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# *Denmark review study: the Danish digital journey and case studies*

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# Contents

# 1 Introduction

This report sketches the evolution of the digitalized public sector in Denmark and highlights central policy initiatives and milestones that have contributed to a comprehensive digitalization of public sector administration and service. After describing Denmark's level of digitalization on the basis of international benchmarks, the report offers a brief history of the Danish digitalization initiatives, the key outcomes, central digital government arrangements, as well as a section focusing on the recent initiative to make legislation 'digital-ready'.

It then describes two illustrative digitalization cases. The first is about the centralization and automation of administrative case processing, highlighting how standardization and automation have efficiency potentials, but also discussing implications related to privacy rights, changes in public service delivery, and invisible work. The second is about digitalization in the health sector, and it describes the strategies and initiatives in this area, focusing on the establishment of a coherent digital health sector based on shared data and 'the patient in the center'. It highlights some organizational challenges of implementing shared health platforms, but also describes how the digital infrastructure allowed for an efficient response to the Covid-19 pandemic.

The last part of the report focuses on some of the challenges related to the ambitious digitalization agenda, as well as insights from the discussions of potentials and challenges. Digital inclusion is selected as a focus area because it continues to be an area of concern and discussion, even in a country where more than 90% of the population are digital citizens. Other challenges are highlighted as important for the legitimacy of the digitalization agenda – namely challenges resulting from the cost of large IT projects, flawed digital solutions, and experiments with immature technologies. The report ends by discussing the insights that can be derived from studying a country with very ambitious and successful digitalization strategies, in particular with regards to upholding legitimacy in relation to digitalization.

# 2 Evolution of the digitalized public sector in Denmark

Denmark has one of the most digitalized public sectors in the world. The European Commission's Digital Economy and Society Index (DESI) (2021), which measures levels of digitalization in the EU, has consistently placed Denmark above the EU average, and in 2021, Denmark moved to the top of the index, based on the benchmark categories *human capital, connectivity, integration of digital technology, and digital public services*. Through the choice of these indicators, the advanced digital public sector is linked to the general level of digital technology adoption in society; internet user skills and advanced digital skills; fixed broadband take-up, fixed broadband coverage, mobile broadband and broadband prices, and business digitalization and e-commerce. When the OECD

measures the digital transformation of the public sector – understood as the transition from e-government to digital government – in its Digital Government Index (DGI), Denmark is in the top-five with its composite score relating to the dimensions of digital government defined by the OECD: *digital by design*, *data-driven public sector*, *government as a platform*, *open by default*, *user-driven* and *proactiveness.*

## 2.1 Key milestones

The history of Danish digitalization has its starting point in 1968 where it was decided by law to establish an unambiguous identifier for all citizens, the unique personal registration number (CPR) given to all citizens. The ensuing collection of data related to personal registration numbers rests on citizens' trust in the public authorities. Today, 78% indicate that they have high or some degree of confidence that public authorities take good care of their personal information (2021)[1].
The CPR number allowed for the development of IT systems to handle for instance tax administration, already from 1970. In the 1970s and 80s, the Data Central developed IT systems for different sectors – such as the police – based on the CPR number. In 1985, a similar number (now the CVR number) was developed as unique identifiers for businesses. This paved the way for the development of IT systems handling for instance VAT. Throughout the 1990s, public authorities developed numerous new systems to handle administration and automate calculations. At that time, IT strategies were mostly local, developed in the individual organizations or policy areas. Around year 2000, the first national strategies for 'digital public administration' were launched, and in 2001, a Digital Task Force was established by the Government. Their aim was to investigate how IT could become beneficial to citizens and businesses, and how governance in this area could take place across sectors. The first common public digitalization strategy focused chiefly on the uses of technology to create a more efficient public sector.

Denmark's global position in relation to public digitalization is often explained both by a high level of political ambitions and initiatives, and by a structured collaboration across government sectors and levels of government, as well as public-private collaboration. The political ambitions have, amongst others, resulted in increasingly ambitious digitalization strategies and led – in 2011 – to the establishment of The Agency for Digitisation under the auspices of the Ministry of Finance, with a mandate to further the digitalization of the Danish public sector[2]. It became their responsibility to coordinate, develop and implement the cross-sectorial digitalization strategies, and to develop a shared public infrastructure. The Agency for Digitisation employs around 300

[11] https://digst.dk/nyheder/nyhedsarkiv/2021/november/ny-analyse-afdaekker-borgernes-tillid-til-den-digitale-offentlige-sektor/
[2] https://digst.dk/om-os/om-digitaliseringsstyrelsen/

people and is organized in offices and centres that handle both infrastructural and strategic aspects of public sector digitalization[3].

### 2.2 Key outcomes

Important outcomes of the national strategies are 1) the establishment of a coherent digital service infrastructure, meaning that all residents and businesses use the same services to access all public services and for communicating with public authorities and 2) a 'digital by default' policy, implying that communication between citizens and the public sector is digital, unless citizens actively choose to opt out. Citizens and businesses encounter the public sector through a number of portals containing relevant information and self-service solutions, including personalized one-point entries to citizen's data and interactions with for instance the health care sector or the tax administration. All citizens have one free national eID used to access all public services securely and one common national digital post system that all public authorities use to communicate with residents and businesses. Usage of the digital post system in public institutions is mandatory by law, but digital post is also used voluntarily by private organizations. This digital infrastructure allows for increased efficiency both in daily public administration, as for instance in the automation of payment of benefits, or in the handling of an emergency such as the Covid 19 lockdown. The roll out of the Covid 19 vaccination program, for instance, could build on pre-existing systems, platforms, and databases.

This section focused chiefly on how a digital infrastructure has been established. The coming section zooms in on the government arrangements and cross-level collaboration that ensures the development and use of the shared digital infrastructure and public service delivery.

## 3 Digital governance

### 3.1 Coordination between state/regional/municipal actors

Digitalization in the Danish public sector is based on the collaboration between municipalities, regions, and the state. The collaboration is organized in interest organizations (Local Government Denmark, The Regions, and the Agency for Digitisation). The parties have made strategies together since 2001, and they develop digital solutions, fund them, and implement them together. This is done to avoid having different digital solutions in the different sectors or on different government levels. Particular problems need to be solved together – for instance, the parties have developed the eID solution in collaboration, so citizens do not have to log on to different platforms with different IDs. Similarly, functionalities and data related to various sectors (such as health or tax administration) are assembled in single platforms.

[3] https://digst.dk/om-os/organisation/

The shared infrastructure is the foundation for the digitalized Danish public sector. The next important element is shared data about citizens. On top of these elements sit the digital solutions of different public organizations, in so far as they need individual solutions. To a large extent, public organizations attempt to copy others' solutions rather than reinventing the wheel, and they attempt to use data that is already available rather than asking citizens for them several times.

*4.1.1 The shared infrastructure* consists of (among others) mitID (MyID), which is each citizen's individual log-in ('unique key') to self-service solutions across public (and private) organizations; nemLogin (easyLogin), which is a shared access point to public solutions ('the keyhole'); obligatory Digital Post to and from public authorities; and nemSMS (EasyTextMessages) with notifications from public authorities.

*4.1.2 Shared data* is the structured information that the state possesses about citizens and businesses, as well as data on buildings, geodata, and infrastructure data. The amount of data is growing and is increasingly made publicly available. The Basic Data Program, which became operational in 2019, aimed to ensure that the basic data quality was enhanced. Data has since been made easily accessible through the so-called Data Distribution Platform (Datafordeler), along with other specialized data distribution platforms. The Agency for Data Supply and Efficiency[4] is responsible for the quality of data warehouses and basic data, as well as for their distribution. It was a political decision to make the uses of this data free, and the downloads of data is steadily increasing, for instance used in innovations in applications. Different authorities (the CPR registry, the Agency for Data Supply, the Geo Data Agency, the Tax Administration and the Business Authority deliver data to the platform, each being responsible for the correctness and update of the data. When someone uses data, the responsibility for handling the data is passed on to the user. One example of a data user is the Agency for Digitisation, which displays data on borger.dk (citizen.dk) acquired from the Data Distribution Platform.

The Agency for Digitisation has established a Committee for Architecture and standards, which has the responsibility for developing the elements of the IT architecture and standards that are to ensure an experience of a coherent public sector. A number of public authorities participate in this work – various national Agencies as well as for instance the police, the Danish Regions, and ATP (the organization responsible for Payment Denmark). The authorities have prepared data models with a view to their correspondence to other authorities' data models. The standardization is key to the ambition of creating a coherent digital public sector[5].

*4.1.3 The digital solutions of different public organizations* are made accessible for citizens and businesses through large one point entry portals such as borger.dk (citizen.dk) and virk.dk

[4] https://eng.sdfe.dk/
[5] https://digst.dk/data/it-arkitektur/udvalget-for-arkitektur-og-standarder/

(business.dk), through which it is possible to access thousands of self-service solutions – more than 2000 on the citizen portal alone. Most Danes use the portals often. For instance, borger.dk (citizen.dk) had 46.2 million visits in 2019. 88% of users are primarily satisfied with how easy it is to use public services online (2020)[6].

## 3.2 The governance model for the collaborative cross-sectorial work

The state, the municipalities, and the regions have collaborated about digitalization strategies for 20+ years, but recently the parties agreed on a new governance model for their work. In this model, the number of steering committees has been reduced, the parties have high-level representatives, and more decision-making power has been granted to project groups. This allows for more dynamic project managements and room for prioritizing strategic work in steering committees. The collaboration is organized in three levels: on top is a forum for the three central parties where the general strategic direction for the collaboration is set. In the middle level are steering committees, which coordinate and prioritized initiatives within three topic areas (digital infrastructure; digital communication; new technologies and better use of data). On the last level are projects where initiatives are realized[7]. The aim is to conduct cooperation in a flexible and scalable way to accommodate the constantly changing possibilities and challenges of digitalization. Also, it is key to assure that decisions are made at the right level. The public parties should not have to consider the same questions several times in different fora. Instead, tasks are to be resolved as close to where the professional in-sights are in a given matter. To create results and achieve the common goals, the implementing actors must be assigned the necessary mandate to implement projects and activities. In this way, quick decisions and solutions can be made when problems arise. Additionally, representatives from the private sector and many private associations are included in both development- and implementation processes for knowledge exchange and independent counseling. By including the regional and local level parties early on, the Agency for Digitisation ensures that those who have to implement government decisions understand what they are doing and feel a large degree of ownership, while valuable insights are obtained from the authorities closest to the citizens and corporations.

## 3.3 Cross-sectorial focus on competency development related to digitalization

Across the public sector, much attention is given to competency development related to digitalization and there is an abundance of courses, conferences and other education initiatives at various levels. One initiative of the Agency is the Academy for Digitalization, which has the aim of driving and supporting competency development relating to digitalization for state employees. The Academy offers courses for employees and managers who do not have formal education in IT, in recognition of the centrality of digital solutions across areas such as health, tax administration,

[6] https://digst.dk/nyheder/nyhedsarkiv/2020/marts/ny-undersoegelse-danskerne-er-tilfredse-med-de-digitale-loesninger/
[7] https://digst.dk/strategier/digitaliseringsstrategien/governance/

and security. The course offerings are based on a large analysis of the need for digital competencies in the state administration, pointing to the centrality of digitalization in four areas; strategy and business development, projects and development, governance and collaboration, and data and security[8]. In collaboration with consultants and education providers, The Academy offers both open courses for state employees across sectors, and courses that are tailored specific organizations. Competency development is also a priority for the interest organization Local Government Denmark (LGDK). LGDK has developed a tool where employees in the municipalities can test themselves and assess their own strengths and weaknesses in relation to the needs for new competences brought about by digitalisation[9]. Another means to spread knowledge and inspiration is a case catalogue with experiences from 26 specific examples of successful digitalization projects in different municipalities, with a focus on how the municipalities have digitalized administrative processes in a number of domains. In each case, there are descriptions of the background, the implementation, and the changes brought about by each digitalization initiative, as well as descriptions of generic learnings[10].

## 3.4 Digital-ready legislation

A recent outcome of the ongoing work to create an even "more digital public Denmark"[11] has been the passing of a bill on Digital-ready legislation, which implies that whenever possible, legislation should build on simple rules and unambiguous terminology to allow for the extended use of automated case processing across all types of public sector organizations and policy areas. A legal scholar noted in 2018, "legislation may at some point be written in a way that is conducive to algorithmic application"[12] – and this has now become a political ambition in Denmark, just like other European countries and institutions are working towards realizing it[13].

Policymakers in the Agency of Digitisation had observed that many digitalization projects could not be realized, for instance when old legislation contained ambiguous language and therefore did not allow for automation of case processing. As the Agency states: "Complex legislation with several exceptions, vague terms or many procedural requirements may prevent an efficient and digital public administration."[14] An example often used by the Agency of a simple and digital-ready legislation is in the area of pension allocation and payments, where the law is based on objective

[8] Model for digitale kompetencer (digst.dk)
[9] https://kl.digitalekompetencer.dk/
[10] https://www.kl.dk/okonomi-og-administration/okonomi-og-styring/omstillings-og-udviklingsenheden/casekatalog-digitalisering/
[11] https://digst.dk/om-os/om-digitaliseringsstyrelsen/
[12] Hildebrandt, Mireille. 2018. "Algorithmic regulation and the rule of law." *Philosophical Transactions of the Royal Society* A 376: 20170355.
[13] https://en.digst.dk/news/news-archive/2020/november/international-recognition-of-denmark-s-work-on-digital-ready-legislation/
[14] https://en.digst.dk/policy-and-strategy/digital-ready-legislation/

criteria such as age, citizenship and country of residence, and where data is available to the authorities: "the possibility to utilise automated case processing and digitisation varies from legislation to legislation. For instance, the Danish pension system is relatively easy to IT-support, whereas legislation concerning social work implies case processing based on professional estimates and discretion."[15] Implied in this formulation is the recognition of the fact that some legislation is non-digitizable, because particular types of cases cannot be processed without consideration for citizens' particular situations.

A main purpose of vetting new and existing laws is to reduce the need for applications, physical encounters, and professional discretion, as has been the case with pension allocation and payments. Digital-ready legislation is a legislative practice that "1) enables digital support or automation of administrative procedures, 2) establishes the framework for cohesive digitalization across authorities, and 3) does not prevent authorities from developing public services using new technology"[16].

## 3.5 Policy tools and complexities

It is essential that the different ministries assume responsibility for developing digital-ready legislation, and the Agency for Digitisation has developed a set of policy tools to guide the work[17]. For instance, 1) guidelines for assessing whether a bill is digital-ready, 2) a mandatory paragraph in the formal template ministries are required to use when drafting new legislation, and 3) a control function in the Agency, which is supposed to follow up on whether public implementation impacts are properly described in new legislation and to evaluate whether digitalization has been fully considered in new bills. Furthermore, an annual meeting assembles permanent secretaries from different ministries to prepare and discuss the plan for new bills for the upcoming year, and here, The Agency's top manager participates to provide input and screen bills with possible digitalization implications.

There are several challenges related to realizing the ideal about digital-ready legislation. First, there is the complexity of legislation, which obviously stems from the complexity of the policy areas – which cannot be reduced. Second, there is the complexity of collaborating to draft digital-ready legislation; legal experts in the ministries have to collaborate with experts from other parts of the public administration as well as IT experts – because of the required interdisciplinary understanding regarding the intertwinement of law, the administration of the law, and the technical and mathematical aspects of IT solutions. Third, there is a temporal aspect; as society and political agendas change, so must legislation – and this entails that a legislative area that was digital-ready at one point needs not be at a later point in time.

[15] https://en.digst.dk/policy-and-strategy/digitisation-ready-legislation/digitisation-ready-legislation-examples/
[16] https://en.digst.dk/policy-and-strategy/digital-ready-legislation/
[17] Plesner & Justesen 2022

As it will be demonstrated in the following case, digital-ready legislation allows for increased efficiency. However, drafting it is a resource demanding process, and while it may result in efficient automated administrative processes, digital systems and processes need to be adjusted when legislation changes.

Section two focused on central elements in digital government, placing emphasis on collaboration and coordination among representatives of different government levels. It also highlighted two current means to push the digitalization forward; tools and institutions aimed at competency development and the work done to make more legislation 'digital-ready'. The coming section describes a case that illustrates the importance of the shared digital infrastructure, the cross-sectorial collaboration, and digital ready legislation.

# 4 Case study 1: Automation in the administration of benefits – an efficiency focus

In 2010, the Danish Parliament passed a law on the establishment of a new central (national) organizational unit responsible for the payment of benefits such as pensions, family subsidies, housing subsidies, etc. The organization, Udbetaling Danmark (Payment Denmark) took over the task from the 98 municipalities both to ensure equal treatment for all citizens and to increase efficiency through centralization, standardization, and automation. Payment Denmark is an autonomous institution, supported technically and administratively by the largest pension fund (ATP) in Denmark. ATP was chosen as a service provider with reference to its yearlong experience with the payment of 'objective benefits', which can easily be administered automatically. Over the years, Payment Denmark has taken over the administration of more types of benefits from the state (e.g., repayment of student loans). It characterizes all the tasks that their handling is based on objective criteria (such as regulation, income level, civil status, age, etc.), which means that they have the potential to be automated. In the years 2013-2019, "the total administrative costs were halved, compared to when Payment Denmark took over the first tasks"[18]. The organization is governed by a politically elected board appointed by the Ministry of Employment and Local Government Denmark, and the daily operation is taken care of by an apolitical director employed by the pension fund. Every year, the relevant ministries allocate an amount for administration costs in the Finance Bill, and the municipalities pay an annual amount for administration, according to their size.

[18] https://www.djoef.dk/~/media/documents/djoef/a/administrativdebat_01_2017.ashx?la=da, p. 14

## 4.1 Standardization, specialization, and automation

Payment Denmark is organized in five centers, which handle different types of benefits. This implies an economy of scale because of the standardization and specialization that lead to both increased productivity and fewer administrative costs. It goes for all tasks that they are based on objective criteria. The organization has developed formalized methodologies and documentation for all types of case handling. In the words of Payment Denmark's first director: "The objective criteria also ensure that technological potentials can be unleashed, for instance through automation. Often, the computer can handle tasks that used to be manual. At the same time, there are better conditions for ensuring that social benefit payments are correct now that data can be pooled across different registries from different public authorities"[19]. The organization continues to develop digital solutions and work for the simplification of rules and regulations in collaboration with legal experts from the ministries, because this allows for the reduction of professional discretion and the increased use of automated solutions.

## 4.2 Concerns about rights to privacy

The practices related to data pooling have been problematized by legal experts with reference to the European Convention on Human Rights and the European Charter of Fundamental Rights. In the area of social welfare, Payment Denmark has extensive rights to collect data from different public and private institutions about both beneficiaries and their relatives. Such data can be pooled in order to identify possible fraud, or probabilities relating to fraud. The vice director of a legal think tank expresses the criticism like this: "The goal of preventing mistakes and fraud is legitimate, but the legal criteria for when Payment Denmark can collect and process data are not very clear. Additionally, we see an extensive and systematic processing of information about a very large segment of the population without their knowledge or consent and without a specific reason such as indications of fraud or the like. Besides, the control has very modest results. For instance, the extensive pooling of data about Payment Denmark's 2,7 million beneficiaries only result in approximately 670 annual cases where subsidies are regulated"[20]

## 4.3 Automation and the need for humans

The concerns about rights to privacy and the protection of personal data are not the only issues voiced in relation to Payment Denmark. Another issue has to do with the type of public service following from extensive automation, and with making organizational decisions about the potentials and limits of automation in relation to the need for professional discretion[21]. The automation implies that case processing is 'untouched by human hand' by default; data are collected automatically, objective criteria for decision-making are defined, and benefits

[19] https://www.djoef.dk/~/media/documents/djoef/a/administrativdebat_01_2017.ashx?la=da, p. 16
[20] https://www.raeson.dk/2018/birgitte-arent-eiriksson-justitia-med-digitaliseringen-oeges-myndighedernes-overvaagning-af-danskerne-vaesentligt-hvem-tager-sig-af-retssikkerheden/
[21] Justesen & Plesner, 2018

automatically enter citizens' bank accounts. At the same time, Digital mail explaining the rationale for the size of the benefit enters the citizens' digital mailboxes. Both events often lead to citizen requests for explanations or clarifications. These are handled in Payment Denmark's call center, which experiences a surge in calls in periods where benefits are automatically regulated, or post is automatically generated. The regulations are made on the basis of ongoing assessments of citizens' financial situations, based on for instance monthly adjustments in income.

Automation also complicates organizational processes, in so far as programming of complex digital systems is reliant on regulation, which changes regularly. A case in point is the payment of child subsidies, which used to be a perfect case for automation; it would be registered by the health authorities when a child was born; Payment Denmark would have access to data about the family income and could calculate the benefit accordingly; and payments could be transferred automatically to the mother's bank account. When politicians decided to modernize the law and divide the subsidies equally between a child's parents – also in alternative family constellations – this entailed extensive work with redesigning the systems in Payment Denmark.

The lessons from the Payment Denmark case are that standardization and automation can significantly reduce resources spent on administration, but that the automated processes are intertwined with ethics and politics and are not easily settled once and for all. Continued work to comply with regulation, adjust automated systems, and answer citizens' concerns is required.

In the next section, another public digitalization case zooms in on the tensions between the digital strategies that aim to solve important problems of fragmentation and inefficiency and some organizational complexities that come with implementing large-scale digital systems, taking a large, shared digital Health Platform as an example.

# 5 Case study 2: Digitalization in the health sector

In Denmark, health care is financed by taxes and is free for all citizens. The health care system operates across the national, the regional, and the local levels: The state holds the overall regulatory and supervisory functions in health and elderly care, the five regions are primarily responsible for the hospitals, the general practitioners (GPs) and for psychiatric care, and the 98 municipalities are responsible for a number of primary healthcare services as well as for elderly care. The health sector relies on collaboration between the different levels, also when it comes to digitalization. A national board for health-IT consists of members from the Ministry of Health, The Danish Health Data Authority, Danish Regions, Local Government Denmark, and The Agency for Digitisation[22]. They are responsible for driving the development in health-IT, and they are

[22] https://sum.dk/arbejdsomraader/digitalisering-og-data/strategi-for-digital-sundhed

supported administratively by a secretariat in the Danish Health Data Authority. The latter describes its raison d'être as working to "ensure better health for the Danish citizens through the use of data and by creating digital coherence in the healthcare sector"[23]. As they note, "The use of health data is a key element in the Danish healthcare system, and Denmark has some of the most comprehensive health registers in the world. We use health data to strengthen and develop the healthcare system and at the same time give the best treatment to each individual patient. The Danish Health Data Authority is instrumental in providing coherent health data and digital solutions that benefit patients and practitioners as well as research and administrative purposes in the healthcare sector"[24]. This focus on data and coherence has a parallel in the general visions and strategies for the digitalized public sector.

## 5.1 A strategy for Digital Health

In 2018, a strategy for Digital Health was launched. The title was "One safe and coherent health network for all"[25]. Here, it is highlighted that there is a solid digital infrastructure to build on already. The Danish health data has been collected for over 40 years from all patients from cradle to grave, which gives unique opportunities for research. The personal identification number makes it possible to link data across the national health registers. Common standards and digitalization entail that data can be shared across domains. This is at the core of digital health solutions[26] such as the portal sundhed.dk (health.dk), where citizens can access their Patient Journals, test results, etc., and the Shared Medication Record, which provides access to information on the citizen's medication for both citizens and health professionals. The 2028-2022 strategy's primary goal is to support collaboration to create coherency for patients through digital solutions. It is recognized that this requires both shared and local initiatives in relation to digitalization. For instance, municipalities introduce handheld devices and new app-based care journals to digitally support care workers' planning, work, and documentation while they take care of citizens in their homes. And the regions implement new digital Health Platforms that support work flows and allow for registration and sharing of data at a new level.

## 5.2 Digitalization in practice in the health sector – an example

The locally developed digitalization projects and platforms are major change projects, marked by technological and organizational complexities. One illustrative example is the introduction of the controversial Danish Health Platform (Sundhedsplatformen), which was to replace a number of systems used in 17 hospitals in Copenhagen and the neighboring Zealand region. In line with the national health-IT strategies, the goal was to create an integrated health records platform for all hospitals to enable a better course of treatment, increased cross-regional cooperation, improved

[23] https://sundhedsdatastyrelsen.dk/da/english/about
[24] Ibid.
[25] Ibid.
[26] https://sundhedsdatastyrelsen.dk/da/english/digital_health_solutions

treatment quality, and greater productivity at all hospitals in Eastern Denmark[27]. Prior to the implementation of the Health Platform, the state of health IT was widely problematized. Hospitals were facing an increasing demand to document clinical procedures and report data to different national registers and research databases, and concerns were voiced about the inefficient and fragmented nature of the IT infrastructure and the continued dependence on outdated technologies. For instance, telefax machines were used to transfer medical records between hospitals, and daily clinical work was slowed down due to multiple registrations in various systems, multiple login prompts, lengthy waiting time for systems to process data, etc.[28]

The Health Platform was first introduced in 2016-2017 and is still under development. It is supposed to support a paperless workflow and entail structured clinical documentation. All information pertaining to any individual patient is collated in one common system, allowing easy access to patient health data for all relevant stakeholders, placing patients in the center and offering them a one-point entry (My Health Platform/Min Sundhedsplatform). These features increase patient mobility between hospitals and other healthcare institutions and increase transparency for patients. After the experiences with online video consultations during the corona lockdowns, much more attention is given to expanding the uses of digitalization to bring health services into citizens homes, rather than bringing citizens into the hospitals. It is argued that this holds potentials for increasing efficiency and making monitoring and interaction easier for patients, but worries about lower quality health care are also voiced.

Since the platform is also supposed to provide process support, a standardization of clinical workflows has been part of the implementation, just like the reorganization of the division of labor between doctors, nurses, and medical secretaries. One of the controversial changes was the expectations that doctors could (and would) take responsibility for documentation and the keeping of records in connection with the patient consultations, which would reduce the need for medical secretaries. Several hundred medical secretaries were made redundant in connection with the implementation, and since then doctors have had to spend more time on documentation and less time with the patients[29]. The work related to ensuring quality documentation had more facets than calculations of efficiency gains had projected[30]. In recognition of the need for a new type of administrative support, a new education, 'Health coordinator' has been launched. Instead of serving as doctors' secretaries, candidates will become "health professionals who can support the holistic approach to the health sector [and] handle the information flows during the patient's entire treatment [and] function in a new world with technological solutions and digital

[27] Winkler et al, 2021
[28] Ibid.
[29] https://ugeskriftet.dk/sundhedsplatformen
[30] https://www.version2.dk/artikel/sundhedsplatformen-opgaverne-har-bare-skiftet-haender-1081114

workflows"[31] After five years, the Health Platform still both have proponents and critics among its users, and technical and organizational issues are not settled.

The case of controversies around documentation work in relation to the implementation of the Health Platform is just one example of unexpected organizational implications of digitalization projects in the health sector, where invisible data work[32], documentation work, and coordination work is key to the success of a digitalization project. Examples of data work include for instance 1) ensures that documentation is meaningful and ready for coding and analysis, tying digital infrastructures together across databases and systems, 3) managing people's questions, rights, and concerns about data and mitigating those concerns[33]

## 5.3 Digital responses to COVID-19

When COVID-19 hit Denmark in March 2020, the digital transition in different societal domains was quick (online teaching allowed students to continue their education, digital platforms enabled work from home, etc.), and all digital public services were able to continue as before. The fact that the Danish public digital service infrastructure is well developed and integrated implied that the authorities could respond to the health crisis in a timely manner. Public information regarding COVID-19 was sent to 4.5 million citizens via the national Digital Post solution (covering approximately 80% of the population). Not only did the system ensure fast delivery of relevant information; authorities were also able to use statistics on how many people opened the letters, for instance to assess knowledge about the pandemic and on the interest in vaccination.

Denmark's extensive test-and-trace system during the pandemic was facilitated by the digital infrastructure, which allowed for the booking of PCR tests free of charge on a national booking website. Citizens could also access their personal test results – from both public and private test centers – through the national health portal. When the national vaccine roll-out began in January 2021, citizens were contacted by the authorities through the national digital post system once they were eligible for vaccination, and a national vaccination booking website was established.

Because all test results and vaccinations were registered in national databases, the roll-out of a corona pass was comparatively simple: A person authenticated in the corona pass app using their eID, whereafter the app could present test results and vaccination status for use in restaurants, bars, museums, concert halls, gyms, etc. After the second lockdown in December 2020, the corona pass was central in curbing the spread of Covid-19 during the speedy re-opening of Danish public

[31] https://www.kp.dk/uddannelser/sundhedsadministrativ-koordinator/

[32] Møller, N., Bossen, C., Pine, KH, Nielsen, TR, Neff, G. (2020) Who does the data work? *Interactions*, May-June 2020 Pine KH, Bossen C. (2020) Good organizational reasons for better medical records: The data work of clinical documentation integrity specialists. *Big Data & Society*.

[33] Møller et al (2020).

life from April 2021. The corona pass was developed according to EU specifications for the EUDCC (European Union Digital Corona Certificate), meaning that Danish citizens can present their test results and vaccination status when travelling abroad. Other European countries have developed and implemented similar corona passes.

Both the case study on the automation of benefit payments and the case study on digitalization in the health sector are examples of initiatives that aim to put the citizen in the center of public service delivery, among others through shared data accessible through one-point entries and through self-service solutions. Both types of digitalization initiatives are based on assumptions about the digital citizen and hence raise questions about digital inclusion, which is the topic of the next section.

# 6 Digital inclusion

Already in the 1990, advances in the uses of information technologies and dominant discourses about the "Information Society" resulted in policy documents regarding the topic of inclusion and exclusion of citizens. The Ministry of Research published several strategy documents. Here it was emphasized that free access to information and information exchange were considered important democratic tools to – for instance – ease communication between citizens and politicians and reduce the distance between them. At the same time, it was acknowledged that the strategies had to "be based on values such as openness, democracy and responsibility for all members of society so that we will not see a division of Danish citizens into information technological A- and B-teams"[34]. Basic education was seen as an important place to ensure that citizens obtained IT competencies and were not left behind the information society. It was also emphasized that IT use should be a possibility, not enforced. Everybody who wished so should have the possibility of communicating electronically with the public sector, but nobody should be forced to do so – the public sector should have solutions tailored to individual citizens' needs. "The citizen is not to be trained […] Citizens are given the freedom to act as they please, and then the public sector has to adapt" (ibid, p.39). As the access to – and uses of – the internet expanded around year 2000, it became more common to assume that citizens were digital, or that they ought to be. As the Ministry of Research wrote in 2000: "In a society where work, communication and trade happen in networks, it is crucial that everybody is able to participate. The technological tools are widely used, so it is no longer sufficient to focus on diffusion. It is more relevant to focus on accessibility and use. The challenge is to eliminate some of the barriers to leverage the potentials offered by network technologies"[35].

[34] Hjelholdt & Schou, p. 38
[35] Hjelholdt & Schou, p. 44

## 6.1 Expectations to digital citizens and their needs

From 2001, a change in government resulted in the gradual move of responsibility for digitalization strategies from the Ministry of Research to the Ministry of Finance. With an increased focus on the efficiency potentials of digitalization, a change in discourses regarding the view of – and expectations to – the digital citizen emerged, where citizens were to a higher degree portrayed as users of public services, and expected to be digital: "…one way of catering to the citizens' needs is the introduction of digital self-service solutions. Digital citizens are thereby expected to be able to service and help themselves via digital solutions"[36] In 2002, the Ministry of Finance asserted that digitalization would "improve service for 'customers' by giving them access to self-service solutions and information around the clock, faster case processing and a reduced experience of bureaucracy"[37].

## 6.2 Digital by default

From 2014, a change in legislation implied that citizens are now expected to be "digital by default" – able and willing to interact digitally with the public sector. Both citizens and businesses can apply to be exempted from Digital Post, but only around 7% of the citizens have currently done so. Of the 93% citizens who use Digital Post, 83% are "satisfied or very satisfied"[38] with the solution.
A high amount of mail is being sent electronically – in 2020, 184.535.240 mails were sent to citizens and businesses. Advantages of the Digital Post solution are, among others, reduced costs, possibility of sending and receiving Digital Post with protected sensitive personal information, and automated emails generated by authorities.

Obligatory Digital Post has been termed "an underexposed historical shift in the relationship between the welfare state and its citizens"[39], moving large parts of the public administration's tasks out of public offices and into citizens' everyday lives on their phones and computers in their homes. Optimist discourses surround it, as in the 2013 Strategy for Digital welfare: "Digital welfare offers new opportunities for all of us. Each of us can be a more active participant in welfare. And new digital solutions can enhance the quality of life, safety and flexibility in our everyday lives"[40]

Officially, 93% of Danish citizens are 'digital citizens' in the sense that they have access to the digital infrastructure components such as the digital postbox and EasyID. When the issue of inclusion and exclusion is discussed, the interest centers mostly on the vulnerable and marginalized groups that are exempted from digital post – currently 8%. Not having the ability to participate digitally can be explained by lack of access to digital technologies, but most importantly with struggles with either basic practical-technical competencies (e.g. using a mouse),

[36] Hjelholdt & Schou, p. 49
[37] Quoted in Hjelholdt & Schou, p. 50
[38] https://digst.dk/it-loesninger/digital-post/om-loesningen/tal-og-statistik-om-digital-post/
[39] Pors 2021
[40] Quoted in Pors 2021, p. 53

basic social and cognitive competencies (e.g. literacy), information navigation competencies (e.g. finding and assessing sources) or "bureaucratic competencies", which are important for citizens expected to interact digitally with the public sector through self-service solutions (e.g. understanding terminology, policy areas, templates).[41] Among young people, who are otherwise considered digital natives, a large number do not use the digital infrastructure, so they miss important mail[42], for instance about holiday pay, military service, admission to educational programs, or messages from the hospital.

## 6.3 Digital inclusion as focus area

In the Digitalization strategy for 2016-2020, one focus area was 'Digitalization for everyone'. Here, it is stated that "Many citizens have had – and still have – the need for assistance to become digital and utilize the digital public service solutions. Therefore, going forward we must still be considerate of the citizens who have difficulties using new technology or communicate digitally with the public sector or have special needs. They should get the guidance and support they need. For instance, some need support to get started with the digital, as in learning to use EasyID and Digital Post. Others simply need advice occasionally, for instance regarding their use of a self-service solution. The municipalities play an important role in this regard. Obviously, citizens who cannot use the digital entry-points to the digital public sector should still have good access and assistance"[43]. Digital inclusion is a focus area for The Agency for Digitisation, who has established a network for digital inclusion, a learning portal, instructions, teaching resources, and support of IT-volunteers[44]

## 6.4 The new task of helping citizens help themselves online

In the municipalities, employees play a new role helping citizen help themselves at computers installed in the few remaining physical citizen service centers, rather than solving citizens' problems. What was previously the public servant's task is now the responsibility of the citizen, assisted by the public servant: "The front-line worker gets close to the citizen: physically, they stand shoulder by shoulder, the desk and the line on the floor are gone and […] the classical virtues in the exercise of authority such as distance, impersonality and professional focus on the case are turned upside down"[45] This reorganization of the public administration has demanded considerable change management work, including work done by civil servants to change citizens' expectations and behaviors.

[41] Pors 2021, p. 51.
[42] https://digst.dk/nyheder/nyhedsarkiv/2020/august/unge-gaar-glip-af-vigtige-beskeder-fra-det-offentlige-ny-kampagne-skal-hjaelpe-de-unge-godt-i-gang-med-digital-post/
[43] https://digst.dk/media/12810/faellesoffentlige-digitaliseringsstrategi-2016-2020-dobbeltopsl.pdf, p. 56
[44] https://digst.dk/digital-service/digital-inklusion/
[45] Pors 2015, p. 640

### 6.5 'Moral costs' of digital inclusion

Another issue related to inclusion is the challenges experienced by those who are officially included but have a feeling of being "second rate citizens"[46] because they feel incompetent and as a burden to others when needing help to interact with the digital public sector. On the basis of qualitative studies, it has been argued that the strategy to "gently push" citizens to become digital implied that "a number of citizens have become digital without having the will, motivation or competencies"[47], leading to self-blame and feelings of guilt. This has been problematized in the following way: "the visions of a digitalized relation between citizen and state, as a means to efficiency, optimization and flexibility, are realized – besides the benefits – with a number of moral costs for citizens"[48]

This section explored the topic of digital inclusion, focusing on ambitions and achievements as well as on some of the costs both for citizens and employees who must work to realize the ambitions. The coming section zooms in on challenges and dilemmas related to present and future public sector digitalization in Denmark – both those articulated by policy-makers in the area and some raised in academia and the press.

## 7 Key challenges and dilemmas

The identification of key challenges regarding public digitalization obviously change over time and depend on perspective. Currently, The Agency for Digitisation articulate concerns with cyber security; with maintaing trust in the digital solutions of the public sector; with ethics and transparency; with leveraging new technologies such as AI in responsible ways; with creating a more coherent public sector through increased data-sharing; and with digital skills. The foundation for working with these areas has been established through the past years, but technological and societal development continue to call for renewal and strengthening of the work. One means to do so is through increased collaboration with for instance the private sector and other actors. An initiative here has been the establishment of the new Digitalization Partnership[49] with representatives from business organizations, labor unions, academia, Local Government Denmark, The Regions, and the Agency for Digitisation (forming the secretariat and representing the national level). The Digitalization Partnership has presented it first recommendations on initiatives for a new digital strategy to the Danish government. The 46 recommendations are based on four foundational areas which must be prioritized to allow for the realization of the recommendations; digital competencies as life-long learning; increased and responsible uses of data; strong cyber security; and an accelerated update of the digital infrastructure. The partnership emphasizes that

[46] Pors 2021, p. 49
[47] Pors 2021, p. 54
[48] Pors 2021, p. 58
[49] https://digst.dk/digital-transformation/regeringens-digitaliseringspartnerskab/

the accelerating technological developments imply that new potentials of digital technologies must continuously be considered.

Besides this focus on being at the forefront and leveraging new technological possibilities, the complexities of existing digitalization projects continue to pose challenges and bring forward new dilemmas. Besides the areas mentioned above, concerned voices – for instance in academia and the media – repeatedly point to 1) challenges related to the cost and government of large IT projects, 2) challenges related to flawed digital solutions, and 3) challenges related to experiments with immature technologies in the public sector.

7.1. The cost and government of large IT projects is monitored by both the National Audit Office and the National IT-council. The National Audit Office has repeatedly pointed out that the estimated benefits of large digitalization projects can rarely be documented, as for instance in the case of Digital Post[50]. In a large analysis of the realization of expected benefits in the state's IT projects from 2011-2020, the National Audit Office notes that less than half of the expected benefits of projects have been realized, and a third of the projects have not at all been evaluated in terms of the realization of benefits[51]. In their biannual reports, the National IT-council analyze projects for instance in relation to whether they stay within budget and estimated time frame. The status of each large digitalization project is symbolized with traffic light colors; red (if a project is late, more costly than planned), green (if the project runs according to estimates) and yellow if it is in between. As an example, in the first half of 2021, 45 projects were evaluated, 11 with a red traffic light, 11 with a yellow, and 17 with a green[52]. Researchers in project governance and public IT explain this with general over-optimism and lack of realism in budgeting[53] Although costs are monitored, the complexity of the multitude of local or sectorial projects does not allow for an overall assessment of costs and benefits of the digitalization agenda. But to give an indication of the scope, the 2019 spending on ICT was 1.13 billion EUR. Running costs count for 22%, maintenance cost 19%, development cost 19%, internal staff cost 25% (these are allocated to both running, maintenance and development cost), and 15% to other cost (including IT goods and services). The share of overall central government spending was approximately 10.7 %.

7.2. Flawed digital solutions can explain some of the missing benefit realizations. Some of the complex digital systems that are intended to support, streamline, and automate case processing are not fully developed or without flaws when they are introduced, which results in increasing workloads and stress among public servants. One example is a system introduced to support the

[50] https://rigsrevisionen.dk/revisionssager-arkiv/2016/jan/beretning-om-besparelsespotentialet-ved-obligatorisk-digital-post-paa-ca-1-mia-kr-om-aaret
[51] https://rigsrevisionen.dk/revisionssager-arkiv/2020/sep/beretning-om-gevinstrealisering-i-statslige-it-projekter
[52] https://digst.dk/media/25615/statusrapportering-for-statslige-it-projekter-1-halvaar-2021.pdf
[53] Fribo, A. (2021) 'Kendt professor vil undersøge sprængte it-budgetter: "Dumme kunder er der nok af " in *DIgiTech* 22.11.2021

payment of benefits in the municipalities. This system generated extra calls from citizens, extra work with correcting mistakes, etc., because it had flaws such as the uses of the wrong data and the generation of letters with the wrong legal references[54] This project was criticized for being planned as an agile process and implemented too early. Another example is a system introduced in the municipalities to support the work with sickness payments, relying on self-service and automated, instant decision-making. The system generated flawed decisions and extra work correcting these[55]. While some technical difficulties and implementation issues can be expected in relation to all complex digital solutions, it can hardly be underestimated how important it is to have realistic expectations to and plan for the work required to compensate for the mistakes and ensure that citizens receive the right services and benefits. The Danish Council for Strategic Research has supported a four-year research project[56] on the value of invisible work that follows from digitalization projects.

7.3. Experiments with immature technologies bring forward similar challenges and dilemmas as the large complex digitalization projects, but also new types of challenges and dilemmas that are particular for digital solutions for public administration based on, e.g., Artificial Intelligence, chatbots, and predictive algorithms. Artificial Intelligence is expected to "enhance the quality and capacities of the future public sector"[57]. Therefore, the Government, Local Government Denmark, and the Regions agreed in 2020 to invest in 15 large 'signature projects' to test AI in the municipalities and the regions. In a recent status report, the Agency for Digitisation has collected, analyzed, and presented preliminary learning points from the AI signature projects. The report places particular emphasis on three challenges with AI projects; 1) a third of the projects have experienced considerable challenges related to data quality, 2) almost half of the projects have experienced considerable challenges related to GDPR interpretations, 3) more than half of the projects have experienced challenged related to IT-infrastructures, having problems with accessing data sets[58].

Potentials for offering better and cheaper services to citizens who call the authorities have led to several experiments with developing and integrating chatbots. The ambitions range from having chatbots answer simple requests about for instance hours of operation, to having them help citizens with individual requests about their own data or cases. Often, such projects are not based

[54] https://www.version2.dk/artikel/kommune-meget-bekymret-stort-netcompany-system-stop-udrulningen-1092087
[55] https://www.altinget.dk/artikel/nyt-ydelsessystem-giver-fejlagtigt-afslag-paa-sygedagpenge?SNSubscribed=true&ref=newsletter&refid=forside-morgen-06112020&utm_campaign=Altinget.dk&utm_medium=e-mail&utm_source=nyhedsbrev
[56] https://www.cbs.dk/en/research/departments-and-centres/department-of-organization/centres-and-groups/valuing-invisible-work-view
[57] https://digst.dk/media/24196/temperaturmaaling-af-signaturprojekterne-endelig.pdf
[58] https://digst.dk/media/24196/temperaturmaaling-af-signaturprojekterne-endelig.pdf

on business cases since there are few experiences to base calculations on[59]. It demands considerable design and training work to develop the chatbots, and early experiences with using them lead to mixed results.

Finally, experiments with predictive algorithms have promised better insight and grounds for intervention in relation to complex problems such as children at risk, risk of long-term unemployment, and the like. Based on the collection and combination and analysis of patterns in historical data, models have been developed to predict risk and guide public servants. One experiment was about generating risk profiles about potentially vulnerable children, where early prevention was important – and made difficult by the partiality of the perspectives of public servants from different sectors[60]. The predictive algorithm was supposed to generate profiles on the basis of data points such as place of residence, missed dentist's appointments, parents' divorce, mental health diagnoses, and other sensitive data[61]. It was heavily criticized for not being GDPR compliant[62] and was abandoned. Predictive algorithms are experimented with in other contexts as well, expected to support caseworkers and make their work more efficient and their decisions more valid.

The Agency for Digitisation often plays a role in initiating and securing public funding for pilot projects, signature projects, and the like – for instance regarding innovation in AI. Private entrepreneurs, consultants, and businesses are involved in partnership in such projects, and also contribute themselves to innovative digital solutions to various societal problems.

Sections 1-6 have described some of the goals, tools, and achievements relating to public sector digitalization in Denmark, and have aimed illustrate some of the complexities and challenges that for instance policy-makers, organizations, and citizens face as they participate in public sector digitalization. The final section points to some general insights and lessons to take from the Danish digitalization experience.

# 8 Insights and lessons as a basis for dialogue

## 8.1 Driving a digitalization agenda forward

IT has become a critical infrastructure in society, and the establishment, maintenance, and protection of the common digital infrastructure has been a cornerstone in the Danish public sector digitalization. Another cornerstone is the amount and quality of basic data, which can be

[59] https://pro.ing.dk/digitech/artikel/derfor-satser-36-kommuner-paa-faelles-chatbot-uden-business-case-vi-er-overbeviste
[60] https://www.altinget.dk/digital/artikel/gladsaxe-kommune-dataovervaagning-skal-spotte-udsatte-boern-tidligere
[61] https://www.djoef.dk/-/media/documents/djoef/t/techdk/techdk_rapport_1_%C3%B8konomi_a4_0519.ashx
[62] https://www.version2.dk/artikel/juridiske-eksperter-gladsaxes-algoritme-overtraeder-persondata-lov-1087407

leveraged in many digital services and innovative solutions in public sector administration and innovation.

The work to establish these foundations is driven by political ambitions to be at the forefront with leveraging digital technologies, and by a general political agreement to give priority to the area. The collaborative cross-sectorial arrangements and the establishment of institutions with mandates to further the digitalization agenda have implied a sustained focus on increasingly ambitious digitalization strategies. The strategy work, the policy work, and the incentives to work with digitalization projects in public institutions have established a discourse that portrays digitalization as inevitable and as related to progress. The general support of the digitalization agenda can be linked to the public's general trust in the authorities, as well as the digital literacy and innovative capabilities of the population.

## 8.2 Identifying potentials and barriers

There are large potentials for increasing quality and efficiency in the public sector in common standards, common data, interoperationability, shared platforms, automation, self-service solutions, etc., like we saw it in the case of automated case processing or the establishment of a coherent digital health infrastructure. Such large-scale initiatives are dependent not only on technological solutions, but also on legislation. Therefore, a sustained focus on digital-ready legislation is an important component of the digitalization agenda, implying that when potentials are identified, legislation often has to be adjusted, or conversely, that legislative work can identify potentials for digitalization.

When assessing potential benefits, potential barriers are commonly underestimated so that projections are overoptimistic. Barriers may be related to the complexity and cost of developing a technology, to the organizational implications and challenges related to creating new work routines and relations, to ensuring competency development and education, to handling the invisible (data) work following from digitalization, and to adapting to changing technologies and legislation over time. Most digitalization projects carry assumptions about the capabilities of their end users/citizens, the public servants working with them, the managers responsible for their implementation, the developers responsible for their functionalities, and the policy makers creating the legal foundation for their operation. It is thus a complex task to ensure that the different types of capabilities (technical, bureaucratic, legal etc.) are in place on all levels. Understanding and preparing for these types of barriers are central to the success of digitalization projects and the perceived legitimacy of the ambitious public digitalization agenda.

## 8.3 Maintaining legitimacy

The legitimacy of public sector digitalization rests on the authorities' ability to develop digital solutions, which generate value on several levels: Both 1) creating a more efficient and well-

functioning public sector and 2) giving citizens a subjective experience of quality service via digitalization. The potential threats to this legitimacy are challenges and dilemmas related to both these levels: Both 1) the complexity of evolving digital technologies, which sometimes lead to failed projects and missing benefit realizations, and 2) experiences of being digitally excluded and getting lower quality public service, or experiences of being surveilled, profiled, or handled automatically as a standard case.

Pursuing potentials and assessing risks and barriers are equally important lessons from the Danish digitalization experience.

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