

## A Case Study of Digital Transformation of Danish Public Services

Actors and Policies

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# A Case Study of Digital Transformation of Danish Public Services: Actors and Policies<sup>1</sup>

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## Abstract

This paper investigates the policies and actors that have contributed to achieving the digital transformation in Danish public administration as it is reflected by the current 2018 DESI index (European Commission, 2018). The study is part of a European Horizon 2020 project entitled Co-Val (Understanding value co-creation in public services for transforming European public administrations) and reports some partial results of WP3 on digital transformation in European public administrations (<http://www.co-val.eu/>). The study uses a qualitative methodology in the form of case study (Yin, 2009). In particular, a longitudinal case study and process tracing methodology is used to identify the key factors. The data are secondary data consisting of digital transformation strategies, policies and related documents and press releases retrieved on official governmental websites. The case study provides an overview of Denmark's digitalization position in relation to the rest of EU, the basic digital policies and strategies that

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<sup>1</sup> This study is based on the report by Mergel, I., Gago, D., Liefooghe, C., Mureddu, F. and Lepczynski, S., Scupola, A. (2018) "Policy and process tracing of international digital transformation practices" WP3 / D3.2, Co-VAL [770356] "Understanding value co-creation in public services for transforming European public administrations." European Commission. (<http://www.co-val.eu/>)

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the Danish government has undertaken over the last two decades as well as an account of the key stakeholders involved in such a process.

## **1 Introduction**

Denmark has been the leading European and world country regarding digitalization of public services for the last several years (European Commission, 2017a, 2018). Denmark has a long tradition of ICT governance and policy making to promote Internet in the society (Scupola & Zanfei, 2016). Several studies have investigated the development of the information society, network society and e-commerce adoption in Denmark from different point of view. For example, Andersen and Bjorn-Andersen (2001) (Andersen & Bjorn-Andersen, 2001) analyzed the Danish e-commerce strategy and e-commerce adoption and found that there was in 2001 a policy commitment from the Danish Government to utilize e-commerce for welfare purposes. E-commerce had to be used to further develop the current welfare society model for a better quality of life; to reach new scientific achievements; better public service; improved healthcare; more exciting jobs; more interesting cultural offerings; and a less stressed workforce with more time for individual development. In addition, Andersen et al. (2003) point out that the Danish e-commerce strategy is a highly ambitious effort to become the world's leading IT nation (K. V. Andersen, Bjørn-Andersen, & Dedrick, 2003). Instead of a production-led strategy aimed at stimulating domestic hardware and software production, Denmark pursued a demand-oriented approach focused on promoting the widespread adoption of e-commerce in the Danish society. In the article, Andersen et al. (2003) analyzed the Danish national environment for e-commerce, discussed four sets of governance initiatives aimed at the development of e-commerce, and analyzed the reasons for its success in B2B and relative failure in B-to-C e-commerce (K. V. Andersen et al., 2003). Furthermore, a more recent study by Scupola and Zanfei of digital transformation in academic libraries (Scupola & Zanfei, 2016) argued that information policies which persist over time, and are designed to increase collaboration between different (public and private) actors are necessary for the transition towards a networked governance approach in public service administration. However, most of the studies addressing Danish e-government policy have been published in the last decade and address mostly e-commerce adoption and diffusion in a B-to-B and B-to-C context. Therefore, besides being a bit old, previous studies do not provide a comprehensive overview of the events and actors that have led to Denmark having a leading position concerning digital transformation and especially

the digital transformation of public administration. In order to fill this gap, this paper investigates the following research question: What policies and actors have contributed to achieving the digital transformation in Danish public administration as reflected by the 2018 DESI index? To answer the research question an in depth case study is conducted by applying process tracing methodology and using secondary data such as key governmental documents, strategies and reports. The study finds that a continuity in the strategies and digital agendas as well as in the involvement of the main key stakeholders are some of the factors explaining the ranking of Denmark as the most advanced country concerning digitalization in the EU and the world.

The article is structured as follows. The following paragraph briefly presents the methodology. This is followed by the main case results and a short conclusion.

## **2 Research Method**

In order to investigate the research question, this study conducts a case study of Denmark. Case study is a useful method for investigating complex real-life phenomena based on rich data (Yin, 2009). The chosen case is an ideal setting to collect the necessary data to investigate the factors such as policies and actors that have contributed to achieving the current digital transformation in Danish public administration. In particular the study uses explanatory-outcome process tracing to investigate such factors (Mergel, I., Gago, D., Liefoghe, C., Mureddu, F. and Lepczynski, S., Scupola, 2018). Process tracing is used to study the causal mechanisms in a single-case research design. Process tracing is especially suited to tracing the combination and interaction of divergent causal factors in the process that leads to an outcome (Beach, 2017; Beach & Pedersen, 2015; Blatter & Haverland, 2012; George & Bennett, 2004). By using explanatory-outcome process-tracing the study aims to provide an explanation of the outcome of the case. The aim is to show the presence or absence of causal mechanisms that contributed to digital transformation of public administrations in Denmark. The data collection included official policy and strategy reports, press releases published on key governmental web sites such as the Danish digitalization agency and reports written by other international organizations such as OECD and European Commission.

### 3 The Danish Public Administration Case

#### 3.1 Denmark and Digitalization

According to the Digital Economy and Society Index (DESI) report 2018, Denmark ranks first out of the 28 EU Member States and as Fig. 1 shows it has done so for the last several years (European Commission, 2018). The DESI Index tracks the progress of a country's digitization according to connectivity, human capital, use of internet services, integration of digital technology and digital public services. Denmark belongs to the high-performing cluster of countries and is a leader in digitization in the world. Denmark together with Sweden, Finland, and the Netherlands have the most advanced digital economies, followed by Luxembourg, Ireland, the UK, Belgium and Estonia. In 2018, Denmark made progress in most DESI dimensions, with the exception of Integration of Digital Technology.

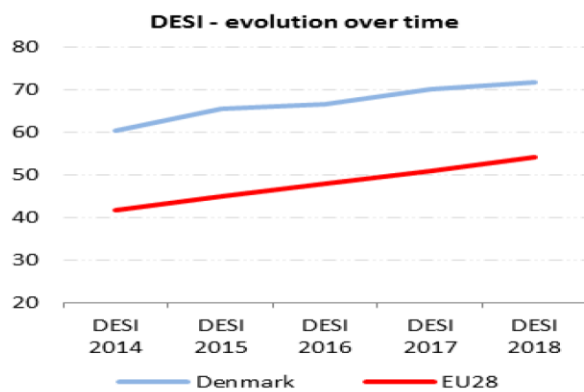


Fig 1: DESI evolution over time- Source: European Commission (European Commission, 2018)

According to DESI report 2018 Denmark performed very well in the connectivity dimension, also due to the widest 4G coverage in Europe, and the increase in coverage and take-up of fast and ultrafast fixed broadband connections in Denmark. In Denmark, broadband goals have been strongly linked to digitalization initiatives and are supported by a number of political initiatives both at central government, regional and municipality level aiming at nation-wide fixed and mobile broadband coverage.

Concerning the “Human capital” dimension, a high percentage of Danes have at least basic digital skills as well as the percentage of ICT specialists is slowly increasing in the country.

Denmark is performing very well and making progress in particular in its percentage of STEM – science, technology, engineering and math -graduates. As it can be seen in Fig. 1 “DESI Evolution Over Time”, Denmark has performed above the average of the EU countries at least over the last 4 years (European Commission, 2018).

Regarding “Use of Internet”, almost all Danes are online (95%) and are good users of a variety of online services, particularly for banking, shopping and accessing online entertainment. They are also heavy users of online video calls (62 %) and social networks (78 %). Denmark is leading the EU and the world rankings in the use of digital technologies by enterprises and in the delivery of online public services. For example, Denmark scores the highest (100 points) in availability of domestic and cross-border online public services for businesses and 86 % of internet users that must submit forms use online services to do so.

In addition, Denmark leads the Integration of Digital Technology in the business dimension with 28 % of SMEs selling online and a majority of Danish enterprises having embraced digital technologies well above EU average. About 10 % of Danish SMEs sold cross-border in 2017 with a high percentage of their revenues coming from e-commerce (14.5 %). A large number of Danish enterprises embraced digital technologies, such as cloud (38 %) and social media (29 %) and are highly using electronic information sharing technologies (40 %). Please refer to Fig 2 below for an overview of integration of digital technologies by companies.

	Denmark				EU
	DESI 2018		DESI 2017		DESI 2018
	value	rank	value	rank	value
<b>4a1 Electronic Information Sharing</b>	<b>40%</b>	<b>↓</b>	<b>6</b>	<b>47%</b>	<b>34%</b>
% enterprises	2017		2015		2017
<b>4a2 RFID</b>	<b>2.0%</b>	<b>↓</b>	<b>26</b>	<b>3.2%</b>	<b>4.2%</b>
% enterprises	2017		2014		2017
<b>4a3 Social Media</b>	<b>29%</b>	<b>↑</b>	<b>5</b>	<b>27%</b>	<b>21%</b>
% enterprises	2017		2016		2017
<b>4a4 eInvoices</b>	<b>NA</b>			<b>64.0%</b>	<b>NA</b>
% enterprises	2017		2016		2017
<b>4a5 Cloud</b>	<b>37.7%</b>	<b>↑</b>	<b>3</b>	<b>29.6%</b>	<b>NA</b>
% enterprises	2017		2016		2017
<b>4b1 SMEs Selling Online</b>	<b>27.8%</b>	<b>↑</b>	<b>3</b>	<b>27.0%</b>	<b>17.2%</b>
% SMEs	2017		2016		2017
<b>4b2 E-commerce Turnover</b>	<b>14.5%</b>	<b>↓</b>	<b>5</b>	<b>18.0%</b>	<b>10.3%</b>
% SME turnover	2017		2016		2017
<b>4b3 Selling Online Cross-border</b>	<b>9.2%</b>	<b>↓</b>	<b>11</b>	<b>9.8%</b>	<b>8.4%</b>
% SMEs	2017		2015		2017

Fig 2: Use of ICT by Danish companies-Source European Commission (European Commission, 2018)

However, some indicators show that there is still room for improvements. For example, more than a quarter of the Danish population still lacks basic digital skills. Furthermore, Denmark needs to create a better match between the digital skills required by companies and the supply of graduates with these skills. According to the latest EDPR report (European Commission, 2017c), Denmark, in fact, still lacks an overall strategy for digital skills as digital skills initiatives have mainly been associated to individual policies. Addressing the availability of ICT specialists is important for supporting the digital and innovative transformation of the Danish economy.

### **3.2 Governmental Strategies for Digital Transformation**

Denmark has a long tradition of using IT in public administration and many initiatives go back to the 1990s and even to the 70s (OECD, 2006). Table 1 summarizes the main strategies and key projects of the last two decades.

The Danish eGovernment strategy, 'Towards eGovernment: Vision and Strategy for the Public Sector in Denmark' (Den Digitale Taskforce, 2002), is published in January 2002. It sets out a vision to systematically use digital technologies to introduce new ways of thinking and to transform communication and collaboration. This is still the basic concept behind the Danish approach to e-government. It is considered as the beginning of joint digitization co-operation between the municipal, regional and state levels of the administration. This strategy was revised and a new eGovernment Strategy for the period 2004-2006, "Den offentlige sektors strategi for digital forvaltning 2004-06 - realisering af potentialet "(Den Digitale Taskforce, 2004) was launched as a result in 2004. The e-government strategy for 2004-06 further strengthened the focus on the development of the internal public-sector digitization and efficient payments.

The e-government strategy for 2007-2010 (Den Digitale Taskforce, 2007) focused instead on common infrastructure and established new standards for the development of citizens' services and cohesion across the public sector. The main idea of the strategy is that the public sector should deliver better, more cohesive and efficient digital services to citizens and businesses.

The strategy developed in 2011-2015 (The Danish Government, Danish Regions, 2014) puts again focus on increased digital communication and cross-agency cooperation on public sector's digital infrastructure and shared use of data, as well as the promotion and development of shared solutions.

In 2013, the Danish Government, Local Government Denmark and Danish regions launch again a new strategy “Common Public Sector Strategy for Digital Welfare” (Danish Government, Local Government Denmark, & Danish Regions, 2013). The strategy has the main goal of improving the welfare of the Danish society through digital solutions. Digitalization should provide the citizens with better opportunities to contribute to welfare as well as public authorities should exploit digital solutions to increase efficiency, cooperation, and knowledge sharing.

In 2016, the Danish government lunches the strategy “A stronger and more secure digital Denmark-Digital Strategy 2016-2020” which sets focus on user friendliness and high quality, growth and security (The Government, Local Government Denmark, & Danish Regions, 2016).

In January 2018, the Danish government launches again two new digital strategies. The first, “Strategy for Denmark’s Digital Growth”, consists of 38 initiatives, structured under seven main pillars. The strategy aims at bringing Denmark to the forefront of the digital development, to create the best foundation for Danish companies and exploit new sources of digital growth (Ministry of Industry Business & Financial Affairs, 2018). The second strategy, ”Danish Cyber and Information Security Strategy 2018-2021”, focuses on improving Internet security and will involve 13 ministries (Ministry of Finance, 2018). This strategy will secure better protection of critical government IT systems, it will improve citizens, businesses’ and authorities’ knowledge and skills on how to protect themselves and it will strengthen national coordination and cooperation on information security (Ministry of Finance, 2018).

**Table 1: Danish Digital Agendas**

Year published	Digital Agenda	Key Projects
2002	På Vej mod Den Digitale Forvaltning– Vision og Strategi for den Offentlige Sektor (Towards Digital Management - Vision and Strategy for the Public Sector (own translation) (Den Digitale Taskforce, 2002)	Digital Collaboration: Digital Signatures



2004	Den Offentlige Sektors Strategi for Digital Forvaltning 2004-06 - Realisering af Potentialet (Public sector strategy for digital management 2004-2006 - realization of potential- own translation)(Den Digitale Taskforce, 2004)	Efficient Payments and Internal Digitization: Nemkonto, Virk.dk
2007	Towards Better Digital Service, Increased Efficiency and Stronger Collaboration (2007-2010) (Den Digitale Taskforce, 2007)	Common Infrastructure: NemID, Digital Post
2011	The Digital Path to Future Welfare (egovernment strategy 2011-2015) (The Danish Government, Danish Regions, 2014)	Digital Communication: Digital Post, Online Self-service, The Basic data Program
2013	The Strategy for Digital Welfare (2013-2020) (Agency for Digitisation, 2016)	Dissemination of Telemedicine, Digital learning and Education, Digital collaboration in Health and Education, Welfare technology in Nursing and Care
2016	A Stronger and More Secure Digital Denmark-Digital Strategy (2016-2020) (Agency for Digitisation, 2016)	Clear legal framework for eGovernment, Better data about disabled and marginalized adults, Digital tendering procedures and procurement, Common data on topography, climate and water  Digital skills for children and young people
2017	Strategy for ICT management in central government(Ministry of Finance, 2017)	Data sharing between central government authorities  Partnerships for ICT development  A common central government digital academy
2018	Strategy for Denmark's Digital Growth (2018-2025)(Ministry of Industry, Business and Financial Affairs, 2018)	Technology Pact
2018	Danish Cyber and Information Security Strategy (2018-2021)(Ministry of Finance, 2018)	Creating a national cyber situation centre  Information portal

The overall digital agendas formulated at state level have given rise through the years to spin off strategies focusing and addressing specific elements of the overall digital agenda.

Since the very beginning of the digitalization plan in Denmark, broadband goals and policies have been linked to digitalization initiatives and have been supported by a number of political initiatives both at central government, regional and municipality level aiming at nation-wide fixed and mobile broadband coverage. For example, according to the European Commission (European Commission, 2017d) Denmark has the goal of making 100 Mbps download and 30 Mbps upload speeds available for all households and businesses by 2020. The broadband strategy contains initiatives concerning framework conditions for operators, municipalities and regions as well as consumer-related issues.

### **3.3 Stakeholder involvement from 2000 at national/local government**

The Danish public sector is characterized by a high level of decentralization. The public administration is divided into three levels, state, regions and municipalities, which collaborate closely through the tasks and obligations laid down in the legislation adopted by the Danish Parliament (OECD, 2010). Traditionally, the three levels of government, Danish Government, Local Government Denmark and Danish Regions have collaborated since the beginning in developing and implementing the e-government policies and strategies. Their work has been then accomplished, supported and coordinated through governmental agencies under the umbrella of different ministries. Task forces lasting several years and spanning several strategic agendas as well as a number of more temporary commissions have also been established. Such commissions and task forces have changed according to the plans and needs of the moment. Recent examples include the digital growth panel and the Danish government's disruption committee.

Some actors such as the Ministry of Finance and Ministry of Industry, Business, and Financial Affairs have always been involved from the beginning together with Ministry of Energy, Utilities, and Climate, which is responsible for broadband coverage. A few actors have changed name over time by keeping the same tasks or have merged with other actors (European Commission, 2017b).

Finally, the administrative and political structure of Denmark has been also changed over the years to adapt to e-government developments and make its implementation possible. An important example is the structural reform of the local government in 2007, which by reducing

the number of regions and municipalities has simplified the political structure by simultaneously increasing the size of each single unit, thus also increasing the budgets that each municipality or regions have to implement e-government (Statistics Denmark, 2018).

## 4 Conclusions

Falck and Henten (2000) already in 2000 examined Denmark's policy report, Digital Denmark on the 'conversion to a network society', which followed the Information Society 2000 report published in 1994 (Falch & Henten, 2000). They stated that Denmark provided an interesting case study because it ranked high in the benchmark indicators of information network society developments. This position was obtained largely by public sector initiatives and without erosion of the highly reputed Scandinavian model for a welfare society. In addition Falck and Henten (2000) showed that the Danish government had a vision and an ambition of being the best or among the 5 best countries in embracing information technology for public services and in the society as a whole (Falch & Henten, 2000). The present paper shows that Denmark has succeeded in achieving its goal and after two decades it is still number one in Europe and in the world concerning digitalization initiatives. In addition, the paper provides a brief overview of the policies and the actors that have made this happen

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