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Examining Welfare Technology in Denmark

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MANAGING COMPETING CONCERNS IN DIGITAL INNOVATION

EXAMINING WELFARE TECHNOLOGY IN DENMARK

BY
JON AEN

DISSERTATION SUBMITTED 2022

AALBORG UNIVERSITY
DENMARK

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by

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Dissertation submitted

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ABOUT THE AUTHOR

Jon Aaen joined the PhD program at the Department of Politics & Society, Aalborg University in 2018, where he has since been a member of the Center for Information Systems Management (CIM) research group. During his PhD study, Jon has presented his research at several prestigious international conferences and published in prominent journals such as the European Journal of Information Systems, the Scandinavian Journal of Information Systems, and Information Polity. He served as a member of the executive board in IRIS, the Scandinavian Chapter of AIS, from 2019 to 2021.

Prior to joining the PhD program, Jon obtained his MSc in Public Administration at Aalborg University in 2015. From 2015 to 2017 he co-founded a startup company developing a digital web application for primary schools. The project was financed by the Ministry of Education and sold to the three largest municipalities in Denmark. However, despite obtaining funding, great strategic partnerships with key stakeholders, and successful pilot tests, the most difficult challenge proved to be diffusing the application to new users and across organizational settings. The encounter of this real-world problem has ignited a profound research interest in understanding the complexities in managing and scaling digital innovation.

ENGLISH SUMMARY

Digital technologies – such as internet of things, data analytics, artificial intelligence, and robots – enable transformations in how organizations operate, create, and deliver value. However, the technological component is only part of the complex puzzle organizations must solve to manage digital innovation processes. With its dynamic, unbounded, and collective nature, digital innovation is not a harmonious phenomenon in which the involved actors speak with a unified voice. Instead, digital innovation is a multifaceted and contested socio-technical process that involves diverse actors with different goals and views that create organizational tensions and competing concerns. Accordingly, organizations need not only ensure technical feasibility and economic viability when engaging in digital innovation. Equally important is to understand and manage the untidy and often conflicted nature of digital innovation.

This dissertation set out to expand the understanding of competing concerns in digital innovation by answering the following question:

> **How can managers understand and address competing concerns in digital innovation?**

To answer this question, the dissertation zooms in on digital innovation in Danish health- and eldercare services as the empirical point of departure. Labeled as "welfare technologies" (WT), emerging digital technologies such as virtual home care, digital surveillance, and care robots are expected to radically transform health- and eldercare services in Scandinavian public sectors. However, despite high expectations, strategic importance, and growing investments, many promising projects struggle to become implemented on a large scale. The empirical analysis demonstrates how this critical phase of digital innovation is a cumbersome process with many uncertainties and competing concerns. Consequently, managing digital innovation is a complex and often contested socio-technical process that relies not only on reconfiguring technical and organizational capabilities but also on continuously identifying and addressing competing concerns.

The dissertation consists of four articles that explore competing concerns in digital innovation from different empirical and theoretical perspectives:

- Article 1 (Chapter 2) systematically review and discuss the extant literature to identify eight competing concerns central to the challenges of implementing, scaling, and sustaining emerging WTs. By highlighting and contrasting practical and theoretical positions in this novel and interdisciplinary research topic, the review contributes to understanding the complexities managers must address to implement, scale, and sustain digital innovation in health- and eldercare.

- Article 2 (Chapter 3) reports the results of a longitudinal case study of the emergence of a service robot in primary healthcare, from project launch to testing, development, and evaluation. Seeking new ways of organizing digital innovation, nine Danish municipalities and a consortium of four private

companies launched a collaborative project, aiming to develop and implement the use of a medication-dispensing robot for patients living at home. The analysis traces how project managers address competing concerns at critical innovation junctures regarding innovation strategy, testing, coordination, and user mobilization and how these responses shape the project's trajectory.

- Article 3 (Chapter 4) investigates an example of a failed attempt to scale a digital innovation project in the Danish public sector. The specific service robot project had a high degree of management support and commitment from key actors, and the paper analyses what went wrong and detect learning points. Based on an in-depth case study of the robot project, the article demonstrates how failure was caused by interrelated and context-specific reasons regarding the design of the robot (technology-oriented explanation), inadequate problem-solution fit (scope-oriented explanation) and misalignment between robot company and public sector organization mindset (competing concerns and logic-oriented explanation).

- Article 4 (Chapter 5) revisits the failed robot project from an innovation narrative perspective. The empirical analysis demonstrates how four types of narratives supported socio-cognitive sensemaking among the participants as they formed the innovation project. Initially, narratives of origin (how the innovation idea emerged) legitimized the robot idea to a wider community; narratives of potential (its value proposition) then kept the idea alive and encouraged participants to solve problems. As the project struggled to implement the robot into practical use, narratives of practice (about the implementation efforts) began to emerge. After the project collapsed, narratives of learning (about the innovation process and outcomes) provided lessons for participants and their future digital innovation efforts. The article theorizes how formative narratives—as discursive social constructions of actors' meaning-making and actions—shape and are shaped by the emergent context of digital innovations. The theory distinguishes between reinforcing and colliding interactions between formative narratives to help explain coordination and polarization in the social construction of digital innovation ideas, trajectories, and outcomes.

Concludingly, by theorizing competing concerns as an inherent and ongoing part of digital innovation, the dissertation argues that managers need to identify, engage in, and leverage competing concerns rather than seek to avoid them. In doing so, the dissertation contributes a conceptual model for how managers can understand and address competing concerns in digital innovation as an iterative approach consisting of four interrelated activities. Additionally, the dissertation provides practical insights into the key challenges for developing, implementing, and scaling welfare technologies.

DANSK RESUMÉ

Digitale teknologier – som f.eks. IoT, Big Data-analyse, kunstig intelligens og robotter – understøtter omfattende forandringer i den måde, organisationer opererer, skaber og leverer værdi på. Teknologi er imidlertid kun ét element i den komplekse virkelighed, organisationer må forholde sig til for at håndtere digitale innovationsprocesser. Digital innovation er både dynamisk, samskabende og ofte frigjort i tid og sted. Digital innovation er ikke et harmonisk og konfliktfrit fænomen, hvor alle aktører har samme interesse. Derimod er digital innovation en mangesidig og modsætningsfyldt socio-teknisk proces, der involverer forskellige aktører med forskelligartede målsætninger og synspunker, som kan give anledning til konflikter og konkurrerende hensyn. Derfor bør organisationer, der indfører digitale innovationer, ikke blot fokusere på, at teknologien er tilpasset og økonomisk rentabel. Det er lige så vigtigt at forstå og adressere den uforudsigelighed og ofte konfliktfyldte natur, som karakteriserer digitale innovationsprocesser.

Denne afhandling har til formål at bidrage med viden om betydningen af konkurrerende hensyn (competing concerns) i forbindelse med digitale innovationsprocesser. Dette søges gjort ved at besvare følgende hovedspørgsmål:

> **Hvordan kan ledere forstå og adressere konkurrerende hensyn i digitale innovationsprojekter?**

Den empiriske afgrænsning tages i velfærdsteknologi (VT) i den danske sundheds- og ældrepleje. VT er en paraplybetegnelse for en række nye digitale teknologier, såsom virtuel hjemmepleje, digital overvågning og plejerobotter - teknologier der på sigt forventes at ændre sundheds- og ældreplejen radikalt i den skandinaviske offentlig sektor. På trods af de høje forventninger, det strategiske fokus og øgede investeringer i VT kæmper mange lovende projekter med at blive implementering. Afhandlingens empiriske analyse afdækker, hvordan denne kritiske fase af digital innovation er en vanskelig og ofte konfliktfyldt socio-teknisk proces, som ikke blot kræver kompetence til rekonfigurering af de teknologiske og organisatoriske elementer, men også en evne til kontinuerligt at identificere og adressere konkurrerende hensyn.

Afhandlingen indeholder fire artikler, der ud fra forskellige empiriske og teoretiske perspektiver udforsker fænomenet 'konkurrerende hensyn' i digital innovation:

- Artikel 1 (Kapitel 2) er en systematisk gennemgang og diskussion af den eksisterende litteratur. På baggrund heraf identificeres otte konkurrerende hensyn, der hver især afspejler centrale udfordringer knyttet til implementering, skalering og understøttelse af nye velfærdsteknologier (VT). Ved at udpege og sammenstille kontrasterende praksisrelaterede og teoretiske positioner inden for dette nye og tværfaglige forskningsområde bidrager artiklen til at afdække og forstå den kompleksitet, ledere må adressere i forbindelse med implementering, skalering og understøttelse af digital innovation inden for sundheds- og ældreplejesektoren.

- Artikel 2 (Kapitel 3) omhandler et longitudinalt casestudie af innovationsprojekt fra projektlancering til test, udvikling og evaluering. Som led i at

finde nye veje til at organisere digital innovation, lancerede ni danske kommuner og et konsortium af fire private virksomheder et samarbejdsprojekt med det formål at udvikle og implementere en medicinhåndteringsrobot for patienter i eget hjem. Analysen viser, hvordan projektlederne adresserer konkurrerende hensyn i forbindelse med kritiske beslutninger vedrørende innovationsstrategi, testtilrettelæggelse, koordinering og mobilisering af brugere og hvordan disse beslutninger former projektets videre forløb.

- Artikel 3 (Kapitel 4) undersøger et mislykket forsøg på at skalere et digitalt et robotprojekt i den kommunale ældrepleje. Artiklen analyserer, hvordan projektet fejlede som følge af indbyrdes afhængige og kontekstspecifikke forhold relateret til selve designet af robotten (teknologi-relateret forklaring), utilstrækkelig problemforståelse og -løsning (projektramme-relateret forklaring) samt manglende overensstemmelse mellem robotproducentens og aftagerkommunernes forventninger og tankesæt (forklaring relateret til konkurrerende hensyn og logikker).

- Artikel 4 (Kapitel 5) genbesøger det fejlslagne robotprojekt ud fra et narrativt perspektiv. Analysen demonstrerer, hvordan fire forskellige typer narrativer understøtter aktørernes meningsskabelse og handlinger undervejs i projektforløbet. Narrativer om projektets oprindelse, dvs. hvordan projektidéen opstod, legitimerede robotprojektet overfor et bredt netværk af aktører; narrativer om projektets potentiale (dets værdiskabelse) var med til at holde idéen i live og opmuntre deltagerne til at løse de problemer, der opstod undervejs. I takt med, at projektet kæmpede med implementering af robotten i praksis hos slutbrugerne, begyndte divergerende narrativer om implementeringsbestræbelserne at opstå. Til slut, efter projektets kollaps, opstod narrativer om, hvilken læring og erfaring, projektet kunne give i forhold til fremtidige digitale innovationsprojekter. Artiklen formulerer et teoretisk bud på, hvordan disse formative narrativer – forstået som diskursive sociale konstruktioner af aktørernes meningsskabelse og handlinger – former og formes af den kontekst, hvori digitale innovationer udspiller sig. Teorien skelner mellem forstærkende og konfliktende interaktioner mellem formative narrativer som en ramme til at forklare og forstå koordineringsproblemer og polarisering i social konstruktion af digitale innovationsidéer, processer og outcome.

Ved at forstå 'konkurrerende hensyn' som en iboende og løbende del af digital innovation argumenteres der i afhandlingen for, at ledere skal identificere, engagere sig i og drage fordel af konkurrerende hensyn i stedet for at søge at undgå disse. Afhandlingen afsluttes med en opstilling af en konceptuel model for, hvordan ledere kan forstå og adressere konkurrerende hensyn i digitale innovationsprojekter som en iterativ proces, der består af fire gensidigt afhængige aktiviteter. Derudover giver afhandlingen praksisrelateret viden om centrale udfordringer, der knytter sig til udvikling, implementering og skalering af digitale velfærdsteknologier.

ACKNOWLEDGEMENTS

Andrew Van de Ven describes the innovation process as a journey you can't control, but you can learn to maneuver it. When I look back on the past four years as a doctoral student, I think the same description can apply to research. One moment you find yourself with a clear direction and a sense of suddenly understanding your research problem – and in the next, you struggle with setbacks, puzzling events, dead-ends, or external shocks forcing you to rethink and revise the research approach, theoretical frame, or empirical material. Evidently, like the innovation journey, you can't thoroughly plan or fully control these ups-and-downs or sudden changes in direction. But, as demonstrated by the accomplishments of my supervisors, you might be able to learn how to maneuver the process.

In this regard, I think a Ph.D. project instigates the initial steps to develop such skills and practices for maneuvering the research process. Here, I could not ask for better or more dedicated supervisors than Prof. Jeppe Agger Nielsen and Prof. Lars Mathiassen. I will be forever grateful for your guidance and patience with me. Jeppe: You are undoubtedly the most influential person in my academic upbringing, first as a teacher in my BSc and MSc studies and now as my primary supervisor for this dissertation. Whenever I'm in doubt or need advice, you are always ready to step in. My deepest thanks for your mentorship, for involving me in exciting projects, and for introducing me to the information systems research community. Lars: Your inspiring and constructive paper sessions have substantially influenced how I think about research in general and academic writing in particular. Thank you for sharing your vast experience and knowledge for conducting high-end research with me – and for taking the time to discuss and develop my research ideas.

I am grateful for being enrolled in a vibrant and supportive research group: the Center for Information Systems Management (CIM) at the Department of Politics & Society, Aalborg University. Ever since my first day, both former and current CIM members have made me feel welcome. Thank you for taking an interest in my project, the support, and the many valuable suggestions and insights.

I would also like to thank all the practitioners in the two case studies who volunteered to share their knowledge and experiences. Without your openness and willingness to engage with me and my research, there simply wouldn't be a dissertation. I hope my findings can be of use to you.

My Ph.D. position has also involved substantial teaching obligations. In this regard, Laust Høgedahl has helped me become involved in the Innovation & Digitalization study program. Thank you for your trust and belief in my teaching abilities – and for providing me with the opportunity to develop and teach a course on Welfare Technology.

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[1] Aaen, J. (2021). Competing Concerns on Emerging Welfare Technologies: A Review of Eight Prevailing Debates in Current Literature. *Scandinavian Journal of Information Systems*, 33(1), Article 7.

[2] Aaen, J. (2019). Organizing for Emerging Welfare Technology: Launching a Drug-Dispensing Robot for Independent Living. *Selected Papers of the IRIS*, Issue Nr 10 (2019). Article 1.

[3] Aaen, J. & Nielsen, J.A (2021). Lost in the Diffusion Chasm: Lessons Learned from a Failed Robot Project In The Public Sector. *Information Polity* (Preprint). DOI: 10.3233/IP-200286

[4] Aaen, J., Nielsen, J.A., & Mathiassen, L. (2021). Formative Narratives in Digital Innovation. Paper submitted to *Management Information Systems Quarterly* (Revise & Resubmit)

Related publications by the author not included in the dissertation:

- Aaen, J., Nielsen, J.A., & Elmholdt, K. T. (2018). 10 år med velfærdsteknologi: Strategi og praksis [10 Years with Welfare Technology: Strategy and practice]. *Samfundslederskab i Skandinavien*, 33(3), 236-259.

- Aaen, J., Nielsen, J.A., & Carugati, A. (2021). The Dark Side of Data Ecosystems: A Longitudinal Study of the DAMD Project. *European Journal of Information Systems* (Online). DOI: 10.1080/0960085X.2021.1947753

CHAPTER 1.
INTRODUCTION

Rapid technological developments have paved the way for a "golden age of digital innovation" (Fichman et al., 2014), igniting the creation of new technologies – such as robots, artificial intelligence, IoT, and cloud computing – that offer the formation of new products and services and bring radical changes in how organizations operate, create, and deliver value (Kohli & Melville, 2019; Yoo et al., 2012). As a result, it is increasingly becoming a strategic imperative for organizations to understand how to engage in and manage digital innovation (Benbya et al., 2020; Fitzgerald et al., 2014; Nambisan et al., 2017; Yoo et al., 2010).

Decades of Information Systems (IS) research shows a multidimensional relation between digitalization and organizational change (Markus & Robey, 1988; Swanson, 1994; Yoo et al. 2010; Barrett et al., 2015), in which the technological component itself is only part of the complex puzzle that organizations must solve to embrace digital innovation (Barrett et al., 2012; Vial, 2019; Kohli & Melville, 2019). Recent research has described digital innovation as an increasingly dynamic, unbounded, and collective process that involves actors with different and often contradictory views and demands (Nambisan et al., 2017; Holmström et al., 2021). Thus, this line of research stresses how digital innovation is not a harmonious phenomenon in which the involved innovation actors speaks with a unified voice or where innovation agency is conceptualized as a single agent influencing others to follow the agent's will (Kohli & Melville, 2019; Drechsler et al., 2020; Hund et al., 2021). Instead, digital innovation is a multifaceted and contested socio-technical process that involves heterogeneous actors, organizational tensions, and competing concerns (Yoo et al., 2010; Nambisan et al., 2017; Sarker et al., 2019). Consequently, organizations need not only to ensure technical feasibility and economic viability when engaging in digital innovation. Equally important is to understand and manage the untidy and often conflicted nature of digital innovation (Svahn et al., 2017; Dobson & Nicholson, 2018). However, opening up the 'black box' of how competing concerns impact digital innovation and how organizations can address them, remains in an emergent state.

This dissertation sets out to address this shortcoming by focusing on competing concerns in emerging Welfare Technologies – a particular form of digital innovation in health- and eldercare that encompass a highly diverse set of actors such as public sector organizations, private developers, care professionals, care-recipients[1] (and their families), and politicians. Specifically, the dissertation aims to advance our comprehension of how competing concerns manifest in digital innovation contexts – and how managers can understand and address them. In doing so, the dissertation explores,

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[1] Sometimes also referred to as 'clients' or 'end-users' in the dissertation.

refines, and extends the conceptualization of digital innovation as an unpredictable and often conflicted process.

The remainder of this chapter is structured as follows. The following section presents a brief overview of digital innovation literature in Information Systems research and outline key characteristics of the phenomenon. Next section discusses competing concerns as a fundamental notion to study digital innovation as a multifaceted and contested socio-technical phenomenon. This leads to the dissertation's overall research question and objectives followed by an introduction of Welfare Technology as empirical setting and research context. The section afterwards describes the methodological approach and provide an overview of the data collection and analyzing strategy. The chapter ends with an outline of the dissertation and the four included articles.

1.1. DIGITAL INNOVATION

Digital innovation can broadly be understood "as the creation of (and consequent change in) market offerings, business processes, or models that result from the use of digital technology" (Nambisan et al., 2017:224).

Strongly associated with opportunities for growth, new or improved value creation, and critical for ensuring long-term survival, the innovation imperative is ever-present in organizations of all shapes and sizes (Tidd & Bessant, 2018). Following pervasive and rapid technological developments, digital technologies are increasingly regarded as a prominent source of innovation in most products, processes, or services of today (Yoo et al., 2010; Fichman et al., 2014; Ciriello et al., 2018). For instance, digital technologies can make tangible products (re-)programmable, connected, and able to interact with a network of heterogeneous devices (Yoo et al., 2012; Lyytinen et al., 2016), enhance organizational performance and operational efficiency (Vial, 2019), provide new opportunities for service innovation (Barrett et al., 2015), and spawn novel business models and value creation pathways (Nambisan et al., 2017; Henfridsson et al., 2018). As such, digital technologies are not only transforming the outcome of these innovations, but also the nature of innovation itself with increased interaction between products, processes, services, and business model innovation (Bharadwaj et al., 2013; Ciriello et al., 2018). Furthermore, Nambisan et al. (2017) note how digital innovation 1) entails a more dynamic and iterative interaction between innovation processes and outcomes, 2) are less bounded in terms of time, space, and outcome, and 3) has less predefined and more distributed innovation agency among heterogenous actors. These distinct characteristics of digital innovation challenge existing theories on innovation management in three ways (ibid.).

First, as digital technologies are programmable and reproducible, the outcomes of digital innovation are characterized by the ability to (re-)combine previously separate components (*convergence*) and the ability to add infinite expansions of features (*generativity*) (Yoo et al. 2012, Ciriello et al., 2018). While offering unprecedented opportunities for value creation, these characteristics of digital technologies presents signif-

icant management challenges (Nambisan et al., 2017). For instance, convergence requires new understandings of how interdependencies in previously discrete activities emerges, while generativity challenges the degree of managerial control in innovation processes as digital technologies and services continue to evolve through new added functionality or integration with other technologies and services (Bogers et al., 2021). Furthermore, the abilities of generativity and convergence make digital innovation an inherently self-referential process, as digital technology is both the result of and the basis for new digital innovation projects (Lyytinen et al., 2016; Ciriello et al., 2018). As a result, the existing digital infrastructures have both enabling and constraining effects on future innovation projects, invoking the need for a new organizing logic for managing innovation processes that rely on new architectural knowledge for creating and managing digital infrastructures that embrace the generative capacity of digital innovation (Yoo et al., 2010; Henfridsson et al., 2014). Consequently, a pressing issue for digital innovation literature is how to handle upcoming tensions and contradictions in the transition from established organizational practices to digital innovation with less distinct and more complex, dynamic interaction between innovation processes and outcomes (Hylving et al., 2012; Lyytinen et al., 2016; Nambisan et al., 2017).

Second, digital innovations are not isolated processes but deeply integrated into broader organizational contexts and can thus be contradictory with other organizational processes (Bjerkness, 1991; Dobson & Nicholson, 2018). However, these contextual boundaries become even more blurred over time, since digital technologies' scope, features, and value can continue to expand by an increasing number of participating innovation actors long after initial implementation. Thereby, compared to other forms of innovation, digital innovation are less bounded in terms of time, space, and outcome (Nambisan et al., 2017; Henfridsson et al., 2018). This dynamic and open-ended value creation of digital technologies gives digital innovation outcomes an "ambivalent ontology" (Kallinikos et al., 2013) – lacking the stability afforded by physical (mechanical) objects. It also creates unpredictable and fluid boundaries of the what, who, and when is part of the digital innovation initiative (Nambisan et al., 2017). This fluidity becomes especially evident by the emergence of hybrid technologies such as robots that combine digital and physical (mechanical) elements. For instance, Barrett et al. (2012) have shown how a robot's hybrid materiality intertwined mechanical elements with digital inscriptions, and in doing so, reconfigures work boundaries and relations in practice with significant and contradictory consequences related to cooperation and conflict among different organizational actors. Additionally, the temporal structure of digital innovation processes has also become less bounded (Nambisan et al., 2017). As demonstrated in Huang et al.'s (2017) study of the rapid scaling of a digital platform's user base, digitalization provides the ability to minimize the time gap between early idea and implementation through ongoing test and deploy loops based on user response data. Thus, while digital innovation can involve a whole range of activities related to initiating, developing, implementing, and exploiting digital technologies at scale (Kohli & Melville, 2019), such activities do not need to occur in sequential order. Nor do every digital innovation project need to

encompass every activity (ibid.). Therefore, another pressing issue for digital innovation literature is how to organize an increasingly unbounded and unpredictable innovation journey with fluid boundaries (Nambisan et al., 2017).

Third, given its unbounded nature, digital innovations encourage innovation actors to engage with a myriad of organizations and communities. Thus, instead of being situated within a single organization's boundaries, digital innovation are increasingly conceptualized as unfolding among a more extensive network of internal and external actors (Nambisan et al., 2017; Holmström et al., 2021). This involvement of multiple actors limits how much a single change agent can dictate the processes and outcomes of digital innovation (Kohli & Melville, 2019). As such, digital innovation often involve a shift towards distributed agency and more networked organizational forms (Drechsler et al., 2020). This requires new approaches to organize innovation efforts and engage with actors within the broader context of an organization (Hund et al., 2021). Accordingly, organizations need to ensure their employees have the necessary technologies and capabilities to engage with innovation activities' increasingly networked and connected character (Ciriello et al., 2018). Organizations also need to cultivate their "matchmaking capabilities" with external actors to integrate knowledge from external and internal sources (Holmström et al., 2021). Consequently, in order to embrace digital innovation, organizations must find ways to engage in and manage innovation processes that involve a heterogeneous set of actors with diverse goals, logics, and concerns (Nambisan et al., 2017; Holmström et al., 2021). For instance, Svahn et al. (2017) demonstrate how a shift toward more distributed innovation raises competing concerns that managers must balance to realign innovation capabilities, focus, collaboration, and governance. Thus, a third pressing issue for digital innovation literature concerns examining (opposing) forces of change that support or hinders digital innovation (Kohli & Melville, 2019).

In sum, with its dynamic, unbounded, and collective nature, digital innovation should not be treated as a harmonious phenomenon in which the involved actors speak with a unified voice or where agency is conceptualized as a single agent influencing others to follow the agent's will (Lyytinen et al., 2016; Dobson & Nicholson, 2018). Instead, digital innovation should be studied as a multifaceted and dynamic socio-technical process involving heterogeneous actors with varying logics and sometimes competing concerns.

In this regard, Van de Ven (2017) characterizes innovation processes as ongoing cycles of divergent and convergent behavior that may repeat in unpredictable ways over time. Here, an innovation project may begin to develop in an initially planned convergent direction. Later, the process proliferates into a divergent cycle of exploring new directions, viewpoints, and collaborations. Such activities often involve multiple competing concerns as problems, mistakes, and resource constraints are encountered. These divergent activities may lead project managers into a convergent cycle of exploiting a given direction by implementing, testing, and evaluating ideas. This cycle of convergent behavior may diverge again with new exploration of different viewpoints of the chosen direction. Eventually, these iterations might result in a convergent

pattern of innovation implementation or end in a divergent cycle if the project is terminated when resources or support run out (Van de Ven, 2017). Even long after initial implementation, these cycles are likely to continue due to the open-endedness of digital technologies encouraging continues exploration of potential expansions of scope, features, and value creation by an increasing number of participating innovation actors (Kallinikos et al., 2013; Henfridsson et al., 2018).

These messy and complex processes suggest that digital innovation cannot be reduced to a simple sequence of harmonious activities that unfold in an orderly manner. Instead, we need theory that not only conceptualizes digital innovation as continuously nonlinear processes of divergent and convergent activities but also takes into account how competing concerns impact these activities. However, despite scholarly calls (Nambisan et al., 2017; Kohli & Melville, 2019; Ciriello et al., 2019; Hund et al., 2021), existing literature provides limited insights on the impact of competing concerns on digital innovation processes and outcomes. Such exploration requires answering several fundamental questions regarding how we can conceptualize competing concerns in digital innovation.

1.2. COMPETING CONCERNS IN DIGITAL INNOVATION

To provide an integrative understanding and a basis for studying digital innovation as a multifaceted, dynamic, and contested socio-technical process involving heterogeneous actors, I use the notion of *competing concerns* throughout the dissertation. Prior studies have conceptualized the interaction and collaboration between heterogeneous actors in innovation processes in predominantly harmonious perspectives such as open innovation (Chesbrough, 2003), co-creation (Prahalad & Ramaswamy, 2000), lead-user involvement (Von Hippel, 1986), and organizing vision (Swanson & Ramiller, 1997), in which innovation is orchestrated as the symbiotic interaction of different actors contributing with complementary insights and capabilities to collaborate purposefully towards an envisioned end state. In these perspectives, the interaction between different actors with different viewpoints and insights is a key enabler for innovation (Holmström et al., 2021). In contrast, theoretical perspectives such as paradoxical management (Lewis, 2000; Ciriello et al., 2019), institutional theory (Dobson & Nicholson, 2018), and dialectic theory have conceptualized how different logics or views can result in conflict as both a constraining and generative force in innovation projects (Bjerkness, 1991; Van de Ven & Poole, 1995; Robey & Boudreau, 1999; Cho et al., 2007). These theories assume organizational processes to unfold in "*a pluralistic world of colliding events, forces, or contradictory values that compete with each other for domination and control. These oppositions may be internal to an organizational entity because it may have several conflicting goals or interest groups competing for priority*" (Van de Ven & Poole, 1995:517). Moreover, because the innovation process is complex and inherently uncertain, actors can themselves have internal conflicts when deciding which path to take (Garud et al., 2013). As such, competing concerns are not only caused by the involvement of different actors; the innovation journey itself is embedded in ambiguous and uncertain decisions that organizations must

balance to embrace digital innovation (Svahn et al., 2017). In this sense, the changes necessary to pursue digital innovation are inherently characterized by multiple arising tensions and competing concerns shaping the innovation trajectory (Cho et al., 2007; Hund et al., 2021). Examples of such competing concerns in digital innovation include navigating emerging versus institutionalized work practices (Dobson & Nicholson, 2018), technology enthusiasm versus reluctance to change (Askedal & Flak, 2017), and balancing trade-offs between exploration vs. exploitation (Gestaldi et al., 2017).

Appreciating these theoretical insights as point of departure for the dissertation, competing concerns is understood as manifestations of diverging views and demands that contest with each other during digital innovation. These manifestations can arise between different groups of actors such as clashes between risk-willing developers vs. risk-adverse care professionals (Dupret & Friborg, 2018), within a single group of actors (Young et al., 2016), or arise as inherent parts of individual decision-making (Svahn et al., 2017). By drawing on the notion of competing concerns, digital innovation is theoretically framed as a multifaceted and contested socio-technical process involving varying views and demands within and across heterogenous actors. This conceptualization is elaborated further in Chapter 6 (discussion) as part of theorizing a model for managing competing concerns.

1.3. RESEARCH QUESTION

Although different types of competing concerns have been discussed for more than two decades, research remains at a nascent and fragmented stage (Ciriello et al., 2019). The scattered discussion on competing concerns in current literature both indicates their growing importance in digital innovation – and at the same time illustrates the potential for promising research avenues (Hund et al., 2021). Responding to the aforementioned scholarly calls, I set out to expand our understanding of competing concerns in digital innovation by answering the following overall research question:

> *How can managers understand and address competing concerns in digital innovation?*

To answer this question, the dissertation zooms in on welfare technology in Denmark as empirical setting. Labeled as "welfare technologies" (WT), digital technologies such as virtual home care, digital surveillance, and care robots are expected to radically transform health- and eldercare services (Aaen et al., 2018; Søndergård, 2017). However, despite high expectations, strategic importance, and growing investments in them, many promising technologies struggle to become implemented on a large scale (Greenhalgh et al., 2017; Karlsen, et al., 2019; Frennert, 2019). The empirical analyses demonstrate how this critical phase of digital innovation is a cumbersome process with many uncertainties, involving heterogeneous actors such as public sector organizations, private developers, care professionals, care-recipients (and their families), and politicians. Consequently, digital innovation is a complex and often con-

tested socio-technical process that relies not only on reconfiguring technical and organizational capabilities but also on continuously identifying, addressing, and balancing competing concerns and logics between a plurality of actors.

Thus, with its rapid technological developments, the involvement of a highly diverse group of actors, and its high failure rates despite managerial support and financial investments, WT offers a well-suited empirical domain for advancing our comprehension of digital innovation as a multifaceted and contested socio-technical process. Thereby, WT provides rich research opportunities to contribute new insights on how organizations can understand and address competing concerns to orchestrate digital innovation effectively.

The dissertation consists of four articles that guide the overall research process and assist in analytically unravel the phenomenon from different empirical and theoretical perspectives while allowing insights from one article to inform the others as the research process unfolds. Article 1 (a systematic literature review) contributes insights from extant literature on key challenges and competing concerns related to implementing, scaling, and sustaining digital innovation in health- and eldercare. These insights help inform the empirical investigation of a specific digital innovation project (Article 2). Similarly, Article 3 provides an empirical and inductive examination of a failed digital innovation project resulting in three competing explanations. These insights inspired a more theoretical-driven analysis of the same case in Article 4 focusing on how innovation narratives first resolved but later amplified competing concerns by supporting multiple moments of (competing) meaning-making across heterogeneous actors.

In addition to a systematic literature review, the dissertation adopts a longitudinal case study design with digital innovation projects as unit of analysis. Specifically, the dissertation focuses on the emergence, trajectory, and outcomes of two WT projects in Danish eldercare involving multiple organizations and innovation actors (such as private developers, municipal management, care workers or care recipients). While particular emphasis is given to project managers (in municipalities and private developers), the dissertation includes multiple levels of analysis (Gupta et al., 2007) such as strategic level (e.g., Municipal politicians, investors, and board members in private WT companies), organizational level (managers in municipalities and private companies), and work-practice level (care workers and clients).

1.4. RESEARCH CONTEXT

Welfare Technology (WT), a Scandinavian notion launched to promote digital innovation in public sector service delivery, is seen as a means to more efficient and improved welfare services and a solution to demographic challenges, the public's increased expectations, and economic constraints (Aaen et al., 2018; Frennert, 2019). As such, WTs are expected to renew and transform health- and eldercare services by assisting clients in their daily lives, reducing operational costs, and creating better working conditions for staff (Hofmann 2013; Søndergård, 2017; Lo et al., 2019). The

high expectations for WTs are enacted in political strategies and growing markets seeking to promote digital innovation in health- and eldercare organizations (Aaen et al., 2018; Frennert, 2019). However, involving a heterogenous field of actors such as public sector organizations, private technology developers, and several non-technical professionals, emerging welfare technologies are heavily embedded in several and often contradicting logics and concerns, complicating the innovation process and outcomes of WT. Accordingly, despite a growing demand, heavy investments, and numerous initiatives, few WTs become implemented and create real-world value at scale and over time (Greenhalgh et al., 2017; Karlsen et al., 2019; Frennert, 2019).

1.4.1. WELFARE TECHNOLOGY AS A CASE OF DIGITAL INNOVATION

The term 'Welfare Technology' is mostly used in the Nordic welfare states to describe the emergence of a wide variety of citizen-facing digital technologies aiming to transform the delivery of in welfare services – typically in collaboration between citizens (end-users), front employees, service-organizations, and technology companies (Aaen et al., 2018). Although the concept is not specifically linked to the health- and eldercare sector, it is primarily in these areas that the welfare technology agenda has gained political and managerial attention (Nielsen et al., 2016; Fredskild & Dalkjær, 2017). As listed in Table 1.1, examples of WT within this domain include: Telecare services for independent living (Cook et al., 2018); GPS-tracking devices for people with cognitive impairment (Procter et al., 2018); smartphone applications for symptom monitoring (Kettlewell et al., 2018); sensor systems for digital night surveillance in nursing homes (Nilsen et al., 2016); and robotic vacuum cleaners in eldercare (Nielsen et al., 2016). As such, the notion of WT encompasses a diverse group of digital technologies that can be used for a wide range of purposes, such as rehabilitation, remote treatment, communication, assistance with everyday activities, disease monitoring, or social and emotional stimulation. Outside of the Nordic countries, these types of digital technologies are sometimes also known as 'Assistive Living Technologies' or simply 'Assistive Technologies'.

While Table 1.1 illustrates a broad range of very different types of digital technologies – from apps to robots – they entail a number of unifying aggregated characteristics that make WT an optimal research setting for studying competing concerns in digital innovation.

Type	Example 1	Example 2
Social robots (Social and emotional interaction)	 Robotic animals for emotional stimulation such as 'Paro' (Hung et al., 2019). Image source: https://robots.ieee.org/	 Humanoid robots for social interaction such as 'Pepper' or 'Nao' (Chu et al., 2017). Image source: https://www.softbankrobotics.com/
Service robots (Assistance with everyday activities)	 Robotic "butlers" to support personal services in hospitals and care facilities such as 'SeRoDi' (Van Aerschot, & Parviainen, 2020). Image souce: https://robohub.org/	 Robotic vacuum cleaners such as 'Roomba' (Nielsen et al., 2016). Image source: https://www.irobot.com/
Telehealth and telecare (Remote treatment and patient communication)	 Telehealth systems for remote treatment of patients at home (Dorsey & Topol, 2016). Image source: https://rn.dk/	 IoT for independent living to ensure the user's wellbeing, provide reminders etc. (Perez et al., 2018). Image source: Perez et al., 2018:228.
(Sensors and wearables (Ambient monitoring and tracking)	 GPS systems in dementia care to support care for persons with wandering behavior (Wan et al., 2016). Image source: https://www.personalgpstrackers.co.uk/	 Sensitive floors for movement and fall detection (Klack et al., 2011). Image source: https://maricare.com/

Apps and VR (Rehabilitation, training, and re-minders)		
	Apps for training and rehabilitation (Ramey et al., 2019). Image source: https://careware.dk/	Virtual Reality solutions for rehabilita-tion or sharing experiences (Threaple-ton et al., 2017). Image source: https://www.rendever.com/

Table 1.1: Examples of welfare technologies in health- and eldercare

First, in contrast to other forms of digital technologies in health and eldercare such as Electronic Patient Records (EPR) and other "back-office" information systems, WTs are *citizen-facing* technologies that the care recipients (end-users) directly interact with in the creation, delivery, and consumption of welfare services. Thereby, WTs not only brings organizational changes in terms of how the delivery of welfare services are organized, but also changes at work-practice level; challenging existing practices and notions on "good" care and to what extent – and how – digital technologies can support this (Pols, 2015; Hoffmann, 2015). Thus, whereas traditional IT projects in the public sector has been regarded as a tool for more effective administrative pro-cesses (Dunleavy et al., 2006), WTs are digital technologies used by clients and care workers to improve various practical and social tasks; encompassing the more perva-sive and radical changes of digital innovation by linking physical and virtual spaces in new ways, with the potential to fundamentally transform organizations and work processes rather than merely increase efficiency (Lo et al., 2019).

Secondly, the development and implementation of WTs are often organized in close collaboration between private companies (e.g., developers), public authorities (service providers), non-technical employees (e.g., care-professionals), and citizens (users). This makes agency in WT projects inherently *distributed and interdisciplinary*; re-quire new combinations of competencies in ICT and in healthcare to enable the nec-essary adaptation of both technology and work routines that arise in the implementa-tion process (Lo et al., 2019). Though, the differences in skillsets and experiences between diverse actors can not only lead to asymmetric knowledge and competing discourses (Greenhalgh et al., 2012), but also competing logics between e.g., more risk willing technology developers and risk adverse healthcare professionals discour-aged from deviating from official procedures (Dupret & Friborg, 2018; Røhnebæk, 2021).

Finally, being digital, WTs are *interconnected* with other technologies and should not be viewed as isolated or stand-alone products but instead as part of a digital infrastruc-ture (Bygstad & Lanestedt, 2017). On one hand, this characteristic enables recombi-nation and addition of new features of existing WTs. On the other hand, it creates a form of path dependence with previous choices regarding e.g., digital infrastructures or choice of suppliers influence current possibilities for innovation (Lo et al., 2019).

This complicates long-term planning and short-term maneuverability necessary to pursue continuous digital innovation.

In sum, by encompassing multiple heterogeneous actors with different and sometimes conflicting views and demands, ethical dilemmas, and technical and organizational challenges; WT provides rich research opportunities to study competing concerns in digital innovation.

1.4.2. WELFARE TECHNOLOGY PROJECTS IN DENMARK

Like its fellow Nordic countries, the Danish welfare model is based on a principle of universalism in the provision of welfare services, benefits, and social security. Thus, rather than relying on social insurance contributions, welfare services such as healthcare, childcare, and eldercare are publicly financed through general taxation with equal access and most services being free of charge. The welfare services are operated on three political and administrative levels: the state provides the overall regulatory and supervisory functions; the five Regions are primarily responsible for the hospitals, the general practitioners (GPs), and for psychiatric care; while 98 municipalities (local governments) are responsible for several primary health- and eldercare services such as homecare and nursing homes (Danish Ministry of Health, 2017).

Like most other advanced nations, Denmark is expecting a considerable growth in the proportion of older people resulting a significant increase in the need of health, care, and nursing services in the years to come (World Health Organization, 2020). Additionally, Danish municipalities report of recruitment challenges for social and healthcare staff (FOA & Local Government Denmark, 2017), which further challenges the service providers capacity to meet the increased demand. Consequently, public sector organizations look for new ways to innovate the provision of welfare services – especially within the health and eldercare sectors (Søndergård, 2017).

Within this context, WTs are an important tool for enabling the public sector organizations to continue to provide high-quality welfare service and handle the double demographic challenge of the aging population's increased need for health and care services and at the same time a declining access to labor (Nordic Welfare Centre, 2012). Accordingly, WTs have been a strategic imperative for more than a decade in Scandinavian public sectors (Aaen et al., 2018). This political and managerial focus have resulted in a myriad innovation projects and initiatives on national, regional, and local level – with more than 1,450 projects registered in Local Government Denmark's (2021) – the interest organization for all 98 Danish municipalities – database of welfare technology projects in Danish municipalities by 2021. Previously, Danish municipalities have focused on projects seeking to develop, test, or implement technologies to support cleaning (e.g. robotic vacuum cleaners), eating (e.g. robot-assisted eating), mobility (e.g. ceiling lifts), and hygiene devices (e.g. automatic wash-and-dry toilets) (Local Government Denmark, 2017; ÆldreForum, 2010). Now, focus have shifted towards digital technologies such as telecare/telemedicine, rehabilitation and training,

sensors and alarm systems, and technologies to assist with medication (Local Government Denmark, 2021).

While WT has become central to the discussion on how welfare services can be delivered, there are many different perspectives and expectations ascribed to WT's potential value propositions such as opportunities for improving quality of life for the recipients of care (citizens), improved and more efficient delivery of welfare services (public sector), flexible and less stressful working conditions for frontline employees (care professionals), and eventually also new market opportunities and growth potentials for technology developers (private sector) (Aaen et al., 2018).

However, realizing these expectations of new WTs in public sector services has proved to be a notoriously difficult task. As recently emphasized by Local Government Denmark (2016), many municipalities *"still face many barriers, when seeking to transform small-scale pilots into large-scale applications"* (p. 3). Thus, despite policymakers and public sector managers call for WTs to be implemented rapidly and at scale, it has proved particularly challenging for public sector organizations to embrace and sustain WT at scale. Additionally, many WT are met with criticism, especially in terms of ethical concerns with certain WTs being perceived as disempowering, intrusive, or even challenging for the user's basic rights and dignity (Pols, 2015; Hofmann, 2013).

1.4.3. THE PROBLEM OF SCALING WELFARE TECHNOLOGIES

If only the technology is good enough, it will implement itself.
- Interview with Manager at a municipal department for welfare technology

Scaling up welfare technology depends 10% on the technology and 90% on everything else.
- Interview with Project manager at a municipal department for welfare technology

The above quotes, by two municipal managers organizing multiple WT projects, represent two dominant and competing views among practitioners and scholars engaging in WTs – and nicely illustrates the dissertation's point of departure of studying competing concerns in digital innovation. The first quote reflects technology-centric concerns in which the use and spread of WTs is first and foremost a matter of technological development. Scholars highlighting these concerns often points to poor usability, high costs, or inadequate product design to solve actual needs when explaining the challenges for diffusing and sustaining WTs at scale (Glende et al., 2016; Papadopoulos et al., 2020). The practical implications within this line of research typically points to user-centered and participatory development to ensure that the emerging technologies match an actual demand (Sølling et al., 2014, Shaw et al., 2017) or universal design principles to turn well-established and high-quality mainstream technologies into accessible solutions for welfare services (Björk, 2009; Smith et al., 2018). In contrast, the second quote reflects adopter-centric concerns in which the technological

component plays only a minor part of a bigger puzzle. Here, research points to social factors of WT such as lack of acceptance among end-user (Yusif et al., 2016), resistance for change (Nilsen et al., 2016), and the need to create new practices (Procter et al., 2018). The responses to these challenges include facilitating inter-stakeholder dialogue for creating an organizing vision for WT (Greenhalgh et al., 2012), new business model creation (Oderanti & Li, 2016), and system-perspectives on implementation (Sugerhood et al., 2014; Bygstad & Lanestadt, 2017; MacLachlan & Sherer, 2018). While both concerns certainly contain valuable insights, they only paint parts of the picture of the challenges involved in managing WT projects and provide very diverging and sometimes conflicting recommendations for practice. Whereas the technology-centric perspective risk underestimating the organizational and social transformations needed to embrace WTs, the adopter-centric view tends to take the technological component for granted or are naively viewing technical issues as unproblematic that will be fixed. By exploring such and other competing concerns, this dissertation aims to further our understanding of the digital innovation as a multifaceted and contested socio-technical process. In doing so, the dissertation also provides new empirical insights to how emerging (welfare) technologies can succeed on a larger scale.

1.5. RESEARCH APPROACH

In combination with a systematic literature review, the dissertation consists of two longitudinal case studies of WT projects in Denmark. Thereby, the dissertation takes a qualitative approach to study competing concerns in digital innovation.

Qualitative research methods are widely used in IS research to extract comprehensive insights from highly complex, dynamic, and multi-faceted research contexts (Conboy et al., 2012). Accordingly, qualitative research is well suited to explore and make sense of emerging research topics by appreciating the richness of the phenomena and their relational and temporal contexts (Garud et al., 2018). Particularly, in-depth interpretive case studies allow to study a phenomenon within its context while considering the subjective meaning that people bring to their situation (Walsham, 1995; de Vaus, 2001).

Interpretive research's ontological assumption views the social reality through human action constructing and reconstructing subjective meaning (Walsham 1995). Understanding this subjective meaning is only possible through interpretation. Thus, interpretive researchers study social phenomena by focusing on human action-taking and meaning-making and how it constitutes reality (Klein & Myers, 1999). As such, in contrast to positivist research aiming to develop deterministic claims or statistically testable propositions, interpretivist research seeks to explain, make sense, and provide practical guidance for understanding complex social processes from the point of view of those who enact it (Gregor, 2006; Walsham, 1995). In this paradigm, social activities and experiences can be interpreted in many ways allowing for multiple understandings of the same phenomena to coexist if equally competent (or trusted) inter-

preters disagree (Guba & Lincoln, 1994). This calls for critical reflection of the interpretive researchers' process of understanding (*verstehen*) and developing explicit criteria to guide the design, execution, dissemination, and evaluation of interpretive research (Walsham, 1995; Klein & Myers, 1999). For instance, Klein & Myers (1999) provide seven principles[2] to conduct and evaluate interpretive research in information systems, stressing the importance of the hermeneutic analysis by iterating between considering the interdependent meaning of individual parts and the whole that they form. Although such criteria can assist researchers engage with interpretivist methodology, they are not to be treated as clear and prescriptive universal principles for conducting or evaluating such research (Conboy et al., 2012). Instead, interpretive scholars need to appropriate them to the specific research project and use their judgment to determine whether, how, and which of the principles should be applied (Klein & Myers, 1999). The following presents the research approach(es) applied in the dissertation, how data was collected, and how the analytical insights was developed and theorized.

1.5.1. CASE STUDY APPROACH

The overall aim of this dissertation is to study how managers can understand and address competing concerns in digital innovation. To better understand such evolving dynamics, longitudinal studies are particularly useful as they allow for in-depth processual accounts of how specific digital innovation projects emerge, develop, grow, and decline over time (Van de Ven, 2007; Langley et al., 2013; Garud et al., 2013).

The dissertation consists of two longitudinal case studies of digital innovation in Danish eldercare (one prospective and one retrospective case study). Both cases are highly visible (Van de Ven, 2007) and well-documented digital innovation projects that involves technology development of two new service robots in eldercare, the creation of new practices and processes for delivering care services, and collaboration between public and private organizations. The cases provide excellent research opportunities to contribute new theoretical understandings for how competing concerns shape digital innovation while also provide practical insights for WT development and implementation. Data consist of interviews and various types of archival data (reports, newsletters, contracts, etc.).

As suggested by Klein & Myers (1999), accessing other people's experiences requires critical reflections of how the research data is socially constructed through the interaction between the researchers and participants. In this way, the participants – in the same way as the researcher – can be seen as interpreters and analysts:

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[2] The seven principles are: 1. The Fundamental Principle of the Hermeneutic Circle 2. The Principle of Contextualization 3. The Principle of Interaction between the Researchers and the Subjects 4. The Principle of Abstraction and Generalization 5. The Principle of Dialogical Reasoning 6. The Principle of Multiple Interpretations 7. The Principle of Suspicion (Klein & Myers, 1999:72).

> "Participants are interpreters as they alter their horizons by the appropriation of concepts used by IS researchers, consultants, vendors, and other parties interacting with them, and they are analysts in so far as their actions are altered by their changed horizons." (Klein & Myers, 1999:74)

This effect is greater for interviews or observation and diminishes for material that does not involve direct interaction with participants such as documents, websites, meeting logs etc. (Bowen, 2009). Yet, for even such archival data, the researcher should not be seen as an "objective reporter" since the researcher's own subjectivity influence the material's collection and interpretation (Klein & Myers, 1999; Walsham, 1995). Walsham (1995) provides similar reflections concerning the researcher's role in accessing other people's interpretations by distinguishing between the involved researcher (where the researcher becomes an active member of the field for some time) and the outside observer (where the researcher maintains more distance from the informants). For the longitudinal case studies in this dissertation, my role can best be described as an outside observer. The implication of this approach is elaborated in the following section and in section 1.5.4.

The value of being an outside observer is that the diverse set of innovation actors see me as not having a direct personal stake for specific interpretations or outcomes. Accordingly, informants could be expected to be more outspoken in expressing their views (Walsham, 1995). Maintaining the role of an outside observer would therefore allow me to gain insights on competing concerns from multiple and sometimes disagreeing actors. Furthermore, this would also allow me to follow two cases at the same time. However, the main drawback of this role is that on many occasions, the outside researcher will not be present in the field organization nor would it be possible to experience an "inside" perspective (ibid.). In addition, gaining access to certain data and informants can be difficult if they are regarded as too confidential, sensitive, or inconvenient to be shared with outsiders. For instance, scheduling regular interviews proved difficult during busy periods. Furthermore, it was difficult to gain access to care recipients as the municipalities were not keen on bothering their elderly clients with interviews from outsiders. To combat this drawback, the dissertation's empirical studies incorporate various types of archival data as presented in section 1.5.4.

On a final note, even though I take the role of an outside observer, the ongoing interaction and the sharing of concepts and interpretations with informants can still influence on the interpretations of those people who are being researched (Walsham, 1995). For instance, I have presented and discussed my findings and interpretations with project managers from municipality and companies on several occasions in both written and oral forms of dissemination.

1.5.2. CASE 1 – THE MEDICATION-DISPENSING ROBOT

The first case explores the emergence, launch, and initial evaluation of a medication-dispensing robot in homecare from 2013–2019. The project is a collaboration between nine municipalities and a consortium of four private companies.

Existing manual practices and challenges

Danish municipalities are responsible for aiding home-dwelling clients in need of assistance with medication management. Broadly, the municipal service consists of two subtasks; dispensation (effort in which staff count or prepare prescribed medication) and administration (where staff provide and helps clients take medication and observe the clients afterwards). In addition, the service includes documentation, follow-up on medical treatment, prescription renewals, and assistance with acquisition, storage, and eventual disposal of unused medication. Currently, all these tasks are handled manually by the municipalities' staff, and the work processes can be both costly (time-consuming), exhausting (repetitive motions for staff), and prone to human errors (such as delayed or even incorrect dosages).

When the project started, the nine participating municipalities assisted 6200 citizens with aid for medication of which 1700 only received aid for medication. This accumulated to a total of expense of 357.500 hours per year annually (equal to more than 21 million euros) half of which was used on staff's transportation to and from client's homes.

Furthermore, while the procedures for medication management are well-described with clear roles and responsibilities between municipality, clients, doctors, and pharmacies, the manual execution of the procedures quickly become complicated in practice. For instance, 70% of the clients are prescribed more than seven different types of medications – 17% of the clients are prescribed more than 13 different types of medications. The medication can be prescribed by a hospital doctor, a private general practitioner, or be over-the-counter medicine (for nonprescription medication). It can be a challenge for the client to ensure enough medication for the next dosage and remember where the medication is to be re-ordered. If the client does not have the necessary medication when the municipal staff arrives, it may be necessary to make additional visits. Therefore, although the procurement of medication is not a municipal task per se, it becomes part of staff's tasks to assist with ordering and ensuring medication for the next visit.

Next, medication can be stored in various places in the client's home. In the case of memory-impaired clients, it can be particularly difficult for staff to locate the medication as clients may relocate or displace the medication from time to time. Also, medication that is no longer part of the client's treatment (i.e., the prescription has been discontinued) is often stored in the same place as the current medications; either because the client has forgotten to dispose the medication or wants to keep it to avoid additional expenses should the medication be re-prescribed later. As a further complication, since pharmacies are required to offer clients the cheapest medication (unless the general practitioner has stated otherwise on the prescription), the name of the medication can change even though the content remains the same. Consequently, it can be challenging for the municipal staff to maintain an overview as the location and name of the medication can differ from visit to visit.

Finally, in terms of dispensing and taking the medication, it is an ongoing logistical challenge for the municipalities to schedule the staffs' visits to ensure the medication is taken correctly and timely. At the same time, it requires clients to be home at specific time slots.

Accordingly, an automated (digital) solution that makes clients more self-reliant in these tasks would not only have a substantial economic potential by reducing the number of visits to clients or the time needed when visiting clients. It may also result in fewer medication errors and thereby improve client's health and well-being with less hospitalizations, doctor visits, and need for other services.

The technological solution

On this basis, nine Danish municipalities sought to explore whether the tasks involved in medication management could be solved in a more efficient and effective manner. Resulting from a public tender, a consortium of four companies was formed to develop and implement a medication-dispensing robot for private homes to automate the process from prescription to consumption. The consortium consists of a robot development company, a software company in charge of integrating the robot software with the information systems in the healthcare sector, a pharmacy for centralized packing of medication, and a logistics and service company in charge of delivering medication to the citizens' homes and responding to emergency calls. The robot automatically retrieves information about the clients' medical prescriptions to order medication at the pharmacy, remind the clients to take their medication, and check the actual doses before dispensing the pills into a cup. If a client forgets to take the medication, the robot alerts the service company, who calls to remind the client. Finally, the robot logs the process and transmits the data to the electronic care journal, making the activities transparent and accessible to the municipalities. Figure 1.1 visualizes the solution for managing medication from prescription to consumption.
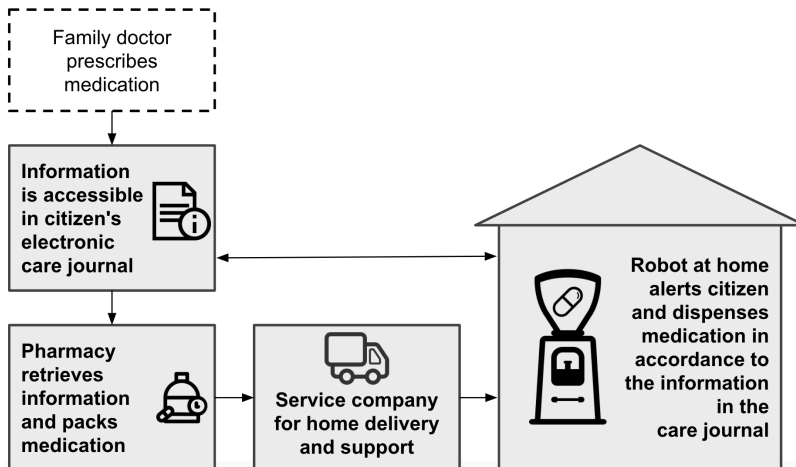
Figure 1.1. The process surrounding the medication-dispensing robot from prescription to consumption. (Source: Article 2)

After years of public tenders, contract negotiations, and project planning, initial testing of the prototype began in January 2018. A centralized project team from the consortium and three of the nine participating municipalities was formed to coordinate the innovation process from the prototype to a "whole solution" that could be implemented on a large scale. The project period has been extended on several occasions. However, despite some setbacks, the nine municipalities are currently unrolling the robot to their clients.

Research opportunity

With its inter-organizational setup involving nine municipalities, four companies, and a broad range of very different actors (such as clients, care professionals, IT developers, robot manufacturers, and municipal consultants), the case provides rich research opportunities for exploring competing concerns in digital innovation projects over time. As demonstrated in Article 2, organizing such projects involves multiple decisions under uncertainty across and within participating organizations. These decisions are characterized by competing concerns on innovation strategy, testing and development, agency coordination, and user mobilization.

Furthermore, as the project takes a new approach to innovating WTs (by using public tenders as point of departure), the case also entails valuable empirical insights on how large-scale digital innovation projects can be organized across multiple municipalities and companies. As such, the case provides an excellent research opportunity to contribute to practical problem-solving concerning development and launch of emerging WTs, while developing new theoretical understandings of how digital innovation unfolds as an ongoing process of interrelated critical decisions embedded in competing concerns.

1.5.3. CASE 2 – THE BATHROOM-ASSISTING ROBOT

The second case explores the rise and fall of a bathroom-assisting robot in homecare from 2015–2019. The project was initiated by a municipality, developed by a private company, and sought implemented in five municipalities before the company went bankrupt.

Existing manual practices and challenges

Going to the bathroom is a private and intimate activity with great impact on clients' quality of life, dignity, and daily routines if a helping hand is needed. Wide-spread implementation of automatic wash-and-dry toilets in eldercare can assist many clients with maintaining personal hygiene. However, for some clients with e.g., sclerosis, arthritis, stroke, COPD, or other physical conditions that can lead to reduced physical mobility pulling their clothes up and down can be a difficult, exhausting or even dangerous task with risk of falling. These clients would still rely on receive assistance with going to the bathroom several times a day and would have to wait for municipal staff to arrive.

When the project began, the initiating municipality assisted 700 homecare clients with up to six toilet visits daily. This is not only costly and logistical challenge for the

municipalities to schedule the staffs' visits but also stressful and potentially harmful for clients to wait for assistance. Thus, making these clients self-reliant during toilet visits would be of great importance for the citizens' quality of life and have economic potential by reducing the number of daily homecare visits.

The technological solution

On this basis, the initiating municipality contacted a local robot company to develop a robotic solution to assist clients with undressing that – in combination with wash-and-dry toilets – was intended to make clients entirely self-reliant when going to the bathroom.

The robot is mounted on the wall behind the toilet (see Figure 1.2). The robot was designed so that a client, after introduction to the product, would be able to use the robot without further assistance from home care staff. Clients would operate the robot by standing with the back to the toilet, pulling up the shirt, and pressing a button that will make the robot's arms slide into the pants and pull them down. When finished, the robot's arms assist the client standing up and pulling the pants up again. The robot is only active when the client presses the button. If the button is released, the robot stops immediately. Furthermore, sensors detect – and automatically stops the robot – if an overload or blockage is detected.
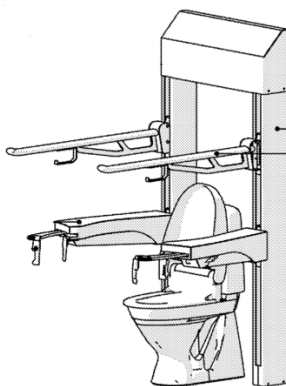
Figure 1.2. Conceptual design for the bathroom-assisting robot, which assists users in dressing and undressing when using the toilet. (Source: Article 3)

The idea for the bathroom-assisting robot emerged from municipal care workers and consultants. After discussing the idea, the municipality suggested a local robot company to develop the robot. The robot gained substantial managerial and political support, received national media attention, and was bought by several municipalities. However, the municipalities only succeeded in installing the robot in very few homes despite numerous different interventions (e.g., expanding potential user groups). The lack of successful implementation halted further sales, and eventually, the robot company went bankruptcy in 2019.

Research opportunity

The bathroom-assisting robot case provides unique access to how different participants experience and explain the failure of an up-and-coming digital innovation project. When I was searching for potential cases in 2017, several informants within the WT field suggested the robot as an exciting and very promising technology. Unfortunately, I was unable to gain access to the seemingly successful case at the time. Thus, it was a surprise to me when the company went bankrupt in 2019.

A year later, during the first Covid-19 lockdown in spring 2020, I reached out again to key actors that had been involved in the project (company founder, investor, project managers, municipal consultants, care workers, and test coordinators, external evaluators, etc.). I identified the actors from websites, news items, municipal meeting logs, and other types of archival documents. This time, all but one participant (a municipal consultant), agreed to partake in the study and share their experiences and interpretations of the project and why it failed. As reported in Article 3, the informants provided very different explanations for why the project failed such as technological immaturity, inadequate conceptual design, or misalignment between the municipalities and robot company. These diverging interpretations inspired me to revisit the case through the lenses of innovation narratives to understand how the articulation and sharing of narratives can explicate competing concerns to promote coordination or create polarization among heterogenous actors in digital innovation (reported in Article 4).

1.5.4. DATA COLLECTION

Essential to longitudinal studies is measuring and analyzing process data of how things change and develop over time (Ven de Ven, 2007). Such process data can be obtained from either real-time observations, interviews, or archival documents. As an outside observer, access to real-time field observations is limited. Instead, interviews provide access to the participants interpretations and reflections of their actions and events which have or are taking place (Walsham, 1995), while documents are particularly useful for tracing event chronologies, meanings, and discourses over time (Langley et al., 2013). Thus, the dissertation's empirical studies incorporate both retrospective and real-time data collection of a combination of various types and sources.

Interviews

The idea of qualitative research interviews is – through conversation between participants and the researcher – to generate deeply contextual, nuanced, and authentic accounts of participants' experiences and how they interpret them (Schultze & Avital, 2011). Thus, while archival documents can be collected in an unobtrusive and nonreactive process (Bowen, 2009), this is not the case for interview-based data. In interviews, researchers are collaboratively engaged in the production of data. This active construction of data creates many pitfalls. For instance, as Myers & Newman (2007) note, interviews are artificial situations, where the researcher intrudes upon the social setting to ask often complete strangers to give or to create opinions under time pres-

sure. A lack of trust can make the interviewee choose to withhold sensitive information. And even the most carefully worded questions can be ambiguous creating uncertainty whether the interviewee understands the questions as intended (ibid.).

To ensure interviews produce rich data on people's life world and its meaning, while mitigating the potential problems and pitfalls, Myers & Newman (2007) draw on a dramaturgical model to provide seven guidelines for qualitative interviewing: 1. *Situating the researcher/interviewer and interviewee* (i.e., introduction and background information). 2. *Minimize social dissonance* (i.e., minimize anything that may lead to the interviewee to feel uncomfortable) 3. *Represent various "voices"* (i.e., triangulation of subjects). 4. *Everyone is an interpreter* (i.e., recognizing interviewees as creative interpreters their own worlds). 5. *Use mirroring in questions and answers* (i.e., using the words and phrases of the interviewees to construct subsequent questions or comments to get interviewees to describe and explain their world in their own words). 6. *Flexibility* (i.e., semi-structured and unstructured interviewing uses an incomplete script and so requires flexibility, improvisation, and openness to explore interesting lines of research and look for surprises). 7. *Confidentiality of disclosures* (i.e., keeping the transcripts/records/ confidential and secure).

Based on these guidelines, I conducted a mix of semi-structured individual interviews and semi-structured group interviews (with two or more interviewees participating at once), and unstructured/informal conversations (i.e., unrecorded, spontaneous conversations with key actors at seminars and fairs). While the specific question-protocols for the semi-structured interviews can be found in the empirical articles, they generally followed a basic script as suggested by Myers & Newman (2007); An opening and introduction explaining the purpose of the interview and my role as a researcher, some key questions, and a closing segment asking permission to follow-up and recommendation for further documents or potential interviewees (snowballing).

As reported in Table 1.2, the interview-based data for Case 1 (the medication-dispensing robot) was collected over a 3-year period as the innovation project unfolded. I interviewed key actors at all organizational levels, including project managers in the municipalities, developers in the company consortium, and frontline care professionals. I conducted re-occurring interviews with the primary project managers from the municipality and the consortium. This allowed me to trace shifts in expectations and concerns as the project unfolded. Furthermore, ad-hoc interviews with care professionals and test coordinators were conducted when relevant (e.g., before, during, or after a test and development iteration). Accordingly, the duration of the interviews varied depending on the number of issues that needed to be addressed at the time of the interview. Throughout the project period, I engaged in a number of unstructured, informal conversations with various actors involved in the project, discussing their views and interpretations of the project. These informal interviews often occurred spontaneously during lunch or coffee breaks at project events such as the midterm and concluding seminar. While the semi-structured interviews were digitally recorded, the informal conversations were not as it seemed inappropriate to pull out an audio re-

corder once a spontaneous conversation had turned into something of research interest. Thus, to minimize social dissonance, I relied on writing notes during and after such informal conversations. Still, I made my role as a researcher explicit.

The analysis of Case 1 is reported in Article 2 (Chapter 3). However, after Article 2 was published by the end of 2019, I continued to follow the case and conduct interviews (colored in grey in Table 1.2), with the latest interview being conducted in June 2020. While these follow-up interviews are not part of the data for the included article, they contribute to the understanding of the case and are thereby part of the overall theorization process of the dissertation (as reflected in Chapter 6).

INTERVIEW TYPE	INTERVIEWEE(S)	DATE	DURATION
Unstructured, informal conversation	MUNICIPALITY 1 Project manager #1, Top level municipal manager	September 5th 2017	Unrecorded conversation at meeting on possible research collaboration
Semi-structured interview	MUNICIPALITY 2 Project manager #2,	February 14th 2018	102 mins (recorded)
Semi-structured interview	MUNICIPALITY 2 Project manager #2,	August 17th 2018	59 mins (recorded)
Unstructured, informal conversation	DEVELOPERS Project manager, consortium	August 31th 2018	Unrecorded phone conversation
Semi-structured group interview	DEVELOPERS Project manager, consortium CEO, company 1 CTO, company 1	October 9th 2018	101 mins (recorded)
Unstructured, informal conversation	DEVELOPERS Project manager, consortium CEO, company 2	October 10th 2018	Unrecorded conversation at conference
Semi-structured group interview	MUNICIPALITY 1 Care professional and test coordinator	November 19th 2018	57 mins (recorded)
Semi-structured interview	MUNICIPALITY 1 Project manager #1	December 3rd 2018	50 mins (recorded)
Unstructured, informal conversation	MUNICIPALITY 1 Project manager #1,	February 7th 2019	Unrecorded conversation at midterm seminar
Unstructured, informal conversation	MUNICIPALITY 3 Top-level manager	February 7th 2019	Unrecorded conversation at midterm seminar

Unstructured, informal conversation	DEVELOPERS Project manager, consortium CEO, company 1 CEO, company 2	February 7th 2019	Unrecorded conversation at mid-term seminar
Semi-structured interview	MUNICIPALITY 1 Top-management level	April 5th 2019	24 mins (recorded)
Semi-structured interview	MUNICIPALITY 1 Test coordinator	April 26th 2019	31 mins (recorded)
Semi-structured interview	DEVELOPERS Project manager, consortium	May 24th 2019	71 mins (recorded)
Semi-structured interview	MUNICIPALITY 2 Top-management level	June 11th 2019	58 mins (recorded)
Semi-structured group interview	MUNICIPALITY 3 Care professional and team coordinator	June 12th 2019	49 mins (recorded)
Semi-structured interview	MUNICIPALITY 2 Top-level manager	October 10th 2019	48 mins (recorded)
Additional interviews conducted after publication of Article 2:			
Workshop with presentation and discussion of research findings	Municipality 1, 2, 3 Top-management level and work-practice level	November 26th 2019	52 mins (recorded)
Unstructured, informal conversation	MUNICIPALITY 1 Project manager #1, Top level municipal manager	February 7th 2020	Unrecorded conversation at concluding seminar
Unstructured, informal conversation	DEVELOPERS Project manager, consortium CEO, company 1 CEO, company 2	February 7th 2020	Unrecorded conversation at concluding seminar
Unstructured, informal conversation	EXTERNAL EVALUATORS Consultant	February 7th 2020	Unrecorded conversation at concluding seminar
Semi-structured interview	MUNICIPALITY 2 Top-level manager	February 17th 2020	38 mins (recorded)
Semi-structured interview	MUNICIPALITY 1 Project manager #1	June 26th 2020	23 mins (recorded)
Semi-structured interview	DEVELOPERS Project manager, consortium	June 29th 2020	100 mins (recorded)

Table 1.2. Interviews conducted in Case 1

While the interviews for Case 1 were conducted continuously as the project was unfolding, the interviews for Case 2 (the bathroom-assisting robot) were primarily conducted retrospectively after the project had ended. Apart from two brief interviews conducted in 2018 when the project was still active, the interviews were conducted in

spring 2020 a year after the company went bankrupt. These interviews were semi-structured individual interviews that – due to the COVID-19 pandemic – were held over Skype or on the phone, following Lo Iacono and colleagues' (2016) recommendations for online interviewing. As reported in Table 1.3, the interviewees were the founder, employees, and an investor in the robot company, municipal project managers in charge of testing, implementing, and evaluating the robot, and a sales manager from an external distributor in charge of the initial marketing of the robot.

INTERVIEW-TYPE	INTERVIEWEE(S)	DATE	DURATION
Semi-structured interview	MUNICIPALITY 1 Nursing home manager	February 21th 2018	15 mins (recorded)
Semi-structured interview	MUNICIPALITY 1 Project manager #1	February 27th 2018	35 mins (recorded)
Semi-structured interview	MUNICIPALITY 3 Project manager	March 16th 2020	64 mins (recorded)
Semi-structured interview	DEVELOPER Project manager	March 18th 2020	60 mins (recorded)
Semi-structured interview	MUNICIPALITY 4 Project manager	March 18th 2020	57 mins (recorded)
Semi-structured interview	MUNICIPALITY 2 Project manager	March 19th 2020	47 mins (recorded)
Semi-structured interview	DISTRIBUTOR 1 sales manager	April 2nd 2020	42 mins (recorded)
Semi-structured interview	MUNICIPALITY 5 Project manager	April 3rd 2020	46 mins (recorded)
Semi-structured interview	DEVELOPER Founder	April 8th 2020	75 mins (recorded)
Semi-structured interview	DEVELOPER Employee	April 17th 2020	67 mins (recorded)
Semi-structured interview	MUNICIPALITY 3 Test coordinator	April 24th 2020	54 mins (recorded)
Semi-structured interview	DEVELOPER Investor	April 29th 2020	39 mins (recorded)
Semi-structured interview	MUNICIPALITY 1 Project manager #2	June 26th 2020	27 mins (recorded)

Table 1.3. Interviews conducted in Case 2

Documents

Documents and other archival materials provide not only background and context information of the case but also a means of tracking change and development over time – even after events has ended or when interviewees have forgotten the details (Bowen, 2009). This makes documents exceptionally suitable for tracing event chronologies, meanings, and discourses over time (Langley et al., 2013). However, as documents are produced for some purpose other than research, they usually do not provide sufficient detail to answer a research question (Bowen, 2009). Furthermore, in organizational contexts, the available documents are likely to be aligned with managerial policies and formal procedures, reflecting the emphasis of certain organizational actors

and agendas. However, documents still entail many advantages for qualitative re-
search that outweigh their limitations, especially when combined with other data
sources such as interviews. Among the advantages are their; *availability* (especially
since the advent of the Internet where locating public records is limited only by one's
imagination and industriousness), *stability* (the collected data is not altered over time
or by the researcher's presence), *exactness* (inclusion of explicit names, references,
and details of events), *coverage* (a collection of documents can span many events and
settings and over long periods) and *cost-effectiveness* (in terms of gathering the mate-
rial) (ibid.). Both case studies include a substantial number of documents of different
types such as project plans, newsletters, meeting logs, websites, media coverage. For
Case 1 (the medication-dispensing robot) this amounted to 57 documents and 519
pages (see Table 1.4).

Document type	Sampling
Applications and public tender	10 public tender documents (204 pages)
	6 strategy documents (27 pages)
Project plans and reports	5 project plan documents (28 pages)
	1 product evaluation report (17 pages)
Project newsletters	4 newsletters (8 pages)
Presentations and information materials	4 websites (7 pages)
	8 powerpoint presentations (203 pages)
	1 flowchart (1 page)
Press	18 news articles (24 pages)

Table 1.4. Document collected for Case 1

As Case 2 (the bathroom-assisting robot) was conducted retrospectively, constructing
a processual account of the project and mapping key actors relied heavily on the avail-
able documents. Documents was retrieved in two steps. First, I searched and assessed
publicly available documents to map out a timeline of project incidents and partici-
pating actors. This included reconstructing the closed down product webpage using
the Internet Archive Wayback Machine (web.archive.org) to retrieve otherwise inac-
cessible and deleted documents, including subpages and project newsletters. The sec-
ond step involved chain sampling by pursuing links and references found in the in-
cluded documents, searches on participating municipalities' websites, and documents
received by the interviewees. This included a variety of documents such as city coun-
cil meeting logs and appendices describing the municipality's involvement in the pro-
ject, business cases, project plans, and product evaluations. In total, 115 documents
and 433 pages was collected (see Table 1.5).

Document type	Sampling
Product descriptions (user manuals, videos, and developers' webpages)	1 User manual (10 pages) 1 Patent description (1 page) 17 Reconstructed webpages (64 pages) 2 videos (3 mins)
Municipal project plans, contract and tenders, and evaluations	1 project plan (8 pages) 2 contracts and tenders (6 pages) 4 evaluations (72 pages)
Municipal meeting logs and appendices	20 records (67 pages)
Press and other media documents (e.g., websites, magazines, and reports)	39 news items (89 pages) 30 other media documents (116 pages) 4 videos (8 mins)

Table 1.5. Document collected for Case 2

1.5.5. DATA ANALYSIS AND APPROACHES TO THEORIZING

> "The theoretical insights that are drawn from the data are thus not simply "given" in the data but actively constructed by researchers to address puzzles that they find interesting and important" (Grodal et al., 2021:606)

A critical issue for qualitative research – and interpretive case studies in particular – concerns the generalizability of the findings and theoretical insights (Conboy et al., 2012). Constructing meaning and explanation of qualitative data is a process of classifying individual empirical observations into more abstract and general patterns and themes to explain the phenomenon under investigation while drawing on and contributing to existing theories (ibid.). In contrast to positivistic research striving to develop statistically testable universal laws, interpretivist research aims to provide greater understandings and explanations of the phenomena of interest and how or why they occur (Lee & Baskerville, 2003; Gregor, 2006). Such theories for understanding become "sensitizing device" to interpreting the world in a certain way as particular instances can be related to ideas and concepts that apply to multiple situations (Klein & Myers, 1999). Rather than being testable hypothesis, interpretive contributions to theory needs to provide new and interesting insights or improve the explanation of something that was poorly or inaccurately understood before (Gregor, 2006). In this regard, Walsham (1995) suggests four types of generalization from interpretive case studies: 1) the development of concepts, 2) the generation of theory, 3) the drawing of specific implications, and 4) the contribution of rich insight.

Making such analytical generalizations requires concrete and comprehensive understandings of the particular (Langley et al., 2013). Thus, a key criterion for generalizing from case studies is to provide rich contextual details of the empirical accounts, so readers can follow how the researcher reached the analytical insights and determine the potential transferability of the proposed theoretical ideas (Klein & Myers, 1999; Langley et al., 2013). In this regard, the variety of data sources in the dissertation's two empirical case studies provides rich descriptions of the innovation processes as

observed (by providing an overview of the events and actors involved in the innovation process) and as *experienced* (by tracing how different actors experienced and interpreted this process) (Garud et al., 2018). This analytical approach implies synthesizing and connecting empirical observations to existing theoretical understandings back and forth to generate new conceptual insights and plausible explanations (Alvesson & Kärreman, 2007). For instance, Case 1 (the medication-dispensing robot) observed the innovation project in real-time. While this approach may increase the probability to identify even short-lived factors and changes in the events currently unfolding, the lack of knowing the "big picture" makes it difficult to sort which observations are important and which are not (Van de Ven, 2007). For such ongoing research projects, abduction provides a particularly useful reasoning approach as it stimulates a continuous dialogue throughout the research process between theory and empirical observations to frame and construct empirical surprises while reflecting on and problematizing existing theory (Alvesson and Kärreman, 2007). Similarly, as researchers can approach and analyze the same data in different ways (Grodal et al., 2021), multiple interpretations of the cases were explored to provide the foundation for theory development grounded in the empirical findings (Klein and Myers, 1999). This is seen in Case 2 (the bathroom-assisting robot) where the primarily inductively grounded findings in Article 3 inspired a revisit of the case through an entirely different theoretical lenses in Article 4. Thus, both longitudinal case studies involved multiple iterations of induction, deduction, and abduction seeking to unravelling the innovation processes and developing new conceptual and theoretical insights throughout the research process (Van de Ven, 2007). Broadly, the data analysis approach for both case studies can be described in the following three steps:

First, the early coding iterations provided an initial summary of the diverse empirical data (Miles et al., 2014). Here, the analytical focus was exploratory aiming to establish comprehensive accounts of the events, actors, challenges, and concerns in each case. the initial. This resulted in a timeline of events with a myriad of observations with analytical coding closely matching the empirical accounts found in documents and interviews (Gioia et al., 2013). Second, as the studies progressed, it was possible to begin identifying the recurring themes by cycling back and forth between examining individual observations and the aggregate context that they form (Klein & Myers, 1999). This allows to group the myriads of initial (first order) codes into more meaningful and parsimonious units of analysis (Miles et al., 2014), such as competing concerns at critical innovation junctures (as seen in Article 2), different types of explanations for innovation failure (as seen in Article 3), or types of innovation narratives (as seen in Article 4). To illustrate manifestations of these thematic findings, all three empirical articles use "illustrative power quotes" (Cloutier & Ravasi, 2021) from interviewees and documents throughout the analysis section. Finally, in the later analytical iterations had explanatory focus aiming to develop theoretical insights and conceptualizations by iterating between exiting literature and the empirical data. This involved numerous rounds of experimentation and critical dialogues between theoretical frameworks and the empirical work to discover, create, and possibly solve potentially interesting puzzles or "mysteries" where the empirical observations lack fit with

existing theory (Alvesson & Kärreman, 2007). Each article provides further elaboration of the specific activities and the theoretical frameworks applied. The dissertation's overall results, contributions to theory and practice, and limitations are discussed in Chapter 7.

1.6. SUMMARY OF INCLUDED ARTICLES

This dissertation is article-based, which means that the results are primarily disseminated through four independent publications (reported in Chapter 2 to 5). The four articles explore digital innovation as a cumbersome process with many uncertainties and involving heterogeneous actors with different and often competing expectations and concerns shaping the innovation process and trajectory.

The first article (Chapter 2) systematically reviews and discuss the extant literature to identify eight competing concerns central to the challenges of scaling, diffusing, and sustaining emerging WTs. By highlighting and contrasting practical and theoretical positions in this novel and interdisciplinary research topic, the review contributes to understanding the complexities that organizations must address to implement, scale-up, and sustain digital innovation in health- and eldercare.

The second article (Chapter 3) reports the results of a longitudinal case study of the emergence of the medication-dispensing robot in primary healthcare, from project launch to testing, development, and evaluation. The analysis traces how project managers address competing concerns at critical innovation junctures regarding innovation strategy, testing, coordination, and user mobilization and how these responses shape the project's trajectory.

The third article (Chapter 4) investigates the failed attempt to scale up the bathroom-assisting robot to analyze what went wrong and detect learning points. Based on an in-depth case study of a robot project in the Danish public sector that had high degree of management support and commitment from key innovation actors, the article demonstrates how failure was caused by interrelated and context-specific reasons regarding the design of the robot (technology), inadequate problem-solution fit (scope) and misalignment between robot company and public sector organization mindset (competing logics).

The fourth article (Chapter 5) revisits the bathroom-assisting robot project from an innovation narrative perspective. The empirical analysis demonstrates how four types of narratives supported socio-cognitive sensemaking among the participants as they formed the innovation project. Initially, narratives of origin (how the innovation idea emerged) legitimized the robot idea to a wider community; narratives of potential (its value proposition) then kept the idea alive and encouraged participants to solve problems. As the project struggled to implement the robot into practical use, narratives of practice (about the implementation efforts) began to emerge. After the project collapsed, narratives of learning (about the innovation process and outcomes) provided lessons for participants and their future digital innovation efforts. The article theorizes

how formative narratives—as discursive social constructions of actors' meaning-making and actions—shape and are shaped by the emergent context of digital innovations. The theory distinguishes between reinforcing and colliding interactions between formative narratives to help explain coordination and polarization in the social construction of digital innovation ideas, trajectories, and outcomes.

Table 1.6 provides an overview of each article's design, empirical setting, theoretical framing, and analytical approach.

	Article 1	**Article 2**	**Article 3**	**Article 4**
Title	Competing concerns on emerging welfare technologies – A review of eight prevailing debates in current literature	Organizing for Emerging Welfare Technology: Launching a Medication-Dispensing Robot for Independent Living	Lost in The Diffusion Chasm: Lessons Learned From A Failed Robot Project In The Public Sector	Formative Narratives in Digital Innovation
Design	Systematic literature review	Retrospective and prospective longitudinal study of Case 1	Retrospective longitudinal study of Case 2	Retrospective longitudinal study of Case 2
Research question	*What are the competing concerns in managing the transition from small-scale welfare technology inventions to large-scale implementation?*	*How can managers understand and respond to competing concerns in the process of organizing emergent WTs?*	*Why do seemingly successful robotic innovations fail to be diffused on a larger scale? What key lessons can be learned from diffusion failure in public sector services?*	*How do actors articulate and share narratives to construct digital innovation ideas, trajectories, and outcomes?*
Informing theoretical perspectives	Dialectic, sensemaking	Dialectic, path theory	Diffusion chasm	Narratives, social construction, formative context
Analysis approach	Thematic analysis, induction	Temporal bracketing strategy, abduction	Thematic analysis, induction	Thematic analysis, abduction

Table 1.6: Summary of included articles' research design.

1.7. DISSERTATION OUTLINE

This chapter has introduced the research motivation for studying competing concerns in digital innovation, welfare technology as empirical setting, and presented the methodological approach for the dissertation. The following four chapters (Chapter 2-5) contains the four articles included in the dissertation. Afterwards, Chapter 6 discusses observations across the four articles to theorize competing concerns, how they can manifest in digital innovation, and how managers can understand and address them. Finally, Chapter 7 concludes with an overall discussion of the work contained in this dissertation in response to the research question, pinpointing contributions and directions for future research.

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CHAPTER 2.

COMPETING CONCERNS ON EMERG-ING WELFARE TECHNOLOGIES

A REVIEW OF EIGHT PREVAILING DEBATES IN CURRENT LITERATURE

Abstract. Welfare technologies (WT) such as telecare, service robots, and other digital innovations for public sector service delivery are expected to improve and even radically transform health- and eldercare. However, despite political awareness and financial investments, many studies report promising inventions that fail to become implemented on a larger scale. Current research draws a fragmented and heterogeneous picture of this problem, with divergent implications for practice. This article reviews and discusses the extant literature to identify eight competing concerns central to how WT can become implemented on a large scale. By highlighting and contrasting practical and theoretical positions in this emerging and interdisciplinary research topic, the review contributes to understanding the complexities that managers and policy-makers must address to diffuse and sustain WT innovations from small to large scale.

Key words: Digital innovation, diffusion, adoption, welfare technology, and systematic literature review.

CHAPTER 3.
ORGANIZING FOR EMERGING WEL-FARE TECHNOLOGY

LAUNCHING A MEDICATION-DISPENSING ROBOT FOR INDEPENDENT LIVING

Abstract. Emerging technologies, such as robots, virtual homecare, and sensor technologies, have considerable potentials to transform health- and eldercare. These so-called welfare technologies (WTs) are expected to increase the quality of services, empower citizens, improve working conditions for professionals, and reduce costs for care providers. However, as this involves both technological development and radical changes in how these services are organized, many promising WTs fail to advance beyond the pilot stage and create value on a large scale. This paper reports the results of a longitudinal case study of the emergence of a service robot in primary healthcare, from project launch to testing, development, and evaluation. Seeking new ways of organizing emerging technologies, nine Danish municipalities and a consortium of four private companies launched a collaborative project, aiming to develop and implement the use of a medication-dispensing robot for patients living at home. The analysis traces how project managers respond to competing concerns on innovation strategy, testing, coordination, and user mobilization and how these critical decisions shape the project's trajectory. As such, the paper sheds new light on how to understand and manage competing concerns in the process of organizing emergent WTs.

Key words: innovation process, healthcare robot, competing concerns, welfare technology, longitudinal case study

CHAPTER 4.
LOST IN THE DIFFUSION CHASM

LESSONS LEARNED FROM A FAILED ROBOT PROJECT IN THE PUBLIC SECTOR

Abstract. Public sector organizations increasingly engage in robotic innovation projects to assist or substitute for humans in service delivery. However, transitioning small-scale development projects into a large-scale context is a notoriously difficult task that often fails, with many promising robotic projects becoming lost in the diffusion "chasm." We investigate a failed robotic diffusion project to analyze what went wrong and what can be learned from it. Despite an increased interest in learning from public sector digitalization failure, little attention has been paid to how and why seemingly successful service robot initiatives fail to move beyond the pilot stage. We identify three types of explanations for diffusion failure using an in-depth case study of a service robot initiative in the Danish eldercare sector that had a high degree of management support and commitment from key stakeholders. Our analysis demonstrates how the failure was caused by interrelated and context-specific reasons regarding the lack of technological maturity of the service robot (technology-oriented explanations), inadequate problem–solution fit in the conceptual design (scope-oriented explanations), and misalignment between the robot company and public sector organization mindsets (competing logic-oriented explanations). We outline the lessons learned for public sector digitalization and discuss the paradox between the hype surrounding robot innovations and their slow diffusion.

Key words: Public sector digitalization, service robots, diffusion, diffusion chasm, learning from failure

CHAPTER 5.

FORMATIVE NARRATIVES IN DIGITAL INNOVATION

Abstract. Although information systems researchers are increasingly adopting constructivist perspectives, they pay limited attention to the role of narratives in digital innovation. We address this gap by drawing on innovation narratives and formative contexts to advance theory about how formative narratives are used in the social construction of digital innovations. This theoretical perspective can help scholars explore how individuals and groups involved in digital innovation circulate ideas and cognitive imageries through narration to interpret problems and identify solutions. Our theorizing is based on a longitudinal case study in Denmark that explores the emergence, mobilization, and eventual collapse of a service robot initiative in the primary healthcare context. We demonstrate how actors constructed the initiative through different formative narratives that supported meaning-making and encouraged action among the participants. Initially, narratives of origin (how the innovation idea emerged) legitimized the robot idea to a wider community; narratives of potential (its value proposition) then kept the idea alive and encouraged participants to solve problems. As the initiative struggled to implement the robot into practical use, narratives of practice (about the implementation efforts) began to emerge and, after the initiative collapsed, narratives of learning (about the initiative outcomes) provided lessons for participants and their future digital innovation efforts. We combine our empirical findings with extant literature to theorize how formative narratives—as discursive social constructions of actors' meaning-making and actions—shape and are shaped by the emergent context of digital innovations. Our theory distinguishes between reinforcing and colliding interactions between formative narratives to help explain coordination and polarization in the social construction of digital innovation ideas, trajectories, and outcomes.

Key words: Digital innovation, formative narratives, service robots, longitudinal case study, social construction

CHAPTER 6.

DISCUSSION: THEORIZING COMPETING CONCERNS IN DIGITAL INNOVATION

As reported in Chapter 2 to 5, the dissertation consists of four articles that explore competing concerns in digital innovation from different empirical and theoretical perspectives. Grounded in the dissertation's exploration of different forms of competing concerns and their role in digital innovation, I suggest that competing concerns can be defined *as manifestations of views and demands that contest with each other in digital innovation*. Drawing on this conceptualization and looking across the four articles, the following sections theorize how competing concerns manifests in digital innovation contexts and proposes a model for how managers can understand and address them. The chapter concludes by outlining theoretical and practical implications in response to the overall research question.

6.1. MANIFESTATIONS OF COMPETING CONCERNS

Throughout the four articles, we saw how these manifestations can unfold in three contexts: 1) Between groups, 2) within groups, and 3) at individual level.

6.1.1. COMPETING CONCERNS BETWEEN GROUPS

The first – and perhaps the most recognizable – type of competing concerns arise as manifestations of clashes, debates, and tensions between different groups of actors (Askedal & Flak, 2017; Dobson & Nicholson, 2018). For instance, in the longitudinal study of the medication-dispensing robot (Article 2), we saw several competing concerns between the municipalities and the company consortium about innovation strategy, testing, and user mobilization. This included competing concerns on whether user testing should be on the least care-demanding clients (having the least complicated medication and the best cognitive abilities to give useful feedback) *versus* test on the most care-demanding clients (creating an inexpensive test run and exploring the most promising business case). Another set of competing concerns related to the innovation effort and whether the focus should be on technology development (integrating the robot into existing digital infrastructure) *versus* focus on organizational transformation (new work practices and training of employees in a new IT system).

Such manifestations of competing concerns between the developers and municipalities were also evident in Case 2 (the bathroom-assisting robot). For instance, in Article 3, we saw competing concerns between a short-term-oriented and sales-driven startup company on the one side and long-term and collaboration-oriented municipalities on

the other. This not only created frustrations during slow and complex sales and implementation cycles. It also resulted in misaligned expectations and interpretations of the events unfolding. Such competing understandings are explored in detail in Article 4 analysis of reinforcing and colliding innovation narratives circulating between and across different groups of actors. For instance, diverging narratives concerning implementation barriers between the municipalities (barriers due to technological immaturity) and the robot company (barriers due to resistance to change) created unresolved competing concerns on the initiative's next steps that ultimately hampered innovation progress.

6.1.2. COMPETING CONCERNS WITHIN GROUPS

The empirical investigations of the bathroom-assisting robot (Article 3 and Article 4) revealed a second type of competing concerns within the same group of innovation actors. For instance, in Article 3, we saw how actors in the robot company disagreed on whether the lack of successful implementations was rooted in technical aspects in the robot or social aspects in the adopting organizations. This resulted in competing concerns in the innovation strategy regarding whether the resources should be allocated towards further development or sales and implementation activities. Furthermore, as illustrated in Article 4, competing narratives circulated within the robot company on whether the municipal consultants had overestimated and incorrectly assessed the target user group or whether the implementation was sabotaged by care workers who feared to be replaced. Likewise, the municipal project managers formed competing understandings on how the innovation process of the bathroom-assisting robot had unfolded and what could be learned from it. As illustrated in Article 4, this ranged from narrating the project as a noteworthy example to follow (the innovation approach was "exactly right") *versus* narrating the project as an illustrative example of how not to engage in digital innovation (the innovation approach was "a really good example of what not to do").

In the case of the medication-dispensing robot (Article 2), we also saw how municipal managers were inconsistent on whether the undertaking was a development project or a test and assessment project. This inconsistency impacted several competing concerns within and between different innovation actors regarding innovation strategy related to project planning, business case evaluation, and user testing. Consequently, corresponding with findings from Young et al. (2016), individual groups of innovation actors (developers, municipal managers, care workers, users, politicians, and others) can have inconsistent or conflicting assumptions and expectations that manifest as competing concerns within the group.

6.1.3. COMPETING CONCERNS AT INDIVIDUAL LEVEL

Finally, given the uncertain and complex nature of digital innovation, competing concerns does not necessarily manifest between or within groups of actors. Thus, a third type of competing concerns can arise at individual level in the decision-making pro-

cess. For instance, Article 1 systematically reviewed and discussed the extant literature to identify competing concerns that organizations must balance to implement, scale up, and sustain digital innovation in health- and eldercare. The review found inconsistent and contradicting suggestions for managers to navigate this critical aspect of the innovation journey. These concerns were synthesized and contrasted into eight competing concerns related to user acceptance, implementation, business strategy, and governmental participation.

Thereby, Article 1 illustrates how organizations or individual managers face several competing concerns when implementing, scaling up, and sustaining emerging digital innovations. Such intrinsic competing concerns are seen empirically in the case of the medication-dispensing robot (Article 2), where municipal managers initially needed to decide between two competing innovation strategies: using available technologies in the marketplace (imitator strategy) *versus* seek to innovate a new to market solution (inventor strategy). Thus, initially these competing concerns did not manifest as explicit clashes between disagreeing actors. Instead, they arose as an intrinsic part of managing digital innovation (Svahn et al., 2017). Accordingly, the innovation process involves ambiguous and intricate decision-making embedded in multiple competing concerns (Cho et al., 2007; Svahn et al., 2017).

However, intrinsic competing concerns can over time interrelate and manifest as explicit clashes between or within groups of actors. Even though an inventor approach was chosen in the case of the medication-dispensing robot, the municipal managers remained somewhat reluctant to commit resources for test and development. As noted above, this led to competing concerns between the company consortium and the municipalities on whether to test on the least or the most care-demanding citizens and whether the project was about assessing a business case or developing a new technology. In this way, competing concerns can manifest differently over time and interact with other competing concerns. Consequently, managing competing concerns involves ongoing exploration of diverging concerns and converging decision-making.

6.2. MANAGING COMPETING CONCERNS

Based on the conceptualization of competing concerns and how they can manifest in digital innovation contexts, we can begin to theorize how managers can understand and address them. To do this, I propose a model for managing competing concerns. As depicted in Figure 6.1, the model consists of four interrelated activities unfolding between two dimensions. The horizontal dimension distinguishes between whether a competing concern relate to actors' meaning-making or action-taking, while the vertical dimension distinguishes between whether the related digital innovation unfolds as ongoing cycles of diverging or converging behavior. The following sections first theorizes these two dimensions before unfolding the model's four activities for managing competing concerns in digital innovation.
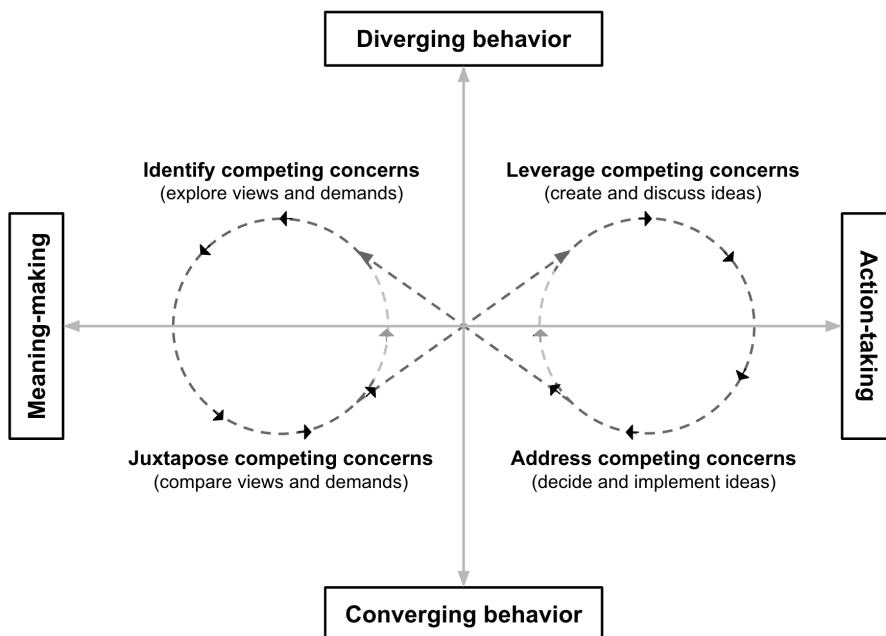
Figure 6.1. Managing competing concerns in digital innovation [6]

6.2.1. MEANING-MAKING AND ACTION-TAKING

Throughout the dissertation, we have seen how competing concerns relate to actor's meaning-making and action-taking in digital innovation. Whereas meaning-making entails how actors come to understand situations that can be regarded as puzzling or problematic, action-taking refers to activities directly aiming at addressing these situations (Lanzara & Mathiassen, 1985; Nambisan et al., 2017). This distinction is reflected in the horizontal dimension of the proposed model.

Competing concerns and meaning-making

Rather than being situated within a single organization's boundaries, digital innovation are increasingly conceptualized as unfolding among a more extensive network of internal and external actors (Nambisan et al., 2017; Holmström et al., 2021). Each actor can have a different impression of what is happening and what needs to be done – and thus, multiple and competing meaning-makings can develop simultaneously and over time. In Case 1 (the medication-dispensing robot), we saw how different actors' meaning-making of the digital innovation project resulted in competing concerns at critical innovation junctures. Here, we saw different meaning-makings during project planning on whether the initiative was a development or an assessment project. This created competing concerns on whether initial user testing should be orchestrated to

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[6] The visual design of Figure 6.1 is inspired by Müller et al. (2018).

provide optimal insights for technological development or to evaluate the business case.

This relation between actors' meaning-making and competing concerns is also seen in Case 2 (the bathroom-assisting robot). By analyzing how key actors from both adopting organizations and robot company developers experienced and explained the challenges they encountered, Article 3 identified three different explanations for innovation failure; (1) lack of technological maturity of the robot (technology-oriented explanations), (2) inadequate problem-solution fit in the conceptual design (scope-oriented explanations), and (3) misalignment between the robot company and public sector organization mindsets (competing logic-oriented explanations). Here, we saw how different meaning-makings (e.g., on whether the contract and purchase of robots marked the first of many future sales of an already mature product or only the beginning of a continuous collaboration for further testing and development) created misaligned expectations and competing concerns between the robot company and municipalities on the next steps in the innovation journey. Thereby, competing retrospective accounts of the events unfolded can result in diverging meaning-making and learning outcomes across different innovation actors.

Article 4 further demonstrated how different reinforcing and colliding narratives circulating among different groups of innovation actors supported socio-cognitive meaning-making. The case study illustrated how the articulation and sharing of innovation narratives could, on the one hand, mobilize support and promote coordination – and on the other hand, explicate competing concerns and create polarization among heterogeneous actors. For example, the care workers' increasing skepticism on the robot's practical relevance and feasibility fueled their meaning-making of the initiative being a top-down project. This contradicted with the initial narratives of the idea emerging from the work-practice level told by the municipal departments, politicians, and the robot company.

Competing concerns and action-taking

The involvement of multiple actors limits how much a single change agent can dictate the processes and outcomes of digital innovation (Kohli & Melville, 2019). As such, digital innovation often involve a shift towards distributed agency and more networked organizational forms (Drechsler et al., 2020).

In both case studies, we saw how competing concerns arise and impact action-taking within such collaborative networks between different internal and external innovation actors. For instance, in Article 2, we saw how competing concerns relate to action-taking by tracing how the organizational responses operate as path-creating decisions at critical innovation junctures. Given digital innovation's dynamic and unpredictable nature, addressing competing concerns requires a flexible path-in-the-making approach with an ongoing series of interrelated decisions and priorities shaping the trajectory. Consequently, as this path mechanism creates a degree of irreversibility where previous decisions have consequences for future maneuverability in the innovation

process, it becomes critical for managers to identify these path-creating decisions as they occur (Singh et al., 2015).

When identified, highlighting competing concerns during these critical decisions enables managers to recognize different aspects surrounding the challenges in digital innovation and identify possible organizing actions and responses. This is illustrated in the case of the medication-dispensing robot by how competing concerns between technology-intrinsic vs. social/contextual barriers for user acceptance allowed managers to think of combined interventions and strategies through shifts in vantage points when deadlocks were encountered. Thus, whereas the problem of low user acceptance initially was rooted in technology-intrinsic factors, the solution involved reconfigurations in socio-contextual factors. Thereby, competing concerns can help pinpoint new directions for actions.

In contrast, Case 2 demonstrated how competing concerns can obstruct action-taking and innovation progress as the robot company and municipalities formed completely different understandings on the causes and potential remedies for the failing innovation projects. Thus, whereas in Case 1, the actors utilized competing concerns to identify new courses for actions, the actors in Case 2 continued to diverge, resulting in inaction until the project ran out of resources. Consequently, managers need to encourage and explore different viewpoints (diverging behavior) – and, at the same time, resolve or balance competing concerns to provide a given direction and move the project forward (converging behavior). This brings us to the vertical dimension in the proposed model regarding how competing concerns in digital innovation unfold in non-linear iterative cycles of diverging and converging behavior.

6.2.2. DIVERGING AND CONVERGING BEHAVIOR

The vertical dimension draws on Van de Ven (2017) 's characterization of innovation processes as ongoing cycles of diverging and converging behavior. Here, diverging behavior involve using multiple (competing) perspectives to generate and explore ideas and concerns, while converging behavior involve selecting and implementing ideas to provide a given direction. This distinction enables us to theorize how competing concerns can play different roles in meaning-making and action-taking during digital innovation.

Competing concerns and diverging behavior

According to Van de Ven (2017), divergent innovation behavior designates branching and expanding activities. This entails learning by discovery and creating ideas to explore new directions and options. In both cases, we saw how the municipalities initially expanded the project by building relationships with diverse actors to engage in digital innovation activities. The introduction of new actors proliferated the range of possible views and demands to be explored and discussed. As the projects unfolded, the actors encountered new puzzling or problematic situations such as technical challenges or problems with mobilizing test users (as seen in Case 1) or implementation

failures and resource constraints (as seen in Case 2). These challenges prompted new diverging cycles of exploring and discussing competing concerns.

Competing concerns and converging behavior

Correspondingly, converging behavior entails integrating and narrowing activities (Van de Ven, 2017). This involves learning by testing and implementing ideas to exploit and execute a given direction. In both cases, we saw how key decisions, projects plans, and contracts between the municipalities and private companies provided the projects with a given direction by developing a proposal while obtaining funding and support. As the projects unfolded, the managers responded to numerous competing concerns by implementing decisions regarding, e.g., innovation strategy, testing, coordination, and user mobilization (as seen in Article 2). While these converging activities propelled the innovation projects onwards, they also created new situations with competing concerns to be explored and addressed.

6.2.3. ACTIVITIES FOR MANAGING COMPETING CONCERNS

By combining the two dimensions theorized above, the proposed model conceptualizes an iterative process with four interrelated activities that help managers understand and address competing concerns: 1) Identify competing concerns, 2) juxtapose competing concerns, 3) leverage competing concerns, and 4) address competing concerns.

Identify competing concerns

The first activity is to identify competing concerns by exploring different actors' views and demands (diverging meaning-making). As a socio-technical process, digital innovation rely on how actors come to understand, share with others, and then modify their understandings of innovation ideas, processes, and outcomes (Nambisan et al., 2017; Sarker et al., 2019). Each actor can form different ideas on what is happening and what needs to be done – and thus, multiple meaning-making can emerge simultaneously and over time (Holmström et al., 2021). Failure to explore and understand other actors' meaning-making can create disastrous misunderstandings and misaligned expectations, as seen in Case 2, where the robot company and municipalities interpreted their collaboration very differently. Thus, managers need to develop capabilities to collaborate between heterogeneous actors on a continuous basis (Holmström et al., 2021). Therefore, an important element in managing digital innovation is analyzing socio-cognitive meaning-making and how they are developed and shared between heterogeneous actors (Nambisan et al., 2017). Accordingly, the process of embracing competing concerns may begin with identifying and exploring different actors' views and demands when encountering a decision or situation regarded as problematic or puzzling. The goal of the activity is to provide managers with a list of diverging concerns and viewpoints regarding a specific issue in the innovation process.

This is not a trivial task as actors do not always voice their concerns explicitly, nor is it given which actors might be relevant for the project. Prior research provides numerous theoretical lenses to explore actors' meaning-making in digital innovation, including how actors use interpretive frames to make sense of technology (Orlikowski &

Gash, 1994; Kaplan & Tripsas, 2008; Young et al. 2016) or how meaning-makings are articulated and interpreted in different ways through theorization and translation work as they circulate between heterogeneous actors (Nielsen et al., 2014). Article 4 in this dissertation adds to this line of research by demonstrating how narratives can circulate meaning-making between and across heterogeneous actors. Because these narratives allow for flexible interpretations, they create a powerful dynamic for spreading ideas and knowledge in a way that appears legitimate to other organizational actors, who can then enact ideas into everyday work routines (Bartel & Garud, 2009). In this way, identifying and analyzing different narratives can support the exploration of different actors' problem framing and views on the project's ideas, trajectory, and outcome. This strategy relies on the premise that competing concerns are both detectable and socially constructed through actors' rhetoric and conversations (Lewis, 2000). However, as discussed above, competing concerns can manifest in other ways than through explicit discursive work. For instance, in terms of intrinsic competing concerns arising at individual level in the decision-making process. Thus, while narratives can provide valuable insights into different actors' meaning-makings, it is unlikely that this approach can function as a stand-alone approach for such inquires in practice or is applicable for all types of competing concerns. This points to a need for future research on effective strategies and practical tools for exploring different views and demands in digital innovation.

Juxtapose competing concerns

The second activity is to juxtapose competing concerns by linking and contrasting multiple views and demands (converging meaning-making). As illustrated in this dissertation digital innovation involves a continual influx of competing concerns. While each of the fragmented meaning-makings explored in the previous activity provides valuable insights on their own, they only address parts of the multifaceted nature of digital innovation.

Article 1 argued how organizing and contrasting these insights into sets of competing concerns can assist managers' meaning-making of the challenges encountered in digital innovation. This approach of juxtaposing different perspectives can help managers to delineate and link conflicting viewpoints to create more coherent insights into the current events and possible strategies for interventions. In this way, competing concerns can be a means for understanding and framing the situations regarded as problematic. This line of thinking follows Bjerkness (1991) argument of looking for contradictions as *"a kind of conversation with the situation"* (p. 74) that on the one hand allows managers to assess specific qualities of the situation and on the other hand to apply general knowledge or previous experience.

Hence, the goal of the second activity for managing competing concerns is to provide a synthesized set of competing concerns by organizing and comparing views side by side. Rather than polarize phenomena into either/or notions, this activity involves using both/and constructs that can accommodate competing concerns and enable a more nuanced understanding of their coexistence and interrelationships (Lewis, 2000).

Here, Article 1 illustrated how this converging activity involves deliberately simplifying diverging viewpoints into abstract positions that can be used as reference points to link, discuss, and make sense of various factors, drivers, and barriers for digital innovation. Accordingly, the output of this activity can trigger action-taking activities by serving as a point of departure for idea generation and facilitating discussion across various innovation actors.

Leverage competing concerns

The third activity is to leverage competing concerns to create and discuss possible ideas (diverging action-taking). A fundamental argument in this dissertation is that competing concerns can be a generative force in digital innovation. Whereas dialectic research has pointed to the generativity arising from resolving a confrontation between opposing forces (Van de Ven & Poole, 1995), I have argued that competing concerns can also serve as heuristics to creating and discussing ideas. This follows Lewis's (2000) reasoning of using contradictions as a thought-provoking tool. Thus, instead of striving for harmony and consistency, this activity encourages managers to look for ambiguities and contradictions and use them creatively (Ciriello et al., 2019). It is a playful but instructive argument for managers seeking to navigate seemingly insurmountable dilemmas and complexities in digital innovation.

Heuristic cues can help people decide what information is relevant and make sense of complex events (Weick, 1995). These cues provide reference points as explicit notions that tie complex elements together cognitively. Similarly, linking diverging factors, drivers, and barriers together in competing concerns can provide managers with heuristic cues to stimulate the creation and discussions of possible actions between heterogeneous actors (Bjerkness, 1991). As discussed in Article 1 and showcased in Article 2, competing concerns allow managers to think of combined interventions and strategies through shifts in vantage points when deadlocks were encountered. Furthermore, competing concerns can help facilitate social interactions and discussions between heterogeneous actors by making diverging views explicit and connecting them as abstracted points of reference for ongoing discussions. Thus, the goal of this ongoing activity is to continuously leverage the exploration and juxtaposing of competing concerns to create and discuss a wide range of possible ideas and strategies.

Address competing concerns

The fourth activity is to address competing concerns by deciding on and implementing ideas to give the innovation project direction (converging action-taking). Following digital innovation's dynamic and open-ended nature, it would be naïve to assume that addressing these competing concerns can be made with complete comprehension of the advantages and disadvantages of each possible strategy – let alone lead to consensus among the participating actors. Instead, as illustrated in Article 2, managing the competing concerns will unfold as a series of interrelated decisions and priorities throughout the innovation process (Cho et al., 2007; Svahn et al., 2017). Thus, while harmonious perspectives such as organizing vision suggest that discussions between heterogeneous actors are the "developmental engine "(p. 458) for shared meaning-making providing an agreed-upon envisioned end state (Swanson & Ramiller, 1997),

the proposed model in this dissertation does not rely on the actors to reach consensus. Instead, competing concerns are conceptualized as an inherent and continuous part of digital innovation.

Although the involved actors do not need to develop a homogeneous understanding, the innovation still involves decision-making and coordinated actions (Svahn et al., 2017). As such, the goal of the final activity is not to definitively resolve competing concerns once and for all – but rather to implement direction by deciding on and executing specific ideas and strategies into the innovation project. Extant research provides many suggestions for how project managers can maneuver such decision-making activities, including effectuation or causation inspired decision-making processes (Henninger et al., 2020), mindful decision-making (Swanson & Ramiller, 2004), and heuristics (Kheirandish & Mousavi, 2019). The proposed model adds to this line of research by suggesting how competing concerns can be utilized as inputs for the decision-making process by generating ideas, provide coherent insights, and refence points for discussions, as discussed above.

The activity may result in different outcomes such as a creative synthesis that satisfies all concerns (a "win-win" solution), a trade-off or balance between concerns (a compromised solution), or a direction suppressing one or more concerns (a "win-lose" solution) (Van de Ven & Poole, 1995). Regardless, the implemented direction creates a new situation – and thereby – new competing concerns, initiating a new iteration of the proposed model. Thus, to fully utilize the generative force of competing concerns and its ability to shift vantage points and directions as the project unfolds, managers should approach decision-making as an "emergent tuning process" (Svahn et al., 2017:250).

Interaction between activities

Accordingly, the proposed model conceptualizes how managers can understand and address competing concerns as an ongoing, flexible, and iterative process of four interrelated activities. The process may begin with managers encountering a strategic decision or practical problem in the innovation project and exploring different views and demands (identify competing concerns). For instance, in Case 1, we saw how nine municipalities sought new was to organize digital innovation in health- and eldercare. Next, linking these diverging views into sets of competing concerns can provide managers a more coherent understanding of the various factors, barriers, drivers, and contradicting demands at play in the digital innovation project (juxtapose competing concerns). In Case 1, this converging activity consisted of juxtaposing competing concerns regarding imitator versus inventor strategies. Subsequently, this can trigger the next activity in the process by stimulating the creation and discussion of different ideas and strategies for actions between participating actors (leverage competing concerns). In Case 1, the municipalities engaged in initial market research with potential suppliers to explore the two competing strategies. These discussions provide the basis for the fourth activity in the model, which entails deciding on a direction to implement into the innovation project (address competing concerns). In Case 1, the municipalities

decided on the inventor strategy and launched a public tender to facilitate the innovation project, triggering a new situation with different but interrelated competing concerns as seen in Article 2.

However, as depicted in the model, the four activities do not need to unfold in sequential order. For instance, one might identify new concerns during the juxtaposing activity that need further exploration. Hence, the second activity (juxtapose) might loop back into the first activity (identify). Correspondingly, addressing competing concerns might involve going back to creating and discussing ideas, triggering a loop between the third (leverage) and the fourth activity (address).

Both cases in the dissertation involve multiple iterations of diverging and converging cycles of meaning-making and action-taking throughout the innovation process. These cycles are likely to continue even long after initial implementation due to the open-endedness of digital technologies that encourage continuous exploration of potential expansions of scope, features, and value creation by an increasing number of participating innovation actors (Kallinikos et al., 2013; Henfridsson et al., 2018). Similarly, if a project is terminated or runs out of resources, the process might continue into diverging cycles of competing learning outcomes shaping actors' meaning-making of future innovation efforts, as seen in Article 4's exploration of actor's diverging learning outcome in the bathroom-assisting robot case.

6.3. PRACTICAL AND THEORETICAL IMPLICATIONS

The practical and theoretical implications of the dissertation's theorization of competing concerns contribute to the understanding of; 1) competing concerns as an inherent, unavoidable, and ongoing part of digital innovation, 2) competing concerns as a means for meaning-making and action-taking, and 3) competing concerns as a means for maneuvering between diverging and converging behavior.

Firstly, the dissertation conceptualizes competing concerns as an inherent part of digital innovation that can arise in three contexts (between groups, within groups, and at individual level) and be understood as views and demands that contest with each other. Furthermore, digital innovation involves a continuous influx of competing concerns. When ideas and decisions become implemented, it creates diverging behavior with new situations and encounters for participating actors, forming new views and concerns. This is reflected in the ongoing and iterative aspect of the proposed model, linking previous decisions with current concerns. By addressing competing concerns, the manager creates a converging direction to the innovation project. However, given the distributed and dynamic nature of digital innovation, it is unreasonable to think that managers can single-handily control or plan the innovation trajectories and outcomes. In this sense, it is important to view the proposed model as an open system. Actors can enter or leave the project (e.g., the GPs' unexpected entry as gatekeepers in Article 2), and external opportunities and constraints can emerge or decline (e.g., the Covid19-pandemic limited available personnel and possibilities for user testing of

the medication-dispensing robot). Similarly, given the integrative capabilities of digital technologies (Yoo et al. 2012), digital innovation projects are increasingly interacting with other digital innovation projects (e.g., a year into the medication-dispensing robot project, the municipalities launched a new electronic care journal and thereby changed the key component of the robot's digital infrastructure). Such external changes create new situations for actors to understand and address. Thus, in practice, a "good" response or course of action cannot be entirely designed in advance, expecting the outcome to be precisely as envisioned (Lanzara & Mathiassen, 1985). Thereby, managerial responses to competing concerns are not a way to achieve pre-fixed objectives but rather integrated and ongoing diverging and converging processes of exploration and decision-making. In this way, competing concerns continue to emerge throughout or even after the digital innovation project. Accordingly, competing concerns can be seen as results of – and thereby also a sign of – innovation progress (Bjerknes, 1991). However, failure to manage competing concerns can result in the project staying in diverging and fragmented meaning-making and innovation deadlock. Therefore, instead of regarding competing concerns as a result of incoherent visions or bad project planning, the model conceptualizes competing concerns as an inherent and ongoing characteristic of digital innovation that managers should seek to leverage rather than try to avoid.

Secondly, the dissertation conceptualizes competing concerns as a means for meaning-making and action-taking. The proposed model entails that juxtaposing competing concerns can frame multifaceted and complex situations to create more coherent understandings by digging deeply into the situation and trying to surface and analyze as much information as possible. Since innovation success is related directly to how well informed and knowledgeable managers are (Van Riel et al., 2004), exploring different actors' concerns are necessary not only because their actions influence the innovation trajectory and outcomes (distributed agency) but also because relevant insights and viewpoints are distributed resources across the participating actors, regardless of where they sit in the hierarchical ladder (Lanzara & Mathiassen, 1985). As discussed above, juxtaposing and leveraging competing concerns allows managers to think of combined interventions and strategies through shifts in multiple perspectives. Additionally, competing concerns can support ongoing mutual conversations between actors by connecting diverging views and making them explicit to inform ideas and decisions. Consequently, the proposed model encourages managers to facilitate participatory innovation approaches and seek out collaborations between heterogeneous actors. However, while the model's overall logic is indifferent regarding how competing concerns are manifested, it is possible that managers would approach the four activities differently depending on whether competing concerns manifest at individual level or as clashes within or between groups of actors.

Finally, the competing concerns model conceptualizes how managers can maneuver between diverging and converging behavior in digital innovation. With digital innovation entailing less predefined and more distributed innovation agency among heter-

ogenous actors (Nambisan et al., 2017; Drechsler et al., 2020), managers cannot control - but only increase - an innovation project's chances for success by developing and practicing skills for navigating the challenges encountered in divergent and convergent cycles of the innovation process (Van de Ven, 2017). The proposed model support managers maneuvering these processes through four interrelated activities. Thus, the four activities are not discrete entities that unfold sequentially in practice. Instead, the activities are closely connected and may even unfold simultaneously. For instance, during strategy meetings, participatory workshops, or similar events, different actors may raise and share their concerns and discuss and decide a response concurrently. On these occasions, the model can provide a conceptual framework to facilitate exploration and discussion. At other times, when encountering problems or puzzling situations, the model provides managers guidelines to systematically approach and maneuver the situation to establish a coherent meaning-making and basis for action-taking. Thereby, the insight gained from the dissertation can be used as a productive basis for engaging multiple aspects of digital innovation management such as facilitating collaboration between actors (by making diverging expectations, concerns, and goals transparent), analyzing complexity and problematic situations as they emerge (by juxtaposing multiple views and perspectives), and idea-generation and problem-solving (by expanding the perceived spectrum of possible ideas and configurations).

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CHAPTER 7.
CONCLUSION

This dissertation sets out to study competing concerns in digital innovation. Rather than seeing digital innovation as a harmonious phenomenon where actors speak with a unified voice, the dissertation has studied digital innovation as a multifaceted and contested socio-technical process. Existing literature has helped expand our understanding of digital innovation's nonlinear, unbounded, and distributed nature (Yoo et al., 2010; Nambisan et al., 2017; Sarker et al., 2019). Still, we know little about what happens when digital innovation increasingly unfolds in a network of heterogeneous actors with diverging logic and competing concerns (Nambisan et al., 2017; Kohli & Melville, 2019). While dialectics (Van de Ven & Poole, 1995) and paradoxical perspectives (Lewis, 2000) have provided theoretical insights on contradictions in innovation processes, the notion of competing concerns remains undertheorized and implicit in digital innovation research.

Responding to scholarly calls, the dissertation aimed to expand our understanding of *how managers can understand and address competing concerns in digital innovation.* To answer this question, the dissertation empirically zoomed in on Welfare Technology (WT) as a particular form of digital innovation in Scandinavian health- and eldercare. WT is characterized by rapid technological developments, a high degree of managerial and political focus, the involvement of a highly diverse group of actors, and radical changes to how services are organized. Thereby, WT provides rich research opportunities to study competing concerns in digital innovation and how managers can understand and address them. The main research process and results are structured in four articles (Chapter 2-5) providing different empirical and theoretical perspectives on competing concerns in digital innovation while allowing insights from one article to inform the others as the research process unfolded.

The following sections provide an overview of the dissertation's primary contributions, reflections on research context, limitations, and suggestions for future research.

7.1. CONTRIBUTIONS TO DIGITAL INNOVATION RESEARCH

The thrust of the dissertation is the four research articles investigating competing concerns in WT-projects from different empirical and theoretical perspectives. Article 1 systematically reviewed existing literature to identify eight competing concerns central to implement, and scale-up and sustain WT. The theoretical implication of this was that juxtaposing multiple viewpoints into sets of competing concerns can support idea generation and discussions between innovation actors. This notion of competing concerns as a generative force was empirically examined in Article 2's longitudinal study of the medication-dispensing robot. The study explored how organizational responses to competing concerns shaped the innovation trajectory. Thereby, the Article

2 theorized how identifying and addressing competing concerns can operate as path-creating mechanisms in digital innovation. The practical implication of this research is that instead of downplaying or avoiding their existence, managers should identify and highlight competing concerns as part of their decision-making process. Article 3 explored the rise and fall of the bathroom-assisting robot. The analysis found how the involved actors create competing explanations for innovation failure, suggesting that competing concerns can result in diverging and polarized meaning-making and learning outcomes. This idea is explored in detail Article 4's revisit of the same case. The article theorizes how formative narratives—as discursive social constructions of actors' meaning-making and actions—shape and are shaped by the emergent context of digital innovations. The theory distinguishes between reinforcing and colliding interactions between formative narratives to help explain coordination and polarization in the social construction of digital innovation ideas, trajectories, and outcomes. Table 7.1 presents a summary of the articles' main findings and contributions in relation to the overall research question.

	Article 1	Article 2	Article 3	Article 4
Main findings	Eight competing concerns central to implementing and scaling digital welfare technologies.	Organizational responses to competing concerns shapes the innovation trajectory.	The involved actors create competing explanations for innovation failure.	Innovation narratives shape actors meaning-making and action-taking and explicate competing concerns.
Theoretical implications for digital innovation research	Juxtaposing multiple viewpoints into sets of competing concerns can support idea generation and discussions between innovation actors.	Identifying and addressing competing concerns can operate as path-creating mechanisms in digital innovation.	Competing concerns can result in diverging and polarized meaning-making and learning outcomes.	Innovation narratives can support actors' problem framing and viewpoints on digital innovation ideas, trajectories, and outcomes.
Practical implications for welfare technology projects	The article provides managers a framework to help identify and discuss critical decisions when implementing and scaling digital welfare technology projects.	Instead of downplaying or avoiding their existence, managers should identify and highlight competing concerns as part of their decision-making process.	Seven managerial lessons to help develop, scale-up, and sustain robotic welfare technologies.	The manager as "context-maker" who facilitate the influx and sharing of formative narratives in digital innovation.

Table 7.1: Summary of included articles' main findings and contributions in relation to the overall research question.

The findings suggest that competing concerns can manifest in three contexts. Competing concerns can arise between different groups of actors, such as clashes between a short-term-oriented and sales-driven startup company on one side and long-term and collaboration-oriented municipalities (as seen in Article 3). Competing concerns can arise within a similar group of actors, such as whether the project was an illustrative example of how to or how not to conduct digital innovation (as seen in Article 4). Finally, competing concerns can arise inherently to the decision-making process, such as whether scaling up innovation projects should depend on centralized organizational efforts or be organized as a decentralized process in a network of autonomous agents (as seen in Article 1). As seen in Article 2, these competing concerns are often interrelated and evolves over time as responses to previous concerns create new situations and, thereby, trigger new competing concerns. Consequently, managing competing concerns in digital innovation is a continuous process of identifying, juxtaposing, leveraging, and addressing competing concerns.

Grounded in the dissertation's exploration of different forms of competing concerns and their role in digital innovation, I suggest that competing concerns can be defined *as manifestations of views and demands that contest with each other in digital innovation*. Drawing on this conceptualization and looking across the four articles, the following sections theorize how competing concerns manifests in digital innovation contexts and proposes a model for how managers can understand and address them. The model consists of four interrelated activities unfolding between two dimensions. The horizontal dimension distinguishes between how competing concerns relate to actors' meaning-making and action-taking, while the vertical dimension distinguishes between how digital innovation unfolds as ongoing cycles of diverging and converging behavior. These insights contribute to broader digital innovation literature by conceptualizing competing concerns as an inherent, ongoing, and unavoidable part of digital innovation.

7.2. DIGITAL INNOVATION THROUGH WELFARE TECHNOLOGY

The dissertation has zoomed in on WT as the empirical context for studying competing concerns in digital innovation. In general, digital innovation has been characterized in terms of its generativity (Yoo et al., 2012), blurring of boundaries and convergence of previously separate areas (Hund et al., 2021), and more distributed agency among heterogeneous actors (Nambisan et al., 2017; Drechsler et al., 2020). These characteristics are also present in WT. For instance, in Case 1, we saw how the municipalities' electronic care journals constitute the digital infrastructure needed to provide and transmit information about the client's medications to the medication-dispensing robot. In turn, the robot generates new data analytics opportunities for municipalities to track and analyze the services provided. The robot blurs boundaries between various subprocess, roles, and organizational entities by addressing the entire value chain from prescription, acquisition, delivery, and consumption. Consequently, the robot project also involves distributed agency between multiple internal and external actors.

Digital innovation has also been characterized in terms of the speed and scale with which it unfolds, emphasizing how digitalization provides the ability to minimize the time gap between early idea, implementation, and rapid scaling of the user base through ongoing loops of test and deploy (Bogers et al., 2021). However, as reflected in both case studies and the systematic literature review, WT projects are notoriously difficult to scale up and involve slow and complex adoption and implementation processes. When digital platforms targeting private consumers succeed in rapidly scaling their user base (Huang et al., 2017), it is likely supported by a relatively uncomplicated implementation process involving a single actor deciding to adopt the technology with a limited cost for entry or exit. On the contrary, implementing WTs involves decisions from multiple actors. It is often associated with high entry costs for acquiring the technology, user training, creating new practices, and aligning processes across organizational boundaries. These complexities are also reflected in slow test and development iterations, as illustrated in the two case studies. The findings of this dissertation suggest that many of these challenges related to developing, implementing, scaling, and sustaining WTs can be ascribed to competing concerns between and within heterogenous actors. Thus, while it may seem a straightforward task in terms of the technical aspects of deploying and distributing digital technologies at scale, these are rarely trivial tasks from an organizational perspective. Thereby, the insights generated with WT as a research context contribute nuances to two of the prevailing characteristics of digital innovation in general: Rather than being intrinsic features of digital innovation, speed and scale are likely to be constrained by the context in which the digital innovation project unfolds.

Furthermore, WT often integrates digital aspects into physical components, as reflected in the two case studies of robots. Thereby, WT entails promising research potentials to study tensions and competing concerns between digital and non-digital elements and how such tensions shape the scope and functionalities of the innovation (Nambisan et al., 2017). Since robots take up a physical and highly visible presence (Wirtz et al., 2018), implementing such "digital-physical information systems" (Sprenger & Mettler, 2015:271) in clients' private residences involves new challenges related to aesthetics (Salvini et al., 2010) and interactions with physical and human surroundings (Sparrow & Sparrow, 2006). Although this has only been examined lightly in the dissertation, both case studies contain competing concerns in this regard. For instance, both robots' digital interfaces, physical appearances, and sizes have been part of multiple competing concerns regarding user acceptance (e.g., "the robot is too big"), usability (e.g., "it is difficult to stand in the position the robot requires"), and safety (e.g., "the medication can be mixed up in the robot's chambers during transportation"). This further emphasizes the importance of ongoing user involvement and managing competing concerns throughout the innovation process.

7.3. IMPLICATIONS FOR WELFARE TECHNOLOGY

As reflected in Table 7.1, the dissertation contributes several practical insights to WT innovation.

Article 1 synthesizes and discusses fragmented research regarding the complexities and tensions organizations face when scaling up, diffusing, and sustaining emerging WTs. By highlighting and contrasting the research positions in this emerging and interdisciplinary topic, the article provides managers a framework to help identify and discuss critical decisions when implementing and scaling digital welfare technologies.

The dissertation's two in-depth case studies provide rich descriptions of the complexities of managing WT projects. In Article 2, we saw how a narrow focus on the target user group and the business case evaluation early on could obstruct the exploration necessary for innovating emerging WTs. We also saw how failure to assess the technological maturity before initiating real-world testing caused skepticism among care workers and clients that proved difficult to overcome later despite substantial product improvements and safety measures. Thus, to create lifelike scenarios capable of revealing potential issues, initial testing in a simulated environment should not be limited to the facility of the technology developers but also be situated locally in the municipalities, involving care professionals, and connected to each municipality's digital infrastructure.

Article 3 provides seven managerial lessons to help develop, scale up, and sustain robotic welfare technologies. The empirical investigations of the bathroom-assisting robot's failings demonstrated the long way from visions of disruptive potentials to a feasible robot in a complex use context. While the journey from an idea to a functioning prototype can take years, transforming this prototype into a product that fits users, surroundings, and organizational contexts can be equally demanding, if not more so. Indeed, the analysis suggests that developing a "whole solution" that adequately solves the users' core problem(s) can be a deceiving process. Especially in the context of WT, where the different actors involved (i.e., developers, managers, staff, and clients and their families) can have competing views on, expectations of, and interpretations of the technology and the challenges encountered.

Article 4 proposed how innovation narratives can support how actors construct and circulate ideas and interpretations of problems and potential solutions when developing, implementing, and scaling digital (welfare) technologies. However, while narratives can help preserve an idea and mobilize support, they can also seduce actors to act based on anecdotes rather than critical assessments. This, in turn, reinforces polarization through the competing narratives that emerge. Thus, it becomes crucial for WT managers to be vigilant about how narratives shape the context for meaning-making and actions in ways that either reinforce initiatives or create inertia and barriers. To increase the odds of profiting from the strengths of narratives while mitigating their pitfalls, managers must develop and practice their skills to facilitate the influx and sharing of narratives.

7.4. LIMITATIONS AND FUTURE RESEARCH

When applying the dissertation's contributions to other settings and types of digital innovation, it is crucial to understand that the findings are based on two qualitative case studies (Yin, 2014) of WT in Danish eldercare. While WT has proven to be useful research setting to study competing concerns in digital innovation in general, the research context – as always – also has its limitations. First, Denmark and other Scandinavian countries have been at the forefront of collaborative and participatory processes between various actors (Bergvall-Kåreborn et al., 2014). Furthermore, Danish public sector organizations have been characterized as having a consultative and consensus-oriented culture regarding strategy formulation and implementation of digital innovation initiatives (Meyerhoff Nielsen, 2019). One hypothesis would be that such characteristics can promote actors' likeliness to perceive competing concerns as a generative force for developing and discussing ideas between different actors. An opposing hypothesis would be that such characteristics can result in actors being less likely to identify competing concerns or neglect to manage them until they result in polarization and inertia. This raises questions regarding contingency factors regarding how competing concerns arise and manifest in various organizational contexts and how managers can understand and address them. It also raises questions on to what extent actors can have diverging meaning-making and still successfully collaborate on an innovation project. Or put differently; to what extent does meaning-making need to converge to successfully implement and execute coordinated action-taking between different actors? Thus, future research on competing concerns would benefit from looking at digital innovation in different contexts to compare strategies and practices for understanding and managing competing concerns. The dissertation's theorization of competing concerns, how they manifest, and the proposed model for managing them provide valuable points of departure to study such activities and their interactions.

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