Becoming a most Digitalized Country: A History of Digital Organizational Resilience in Denmark

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Published in:
Communications of the Association for Information Systems

Publication date:
2022

Document Version
Peer reviewed version

Citation for published version (APA):
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Please cite this article as: Fleron, Benedicte; Pries-Heje, Jan; Baskerville, Richard: Becoming a most Digitalized Country: A History of Digital Organizational Resilience in Denmark, Communications of the Association for Information Systems (forthcoming), In Press.
Becoming a most Digitalized Country: A History of Digital Organizational Resilience in Denmark

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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 a continuity in the transformation. From significant events in the history of Denmark becoming a digitalized nation, we find a pattern of what constitutes digital organizational resilience in e-government: first, new ways to strategize digitalization, second, collaborative strategy execution across the public sector that envelopes the ability to learn from overcoming barriers and hindrances, and third, an organizational resilience path that iterates action, collaboration, and learning. Digital resilience has previously been studied in the context of individual learning and cyber security. The pattern found in the historical account is a promising basis for understanding and achieving resilience in a transformative digitalization strategy in the public sector.

Keywords: Digital organizational resilience, Policies and strategies for digital government, Strategy, E-government, IS history.

[Department statements, if appropriate, will be added by the editors. Teaching cases and panel reports will have a statement, which is also added by the editors.]

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This manuscript underwent [editorial/peer] review. It was received xx/xx/20xx and was with the authors for XX months for XX revisions. [firstname lastname] served as Associate Editor. or The Associate Editor chose to remain anonymous.]
1 Introduction

All over “[t]he public sector is experiencing tremendous pressure for strategic change.” (Joyce, 2000, cover). Managers in the public sector are required to “… be more responsive to the public and to deliver more value with constrained budgets” (Joyce, 2000, cover). 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. (Soule, Puram, Westerman, & Bonnet, 2016). Furthermore, the crisis brought about by COVID-19 has with all clarity shown the importance and necessity of a digitalized public and private sector. Digitalization encompasses strategies and infrastructures regarding hardware, internet access, software integration, and digital communication (Telecommunications Infrastructure Index II in UN-EGS, 2020). Digitalization requires the necessary legislation to manage data, security and privacy along with online services delivery, innovative partnerships, and open government data (Online Services Index in UN-EGS, 2020). Also required are the human competencies to utilize the technologies (Human Capacity Index in UN-EGS, 2020) and to draft the appropriate digitalization strategies for changing work practices to accommodate digital services and new ways of serving the citizens.

In 2020, Denmark was ranked highest on UN’s E-Government Survey (Table 1.2 in UN-EGS, 2020, p. 6) indicating Denmark having a very high performance when it comes to public digitalization. An element that makes Denmark rank amongst the most digitalized countries in the world is the high connectivity in the country. Ninety-three percent of all households and businesses have broadband coverage with speeds of minimum 100 Mbps download/30 Mbps upload (DESI, 2020). According to DESI 2020 - DK, the use of Internet services in Denmark is high and Danes are eager Internet users. Even though Denmark is strong on all measures there are still room for improvement. On matters like integration of digital technologies we have seen growth in SMEs selling online, online cross-border sales, and e-commerce turnover. However, some stagnation in cloud and big data usage has been observed. Though Denmark performs very well on digital skills, its portion of ICT specialists and female ICT specialists has stabilized since 2018 and only about five percent of the graduates in Denmark are ICT. Such stabilization is a huge challenge for the growth of digitalization in industry and the public sector because it results in a shortage of qualified labor1(Breinstrup, 2021). However, on the matter of digital public services Denmark’s share of citizens interacting with public authorities online is relatively high. Denmark is a leader in digital public services provided for businesses (DESI, 2020; UN-EGS, 2020). Collectively, these performance measures are possible because Denmark has systematically worked with e-government strategies. Local, regional, and national government levels have set the course for the cohesive digitalization of the Danish public sector. The government continues to monitoring the status of the initiatives to support the digitalization of trade and industry, to provide the best conditions for the digital transformation of businesses, and to ensure that Danes are the most digitally prepared and secured citizens in the EU (DESI, 2020; UN-EGS, 2020).

COVID-19 has become a litmus test for nations to realize their level of successful digitalization. The demands that followed in the path of the pandemic strained digital infrastructures and services. Elements that were relevant indicators of a strong and resilient digital transformation and economic recovery included high-capacity networks and 5G, digital skills and advanced technologies for businesses and digital public services (DESI 2020 – DK:3). Most of these elements were well established in Denmark. As a result, the impact on key societal indicators has been manageable, and Denmark could execute a total lock-down of the country March 11, 2020, and still sustain a relatively high productivity. Across industries, many managers experienced normal or higher levels of productivity amongst their employees; and they even got fewer sick days in the bargain2.

Countries that ranked lower in public digitalization appear to have struggled more in the coronavirus crisis. The necessary investments in infrastructures in general, and in digitalization in particular, lagged; COVID-19 has, in a brutal way, shown us what is at stake if we do not keep up with the technological development at all levels of the society. Italy, for example, ranked near the bottom of the DESI 2020 survey and ranked 37th on the very-high scale of the EGS survey. In 2018 only 3.6% of employed people worked from home in Italy, compared to 7.8% in Denmark (Eurostat, 2020). With COVID-19, Italian

1 https://apps-infomedia-dk.ep.fjernadgang.kb.dk/mediearkiv/link?articles=e875e49b accessed October 17, 2021
2 https://finans.dk/erhverv/ECE12632282/hjemmearbejde-goer-danskerne-produktive-kreative-mindre-syge/?ctxref=ext accessed October 17, 2021
companies large and small scrambled to develop the digital capabilities essential to survive in a pandemic-locked-down environment (Valentina Za, 2021). It took a coronavirus crisis to force Italy into becoming a digital country: “As of 2019, three out of ten people in Italy were not regular internet users yet, and more than half of the population still lacked basic digital skills. … That’s very likely going to change.” (Guerrini, 2020). The government also scrambled: introducing new legislation early in the lockdown to enable companies to implement new forms of smart working, eliminating legal requirements for a previous agreement. In other words, the disruption spurred a 37th ranked E-Gov government into active societal-changing digitalization. For some, the virus has a “silver lining” (Guerrini, 2020).

If digitalization requirements are not met at the government level, it can result in hardships on citizens. Even in more highly digitalized countries, the lack of digitalization as government policy created chaos in society. In parts of Germany (ranked 12th in DESI 2020, 25th on the very high scale of the UN EGS, and first amongst EU countries in 5G readiness) stiff, discouraging regulation of home schooling created a void in digital capabilities for work-at-home school students. Children in analogue home schooling had to do schoolwork with pen and paper because there simply was not enough hardware available, or distribution chains were not in place to ensure digital home schooling. Parents brought school materials back and forth between the school and home because of insufficient hardware, software or platforms to run teaching and learning programs. Teachers, children, and people working from home could not communicate due to poor internet accessibility (Reiter, 2021). Unfortunately, the educational sector was not alone in facing these challenges, as the healthcare sector experienced similar barriers. As in the case of Italy, there was a silver lining: the Corona crisis also enabled resourcefulness in the usage of existing technologies and innovative new digital solutions (Matthiesen, 2021).

Government leaders in nations caught poorly prepared for a pandemic are realizing what the private sector has known for years. Timely technical equipment and digital processes must have highest priority as must the healthcare sector. Education, healthcare, and other cross-national sectors must be trussed digitally to safeguard a country’s competitiveness and “the deepening gorge between the digital equipment in the public sector and the private companies becomes a severe problem still, in relation to being an attractive place to run a business.” (Russwurm, chair of Bundesverband der Deutschen Industrie, BDI. Our translation) (DPA, 2021).

The COVID-19 situation in countries like Italy and Germany provide examples that illustrates the magnitude with which digitalization infuses (or defuses) every part and level of modern society. Governments can no longer afford to forego local digitalization solutions. So, the pressure has only been increasing with demands for digitalization. “Digital business strategy has evolved in its own right. Starting off in the private sector as part of every department, it has become the core of business strategy when it comes to planning for the future” (Lerner, 2015, p. 48).

On that basis, 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 (Annarelli & Nonino, 2016), cybersecurity (Björck, Henkel, Stirna, & Zdravkovic, 2015) and disaster recovery (Sahebjamnia, Torabi, & Mansouri, 2015), 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. Stone, Knapper, Evans, & Aravopoulos, 2018) rather than just creating resilience in the government organization itself.

In this paper, we consider the problem of how public sector organizations ensure effective pursuit of digitalization and digital transformation. Using an 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. As such, our research contributes to our knowledge of resilience in government organizations (Abdullah, Noor, & Ibrahim, 2013) by analyzing which factors were used in response to the historical events that our account of Denmark’s digital transformation unfolds.
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 (Annarelli & Nonino, 2016). The concept has been widely adapted and applied in information systems (IS) and its related fields. Examples include the study of resilience in organizations (Abdullah et al., 2013; Gover & Duxbury, 2018), disaster recovery (Sahebjamnia et al., 2015), cybersecurity (Björck et al., 2015), elite sport (Fasey, Sarkar, Wagstaff, & Johnston, 2021), human resource development (Mitsakis, 2020), supply chains (Annarelli & Nonino, 2016), ecologies (Linnenluecke, Griffths, & Winn, 2012), and individuals (Lengnick-Hall, Beck, & Lengnick-Hall, 2011).

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” (Annarelli & Nonino, 2016, p. 3). It is “the firm's ability to sense and correct maladaptive tendencies and cope positively with unexpected situations.” (Ortiz-de-Mandojana & Bansal, 2016, p. 1627). And this coping involves the ability to improvise (Coutu, 2002).

Hillman & Guenther (2021) in a recent review found that many see organizational resilience as “being fuzzy” and try to define it as a more precise construct. Gover and Duxbury (2018) 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 (Lengnick-Hall et al., 2011). Under the latter perspective, organizational resilience is developed through organizational structures, such as ensuring business delivery (Björck et al., 2015), anticipatory adaptation (Linnenluecke et al., 2012), resource allocation (Sahebjamnia et al., 2015), etc. Annarelli and Nonino (2016) 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” (Glossary, 2021). 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 (Joyce, 2000). 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 (Bloomberg, 2018).

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 (Urbach et al., 2019). 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) (Baskerville, Myers, & Yoo, 2020).

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 (Lindgren, Madsen, Hofmann, & Melin, 2019). 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 (Flak & Rose, 2005). 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) (Lindgren et al., 2019).

3 Research Method

Following Mason, et al.’s (Mason, McKenney, & Copeland, 1997) steps for writing histories in the information systems field, we build on this methodological approach for studies in IS history (Porra, Hirschheim, & Parks, 2014). 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 (Mason et al., 1997; Porra, Hirschheim, & Parks, 2005).

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 (DESI, 2020). 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 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., Berger & Hertzum, 2014; Berger, Hertzum, & Schreiber, 2016; Hjort-Madsen & Pries-Heje, 2009), legal documents, municipalities’ websites and strategy documents over time going back to the first reports in the 90s (e.g. Dybkjær & Christensen, 1994); 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.

We have conducted in-depth interviews involving key stakeholders from the Danish public and private sector. At least one of the authors has participated in each of these interviews which 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 (Baskerville et al., 2005; Hjort-Madsen, 2006).
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 (Berger et al., 2016; Pries-Heje & Berger, 2016).
4. The fourth burst took place in 2018 focusing on the implementation of smart cities at the municipality level in Denmark (Cranefield & Pries-Heje, 2019).
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 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.

**Figure 1:** History timeline with the indication of major events and our findings and collected data; = law initiative, = strategy document, = 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 e.g., by peer reviewed research and governmental published documents, and convergence e.g., by 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

Mason et al. (1997) explain how different kinds of patterns provide analysis tools for analyzing and interpreting historical evidence. Causal chains are one of these kinds of patterns that proved appropriate for analyzing our evidence. Cause-and-effect relationships are the “essence of historical interpretation”; causes create momentum and “the effects form causal chains” (Mason et al., 1997, p. 315-316). Causal chains in historical research tend to be inductive and limited to showing causes are a necessary but not sufficient condition for effects (sometimes known as a producer/product relationship). From the retrospective overview of events that our timeline provided we identified causal chain patterns (regularities in the data). We concentrated our focus on the major changes in our timeline centered around the public digitalization strategies. Hence, what we interpret as major changes were changes at the strategical level caused by, or being an effect of, the public digitalization strategies both national and regional. Leading to an emerging pattern of changed behavior or approach to strategizing, to executing strategies, and to collaborate. 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 (Porra et al., 2014), 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 (Munslow, 2006). It is an account of the emergence of Danish national digitalization strategy written from our interests and perspectives as information systems researchers (Munslow, 2006).

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 by creating meaning of the evidence and not simply reporting it (Smith, 1999). 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 (Porra et al., 2014).

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.

Originally, our story dates back to the time of punch cards and church records. In the 1960s and 70s there were punch card centers and centralized electronic calculating machines. Strategic thinking became part of the modernization program in the 1980s. The need for strategies took the political foreground in the
beginning of the 1990s. Accordingly, our main history of digitization in the Danish public sector starts in the 1990s even though our research database included documents from the 1980s.

As technology progressed and became even more entangled in our daily lives, the political agenda hardened toward countering the perceived threat to the welfare society. This agenda aimed at balancing the welfare society and the information society. Political areas related to technology were gathered in the Ministry of Research in 1993 (where also Universities were placed). In 1994 the European Union has the ‘Information Society’ on the Agenda (Bangemann, 1994). The Danish version of the European agenda targeted the new millennium and was called the *Info-Society Year 2000* (Dybkjær & Christensen, 1994).

In Denmark the ‘90s abounded with failed political IT projects (Johansson, 2004); so when the government changed in 2001, a new Digital Taskforce was established. The taskforce was headed by the Ministry of Finance and included members from other Ministries, KL, Amtsrådsforeningen (organizing what is now the Five Regions of Denmark), and two municipalities; Copenhagen and Frederiksberg. This move of centralization aimed to resolve previous issues with coordination and management that had led to public IT project failures.

Shortly after the first public sector strategy saws the light of day a new vision was stated (Den Digitale Taskforce, 2002). 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 late came the Whitebook on IT Strategy (Ministeriet for videnskab teknologi og udvikling, 2003).

In the following years four new strategies were published. The timeline in Figure 1 shows the main initiatives (illustrated by a document) coming at the national level in Denmark (Regeringen, KL, Amtsrådsforeningen, Københavns Kommune, & Frederiksberg Kommune, 2004; Regeringen, KL, & Danske Regioner, 2007, 2011, 2016).

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.

![State](State) ![Regions](Regions) ![KL](KL) ![Municipalities](Municipalities)

**Figure 2: Governmental levels in Denmark**

Beginning in 2007, KL takes on an increasingly active role. In 2015, they publish their "joint municipal" perspective on strategy (KL, 2015) as a pendant to the "joint public" strategy (Regeringen et al., 2016). They also publish "Action plans" (KL, 2016) for how to achieve the strategy as well as a "Project Catalogue" (KL, 2016). The status today is that work has started on the next strategy probably named 2021-2025. KL has also recently published the municipality perspective (KL, 2019) coined “At the frontline of future welfare”.

### 4.1 New Ways of Strategizing

The first event noticeable on our timeline is one of incoherent strategizing across different public sectors. The effect of this incoherence is a breakdown in strategizing; that in turn, creates conflicts among different
narratives about the strategy. As a final effect in the causal chain, the public sectors are compelled to seek out new ways to frame strategies such that they can be executed across different public sectors.

4.1.1 The Top-down and Bottom-up digitalization strategy

In the late 1990’s the collective effort on digitalizing the nation began with thorough and ongoing work by all governmental levels to develop and diffuse digitalization strategies every fourth year as mentioned above (Whitebook Strategy and Project Digital Administration). Based on political agendas and supported by financial incentives, this collective approach to develop strategies had proven efficient in driving the digitalization agenda. Due to the collective effort, even the municipalities that were lagging behind would not need to be in the driver’s seat of the digitalization racecar. The collective effort would ensure that they would stay on track and proceed at their own pace. The fundamentals would be in place either by following an earlier strategy or by the support from 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).

4.1.2 The Whitebook Breakdown

The first strategic move was the 2003 vision and strategy paper called ‘The Whitebook on IT Strategy’ (Ministeriet for videnskab teknologi og udvikling, 2003). It was meant to be used throughout the public sector but failed to diffuse and gain adoption. To support the strategy a law was passed proclaiming a federal bank account for each citizen for public and private payouts, called NemKonto, along with an e-Invoicing system which provided electronic payments between public and public/private entities.

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).

The Whitebook was not written in a way that was easy to apply and diffusion was not seen as an important task at the time for the Agency of Digitization. In hindsight, from KL’s point of view, the Whitebook strategy focused on administrative tasks in the e-days of the 200X’s. KL would use their influence to focus on digitalization as a matter of business development (from Interview in KL, November 2019). With this focus, the Whitebook became a kind of pilot strategy: one of the first strategy documents launched from the Agency of Digitalization.

As such, 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 (Mintzberg, 2000); only 10% of strategies written are ever implemented, it was simply a glossy paper with fine print.

Some of the 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 (Regeringen et al., 2004) and 2007-2011 (Regeringen et al., 2007).
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.

In the aftermath of the Whitebook case, the Danish Agency for Digitisation learned from their mistakes and shifted focus to local government. These historical events point to a change in the approaches to strategy deployment by the strategic bodies, and this lays the ground for the emergence of not only an ability to learn in many ways, but also 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.” (Regeringen et al., 2004, 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. In the 2011-15 strategy special emphasis was put on coordinating the implementation of initiatives across the various 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.” (Regeringen et al., 2011, p. 7).

4.1.3 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:

- 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.

4.1.4 Framing Nationally Executable Strategies

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 (Morgan, Malek, & Levitt, 2008). 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. What we see from the evidence in the strategies at hand and how they changed over time is how learning from one strategy work to the next not only helps creating new strategic focus points but learning how to strategize in new ways builds
organizational resilience at all three governmental levels. This is not the mere matter of ensuring digital strategies at all governmental levels of the country, it is the way in which these strategies are conducted, the approach to strategizing that is a change enforcing the path to a digitalized country.

4.2 New Ways of Strategy Execution

We also found a change in the way strategies had to be executed across different public sectors. The different sectors were driven to collaborate. First the different sectors were compelled to reconcile their differing narratives. This demand further compelled them to find new ways to learn about the strategy and the underlying technologies.

4.3 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 (Regeringen et al., 2007), 2011-15 (Regeringen et al., 2011), and 2016-2020 (Regeringen et al., 2016). 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. 2018).

4.3.1 The Ability to Learn in Many Ways: The Digital Post Challenge

On the legal front, the Danish Parliament passed a 2012 law that established the Public Digital Post (Danish Ministry of Finance, 2012). In the course of the next couple of years Denmark implemented digital mailboxes for every legal entity and every Danish citizen 15+ years. 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.

The 2012 public digital post legislation also required all levels of the Danish public sector to be ready to receive digital post. However, in 2013 a survey study by two Danish researchers found that 8 out 10 public authorities never answered email. That research sent out email and digital post to 243 instances in Danish public sector. “It has been striking to us that it is so bad”, said one of the researchers (Fribo, 2013).

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 (Thomsen, 2013). 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 (Danish Digitization Agency, 2015). In the conclusion of the report it is stated that “the transition as a whole has been satisfactory” (Danish Digitization Agency, 2015, 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 National Association of Municipalities had taken an increasingly active political role; in 2015 they published their own strategy and action plan as appendices to the national publications. Hence, organizational resilience emerged at the regional and municipality level of government as a change that we saw from the evidence in our historical outline as an ability to learn in many ways.

4.4 Digital Organizational Resilience at Play

At a meta level, we found an accumulative pattern in the data represented by our historical timeline. In this accumulative pattern, the new ways of strategizing (first major historical event) propelled the different sectors to find new ways of executing strategies (second major historical event). The resulting development of these two capabilities sets up resilience such that, when new challenges arise, the different sectors iterate processes that take action, collaborate, and learn. In this way, collective sectors can encounter disruptions and cope positively in recovering.

The Agency for Digitalization has succeeded in automating the implementation process between the government and the municipalities by introducing a system called ‘Click’. In ‘Click’ all mandatory tasks that the municipalities must attend are automatically shipped out, so they stay on track with the current national digitalization strategy. Here we see a digitalization effort that provides the local authorities with a sense of assurance that they stay on track with the digitalization process. The effort also provides an overview of what needs to be done in order to relieve the individual municipality of excessive work involved in rearranging internal processes (source: Interview with Department Head at the Agency, as well as the Mayor and the CIO of a municipality, November 2019). 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 (Regeringen et al., 2016) ensuring the execution of a strategy (Morgan et al., 2008).

It is notable at this point in our analysis that, had we taken a case study approach instead of an historical approach, we would probably have expected that it would have been challenging to automate project processes. Instead, the historical research approach reveals the causal effect of the major changes in the history of the strategic events of digitalizing Denmark. The effect resulted in digital organizational resilience in the form of initiatives at different governmental levels. These initiatives were ways to devise digitalization strategies that follow the aim of automating manual processes.

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 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 (Rogers, 2010) 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) (Ortiz-de-Mandojana & Bansal, 2016) 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.

4.4.1 New Challenges Arise: Iterating Action, Collaboration, and Learning

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 which with almost any certainty will become a focus for new digital strategies might infuse 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 story of Denmark becoming a most digitized country started with two breakdowns. The first breakdown was the 2003 event of creating a Whitebook that did not disseminate. 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 any observable actions in practice. Overall having a solid enterprise architecture in municipal, regional and state entities was an attractive goal and plan. However, the breakdown seen from a resilience viewpoint was that the Whitebook was a mindset disruption, an event that began creating an awareness that technological disruptions were coming. But as it did not disseminate into actions in the targeted entities, it was a breakdown. In that awareness we can find the seeds of a national capability to face such disruptions and operationally manage such shocks.

The second breakdown can be linked to the case of the Public Digital Post from 2012. The breakdown here was that the Digital Post was adopted by municipalities as expected. At this point 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” (Ortiz-de-Mandojana & Bansal, 2016, p. 1627). From the viewpoint of the national strategy, local municipal governments were maladaptive. Thus, at the national level the breakdown was handled not by forcing or commanding technical conformance, but rather by making maladaptation a more expensive option for local governments (an approach called “soft control”, Couger, 1986). So, it is clear that, from the 2003 Whitebook breakdown to the 2012 Digital Post breakdown, organizational resilience had started to develop.

The notion of breakdowns has been in focus before in relation to other areas than organizational resilience. Madsen (1988) discussed breakthrough by breakdown when designing an artifact; a breakdown forces one to “reflect on their own tasks”. Later, Kim Madsen has used the same idea of breakthroughs for reframing (Greenbaum & Madsen, 1988) and for interaction design (Kensing & Madsen, 2020). An example here is generating visions for future systems.

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 both a distributed and a localized way.

Over the years, the Danish Public sector matured with more and more changes in the ways of strategizing the process for digital transformation. Notions of digitalization strategies materialized in national agencies
and local governments. In an era dominated by a financial meltdown and rising awareness of “green” goals, e-government became cool (Towns, 2008). Resilience in local governments took shape in bold decisions about how to effectively adapt national initiatives for particular locales.

We observed that there was a clear link between organizational resilience at the national and local level. We found that resilience in the national agency took shape through a heightened awareness of, and cooperation with, local municipal entities. Also, the collaboration over time became automated in a way such that new changes or disruption by national strategies upon local governments became routinized. However, because of this routinization, national agencies began gaining more timely awareness of how these local responses disrupted the intentions of the national agencies. As a result, the national agencies begin to develop a sense-and-correct learning posture. Hence, what we could call the feedback mechanism between levels was instrumental in developing organizational resilience:

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 change events described in ‘The History’ section (which we coined; new ways of strategizing, new ways of strategy execution, and the resilience path) occur with increasing regularity throughout the history of our case and constitute a pattern that over time developed digital organizational resilience in the government organizations. Hence, the synthesis of our findings is that it was the organizational resilience developed over time that led to Denmark becoming a most digitized country.

As proceeds from our historical research, the pattern contributes to both research and practice with potential for serving as an analytical lens and a method for managing emergent organizations, though it was not possible to evaluate that proposition in this paper. Future research is needed to develop the patterns 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 an 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 (Annarelli & Nonino, 2016; Gover & Duxbury, 2018).

Our concept of organizational resilience is enhanced by our original conceptualization of digital organizational resilience. This conceptualization is timely, because many contemporary organizations are struggling today with strategies for digital transformation (Urbach et al., 2019). The concept distinguishes organizational resilience (which can be anchored to myriad organizational structures and human capability) (Gover & Duxbury, 2018), 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. By tracing the history between different levels, we also show that the coordination and feedback mechanism enhances digital resilience.
Furthermore, resilience, in relation to e-government, has been a feature in strategic plans to create smart cities, resilient societies, etc. (Stone et al., 2018; Zait, 2017). We contribute to the research into resilience as a quality of organizations (Abdullah et al., 2013) focusing on e-government and public sector. 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 historical research.
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