DIGITAL EXPLORATION

SEPTEMBER 2019

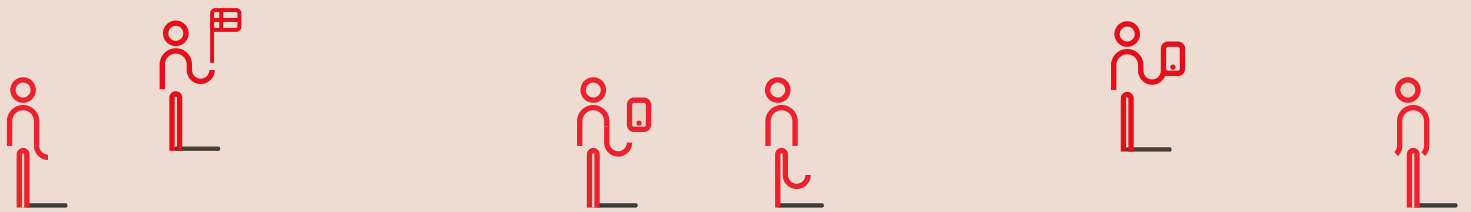
DENMARK: A DIGITAL WILL

RENAISSANCE numerique

The Series Digital Exploration

Launched in 2015, the *Digital Exploration* series aims to observe digital practices internationally. The objective of this series is twofold: to identify inspiring digital activities, applications, and policies for France and Europe, and to establish relationships with structures abroad that are also concerned with the digital transformation of our world. With the series *Digital Exploration*, the think tank Renaissance Numérique aims to provide public actors, private actors, and citizens, with new material to nourish reflection on digital issues in light of the best practices observed abroad.

DIGITAL EXPLORATION



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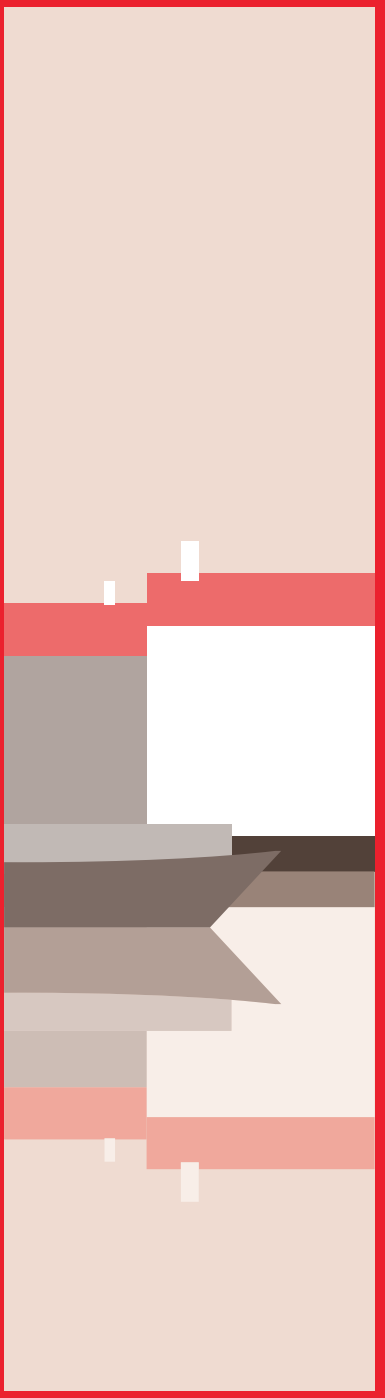
Preface

When we consider Internet and digital-related issues, we are forced to confront different practices which are rooted in national or regional contexts, as well as concomitant cultural factors. This approach is inherent to the think tank Renaissance Numérique, which assembles actors from a range of backgrounds, representative of the diversity of the contemporary digital world. It is by this logic that the think tank seeks to reflect on digital activities and policies implemented abroad.

After studies of Estonia and Switzerland, Renaissance Numérique turned its attention to Denmark in 2019. The advanced digital public policy of this Scandinavian state and its rapid rise from ninth to first place in the United Nations 2018 world ranking for e-Government practices[1-2], make it an important case study, particularly at the dawn of the "100%" dematerialization of public services in France.

Renaissance Numérique organised a study trip to Copenhagen, the capital, to analyse the country's digital transformation policy. Renaissance Numérique's team of experts exchanged with a dozen actors in the Danish digital ecosystem, from public agencies leading the state's digital transformation to private companies participating in this digitisation process, including *Sundhed.dk* the public health platform, to the team of the Danish Tech Ambassador, Casper Klynge.

Following the trip, this document surveys the central issues of Denmark's digital policy, more precisely, its policies regarding the transformation of the state and the development of *Techplomacy*.



1 The Organisation for Economic Co-operation and Development (OECD) defines "e-Government" as *"the use of information and communication technologies, and more particularly of the Internet, as tools for achieving better administration"*. OECD e-Government Studies - "E-Government: An Imperative", February 2004.

2 "United Nations e-government survey 2018", United Nations, August 2018.

Digital Denmark by the numbers

1ST

according to the United Nations 2018 ranking of the most advanced countries in terms of e-Government

92,7%

of the population has access to the Internet

1

single point of access for more than 100 digitized services

90%

of interactions between citizens and public authorities take place online (compared to 64%, the average in Europe)

1/3

1 Danish citizen out of 3 consults the e-health platform Sundhed.dk at least once a month

Table n°1 - Denmark vs. France

Characteristics	Denmark	France
Population (January 2018)	5,887,565 inhabitants	67,795,000 inhabitants
Surface Area	2,220,093 km² (including Feroe and Greenland)	632,734 km²
Gross national income (GNI) per capita (dollars in 2011 in PPA)[3]	47,918 dollars	39, 254 dollars
Human Development Index[4]	0.929/1.0 (ranking: 11/189)	0.901/1.0 (ranking: 24/189)
Low skill level (2016, with respect to the total population)[5]	In reading comprehension: 15 % In mathematical literacy: 13.6 % In scientific literacy: 15.9 %	In reading comprehension: 21.5 % In mathematical literacy: 23.5 % In scientific literacy : 22.1 %

3 "Human Development Indices and Indicators: 2018 Statistical Update" United Nations Development Program (UNDP).

4 "Human Development Indices and Indicators: 2018 Statistical Update", United Nations Development Program (UNDP).

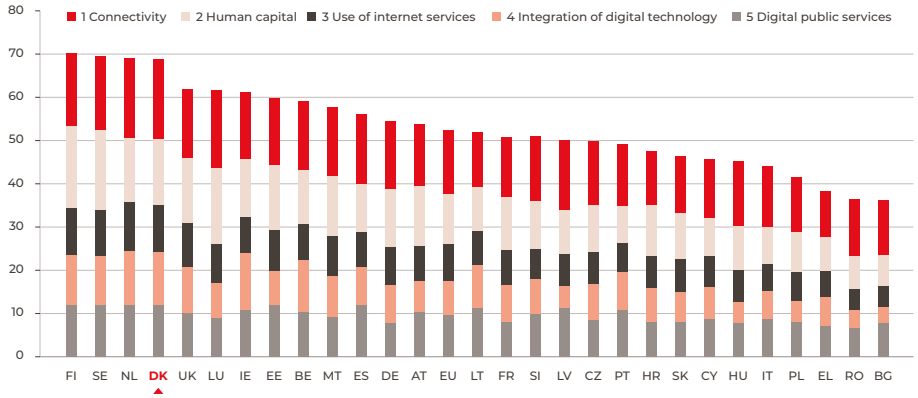
5 "L'Europe de l'Éducation en chiffres, 2018", Ministry of National Education and Ministry of Higher Education, Research and Innovation.

PART 1 - A Complete Transformation of Public Administration

For more than twenty years, the modernisation of state administration has been at the heart of Danish policy, most notably in the form of digital transformation. Denmark, like most countries that have established digitisation strategies, sees e-government not as an end in itself, but as a means to achieve political objectives.

With more than 100 dematerialised administrative services (including university enrolment, health care, contact with departmental services, etc.), Denmark is now a model in terms of e-administration. It has made the digitisation of public services an instrument enabling the government to reduce administrative burdens and improve services to citizens and businesses. E-Government is considered the most efficient strategy, "a necessity and not an option"[6], to achieve the state's objectives for public sector effectiveness. Today, this understanding, shared by all actors in Danish society, permits the public authorities to establish 100% electronic government services.

Graph n°1 - 2019 ranking of European countries according to the Digital Economy and Society Index (DESI)[7]



6 "Denmark: efficient e-Government for Smarter Public Service Delivery", OECD e-Government Studies, August 2010.

7 "Digital Economy and Society Index 2019, Country Report Denmark", European Commission, 2019.

A PROACTIVE POLICY FOR STATE DIGITISATION

Digitisation: a priority for the Danish government

Considered necessary to the modernisation of the State, digital transformation has been a priority on the Danish political agenda since the early 2000s. As early as 2001, Denmark introduced multi-year digital strategies[8], and in 2005 created an agency dedicated to digital issues, *IT-og Telestyrelsen* (the Danish Agency for Science, Technology and Innovation), now renamed the *Digitaliseringsstyrelsen* (the Danish Agency for Digitisation).

With this desire to digitise the administration, Denmark has achieved over the years a comprehensive transformation of the way its services operate, for those who use them as well as for those who produce them. Denmark's leap in one year from ninth to first place according to the world ranking of countries with highly developed e-governments is partly explained by the evolution of this ranking's criteria. The world ranking now takes into account this "360°" transformation; it is longer only concerned with the transformation of the *front desk*—the interface dedicated to citizens, which has so far allowed some countries to be classified without any verifiable basis—but also with the evolution of the *back office*, which includes all the support for and control of activities that ultimately make it possible to administer and manage the IT system, such as user management, web page modification or settings modification. The objectives were to stop, or reduce the use of paper by ministries, to improve collaboration between government departments through data and information sharing, and to provide entirely online services for citizens.

It should be emphasized that Danish political leadership seems to consider, perhaps more than elsewhere, that its administration is a tool for the production of services—services on which the implementation of any ambitious strategy depends, digital or not. Thus, the implementation of projects is more valued than the elaboration of strategies, especially at a moment when the speed of execution is a key factor for success, even survival.

8 See Table n°2, p.14.

In order to anchor the use of digital services in public behavior, the Danish government is systematically incorporating digital transformations into proposed legislation. The most telling example is a law passed in 2015 which made the use of digital technology mandatory for communications with the administration and access to administrative services, with the exception only of telephone and post. This *"digital-by-default policy" shows a strong state will to adapt to technological developments and to introduce their use widely.*

Frame n°1 - e-Boks, the technical intermediary between the administration and users

e-Boks, a 50% subsidiary of *PostNord* and *Nets*, a banking payment company that offers secure payment as well as hosting and communication solutions for public authorities, citizens and businesses, won a project call launched by the Danish government in 2015. *e-Boks* now exclusively operates all C2A (*Consumer to Administration*) and A2C (*Administration to Consumer*) exchanges, supplying an email service, a digital safe, and a secure payment method that ensures all online procedures.

Table n°2 - Denmark's multiannual digital strategies: from 2001 to the present

Period	Strategy	Objective
2001 -2004	"Towards digital governance of the public sector"[9]	**Enable various public authorities to facilitate their communications through digital technology** · Creation of an electronic signature for all Danish citizens. · Email communication between Danish citizens and public authorities · Email communication between Danish public authorities
2004 -2006	"Strategy for digital governance of the public sector"[10]	**Enable citizen authentication and digitisation of new services** · Creation of a national health service platform, *Sundhed.dk*. · Securing digital communication between different authorities.
2007 -2010	"Towards better digital services, increased efficiency and closer collaboration"[11]	**Develop new, common infrastructures** · Creation of *NemID*. · Creation of the platform *borger.dk*. · Public authorities are obliged to use a common digital infrastructure.
2011 -2015	"The digital path to future welfare"[12]	**Renforcer les communications par voie numérique** · The use of online services instead of telephone or post becomes mandatory. Implementation of the *"digital-by-default policy"*. · Mandatory use of digital channels for traditional post (letters).
2016 -2020	"A stronger and more secure digital society"[13]	**Secure the digital transformation process and online services** · Data Interoperability. · Strengthening the protection of citizens' data. · Adapting online services to be accessible to all.

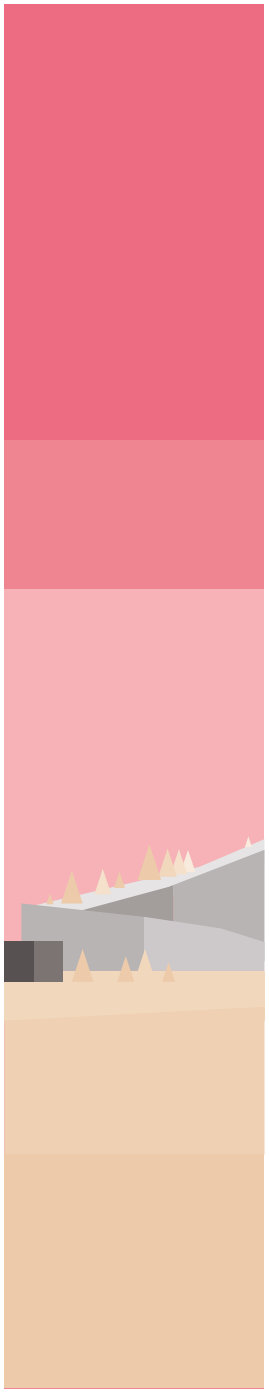
9 Unavailable for online consultation.

10 *Idem*.

11 "Towards better digital service, increased efficiency and stronger collaboration - The Danish e-Government strategy 2007-2010", the Danish Government, Local Government Denmark (LGDK) and Danish Regions, June 2007

12 "The digital path to future welfare – e-Government strategy 2011-2015", the Danish Government, Local Government Denmark (LGDK) and Danish Regions, August 2011

13 "A stronger and more secure digital Denmark - Digital Strategy 2016-2020", the Danish Government, Local Government Denmark (LGDK) and Danish Regions, May 2016



An agile approach to transformation

Denmark's success in digitising public authorities is strongly linked to the interconnectedness of both *back office* and interface issues. In parallel with the development of user interfaces, interviews and questionnaires conducted by the Danish Agency for Digitisation within the administrative services have shown the need to digitise all procedures needed to perform a service in a coherent way, from user interface and user experience to the internal administrative missions.[14] Administrative agents expressed the need to make dematerialized user interfaces compatible with the support missions of administrative agents by dematerializing the latter as well. Under the direction of the Danish Agency for Digitisation, the evolution of the *back office* has led to a better distribution of competences and tasks between administrative agents and digital services, in particular by introducing the automation of certain elements.

With the transition to a policy that includes *back office* transformation, Denmark exceeded the limitations of a policy solely focused on the dematerialization of user interfaces. The country has transformed the entire administrative process, from the user-administration relationship to the internal administrative processes to inter-ministerial activities.

This policy demonstrates the importance of a pragmatic approach to transformation: starting from a simple operational area, respecting the operations within this area (as perceived by the agents themselves), relying on the agents to better understand the operations of the service, proposing ad hoc solutions for automating certain steps that relieve them of repetitive or redundant tasks, streamlining processes, and finally improving the quality of the service provided. This quality of service contributes more broadly to the trust that Danish citizens hold in their administration. This choice also reveals an attentiveness to the successful adoption of digital tools. Public officials know their departments better than anyone else. They are in the best position to document and reflect on how their services can be improved, and they will ultimately be the ones called upon to use these digital tools. Their systematic and continuous collaboration is key to the success of this "co-transformation".

COOPERATION BETWEEN THE PUBLIC AND PRIVATE SECTOR: A DRIVING FORCE BEHIND THE DIGITISATION OF PUBLIC SERVICES

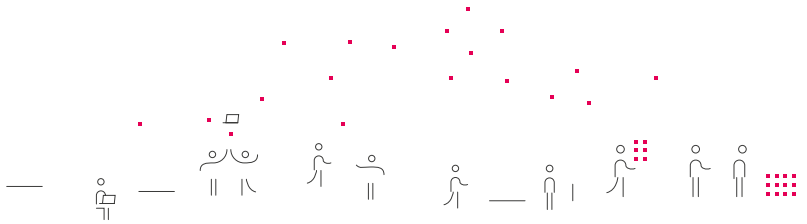
Voluntary and agile in its digital transformation, the Danish state has managed to surround itself with a variety of actors, including private companies from the technology and innovation sector. The administration does not hesitate to call on the expertise of the private sector in its transformation process. This cooperation has led to the success of Danish online devices such as *NemID*[15], the national secure digital identification service, and the websites of Danish ministries. Over the years, public authorities have become important customers for Danish technology companies. For example, activities carried out for the public sector now represent 60% of the revenue of *Netcompany*, an IT consulting firm, whereas twenty years ago, when the company was founded, they represented barely 20%.[16]

The digital transformation of public services was never driven by the desire to "adapt to the digital age", but rather by the desire to improve services and reduce financial or time-related costs. Within this public-private cooperation, whenever an idea, product or service appears to have the potential to improve administrative functioning, the Danish public authorities are

14 "Denmark's Digital Strategy", *Digitaliseringsstyrelsen*, February 2017.

15 See Frame n°4, p.22.

16 Interview with Kim Clausen, Head of the Public Sector *Netcompany*, conducted on 29 January 2019.



primarily concerned with providing the managerial skills and funding necessary for its implementation—essential conditions for the implementation of any public policy.[17]

As a result, the Danish authorities have not sought to put all services online as quickly as possible, but rather to put in place, along with private partners, a digitisation process that respects the specificities of each administrative authority while standardising and simplifying dematerialisation tools. The first step was to define a common transformation process that would respect the specificities of each administration. Counterintuitively, the administrative process had first to be digitized before it could be simplified, because it is easier to remove, reduce, consolidate and simplify the steps once the dematerialized value chain is in place. Secondly, they called on public authorities and companies deploying digital tools to standardize the dematerialisation tools used by all agencies, such as interfaces. This was done, for example, through solution updates and through the exchange and cross-referencing of data. Standardization allows all services to maintain their specificities while accelerating their digital transformation and simplifying their interactions with other services.

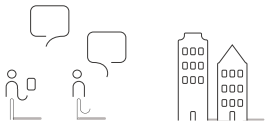
17 "e-Government in Denmark", European Commission, February 2016

Frame n°2 - cBrain, the archetype of Danish public-private cooperation

The work carried out by the ministries with the company *cBrain* illustrates the degree of cooperation between the state and private companies in the Danish technology sector. A Danish company founded in 2002 by Per Tejs Knudsen, *cBrain* is the origin of the computer software F2, created exclusively for the Danish administration, and used by more than half of the ministerial departments in Denmark, including the Prime Minister's Office, the Ministry of Finance and the Ministry of Foreign Affairs. Its national success enabled it to move abroad; this system is currently used in the United Kingdom, by the city of Liverpool.

Along with the Danish public authorities, *cBrain* has co-constructed the overall digital architecture of Danish administrative services. The objective of this cooperation was to enable the state to modernize while maintaining specific features and the essence of the administration's functions, which aim to serve the general public. The digitisation of services with a single software package, built specifically for the administration, has also made it possible to facilitate the tasks of government agents, thanks in particular to the standardisation of *back office* operations. According to a 2017 survey of Danish government employees conducted by the company, employees are more satisfied with their working conditions after the installation of the F2 software—an increase from 7% to 81% satisfaction—due in particular to the reduction in steps of day-to-day administrative processes, and to simplified access to data and information.[18]

18 Interview with Per Tejs Knudsen, Founder and Director of *cBrain* and Tine Havkrog Brandenborg, Director of International Development *cBrain*, conducted on 28 January 2019.



THREE LEVELS OF GOVERNANCE, ONE SINGLE COMMITMENT IN THE TRANSFORMATION PROCESS

In addition to cooperation between public authorities and private companies, the cooperation of the country's various levels of governance, "cross-governmental partnership"[19], is a key element of Denmark's digital transformation. The digital strategy of the administration is decided, financed and implemented by a steering committee that meets once a month under the direction of the Danish Agency for Digitalization, assembling actors from each level of governance. For example, the platform *borger.dk*, the public services information portal created in 2007, is 40% funded by the government, 40% by municipalities and 20% by regions[20]. For Adam Lebech, Deputy Director General in the Danish Agency for Digitisation, "a culture of decentralisation is prerequisite for the digital transformation of public services". Distributing responsibility among the three levels, instead of relying on a single entity, allows for faster progress, most of all for funding reasons but also due to an element of group pressure. Since each level of governance is responsible for setting up the services for its citizens, the public authorities may be rejected by their citizens for failing to do their share of the work (this is all the more true for local actors who are used to the pressure of comparison between communities). This pushes each level to collaborate with the others and create successful digital policies.

19 Denmark has twenty-one ministries, five regions, and ninety-eight municipalities

20 "Denmark: User friendliness, e-services and borger.dk", eSuomi, August 2015.

Frame n°3 - Multi-governance of the health platform *Sundhed.dk*

Since the national e-health platform project Sundhed.dk was launched in 2004, e-health platforms have been developed at different levels of governance over the years, including at the regional level[21]. *Sundhed.dk* is positioned as a platform which receives data from hospitals in each region while they themselves are responsible for hospitals in their territory. Thus, the e-health system suffered from fragmentation caused by data that were not interoperable, which led to certain communication and information sharing dysfunctions within the medical system. The impossibility of having all of a patient's medical data on a single platform has, in some cases, led to cases of incorrectly treated patients being readmitted, due to preexisting pathologies that were not communicated and not taken into account in medical decisions. Cooperation between the different levels of governance, at the heart of the 2011-2015 action plan, has become necessary. It has led to a refocusing of activities at the national level and to the development of technological infrastructure and standards capable of coordinating and uploading all data to *Sundhed.dk*.

MAKING PUBLIC SERVICES ACCESSIBLE TO EVERYONE

In addition to the transformation of tools for administrative agents, the digital transformation of the state aims for citizen adoption and control. In Denmark, the acceptability of these new electronic services has been achieved through the simplification of tools and access, as well as through increased public service support for citizens.

21 "eHealth in Denmark: a case study", Patrick Kierkegaard, *Journal of Medical Systems*, 37, 2013.

Frame n° 4 - *NemID*: a single access point for a multitude of services

In order for the use of digitised services to become a habit for the population, access to these services must be facilitated and barriers lifted—such as, for example: asking everyone to remember a multitude of identifiers and passwords. In line with this logic, the 2007-2010 digital strategy proposed by the Danish government has made it possible to set up a single digital identity solution to access almost all government services (pension applications, scholarships, university enrolment, taxes, and even the national lottery). This solution is called *NemID*, which means "easy identity". The result of cooperation between *IT-og Telestyrelsen* and the banking sector, *NemID* was developed by *DanID A/S* and was officially launched in 2008.

The functionality is simple. By logging into the NemID website, a Danish citizen can then choose which service website they want to visit and open their personal account in a new window. In this way, *NemID* allows citizens to easily access each administrative site and service as well as those of some private companies. The smartphone application was launched in May 2018, allowing automatic redirection to the desired site. Danish citizens over age 15 can use *NemID* to access all services. In 2018, 4.8 million Danish citizens used *NemID*, or more than 85% of the population, and 55 million transactions took place each month[22].

22 "Next generation NemID", website of the Danish Agency for Digitisation

User experience at the heart of simplified use

Internet access, whether in terms of equipment or coverage, is the first mechanism for adoption of these new services. In this area, Denmark is rather well established, with internet coverage ranging from 88% to 92% depending on the region, as well as internet access in 97% of Danish households in 2017[23-24]. Denmark has also understood the importance of mobile in this transformation. With smartphone use among over 77% of the population in 2017, 60% of whom use it to surf the Internet, Denmark has the highest mobile penetration rate in the world[25-26]. For almost five years now, with the implementation of the "Digital Strategy 2016-2020", political decision-makers have been keenly interested in facilitating the use of administrative services via smartphones. The development of the *NemID* mobile app in 2018, ten years after its launch, illustrates the government's attunement to new technologies; it is constantly seeking to offer updated digital solutions that are accessible to everyone, everywhere.

> *"When development of the eIdentification solution NemID was planned in 2008, smartphones were not that widespread and the computer tablet had yet to be invented (...) In order to ensure user-friendly and up-to-date digital solutions, self-service solutions, infrastructure components and portals must meet a few agreed requirements when new solutions are developed or further developed."*[27]

23 "Broadband internet penetration rate in Denmark in 2016, by region", *statista* website

24 "Share of households with internet access in Denmark from 2007 to 2018", *statista* website

25 "Denmark "has highest smartphone penetration rate in the world"", *netimperative* website, 6 December 2017

26 "Forecast of smartphone user numbers in Denmark from 2018 to 2024 (in million users)", *statista* website

27 "A stronger and more secure digital Denmark - Digital Strategy 2016-2020", the Danish Government, Local Government Denmark (LGDK) and Danish Regions, May 2016

Access is also a question of design and user command. The work of designing service interfaces is a critical element of the dematerialization process. For Adam Lebech, "the conception and design of websites are vital. The user experience must be simple and pleasant in order to encourage the citizen in their adoption of these new forms of service", with the objective of including the entire population "without any citizen being forgotten"[28]. The implementation of the state's Digital Strategy 2010-2013 illustrates this attentiveness. In 2010, the Danish Agency for Digitisation conducted a national survey: while 80% of respondents were in favour of online services if they were easy to use, only 15% of the population actually used them. Changes in the website design were therefore necessary to ensure that the rate of use of these services was commensurate with the investments they required, and administrative burdens were in fact reduced.

Supporting the public for a shared digital culture

Danish policy makers have avoided the pitfall of ergonomics as a panacea for accessibility. They never believed that the development of ergonomic websites was enough to include citizens. They have therefore implemented ambitious digital literacy training measures. For Per Tejs Knudsen, founder and director of *cBrain*, "Denmark is very good at thinking about its citizens"[29]. In concrete terms, this has meant, for example, the rehabilitation of municipal libraries as local places for training in digital tools, particularly for the elderly. The Danish Agency for Digitisation has also organised seminars in partnership with associations for people with disabilities so that they can learn not only how to use these services, but also how to improve and adapt these tools by sharing feedback. The user experience of all Danish citizens is central to the work of the Danish Agency for Digitisation and is part of its long-term digital policy.

28 Interview with Adam Lebech, Deputy Director General in the Danish Agency for Digitisation , conducted on 29 January 2019..

29 Interview with Per Tejs Knudsen, Founder and Director of *cBrain* et Tine Havkrog Brandenborg, Director of International Development at *cBrain*, conducted on 28 January 2019.

> *"Technological solutions must be accessible to all people in all situations, such as the elderly or people with disabilities. They must also be tested by users. Collecting data on user experience helps to constantly improve solutions."*[30]

Citizens' trust: the pillar of a digital state

The trust of Danish citizens is a key element to the success of the Danish State in its digital transformation. Led by public authorities who cultivate a culture of trust between themselves and Danish citizens, the digital transformation of the state is widely supported by the public. In 2015, 85% of the population believed that having a public authority entirely dedicated to managing this transformation process was a pledge of trust[31]. In order to maintain citizens' confidence in their actions, policy makers are committed to developing secure digital solutions that respect citizens' privacy and the use of their personal data.

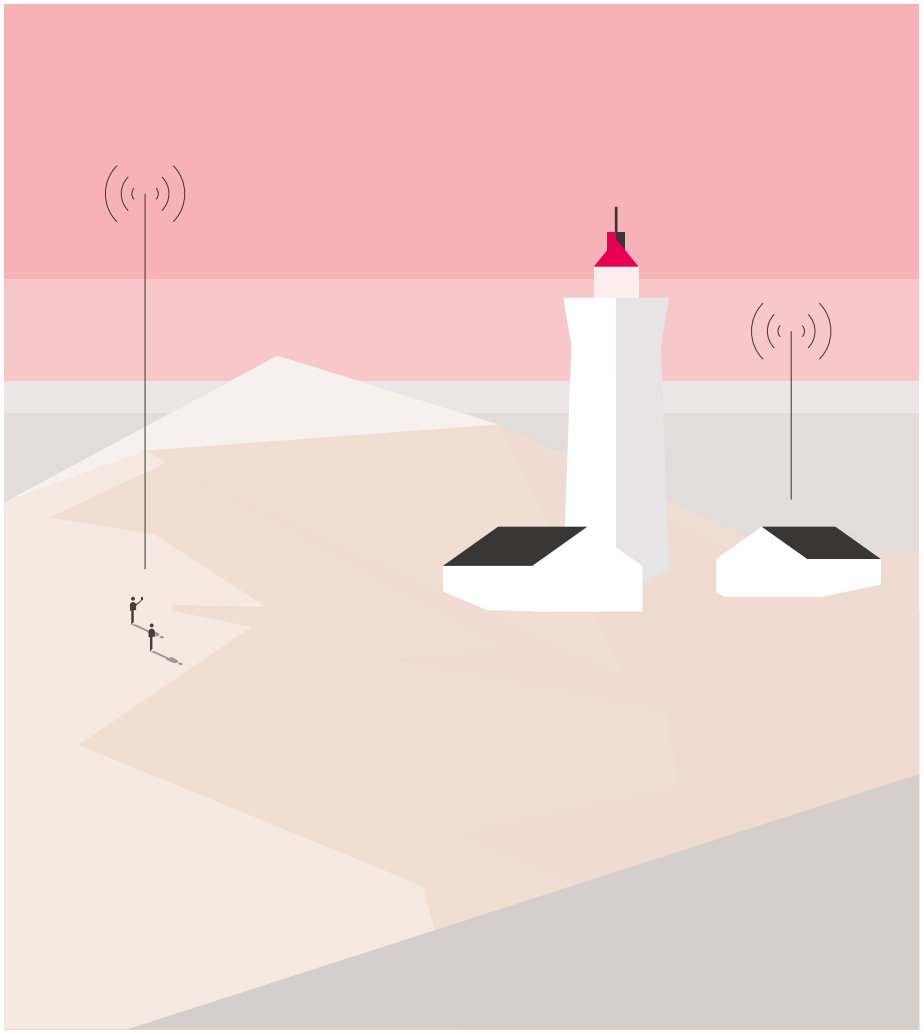
> *"It is important not to compromise citizens' trust in the public sector's usage and processing of data."*
>
> Adam Lebech,
> Deputy Director General of the Danish Agency for Digitisation[32]

30 "A stronger and more secure digital Denmark - Digital Strategy 2016-2020", the Danish Government, Local Government Denmark (LGDK) and Danish Regions, May 2016

31 "How to successfully promote ICT usage: A comparative analysis of Denmark and Japan", Noriko Igari, *Telematics & Informatics* 31(1), 2015.

32 Interview with Adam Lebech, Deputy Director General in the Danish Agency for Digitisation, conducted on 29 January 2019.

The measures for citizen accompaniment and training, combined with the high level of trust citizens hold in their administration, have gradually strengthened the digitisation of administrative services and made Denmark a model in terms of e-Government. Even more so, the government's concern with maintaining trust reinforces its efforts to support and train citizens and thereby strengthens citizen confidence in the administration: this virtuous circle accelerates the deployment of an administration that is revitalized and legitimized by the quality of its operations and services.



PART 2 - Open Data and Protected Data: Prerequisites for a Democratic Digital State

PROTECTING PERSONAL DATA: ENSURING A DIGITAL TRANSFORMATION THAT RESPECTS CITIZENS

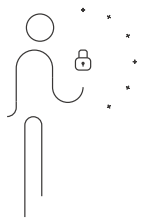
As the dematerialization of the administration creates new data sets and new principles of data sharing, multiple risks related to data protection emerge. In order to address these risks, the Danish government seeks to promote technical and legal tools against the inappropriate and fraudulent use of citizens' data.

This political recognition of the right to privacy translates to a strengthened legal framework for data protection. The country is a signatory to the European Convention on Human Rights (ECHR)[33], Article 8 of which guarantees the right to privacy, including privacy in correspondence. Denmark has also ratified the Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data (Convention 108)[34], which protects individuals from abuses that may occur during data collection and processing. In parallel, the protection of personal data is enshrined at the national level by the Act of 31 May 2000, which supplements Article 72 of the Danish Constitution. Amended several times since its adoption, this measure stipulates that the collection and processing of data must be "adequate, relevant and proportionate"[35]. This act applies to any person or service that collects personal data in Denmark, including government agencies, regardless of the quality or purpose of their activity. It was recently reinforced by the entry into force of the General Data Protection Regulation at the european level.

The current debate over the level of personalisation of public services reflects this attention. Denmark possesses the technological capabilities to improve the personalisation of its public services. The reason why agencies do not do this is twofold. First of all, as Morten Nielsen Meyerhoff, a researcher at the Tallinn University of Technology (Estonia), explains, *"It is a political choice. Are we waiting for a citizen to apply for retirement pension or are we sending it to them directly when they are entitled to it, because the information collected through online services allows us to know this kind of thing about citizens? It's a question of budget"*[36]. However, this problem is also ethical, because it concerns the use of citizens' data. At what point is the citizen being "spied on"? Until then, and in accordance with its desire to preserve user confidence, the Danish administration has chosen not to set up a system for personalising services, in order to *"not worry citizens or question the fact that their data is protected"*[37], that its use is proportional and relevant to the proper functioning of dematerialised administrative services.

A GOAL OF TRANSPARENCY IN PUBLIC SECTOR DATA USE

In accordance with the dual imperative for personal data protection (recognized in public policy for over twenty years) and for users' trust in their administration, Denmark aims to make the usage of data (including data produced by users themselves) for public services more transparent and open. According to Torsten Andersen, Deputy Director-General of the Danish Business Authority, *erhbervsstyrelen*, data management has become a priority in their daily work.



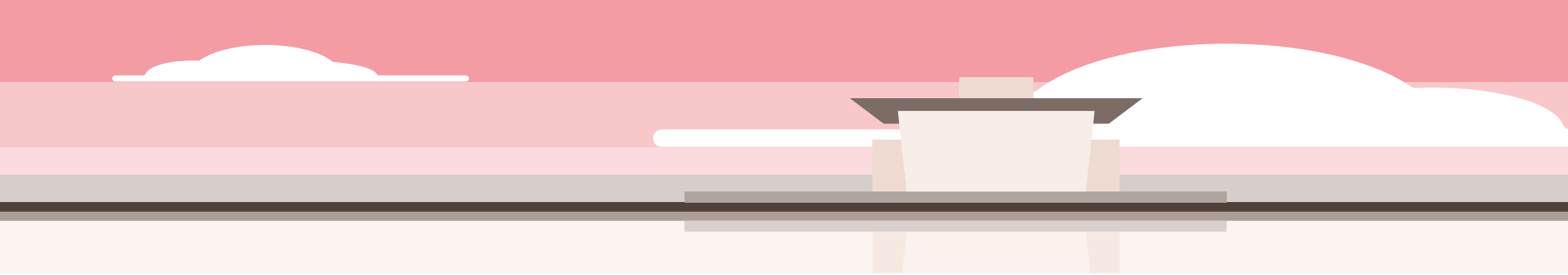
33 European Convention on human rights.

34 Convention 108.

35 Law of 31 May 2000 on the treatment of data.

36 Interview with Morten Meyerhoff Nielsen, Researcher at Tallinn University of Technology (Estonia), conducted on 23 January 2019.

37 *ibid.*



> *"We want to make the Danish Trade Authority a data-guided agency. To this end, the processing of data collected by public services and businesses must be better managed and citizens must be aware of what is being done with their data."*
>
> Torsten Andersen,
> Deputy Director-General of the Danish Business Authority[38]

This ethical data management, whose principles are in line with the obligations arising from the General Data Protection Regulation to which all European administrations are subject, is now a central step in the Danish State's digital transformation. According to the Danish Agency for Digitisation, citizens should have no doubt that data sharing is "secure and conducted with their consent"[39].

38 Interview with Torsten Anders, Deputy Director-General of the Danish Business Authority, conducted on 28 January 2019.

39 *World-class Digital Service*, p.7, Finance Minister of Denmark, October 2018.

OPEN DATA[40] POLICIES STILL IN THEIR INFANCY, BUT NECESSARY FOR THE CREATION OF A DIGITAL ECOSYSTEM

Unlike personal data protection, open data does not have its own policy in Denmark. As Adam Lebech affirms, *"each new digital policy takes into account the need today to open up access to public data, but this is not a priority or strategy in itself"*. However, efforts are being made, first of all, to promote coherence horizontally between administrations.

For example, the Danish Business Authority, for the purposes of its service, must rely on data held by other administrations that are focused on businesses. However, these data are heterogeneous. The agency has therefore deliberately chosen to use only a limited number of data sets held by these various administrations—at the national, regional or municipal level. It has chosen to standardise its own database, relying where necessary on limited queries in their field to other databases. The agency has also chosen to make its database available to any administration concerned with economic life. Finally, regarding data covering different legal perimeters between administrations (for example, variable legal definitions of certain business results), it chooses to keep only the data that is closely related to its needs and to systematize possible requests for other similar data to facilitate as necessary an adaptation of the administrative solution for the constituent.

40 The Open Knowledge Foundation defines open data as *"data that can be freely used, re-used and redistributed by anyone - subject only, at most, to the requirement to attribute and sharealike."*. http://opendatahandbook.org/guide/fr/what-is-open-data/

The availability of the same dataset for all agencies facilitates exchange between them and therefore their collaboration. One of the successes of this functional scope approach is that it facilitates the adoption of decisions which were *a priori* considered inadmissible, but which in reality were acceptable and accepted by the agents and public decision-makers involved in this transformation. For example, it is through this cooperation that some authorities, together with their digital solutions providers (like *cBrain*), have chosen not to integrate data that was considered outdated, or else, for example, to create conversion tables between heterogeneous databases from different administrations, in the implementation of the F2 software.

The Danish administration has developed an open access data policy in line with their 2016-2020 Digital Strategy, as well as the Open Government Programme (OGP)[41], signed by more than eighty countries including Denmark. This principle, which strengthens cooperation between and transparency of public authorities, aims to foster digital innovation and the development of a start-up ecosystem around the State's digital transformation activities. The Danish authorities consider it essential to open up access to public data in order to facilitate and promote its economic use. To this end, in 2015, the Danish Business Authority entered a partnership with local authorities to entrust the Open Data DK[42] association with the development of data sharing practices between government agencies and companies.

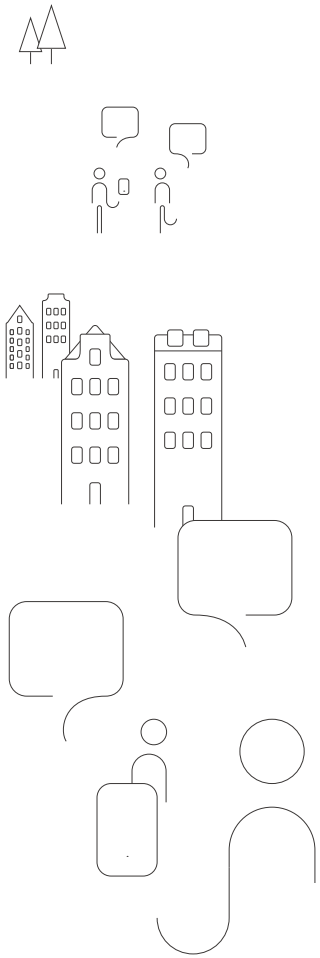
This approach aims in part to facilitate the growth of new companies, by compensating for the potential challenges to growth and development they face due to the rigidity of public contracts. This open approach makes it possible to overcome certain difficulties in the transition from experimentation to large-scale deployment of their activities.

41 "Denmark Action Plan 2017-2019", Open Government Partnership, 28 November 2017

42 *Open Data DK* is an association of Danish municipalities and regions. It aims to make government data open and available to citizens and businesses. It's objective is to improve the transparency of public administration and support data-based growth. http://www.opendata.dk

"*Public procurement regulations have become a bit of an obstacle to the momentum of reform and openness. There is no real ecosystem around our public initiatives today. However, we are trying to make things happen, particularly by making government data available. We are very inspired by initiatives in countries like Israel.*"

Adam Lebech,
Deputy Director General
of the Danish Agency for
Digitisation[43]



43 Interview with Adam Lebech, Deputy Director General of the Danish Agency for Digitisation, conducted on 29 January 2019.

FOCUS

The platform *Sundhed.dk*: a secure, dematerialized health service

The digital transformation of the administration exceeds the simple act of putting administrative procedures online. It contributes to the deployment of many public policies, such as e-health. Denmark is ranked first in the world for its use of new technologies in hospitals.[44] Because the secure architecture of the network was already effective, the state has been able to launch an ambitious health program, based in particular on the national health platform, Sundhed.dk. The platform is 100% public funded, 80% funded by regions, which are responsible for hospital management and the implementation of health policies.[45]

44 "Setting the agenda for universal healthcare", website of the Danish Foreign Ministry

45 The remaining 20% is divided equally between the Ministry of Health and the municipalities.

THE DATA AT THE HEART OF *SUNDHED.DK'S* OPERATIONS

Created in 2004 and accessible thanks to the unique identifier for all administrative services, *NemID*[46], the platform is now used every month by more than one in three Danish citizens. It aims to "create links between existing data sources and to share data between patients and health professionals for easier medical follow-up".[47] It should be emphasized that the first step, at this stage, was to facilitate patient services, not to build a predictive health management plan. Thus, the issue of health professionals accepting data sharing and cross-referencing did not pose a problem for the transformation agenda. This "small steps policy" makes it possible to initiate transformation within a limited functional scope, which can expand over time once new practices have been established.

Citizens and health professionals can find two types of information, and therefore access two distinct types of data:

- Open Data such as general information about illnesses, medications, information put online by laboratories, or medical manuals are accessible through an open space, in order to interpret patients' test results;
- Thanks to their unique digital identifiers, Danish citizens and their doctors can access the personal page *"MyHealth.dk"*, on which their personal patient data are stored, such as medical history and examination results.[48]

46 See Frame n°4, p.22.

47 Official website of the platform: Sundhed.dk

48 Only existing data (provided by patients, physicians, hospitals, regions, municipalities) are used at this time. The platform is not intended to create new databases.

DATA PROTECTION POLICY ON THE DANISH E-HEALTH PLATFORM

In order to meet the expectations of citizens as well as the increasing legal requirements of European data protection, *Sundhed.dk* has developed a data protection policy that Morten Elbaek Petersen, director of *Sundhed.dk*, describes as *"beyond the recommendations of the Danish Center for Cyber Security"*[49], in particular through a biannual technical system inspection. Sundhed.dk aims to guarantee the financial and human resources necessary to adapt the platform as frequently as possible to the market offer and to innovations and to prevent potential threats to the collected data.

The use of data is thus intended above all to protect patients by allowing them to take control of and responsibility for their own health data, and therefore their medical situation. The platform has been approached many times by researchers, both public and private, particularly those supported by the insurance or pharmaceutical sector, for whom this type of platform would make it possible to collect many types of data and significantly facilitate their work. However *Sundhed.dk* has always refused, believing that it must be a *"safe harbour"* for data, as Jacob Uffelman, the platform's innovation director, points out[50]. These strict data protection policies aim to preserve citizens' trust, which is crucial for the proper functioning of the platform.

> *"A condition for success is patients' confidence in the state's ability to protect their personal data. At the moment, the state presents itself as a reliable guardian, capable of coordinating multiple systems and data."*
>
> Morten Elbaek Petersen,
> CEO of *Sundhed.dk*[51]

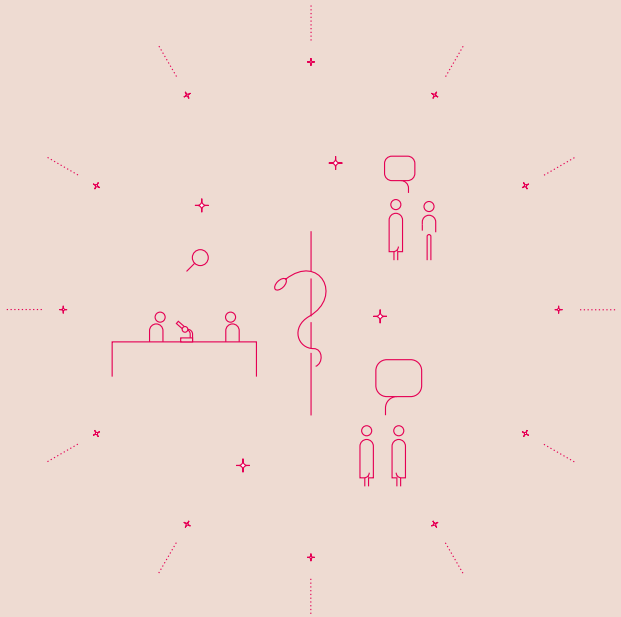
49 Interview with Morten Elbaek Petersen, CEO of *Sundhed.dk* and Jacob Uffelman, Director of innovation at *Sundhed.dk*, conducted on 28 January 2019.

50 *ibid.*

51 *ibid.*

WHERE DOES THE PLATFORM GO FROM HERE?

Today, *Sundhed.dk* has two objectives. Through the personalised monitoring offered on the platform, *Sundhed.dk* aims to become a predictive medical tool that can reduce disease rates, the use of health care services, and thus the costs to the Danish health system. In addition to providing access to available personal health data and medical information, the platform also seeks to develop a support system for citizens during medical procedures, for example, through the development of personalised support for medical expense reimbursement procedures.



PART 3 – Rethinking Foreign Policy in the Digital Age: the Advent of *Techplomacy*

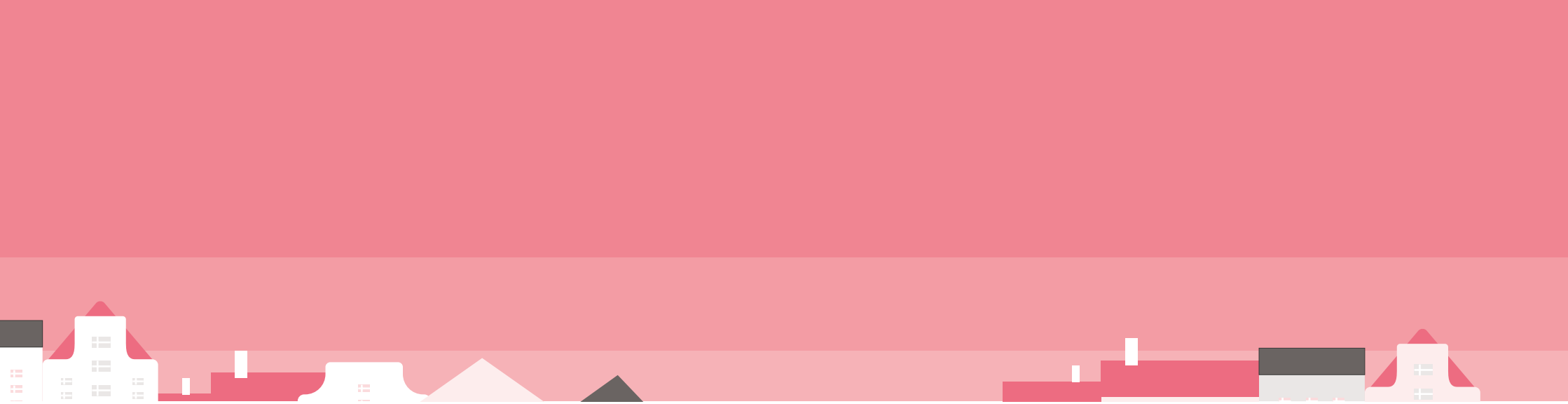
The Danish government's focus on digital transformation has not only resulted in the transfer of the country's administrative activities online. The country was also the first to raise digital issues to the rank of diplomatic affairs with the creation in 2017 of the position of *Tech Ambassador*, embodied by Casper Klynge, formerly Danish Ambassador to the Association of Southeast Asian Nations (ASEAN). Today, this "Embassy of Technology" has offices on three continents: in Copenhagen (Denmark), Palo Alto (United States) and Beijing (China). Denmark is thus the first country to send an ambassador to a segment of the private sector—stateless and without borders—marking a turning point in the history of international relations.

STRENGTHENING DENMARK'S POSITION IN THE INTERNATIONAL DIGITAL ECONOMY

The fact that this embassy is attached to the Ministry of Foreign Affairs demonstrates the desire to no longer consider relations with digital companies solely as an international trade cooperation issue, but also as a diplomatic and foreign policy issue. As explained by Anders Samuelsen, Danish Foreign Minister, "*It is a matter of sending a message that takes into account the Royal Crown and our diplomacy. We need to strengthen economic diplomacy between our country and Silicon Valley… it is a priority for foreign affairs*"[52] According to Danish diplomats, the primary objective in establishing this embassy was not to replace traditional diplomacy, but to complement it by adapting it to contemporary issues, which did not exist until about twenty years ago. The Embassy is thus in charge of relations with private legal entities—companies—to whom it relays the interests and portfolios of various ministries, facilitated by its long-term relationships with the world's leading technology companies.

The creation of this post and its missions in foreign affairs have been critiqued in France and elsewhere as a distortion of international relations—placing on the same level the private interest of companies and the general interest of citizens represented by state institutions. Nonetheless, this Danish initiative has inspired the appointment of some international counterparts, though their roles, mission, and the scope of their activities vary.

52 "Le Danemark nomme un ambassadeur auprès des GAFA", *La Tribune*, February 2017.



In France, the Digital Ambassador, represented by David Martinon from November 2017 to November 2018 and Henri Verdier since then, is not only charged with building relationships with tech companies, as in Denmark, but also with international digital issues, like cyber security and Internet governance.

Estonia has decided to go further than Denmark by creating two "embassies" dedicated to the new technologies sector. First, in September 2019, Estonia appointed a Cybersecurity Ambassador, Heli Tiirmaa-Klaar. Like the posts of Casper Klynge in Denmark and Henri Verdier in France, the Estonian Embassy for Cybersecurity is attached to the Ministry of Foreign Affairs. The Ambassador is in charge of "*developing Estonia's foreign policy with regard to cybersecurity, ensuring its coordinated implementation, representing Estonia in international organisations and contributing to international cooperation in this area*"[53].

While Denmark's creation of the position of Tech Ambassador questions the traditional scope of international relations, Estonia is pushing the boundaries of the role of the Embassy even further, with the creation of a "*Data Embassy*" in Luxembourg. Described as an extension of the Estonian government to the cloud, this "embassy" will have no ambassador to manage it but will consist rather of servers outside its territory to backup a copy of the nation's data.[54] The stated objective: to ensure the continuity of its public services in the event of a crisis, like a cyber attack, a natural disaster or a power failure. This data center is considered an embassy under the Vienna Convention, because it will maintain Estonian sovereign territory on the territory of a foreign state, granted by the state of Luxembourg.

At the international level, United Nations Secretary-General, Antonio Guterres, in his January 2019 call to action in the areas of climate, sustainable development and new technologies, also made clear his desire to create a specific post for digital issues within the United Nations, calling for "*bold and innovative ideas to limit the growing risk of international cyber attacks, while promoting the benefits of digital technologies*"[55].

53 "Estonia appoints Heli Tiirmaa-Klaar as its first Ambassador at Large for Cyber Security", website of the Estonian Ministry of Foreign Affairs, 4 September 2018

54 "Estonia to open the world's first data embassy in Luxembourg", *e-estonia* website

55 "L'ONU appelle le groupe d'experts sur la coopération numérique à proposer des idées audacieuses", *UN Info*, January 2019.

A RANGE OF REACTIONS AMONG TECH COMPANIES

The creation of the position of *Tech Ambassador* has received various reactions from States, but also from companies in the technology sector, which were the first to be affected by its establishment.

Table n°3 - Reactions of tech companies to the creation of a Tech Embassy[56]

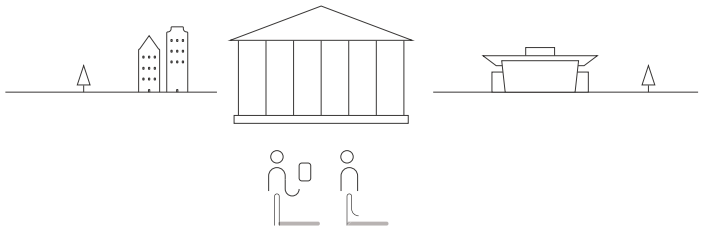
Reactions	Companies	Reasons
Positive – These companies are open to discussion and the establishment of a long-term relationship with this state actor.	Mostly Silicon Valley actors: • - Large online sales platforms, such as Amazon • Google	• This embassy can serve as an intermediary between the interests of companies and the political decision-makers and legislators who regulate their activities; • Relations with the Embassy can help suggest comportement and provide clarity around the application of european regulations and directives as well as national laws.
Curious – Neither enthusiasm for the establishment of this embassy nor reluctance. They agreed to initial meetings with the Ambassador to find out more.	Social networking platforms: • Instagram • Facebook	• These companies do not know exactly how to approach the creation of such an entity or understand the reason for its creation; • They have no preconceptions and wish to know the ambition of establishing such relationships
Reticent - Hostility towards such an approach by a foreign state entity.	Mostly Asian actors, including BATX[57]	• The intervention of a foreign government entity in their activities is contrary to their economic culture and is therefore perceived to be contrary to their economic interests.

56 This typology is not intended to be exhaustive or to generalize the relations between public entities and the private actors mentioned. This classification was established in particular on the basis of discussions held during an interview with Nicolas Juncher Waedegaard, Deputy Tech Ambassador, on 28 January 2019.

57 The acronym BATX stands for four Chinese companies in the digital sector: Baidu, Alibaba, Tencent and Xiaomi. Together, these four companies capitalize more than a trillion euros.

A PRIVILEGED ROLE IN NATIONAL PUBLIC POLICIES

In addition to establishing relations between the Danish government and tech companies to represent the interests of the various ministries towards these companies, the Embassy also aims to advise national policy makers. The creation of this embassy allows them access to meetings and working groups, particularly European ones, that other more traditional actors like ministries cannot attend, and that can inform their decision making. In this sense, the Embassy for Digital Technology has a dual role: to represent the government in its relations with companies, and also to advise the various ministries and political decision-makers in their actions, particularly with respect to regulation of the sector. Today this remains a unique double-endeavor.



Ten Key Factors for the Success of Denmark's Digital Transformation

1. DIGITIZING THE ADMINISTRATION FUNCTION BY FUNCTION

The Danish model is based on a modest but effective method. Choose a functional scope of the administration (a designated public service, a particular administration), work from the beginning and in a systematic way, along with the actors in order to better understand their processes, and introduce digital bricks that support their activities concretely.

2. IMPOSE THE DIGITISATION OF EXCHANGES BETWEEN CITIZENS AND THE ADMINISTRATION WITH THE SUPPORT OF EFFICIENT SERVICES

In a concerted way, Denmark's "*digital-by-default policy*" has been able to function thanks to the parallel implementation of digital tools facilitating these new modes of exchange between citizens and the administration (*e-Boks*, *NemID*).

3. CONSISTENTLY SUPPORT THE DEPLOYMENT OF DIGITAL TECHNOLOGY WITHIN THE ADMINISTRATION

Digital transformation has been held as a priority in Danish multi-annual strategies and budgets for over two decades. Through the "*digital-by-default policy*" coupled with the State's desire to make its administrative services more efficient, the use of dematerialized services and their continuous adaptation is becoming the norm, and sometimes even an obligation.

4. DEVELOP THE USE OF DATA TO IMPROVE THE EFFICIENCY OF PUBLIC POLICIES

The Danish data mapping and exploitation policy makes it possible to modernise administrative processing in strict compliance with the standards for security and the protection of citizens' privacy.

5. IMPLEMENT THE PRINCIPLE OF ADAPTABILITY AND MUTABILITY IN DIGITAL POLICY DECISIONS

Danish policy makers are very flexible in their actions, taking into consideration what is not working and what needs to change. The possibility of making mistakes and improvements is accepted as part of the process of digital transformation of the state. User feedback is considered in order to adapt and improve the administrative services offered.

6. DIGITIZE SERVICES FROM START TO FINISH, FROM THE CITIZEN TO THE PUBLIC OFFICIAL

The digital transformation of the Danish administration is not only an evolution of the *front desk* used by the public, but also includes the *back office* used by public officials. While respecting the administrative tradition of services and professions, the digital transformation of the Danish State lies in a continuum between the citizen and the public official.

7. HOLD ACCOUNTABLE THE DIFFERENT LEVELS OF GOVERNANCE IN CHARGE OF PUBLIC POLICIES

Each level of governance (local, regional, national) is responsible for the implementation and use of online services. As stakeholders in the Steering Committee for the Digital Transformation of the State, municipalities, regions and ministries cooperate and are all responsible for the successful development of the digitisation of administrative services.

8. ENABLE COOPERATION BETWEEN THE PUBLIC AND PRIVATE SECTORS

Public authorities have been able to draw on the expertise of the private sector, and in particular the Danish digital innovation sector, in the transformation of the State. These companies support the entire transformation process and participate in the adaptability of services.

9. SYSTEMATICALLY INTEGRATE SUPPORT AND TRAINING FOR CITIZENS INTO DEPLOYMENT OF ALL DIGITAL SERVICES

Digital education for all citizens is a prerequisite for the dematerialisation of public services. Public agencies are proactive in ensuring that all parts of Danish society have the capacity to use online services. Support is not only to achieve adoption of digitised public services in response to administrative tasks (taxes, administrative authorisation, etc.). It also includes feedback from citizens on their opinions of the digital services offered.

10. MAINTAIN CITIZENS' TRUST

Citizens' trust in their administration is a crucial element in the process of the digital transformation of the state. The management of this process through a single dedicated public agency is held as a measure of trust for Danish citizens, and allows the state to maintain their support during this transformation. The emphasis on the protection of citizens' data and privacy is essential to achieve this transformation.

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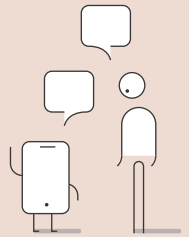

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THE WORKING GROUP

Julien Nocetti, Researcher, French Institute of International Relations

Philippe Régnard, Director of Public Affairs, Digital Division, Groupe La Poste

Amal Taleb, Director of Public Affairs, SAP France

Philippe Walter, Director of Development and Innovation, Public Sector Division, Microsoft France

COORDINATION

Jennyfer Chrétien, Executive Director, Renaissance Numérique

RAPPORTEUR

Romane Malysza, Project Manager, Renaissance Numérique

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Renaissance Numérique
22 bis rue des Taillandiers - 75011 Paris
www.renaissancenumerique.org

DIGITAL EXPLORATION

Denmark:
A Digital Will

September 2019