken into consideration to enable both exploration and exploitation. For example, political intervention and strict regulations constrain ongoing balancing activities in public sector organizations (Gil-García and Pardo, 2005; Choi and Chandler, 2015). Consequently, the more maintenance is emphasized, the more the cost of development increases, which, in the long-term, contributes to the lack of benefits from the digital infrastructure. Thus, not using funding for both operations and investment has negative effects, particularly a lack of long-term perspectives, which leads to eroded expediency and difficulties coordinating and scaling benefits related to digital transformation. As noted by Zimmermann et al. (2018), simultaneously chasing exploration and exploitation causes contradictory organizational tensions that are hard to manage. At the same time, this is an essential aspect of balancing short- and long-term performance. The insight is that digital transformation is constrained within public sector organizations by the reactivity in the existing funding model. This contrasts with the idea that digital transformation tends to facilitate proactive solutions (Jonathan, 2019).

MISALLOCATION OF RESOURCES MECHANISM IN DIGITAL INFRASTRUCTURE

My results regarding digital infrastructure support the findings from Alta-meem et al. (2006) and Montealegre et al. (2019), who argued that dealing with digital infrastructure is vital to enabling digital transformation in public sector organizations. Kobarg et al. (2017) and Cannaerts et al. (2019) argued that to cope with the rapid development in the external environment, public sector organizations need to strictly direct exploration to increasing activities, such as discovering new ideas, services, and products and designing new digital platforms. Davenport and Westerman, (2018) noted that the misallocation of resources negatively affects both the organization and practitioners' long-term demands. In contrast, the results in this thesis show that most resources are allocated to maintaining existing systems. This situation makes public sector organizations rigid and outdated because the existing digital infrastructure does not support innovation and uncertainty. The results in this thesis regarding the misallocation of resources also reinforce the argument by Kokkinakos et al. (2016), Larsson and Teigland (2019), and Magnusson et al. (2020a) that digital transformation within the public sector is stumped by legacy systems.

The insight is that digital transformation is constrained within public sector organizations by the misallocation of resources, which decreases exploration activities. While public sector organizations mainly respond to short-term demands, Warner and Wäger (2019) emphasized that organizations need to have a long-term digital vision and, at the same time, encourage a digital mindset and a robust, digitally oriented culture, which accelerates their digital transformation. The results in this thesis show that if they want to test new idea something quickly, it is not possible to do without it becoming a big project that takes several months to set up. The existing digital infrastructure is stable, with little flexibility. As noted in the literature, exploration activities are associated with ambiguity and uncertainty, which contrasts with the nature of highly stable public sector organizations with well-established functions. Public sector organizations, therefore, often lack exploration activities due to their response to the status quo (Janssen and van der Voort, 2016; Hong and Lee, 2018; Schirmacher et al., 2019).

DIGITAL TRANSFORMATION AS A DUAL APPROACH

Research identifies that public sector organizations attribute different meanings to the term digital transformation. Different perceptions and interpretations of the concept are often linked to different professions, giving rise to so-called interpretive barriers (Dougherty, 1992; Agrawal et al., 2019; Mergel et al., 2019). These barriers are constantly present and interfere with the creation of a common understanding of digital transformation. The issue is that digitalization is implemented according to individual views of what it is and with little dialog with others who have experienced enablers and constraints on digital transformation in earlier projects. Thus, practitioners spin the wheel without considering the cumulative knowledge in the organization, which results in immaturity in the organization's digital transformation.

The current split views and interpretations of the meaning of the digital transformation notion in the studied case settings counteract the balancing of exploitation and exploration. Losing the dual ability of digital transformation makes public sector organizations focus on one-sided activities (Khisro, 2021). This is evident from the conclusion in my fifth paper (Khisro, 2021) that public sector organizations consider digital transformation to be a management fashion or a reincarnation of past IT-enabled change initiatives (Wessel et al., 2019). Approaching digital transformation as geared toward risk-free, short-term demands and often choosing the safe option are reasons behind the mechanisms of sluggishness, reactivity, and resource misallocation in public sector organizations. Consequently, the difference between automation and digitalization is not obvious. Indeed, there are two sides of digital transformation; on one hand, there is the automation of existing activities and services, which increases efficiency, and on the other, there are innovation activities to explore new opportunities (Magnusson et al., 2020b). In many situations, organizations are merely seeking to automate their processes (Legner et al., 2017), although Asgarkhani (2005) argued that solely automating existing services is insufficient and does not produce improved results. In times of digital transformation, new demands for parallel robustness and flexibility are placed on public sector organizations. They are stuck in IT-transforma-

tion as they focus on enhancing existing services, such as automation. The inappropriate control of the full benefits of digital transformation leads to unbalancing of exploration and exploitation activities. It indicates that public sector organizations are stuck in the digitizing wave (Mergel et al., 2018). This is rooted in the e-government logic of transforming manual working processes with computerization/digitization (Janowski, 2015), which contrasts with digital transformation as a dual approach.

Mergel et al. (2019) and Brunetti et al. (2020) highlight that digital transformation requires internal cultural change within the organization, which demands breaking down resistance to digital transformation. Earley (2014) stated that cross-functional collaboration is a significant benefit of digital transformation. Fehér and Varga (2017) noticed a need to cultivate a desire to test new ideas, experiment, and take risks. In contrast, the results demonstrate that when practitioners' understanding of the notion of digital transformation differs, then implementation also becomes different. In public sector organizations, there is a lack of continuous dialog about creating a culture of digital transformation in which everyone is involved. These activities are affected, for instance, by political behavior and decision-making. Public sector practitioners tend to overcome the disruption from digital transformation by using their prior experience, digital legacy, and familiar work silos to explore new opportunities to solve unfamiliar issues. Their everyday activities do not support processes that contain uncertainty and innovative ideas. The results of show that a one-sided or standalone perspective is not enough to fully address contrasting demands, settle tensions across different areas in the organization, and thus benefit from digital transformation. The insight is that digital transformation requires a dual repertoire of exploration and exploitation that, in turn, demands different mindsets. As noted by Peng (2019), digital transformation requires an organizational structure and culture and managerial skills, particularly leadership improvement, to increase the ability to balance various tensions. Digital transformation is constrained within public sector organizations by their inability to see digital transformation as a dual approach (for work on the performance effects of this inability, see Mithas and Rust, 2016).

DIGITAL TRANSFORMATION FROM AN ORGANIZATIONAL AMBIDEXTERITY PERSPECTIVE

The results in this thesis show that digital transformation within public sector organizations often triggers a hiatus of innovation activities. Implementing innovation requires access to resources. My results are in line with Zimmermann et al. (2018) and Cannaerts et al. (2019); organizational ambidexterity is a dynamic process requiring a constant effort to balance tensions, such as rigidity and flexibility, short- and long-term demands, and exploitation of existing services and products and exploration of new opportunities i.e., innovation. It is about synthesizing two kinds of activities. Thus, organizational ambidexterity is not achievable; it is a question of balancing (Heracleous et al., 2019). Each mechanism is contingent on the other, so it is not enough to focus on one mechanism alone. In other words, balancing activities in IT Governance only, does not mean that the funding model and infrastructure interact correspondingly.

The public sector is generally stuck in one-sided, short-term activities that answer present demands. The pressure for short-term performance contributions is especially pronounced. Common tensions that need constant balancing are between the present and the future, now and then, and short- and long-term demands. As Lewis (2000) discussed, these tensions can be negative when practitioners adopt either/or orientation trade-offs and let one activity dominate. It can also be positive when practitioners focus on and act in a both/and fashion (Lewis, 2000). However, there may be demands and plans, but they are not well synchronized with digital transformation. Public sector organizations focus on reducing risk by repeating what they did previously. There is a lack of settled tensions across different areas of the organization. Focusing on enhancing existing processes and services and having a risk-avoiding attitude leads the organization to neglect long-term demands. Kö and Szabo (2019), however, emphasized that the experience of risk is a source for improving knowledge and skills. When the public sector focuses only on short-term demands, the risk of limiting innovation becomes high. In the future, this could generate a competitive inability or significant reduction in organizational

and economic performance and, in turn, depress the social and economic context.

My results show an authentic need to balance short- and long-term demands in public sector organizations. To be able to balance, organizational actors must constantly switch between looking at the overall process and specific actions; they must have detailed knowledge and an overview of the whole. The balance thus is not only between innovation (exploration) and efficiency (exploitation) but also between different phases of development. There is a need for a continuous inventory of knowledge and resources. There is very little control over how many resources are devoted to balancing exploration and exploitation. In sum, this research shows that organizations that pay close attention to the mechanisms of constraints of digital transformation can enable digital transformation as a dual approach and thus ensure better services and mission outcomes.

CONTRIBUTIONS TO RESEARCH

The aim of this thesis is to contribute to three previous calls for research. The first of these concerns the construct validity of digital transformation. In the e-government literature, there is an ongoing discussion regarding how to differentiate digital transformation from other phenomena (Mergel et al., 2019; Markus and Rowe, 2021). In the past there has been a tendency to study e-government as IT solutions by modernizing paper-based working processes to digitized ones. In this thesis, I highlight that there is a need to leave behind the successful wave of e-government built on industrialization and move on to digital government, which requires more transparency, development, collaboration, and proactivity to balance various tensions, such as exploration and exploitation activities. I contribute to an explicit reconceptualization of the notion of digital transformation through organizational ambidexterity to understand that digital transformation is a never-ending process (Chanias et al., 2019; Mergel et al., 2019; Vial, 2019; Warner and Wäger, 2019) with a need to balance the contradictory tension of exploration and exploitation. My contribution to the construct validity of digital transformation is a deepened understanding of digital transformation as a dual approach to business development. In that sense, understanding digital transformation only as the automation of

existing processes and services is detrimental to the long-term performance of public sector organizations (Janowski, 2015). In contrast, digital transformation is about dynamic balancing between different tensions (Janssen and van der Voort, 2016). My research confirms the recent work by Mergel et al. (2019) and Wessel et al. (2019) finding that digital transformation in public sector organizations concerns more than the level of sophistication of IT solutions. Instead, it is about how governance, financial resources, processes, people, policies, and leadership need to change to cope with the pace of digital transformation (Mergel et al., 2019).

Second, I contribute to the issue of how digital transformation is constrained in organizations (Vial, 2019; Magnusson et al., 2020 a; Magnusson et al., 2020 b). My research identifies three mechanisms that constrain digital transformation: the sluggishness mechanism in IT Governance, the reactivity mechanism in the funding model and misallocation of resources mechanism in digital infrastructure. These three constraining mechanisms hinder innovation, which is detrimental to the long-term performance of public sector organizations (Vial, 2019; Magnusson et al., 2020a, b). I contribute to research on IT Governance, funding models, and digital infrastructure by identifying the mechanisms and detrimental effects of not sufficiently balancing the dual sides of digital transformation. In this sense, my contribution enriches the current literature on public sector organizations by exploring and theorizing the constraints of digital transformation.

Third, I contribute to organizational ambidexterity research by highlighting how organizational ambidexterity is enacted through these three mechanisms. My contribution supports the findings by Zimmermann et al. (2018) that organizational ambidexterity is a matter not of design but of enactment. In line with Cannaerts et al. (2019), who argued for a combination of design and enactment in balancing exploration and exploitation activities, my research contributes to the understanding of how the intricacies of design (e.g., governance) and enactment may counteract, resulting in unexpected, counterproductive practices. Building on the research of Zimmermann et al. (2018) and Cannaerts et al. (2019), I also contribute by balancing enactment and design in organizational ambidexterity.

CONTRIBUTIONS TO PRACTICE

My main contribution to practice is the identification and description of three mechanisms that constrain digital transformation in public sector organizations. Practitioners need to be cognizant of these mechanisms to address them in practice. Thus, awareness is the first point of action. Regarding the first mechanism, there is a need to rebalance IT Governance to take into consideration both top-down and bottom-up decision-making processes. I also contribute by highlighting the need to redesign funding models to be able to finance both innovative ideas and activities that enhance existing processes and services. To take full advantage of digital transformation, there is a need for both proactive and reactive funding. Regarding digital infrastructure, I contribute by pointing out that digital infrastructure should not only automate existing processes and services; it also needs to be flexible enough to test innovative ideas without long wait times. This could be done by widening the perspective on digital infrastructure beyond cables, WIFI, and computers and by allocating resources to meet both short- and long-term business demands.

Public sector leadership should adapt existing approaches to digital transformation to ensure that their organizations cultivate a digital mindset and simultaneously are able to respond to the disruptions associated with the use of digital technologies. Digital transformation is also about leadership changes to redesign management structures (Warner and Wäger, 2019). Scholars such as Teece (2007), Hess et al. (2016), Svahn et al. (2017), Warner and Wäger (2019), and Singh and Hess (2020) have noted that one of the important issues facing leadership is that digital transformation has become a strategic imperative on their agendas to cope with rapid change. At the same time, top management needs to make dynamic decisions, learn actively at different levels, manage conflicts, and build commitment to vision, mission, and goals (Smith et al., 2010). My research further finds that a sole focus on automation risks leading to a focus on short-term demands. Leadership needs to play a supportive role in the innovation process. There is also a need to improve practitioners' capabilities, such as competences and behaviors for managing short- and long-term demands. Furthermore, it is essential to establish a constant

dialog across traditional, face-to-face spaces and digital spaces that helps practitioners understand where their organization is heading and why.

This thesis shows the varied interpretations of the digital transformation concept in both theory and practice and makes the vagueness of digital transformation explicit by showing how practitioners deal with the concept in practice. It spotlights the fundamental implications for practitioners who face challenges as they drive and implement activities geared toward digital transformation. Digital transformation requires a common understanding of the notion throughout the organization to fulfill short- and long-term demands. Furthermore, this thesis highlights the importance of developing skills and a digital culture before investing in digital infrastructure. Public sector organizations should alter their one-sided vision before reconfiguring their practices. This thesis shows that digital transformation is always in the making as a continuous, never-ending process (Chanias et al., 2019; Mergel et al., 2019; Warner and Wäger, 2019). This implies that a new working process for proactive development is needed, along with increased digital skills and a digital culture.

CONCLUSION

This thesis set out to develop knowledge of digital transformation by exploring how it is constrained within public sector organizations. The conclusion is that digital transformation is constrained within public sector organizations by three mechanisms: the sluggishness in IT Governance, the reactivity in funding model and the misallocation of resources for digital infrastructure, which leads to non-purposeful balancing of exploration and exploitation activities. These three mechanisms constrain approaching digital transformation as a dual approach and create a suboptimal situation. The organizational ambidexterity perspective has proved to be useful for understanding and explaining the dual functions of digital transformation and has helped reveal the three mechanisms. These three mechanisms slow the realization of digital transformation as a dual approach. Thus, digital transformation is biased by dominating, one-sided activities that fulfill short-term demands and enhance existing processes i.e., exploitation. There is a lack of settling and constantly balancing tensions across organizational boundaries in public sector organizations. Common ten-

sions that need constant balancing are between the present and the future and between short- and long-term demands. The public sector is trapped in the now of short-term performance. The pressure for short-term performance contributions is especially pronounced. Digital transformation, however, is not a project; it is a dual approach to business development.

LIMITATIONS AND FUTURE STUDY

This thesis has four major limitations that raise the need for future studies to further expand and evaluate the potential generalizability of my findings. First, I identify three mechanisms that constrain digital transformation: the sluggishness in IT Governance, reactivity in the funding model and misallocation of resources for digital infrastructure. Future studies could seek to identify additional constraining mechanisms from other perspectives, for instance, from a sociocultural view. Carrying out more longitudinal studies could also offer a deeper understanding of the identified constraints of digital transformation.

Second, my focus is limited to balancing exploitation and exploration activities as a dyadic pair of tensions within public sector organizations (Cannaerts et al., 2019; Magnusson et al., 2020a, b). Practitioners' activities could be further explored in a future study focusing on triangle and quadruple tensions. Take, for example, the relations between non-dyadic interdependencies: decentralization and centralization, formal and informal control, structural and cultural. I, therefore, propose that future studies develop and expand the organizational ambidexterity literature by balancing triangle and quadruple tensions.

Third, my context is limited to Swedish public sector organizations with specific characteristics; for example, they are non-profits, bureaucratic, and politically controlled. In accordance with Bannister (2007), research on public sector organizations has investigated specialized institutional characteristics, which can vary from country to country. Furthermore, the notions of innovation, automation, and digital transformation have fundamentally different interpretations depending on the context, particularly the politically controlled public sector and the market-driven and market-controlled private sector (Palm and Lilja, 2017). Thus, my findings have the potential for intersectoral transferability in two avenues:

different sectors and different countries. I, therefore, acknowledge the limitations of the generalizability. However, according to Eisenhardt (1989), this does not necessarily have negative impacts on theoretical generalization.

Nonetheless, to generalize my results, I suggest replicating this study using the same research process but with a different population. By doing so, we could see what results remain the same and what results are specific to each study. Furthermore, to consider whether the results are replicated in other public sector organizations, the credibility and validity of this research was evaluated through the improvement in the studied cases. I, therefore, suggest conducting a study within public sector organizations in other countries. In addition, I propose a future study to apply the theoretical concepts and methodology to the private sector and compare the results, which would broaden the knowledge (Rocheleau and Wu, 2002).

Fourth, my focus was limited to practitioners working in public sector organizations. The public sector is democratically governed, so citizen participation is central in a completely different way than in the private sector (Mergel et al., 2018). A future study that includes citizen perspectives and impacts on digital transformation, therefore, would also be of interest to improve knowledge. Take, for instance, a research study that uses a mixed methodology, including a qualitative method for practitioners in the public sector and a quantitative method such as a survey for citizens. For future studies, I also encourage more scholarly engagement from the clinical inquiry approach (Schein, 1987) in IS research in general and in studies to improve the understanding of digital transformation.

In addition to these required studies, my research also sets the stage for two additional projects that would deepen our understanding of the constraints of digital transformation in the public sector. First, I argue for a project that studies rhizomatic strategizing in digital transformation (Magnusson et al., 2022) for more detailed understanding for both enabling and constraining mechanisms on rhizome deliberate and non-deliberate activities enacted in the public sector. I suggest making this a longitudinal project beginning with a clinical study of strategizing pathology.

Second, I suggest a project that includes the ambiguous interpretative viability of digital transformation (Khisro, 2021). In this study, I propose to focus on a temporary discourse of the digital transformation concept

based on dynamic organizational change. Interpretative viability, a key characteristic of management (Benders and Van Veen, 2001) will facilitate the possibility to associate digital transformation and its enabling mechanisms.

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Appendix

Appendix Table 1. Interviewee's Role and Department in the municipality.

Role	Department
(Two interviews) Finance director	Municipal office
Municipality accountant	Municipal office
Assistant municipality chief executive	Municipal office
Controller	Municipality energy company
Unit manager	Municipality water company
Section manager	Municipality building company
Head of local government	Municipal office
Chairman of the municipal board	Municipal office
Municipal commissioner's Senior advisor	Municipal office
Chief Executive Officer (CEO)	Core-business
Chief Financial Officer (CFO)	Core-business
Chief Information Officer (CIO)	Core-business
Director of HR	Core-business
Social director	Social services
Head of development – Social services	Social services
IT-Coordinator Social services	Social services
IT-strategist	Children and education administration
(Five persons) IT strategist	Digitalization and innovation
(Two persons) IT strategist	Enterprise Architecture Centre
Director of IT	Digitalization and innovation
Head of the digitalization – action plan	Digitalization and innovation
Process developer	Digitalization and innovation
Head of innovation	The idea hub
Innovation leader	The idea hub
IT-manager	IT-Service center
Head of development and project resources	IT Service center
IT coordinator	City Planning
IT manager	IT-service center
Manager, System owner	Children and education administration
System administrator	Children and education administration
Chair	Service and Finance Committee
Business developer, strategist and investigator	Human resources

Information security assistant	Digitization and Innovation
Manager, Business developer	Care and welfare administration
IT operator	IT-service center
Business manager	Service Centre
System owner, Information architect	Enterprise Architecture Centre
Councillor, Chair	Municipality board
IT-coordinator	Care and welfare administration
IT manager	Municipality central company
IT architect	IT-service center
IT manager	Municipality board administration

Appendix Table 2. Interviewee's Role and Organization in the County Administrative Boards (CAB)

#	Role	Organization
1	IT Controller	SSC
2,3	Developer	SSC
4,5	Head of IT Business support	SSC
6,7,8,9	Chief Information Officer	SSC
10,11	Manager Infrastructure and Operations	SSC
12,13,14	Chief Strategy Officer	SSC
15	Manager user support	SSC
16	Manager environmental protection, object owner	Agency
17	Head of Maintenance, object owner	SSC
18	Department manager user support	SSC
19	Head of development	SSC
20, 21, 22	Portfolio controller	SSC
23	Director Legal	VGR
24	County governor	Agency
25	County governor	Agency
26	Department manager business support	Agency
27	Enterprise Architect	SSC
28	Business developer, manager operations	SSC
29	Deputy governor	Agency
30	Financial controller	SSC
31	Deputy governor	Agency

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