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Fleron, Benedicte; Pries-Heje, Jan; Baskerville, Richard

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Digital Organizational Resilience: A History of Denmark as a Most Digitalized Country

Benedicte Fleron
Roskilde University, Denmark
bff@ruc.dk

Jan Pries-Heje
Roskilde University, Denmark
janph@ruc.dk

Richard Baskerville
Georgia State University
and Curtin University
baskerville@acm.org

Abstract

The purpose of this paper is to demonstrate how digital organizational resilience was a key to digital transformation success in the public sector of Denmark. Using a historical research method, we analyze the IS history from 1998-2019 at all three levels of the public sector in Denmark. This study finds historical events about barriers and hindrances and shows how resilience enabled continuity in the transformation. We find a pattern of three elements in the history of what constitutes digital organizational resilience in e-government: digitalization strategy, collaboration across the public sector, and the ability to learn from overcoming barriers and hindrances. Digital resilience has previously been studied in the context of individual learning and cyber security. This pattern is a promising basis for understanding and achieving resilience in a transformative digitalization strategy in the public sector.

1. Introduction

All over "[t]he public sector is experiencing tremendous pressure for strategic change." [1, cover]. Managers in the public sector are required to "… be more responsive to the public and to deliver more value with constrained budgets" [1, cover]. That pressure has only been increasing with the wave of digitalization. "Digital business strategy has evolved in its own right. Starting off as part of every department, it has become the core of business strategy when it comes to planning for the future" [2, p. 48].

In order to execute digitalization strategies, organizations benefit from a set of recognizable qualities such as entrepreneurship, data resources, data-driven decision-making, technological skills and aptitude, etc. [3]. However, our research reveals that one of the most important qualities for the execution of public sector digitalization is rather unnoticed and unexplored: organizational resilience. Long associated with supply chain resilience [4], cybersecurity [5] and disaster recovery [6], we find organizational resilience is critical as an overall organizational quality in the public sector; an important coping capability that enables an organization to effectively sense and correct disruptions. Furthermore, much of the literature regarding e-government and resilience regards the role of e-government in creating resilient societies [e.g. 7] rather than creating resilience in the government organization itself. As such, our research responds to calls for research into resilience in government organizations [8].

In this paper, we consider the problem of how public sector organizations ensure effective pursuit of digitalization and digital transformation. Using a historical research method, we analyze the history of digitalization strategies in Denmark. The history spans some 20 ministries, 5 regions, and 98 municipalities.

We were surprised by the results of our analysis. In our case of public sector pursuit of digitalization, we expected to find effective strategy execution at the heart of digital transformation. Instead, we found organizational resilience, developing in the face of breakdowns in strategy, to be at the heart of effective strategy execution.

2. Background

Three research arenas provide the main set of assumptions underlying our research.

2.1. Organizational resilience

In the physical sciences, resilience regards the capacity of a system to recover its original condition following a disruption [4]. The concept has been widely adapted and applied in information systems (IS) and its related fields. Examples include the study of resilience in organizations [9], disaster recovery [6], cybersecuri-

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ty [5], supply chains [4], ecologies [10], and individuals [11].

We focus on the role of resilience in an organization's digitalization processes. Such an organizational view of resilience is defined as, "the organization's capability to face disruptions and unexpected events in advance thanks to the strategic awareness and a linked operational management of internal and external shocks" [4, p. 3]. It is "the firm's ability to sense and correct maladaptive tendencies and cope positively with unexpected situations." [12, p. 1627].

Gover and Duxbury [9] noted that research in organizational resilience tended to adopt either a psychological or an ecological perspective (or both). A psychological perspective tends to attribute organizational resilience to the resilient qualities of the individuals making up the organization. An ecological perspective recognized inherent resilient qualities in the organization that were independent of the individuals. Under the former perspective, organizational resilience is developed by aggregating key employees' core competencies [11]. Under the latter perspective, organizational resilience is developed through organizational structures, such as ensuring business delivery [5], anticipatory adaptation [10], resource allocation [6], etc. Annarelli and Nonino [4] distinguish two kinds of such organizational resilience structures: static, which involves minimizing the probability and impact of disruptions through preparedness and prevention; and dynamic, which involves maximizing the speed of recovery from unexpected disruptions.

2.2. Digitalization

In the ecosystem of collaboration between the public and private sectors, digitalization regards "the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business."[1] This process is sometimes termed as an organization "going digital". It is a process that changes the fundamental ways organizations get things done. As with digitalization, going digital creates new frontiers, new experiences, and new capabilities [1]. Unfortunately, the terms digitalization, digitization and digital transformation are often confused. For a global practitioner perspective, we will adopt the Forbes distinctions: digitization is the process of changing from analog to digital form, and digital transformation is a strategic transformation of an organization that is customer centric and built on changes in core competencies [13].

Digitalization changes the role of information technology (IT) in an organization, often shifting the needs for IT expertise out from information systems departments and into many other organizational units simultaneously [14]. Digitalization can change the role of these experts. For example, the work of the CIO may become divided with a CDO (chief digital officer) or distributed over operational units like finance (i.e., FinTech) or marketing (i.e., customer data analytics) [15].

2.3. E-Government digitalization

The advances brought through digitalization have not been restricted to commercial organizations. Government and other public-sector organizations have sought equally transformative benefits from digitalization [16]. In E-Government, however, ethical considerations are more prominent in regard to digitalization of public sector services. For example, customer-centricity, prominent in commercial digitalization is adapted as the concept of stakeholder orientation in E-Government [17]. Such a revision means that public sector digitalization increases the attention given to its societal impacts, such as the reskilling of stakeholders (e.g., citizens, public servants) and broad accountability (e.g., regulation of public surveillance and privacy concerns) [16].

3. Research method

Following Mason, et al.'s [18] steps for writing histories in the information systems field, we build on this methodological approach for studies in IS history [19]. Such studies (1) build focus questions and specify the domain, (2) gather evidence, (3) critique the evidence, (4) determine patterns in the evidence, (5) compose and transcribe the story [18, 19].

3.1. Focus questions and specify the domain

From a pragmatic perspective on writing history there is no point in pursuing dull stories. To achieve a compelling history, we search for evidence that answers the question, what does it entail to ensure a national digital public sector? As this question is very broad, we have chosen to focus our historical lens on the story of how Denmark became one of the top 4 digitalized countries in the world. Which significant changes were made at a political, strategical, and technical level to support a national digitalization of the public sector? How were these changes implemented

[1] https://www.gartner.com/en/information-technology/glossary/digitalization

locally, regionally, and nationally? And, what were the learning outcomes in terms of how to proceed with the national digitalization project?

These focus questions helped define the boundaries of the domain of interest and also framed our methodological assumptions. We primarily investigated the public strategies and initiatives unfolding in the course of the Danish public sector becoming digitalized. Our unit of analysis has not been one single organization, but how the central governmental body has enforced digital transformation. Secondarily, we have looked at how regional and local governmental bodies have complied with that enforcement and how those initiatives have implied private sector actions. Our study of the digitalization of the Danish public sector focuses on events beginning in the 1990s.

3.2. Gather evidence

We have gathered a vast amount of data from private and public sources. We have studied previous academic research [i.e., 20, 21, 22], legal documents, municipalities' websites and strategy documents over time going back to the first reports in the 90s [e.g. 23]; and then conceptualizing, using and assessing these documents. We have mainly applied qualitative data analysis to the content of the documents, but we also looked at the complete set of 98 Danish municipalities in order to quantify how many of them have written and published a digitalization strategy.

The in-depth interviews involved key stakeholders from the Danish public and private sector. These interviews took place in five "bursts":

1. The first burst of interviews took place in relation to studies of enterprise architecture in Denmark from 2005-09 [24, 25].
2. The second burst of interviews took place in 2013-14, ten years after the publication of a Whitebook on IT-Architecture. Eight interviews were conducted with managers, enterprise architects, users and contributors to the Whitebook. These interviews focused on the diffusion of the recommended practices over that ten-year period. Results have not been published.
3. The third burst of interviews took place in relation to a study of the implementation of digital post across the Danish public sector [21, 26].
4. The fourth burst took place in 2018 focusing on the implementation of smart cities at the municipality level in Denmark [27].
5. The fifth burst finally took place in 2019 focusing on the diffusion of strategies from the state level to actions at the municipality level.

As mentioned earlier our study spans the whole Danish public sector with some 20 ministries, 5 regions, and 98 municipalities. The key stakeholders are the digitalization agency at the ministry level (burst 2, 3 and 5), the hospital in burst 1 at the regional level, and the smart cities (burst 4) at the municipal level

In total there were more than 100 interviews over a period of 15 years. Each was recorded and either transcribed or documented with extensive notes.

All of our collected data was recorded into a retrospective timeline in five categories: EU accounts; governmental initiatives; national public strategies; regional public strategies; and data collection.

3.3. Critique the evidence

We ensured internal coherence of our recorded evidence using logic, historical cause/effect thinking, and basic investigative techniques. These include determining the credibility of the sources (i.e. peer reviewed research and governmental published documents), and convergence (for instance confirming similar information from multiple sources).

We acknowledge that the history told in this paper is not the entire, singular, true story of what happened when Denmark became a digitalized nation. Rather, it is our purposefully selected and interpreted account of those significant events that we deem important for the changes to, and the development of, the Danish public sector. This account is understood from an IS research perspective. While illuminated by data collected contemporaneously and empirically, it is episodic, not continuously collected throughout the entire 20-year period.

3.4. Determine patterns

From the retrospective overview of events that our timeline provided we identified patterns (regularities in the data). The major changes in our timeline centers around the public digitalization strategies. Hence, we elicited patterns by looking for changes at the strategical level caused by, or being an effect of, the public digitalization strategies both national and regional. The consequential changes that we found were determined on the basis of our research backgrounds in IS research and because the pattern we found helped compose a believable story that makes a useful point about the past [19], and hence the journey Denmark has taken in order to become a top digitalized country.

3.5. Compose and transcribe the story

We have told a Danish national digitalization history based on the evidence we have collected, and the studies conducted following the timeline provided. We

have included significant events affecting the strategic shifts at different governmental levels for driving the digital transformation.

We have written the history of Danish digitalization as a narrative of the past [19]. It is an account of the emergence of Danish national digitalization strategy written from our interests and perspectives as information systems researchers [19].

The narrative has unfolded as a duality between making sense of the whole history unfolding as well as the individual story told by our interviewees. Hence, we borrowed from the hermeneutic tradition as Porra et al. [19] describe by creating meaning of the evidence and not simply reporting it. The history is as much a story about the digitalization of Denmark as it is a story about the field of IS told by IS scholars [19].

4. The history

Denmark is divided into 98 municipalities and 5 regions. At the state level there are around 20 Ministries (the exact number varies dependent on the government-in-power and time). As of this writing, Digital Strategy is placed in an Agency of Digitization under the Ministry of Finance. Another key stakeholder is an organization named KL (Local Government Denmark) which is the association and interest organization of the 98 Danish municipalities.

While our research database included documents from the 1980s, the main history of digitization in the Danish public sector starts in the 1990s. Political areas related to technology were gathered in the Ministry of Research in 1993 (where also Universities are placed). The European Union puts the Information Society on the Agenda the year after [28]. There is a Danish interpretation and adaptation of that agenda coined the *Info-Society Year 2000* [23].

The 1990s were replete with failing public IT projects [29]; so when the government changes in 2001, a new Digital Taskforce is established. The taskforce is headed by the Ministry of Finance and includes members from other Ministries, KL, Amtsrådsforeningen (organizing what is now the 5 Regions of Denmark), and two municipalities; Copenhagen and Frederiksberg.

Shortly after the first public sector strategy sees the light of day a new vision is stated [30]. From page 4 of that vision, we have translated the following: “It is the ambition across the state, counties and municipalities to leverage the potential of a digital community to shape the Danish public sector to be more flexible, more efficient, and with greater quality for citizens. The essence of digital management is precisely that an improved and more effective solution of management tasks is through the use of information technology”. From the same source a year after comes the Whitebook on IT Strategy [31].

In the following years four new strategies were published. The timeline below summarizes the main points coming at the national level in Denmark [32-35].

2004-06: Strategy for Digital Administration
- NemKonto – One bank account for each citizen to pay out money
- e-Invoicing
- Virk.dk – A portal for Danish companies
- Secure Email between public agencies

2007-10: Strategy for Digitalization of the public sector
- NemID – Identification for digital login
- Digital Mail for public agencies
- Borger.dk – A portal for Danish citizens
- Authorities to use same infrastructure

2011-15: The Digital Path to Future Welfare
- Digital Mail for citizens and companies
- Self-service on the internet
- Digital welfare in focus
- Basic Data – gathering Denmark’s digital resource

2016-20: A stronger and safer digital society
- Sharing public data
- Working with User Journeys across public systems e.g. for how to register a marriage
- Increased IT security
- New generation of NemLogin and NemID – identification for digital login

The producer or source of the digital strategies is initially The Digital Taskforce. From 2004 all three government levels are represented. And from 2007 and onward KL and Danske Regions became co-signers.

Beginning in 2007, KL takes on an increasingly active role. In 2015, they publish their “joint municipal” perspective on strategy [36] as a pendant to the “joint public” strategy [35]. They also publish “Action plans” [37] for how to achieve the strategy as well as a “Project Catalogue” [38]. The status today is that work has started on the next strategy probably named 2021-2025. KL has also recently published the municipality perspective [39] coined “At the frontline of future welfare”.

4.1. The Whitebook breakdown

In 2003, as mentioned above, a Whitebook on IT Strategy [31] was presented to the public. It was meant to be used throughout the public sector but failed to diffuse and gain adoption. Ten years after the launch one of the authors did an interview study that included the Agency of Digitization, a number of the Enterprise

Architects that contributed to the Whitebook, and other key players from both Danish regions and municipalities. The conclusion was that it had not diffused to very many Ministries (other than the Ministry of Finance from whence it was published); it had not diffused widely across the five Danish Regions; and it had not diffused to the average Danish municipality – possibly only 10 out of 98 applied it (our estimate).

What were the reasons for this failure? First, the Whitebook was not written in a way that was easy to apply. Second, diffusion was not seen as an important task at the time for the Agency of Digitization. Third, it was meant as a kind of pilot strategy – it was one of the first strategy documents launched from the Agency on glossy paper with fine print.

Looking back, the Whitebook was a strategy that stayed on paper and never became action. In that sense it illustrated the point made by Henry Mintzberg in *The Rise and Fall of Strategic Planning* [40]; only 10% of strategies written are ever implemented.

Some of key players involved in writing the Whitebook, however, would not agree that the Whitebook was a breakdown. Instead they saw it as a success in that it was setting the agenda for enterprise architecture across the public sector. Furthermore it influenced the strategies that followed from 2004-2007 [32] and 2007-2011 [33].

In relation to resilience the Whitebook was the first strategy documents on glossy paper; but it failed to diffuse widely. However, this way of strategizing was different: the derivation of digitalization strategies included execution and actions strategies.

4.2. Cross-sectoral collaboration

A structural reform in 2007 of the Danish public sector entailed a new division of municipalities and regions and a new distribution of tasks between municipalities, regions and state. This reform also affected the collaboration regarding the strategic work of digitalizing Denmark. KL, Danish Regions and the Agency for Digitization became contributors at crafting the national digitalization strategies 2007-2010 [33], 2011-15 [34], and 2016-2020 [35]. These new ways of collaborating at a strategic level also dribbled downwards to the more operational levels amongst the 98 municipalities. Likewise, a cross-sectoral interdependence paved the way for collaborations, not only across the 98 municipalities, but also across state and regions. This interdependence is exemplified by one interviewee who states: *"Cross-sectoral issues. An example of this has been the 'water, terrain and climate' in the technical area, where we have to say that we cannot solve this by having digital efforts across all 98, because we have a lot of data and a lot of efforts that lie with the Danish Agency for Efficiency and Digitization over in the state (in STFE). We need a collaboration here in order to lift our efforts here."* (Cited from Interview in KL, November 2019).

The increased involvement of multiple agencies and the *cross-sectoral collaboration* indicates a way to overcome some of the hindrances from the experience in the Whitebook breakdown. This element could be important to government-related organizations because studies in other sectors link resilience to intraorganizational elements rather than interorganizational elements [cf. 9].

4.3. The ability to learn in many ways: The digital post challenge

In 2012 the Danish Parliament legislated the Public Digital Post [41]. This law states that every legal entity should have a digital mailbox from 2013 onwards and every Danish citizen aged 15+ should have one beginning in 2014. Further, it stated that a digital message from a public institution is regarded legally as "read" when the message has been sent and can be accessed digitally.

This event followed a requirement from 2010 that the Danish public sector – at the state level and locally in the municipalities – should be ready to receive digital post. However, in 2013 two Danish researchers published a survey. They had sent out email and digital post to 243 instances in Danish public sector. They found that 8 out 10 public authorities never answered email. "It has been striking to us that it is so bad", said one of the researchers [42].

Another initial problem was that all Danish businesses should have registered their account in Digital Post before a deadline set in 2013. But three months before the deadline only 90,000 of 660,000 businesses were registered. The 90,000 registrations resulted in 33,000 calls to support [43]. Seventeen days before the deadline, 553,000 businesses were not registered so the Agency responsible had to announce a delay.

However, following this poor beginning the Agency did several things to diffuse and help the implementation. They applied organizational change management using both positive and negative incentives. An example of the latter was that the Ministry of Finance deducted the money from local budgets that municipalities received to pay stamps for old-fashioned snail mail. In November 2015 the Danish Agency of Digitization published an evaluation report on the implementation of the Digital Mail project in Denmark [44]. In the conclusion of the report it is stated that "the

transition as a whole has been satisfactory" [44, p. 9] and that "the many efforts together bears witness to the fact that the public sector together has solved the large undertaking of making citizens ready for Digital Post".

The focal element that we find in the Digital Mail case is that the Agency responsible for Digitization showed *an ability to learn in many ways*.

4.4. New ways of strategizing

In the aftermath of the Whitebook case, the agency at the helm, the Danish Agency for Digitisation, learned from their mistakes and found *new ways of strategizing*. In the following strategy (2004-2006) it was clearly stated that the responsibility of executing the strategy fell into the hands of the local authorities:

"Project Digital Management creates a common framework and supports cross-border collaboration, but the responsibility for realizing tangible benefits involves and obliges the individual authorities to work for the strategy's goals - across sectors and levels of government throughout the public sector." [32, p. 3 our translation].

Such 'new ways of strategizing' implied that a range of governing bodies oversaw securing the realization of the national digitalization strategy. Having learned from the early strategizing work in the beginnings of the 2000s, strategizing had taken on a different form with new collaborating bodies that, over time, also led to new ways of strategizing. From the 2011-15 strategy and onwards we have seen steps to support the cross-sectoral collaborations, strategy development, and implementation at all levels of public sector administration:

"The public sector's eGovernment strategy puts special emphasis on coordinating the implementation of these four initiatives across the various levels of public sector administration. This gives the central government, regions and municipalities scope to exploit the opportunities of digitalization and realize their own strategies within the shared framework." [34, p. 7].

4.4.1. The top-down and bottom-up digitalization strategy. As described previously, the political and governmental levels have been quite meticulous in continuously formulating and distributing new digitalization strategies every fourth year. This effort began with the collective work on digitalizing the nation in the late 1990's (Whitebook Strategy and Project Digital Administration). The approach of developing collective strategies based on the political agenda and supported by financial incentives had proven efficient in powering the locomotive of digitalization. Some municipalities were lagging and vacated the first-class seats behind the digitalization locomotive; but they were still on the train. These municipalities will proceed with the digitalization process because the collective effort will ensure that the fundamentals are in place either from adhering to a previous strategy or due to the help and support of the collective embodied in the agency of the County Council Association. *"We are an interest organization. So, we gather the municipalities and find out what common interests we have across our municipalities. Where is it that it makes sense for each municipality to go ahead. Where does it make sense that we as a collective of 98 municipalities make an effort, and where does it make sense that all 98 do something?"* (Cited from Interview in KL, November 2019).

Contrary to the top-down approach that was exercised in the early days, we have also in our contemporary data seen a more bottom-up approach. For example, when a city council, with the mayor at the helm, instigates the local digitalization strategy work. Then as a municipality they have to act upon the political agendas which may change from year to year, but they also have to listen to their citizens who are the real users in need of and affected by this digitalization agenda. So, he learned the hard way that strategies must be based on those needs of the citizens, and not just compliant with the whims of a proactive employee. Such an employee engages everyone and only drives the project because that project will die once the person is discharged (source: Interview with the Mayor and the CIO of a municipality, November 2019).

4.4.2. The national digitalization narrative differs from the local narratives. As the strategies differ from top-down and bottom-up, so do the political stories or narratives about where to focus in the pursuit for digitalizing the Nation. The various national and municipality level digitalization strategies change over the course of time depending on the next step in the national digitalization efforts. However, the way each municipality has chosen to implement or carry on the national strategies in their own organization varies from mimicking the national strategy at a local level to fully integrating digitalization across all parts and services in the municipality. The number of municipalities that have material publicly online regarding their digitalization efforts are listed below. Some municipalities may have several strategies, so the list does not add up to 98:

- 5 municipalities do not have a digital strategy
- 55 municipalities do have a digital strategy
- 53 municipalities do have one or more digital strategies for subject area(s)

- 12 municipalities have listed digitalization initiatives

The local narratives allow the individual municipality to showcase themselves to the public, to become forerunners of the digitalization process, or to just ride the digitalization train and focus on other citizen valued issues.

The work of continuously framing new digitalization strategies from a national level and taking steps to ensure that execution of the strategies is in line with the writings on strategy execution [45]. It has turned into a successful way of ensuring digital resilience at an organizational level across sectors. Due to the public and continuous top-down strategy work from the governmental level, these strategies work as a lighthouse for the localized strategy work. Likewise, the narratives of the strategies, regardless of the level of authority, tell the public the story of the political plans and actions of the given body: the focus, priorities, and progression. As such, the ecosystem of local and national interrelated influences become evident as resilient actions.

This historical account describes the three elements in the pattern of resilience: the new way of strategizing, the collaboration across all levels of the public sector, and the ability to learn in many ways.

4.5. The pattern of digital organizational resilience at play

The historical research of the previous elements elicits a pattern of digital organizational resilience. With the latest edition of the digitalization strategy for 2016-2020 KL devised plans and strategies for a range of initiatives, action plans, milestones, etc. There was a total of 18 initiatives [35] ensuring the execution of a strategy [45]. This strategy also follows the aim of automating excess manual processes. In this regard we would expect that the requirement and the implementation processes would be a challenge in atomizing project processes. However, the Agency for Digitization has managed to automate the implementation process between the governmental level and the municipalities by the introduction of the 'Click' system. This system ships out all mandatory tasks that the municipalities have to solve in order to keep up with the current national digitalization strategy. This system provides a certain sense of overview and security in knowing that you are still riding the digitalization train. It also relieves the individual municipality of a lot of work rearranging internal processes. (source: Interview with Department Head at the Agency, as well as the Mayor and the CIO of a municipality, November 2019).

This pattern of change indicates that the interplay between all the governing parties shows a build-up of digital organizational resilience based on the experiences and knowledge that has led the actors to combat the challenges and hindrances faced during close to 20 years of digitalizing the Danish Nation. The pattern shifts into *new ways of strategizing* by enacting digitalization strategies at all levels of public administration, regardless of some laggard or innovator municipalities. The shift improves resilience by allowing and making space for the diffusion and adoption [46] of the technologies (or at least basic parts of them). Quite early the element of *cross-sectoral collaboration* became a stern necessity in succeeding with the execution of the digitalization strategies. The element of *new ways of learning* how to overcome the barriers and hindrances, shows how maneuverable and resilient (in the sense of being able to cope in a positive manner to unexpected situations) [12] the endeavor of digitalizing the Nation had become.

The pattern we see here is that all organizational resilience elements recur with regularity in resilient government organizations. There is a new digitalization strategy. There is collaboration across the public sector. And there is a particular goal of achieving learning through collaboration and action.

4.6. New challenges arise

Even though cross-sectoral collaboration is essential for driving the digitalization process, power does come into play and is not easily shared.

The case of the 'water, terrain, and climate' initiative (mentioned by the collaborating body) is also mentioned by one of the municipalities. Here the story is not about collaboration. Rather it is about power. Once extrapolated from the collective of the municipalities, the suppliers of data collected in the territory of the municipalities now act as vendors forcing the municipalities to pay for their own data. This resale is because the data was collected with technology owned by the vendors. Hence, a struggle for the right of ownership of data is lurking beneath the surface:

"For a number of years, we simply have not been sharp enough in the municipalities to ensure how we contractually secure ownership of our data." (source: Interview with the Mayor and the CIO of a municipality, November 2019).

Such events elicit new challenges and barriers that seem to arise in the mist of the new landscape. The authorities are challenged by the breach of their

monopoly, the digitalization pact, and the focus on ownership of data and data security.

"Why is it that our own companies are becoming islands where they suddenly have their own agenda and disconnected from the needs that we as founders have ... and then that uncertainty arises. […] And I often feel that I know that we are simply doing this to protect data and the customer so that you do not suddenly end up in a situation where there is someone that misuses data. And I haven't found the political argument against it yet." (source: Interview with the Mayor and the CIO of a municipality, November 2019).

This focus on data might point to a new pattern of change that underlines the continued importance of organizational resilience while an ability to constantly learn in new areas becomes extremely important. We can see the interaction between all three change elements growing more equal: action interacts with collaboration and collaboration interacts with learning and learning interacts with action, and so forth.

5. Discussion

The pattern of change starts with the historical event of the creation of a toothless strategy. It set an assumption for what followed by proposing that a national IT architecture was desirable; but otherwise did little more than open a debate about such an architecture without action. It set an attractive goal and plan, but without accumulating the energy necessary for stepping off. From a resilience viewpoint, the Whitebook was a mindset disruption, an event that began creating an awareness that technological disruptions were coming. In that awareness we can find the seeds of a national capability to face such disruptions and operationally manage such shocks.

In the case of the Digital Mail challenge, we see the capability for resilience developing at the level of national agencies. Here, a national agency is developing the capability to "sense and correct maladaptive tendencies and cope positively with unexpected situations" [12, p. 1627]. From the viewpoint of the national strategy, local governments were maladaptive. They coped in a positive way: not by forcing technical conformance by fiat, but rather making maladaptation a more expensive option for local governments [an approach called "soft control", 47].

Next, resilience begins developing across the local level of government. For local governments, national strategies for IT were a series of disruptions framed by administrative sectors such as water and climate. Each local government had to find ways to cope with these disruptions. Local governments developed resilience capabilities by collaborating with each other in order to manage the disruptions across multiple sectors as a shared problem. Resilience increased in a distributed and localized way.

With the pattern of change to the ways of strategizing the process for digital transformation, the Danish Public sector matures. Notions of digitalization strategies materialize in national agencies and local governments. In an era dominated by a financial meltdown and rising awareness of "green" goals, eGovernment becomes cool [48]. Resilience in local governments takes shape in bold decisions about how to effectively adapt national initiatives for particular locales.

The history narratives show how resilience in national agencies takes shape through a heightened awareness of, and respect for, local narratives. Through automation, the disruption by national strategies upon local governments becomes routinized. The sense-and-correct resilience of local governments becomes routinized. However, because of this routinization, national agencies begin gaining more timely awareness of how these local responses disrupt the intentions of the national agencies. As a result, the national agencies begin to develop a sense-and-correct learning posture. Resilience permeates the eGovernment landscape and enables digitalization transformation to proceed in a healthy way.

This historical account demonstrates how an emergent network of national and local government organizations developed an ecosystem of digital transformation based on a quality of resilience. Digital organizational resilience is a response mechanism to the continuous shocks, disruptions, and maladaptive tendencies that proceed from new information technologies. The transformation process is itself an ecosystem that extends beyond the organization because the resilience qualities of the various cross-sectoral organizational units grow to become an interactive network of resilient actions. Digitalization strategies and adaptations in one part of the network disrupted digitalization in other parts, which in turn, produced further disruption and consequent resilience. This pattern extends beyond the public sector. The same kind of capabilities developed for sensing and correcting maladaptive disruptions does appear in dealings between government and vendor organizations. Government organizations find their well-developed capabilities for digital organizational resilience useful in adapting to disruptive events arising in their vendor relationships.

6. Conclusion

The three elements mentioned in 'The History' section (new ways of strategizing, cross-sectoral col-

laboration, and new ways of learning) occur with regularity throughout the history of our case and constitute a pattern for developing digital organizational resilience in government organizations. As proceeds from historical research, the pattern contributes to practitioners and researchers with potential for serving as an analytical lens and methodological emergent phenomenon, though it has not been tested as a prescription. Future research is needed to develop the pattern into a methodology. Such research could then test the methodology using interventionalist research such as Design Science or Action Research.

Further, our research provides contributions to the literature in organizational resilience and breaks new ground by conceptualizing digital organizational resilience and e-government organizational resilience.

For organizational resilience in general, our study contributes a historical account of how large federated organizations can grow resilience in the organizational network as a resilience ecosystem. This contribution provides a novel study in an area where the paucity of organizational research has been notable [4, 9].

We also extend the work on organizational resilience by contributing an original conceptualization of *digital organizational resilience*. This conceptualization is timely, because many contemporary organizations are struggling today with strategies for digital transformation [14]. The concept distinguishes organizational resilience (which can be anchored to myriad organizational structures and human capability) [9], with resilience that arises through digitalization (as both the organizational challenge and its organizational and technological resolution).

We also contribute further work in how e-government and public sector organizations successfully cope with digitalization and digital transformation by developing their organizational resilience as a means to accomplish such a transformation. Resilience, in relation to e-government, has been a feature in strategic plans to create smart cities, resilient societies, etc. [7, 49]. In our contribution, we respond to calls for research into resilience as a quality of e-government and public sector organizations [8].

Lastly, by applying Mason et al's historical research techniques to the IS field, our historical account of Denmark as a most digitalized country contributes to forming a methodological tradition in IS history writing.

10. References

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