

NORDIC INNOVATION REPORT 2015:08 // DECEMBER 2015

The Nordic Digital Ecosystem

Actors, Strategies, Opportunities



The Nordic Digital Ecosystem

Actors, Strategies, Opportunities

Authors:

Lars van Marion
Rambøll Management Consulting

Jon Honerud Hovland
Red Tape Crossing

December 2015

Nordic Innovation Publication 2015



The Nordic Digital Ecosystem Actors, Strategies, Opportunities

Nordic Innovation Publication 2015:08©
Nordic Innovation, Oslo 2015

ISBN 978-82-8277-080-4 (Print)
ISBN 978-82-8277-079-8 (Digital)
(URL: <http://norden.diva-portal.org>)

Authors:

Lars van Marion
Rambøll Management Consulting

Jon Honerud Hovland
Red Tape Crossing

Publisher:

Nordic Innovation, Stensberggata 25,
NO-0170 Oslo, Norway
Phone: (+47) 22 61 44 00.
E-mail: info@nordicinnovation.org
www.nordicinnovation.org

All Nordic Innovation publications can be
downloaded free of charge as pdf files from
<http://norden.diva-portal.org>

Cover photo: 123RF Limited

Copyright Nordic Innovation 2015. All rights reserved.

This publication includes material protected under copyright law, the copyright for which is held by Nordic Innovation or a third party. Material contained here may not be used for commercial purposes. The contents are the opinion of the writers concerned and do not represent the official Nordic Innovation position. Nordic Innovation bears no responsibility for any possible damage arising from the use of this material. The original source must be mentioned when quoting from this publication.

Nordic Innovation

Stensberggata 25, NO-0170 Oslo,
Norway

Phone: +47 47 61 44 00

info@nordicinnovation.org

www.nordicinnovation.org



Ramboll

Hoffsveien 4, NO-0213 Oslo,
Norway

Phone: +47 22 52 59 03

www.ramboll.com



Red Tape Crossing

Sandsvæerveien 119, NO-3616 Kongsberg,
Norway

Phone: +47 93 00 87 91

post@redtape.no

www.redtape.no



Table of contents

1. Introduction	10
2. Methodology	12
3. The Nordic Public Landscape	14
3.1 Denmark	15
3.2 Finland	21
3.3 Iceland	27
3.4 Norway	31
3.5 Sweden	37
4. The Potential for Nordic Collaboration	45
4.1 The strategies and beyond	45
4.2 What do the Nordic stakeholders tell us	47
4.3 Possible cases for further Nordic digital collaboration	52
5. Conclusions and Recommendations	57
5.1 Key findings	57
5.2 Conclusions	61
5.3 Recommendations	62
Appendix 1	
6. The Nordic Digital Eco System	63
6.1 The actors of Denmark	63
6.2 The actors of Finland	70
6.3 The actors of Iceland	77
6.4 The actors of Norway	81
6.5 The actors of Sweden	93
Appendix 2	
7. Maturity and Receptiveness of the Nordics	101
7.1 Rankings and comparisons	101
7.2 Assessment of Nordic governments' maturity	120
7.3 Summary of recent reports, benchmarks and assessments	123

List of figures and tables

Figure 4.1	47
Figure 4.2	48
Figure 4.3	49
Figure 4.4	49
Figure 4.5	50

Executive summary

This report describes possibilities for Nordic digital collaboration by providing an overview of the actors in the Nordic digital eco-system and their characteristics, an analysis of the actors' will and abilities to collaborate, and a discussion of potential business cases for such collaboration.

It seems evident that the public actors see benefits in enhanced Nordic knowledge sharing and joint projects in the area of digitalization. The results indicate that the actors believe such collaboration can:

- a) Provide more efficient ways of developing and delivering digital services within each country.
- b) Provide cross-border services to citizens residing and enterprises doing business in the Nordic countries.
- c) Spearhead European initiatives.
- d) Provide better market opportunities for Nordic-based ICT businesses.

Through a mapping of the actors in the Nordic digital eco-system, and an analysis of recent international benchmarks, the report shows that Nordic countries have a comparatively high level of digital service provision. Furthermore, the countries have highly developed specialized sectors, which deliver many complex and high-quality government services. The modernization of the Nordic public sectors through digitalization seems to be backed by formal plans and political commitment. The strategic goals are basically the same and revolve around improving government services through the sharing of information resources between government agencies. The principle of "once-only" registration of relevant data, which is also embraced by the EU¹, appears to be common ground for the Nordic countries.

Although the Nordic countries are high achievers, the study indicates that there are notable differences between the countries in terms of the topics they excel in. The ways in which the Nordic countries work towards achieving these goals also differ a lot. On the one hand, we find differences that can be explained by different national/political priorities. On the other hand, there are significant differences in how the countries govern their national digitalization efforts. The latter can be viewed as an obstacle to formalizing Nordic digital collaboration. The coordinating bodies of countries such as Norway and Sweden are to a lesser degree able to mandate such collaboration between agencies than their peers in countries such as Denmark, Finland and Iceland.

¹ http://europa.eu/rapid/press-release_IP-15-4919_en.htm

The study indicates that most public actors are involved in Nordic collaboration of some kind. The Nordic countries look to one another for inspiration, and there are a handful of cross-national pilot projects and reports. The actors see the benefits of greater collaboration on digitalization within the Nordic region. However, the countries seem to lack formal arenas for knowledge sharing and coordinating joint projects. The report also indicates that there is a lack of political attention to Nordic digital collaboration. The report shows a somewhat reticent attitude towards joint development projects among the Nordic national CIOs, and clear business cases are seen as an absolute prerequisite for enhanced collaboration. Furthermore, in terms of resources, the EU is the most important international arena for actors in the digital eco-system, and Nordic collaboration is expected to add value to this.

The report exhibits a number of areas in which there potentially could be a positive business case for Nordic collaboration. Based on the report's discussion on how to improve and increase the value of Nordic collaboration, the report recommends that the Nordic digital actors:

- Use the implementation of EU initiatives as a starting point. Accelerate them, demonstrate the potential.
- Make trans-national eID work within government systems. Reduce the waiting-room issue for citizens and enterprises within the Nordic countries.
- Show how common standards for public e-tenders and e-invoicing can provide a de facto internal market for companies doing business in the Nordic region.
- Start at a bilateral or trilateral level. Not all projects are suited to every Nordic country.
- Bypass national coordination issues by not focusing on the overarching policy level. Aim for collaboration amongst service providers on concrete issues that have a clear business case (for example e-prescriptions, procurement).
- Challenge and partner up with the supplier side. There are many strong Nordic technology companies that already provide services to more than one Nordic government. By expanding their market, they can expand their innovation efforts.

Introduction

This report is part of the Nordic lighthouse project “Innovative Nordic digital solutions”, which aims to develop the Nordic region into a pioneer region for new and innovative digital solutions. The project will work to remove barriers to a common Nordic digital market, and support development of new and innovative solutions that can be applied in the Nordic countries. The idea is that this lighthouse project will help to strengthen the Nordic region as a digital frontrunner and prepare for the digital inner market in Europe². Nordic Innovation, working under the auspices of the Nordic Council of Ministers, contributes to the realization of the lighthouse projects together with the Nordic countries.

At the macro level, the Nordic countries have similar visions for the welfare state and a set of common challenges. There is a demand throughout the whole region for more effective use of ICT in the public sector as well as delivery of fast and effective public services to enterprises, other public institutions and citizens. The initial assumption of this report is that the Nordic region is high-performing and mature in terms of public sector digitalization, and that there are potential benefits for citizens, businesses and for government itself from increased digital collaboration between governments.

Ever since the emergence of the networked public sector, the potential of collaboration between government agencies, sectors and responsibility areas have been repeated. Lately, the networked economy has also been putting pressure on government actors to open up their data resources and let private actors contribute to service provision that was previously considered a public sector monopoly.

Nevertheless, collaboration and sharing of information has proven challenging. Public sector government traditionally takes place vertically through sectors, while many of the benefits of digital government emerge through horizontal collaboration, i.e. collaboration between the sectors. Each sector is, however, mandated through separate legislation and comprises organizations dedicated to their limited tasks. This has sometimes resulted in conflicting targets, and an increased demand for new and adjusted governance models.

² <http://www.nordicinnovation.org/projects/lighthouse-projects/innovative-nordic-digital-solutions/>

The aim of the report is threefold:

- To provide a basic overview and understanding of the actors that make up the digital public eco-system in the Nordic countries, the services they deliver and the strategies they follow. This could be useful for anyone who has an interest in establishing contact and/or collaboration with their Nordic peers.
- To analyze the potential for Nordic collaboration in the field of digitalization, both in terms of the countries' performances and maturity and in terms of the actors' conception of potential benefits.
- Finally, based on actor structures, strategies, ICT maturity in different areas and potential benefits, to suggest some potential business cases for Nordic collaboration that support a Nordic digital internal market and/or improve the quality and benefit of public digital solutions in the Nordic countries

The report has been produced by Rambøll Management Consulting in collaboration with Red Tape Crossing AS, on behalf of Nordic Innovation. We would like to thank agencies and stakeholder that have provided input and information throughout the data gathering process.

Methodology

The mapping of actors, initiatives and processes was performed through desktop studies, with a combination of network mapping and reviews of strategies, policy documents, regulations and directives. The desktop studies were performed by Rambøll Management Consulting Norway, with support of Rambøll teams in Finland, Denmark, and Sweden.

In societies as digitalized as the Nordic countries, digitalization actors, policies and solutions are fairly broad and complex. This implies that we have made some analytical choices that are important with regard to what questions and decisions this report may be applied to.

Therefore, we have made the following criteria for the mapping – choosing entities that provide policies, services, solutions or infrastructures that either:

1. Relate to backbone public services that support the Nordic welfare model
2. Relate to enabling horizontal service provisions in the public sector
3. Relate to enablers or barriers for enterprises' ability or cost of doing cross-border business in the Nordic countries.

The entities in each country providing such services were added to the mapping. In addition, we mapped central actors that constitute a part of the public digital eco-system, such as ICT industry interest organizations and organizations dealing with open data/open knowledge. These actors are described in Appendix 1.

The mapping also includes an overview of the Nordic countries' main strategies towards digitalizing society in general, and the public sector and its services in particular. Describing the longer term strategic choices has proven somewhat challenging. The Norwegian, Danish and Finnish governments have signaled new national ICT strategies to be launched at the beginning of 2016, whilst the Swedish and Icelandic government has also signaled that they will start working on new strategies. The EU is also preparing a new eGovernment Action Plan (2016-2020) to be launched in 2016. Given the uncertainty of the strategic directions ahead, we have chosen to rather briefly describe the formally adapted national strategies in the description of each country.

To supplement the desktop studies, a maturity assessment of the capacities of the Nordic governments was performed, together with a questionnaire. We used Rambøll's own survey institute to execute the survey, which was done electronically.

The survey was performed from October to November 2015. The respondent list was created in parallel with the mapping exercise, and for each public entity respondents were

selected according to whether they were regarded as key stakeholders for the policies, services, solutions or infrastructures that qualified their entities.

The survey was exclusively for government actors, as the questions were intended to assess public sector opinions. The survey was sent to 155 public sector representatives, and 43 completed it. The distribution of replies between the Nordic countries was as follows:

Norway 12
Sweden 5
Denmark 12
Finland 6
Iceland 7

Finally, qualitative interviews were performed with the five member of the Nordic CIO group, an informal network organized under the Nordic Council of Ministers for Education and Research (MR-U). The interviews were mainly held by telephone, with one exception. On average, the interviews took about 35 minutes.

The Nordic Public Landscape

This chapter contains an overview of the Nordic landscape that forms the basis of the Nordic digital ecosystem. The overview will be presented on a country by country basis, with an introduction of each country, the country's performance in international benchmarks, its strategies, architectural choices, open data initiatives and general governance of the digitalization efforts.

Different sources have been used to gather relevant information, like the EU National Interoperability Framework Observatory's (NIFO) eGovernment factsheets³ and the NIFO architectural factsheets⁴. The information has been supplemented by extensive desktop research by Rambøll's consultants and interviews with the Nordic CIO group.

Given the starting point, there will be a bias towards regulators, public services and government, as most of the services and infrastructures discussed are managed through these. The aim is to provide the relevant knowledge on how and where initiatives can be addressed, discussed and changed. In this context, we also present some of the more central stakeholders, groups and recurring events.

The full picture of the actors in each Nordic country constituting the eco-system is found in appendix 1 of this report. A thorough review of the Nordic countries performance in recent benchmarks and reports is found in appendix 2.

³ https://joinup.ec.europa.eu/community/nifo/og_page/egovernment-factsheets

⁴ <https://joinup.ec.europa.eu/elibrary/factsheet?page=1>

3.1 Denmark

3.1.1 Brief assessment of the country

Both public digital service provision and user uptake are high in Denmark, which is reflected in its high scores in international benchmarks in this regard. Legal means are being used as a key instrument to promote digitalization of public services, and there is political support for and commitment to the modernization of government services through digitalization. On other areas concerning the information society than e-government services, like infrastructure and openness, Denmark scores comparatively lower than its Nordic neighbors.

Denmark seems to be moving towards a centralized, data driven architecture, where the aim is to optimize services regardless of how the public sector is organized internally. In Denmark, as a general rule, basic data is to be freely available to all public authorities, private businesses, and individuals. Basic data is viewed as a common digital resource, which can be exploited freely for commercial as well as non-commercial purposes. This has led to several new open data initiatives, in which public agencies also promote the re-use of their data.

Although there are many government actors taking part in realizing Denmark's digitalization strategies, the Danish Agency for Digitisation seems to have a relatively clear mandate that goes beyond simply coordinating. The authority regularly monitors the progress of government digitalization and publishes quarterly status reports that assess the progress of public projects' progress according to a traffic light system (green, yellow, red). On a general level it could be stated that Denmark, along with Finland, has the strongest coordination on digital issues among the Nordic countries. Most issues can be addressed through the Danish Agency for Digitisation, which also has the means to govern municipalities and regions.

3.1.2 Performance in international rankings and benchmarks

Denmark is one of the most advanced countries in terms of internet usage. Ninety-two percent of Danes use the internet regularly⁵. This is above the EU average of 75%, and about equal to the Nordic average. With regard to businesses activities, around 25% of Denmark's businesses receive orders online, which is similar to other Nordic countries.

According to the EU eGovernment Benchmark⁶ the performance of the Danish authorities is above average regarding services for citizens moving, but about average when it comes to business start-up and operations when moving. On regular business operations, however, Denmark far outranks the other Nordic countries, in particular due to the strong presence of key enablers.

While the EU Government benchmark finds similar high levels of government transparency, the OECD's comprehensive Government at a glance study⁷ offers

⁵ https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/DK%20internet%20use_0.pdf

⁶ <https://ec.europa.eu/digital-agenda/en/news/eu-egovernment-report-2015-shows-online-public-services-europe-are-smart-could-be-smarter>

⁷ <http://www.oecd.org/gov/govata glance.htm>

more detail. Denmark scores below the OECD average on the OURdata index, which measures data availability, accessibility, and promotion. The study found that Denmark, unlike other Nordic countries (Iceland is not included), does not have a central open government data strategy, or regular consultation with the public about users' need for data. This may be a harsh judgment, as there is evidently a strategy in place⁸, although it could be debated whether it is actually an all-government strategy for open data.

The UN (UNPACS) produces both the annual e-Government Development Index⁹, in which all Nordic countries steadily achieve top scores, and, more interestingly, an e-participation index. The latter measures the use of online services to facilitate provision of information by governments to citizens ("e-information sharing"), interaction with stakeholders ("e-consultation"), and engagement in decision-making processes ("e-decision making"). Here as well, Denmark's scores are comparatively low. This is noteworthy, given the high scores and positive assessments of Danish solutions in other studies more focused on general services and delivery.

The World Economic Forum publishes the Networked Readiness Index (NRI)¹⁰, which unlike the studies mentioned above, targets indicators on a more societal level, using scores that range from 0 to 7. For the most part, values are quite similar, and all Nordic countries achieve high scores for infrastructure readiness and general usage. Denmark is the only Nordic country with less than a full score on infrastructure readiness, due to its low mobile coverage, which is an ongoing issue in Danish politics.

The OECD Government at a glance provides instructive data on e-tendering and e-procurement. Here we find that, compared to the OECD average, a lower percentage of Danish businesses access tender documents online, but a higher percentage of businesses have an e-tendering process. This means that once the initial phase of a process is digital, it is normal that the further steps in the tender process are also digital. This is not surprising, since online provision of public tender documents is not mandatory in Denmark, as it is in Finland, Sweden and Norway.

Finally, we find the Waseda University Institute of e-Government international ranking¹¹, which differs from the other rankings in that it is more analytical in its approach, and based on workshops and dialogues with CIOs and stakeholders. In this study Denmark ranks in the top ten, and outranks all the other Nordic countries, in all areas of measurement: network preparedness, management, services, national portal, Government CIO, promotion of eGovernment, e-participation, open government, and cyber security.

In this context, it is interesting to find that, in Rambøll's maturity assessment, Danish decision makers are self-critical of their performance in certain areas, especially benefit realization. Few countries have put as much emphasis on this issue as Denmark, and one could expect this to lead to a high ranking compared to the other countries. This

⁸ <http://www.digst.dk/ServiceMenu/English/Policy-and-Strategy/Open-Data-Innovation-Strategy-ODIS>

⁹ <http://unpan3.un.org/egovkb/Data-Center>

¹⁰ <http://reports.weforum.org/global-information-technology-report-2015/network-readiness-index/>

¹¹ <https://www.waseda.jp/top/en-news/28775>

may, in effect, reveal a methodological weakness of the survey. Insight into a subject may lead to a more critical view of one's own performance than others'.

3.1.3 National policies and strategy

In Denmark, the creation of a new digitalization strategy is in progress. The strategy will set ambitious new targets for digitalization in the public sector in 2020 and is expected to be launched early in 2016.

Terms of reference for the new strategy have been prepared, defining three milestones for the strategy¹²:

1. A productive and efficient public sector
2. Public services must create value for citizens and businesses
3. Public digitalization must support business growth

The current Danish digitalization strategy, published in August 2011, is entitled 'Joint Public Digital Strategy: The Digital Road to Future Prosperity 2011-2015'¹³. The central aim of the strategy is that by 2015 digital self-service solutions will be established as the normal procedure for citizens to interact with the public sector. Overall, the strategy aims to modernize, rethink, and increase the effectiveness and efficiency of production and provision of public welfare services. The goal is to maintain or increase the quality of public welfare services while at the same time reducing public expenditure. The strategy consists of 72 specific initiatives, 51 of which have been successfully implemented to date¹⁴.

The strategy is divided into three main tracks, each of which covers different areas and target groups:

Track 1: An end to paper forms and post

The Danish Government wants 80% of all written communication between citizens and the public sector, and 100% of all written communication with businesses, to be done through the digital channel by the end of 2015. This process is well underway and is underpinned by legislation.

As part of the digitalization strategy, in June 2012 the Danish Parliament passed the first piece of legislation on mandatory digital self-service, which made mandatory the first of four sets of digital self-service solutions. The fourth and final set of digital self-service solutions is expected to become mandatory by December 2015. In June 2012, the Danish Parliament also passed the Act on Public Digital Post. The act states that citizens and businesses must have a digital post box for receiving digital messages, letters, documents, etc., from the public authorities rather than paper-based letters by traditional post. The act also states that digital messages transmitted through the Digital Post solution have equal status to that of paper-based letters, communications, documents, etc.

¹² <http://www.digst.dk/Digitaliseringsstrategi/Ny-digitaliseringsstrategien-2016-2020/Kommissorium-og-maalbillede-2020>

¹³ <http://www.digst.dk/Digitaliseringsstrategi/Den-faellesoffentlig-digitaliseringsstrategi-2011-15/Download-strategien>

¹⁴ https://joinup.ec.europa.eu/sites/default/files/egov_in_denmark_-_january_2015_-_v_17_0_final.pdf

Track 2: New digital welfare

The strategy that has been planned for the digitalization of welfare technology, to be used consistently in order to modernize and streamline the major areas of welfare, will be implemented, among other actions, through the following:

- Undertaking an ambitious venture in the use of IT in schools. Investments of up to DKK 1.5 billion are being made to bring schools into the 'digital future';
- Using welfare technology to move the treatment of chronic illnesses out of hospitals and into private homes, thus engaging patients in their own treatment;
- Setting clear targets for the use of health IT, so that everyday matters in hospitals can be facilitated;
- Simplifying and streamlining employment efforts.

The Danish government, Local Government Denmark, and Danish Regions jointly launched a common public sector "Strategy for Digital Welfare 2013-2020"¹⁵. The aim of the strategy is to accelerate through concrete initiatives the use of ICT and welfare technology in frontline public service delivery, specifically within healthcare, care for the elderly, social services, and education.

Track 3: Closer digital public cooperation

The common digital solutions promoted by the State, regions, and municipalities have been developing together. These must constitute the natural platform for the authorities' digitalization efforts. Each public authority or institution should not develop its own systems; rather, it must adopt systems in areas where there are already, effective common solutions available.

The strategy aims for stronger joint public efforts in four main areas:

- Promotion of a common digital infrastructure, secure and robust enough to cover future needs;
- Effective sharing of reliable baseline data between administrations;
- Adoption of laws which take into consideration and cultivate opportunities in the digital society;
- A stronger coordination of public digitalization efforts.

3.1.4 Architecture

Denmark has taken on board the concept of interoperability (cross-government cooperation) in specifications to be followed when developing IT architecture and standards. The OIO architecture¹⁶ is a common framework for public sector IT solutions. The OIO architecture methodology defines a series of activities, steps, and deliverables. For each step, the objectives, actors, inputs, outputs, methodology, sample, tips, and links are described¹⁷. Denmark describes an architecture based on service-oriented architecture principles and has put forward standards for such architecture. Authentic sources are often made mandatory by law and the digitalization strategy 2011-2015 heavily promotes the improvement of these sources.

¹⁵ <http://www.digst.dk/ServiceMenu/English/Policy-and-Strategy/Strategy-for-Digital-Welfare>

¹⁶ <http://www.digst.dk/ServiceMenu/English/IT-Architecture-and-Standards/OIO-architecture-framework>

¹⁷ https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/NIFO%20-%20Factsheet%20Denmark_01_2015.pdf

The OIO architecture guide¹⁸ provides information on the architecture principles, methodologies, standards, and example cases.

Denmark has put forward a number of public services and centralized building blocks. The public services are accessible through the Borger.dk (citizens) and Virk.dk (businesses) portals. The building blocks include among others eID and single sign-on through NemID, eProcurement, digital post and national registers. Both eID and digital post are provided through partnership with market actors.

Public authorities and businesses using basic data must be able to receive data rapidly and reliably. At the same time there is money to be saved in the public sector by distributing data via a single common channel rather than via several different channels. This constitutes the reason for establishing a Common Public-Sector Data Distributor. A common distribution solution will accommodate the need to retrieve data rapidly, easily and reliably, and as cheaply as possible. Furthermore, the authorities responsible for the registers will save resources, as they will no longer have to modernize a host of different distribution solutions individually¹⁹.

3.1.5 Open data initiatives

In Denmark, as a general rule, basic data is to be freely available to all public authorities, private businesses, and individuals. Basic data is viewed as a common digital resource, which can be exploited freely for commercial as well as non-commercial purposes. This has led to several new open data initiatives, in which public agencies also promote the re-use of their data

The 'Open Data Innovation Strategy' (2013)²⁰ is managed by the Danish Agency for Digitisation and aims to develop a vision and a concept for how a business, an entrepreneur or a citizen can access government data in a uniform way—i.e., creating a "one entry to public data re-use" policy and service, in which the legal, economic and practical aspects are dealt with in a uniform and efficient manner.

Currently, there is no national open data portal – but it is believed that the Common Public Sector Data Distributor will soon fill that role. There exist local open data portals throughout government, like the Open Data Aarhus²¹ which was Denmark's first of kind.

3.1.6 Governance

The Danish public sector is characterized by a high level of decentralization; however, state, regions and municipalities collaborate closely. The sub-national administrations are closely connected to the central administration through legislation. However, the legislations and ICT solutions leave space for local adaptation. Major ICT solutions will consist of large e-government building blocks, with each building block representing a defined part of the digital procedure.

¹⁸ <http://arkitekturguiden.digitaliser.dk/introduction-national-enterprise-architecture-denmark>

¹⁹ Nordic eID survey – final report to the Nordic Council of Ministers. Difi/Kjell Hansteen (2015)

²⁰ <http://www.digst.dk/ServiceMenu/English/Policy-and-Strategy/Open-Data-Innovation-Strategy-ODIS>

²¹ <http://www.odaa.dk/>

Government ICT and ICT policies are primarily controlled through the Ministry of Finance. The core agency is the Danish Agency for Digitisation (Digitaliseringsstyrelsen) which operates and regulates most service-related ICT and infrastructure. The Danish Agency for Digitisation also takes part in yearly budget negotiations with municipalities and regions. KL, the municipalities' consortium, is mandated to participate in negotiations and to commit its members to the negotiated levels of service provision and technical procedures.

A Steering Committee for Joint Government Cooperation (STS) has been established to ensure coordination and to prepare common framework decisions on the development of public sector digitalization. The STS consist of KL (municipalities), DR (regions) and the ministries of Finance, Research, Economy, Social Matters, Tax and Health. The group is serviced by the Agency for Digitisation.

There is no general eGovernment legislation, but two important pieces of legislation are the Act on public mail (2014), which makes digital self-service mandatory, and the Access to public information act (2014).

3.1.7 Relevant recurring events

"Offentlig digitalisering"

This is the largest conference on eGovernment in Denmark, attracting over 1,200 participants each year to discuss digital architecture, the use of data, welfare technology, service design, cyber security and other relevant trends.

The annual event is hosted by Dansk IT, an organization for IT professionals in Denmark, and the aim is to facilitate a yearly event where people involved in eGovernment can meet, network and get inspired.

<http://dit.dk/events/2016/03/16-offentlig-digitalisering-2016.aspx>

HACK4DK

HACK4DK is an annual hackathon on cultural heritage, organized by the major heritage institutions in Denmark: the Danish Agency for Culture, the National Museum, the Royal Library, the Danish Film Institute, and the national broadcaster DR. The first event took place in October 2012.

<http://hack4.dk/>

Internet week Denmark

Internet Week Denmark is an annual week-long festival celebrating the Internet and the Internet economy. The annual festival is held in Aarhus, where more than 4000 participants gather. Internet Week Denmark was founded by Business Region Aarhus, Creuna and the City of Aarhus

<http://internetweekdenmark.com/>

3.2 Finland

3.2.1 Brief assessment of the country

Both public digital service provision and user uptake are high in Finland, which is reflected through high scores on international benchmarks. Amongst the Nordic countries, the Finnish government assesses itself as less mature with regard to capabilities to adapt to organizational and technological changes and innovation.

Despite that, Finland is currently perhaps the most exciting Nordic country in terms of ICT development in the public sector. Through the establishment of Palveluväylä²², the Finnish version of the Estonian X-road integration solution, Finland will make data exchange between government organizations as easy as possible and provide an infrastructure for new digital services and solutions. Palveluväylä could also enable the development of potential new services in collaboration with private parties. Finland has a strong open data community, and government is backed with a clear policy on opening up public data and establishing an infrastructure for accessing public data.

Additionally, Palveluväylä opens up the possibility of international co-operation. For instance, the Finnish Tax Administration is working together with the Estonian Tax and Customs Board on cross-border data exchange and has already completed the first phase of testing. Finland can, in that sense, be considered the Nordic country most open to operational, cross-border collaboration.

The Ministry of Finance is without doubt the core policy provider for ICT and digitisation in Finland. A steering group coordinating the implementation of measures was set up by the Government in January 2013 (JUHTA), which is serviced through the Finance Ministry Public Sector ICT Unit (JulkICT). However, other Finnish institutions also aspire to define strategic directions for government digitization.

We believe this bilateral coordination of eGovernment in Finland could be traced back to general governance tradition, which, compared to its Nordic neighbors, is one of corporate ownership. This implies that governance is organized in the form of active ownership through enterprise models. This also implies that ownership and governance are formally linked to a (personal) position rather than an institution, which may or may not imply more direct responsiveness in institutions. If nothing else, it is a slightly different way of formalizing business and carrying out decisions.

3.2.2 Performance in international rankings and benchmarks

According to the EU Information Society indicators, Finnish citizens are the least active of the Nordic citizens in social networks. This is also confirmed in OECD's Government at a glance study, where we also find further differences in social media usage between those with higher education and those with little education. The Finnish are, on the other hand, above the Nordic average when it comes to downloading entertainment, and far surpass other Nordic countries in individuals creating websites or blogs – more than three times as many do this in Finland than any other Nordic country.

²² <http://vm.fi/palveluvayla>

Looking at individuals' use of business services, e.g. internet banking, finding purchase information and job searching, Nordic countries are fairly similar, with Finland being slightly in front of its neighboring countries in most areas. It is also significantly more common to make appointments with practitioners in Finland, with a third of the population participating in such. Travel and accommodation services are also almost as normal as internet banking.

With regard to businesses' online activities, around 15% of Finland's businesses receive orders online. This is less than other Nordic countries and in line with the EU average. Business interaction with government is high, and similar to the other Nordic countries.

The EU Government Benchmark is a broad study based on mapping and analyses of online services. Nordic countries are very similar in having high scores on user-centric government and transparency, but there are interesting differences in services concerning mobility for citizens and businesses. Finland differs within the Nordic countries by leading the way on services for especially citizen mobility, but also business mobility.

The study also finds good online services in all areas for Finland, but interestingly far lower scores on key enablers in the areas of ordinary business operations, and owning and driving a car.

Where the EU Government benchmark finds similar high levels of government transparency within the Nordics, OECD's comprehensive Government at a glance study offers more detail. Finland scores above the OECD average on the OURdata index, which measures data availability, accessibility and promotion and support. Finland is found to have relevant strategy, infrastructure, consultations and promotions, with some shortcomings in the topic of systematic provision of metadata and possibilities for notification of newly added datasets.

The UN (UNPACS) produces the annual e-Government Development Index. Finland scores top marks, together with Norway.

The World Economic Forum publishes the Networked Readiness Index (NRI). Finnish citizens score better than the other countries on digital skills, and, together with Sweden, economic impact is higher, meaning that businesses more readily apply new ICT solutions in new services.

One especially relevant area is tendering and procurement, and we find more data on this in OECD Government at a glance. Here we find that a similarly high percentage of Finnish, Swedish and Norwegian businesses access tender documents online, which is not surprising as there are similar requirements for online availability of tender documents in these countries. However, in Finland, e-tendering is less normal than in the other Nordic countries.

Finally, we find the Waseda University Institute of e-Government international ranking²³,

²³ <https://www.waseda.jp/top/en-news/28775>

which differs from the other rankings in that it is more analytical in its approach, and based on workshops and dialogues with CIOs and stakeholders. Finland is in the top ten for network preparedness and online services.

In this context, it is interesting to find in Rambøll's maturity assessment that Finnish decision makers are self-critical in certain areas, especially IT strategy planning and IT governance, but much more positive about their own performance in the area of portfolio management, where they rank themselves alongside Denmark.

3.2.3 National policies and strategy

In 2012 the Ministry of Employment and the Economy assigned an ICT 2015 strategy work group. The report drafted by the group was entitled "21 paths to Frictionless Finland"²⁴ and published in January 2013. The concept of "Frictionless Finland" describes a state of affairs in which the optimal preconditions for the creation of competitive business that generates well-being are enabled.

The report established a roadmap for long-term efforts to make Finland a leader in information technology applications over the next ten years. There were three crucial measures identified in the report, which are being implemented:

1. Building a common national IT service architecture. Harnessing of this common architecture will enable easier creation of services across organizational boundaries.
2. A ten-year research, development and innovation program, ICT 2023. This program is to bring together key actors in the sector, such as universities, research institutions, companies and funding agencies.
3. A new financing program to ensure sufficient funds for start-ups and companies in the growth phase.

To build the common national service architecture, and establish a robust, central coordination regime, the Ministry of Finance drafted a new public sector ICT strategy, in broad collaboration with other central government authorities and local authorities. The strategy is the first public sector ICT strategy for both central government and local government administrations. The strategy was published in 2013, although it was never formally adopted. Despite the lack of formal decision from the government, a number of the government's actions and measures have been taken in line with the strategy.

According to the strategy, the authorities must ensure that the digital channel is an attractive option to the client. In building digital services, key issues include user-oriented design, renewal of service processes, interoperability of services, and information security and data protection.

The principles of opening up data have been approved by a government resolution on improving the accessibility and promoting the reuse of public information resources in digital format. In order to realize the goals of the resolution, the Ministry of Finance launched the Open Data Program²⁵ in spring 2013, which ran until June 2015. After

²⁴ https://tem.fi/en/current_issues/publications/innovation/21_paths_to_a_frictionless_finland_report_of_the_ict_2015_working_group.98141.xhtml

²⁵ <http://vm.fi/en/open-data-programme>

that, promoting open data is assumed to have become a regular part of administrative activity. In the opening up of public information resources, the strategy is that emphasis will shift to utilizing data and strengthening information skills as part of the digitisation of administration.

3.2.4 Architecture

The Ministry of Finance has launched a program (National Architecture for Digital Services²⁶) for building the key components of the national service architecture. In the service architecture the main elements are a national service bus, e-identification and e-service channels. Service architecture is the framework which defines how different systems and services co-operate, connect to each other and access data. The national service bus, known as Palveluväylä²⁷, is in practice operated through the X-road data exchange layer, in cooperation with Estonia.

The X-Road data exchange layer is a technical and organizational environment that allows the organization of secure web-based data exchange between the information systems of the government. The X-Road allows people, institutions and enterprises to securely exchange data and organize access to the data processed in government information systems.

The reference architecture for the base information repositories was published in 2013 and is a part of the public administration's common architecture. The objective of the reference architecture is to create a common design model for the information in the base information repositories and instructions for utilization in the processes and systems of government organizations. The advantages of the reference architecture are considered:

- Improved searching of the core registers' information
- Enabling updates of information even from outside the responsible organization
- Uniform distribution of information

The program budget is 120 M€, and is operated through the Populations Center Service (VRK).

3.2.5 Open data initiatives

In Finland, diverse information resources have been provided, from terrain data to weather, climate, sea, transport, financial, statistical and cultural data. The opening up of information resources has been prepared as part of the planning of the central government spending limits and nowadays as part of the general government fiscal plan. Every year, the Ministry of Finance has requested plans from the ministries outlining which information resources will be opened up in the administrative branches, and what the economic and social impacts will be. A growing number of municipalities are also opening up their data. To support the opening up of central government and local government data, the Ministry of Finance and the Association of Finnish Local and Regional Authorities are cooperating on the preparation of a manual, the first parts of which will be published in late 2015.

²⁶ <http://vm.fi/en/enterprise-architecture-in-public-sector>

²⁷ <http://vm.fi/palveluvayla>

Launched in September 2014, the open data portal - avoindata.fi/opendata.fi – provides open data and tools and instructions promoting interoperability. Opendata.fi provides access to datasets from the Finnish administration. The portal is currently making more than 1400 datasets available²⁸, which are also accessible via ODIP²⁹, the pan-European single point of access to European datasets.

3.2.6 Governance

The Ministry of Finance is the core policy provider for ICT and digitization. There are claims that there is, or at least has been, a lack of coordination and some “turf wars”. This might be illustrated by the fact that the first “whole-of-public sector” ICT strategy was launched only in 2013 - a government-wide strategy existed before, but applied only to the central government – and it was not formally adopted, but was published. Further parallel strategies were developed and provide alternative, but not necessarily coordinated visions of the use of information technology for public sector reform: Public Sector ICT Strategy (2012), 21 paths to a frictionless Finland (2013), Government decision on implementing the Structural Policy Program (2013).

A recent OECD-report³⁰ states that it is unclear which institution is responsible for defining strategic directions for government IT and national IT developments, and ensuring they serve national priority objectives. Currently, at least three institutions have shown ambitions to set strategic directions: The Prime Minister's Office, the Government CIO office at the Ministry of Finance and the Ministry of Economy and Employment. Even within the Ministry of Finance there seem to be strategic ambitions for whole-of-government digitization to take place outside the government CIO office.

This being said, there is also strong evidence of functional coordination and common activities. The Act on the organization of shared information and communication technology services in central government entered into force in January 2014, and established the Valtori Government ICT center - a core player in common digital solutions. The Act on Information Management Governance in Public Administration (2014) is fundamental to eGovernment governance in Finland, and describes management and governance through recommendations (notably the JHS recommendations³¹), standards and regulations.

The Ministry of Finance has set up an active and adaptable governing structure for coordination and decision-making in common solutions and standards, and the X-road initiative would not be possible without some coordination tools. A steering group coordinating the implementation of measures was set up by the government in January 2013 (JUHTA), this is serviced through the Finance Ministry Public Sector ICT Unit (JulkICT).

²⁸ <https://www.opendata.fi/data/en/dataset>

²⁹ <http://data.opendatasupport.eu>

³⁰ <http://www.oecd.org/gov/oecd-public-governance-reviews-estonia-and-finland-9789264229334-en.htm>

³¹ https://www.paikkatietoikkuna.fi/web/en_old/jhs-recommendations

3.2.7 Relevant recurring events

Slush

Slush is the focal point for entrepreneurs and tech talent to meet with top-tier international investors, executives and media. The two-day event takes place every autumn. It is a non-profit event organized by a community of entrepreneurs, investors, students and event production professionals. In 2015, Slush brought together over 14,000 attendees and more than 3,500 companies for the two-day event.

<http://www.slush.org/>

Open Finland Challenge

Open Finland Challenge (previously known as Apps4Finland) has been arranged for 7 consecutive years and is possibly the largest “digital openness innovation contest” in the Nordic region. Open Finland Challenge produces and empowers innovations that enhance an open society, and supports individuals, collectives, organizations and companies that develop these innovations. In the previous years, the competition has spawned hundreds of applications, visualizations and concepts, tens of companies, and has grown the Finnish open data community into a network of several thousand people.

Open Finland Challenge is organized by Open Knowledge Finland, with Forum Virium Helsinki as its main organizing partner. In addition, there are over a dozen challenge and support partners who enable the competition.

<http://openfinlandchallenge.fi/>

Mindtrek Openmind

Mindtrek Openmind 2015 is an international three-day conference about the future of open source, open data and open content. Mindtrek was held for the first time in 1997. Since 2015, COSS (the Finnish Centre for Open Systems) has been taking part in the event as a producer.

The conference consists of tracks on Open Data and Open & Agile Smart Cities, Open Source Business, Open Source Technology, API, Digital Competence & Learning, Health, Games for Health and Open City.

<http://www.mindtrek.org/>

3.3. Iceland

3.3.1 Brief assessment of the country

When examining Iceland's status in international benchmarks, and comparing it with neighboring countries, considerable strengths appear in some areas, while weaknesses are revealed in others. As stated by the Icelandic government itself in its 2013 eGovernment strategy³², status is currently that the public is ready to use the services offered, the general population owns the relevant equipment and is already online, but government sector bodies appear somewhat behind the other Nordic countries in making adequate use of the inherent opportunities. A direct comparison with the other Nordic countries is not straightforward, however, due to Iceland's smaller population and comparable smaller public institutions.

The country has a decentralized governance system – but with considerably fewer actors than, for example, Norway. In practice, coordination of eGovernment activities is strong and predictable, despite rather generally stated goals and activities and the lack of an eGovernment agency. Registers Iceland in practice operates many of the common eGovernment solutions, and acts as a common spearhead in the digitization of services. Iceland could probably rapidly push new digital services if it chooses to.

3.3.2 Performance in international rankings and benchmarks

According to EU Information Society indicators, Icelanders are particularly active in social networks online³³, and also in reading news and magazines online. Icelanders are also much more involved in online consultations and voting than other Nordic citizens (every fourth citizen has engaged online). Icelanders also stand out when it comes to uploading self-created content (together with Denmark). For nearly all indicators (even for the most frequent activities), the EU average is significantly exceeded.

Looking at citizens' use of business services, e.g. internet banking, finding purchase information and job searching, Nordic countries perform fairly similarly and Iceland is similar to its fellow Nordic countries in most areas. Exceptions are online selling or buying of goods, which in Iceland is more normal, and making appointments (with practitioners), which is almost non-existent.

Turning to individuals' use of government services, Iceland and Denmark have Europe's highest proportion of citizens submitting forms online (approx. 65%). When it comes to businesses' online activities, around 25% of Iceland's businesses receive orders online, which is similar to other Nordic countries.

Looking at the EU Government Benchmark, Iceland does not differ greatly from the other Nordic countries. A few exceptions are that Iceland seems to be the only country with well-functioning services for small claims procedures (however not for people moving house), and relatively good general citizen mobility services (though not close to Finland's scores).

³² <http://www.ut.is/media/utvefur-skjol/e-power-enska-okt2013.pdf>

³³ This is also confirmed in OECD Government at a Glance

The UN (UNPACS) produces the yearly e-Government Development Index, in which all five countries (including Iceland) gain top scores, and an e-participation index. The latter measures the use of online services to facilitate provision of information by governments to citizens, interaction with stakeholders and engagement in decision-making processes. Iceland scores quite poorly on this, both generally and compared to other Nordic countries.

The World Economic Forum publishes the Networked Readiness Index (NRI), which, unlike the above studies, targets indicators on a more societal level with scores from 0 to 7. Mostly, values are very similar, and all Nordic countries have especially high scores on infrastructure readiness and general usage. According to the latest study, Icelandic businesses are somewhat less prone to using digital services to innovate and find new solutions for efficiency, the same is observed for the Icelandic government.

The OECD Government at a glance provides data on the area of public tendering and procurement. Iceland is behind Finland, Norway and Sweden in accessing and tendering online. The study reports that Iceland does not provide electronic bidding, tendering, notifications or orders.

Finally, we find the Waseda University Institute of e-Government international ranking. Iceland is in the top ten for network preparedness and online services, but generally has the lowest ranking amongst Nordic countries, with an overall ranking of number 19.

In Rambøll's maturity assessment, Icelandic decision makers rank themselves as very much average, with the exception being change management and innovation management, which is assessed to be less mature in Iceland.

3.3.3 National policies and strategy

Iceland has a general, governmental policy entitled "Iceland 2020"³⁴, which forms the basis for the Icelandic government's policy-making and planning for digitization in the coming years. The main goal of the Iceland 2020 plan regarding eGovernment and the information society is that, by 2020, Iceland will be in the top 10 nations in the eGovernment development index and eParticipation Index measured by the United Nations. The previous Icelandic government policy on Information Society 2008-2012³⁵ will be the basis used for further development and will be integrated in the new general plan.

The Icelandic eGovernment strategy is covered in the "Icelandic State and Municipal Policy on the Information Society 2013-2016"³⁶. This is likely to be revised with the new government in office. The strategy lists six areas of priority:

(1) Knowledge, (2) Accessibility and transparency (3) Coordinated structures and synergies between municipalities and state: (4) Reducing expenditure, (5) Democracy and (6) Services – immediate and always available.

³⁴ <http://eng.forsaetisraduneyti.is/iceland2020/>

³⁵ http://eng.forsaetisraduneyti.is/media/utgefifidni/Iceland_the_eNation.pdf

³⁶ <http://www.ut.is/media/utvefur-skjol/e-power-enska-okt2013.pdf>

A task force to address strategy on cyber security in Iceland was appointed by the Ministry of the Interior in June 2013. Its main task was to formulate government strategy on cyber security and the protection of IT infrastructure elements that are relevant to national security, i.e. the IT systems of key institutions in Icelandic society. The Minister of the Interior released the Icelandic National Cyber Security Strategy for Iceland³⁷ - for 2015–2026 and a three year Action Plan. The new strategy is also linked to a broader set of national policies and resolutions, e.g. on civil protection and public security, law enforcement and the information society.

The government of Iceland has agreed on a policy regarding free and open-source software. The policy states, among other things, that when purchasing new software, free and open-source software and proprietary software are to be considered on an equal footing, with the object of always selecting the most favorable purchase. In 2012 the government launched a one-year migration project for all of its public institutions.

3.3.4 Architecture

The *island.is* web portal plays a central role in the government's ICT architecture, as a site that gives access to information and services from any public body. The portal has three main functions:

- It operates as a government information and service portal. It provides easy access to information on public services and to a large number of public forms.
- It operates as a toolbox. Tools which are of use to all public bodies have been developed on the island.is website. These include centralized authentication, electronic document delivery (C2G and B2G), electronic document distribution (G2C and G2B) and an electronic service layer.
- Since May 2011 it provides 'My pages' services. There, people obtain individualized access to information about themselves in key registers owned by the authorities and access to documents sent to them electronically by public bodies.

Íslandsrót (Iceland Root) is the certification authority, responsible for issuing and distributing eCertificates. It is controlled by the Ministry of Finance and stands at the top of the organizational pyramid for electronic identification, constituting the source of trust in the system of distributed electronic certificates throughout the public and private sector.

Iceland has a draft interoperability framework that has been published for public consultation³⁸. Several parties are involved in the establishment of the framework; these are all layers of government, the Icepro group (public institutions and private entities) and the general public. Iceland is actively stimulating the use of open standards and has a specific process to define these standards in collaboration with not only standardization bodies but all interested parties in all layers of government and the public.

³⁷ https://www.innanrikisraduneyti.is/media/frettir-2015/Icelandic_National_Cyber_Security_Summary_loka.pdf

³⁸ <http://samvirkni.ut.is/samhengi.html>

3.3.5 Open data initiatives

The Icelandic eGovernment strategy for 2015-2025 states that; *“The general public, businesses and stakeholders shall have easy access to non-personal information and files kept by the State or municipalities. The basis for State and municipal policies shall be openly accessible data, providing a single portal for accessing such data or databases.”*

At the beginning of 2013, digital maps and spatial data held by the National Land Survey of Iceland were made available free of charge. As of the end of 2015, Iceland has no national open data portal.

3.3.6 Governance

Digitalization policy in Iceland is concentrated in the Ministry of the Interior. The Ministry of the Interior is responsible for the formulation of policy on information society and eGovernment.

The policy is coordinated and supervised by a special project management team, the 'Information Society Taskforce', operating under the auspices of the Ministry of the Interior. The taskforce focuses on eGovernment issues in the policy and coordinates central eGovernment projects. This includes assisting public institutions in their efforts towards achieving the policy's main objectives. The Chairman of the taskforce leads the efforts to increase the use of ICT to improve digital services to citizens and to increase the effectiveness of government services

There is no general eGovernment or digitization agency, although Registers Iceland operates most of the relevant common eGovernment solutions and operational measures.

Municipalities are independent from central government, but under the supervision of the Ministry of the Interior. As the registers, the policy area, and the regulation of municipalities are now under the Ministry of the Interior, there is reason to believe that digital coordination in Iceland will grow stronger.

3.3.7 Relevant recurring events

UTmessan

UTmessan is one of the largest IT events in Iceland. The purpose of the UTmessan is to highlight the importance of information technology and its effects on individuals, businesses and Icelandic society alike. The goal is to see a significant increase in the number of students who choose technical disciplines in universities across the country and especially in computer science.

<http://utmessan.is>

The Information Society Day (UT-dagur)

Organized by the Ministry of Interior, the Information Society Day aims to increase the digitization of the public sector by presenting recent experiences and emerging trends, primarily from the public but also from the private sector, which contains important inspiration. It is an annual conference.

<http://www.ut.is/vidburdir/ut-dagur-2015/>

3.4 Norway

3.4.1 Brief assessment of the country

Like its fellow Nordic countries, Norway performs relatively well on international benchmarks. In Norway, legal means have recently been used as a key instrument to promote digitization of public services, and there is political support for and commitment to the modernization of government services through digitization. Through the introduction of “Digital by default” as a principle for providing services, government agencies can, to a greater degree, focus their activities on providing fully-fledged digital solutions.

In general, we observe strong coordination activities and common objectives in Norway, but compared to Denmark and Finland, portfolio ownership and centralization are not on the same level. The central government is characterized by a division into sub-sectors, and the individual ministers and ministries are fully responsible for their own sectors. This has resulted in overlapping initiatives and solutions in the area of digitization, and disagreement between core actors about who is in charge of a particular area. A current joint initiative between the major governmental digitization actors on establishing a “road map” for the different common components may improve this issue.

3.4.2 National policies and strategy

There are two overlapping national strategy and policy documents concerning the digitalization of society: the Digital Agenda Norway (2013) and the 2012 eGovernment strategy *Digitaliseringsprogrammet*³⁹ (The eGovernment program). Digital Agenda Norway has its primary focus on civil society, business and policy support measures, and also presents a synopsis of the eGovernment program. The eGovernment program presents priorities, goals and strategies concerning user services, effective and efficient public services and coordination. The current strategies were launched under the previous government, and will likely be renewed or replaced during the 2016 Parliament spring session.

The eGovernment program outlines several strategic goals, with most revolving around digital communication becoming the general rule for contact with the public sector.

Other goals include:

- The public sector is to provide unified and user-friendly digital services
- Login to public web services is to be simple and secure
- All citizens and businesses will receive mail from the public sector in a secure digital mailbox
- Development of ICT solutions is to be viewed in the context of the public sector's work processes and organization
- Protection of privacy and information security are to be safeguarded
- Digitization measures of relevance for several services are to be coordinated

³⁹ https://www.regjeringen.no/globalassets/upload/FAD/Kampanje/DAN/Regjeringensdigitaliseringsprogram/digit_prg.pdf

To achieve this goal, the program presents future priorities and actions:

- A common solution for electronic IDs is a precondition for easy-to-use and secure digital services
- *Altinn* is the common technical platform for digital services
- All citizens and businesses will be issued with a secure digital mailbox
- Common public registers are to support the digital public sector
- Common components are to safeguard the overall needs of the public sector
- The government's ICT infrastructure and systems shall be robust and highly secure
- Legislation is to facilitate digital communication by default
- Legislation is to be adapted to a digital public sector
- Digital reuse of registered information by other public agencies is to be facilitated

"Digital by default" was introduced during 2014 through an amendment of the regulation of communications with and within the government. The regulation has a basis in the Act relating to procedure in cases concerning the public administration (Public Administration Act). The amendment is a change from "opt-in", where citizens needed to give explicit consent to digital communication in place of paper-based, to "opt-out", where agencies now can communicate with the citizens digitally. In parallel, a new register has been established by Difi; the "Contact and Reservation Registry" is mandatory for all agencies to use before sending any communication digitally, as the register contains the citizens electronic contact information as well as information on whether they have made a reservation against digital communication.

Other cross sector digitalization strategies:

The local government interest organization, KS, has established a vision, ambition and a strategy for a common municipal ICT-architecture⁴⁰. The strategy is closely linked to the recent work by KommIT, which aims to produce a toolset for common solutions for municipal administrations. The strategy is founded on three groups of principles; seven user needs; seven functional standards; and seven architectural principles. All of these principles are on an abstract or functional level, and are formulated so that it should be easy to evaluate whether or not they are followed.

The eHealth whitepaper to parliament "One citizen – one medical record"⁴¹ is the latest strategy document on eHealth. The document presents three basic goals for ICT development in health and care services:

- Patients should have easy and safe access to patient- and user data.
- Citizens should have access to easy-to-use and secure digital services.
- Data should be made available for purposes of quality improvements, health surveillance, governance and research.

Based on this, priorities will be on researching common e-journal, new services in the portal minhelse.no (my health) and stronger national governance and coordination of ICT development in the sector.

⁴⁰ <http://ks.no/contentassets/6bb57e2d083747f1b7c4c62d7690c728/felles-kommunal-ikt-arkitektur-visjon-ambisjon-strategi.pdf?id=12409>

⁴¹ <https://www.regjeringen.no/no/dokumenter/meld-st-9-20122013/id708609/?ch=1&q=>

The National Strategy for ICT Security⁴² (2012) is a joint strategy between the ministries of Justice, Defense, Transport, and Local Government and Modernization. The strategy points out four common goals: stronger coordination; robustness in ICT-infrastructure in society as a whole; strong capability for handling situations and expertise.

The National strategy for ICT Research and Development⁴³ 2013-2020 is a joint strategy between a broad coalition of ministries. It builds on core research goals of to create jobs and growth, and solve important societal issues.

3.4.3 Architecture

Norway has established a conceptual architecture model for government ICT which includes the use of common components in combination with open standards. In this concept the government agencies are responsible for developing electronic services in their areas, but encourage the public bodies to use and share authentic sources – such as the population registry and the cadaster. The model for ICT architecture is supported by a set of common architectural principles⁴⁴. The principles as defined are: interoperability, scalability, service orientation, availability, security, openness and flexibility. The infrastructure is interconnected through the common component and development platform *Altinn*, although not all agencies use this option.

The solutions recognized as common components are: eID, Secure Digital Postbox, the Altinn portal, the National Population Register, the Business Register, the Contact and Reservation Register and the Cadaster). The services are offered by different agencies, which are responsible for the national common components. As of today, there are four such agencies; The Brønnøysund Registry Center (Altinn, Business Register), The Norwegian Tax Administration (National Population Register), and The Norwegian Mapping Authority (Cadaster), in addition to by the Agency for Public Management and eGovernment (eID, Secure Digital Postbox, Contact and Reservation Register). Notably, several of the newer common components, like the eID solution and the digital postbox solution are provided from the state through partnerships with private sector actors. The citizens can choose between several market based eIDs and post boxes when communicating with public sector.

The Agency for Public Management and eGovernment maintains an open standards portal⁴⁵ with all information regarding standards in the Norwegian public sector. On this portal a catalogue with all the mandatory and recommended standards which are approved by the Standards Council are published.

3.4.4 Open data initiatives

Open data seems to be a crucial area for the Norwegian government, and is coordinated by the Agency for Public Management and eGovernment (Difi). Through the national data catalogue “data.norge.no” and a hosting service “the data hotel”, Difi offers support and tools for open data in Norway. The data hotel is used by the

⁴² https://www.regjeringen.no/globalassets/upload/fad/vedlegg/ikt-politikk/nasjonal_strategi_infosikkerhet.pdf

⁴³ <https://www.regjeringen.no/no/dokumenter/strategi-ikt-forskning/id734430/>

⁴⁴ <http://www.difi.no/sites/difino/files/arkitekturprinsipper-2.1.pdf>

⁴⁵ <http://standard.difi.no/index.html>

agencies that do not have an infrastructure for sharing data through web-api's, to upload their data (CSV, XML etc). The data then becomes available through a REST-API offering several choices of format, as well as querying and paging-mechanisms.

The data.norge.no portal has currently made over 450 datasets available. Over 50 applications⁴⁶ are reusing one or more datasets that are available on the portal. All government agencies are required by common instructions provided by the Ministry of Local Government and Modernization to make suitable and existing accessible data publicly available through the portal.

A Norwegian License for Open Government Data (NLOD)⁴⁷ has been developed, intended for use when public entities distribute data and other relevant content for further use by business and industry as well as civil society.

The national strategy for open maps- and real estate data⁴⁸, published by the Ministry of the Environment, describes general principles for open access, and definitions and clarifications of roles and tasks. The strategy discusses societal security dilemmas concerning map data (access to critical information vs. protection from misuse and terrorism), and presents the following priorities on development for open access: (1) National map data for land and sea; (2) Positioning data (3) real estate data and (4) detailed map data. The strategy also describes pricing strategy and self-service solutions.

3.4.5 Governance

The Ministry of Local Government and Modernization (KMD) is responsible for coordinating the overall policy and regulations concerning the information society. The Ministry possesses a number of governance tools for coordination of government digitalization, notably common formulations for agency regulations, regulations on ICT standards in the public sector and eGovernment regulation⁴⁹. KMD also governs the Agency for Public Management and eGovernment (Difi).

The Norwegian governance model can however not be compared to the central coordination of Finland and Denmark, as many major agencies and important eGovernment initiatives are outside the scope of the ministry. The Norwegian government is characterized by a division into sub-sectors, and the individual ministers and ministries are fully responsible for their own sectors.

Even though KMD holds the responsibilities for overall digitalization strategy and coordination, the responsibility for providing and coordinating eGovernment services to businesses lies within the Ministry of Trade and Fisheries. There are to some extent overlaps between the services provided by these two sectors. The division of responsibilities seems to cause some rivalry between the two most dominant agencies in the field of digitalization, the Agency for Public Management and eGovernment and

⁴⁶ <http://data.norge.no/app>

⁴⁷ <http://data.norge.no/nlod/en/1.0>

⁴⁸ <https://www.regjeringen.no/contentassets/f9162767ed7c4c4f94db7ac2f286d0ff/t-1539.pdf>

⁴⁹ <https://lovdata.no/dokument/SF/forskrift/2004-06-25-988>

Altinn (which is a part of the Brønnøysund Register Centre).

A Strategic Cooperation Council for Management and Coordination of eGovernment Services (known as SKATE) has been established for the heads of selected public agencies, and managed by the Agency for Public Management and eGovernment. This is a key policy advisor concerning which ICT measures ought to be implemented and how to finance them. SKATE will also advise on future development policy and on administration of the common components in the central ICT infrastructure. In 2014, SKATE mandated work on a "road map" for the different common components, and also on identifying needs gaps that were not addressed by existing common components, nor included in their development plans

A Standards Council has been set up and meets 4 times a year in order to select and publish formalized specifications on technical, semantic and organizational standards for use in public ICT solutions.

Important recent regulations include the general instruction that citizens must actively opt out if they prefer paper communications, and that invoicing to the public sector must take place through the standard PEPPOL format.

3.4.6 Relevant recurring events

NOKIOS

NOKIOS (Norwegian Conference for eGovernment) is an annual conference initiated by the Norwegian University of Science and Technology (NTNU) in cooperation with vendors and governmental and local agencies. Approximately 600 people are expected to attend the event each year. The target groups for the event are decision makers from the Norwegian public sector, politicians, managers, project leaders, IT professionals, researchers, as well as other stakeholders working in the public sector and vendors.

<http://nokios.no>

The digitalization conference (Digitaliseringskonferansen)

Norway's Agency for Public Management and eGovernment (Difi) organizes this yearly conference on how to manage government digitalization. The goal is government modernization, allowing public administrations to work smarter, and provide efficient public services that simplify everyday life and that are always available to citizens and businesses.

<https://www.difi.no/kurs-og-arrangementer/digitaliseringskonferansen>

The Altinn-day (Altinndagen)

This annual event, hosted by the Brønnøysund Register Centre, provides an arena to discuss how public actors can utilize the Altinn platform for developing new and innovative government services.

<https://altinnett.brreg.no/no/Altinn/Altinndagen/>

EHiN (eHealth in Norway)

The conference gathers public and commercial e-health actors in a common national arena for discussing digitalization of the health sector. The conference is arranged by the Ministry of Health and ICT-Norway

<http://ehin.no/>

#hack4no

hack4no is jointly organized by the Norwegian Mapping Authority and Norway's Agency for Public Management and eGovernment, Difi. In parallel with the main event, a junior hack is organized where children and teenagers can experiment, program and hack.

<http://www.hack4.no/>

3.5 Sweden

3.5.1 Brief assessment of the country

As with the rest of the Nordic countries, the citizens and businesses of Sweden score highly on most benchmarks with regard to user uptake of ICT. The government seems to be lagging somewhat behind the other Nordic countries on some citizen related services in recent benchmarks and studies of digitization of government. On the other hand, Sweden is ahead in areas regarding provision of digital business services.

The Swedish government structure is slightly different from the other Nordic countries, with stronger regions and sectors. Governance and coordination of digitization in the state administration has, during the 2000s, largely been managed from a decentralized coordination model, based on high levels of voluntarism on the agencies' behalf and cooperation with market actors.

This seems to be a recurring topic in Swedish eGovernment; services are assessed as well-functioning, but coordination and common solutions are not centralized but based on case by case solutions. The digital solutions in Sweden do not differ in quality, but rather that the national and coordinated level is less hands-on than in neighboring countries. This may in turn make the provision of unified digital services across government harder to achieve than in other Nordic countries.

3.5.2 Performance in international rankings and benchmarks

Sweden is one of the most advanced countries in terms of internet usage. Ninety-two percent of Swedes use the internet regularly⁵⁰. This is above EU average (75 %), and around the Nordic average. With regard to businesses online activities, around 25 % of Sweden's businesses receive orders online, which is similar to other Nordic countries.

An interesting detail is that Sweden along with Finland observes relevant differences in social media usage between highly educated and less educated users, with the former being more active, according to OECD Government at a glance. Also according to the EU Information Society Indicators, buying and selling goods online is half as common in Sweden as with neighboring countries, and is on a level with the EU28-average (13%).

According to the EU Government Benchmark, Sweden falls somewhat behind its neighbors in government transparency and citizen mobility, and very much behind in business mobility. However, if we look at life events such as business start-up, operations, moving house and finding work, Sweden compares favorably to its neighbors. This could imply that business operations services are well designed, but do not communicate as well across systems.

OECD's comprehensive Government at a glance study offers more detail. Sweden scores far below the OECD average on the OURdata index, which measures data availability, accessibility and promotion and support. This score is based on assessments of the national open data portal, and its qualities. It should be noted that

⁵⁰ https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/DK%20internet%20use_0.pdf

the study reports the existence of a relevant strategy, portal, consultation and user feedback on open data, and is missing data on the organization of hackathons and similar. There are in fact hackathons and similar in Sweden.

The UN (UNPACS) produces the yearly e-Government Development Index, in which all five countries gain steady top scores, and more interestingly an e-participation index. Here Sweden is measured to be in the middle of the Nordic countries.

These discrepancies in results are even stronger if we compare Global Open Data Index⁵¹, by the Open Knowledge Foundation, and the Open Data Barometer⁵² by the World Wide Web Foundation. The first index is based on observations of availability of government data in a number of areas, and to which degree they are open. In this, Sweden is ranked 12, with only Iceland lower in a Nordic context, the main reason being data from company registers, maps and zip-codes. In the latter study, Sweden is in the top 3. This index is based rather on secondary indicators of the potential and impact of open data in society. In other words, there is reason to believe that there is great potential, but it is not yet fulfilled.

The World Economic Forum publishes the Networked Readiness Index (NRI), which unlike the above studies targets indicators on a more societal level with scores from 0 to 7. Mostly, values are very similar, and all five countries have especially high scores on infrastructure readiness and general usage. Together with Finland, economic impact is higher, meaning that businesses more readily apply new ICT solutions in new services improving competitiveness.

Turning to electronic tendering and procurement, we find more data on this in OECD Government at a glance. A similar and high percentage of Finnish, Swedish and Norwegian businesses access tender documents online. This is not surprising as there are similar requirements for online availability of tender documents. E-tendering is also quite common in Sweden.

Finally, we find the Waseda University Institute of e-Government international ranking⁵³, which differs from the other rankings in that it is more analytical in its approach, and based on workshops and dialogues with CIOs and stakeholders. Sweden is the only one of the Nordic countries that is not scored in the top ten in network preparedness, but rather in national portal and eGovernment promotion, the latter probably due to the work of eDelegationen.

In our own maturity assessment, in which Swedish decision makers make their assessments on different areas, Sweden is assessed to be especially weak on IT strategy planning, but amongst the best on benefit realization.

⁵¹ <http://index.okfn.org/place/>

⁵² <http://www.opendatabarometer.org>

⁵³ <https://www.waseda.jp/top/en-news/28775>

3.5.3 National policies and strategy

The Swedish Digital Agenda⁵⁴ is the main policy document in the area of digitization, and was launched in October 2011. The Digital Agenda identified the need for efforts in four strategic areas based on a user's perspective: easy and safe to use, services that create benefit, the need for infrastructure, and the role of ICT for societal development. As a follow-up, the government set up a Digitization Commission with the task of promoting attainment of the objectives of the Digital Agenda.

The Swedish strategy for collaborative digital services in government administration, "Putting the citizen at the center"⁵⁵, was launched in December 2012. This strategy describes how the Swedish Government plans to further strengthen the ability of government agencies to work together in delivering digital services. The strategy lays down general principles for services: (1) easy to use and find, (2) open data and improved transparency, and (3) quality through reuse of public sector information, common standards and security.

In 2009, the Swedish eGovernment delegation (eDelegationen) was mandated to suggest strategy, coordinate government IT projects and follow up on effects and finally coordinate certain standardization issues. The work of this group was completed in 2014. The delegation has produced a large number of white papers, such as suggestions for a general IT strategy, an anthology of points of view and a study of future scenarios.

These white papers are not adapted to policy documents or legal texts. A number of stand-alone issues and projects have gained momentum, and the delegation further produced an informative portfolio of government development projects⁵⁶. However successful it may have been on a number of practical tasks, the State Treasury⁵⁷ evaluated the delegation as not as successful with regard to the government's coordination and prioritizing of the development of inter-agency and cross-sectorial projects.

3.5.4 Architecture

Sweden published its National Strategy for Interoperability⁵⁸ in February 2013. The eGovernment delegation⁵⁹ provides more information on digital collaboration including the "Guide for digital collaboration"⁶⁰ and the "Principles for digital collaboration"⁶¹. The guide for digital collaboration covers the use of open standards. However, no structured, transparent and objective approach to assess and select formalized specifications has

⁵⁴ <http://www.government.se/reports/2011/12/ict-for-everyone---a-digital-agenda-for-sweden/>

⁵⁵ <http://www.regeringen.se/informationsmaterial/2012/12/n2012.37/>

⁵⁶ <http://nationellautvecklingsportfoljen.se>

⁵⁷ <http://www.statkontoret.se/publicerat/publikationer/2014/delegerad-digitalisering.-en-utvardering-av-e-delegationen/>

⁵⁸ <http://www.edelegationen.se/Documents/Vagledningar%20mm/Nationell%20strategi%20f%C3%B6r%20interoperabilitet.pdf>

⁵⁹ <http://www.edelegationen.se/Stod-och-verktyg/Digital-samverkan/>

⁶⁰ <http://www.edelegationen.se/Documents/Vagledningar%20mm/V%C3%A4gledning%20f%C3%B6r%20digital%20samverkan%20v2.pdf?epslanguage=sv>

⁶¹ <http://www.edelegationen.se/Documents/F%C3%B6rstudier%20och%20rapporter/Principer%20f%C3%B6r%20digital%20samverkan%20v%201%200.pdf?epslanguage=sv>

been defined. A governance system for interoperability is not established at national level. The health sector, however, does have a governance framework.

Sweden has established a new National IT Standards Council to facilitate the coordination of IT standards and specifications in the public sector. A catalogue of advised specifications will be published; some work on standards has already been published. The catalogue will be used in procurement scenarios, both by individual agencies and in central framework agreements.

A services catalogue of base registers has been established⁶². The services catalogue contains API information from agencies, municipalities and county councils. The aim is to facilitate an increased reuse of existing information instead of collecting it from businesses and individuals in digital services. The catalogue is in operation and the authorities have begun to register their services. A revision of the directory is scheduled to improve the structure of services and service content.

In Sweden, the provision of core service authentication relies on eIDs issued by the private sector, mainly through banks and large telecommunication providers. The public sector buys the services for validation control of eIDs on a commercial basis. Currently, the Swedish eID infrastructure is undergoing updates⁶³. In 2011, the recently created Swedish eldentification Board, an agency under the Ministry of Enterprise, Energy and Communications, announced its intention to work towards more flexible approaches to eIDs. The project departs from the existing structure (thereby maintaining the investments made), and will focus on the coordination and gradual development of the infrastructure, a new way to procure authentication and eSignature services (in line with new legislative requirements), as well as introducing standardised identity assertion (using the SAML standard), and a central e-signature service.

Therefore, the new infrastructure will move towards “a more technology-neutral and federated approach, in which private issuers of eID and reliant parties will be connected through an identity federation provided by the Swedish eldentification Board”⁶⁴.

3.5.5 Open data initiatives

There is no national open data page for access to data sets. However, major open data collaborations in Sweden are connected to VINNOVA's (Swedens Innovation Agency) funding of open data initiatives, as seen in the portal opnadata.se. The portal is currently making about 50 datasets available. PSI-datakollen⁶⁵ is an automated web portal to screen public webpages to check if common recommendation to add a / psiopen page for open data, are carried through.

In March 2014, the Swedish Digitisation Commission launched digitalasverige.se, a website to publish data and information on Sweden's digitalization efforts, for anyone to search, compare and share.

⁶² <http://www.edelegationen.se/Stod-och-verktyg/Digital-samverkan/>

⁶³ <https://joinup.ec.europa.eu/community/epractice/case/swedish-eid>

⁶⁴ <https://tnc2013.terena.org/core/presentation/108>

⁶⁵ <http://www.psidatakollen.se/>

3.5.6 Governance

Swedish government structure is slightly different from the other Nordic countries, with stronger regions and sectors. Operational responsibility for eGovernment lies with the Minister for Housing and Urban Development, residing in the Ministry of Enterprise and Innovation. Municipalities and regional authorities are independent of the state. Governance and coordination of digitalization in the state administration has, during the 2000s, largely been managed from a decentralised coordination model, based on high levels of voluntarism on the agencies' behalf.

The eGovernment Delegation (eDelegationen) was a government committee consisting of directors of major public agencies. The committee developed a number of strategic documents and recommendations, mentioned above. Following the termination of the delegation, a number of agencies and actors, at their own initiative, established a Common eGovernment Program eSamverkansprogrammet in June 2015. The program is a membership-based concept, with similar goals and tasks to the former delegation: User-centricity; Open and transparent; Efficient; Infrastructure and interoperability. The position is different, since it does not operate on a central government mandate but rather in its members' interest. What role it will take is yet to be seen.

Inside Regeringskansliet (the Central administration), there are two notable eGovernment groups; the "Statssekreterargrupp för e-förvaltning" at the political level and the "departementsövergripande arbetsgrupp för e-förvaltning" at the administrative level.

Two legal texts in particular are relevant; these are proposition 2009/10:175 on public governance, participation and growth⁶⁶, in which general provisions and priorities are laid down, and the Public access to information and secrecy act⁶⁷.

3.5.7 Relevant recurring events

HackforSweden

HackforSweden is an initiative that aims to inspire students, journalists and developers to produce new products and services through the use of open government data. The event is arranged by the Swedish Meteorological and Hydrological Institute, the Swedish Mapping, Cadastral and Land Registration Authority, the Swedish Environmental Protection Agency, Statistics Sweden, the Swedish Public Employment Service and the Geological Survey of Sweden. 22 other public agencies provide their datasets to the event as well.

The event has been arranged for two years, and will continue in 2016.

<http://hackforsweden.se/>

The ESV-day

Hosted by the Swedish National Financial Management Authority (ESV), this annual

⁶⁶ <http://www.regeringen.se/rattsdokument/proposition/2010/03/prop.-200910175/>

⁶⁷ <http://www.regeringen.se/contentassets/2c767a1ae4e8469fbfd0fc044998ab78/public-access-to-information-and-secrecy-act>

event gathers approximately 700 persons to discuss the possibilities in government digitalization, to network and to meet exhibitors from the ICT industry.

<http://www.esv.se/Utbildningar-och-seminarier/Seminarier-och-konferenser/ESV-dagen/>

eGovernment days (eFörvaltningsdagarna)

eGovernment Days is Sweden's largest annual conference and meeting place for those involved in IT-supported business development in public administration. The conference is organized by an event company, in partnership with several ICT companies and public agencies like the Swedish National Financial Management Authority.

<http://eforvaltningsdagarna.se/>

Digital Health Days

Digital Health Days is an international conference in the growing field of digital health, held annually since 2013. The conference is focused on the transformation within the healthcare system, patient empowerment, emerging business opportunities, the new healthcare ecosystem with new and non-traditional players and trends in related research areas such as biosensors, big data and gamification. The goal is to catalyze progress in digital health internationally, strengthen the local ecosystem and position Stockholm as a premium meeting spot for professionals involved in the digital health transformation. The event is organized amongst others by the County of Stockholm, the Stockholm Chamber of Commerce, the Stockholm Business Region and the Stockholm Science City Foundation.

<http://www.digitalhealthdays.se/>

3.6 Nordic and European processes and initiatives

3.6.1 The Nordic CIO group

The Nordic Council of Ministers for Education and Research (MR-U) coordinates an informal advisory group for the Nordic national CIOs in public sector. Currently, the CIO group includes members from the Danish Agency for Digitisation, the Finnish Ministry of Finance, the Swedish Ministry of Enterprise and Innovation, the Norwegian Ministry of Local Government and Modernisation and the Icelandic Ministry of the Interior.

The group primarily serves as an informal arena for exchange of knowledge, but has also initiated Nordic collaboration projects on topics such as cloud computing, electronic IDs and electronic signatures.

3.6.2 Nordic regulatory agencies for electronic communication

The Director Generals of the Nordic regulatory agencies for electronic communication did in 2014 decide to create a joint working group that will aim to strengthen consumer rights in the region⁶⁸.

The working group will try to find new ways of solving consumer issues and will among other things focus on improving consumer information, net neutrality and better information concerning mobile network coverage.

3.6.3 Digital Agenda Europe

The Digital Agenda presented by the European Commission forms one of the seven pillars of the Europe 2020 Strategy which sets objectives for the growth of the European Union (EU) by 2020. The Digital Agenda proposes to better exploit the potential of information and communication technologies in order to foster innovation, economic growth and progress in Europe.

3.6.4 e-SENS

e-SENS (Electronic Simple European Networked Services) is a large-scale EU project that pursues the idea of European digital market development through ICT solutions. The project aims to consolidate, improve, and extend technical solutions to foster electronic interaction with public administrations across the EU. e-SENS plans to facilitate cross-border processes within the EU by:

- making it easier for companies to set up business electronically
- enabling electronic procurement procedures for businesses
- creating seamless access to EU legal systems
- making it easier to use healthcare services abroad in cases of emergency

The core idea of the project is to develop the digital infrastructure for improving the quality of public services in EU. e-SENS will support the implementation of European policies, in particular the Digital Agenda for Europe.

⁶⁸ <https://www.pts.se/en-GB/News/Press-releases/2014/Nordic-initiative-to-improve-conditions-for-consumers-in-the-Telecom-sector/>

The building blocks are ready and have come through testing, and the e-SENS coordination has achieved a strong status in cross-border e-Government within the EU. All Nordic countries are participating in e-SENS. There is at present no Nordic collaboration towards CEF, but national contact points meet regularly. These are representatives from the Danish Agency for Digitisation, the Finnish Ministry of Finance, the Swedish National Financial Management Authority, the Norwegian Agency for Public Management and eGovernment and the Icelandic Ministry of the Interior. These meetings are important both to ensure a common approach towards e-SENS, and to put pressure on EU regulatory developments to avoid barriers.

Furthermore, the e-SENS project works through pilot projects⁶⁹ based on common components such as most prominently eID, eDocuments and eDelivery. Norway, Denmark and Sweden are active participants in the piloting. Also, there are some smaller, bilateral pilots on isolated topics.

Current eSENS pilots are:

- e-Justice: Matrimonial matters and Account preservation order. No Nordic participation.
- e-Health: ePrescription/Patient summary and eConfirmation. No Nordic participation
- e-Procurement: Virtual Company Dossier (Norway), e-Tendering (Norway and Denmark), and e-Invoicing (Norway).
- e-Agriculture: No live pilot at present.
- Business Life-Cycle: Business registration (Sweden) and Registering new activity (Denmark)
- Citizen Life-Cycle: No live pilot at the moment.

3.6.5 CEF Connecting Europe Facility

CEF is a large financing facility within the EU, of which one part is connected to digital infrastructures (CEF Digital⁷⁰). All Nordic countries are participating in the CEF program, but the program is still in its initial phases. The fact that the European Commission through CEF will be a direct owner of operative, common building blocks is a new scenario – this is usually operated through agency or national consortiums, and it is yet to see the actual governance structure and how it will work.

There is at present no Nordic collaboration towards CEF, but according to our sources this is being discussed in the Nordic e-SENS group. This is also the case for eIDAS⁷¹, a regulation on authentication services in the EU. Especially concerning eIDAS, Nordic cooperation could prove necessary. Until now, the upcoming regulation has been anticipated for clarifying rules and standards concerning cross-national authentication. However, the regulation does not set technical standards, only functional levels. This implies that there is a lot of elaboration to be done to actually conclude on common standards and interconnectivity, and it is not unlikely that the Nordic countries may find some common interests in these processes.

⁶⁹ <http://www.esens.eu/real-life-piloting/>

⁷⁰ <https://ec.europa.eu/digital-agenda/en/connecting-europe-facility>

⁷¹ <http://ec.europa.eu/digital-agenda/en/trust-services-and-eid>

The Potential for Nordic Collaboration

4.1 The strategies and beyond

Chapter 3 explained the national strategies, architectural choices and the relative performance of the Nordic countries through different benchmarks and rankings.

Throughout our review we see similarities. The different indexes on user uptake of digital devices and services among businesses and citizens can be summarized by saying that the Nordic region is one of the world's most sophisticated regions in terms of technology use, especially when it comes to the impact of e-government services.

In all Nordic countries, digital service provision is comparatively high. Furthermore, all countries have a highly developed public sector that delivers many complex and high-quality government services. There are differences between the countries both in terms of service levels and service governance, but none of the Nordic countries can be said to differ in the general level of public services.

The modernization of the public sector through digitalization seems as a whole to be backed by formal plans and political commitment. The goals are basically the same, and are about increasing efficiency and quality. The strategies on achieving the goals revolve around providing optimized services through the sharing of information resources between government agencies, and on moving the users to the digital channel. All countries have responsibility placed in ministries, and most have national strategies that have been discussed in the respective parliaments. All the countries also have core registers in place; each person, entity and piece of land can be identified in the national registers. The core infrastructure serves as a platform for developing services in the sectors and emphasis is placed on reuse of information throughout the public sector and even beyond, with Finland's implementation of the X-road infrastructure and the Danish Data Distributor as the latest developments.

The Nordic countries have shown that there is huge potential in collaboration between governments and the private sector. With regard to electronic identities, for example, a "Nordic model" is observed⁷². The uniqueness of this region lies in the fact that the governments have established effective collaborations with private partners such as

banks and mobile network operators. The successful Nordic cooperation can also be observed in the case of Mobile Public Key Infrastructures. The Mobile PKI solution was introduced by private parties: telecom companies in Finland and banks together with telecom companies in Norway and Sweden (where a mobile version of the BankID was developed). Furthermore, in Denmark the NemID is provided in collaboration with Nets, which again was founded and owned by the banking sector until recently. Nets also delivers the Norwegian BankID.

But if we look behind all these similarities in terms of deliveries, there are some obvious differences on how this situation was reached. The most striking is the difference in governance of the public sector, which becomes very clear in the case of the governance of IT.

Denmark, Norway and Finland have general digitalization agencies at an operational level. In Iceland this role is, in most cases, handled by the governance link between the Ministry of the Interior and Registers Iceland, which handle a broader spectrum of digital services than their Nordic counterparts. In Sweden this role does not exist, but is to some extent leveraged through the Financial Management Authority as coordinating actor, and the newly started eGovernment program (eSamverkansprogrammet) will likely aim to take such a role.

As far as we can see, the differences in governance structure between these digitalization agencies and the state do not necessarily have great implications for how policy is put into operation. However, the governance tools available differ significantly. The Danish Agency for Digitisation has direct access to decision-making processes in municipalities, regions and state sectors through its budget negotiation role. The Finnish Government ICT Centre (Valtori) does not have any such policy role, but is governed through coordinating boards in the Ministry of Finance, which make decisions that are reflected in all levels of government. The Norwegian Agency for Public Management and eGovernment (Difi) does not have any such roles, but does have access to some regulatory means through common regulations and standards regulations. With regard to municipalities it has a strictly advisory role, and the union of municipalities (KS) does not have a general mandate in this area.

All of this implies that the coordination of digitalization policy can be addressed simultaneously, but not necessarily in the same manner. Its relation to policy development and follow-up differs as shown, and its role in providing new services and solutions also varies. Whereas e.g. Valtori has a ready-to-go process for procuring and delivering standard solutions on a broad basis, this is not the case in all areas for the other agencies. At the other end of the scale is Sweden's Ministry of Enterprise and Innovation, which primarily uses soft coordination through advice, studies and evaluations.

As previously mentioned, new strategies are being put into action in 2016, and few details are currently available for what lies ahead. What is clear is that the Nordic scene

⁷² Ioana Bour (2013): Overview of eID solutions connecting citizens to public authorities

(<http://ofti.org/wp-content/uploads/2013/04/114-comparison-of-eid-solutions-with-privacy-preserving-characteristics.pdf>)

has not been identified as a core arena for development. However, the strategies will put emphasis on international collaboration – primarily EU commitments.

4.2 What do the Nordic stakeholders tell us

The Nordic Council of Ministers and Nordic Innovation, this report's principals, were established to strengthen Nordic cooperation. All ministerial councils have enshrined in their visions and strategies that wish to profit jointly.

To explore the potential of cooperation, we believe a useful exercise is to look at:

- 1) Whether collaboration happens between the Nordic countries today.
- 2) How the actors regard the benefits of more digital collaboration.
- 3) What preconditions will make these benefits more likely.

In this context, Rambøll conducted a survey aimed at 155 respondents from 64 Nordic public sector bodies. The target group was the management level in public organizations that play an important role in the development of the digital society.

To supplement the survey, Rambøll interviewed the members of the informal CIO group organized under the Nordic Council of Ministers for Education and Research. As described previously, this group represents the government bodies that oversee the national strategies and priorities for public sector digitalization.

4.2.1 Nordic collaboration so far

Nordic collaboration absolutely exists. 80% of respondents say their organization is involved in Nordic collaboration of some kind. The fact that many agencies are involved in one kind of Nordic collaboration or another may not be very surprising, given that the Nordic Council of Ministers has activities in a range of areas.

Does your organization take part / participate in Nordic cooperation today?

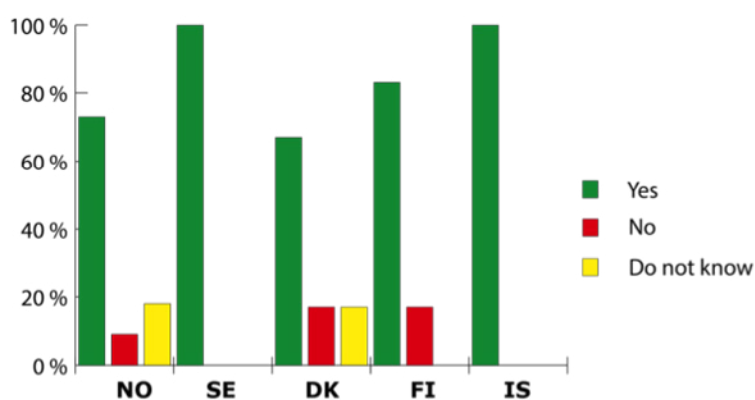


Figure 4.1

It should be noted that the response rate can have impact on the result. One could assume that the organizations and actors not involved in Nordic collaboration are overrepresented amongst those who didn't answer the survey.

4.2.2 How do the actors assess the potential for increased collaboration

The survey did not gather data specifically on what kind of collaboration the countries participate in, but the fact that many agencies are involved in one kind of Nordic collaboration or another may not be very surprising, given that the Nordic Council of Ministers has activities in a range of areas. Some of the actors also meet with their corresponding Nordic agencies in the European Commission's arenas – and there have reportedly been efforts to create a Nordic stance in negotiations on EU directives, for example in the case of eIDAS. Other examples include social security agreements and treaties on the cooperation between population registers. Furthermore, the tax authorities of Denmark, Iceland, Norway, Finland and Sweden operate the “Nordisk eTax” portal in collaboration with the Nordic Council of Ministers.

The interviews revealed additional areas where there has been Nordic collaborative works in the field of public sector digitalization. Sweden and Denmark have piloted a solution for mutual recognition of digital signatures, and the CIO group has initiated projects to investigate the potential for a Nordic collaboration in the areas of eID and cloud computing⁷³.

When asked how they assess the potential for digital cooperation between the Nordic countries, the respondents showed a positive attitude. 37 % believe that there is potential for increased digital cooperation between the Nordic countries to a great extent (figure 4.2), while the number grows to 56 % when asked if increased digital cooperation would be useful for their own organization (fig 4.3). Together with the “to some extent”, more than 90 % of respondents believe there is potential for increased digital cooperation.

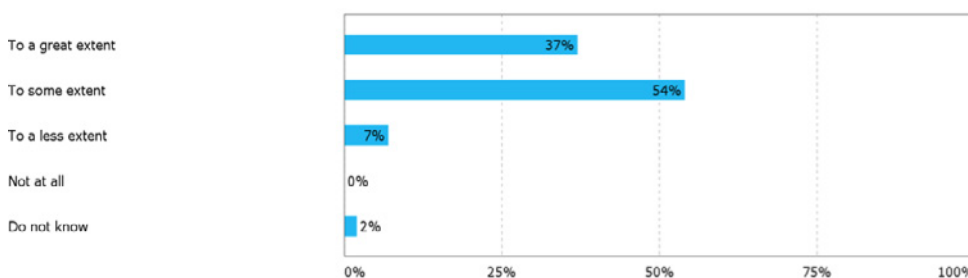


Figure 4.2 There is potential for increased digital cooperation among the Nordic countries.

⁷³ <http://norden.diva-portal.org/smash/record.jsf?pid=diva2%3A701433&dswid=8983>

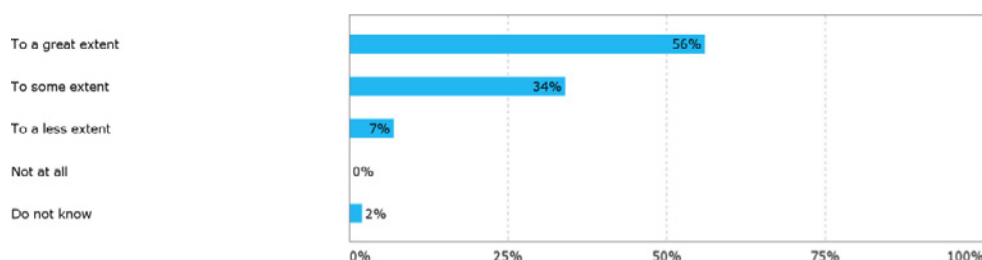


Figure 4.3 An increase in digital cooperation between the Nordic countries would be useful and relevant for my organization.

Respondents from Finland and Denmark show a somewhat more reticent attitude, with a significantly higher level of “to some extent” on both questions than Norway, Sweden and Iceland.

4.2.3 Where is the potential?

When asked what forms of collaboration hold the most potential, 55% of the respondents point out two areas in particular: joint innovation/development projects and exchange of knowledge. The Nordic actors see less potential in developing common technical platforms, but rather see an opportunity in exchange of data through common standards and IT architecture.

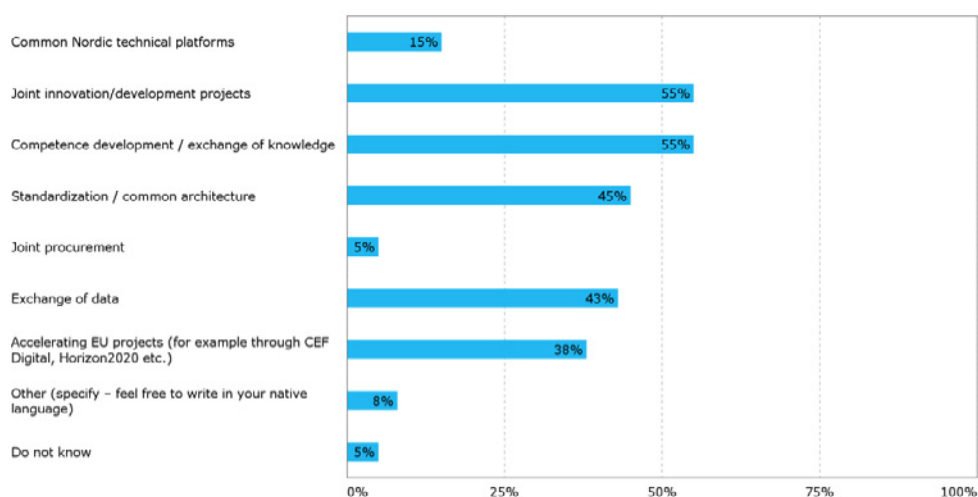


Figure 4.4 What forms of collaboration do you think hold the greatest potential at a Nordic level? (Select up to three forms that you think hold the greatest potential)

The responses to this question vary between the countries. Whilst “Joint innovation/development project” is selected by 83 % of the Icelandic informants, only 36 % of the Norwegians do the same. 60 % of the Swedish respondents believe “Exchange of data” to hold great potential, while only 25 % of their Danish colleagues share the same

belief. More than 50 % of the Norwegian and Finnish respondents hold “Accelerating EU projects” as one of their three preferred areas of potential, while only 20 % of the Danish and 17 % of the Icelandic respondents view it the same way.

Amongst the CIO group, there are also different views of the potential. Several CIOs point out that the rather different governance systems and national legislation limit how far the collaboration can go when it comes to operational measures. The group puts the most emphasis on the benefits of networking and having arenas for exchange of knowledge. They point out that the arenas created through the Nordic Council of Ministers have helped build up a great deal of trust between the Nordic actors. The Nordic CIO group is a forum for discussing strategic choices and possible benefits connected to large national projects, and to a lesser extent used for discussing operational areas for collaboration, such as joint development projects and exchange of data.

According to the Nordic CIO group, the EU seems to be an area that ties the actors together, and holds great potential for further Nordic collaboration. Still, as pointed out by one of the CIOs, collaboration on negotiating with the Commission and the other member states requires that the Nordic countries share a common point of view on what they wish to accomplish. Experience with the initial negotiations with the EU Commission on the eIDAS regulation shows the opposite, in that the Nordic countries could not find a common platform in terms of risk and security levels. This again brings up the issue of governance: according to a national CIO certain Nordic countries could not even agree on one national position. However, implementing the eIDAS regulation will provide another possibility for Nordic collaboration.

4.2.4 What could trigger more Nordic collaboration?

Given that the actors consider Nordic digital collaboration to have potential, what is then needed to enter a cooperation on one or more areas? The respondents do not give a very clear answer, but 50% answer that Nordic digital cooperation has to be on the political agenda (fig 4.5).

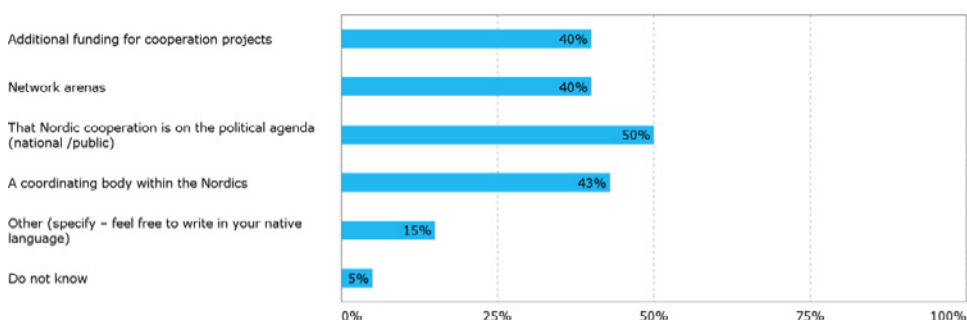


Figure 4.5 In your opinion, what could be decisive for your organization to enter a Nordic digital cooperation? (Select one or more)

That *Nordic cooperation on the political agenda* ranks this high is a clear indicator that there is currently a lack of political attention in this area. This assumption is reinforced by the interviews with the CIO group, and the situation does not seem set to change in the near future. Of the five Nordic countries, all are working out, or plan to work out, new national digital strategies and priorities, and none of them currently include a Nordic agenda. When looking into differences between the countries on this particular variable, it is worth noting that 80 % of Swedes did select this option, while only 33 % of Icelanders did the same.

The CIOs are uniform in their description of sound business cases as an absolute prerequisite to be involved in any kind of formal collaboration, and several express doubts as to whether any such cases exist.

Additionally, as pointed out by several CIOs, the countries have to prioritize EU initiatives when it comes to their international efforts. Nordic projects without relevance to ongoing EU projects were not considered likely to get the necessary attention or resources.

Again, they see a lot of benefits in Nordic collaboration, but mostly limited to sharing of experience and knowledge. As mentioned by several, the only real incentives for a more operational and formal collaboration are clear benefits and good business cases.

40 % of respondents believe additional funding for Nordic cooperation projects could be decisive for their organizations, and 43 % consider a coordinating body to be decisive. The CIOs partly agree on that. On the other hand, it was noted that developing infrastructures and digital solutions on this scale does entail considerable costs. It is by several of the national CIOs considered less likely that the Nordic institutions have that kind of resources or that they will be granted such resources by the Nordic governments. On these options too, the Swedes and Icelanders stand out. They are by far the most positive to a Nordic coordinating body, but differ greatly when it comes to additional funding. None of the Swedish respondents regard this as decisive, while as many as 83 % of the Icelanders did. For the other nations there are only minor differences from the average values.

40 % of respondents see network arenas as decisive for more cooperation. This supports the assumption that knowledge sharing is one of the types of collaboration with the most potential. It could also imply that there are not sufficient arenas for government areas that see an opportunity in Nordic collaboration.

As for the CIO group, there is a uniform understanding among the CIOs that the group best fulfills its mission by being informal and there is little interest in formalizing the group.

4.3 Possible cases for further Nordic digital collaboration

Given the feedback from the Nordic actors in the digital eco-system, we consider there to be at least three possible categories of possible future collaboration:

1. Knowledge sharing and discussions of policy issues
2. Making the existing infrastructure and solutions work together within the Nordic countries
3. Joint development or implementation projects for new Nordic solutions and/or standards

The categories are not mutually exclusive, and serve mostly as a structure for the following discussion. As for category 3, joint development of new Nordic digital solutions, the feedback from the national CIOs leads us to believe that this category of collaboration alone is of little further interest. Instead we believe the Nordic interest in collaborating on the more operational areas falls under category 2, *making the existing infrastructure and solutions work together within the Nordic countries*, and that any new development or implementation cases in practice will evolve around these possibilities. We can however not exclude new Nordic digital solutions as a potentially beneficial and thrilling option for collaboration in the long term.

4.3.1 Knowledge sharing and discussions of policy issues

4.3.1.1 EU - A Nordic collaboration forum for CEF Digital (and other European initiatives)

CEF Digital supports European cross border infrastructure development with a mix of grants and financial instruments. The “building blocks” developed and put into service under CEF Digital evolve through discussions between the Commission and the program participants. According to a recently finalized study of a Nordic collaboration project on eID⁷⁴, initiated by the Nordic CIO group, there is much to gain from Nordic collaboration and alignment of initiatives. CEF Digital represents a possibility for EU funding for digital interconnection to other Nordic countries. CEF digital is very broad in its scope and covers a number of digital infrastructure areas spanning eID, eDelivery, Open Public Data and many others.

All Nordic countries, including the non-EU member states Norway and Iceland, take part in CEF Digital. Until now Nordic cooperation has been on an ad-hoc basis. Given the size and potential impact of CEF Digital, according to the study, establishing a formal collaboration/discussion forum could be beneficial for each Nordic country's ability to benefit from implementing the CEF building blocks.

Ad-hoc Nordic collaboration is also the case for eIDAS, the regulation on authentication services in EU. Until now, the upcoming regulation has been anticipated for clarifying rules and standards concerning cross-national authentication. However, the regulation does not set technical standards, only functional levels. This implies that there is a lot of negotiating to be done to actually conclude on common standards and interconnectivity, and it is likely that the Nordic countries may find some common interests.

⁷⁴ Nordic eID survey – final report to the Nordic Council of Ministers. Difi/Kjell Hansteen (2015)

4.3.1.2 Establishment of ad-hoc task forces/working groups

A relatively large share of the respondents answered that network arenas could be decisive for entering into a Nordic digital collaboration (fig 4.5). This implies there might currently be a lack of meeting places in which Nordic operational actors can network. Current Nordic networking arenas can be at too high a policy level.

The Nordic Council of Ministers could urge the Nordic member states to appoint contact persons for the cross-national digitalization topics. If one of the Nordic countries asks for it, a task force can be set up for mutual knowledge sharing on a specific area or possibly a peer review of a country's efforts in that area.

4.3.1.3 A common Nordic approach towards the Nordic ICT industry

When it comes to electronic identities, a "Nordic model" can be observed. The governments have established effective collaborations with private partners such as banks and mobile network operators on vital national infrastructure. However, this collaboration is on a national level only. Today the Nordic countries are divided into five separate markets for e-government solutions.

Several large ICT companies deliver e-government and back-office solutions for governments throughout the Nordic region. Some of them are of Nordic origin, but the main multinational companies are also substantially represented.

As a general approach, it is less risky for the customer to choose packaged software, i.e. solutions off the shelf. But if a market and the network of users is too small, the supplier will not take the risk of making such generic products more innovative.⁷⁵

In some areas it could be reasonable to challenge the ICT market to provide e-government solutions that can be used throughout the Nordic market. This could end up as a win-win situation for both governments and ICT businesses, as it could provide the supplier with a bigger market and governments with more innovative products and better potential for making solutions work across borders.

The Nordic Council of Ministers could, as a starting point, arrange for an informal meeting place between government actors and the Nordic ICT industry, where possible needs and trends can be discussed openly.

4.3.2 Making the existing infrastructure and solutions work together within the Nordic countries

4.3.2.1 eID – a feasibility study on dummy PID provision and a common attribute provision system

In the Nordic system, the individual countries have well organized systems for identification and authentication of their own resident users. However, these national systems are not interconnected.

⁷⁵ Jan Damsgaard, Jan Karlsbjerg : Seven Principles for Selecting Software Packages. Communications of the ACM, Vol. 53 No. 8, Pages 63-71 (<http://cacm.acm.org/magazines/2010/8/96615-seven-principles-for-selecting-software-packages/fulltext#R26>)

In 2015 there are no operational cross-border connections between any of the countries with a level of service comparable to that offered to residents within a country. Several Nordic countries have participated in interconnection pilots, however the effort has been technically oriented and limited to proof of concepts. Through CEF Digital and the EU eIDAS regulation, efforts are being made to achieve European cross-border acceptance of national eID's. However, the eIDAS directive does not refer to any existing technical specifications, standards or procedures.

Questions concerning identification, authentication and signature are naturally center-stage when it comes to the technical solutions and parts necessary for building common solutions. These are studied in-depth in a Nordic collaboration project on eID, initiated by the Nordic CIO group in late 2014 and finalized in November 2015. A core issue in the report is the so-called "waiting room issue", in which individuals may be identified cross-nationally, but their attributes, rights, and access to services will not be available.

Tens of thousands of Nordic citizens move between the countries each year, or reside in one Nordic country while working in another. Since 2004 it has been easier to switch residence between the Nordic countries, as you simply have to report to the authorities in the Nordic country you are moving to. The Population Register in the country the citizen has moved to will then be responsible for contact with the authorities where the citizen moved from. The information will be transmitted and updated in both places. But this is still a manual and time-consuming exercise, and the citizen and businesses experience a "waiting room" issue, i.e. public services are in general dependent on a personal identifier with a specific format. The format varies from country to country, but an inherent problem is that the PID (personal identification) is not only a reference number, but a carrier of information about the person, e.g. gender.

A possible solution in order to bring the person "beyond the waiting room" is to create a number that fulfils the format requirements and is not already in use by another person.

4.3.2.2 Digital postboxes – establishing standards for sending official post to citizens

In the Nordic countries, numerous public authorities, citizens and businesses today use secure digital postboxes for their digital communication between the three parties. The development and deployment of Nordic countries' digital postboxes has had a national perspective and has not been focused on the formal exchange of experience and standardization of solutions across the Nordic countries.

Both the strategy and implementation of the solutions for digital postboxes in the respective Nordic countries have different approaches. In Denmark it is mandatory for citizens and businesses to be enrolled with Digital Post; in Norway it is mandatory but with several reservations, while in the other Nordic countries enrolment is voluntary and/or not coordinated between different agencies. Likewise, the number of suppliers of the solutions varies across Nordic borders – although some of the suppliers deliver their solutions in multiple Nordic markets.

An exchange of experience across Nordic borders will provide an opportunity to explore the potential in standardization and cross-border use of digital postbox solutions. Such

a focus will again provide new perspectives on the surrounding market.

4.3.2.3 eProcurement – a common implementation of the openPeppol infrastructure

The Nordic countries are already spearheading development in this area. In the earlier PEPPOL pilot funded by CIP ICT PSP (an EU project), Nordic countries were very active, as is the case in the ongoing e-SENS project. All Nordic countries are or have been participating in bilateral pilots in eProcurement, core components are being developed and tested, and will, according to plans, be part of the EU CEF tool-set. e-Invoicing is operational and widespread in most Nordic countries, and digital order documents are gaining ground.

To what degree EU regulations will specify details regarding technical issues and governance is yet to be seen, but what is clear is that Nordic countries have a common interest in EU regulation staying “on track” and not introducing troublesome specifications.

The fact that components and systems are ready does not mean user uptake occurs. Private operators do not use cross-border services as they could. Also, regulations are not quite uniform, notably Iceland has a less detailed regulation on technical procurement procedures, and there are differences in when, how and to what extent procurements are published.

Businesses could expand, and costs concerning initial phases of procurement in particular could drop drastically. We believe it is a matter of interest, and bringing relevant private and public parties to the table.

4.3.2.4 ePrescription – re-establishing the status quo

ePrescription could boost innovative solutions and is ready to use. The technologies are not very advanced, and there are no obvious obstacles. Analogue prescriptions were valid across borders in some Nordic countries, but with ePrescription this has ended due to technological barriers. Hence, the structure and trust are already there, but there has not been any priority placed on this in terms of technological development. Sweden's e-Hälsomyndigheten (e-Health Agency) has been asked to look for Nordic solutions, and to report this in 2015.⁷⁶ Although barriers and potential have not been evaluated yet, there is reason to believe that the lack of cross-border services is due to low priority or perhaps waiting for EU solutions.

4.3.2.5 Nordic life event – moving internally within the Nordic countries for a new job

In all Nordic countries, neighboring Nordic countries are the source of the majority of working migrants. Searching and applying for work involves a number of services and regulations concerning authentication, tax and registration, and the Nordic area, with its tradition of trust and high degrees of exchange, has all the right qualities to be able to succeed in this area.

Today, there are major differences between the countries concerning mobility services, both at a register level as well as practical issues such as buying a car or

⁷⁶ <http://www.esv.se/Verktyg--stod/Statsliggaren/Regleringsbrev/?RBID=16697>

renting property. There is little limit to what could be included in such an event as work migration, so it is vital that a project is based on citizen mapping, to identify the activities that are barriers or time-consuming, and evaluate options for improved service delivery – rather than starting out with technical possibilities.

4.3.2.6 Nordic life event – death of a Nordic citizen living in another Nordic country

As far as we know there are no relevant projects in digitalizing cross-border services concerning death. The potential is big. It is not uncommon for Nordic citizens to end their life in a neighboring country, and the administrative process following this may be rather complicated. This is also the case at a national level, and the Norwegian tax authorities consider death dialogue to be one of the top priorities to develop and digitalize. Furthermore, we believe that this is a service that will highlight and put the focus on areas of cross-border identification and information processing that need to be dealt with for further potential to grow.

Conclusions and Recommendations

The report has described the potential for Nordic digital collaboration by providing an overview of the actors in the Nordic digital eco-system and their characteristics, an analysis of government actors will and ability to collaborate, and a discussion of potential business cases for such collaboration. Based on the data and the analysis, we will, in this final chapter, draw conclusions from the report's key findings – and provide some recommendations on possible further steps for more Nordic digital collaboration.

5.1 Key findings

Myth confirmed – the Nordic countries are high achievers in the digital playing field

A review of available benchmarks and reports reveals that the assumption that the Nordic region is a frontrunner in digital government is true. Nordic countries have a high level of public digital service provision, even compared to the rest of Europe. All the Nordic countries have highly developed sectors within government, which deliver many complex and high-quality digital government solutions.

There are, however, differences between the countries in terms of which topics they excel in. Finland especially outranks its neighbors on mobility-enhancing services, whilst Sweden is below the EU norm. Sweden is ahead on business start-up services. All five countries score equally well on key enablers and user-centric government. This is also confirmed in the UNPACS E-Government Development Index.

The Nordic countries share common goals and challenges on digital services (strategy)

The modernization of the Nordic public sectors through digitalization seems to be backed by formal plans and political commitment. The strategic goals are basically the same, and revolve around providing improved services through the sharing of information resources between government agencies. All countries have responsibility placed in ministries, and most have national strategies that have been discussed in the respective parliaments. All the countries also have core building blocks in place; each person, entity and piece of land can be identified in the national registers and there are functioning solutions for eID. The core infrastructure serves as a platform

for developing services in the sectors and emphasis is placed on reuse of information throughout the public sector, with Finland's implementation of the X-road infrastructure as the latest development.

Differences in how the Nordic countries work towards achieving the goals (governance) can be an obstacle to collaboration

Even though we find similarities in terms of goals, how the Nordic countries work towards achieving these goals differs greatly. On the one hand, we find differences that can be explained by different national/political priorities. For example, Norway puts more emphasis on open data than Denmark, Iceland has a clearer policy on open source than Sweden and mobility of services is prioritized more in Finland than all other Nordic countries.

On the other hand there are the differences in how the countries govern their national digitalization efforts. In some countries, such as Norway, overall IT governance is done through setting goals for services to be digital. To a lesser extent it is governed using parameters such as quality of service and how the service can benefit other agencies and their users. On the opposite end of the scale is Denmark, which to a larger degree, emphasizes developing services in new ways – more user-oriented and independent of the government's internal organization.

This is also reflected in the basic architectural choices related to ICT in the public sector. Denmark is moving towards a data-driven and centralized architecture, in which the aim is to establish optimized services. The other countries are based on a decentralized architecture, in which it is important to establish the connections within government that enable the exchange of data in a way that means that established services can provide higher quality and usability.

These choices may be a consequence of the basic differences in governance traditions. Some countries have clearly top-down governance of the digitalization of the public sector (Denmark, Finland, Iceland), while in other countries with strong and autonomous sectors, governance can best be characterized as bottom-up (Norway, Sweden).

Both approaches have their advantages and disadvantages. But for international coordination at a general level, one could argue that the top-down approach makes it relatively easier to work holistically. As a consequence of bottom-up governance, challenges in national coordination may occur. This is reportedly hampering Nordic coordination, at least at a general level. The participants representing their country in Nordic settings have different mandates, and can commit their domestic agencies to participate in specific Nordic collaboration to varying degrees.

All of this implies that the coordination of digitalization policy can be addressed simultaneously, but not necessarily in the same manner. It is hard to imagine solutions being developed and implemented in all Nordic countries at the same time. As a consequence, results can probably be achieved more quickly if collaboration starts off bilaterally or trilaterally. Not all projects are suited to every Nordic country.

Nordic cooperation exists today, also in public sector digitalization

Nordic collaboration is absolutely existent. 80 % of the study's respondents say their organization is involved in Nordic collaboration of some kind. The fact that many agencies are involved in one kind of Nordic collaboration or another may not be very surprising, given that the Nordic Council of Ministers has activities in a range of areas.

So far, networking and sharing knowledge is regarded as the main purpose and benefit of Nordic collaboration. Today's cooperation is rather informal, but is viewed as sufficient by the actors.

The actors see benefits in enhanced Nordic knowledge sharing and joint projects, but are somewhat reticent

When asked how they assess the potential for digital cooperation between the Nordic countries, the respondents show a positive attitude. 37 % believe there to be potential for increased digital cooperation between the Nordic countries to a great extent (figure 4.2), while the number grows to 56 % when asked if increased digital cooperation would be useful for their own organization (fig 4.3). Together with the "to some extent", more than 90 % of respondents believe there is a potential for increased digital cooperation.

The countries differ a lot on this issue, with Denmark and Finland seeing comparatively less potential in more Nordic collaboration than the other Nordic countries.

The EU is the most important international arena in terms of resources – Nordic collaboration must add value to this

According to the survey, and especially the interviews with the CIO group, the EU seems to be an area that ties the actors together, and holds potential for more collaboration. But as pointed out by one of the CIOs, collaboration on negotiating with the Commission, and the other member states, requires that the Nordic countries share a common point of view on what to accomplish. Experience with the initial negotiating of the eIDAS regulation shows the opposite, with the Nordic countries unable to find a common platform in terms of interests. This again brings up the issue of governance: certain Nordic countries could not even agree on one national position.

Countries report that they use relatively large resources to develop and coordinate initiatives under EU auspices. Several express that there are no resources to invest heavily in Nordic co-operation as well. The exception is if it can contribute to a smoother and better implementation of EU regulations and solutions organized by CEF Digital.

There is a lack of support for Nordic collaboration at a policy/political level

Fifty percent of the respondents answered that *Nordic cooperation* on the political agenda as a prerequisite for more collaboration.

This is a clear indicator that there is currently a lack of political attention and will to prioritize this area. This assumption is also reinforced by the interviews with the CIO group. And this situation does not seem set to change in the near future. Of the five Nordic countries, all are working out, or plan to work out, new national digital strategies

and priorities. None of them plan to include a Nordic agenda in these plans and strategies.

Formal collaboration demands incentives

As mentioned both by several of the national CIOs and several respondents in open text-fields, the only reasons for a more operational and formal collaboration are clear benefits and good business cases.

40 % of respondents believe additional funding for Nordic cooperation projects could be decisive for their organizations to extend their Nordic collaboration, and 43 % consider a coordinating body to be decisive. The CIOs partly agree on that. On the other hand, it was noted that developing infrastructures and digital solutions on this scale does entail considerable costs, and that these initial costs had eventually have to be funded by the Nordic Government's budgets.

The national CIOs are mostly uniform in their description of sound business cases that provide national value as an prerequisite to be involved in any kind of formal collaboration.

There probably is a potential Nordic market for e-government solutions

In the Nordic countries, governments have established effective collaborations with private partners such as banks and mobile network operators on vital national infrastructure. However this collaboration is at a national level only. Today the Nordic countries are divided into five separate markets for e-government solutions.

Several large ICT market actors deliver e-government and back-office solutions for governments throughout the Nordic region. Some of them are of Nordic origin, but the main multinational actors are also substantially represented. All countries are working on standardization as a means of enabling new and better services. Standardization can be an effective way of opening up markets for new actors. A lot of standardization is de-facto done by industry.

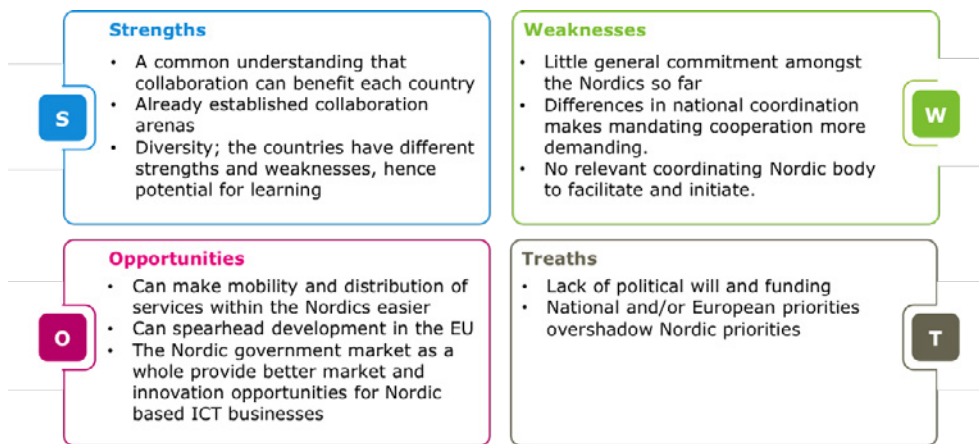
In some areas it could be reasonable to challenge the ICT market to provide e-government solutions that can be used throughout the Nordic market. This could end up as a win-win situation for both governments and ICT businesses, as it could provide the supplier with a bigger market and governments with more innovative products and better potential for making solutions work across borders.

5.2 Conclusions

This study argues that the public actors see benefits in enhanced Nordic knowledge sharing and joint projects in the area of digitalization. The results indicate that the actors believe such collaboration can:

- a) Provide more efficient ways of developing and delivering public digital services within each country.
- b) Provide cross-border services to citizens residing and enterprises doing business in the Nordic countries.
- c) Spearhead European initiatives.
- d) Provide better market opportunities for Nordic-based ICT businesses.

However, to achieve these benefits there are several obstacles to overcome. Benefits and obstacles can be summarized in a brief SWOT-analysis.



5.3 Recommendations

The report exhibits a number of areas in which there potentially could be a positive business case for Nordic collaboration. Based on the report's discussion on how to improve and increase the value of Nordic collaboration, the report recommends that the Nordic digital actors:

- Use the implementation of EU initiatives as a starting point. Accelerate them, demonstrate the potential.
- Carry out trans-national eID work within government systems. Reduce the waiting room issue for citizens and enterprises within the Nordic countries
- Show how common standards for public e-tendering and e-invoicing can provide a de facto internal market for companies doing business in the Nordic countries
- Start at a bilateral or trilateral level. Not all projects are suited to every Nordic country.
- Bypass some of the national coordination issues by not focusing on the overarching policy level. Aim for collaboration amongst the service providers on concrete issues that have a clear business case (for example e-prescriptions, procurement).
- Challenge and partner up with suppliers. There are many strong Nordic technology companies that already provide services to more than one Nordic government. By expanding their market, they can expand their innovation efforts.
- Establish a small pan-Nordic project organization that can provide task forces on the chosen subjects with resources.

Appendix 1

The Nordic Digital Eco System

6.1 The actors of Denmark

6.1.1 Ministry of Finance (Finansministeriet)

The ministry is responsible for IT policy and public sector digitalization, including matters concerning digital communication with citizens and businesses. The ministry develops initiatives concerning administration, public leadership and digitalization with focus on improvements to the efficiency of the public administration. The ministry also engages in yearly budget negotiations with KL representing the municipalities. The Danish Agency for Digitisation (Digitaliseringsstyrelsen) is the main body for digital operations.

The ministry oversees the Danish Agency for Digitisation (Digitaliseringsstyrelsen), the Danish Agency of Modernisation, the Danish Tax Authorities (Skat), the Agency for Governmental IT-services (Statens IT) and Government IT (Statens Administration).

www.fm.dk

6.1.1.1 Agency for Digitisation (Digitaliseringsstyrelsen)

The Agency was set up in November 2011, after the merger of the National IT and Telecom Agency and the Agency for Governmental Management.

The Agency's main responsibility is to contribute to the accomplishment of the political vision, the strategy and the understanding and development of relevant technology. The agency can also be seen as Danish counterpart or operative level for EU Commission digital services.

The agency runs the web portal Borger.dk, and is responsible for the Danish public eID and authentications services named NemID / NemLog-in. Also Digital Post (operated by e-Boks.dk), and NemHandel (procurement portal on OIOUBL – standard) is run by this agency.

They are responsible servicing the STS “The Steering Committee for Joint Government Cooperation”. Similarly, the agency coordinates the national eGovernment Strategy and the Steering Committee for the eGovernment Strategy. The latter committee consists of stakeholders from all levels of government.

The Ministries' Project Office, which resides also within the Agency for Digitisation, offers advice and coaching to public institutions that implement large IT projects. Its task is to develop and maintain the common IT project model for the state.

www.digst.dk

6.1.1.2 Agency for Governmental IT (Statens IT)

Statens IT takes care of the main body of tasks concerning administrative IT, IT-infrastructure and communications services, and subsequently maintenance and user administration for eight ministries (Employment, Economy, Finance, Climate, Energy, Culture, Environment, Regions and Education). It is hence an important operations agency, but not policy-wise.

The agency is under the auspices of the Ministry of Finance. It is also responsible for matters related to the protection of critical IT. Notably, its Centre of Cyber security (GovCERT) is operated on instructions from the Defense Ministry.

The agency has its own strategy⁷⁷ (2015-2018) stating as main task to secure stable operations, standardization, and productivity through outsourcing on standard, framework contracts.

www.statens-it.dk

6.1.1.3 Government Administration (Statens Administration)

Government Administration is responsible for running an efficient IT support and ensuring high quality and consistency in administrative IT services across Denmark. Its main tasks include the support, development and harmonization of IT throughout the territory.

Where the Agency for Digitisation is more of a common policy and architecture provider and controller, and Agency for Governmental IT is more of a procurer and a provider for eight designated ministries, Government Administration rather governs integration levels, establishes access and reuse of public data and basic information exchange. The administration has its own strategy (2015-2020), building on the common digitalization strategy⁷⁸, stating policies towards reuse, procurement and consolidation of systems, and the procurement of a common integration platform in 2016.

www.statens-adm.dk

⁷⁷ <http://www.statens-it.dk/omstatensit/nyheder/nystrategifor2015-2018.html>

⁷⁸ http://www.statens-adm.dk/da/servicemenu/om-sam/~/_media/Files/Om%20os/Digitaliseringsstrategi%20for%20Statens%20Administration.pdf

6.1.1.4 Agency for Modernisation (Moderniseringsstyrelsen)

The agency's mission is to support the government in economic policies and ensure innovation and efficiency in the public sector. Mostly this relates to sound management and general or innovation support. However, it operates or provides a number of common state solutions and products: state payments system, retirement age calculation, economy modules and more.

www.modst.dk

6.1.1.5 Tax Authorities (Skat)

The Danish Tax Authorities provide the self-service platform for tax-related issues <http://tastselv.skat.dk/>. It should be noted that tax services are not integrated in other public services as far as we have understood it.

www.skat.dk

6.1.2 Ministry of Business and Growth (Erhvervs- og Vækstministeriet)

The ministry is notably responsible for telecom and Internet regulation, and for frequency management. Also, it is responsible for intellectual property rights, competition, and consumer policy.

Most recently (September 15 2015) responsibilities concerning frequencies, broadband and telecoms cooperation have been shifted to the Ministry of Energy, Utilities and Climate.

The ministry is responsible for follow up on 2015 agreement on growth for digitalization in Denmark ("Aftale om vækstplan for digitalisering i Danmark") between a broad coalition of political parties. The agreement concerns broadband coverage goals, mobile coverage goals, security and IT use in Danish business.

The Ministry oversees the Danish Business Authority (Erhvervsstyrelsen) and the Danish Competition and Consumer Agency (Konkurrence- og forbrugerstyrelsen). Worth mentioning is also the Patents office (Patent- og Varemærkestyrelsen) and Mindlab; a knowledge innovation laboratory for public sector, developing techniques and guidance for service and process innovation and design.

www.evm.dk

www.mind-lab.dk

6.1.2.1 Business Authority (Erhvervsstyrelsen)

The Danish Business Authority is the main authority concerning business regulation, innovation and government service aimed at businesses. The authority's department for digitalization develops common solutions for communication between government and business.

Virk.dk is operated by the authority, and operates as the single point of contact for businesses in accordance with the EU service directory. Its goal is to yearly add value at a level of 10 pst from 2010 level for businesses. The portal provides services for

refunding of social benefits, VAT and annual reports. The authority also provides user support for government institutions and solutions.

Section for data-analysis and telecoms regulation is likely to be moved, as responsibility has shifted to the Ministry of Energy. The section is responsible for frequency administration, innovation and competition, building ground for market based development.

The authority is taking part in in Agency for Digitisation's work on developing the new, common digital strategy (2016-2020) by coordinating and facilitating stakeholders among businesses.

<https://danishbusinessauthority.dk>

6.1.3 Ministry of Health (Sundheds- og Ældreministeriet)

The Ministry oversees the Danish Health and Medicines Authority, the Government Serum Institute and sundhed.dk

www.sum.dk

6.1.3.1 sundhed.dk

Sundhed.dk is a public, internet-based portal that collects and distributes health care information among citizens and health care professionals. Its goal is to bring the entire Danish health care sector together and provide an accessible setting for citizens and health care professionals to meet and exchange information.

The portal has its own organization, and is under the auspices by the Association of County Councils in Denmark (DR), the Ministry of Interior and Health and Local Government Denmark (KL)

All Danish citizens have access to sundhed.dk, enabling patients to communicate and patients and their families to get an overview of correct and updated health care information.

6.1.3.2 Danish Health and Medicines Authority (Sundhedsstyrelsen)

The authority used to be the supreme health and pharmaceutical authority in Denmark, and is under the auspices of the Ministry of Health. Note that the Agency for Governmental IT provides IT solutions in this sector. Most digital services are either provided by the Agency for Governmental IT or provided by regional authorities. As from 8 October 2015, the Authority has been split into three agencies: The Danish Health Authority, the Danish Medicines Agency and the Danish Patient Safety Authority.

The Government Serum Institute is a parallel institution, responsible for disease control. It also operates a number of citizen directed services:

- eSundhet.dk: Open data information on health and health institutions.
- E-Journal: digital access to information on diagnoses, treatments and notes from EHR systems in all public hospitals.
- Fælles Medisinkort: Common prescriptions is an overview of each Danes current

prescriptions and medicine purchases. In next update it is planned to provide all relevant health professionals and individual citizens a quick overview of current medication.

www.sundhedsstyrelsen.dk

www.ssi.dk

6.1.4 The National Board of Social Services (Socialstyrelsen)

The National Board of Social Services is a government agency under the Ministry of Social Affairs and the Interior (www.sim.dk), that aims to promote new development and initiatives in social services while also supporting and counseling local authorities in providing services to citizens. In this context, citizens are children, young people, socially marginalized groups, elderly and disabled. The agency operates the Office for Digitalization, which notably holds a semantics secretariat. The secretariat is an arena for establishing common semantics in social affairs systems.

www.socialstyrelsen.dk/

6.1.5 Civil Registration System (Det Centrale Personregister - CPR)

The CPR administration is under the auspices of the Ministry of Social Affairs and the Interior. It operates the general registration and registry of persons, and is a key actor in any affairs concerning identification of persons and the moving of housing.

www.cpr.dk

6.1.6 The Danish Geodata Agency (Geodatastyrelsen)

This is a public corporation established in 1989, and has since 2015 been a part of The Ministry of Energy, Utilities and Climate. The agency is the national authority for spatial data infrastructure, surveying, mapping, and cadastral and chartered surveyor administration. Responsibilities are defined in the Act on the Danish Geodata Agency, the Infrastructure for Spatial Information Act, the Act on Subdivision and other Registrations in the Cadaster, and the Land Surveyors Act.

Through the public-sector eGovernment strategy 2011-2015, Local Government Denmark and government have agreed on a basic data program, including specific improvements and initiatives in public-sector basic data. One of these is <http://geodata-info.dk/portal> which is operated by the agency, and is point of access for open map data

www.gst.dk

6.1.7 Local Government Denmark (KL)

Local Government Denmark (LGDK, or KL in Danish) is the interest group and member authority of Danish municipalities. It is voluntary to be a member of KL, but nevertheless all 98 municipalities are members. Its mission is to safeguard common interests of the municipalities, assist the individual municipality with consultancy services and in addition ensure that the local authorities are provided with up-to-date and relevant information.

KL negotiates yearly budget with the Ministry of Finance, on behalf of its members. Digitalization and service delivery is part of the negotiations. KL officially supports the common public digital strategy and the drafting of a new strategy, and but have already concluded their municipal strategy for 2016-2020⁷⁹ before the national strategy. Previous strategy focused on how to break up IT monopolies and provider dependency. Main points of the new strategy are: Standards for data and it-architecture; cost efficiency; infrastructure-like solutions should always be common; joint procurements; joint strength towards the state; member commitment to agreements; healthy competition and transparency.

KL notably runs the Center for Social og Sundhet, concerning eHealth technologies and solutions and common language/semantics, and center for Work flow and IT architecture.

KL services the Municipalities IT architecture board, which advises KL on architecture policies.

“Fælles Kommunal Geodata” is a separate organization set up by KL, to administrate and coordinate the municipalities' access to geodata.

www.kl.dk

6.1.7.1 KOMBIT

KOMBIT is owned by KL, and is KL's IT operations tool. KOMBIT facilitates joint solutions, evaluates market potential and interest, coordinates joint procurements and, if not available, develops solutions demanded by municipalities. KOMBIT is not a policy organisation.

www.kombit.dk

6.1.8 Danish Regions (DR)

DR is the interest organization of Denmark's five regions. Its most important tasks are related the health care, regional development and environment.

www.regioner.dk

6.1.9 Danish NGOs

6.1.9.1 Danish IT (Dansk IT)

Danish IT is an NGO for Danish IT businesses and professionals. Dansk IT contributes through political involvement and representation of its member's interests through government interaction, hearings, publications, participations and press contacts. Through its committee for public sector ICT, Danish IT provides advises to governing bodies on developing the national ICT strategies.

⁷⁹ <http://www.kl.dk/Fagomrader/Administration-og-digitalisering/Digitaliseringsstrategier1/Den-falleskommunale-digitaliseringsstrategi1/>

Danish IT holds an annual conference on public sector digitalization, which gathers stakeholders and professionals from public and private sector.

www.dit.dk

6.1.9.2 The Danish IT Industry Association (IT-Branchen – ITB)

ITB organises its members' in different boards which discuss subjects relevant to each company, for instance digital administration, open source, research and education. The purpose of these boards is to improve the business framework for the members, emphasizing principles of free competition.

www.itb.dk

6.1.9.3 It-forum

It-forum is a Jylland (formerly Århus) network for it-interested businesses, organizations, educational institutions and government. It arranges workshops, visits, seminars and conferences, and focusses on network building activities and cross sector meetings.

www.itforum.dk

6.1.9.4 Danish Technological Institute (DTI)

The Danish Technological Institute is a self-owned and not-for-profit institution. They develop, apply and disseminate research- and technologically-based knowledge for the Danish and international business sectors, in close cooperation with research institutions. They also carry out consultancy and standardization services.

www.dti.dk

6.1.9.5 Alexandra Institute (Alexandra Instituttet)

The Alexandra Institute is a non-profit company that helps public and private organizations develop IT-based products and services based on cutting-edge IT research. Their mission is "to create value, growth and welfare in society." Their role is normally to identify needs, provide knowledge of solutions or optimize or develop software accordingly. Alexandra Institute is actively involving in ongoing process, and organizes or participates in a number of workshops and similar, and their events calendar is a good source of information on upcoming activities. They are also member of the GTS-institutes, or Advanced Technology Group, that consist of nine independent research and technology organizations.

www.alexandra.dk

6.1.9.6 Copenhagen node.js, #tshack and CopenhagenJS

These are two of the more active open data networks in Copenhagen, and organize regular hackathons attracting 30 to 100 participants. Copenhagen node.js and CopenhagenJS usually arrange hackathons in node and JavaScript at Founders, a small company. Copenhagen #tshack is run by Tradeshift, a small company that produce open solutions for trade.

www.copenhagenJS.dk

<http://www.meetup.com/Copenhagen-Node-js-Hackathon/>

<http://www.meetup.com/Copenhagen-tshack/>

6.2 The actors of Finland

6.2.1 Ministry of Finance (Valtiovarainministeriö)

There are two ministers under the Ministry of Finance. The second minister, the Minister of Municipal and Reform is responsible for local and regional government affairs, human resources and administrative policy issues, public administration ICT functions of the controller, and the finances.

The following agencies are overseen by the ministry:

- The Registers Office (more below)
- The State Treasury (more below)
- The Tax administration (more below)
- The Population Register Center (more below)
- Avoindata.fi – the Finnish solution for open data publication.
- The Regional State Administrative Agencies – general local regulatory agency, following up municipal activities

JulkICT / Public Sector ICT is the ministry's department responsible for ICT policies. Notably it runs the "National Architecture for Digital Services programme". JulkICT also supports ICT development in municipality-level services through support and customer relations. However, it does not have the direct negotiation role as seen in Denmark budget administration.

The department coordinates ICT policy through servicing JUHTA. JUHTA is a permanent committee for promoting cooperation in information management between the State and the municipalities. JUHTA coordinates the development of information technology, information management and electronic services in central and local government, and draws up relevant recommendations for the public administration. State agencies, Kela and municipalities are represented.

JulkICT has three departments, and a JHS⁸⁰-section which provides recommendations on information management, through JUHTA:

- PERTIVA coordinates collaboration between organizations responsible for maintaining public base registries (e.g. population register).
- VAHTI, the Cyber security management team for government information and information supervision, is serviced by the department. Different administrative branches and levels of administrations are represented in VAHTI. VAHTI issues information security instructions, policy guidelines, that are important reference materials for the public authorities. VAHTI instructions are also utilized and referenced outside the government organizations in e.g. municipalities and private sector.
- TIETOKEKO, Information management development and co-ordination group, is set up to speed up decision making processes on cooperation and productivity in state information management, coordination of uptake of service, and follow up of common projects. The committee is chaired by Government CIO of Public Sector ICT and members are CIOs or equivalent officials of ministries in the field of ICT. Also the Parliament has a member in the committee.

JHKA is a part of JUHTA committee taking decisions and recommendations on common architecture and interoperability developments, supported by the act on information management governance in public administration.

www.vm.fi

6.2.1.1 Government ICT Centre (Valtori)

The Act on the Organisation of Shared Information and Communication Technology Services in Central Government entered into force in January 2014. The law established a new agency, the government ICT Centre Valtori. Valtori is a government's in-house service center operating under the administrative purview of the Ministry of Finance. Valtori began its operations in March 2014, and now provides sector-independent ICT services for central government administration.

These services are based on commonly available hardware and software solutions and technologies. The center produces services in cooperation with other ICT service centers of public administration. All central Finnish government agencies are customers. These are obliged to employ shared IT infrastructure and services unless there is a specific reason related to the function or mission of the relevant entity that requires the employment of other solutions or services. By providing central government administration with unified ICT services, Valtori claims to enable agencies and ministries to focus on developing information systems specific to the core functions of their administrative sector.

Valtori is organized with account managers for each sector, and aims to provide

⁸⁰ https://www.paikkatietoikkuna.fi/web/en_old/jhs-recommendations

services for all parts of ICT life cycle.

www.valtori.fi

6.2.1.2 Population Register Centre (Väestörekisterikeskus - VRK)

The basic task of the Population Register Centre (PRC) is to enable usage of the data contained in the Population Information System and the PRC's certified electronic services. The center emphasizes in strategy documents the protection of privacy and personal data as well as information security and the development of and compliance with good data processing and data management practices.

PRC is the operating unit for the Digital infrastructure program known as Palveluväylä⁸¹. This is in practice operated through the X-road data exchange layer, in cooperation with Estonia. The program includes four projects: national data exchange layer; service views; roles and authorization and eidentification.

Services implemented in x-road in 2015 include PRC, Trafi (transport safety agency), PRH and MML. In 2016 Vero, Finto and Kela are scheduled to join.

The register is responsible for issuing electronic identities and certificates. It creates an electronic identity (eID) for Finnish citizens in parallel when providing a personal identity code, FINelD.

www.vrk.fi

6.2.1.3 Tax Authorities (Vero)

The Tax Authorities provide a number of tax-related e-solutions, such as digital tax card online, periodic tax returns and similar. The authority is not as far as we understand a core player in cross-service digitalization. Note that the authority is scheduled to implement x-road infrastructure in 2016.

The Business Information System (BIS) is a service jointly maintained by the Finnish Patent and Registration Office (PRH) and the Tax Authorities.

The Tax Authorities have their own eID system, Katso ID, used on the YTJ.fi portal, isolated from the general eID from the Population Register.

www.vero.fi

6.2.1.4 Patent and Registration office (Patentti- ja rekisterihallitus - PRH)

The office is under the administrative branch of the Ministry of Employment and the Economy.

In joint venture with Finnish Tax administrations, they operate the Business Information System (BIS). The Patent and Registration Office participates through its unit for digital architecture.

⁸⁰ https://www.paikkatietoikkuna.fi/web/en_old/jhs-recommendations

⁸¹ <http://vm.fi/palveluvayla>

The office holds the Trade Register, and emphasizes cooperation with its Swedish, Danish and Norwegian counterparts.

www.prh.fi

6.2.1.5 State Treasury (Valtiokonttori)

The State Treasury provides central government organizations with internal services.

The Government IT Shared Service Centre, a part of the State Treasury, is responsible for 'Vetuma'; the public administration's joint service for citizen electronic authentication and payment.

Tunnistus.fi is an identification service similar to Vetuma, but it is providing this service only to its owners, which are the Tax Administration, the Ministry of Employment and The Economy and Social Insurance Institution of Finland.

TILHA is a public procurement solution, run by the State Treasury.

The Suomi.fi portal is a service funded by the Ministry of Finance. Suomi.fi editorial team is located at also at the State Treasury.

<http://www.valtiokonttori.fi>

6.2.1.6 Opendata.fi (Avoindata.fi)

Avoindata.fi is a service for Finnish open data and interoperability standards and guidelines. As a part of the Open data program, the national data portal (Opendata.fi service) was launched in September 2014. The Portal provides a single address to public sector data resources and tools and guides aimed to improve interoperability. The portal aims to enhance the use and availability of open data. The content of the portal can be freely used by anyone. The portal is produced and run by the Government ICT Centre Valtori.

www.avoindata.fi

6.2.1.7 Hansel Ltd.

Hansel Ltd. is a state-owned (through the Ministry of Finance), non-profit limited company, which acts as the government's central purchasing body. They finance operations through service fees, paid by suppliers based on the value of purchases. Currently, the maximum service fee that can be charged is 1.5 per cent of the contract value.

Operations are governed by the Hansel Act, which lays down provisions on their duties and customers.

www.hansel.fi

6.2.2 Social Insurance Institution of Finland (Kela)

Kela is the social insurance enterprise under the supervision of Parliament. The administration and operations of Kela are supervised by 12 trustees appointed by Parliament and 8 auditors chosen by the trustees. Kela has a 10-member Board of Directors that manages and develops its operations.

www.kela.fi

6.2.3 Ministry of Employment and the Economy (Työ- ja elinkeinoministeriö)

The ministry is responsible for the HILMA public procurement portal.

www.tem.fi

6.2.4 Ministry of Transport and Communications (Liikenne- ja viestintäministeriö)

The responsibilities of the ministry include legislation related to infrastructure, i.e. communications networks, data protection and data security questions. The Communications Policy Department, rooted within the Ministry, is divided into two units:

The Communications Networks Unit prepares laws and other strategic guidelines related to frequencies and network licenses, broadband connections, information security and critical infrastructure protection.

The Media and Communications Services Unit is responsible for issues related to information society projects, and to privacy protection of communications.

www.lvm.fi

6.2.5 Sitra

Sitra is an innovation fund operating directly under the Finnish Parliament. However the decision-making processes are tied to parliamentary systems. Administration and governance of Sitra includes a Supervisory Board, Board, and a President. The supervisory board consists of members of parliament, implying that the board is directly answering to Parliament.

Sitra cooperates with Aalto university on the eGovLab SimLab (Enterprise Simulation Laboratory) in the Open Innovation house, Otaniemi, Espoo.

www.sitra.fi

6.2.6 The Ministry of social affairs and health (Sosiaali- ja terveysministeriö)

The Ministry is responsible for The National Archive of Health Information (KanTa), which is intended to serve not only health care professionals but all users of health care services. Services enabled by KanTa include:

- electronic prescriptions,
- an archive of patient records
- a function for viewing one's own health information online.

The range of services is increasing, Kela is now also providing services at KanTa, and

services are developed in cooperation with municipalities through THL.

The development of national information system services is coordinated by the Advisory Board for Electronic Information Management in Social and Health Care.

www.stm.fi

6.2.7 National Land Survey (Paikkatietoikkunasta)

The National Land Survey Development Centre / SDI-team is responsible for national geodata coordination and standardization.

<http://www.paikkatietoikkuna.fi/>

6.2.8 Finnish NGOs

6.2.8.1 Federation of Finnish Technology Industries (Teknologiateollisuus)

The Federation of Finnish Technology Industries is the lobbying organization for technology industry companies.

The federation differs from its Nordic counterparts, in being more enterprise and cooperation oriented and less oriented towards policy development and political agendas.

www.teknologiateollisuus.fi

6.2.8.2 Digile

Digile is a non-profit company operating between the public and private sectors with the goal of increasing know-how and developing the tools required by the Internet economy.

Digile coordinate business-led research programs, aiming to speed up the development of digital services and create business ecosystems, according to their strategy.

www.digile.fi

6.2.8.3 The Finnish Communications Regulatory Authority FICORA (Viestintävirasto)

FICORA supervises and promotes operations in communications markets. It is also tasked to strengthen cyber security, and has recently been mandated to establish a new cyber security center built around traditional information security tasks.

www.ficora.fi

6.2.8.4 VTT Technical Research Centre of Finland Ltd. (Teknologian tutkimuskeskus VTT Oy)

VTT is a Finnish state-owned limited liability company. The decision making structure is defined by the Finnish Limited Liability Companies Act. VTT as the parent company together with its subsidiary companies form the VTT group of companies.

The company is important in any government or societal technological developments, and has been so for over 70 years. It claims to be the leading research and technology company in the Nordic countries, and serve both private and public sectors. They develop new technologies, profitable solutions and innovation services, and also represent Finland in a number of international cooperations and networks.

www.vtt.fi

6.2.8.5 Forum Virium Helsinki

Forum Virium Helsinki, a subsidiary of the City of Helsinki Group, develops new digital services in cooperation with companies, City of Helsinki, other public sector organizations, and Helsinki residents. Forum Virium Helsinki Ltd is owned by the City of Helsinki. Alongside of the Forum Virium Helsinki Ltd Board of Directors, Forum Virium Helsinki is led by its Board of Directors and Steering Group. The forum is responsible for networking and communication in a number of open data initiatives:

Helsinki Region Infoshare (HRI):

The Helsinki Region Infoshare (HRI) service aims to make regional information accessible. Essentially, HRI is a web service for fast and easy access to open data sources between the cities of Helsinki, Espoo, Vantaa and Kauniainen. The data published is mainly statistical. A good proportion of the data material offered by the service is GIS based.

HRI is funded by Sitra, and the participating cities. It is operated by a directive board representing the funding parties, as well as City of Helsinki Urban Facts and Forum Virium Helsinki (Open Data Helsinki).

<http://www.hri.fi/>

The Six City Strategy (6aika):

The primary objective of the Six City Strategy is to strengthen Finland's competitiveness by using the country's six largest cities as innovation development and experimentation environments. The strategy aims to not only produce service innovations, but also to promote competitive business and employment. Forum Virium Helsinki is responsible for the national coordination of the strategy, including networking and communication task.

www.6aika.fi

6.2.8.6 AvoinGLAM (OpenGLAM)

This is an international network of people and institutions working with open content and data in the areas of galleries, libraries, archives and museums (GLAM). The network is rather active in Finland, and organizes workshops, seminars and other events.

www.avoinglam.fi

6.2.8.7 Finnish Centre for Open Systems - COSS Association

COSS is a non-profit association that works to promote open source, open data, open interfaces and open standards. Its stated purpose is to assist its members

to "create successful openness". The association works to influence construction of digital ecosystems, and promote openness and transparency. The network consist of approximately 100 businesses and organizations.

<https://coss.fi>

6.2.8.8 Open Knowledge Finland (OKFFI)

This is the local group of the Open Knowledge Foundation, and is very active as such, and a point of access to most open data activities and events in Finland. They participate or co-organize a number of regular or sporadic open data activities, such as Hack4FI, Apps4FI, OpenGLAM, Open Finland Challenge, D-CENT (Decentralised Citizens ENgagement Technologies - a Europe-wide project bringing together citizen-led organisations that have transformed democracy), and DigiExpo.

fi.okfn.org

6.3 The actors of Iceland

6.3.1 Ministry of the Interior (Innanríkisráðuneytið)

The ministry's main areas of responsibility are: Transport, Justice, Police Affairs, Security, Communications, Human Rights, Local Government, Elections, Immigration, Family Affairs, Religion and the National Church, Posts and Telecommunications and Consumer Affairs.

It notably governs District Commissioners, Icelandic Transport Authority, The Post and Telecom Administration, The Data Protection Authority and Registers Iceland

Relevant policy areas covered by the ministry are:

- eGovernment strategy
- Telecommunications
- eParticipation
- Safer Internet
- Security and CERT policy

www.irr.is

6.3.1.1 Registers Iceland (Þjóðskrá Íslands)

Registers Iceland registers a range of information on Iceland's residents and real properties, and provides related services such as assessment. Importantly in this context, they are responsible for allowing electronic access to the registers, issuing certificates, passports, ID cards and the common eID-solution Íslykill/Icekey. Registers Iceland is also responsible for the operation and development of the national portal Island.is. In practice, the Registers Iceland operates as an eGovernment agency through its tasks. Notable tasks are:

- eAuthentication and issuer of IceKey (and passports)
- Single Sign On project

- ePetitions
- The national portal Island.is
- EUGO – the service directive portal
- eDelivery (by eBox)

www.skra.is

6.3.1.2 Post and Telecom Agency (*Póst- og fjarskiptastofnun*)

The agency is responsible for the administration of electronic communications and postal affairs in Iceland.

Importantly, it operates the cyber security team, CERT-ÍS, whose operations relate to information infrastructure that is critical to the country and to operators of electronic communications networks.

www.pfs.is

6.3.1.3 Data Protection Authority (*Persónuvernd*)

Monitoring data controllers and ensuring that they take appropriate security measures, in accordance with law, is an important part of the Data Protection Authority's work.

www.personuvernd.is

6.3.2 Prime Minister's Office (*Forsætisráðuneytið*)

The Prime Minister's Office holds interest in the area of public sector information (PSI), but general issues concerning governing ICT and information society are permanently moved to Ministry of the Interior.

www.for.is

6.3.3 Ministry of Finance and Economic Affairs (*Fjármála- og efnahagsráðuneytið*)

The ministry holds the policy area of eProcurement and digital certificates.

www.fjr.is

6.3.4 Ministry of Welfare (*Velferðarráðherra*)

The ministry is responsible for administration and policy-making concerning social affairs, health and social security in Iceland as prescribed by law, regulations and other directives, and notably the area of eHealth policy, which is operated through the Directorate of Health.

www.vel.is

6.3.4.1 The Directorate of Health (*Embætti landlæknis*)

The roles of the directorate in terms of electronic medical records include:

- Safety and efficiency in services and public health at all life stages.
- Policy for information technology in health care at the national level, in consultation with health authorities and other key stakeholders.

- To develop and implement electronic medical records.

Focus is put on targeted development of information technology in health care and information sharing to improve operations and services in the health sector. The main objectives of the Directorate of Health for electronic medical records are:

- To develop patient-oriented electronic medical records and electronic communication to ensure the efficient and secure access to relevant real-time information at the national level, wherever and whenever needed.
- To implement electronic medical records nationwide that meets minimum health requirements and supports proper registration.
- Establishing interactive, electronic access to institutions and establishments in the health statistics from the warehouse of the office of health data with defined comparative information.
- Public access to secure electronic access to one's own user data online.
- Managing projects in information technology in health care that can be used nationwide.
- To guide and support coordinated registration of health information across the country

www.landlaeknir.is

6.3.5 Ministry for the Environment and Natural Resources (Umhverfis- og auðlindaráðuneytið)

The ministry coordinates geo-data policies, and is responsible for the Icelandic geoportal.

<http://gatt.lmi.is/geoportal122/catalog/main/home.page>

<http://eng.umhverfisraduneyti.is/>

6.3.5.1 National Land Survey of Iceland (*Landmælingar Íslands*)

The Land Survey's role is to collect, process, preserve and disseminate spatial data about Iceland. The organization acts under the regulation of two regulations; the Act on surveying and basic mapping and Act on the Infrastructure for Digital Spatial Data.

From January 2013, digital maps and spatial data held by the Land Survey were made available free of charge. The data forms the basis of various projects within state agencies, such as registration, planning, nature conservation, natural hazards, energy, research and public projects, but can also benefit the public and businesses in various ways.

www.lmi.is

6.3.6 Icelandic NGOs

6.3.6.1 Open Knowledge Foundation Iceland

Open Knowledge Foundation Iceland is the national branch of the international OKF non-profit network. The first Iceland meet-up was 2013, and the next is planned February 2016. The OKF Iceland ambassador is also behind gogn.island.is, a small collection of open datasets.

Related to the Open Knowledge Foundation, the GitHub repository apis.is is an Icelandic web service that scrapes open data from public websites, providing developer access to various types of Icelandic data. Examples of available data include Icelandic company directories, cinema showtimes, earthquakes, international flights, vehicle registry, bus system information, and more.

is.okfn.org
gogn.island.is
docs.apis.is

6.3.6.2 The Icelandic Computer Society (*Skýrslutæknifélag Íslands, Ský*)

The society was established in 1968, and is mostly based on voluntary work. Members include businesses that rely on information technology, and various vendors. Its main function today is organizing conferences and lectures, international cooperation and a committee dedicated to translating computing terms to Icelandic. Sky is member of Nordisk Data Union, NDU, and the Council of European Professional Informatics Societies, CEPIS.

www.sky.is

6.3.6.3 Icelandic Standards (*Staðlaráð Íslands*)

This is the national standards body of Iceland. It is an independent association whose role is the formal publication of Icelandic standards and the representation of Iceland in international and regional standards bodies (CEN, CENELEC, ETSI, ISO and IEC). Four sector committees operate under the auspices of Icelandic Standards: BSTR, in the building sector, FIF in the fishing sector, FUT in the information technology sector, and RST in the electro-technical sector.

www.stadlar.is

6.3.6.4 The Federation of Icelandic Industries (*Samtök iðnaðarins*)

The organization's purpose is rationalize business, increase collaboration between employers and clarify the role of each member. The organization involves in standards, CE-markings, government purchasing issues and other areas also relevant to ICT solutions.

www.si.is

6.3.6.5 Association for digital freedom in Iceland (*Félag um stafrænt frelsi á Íslandi*)

This is an organization working to promote the freedom to use Icelandic language in digital solutions, and reducing language barriers created by technological standards. Hence, its work is much directed towards open solutions, for possibilities to modify and adapt.

www.fsfi.is

6.3.6.6 The Icelandic Committee on Trade Procedures and e-Commerce (ICEPRO)

The committee is a forum of official bodies, businesses and individuals who are working on facilitating commerce and trade procedures, using EDI (Electronic Data Interchange), ebXML and other standardized means of Electronic Commerce. Icepro works as partner for "interested parties searching for better ways of doing business and for simplifying administrative and trade procedures". They also participate in CEN/ISSS, whose mission is to provide market players with integrated standardization-oriented services and products.

<http://icepro.is>

6.4 The actors of Norway

6.4.1 Ministry of Local Government and Modernisation (Kommunal- og moderniseringsdepartementet)

The ministry is in general responsible for housing policy, the Planning and Building Act, local government finances and local administration, ICT policy and public sector reform, rural and regional policy, the conduct of elections, government employer policy, Sami and minority affairs and national mapping and the geodata policy.

The Department of ICT policy and Public Sector is responsible for ICT policy and public sector reform. In particular, it is responsible for the administration and modernisation of the public sector as well as national ICT policy, including the supervision of the Agency for Public Management and eGovernment (Difi). The department is also responsible for coordination of the government's general efforts for reform and reconditioning the public sector; for formulating strategy and policy for the use of ICT in society at large; for the government's administration policy, including, amongst other things, government use of organisational structures and other supervision instruments. Finally, the department is responsible for providing socio-economic and other fact-based analyses of the public administrative sector and the use of resources in the public sector.

The Information Security Coordination Council (KIS) operating under the supervision of the ministry coordinates regulations relevant to information security and undertakes the coordination of inspection practice within information security. It should be noted, however, that there is an ongoing debate on sharing of responsibilities on ICT security policy area, and it may be shifted to Ministry of Justice.

The Department services the board of (political level) state secretaries on IT coordination (Ministries of Work, Health, Finance, Local Government and Modernisation, Enterprise and Transport participate). It also chairs a ministries general director coordination group on eGovernment.

Core agencies overseen by the Ministry are as mentioned the Agency for Public Management and eGovernment, the Data Protection Agency, the Government Security and Service Organisation (DSS), the Buildings regulatory agency (Dibk), the County Governors, and the Maps Authority - all of which are described further below.

Among the ministry's most prominent regulatory or coordination instruments are:

- Budget process: All major ICT investments that require support in the national budget, are to be described and pre-sent to an internal expert group in the ministry, which sends its opinion on the projects to the ministry of Finance before the first budget drafts are prepared. Topics that will be brought to light are: simplification, whether suggested initiatives promote general effectiveness and usability in public sector, and ICT principals and use of common national components (explained under Difi, IT-architecture).
- Digitalization Communication (Digitaliseringsrundskrivet): This is a yearly notification to all State agencies on regulations and demands concerning ICT. The communication in itself does not have a regulatory status, but presents the Government policies and decisions on how regulations should be interpreted.
- Common regulations: These are the general statements that should be included in all regulatory letters for all state agencies.

The ministry represents Norway in a number of EU, OECD and Nordic forums, sometimes in cooperation with Difi.

www.regjeringen.no/kmd

6.4.1.1 Agency for Public Management and eGovernment (Difi)

Difi's overall task is to ensure that government administration in Norway is characterized by values of excellence, efficiency, user-orientation, transparency and democracy. They generally state to aim to develop the organization and leadership of the public sector, with coordination among public authorities and services.

Furthermore, the agency acts as a competence and coordination center on governance and eGovernment. In most processes concerning cross-sectorial coordination or common solutions, the agency will be involved. Recently, Difi has also been instructed to set up a board on digitalization, Digitaliseringsrådet⁸², which will assist state businesses in improving quality in all phases of digitizing projects.

General goals and tasks in the area of digitalization are:

- Setting up robust public procurement procedures
- Encouraging coordinated and cost-efficient use of ICT within the public sector
- Making public information and services more accessible for citizens and public agencies
- Inspecting public and private organizations to ensure that their web-based solutions and self-service machines fulfill universal design requirements

Operational tasks:

Digital Post: makes available digital post from public agencies to citizens through two competing solutions: eBox and DigiPost. Difi is contract part and oversees contracts on behalf of the public sector.

⁸² <https://www.difi.no/veiledning/ikt-og-digitalisering/digitaliseringsradet>

The ID-gateway: The ID-gateway is a portal for public service authentication. Private providers compete on framework contracts to deliver authentication services. These services are accessed through the portal. In essence, the user will choose which authentication service to apply, based on which they already have, and which they prefer. State agencies can implement the portal, and will be charged on a use cost basis. Difi also operates the public eID (MinID), which operates alongside the other IDs. MinID is considered to operate on a lower level of security than the government approved private sector eIDs. It is frequently used by minors, who can encounter problems acquiring for example a BankID.

Contact registry for individuals: Following regulation of 2013, all who do not make reservation against digital communication will be expected to receive digital communication from public agencies. Difi runs the registry of mobile phone numbers and e-mail addresses, and reservations, based on the ID-gateway authentications.

Skate: The Governance and Coordination of Services in eGovernment Board, Skate, is serviced by Difi. Skate is a strategic cooperation board of general directors. Members represent agencies with major services towards individuals, industries or other public services, and Skate is of major importance for practical implementation and cross-sector solutions development.

Open Data: Difi runs data.norge.no and usually represents Norway in matters of open data.

IT-architecture: Difi is responsible for following up and increasing knowledge about the general IT-architecture principals for Norway: interoperability, service orientation, accessibility, security, openness, flexibility and scalability. The principles state that common components should be used, the existing components at the time are ID-gateway, Altinn (described below), Central cadaster (Matrikkelen – real estate information registry), Secure digital post, the contact and reservation registry, the People Registry, and the Business registry.

Standards: Difi operates the Standardization Portal, which aims to inform its users about which standards are mandatory or recommended for use in the Norwegian public sector. The standards treated on this website are for the most part related to ICT, but one can also find standards related to other areas such as public contracts, semantics, service oriented architecture (SOA) etc. Difi also services the Standards board of advisory (Standardiseringsrådet).

Difi operates OEP, electronic public records, where correspondence and decision from public sector are registered and searchable.

Difi runs yearly studies on public web page quality, and is regulatory authority on the Disability regulations. The requirements are relevant for private businesses, organizations, and government agencies. The regulations on universal design of ICT were approved 21 June 2013 and took effect 1 July 2013. This means that new ICT solutions should be universally designed from 1 July 2014. Existing ICT solutions should be universally designed from 2021.

Difi services the ministry in preparing the annual digitalization communication (Digitaliseringsrundskrivet).

Difi is Norway's point of contact in CEF Digital, and is a core player in e-SENS activities.

www.difi.no

6.4.1.2 County Governor (Fylkesmannen)

The County Governor is the chief representative of (formally the King and) Government, and work to ensure that decisions of the Parliament (Storting) and Government are implemented correctly. There are 19 county governors, and they are coordinated and instructed through the Ministry of Local authorities and modernization.

The County Governor has a responsibility to supervise and advise municipalities on the law as it applies to municipal bodies. This responsibility applies both to general matters and to particular legal issues, as well as budgetary matters. The County Governor is also responsible for communicating the views of central government to the municipalities.

www.fylkesmannen.no

6.4.1.3 Data Privacy Authority (Datatilsynet)

The Data Privacy Authority protects the right to privacy and works to prevent misuse of personal data. It operates the following portals for privacy issues: Personvernbloggen (general information), dubestemmer.no (an educational portal on privacy online), slettmeg.no (support in how to remove sensitive data online).

They have drafted their own digital strategy, in response to the national strategy Digitaliseringsprogrammet, on how to address privacy problems in public sector.⁸³

The strategy focuses on the main register owners (The Brønnøysund Register Center, the Tax Authorities and the Mapping Authority, and addresses cooperation, responsibilities of data ownership, and development of regulations for built in privacy in all processes.

www.datatilsynet.no

6.4.1.4 The Norwegian Mapping Authority (Kartverket)

National strategy for open maps- and real estate data⁸⁴, published by the Ministry of the Environment, describes general principles for open access, and definitions and clarifications of roles and tasks. The strategy discusses societal security dilemmas concerning map data (access to critical information vs. protection from misuse and terrorism), and presents the following priorities on development for open access: (1) national map data for land and sea; (2) positioning data (3) real estate data and (4) detailed map data. The strategy also describes pricing strategy and self service solutions.

⁸³ <https://www.datatilsynet.no/Om-Datatilsynet/Strategier-planer/Innbyggernes-digitale-personvern/>

⁸⁴ <https://www.regjeringen.no/contentassets/f9162767ed7c4c4f94db7ac2f286d0ff/t-1539.pdf>

The Mapping Authority is notably responsible for geodata coordination, and the Cadaster (Matrikkelen), the latter defined as one out of three common component registers.

It also plays an important role as the nationwide coordinator of geodata, which involves establishing and coordinating work with the national geographical infrastructure within Norway. This means working closely with municipalities and other public sector suppliers and users of geographical information.

The Authority is chair of the Geodata board (Nasjonalt geodataråd) where general directors of all public providers of geodata meet regularly.

It carries out extensive work internationally, particularly within the area of property rights and development.

One division is responsible for the New Cadaster (Matrikkelen), the national property registry, which is continually updated in partnership with the municipalities. The New Cadaster contains information and maps concerning all properties, addresses and buildings in Norway.

The municipalities are in charge of local cadastral services and are responsible for entering information into the registry. The Norwegian Mapping Authority is the central cadastral authority with responsibility for the development, operation and administration of the New Cadaster.

The authority is also responsible for training, guidance and inspection in regard to the way in which the municipalities enter data into the registry.

It provides free land map data through data.kartverket.no, where data can be downloaded mostly in SOSI format.

www.kartverket.no

6.4.1.5 Government Security and Service Organisation (DSS)

DSS provides common services for most of the Ministries and the Prime Minister's office.

The main purpose of DSS is to provide synergy for the ministries with cost-effective and reliable shared services. These include cleaning, security, switchboard and postal services, as well as running computer systems and handling government publications. One department of DSS works solely with government procurements, and it also has a department that offers accounting services. Some of the tasks of the agency are carried out by private contractors.

www.dss.dep.no

6.4.2 Buildings Authority Agency (DiBK)

The Buildings Authority Agency (DiBK) is a national competence center on buildings and central authority on a number of areas within Buildings Act. Building permits are notoriously slow, caused by the many levels of government that are relevant to permits. DiBK has a facilitation role in the general process design.

To improve this situation, they have initiated the project ByggNett – a strategy for the future of buildings regulations, put down to five priorities:

1. Develop relations within regulators.
2. Develop processes and methods for digitalization.
3. Competence development.
4. Regulatory developments.
5. Service and solution development.

www.dibk.no

6.4.3 Norwegian Communications Authority (Nkom - Nasjonal kommunikasjonsmyndighet)

Nkom, under auspices of the Ministry of Transport, regulates post and telecom services. They manage frequencies for mobile networks, radio, television and auctions off frequencies on behalf of the government.

The authority further participates in a number of international forums and groups to contribute to the joint European approach to service regulation, market regulation, frequency and numbering management and technical regulation.

They monitor Norwegian compliance with the Electronic Signatures Act for issuers of qualified certificates, and monitor issuers of certificates in accordance with the voluntary self-declaration scheme based on the requirement specification for PKI in the public sector

Nkom operates the Nettvett.no security portal, which provides advice about everyday online security

www.nkom.no

6.4.4 Ministry of Finance (Finansdepartementet)

The Ministry of Finance is a core player in ICT policy through its role as a gatekeeper for all public spending and governance. However, the ministry also oversees the Tax Authority, and through this has a core interest in Altinn, a main common component. It also governs the agency for Norwegian Customs and Excise. Finally, the ministry is responsible for the Agency for Financial Management (DFØ), which provides administrative IT services to public sector.

Furthermore, the recommendations from the Ministry of Local Authorities and Modernisation on ICT investments in the state budget are taken to final decision by the Ministry of Finance.

www.regjeringen.no/fin

6.4.4.1 Tax Authority (*Skatteetaten*)

The Tax Authority is a core actor in digitizing public services both as provider of enterprise and enterprise tax reporting solutions, and through its central role in the development of Altinn. The Tax Authority is regarded as a "locomotive" in digitalization and development, and its views will normally be decisive in questions concerning Altinn. The Tax Authority has a large environment on service and technology development.

"A-meldingen" was introduced in January 2015⁸⁵, and is a digital "pull"-solution for enterprises reporting to the Tax Authorities, the Welfare Authorities and the National Statistics Bureau. The a-melding contains information about salaries and employments. This information is collected in one report, the a-melding, and must be submitted electronically by all who pay salaries, pensions and other remunerations at least once every month.

It is owner of National Person Registry (Folkeregisteret), which is addressed as a common component. The Tax Authority is currently renewing this register, which is considered out of date technologically. It operates the page taxnorway.no, which provides information for migrating taxpayers.

www.skatteetaten.no

6.4.4.2 Agency for Financial Management (*Direktoratet for økonomistyring - DFØ*)

The agency's task is to strengthen financial management within public sector activities and improve resource efficiency within the area. The goal is higher quality and lower total cost for the public sector within financial management. The agency serves approximately 200 organizations under the various ministries, through systems and services within accounting, budgeting, wages and human resources, in addition to technical support and training on relevant systems.

www.dfo.no

6.4.5 Ministry of Trade, Industry and Fisheries (*Nærings- og fiskeridepartementet*)

The ministry is important in this context mainly through its ownership of, the Brønnøysund Register Centre (Brønnøysundregistrene). Also it is regulator on electronic trade and generic eID issues, and oversees the eProcurement regulations and strategies.

www.regjeringen.no/nfd

6.4.5.1 The Brønnøysund Register Centre (*Brønnøysundregistrene*)

The register contains five departments and two staff sections. The main office is situated in Brønnøysund (hence the name), combined with offices in Oslo and Narvik as well.

Main tasks are to instill trust, both as a source of data and in exercising authority, to simplify business and industrial collaboration with the public sector, and to simplify Norwegian public administration.

⁸⁵ <https://www.altinn.no/en/a-ordningen/About-the-a-melding/>

They participate in Nordic registers cooperation, and also on eSENS pilots on Business Life Cycle. They also serve as the single point of contact in regard of the EU service directive. Notably, they are responsible for the operations of Altinn.

www.brreg.no

6.4.5.2 Altinn

Most online services relating to businesses and reporting, but also important citizen services are designed and presented through Altinn. Altinn is a service portal and web page, but it is not an agency.

Rather, Altinn is a result of a consortium of public agencies' joint efforts. Three large public agencies, the Tax Administration, Statistics Norway and the National Business Registry, initiated the work that was to become Altinn. The administration of Altinn was given to the Brønnøysund Register Centre (Brønnøysundregistrene).

They originally wished to create a common web portal for public reporting, but throughout the years since the portal was launched in 2003, it has become much more and really something else. It provides other electronic services such as the opportunity to receive messages from the public authorities as well as other services. For individuals, the most extensively used service is to hand in tax-return electronically. For businesses, most administrative systems providers have integrations with Altinn, so reports are made seamlessly. The Altinn portal is functionally operated through public procurement.

Also all mail to businesses from public sector is made available through Altinn. Besides being a portal, Altinn delivers a framework for developing eGovernment services that allows data and services to flow between government agencies.

Priorities and developments decisions are made in Altinn governance board (Altinn styringsråd), where owner enterprises are present. Owners are all agencies with services and integrations in the platform, which is most of agencies that collect enterprise reporting. The major agencies have permanent positions, whilst smaller agencies circulate the positions.

www.altinn.no

6.4.6 Ministry of Justice and Public Security (Justis- og beredskapsdepartementet)

The ministry is central in several areas of information society policy. Firstly, it has the overall responsibility of information security in the civil sector. The Police are responsible for passport productions. The ministry also governs the National Security Authority (NSM)

Through the Norwegian Directorate for Civil Protection (DSB) it also provides the service regelhjelp.no, which assists enterprises in finding relevant regulatory information by sector or business. Regelhjelp.no is maintained by a consortium of enterprise regulating agencies and authorities.

www.regjeringen.no/jd

6.4.6.1 The Norwegian National Security Authority (Nasjonal sikkerhetsmyndighet - NSM)

The National Security Authority operates the Norwegian CERT.

The National strategy for ICT-security⁸⁶ (2012) is a joint strategy between ministries of justice, defense, transport and local government and modernization. The strategy points out four common goals; stronger coordination; robustness in ICT-infrastructure in society as a whole; strong capability on handling situations and competence. On infrastructure, four areas of importance are brought up: Continuity of operations, physical infrastructure coordination, exercises, identification of core infrastructures.

www.nsm.no

6.4.6.2 Norwegian Centre for Information Security (NorSIS)

The objective of NorSIS is to provide advice and guidance on information security in Norway. It seeks to make ICT a natural part of everyday life by raising awareness about threats and vulnerabilities, advising on specific measures and contributing to forming positive attitudes in information.

www.norsis.no

6.4.7 Norwegian Media Authority (Medietilsynet)

The Media Authority is under the auspices of the Ministry of Culture, and is consulted in matters of internet safety, media content and child safety.

www.medietilsynet.no

6.4.8 Ministry of Health (Helse- og omsorgsdepartementet)

The Ministry of Health is responsible for specialist services and hospitals. Notably, there is an eHealth unit, coordinating eHealth initiatives.

www.regjeringen.no/hod

6.4.8.1 Directorate of Health (Helsedirektoratet)

The directorate's task is to improve the health of the entire nation through integrated and targeted activities across services, sectors and administrative levels. They are instructed to do so by virtue of its role as a sub-ordinate agency, as a regulatory authority and as an implementing authority in areas of health policy.

It runs several services and functions, which of some are:

Ehelse.no, which provides information on eHealth and governance

The Action Plan for eHealth 2014-2016.

The Norwegian Patient Registry (NPR), which holds information on all patients who are waiting for or have got treatment in specialist services (i.e. hospitals etc.).

⁸⁶ https://www.regjeringen.no/globalassets/upload/fad/vedlegg/ikt-politikk/nasjonal_strategi_infosikkerhet.pdf

The National Portfolio Office, which services several health coordination boards, notably:

- E-helsegruppe (eHealth group). The group is mandated to achieve general coordination, priorities of ICT-actions in eHealth. The group is Board for National Core Journal (Nasjonal Kjernejournal) and the national health registry project (Nasjonalt Helseregisterprosjekt), a project on renewed national registers in health. The group is chaired by the Health director, group members are General Directors of Difi, Ministries of Health, and Local Government and Modernisation, the four health regions, KS and a few more.
- NUFA – professional and architectural advisory board (Nasjonalt utvalg for fag og arkitektur), advises on priorities and coordination of national ICT-actions, and choices of workflow architecture in health and care. Chaired by lower level director in Health directorate, the main bodies of participants are KS representatives.

NUIT – National advisory board on IT priorities (Nasjonalt utvalg for IT-prioritering i helse- og omsorgssektoren), which is responsible for coordination and priorities of national IT actions, and predictability for providers. Decisions are presented to the E-helsegruppen for decisions. Notably, NAV also participates in this group.

The directorate does not have direct instruments to control digital solutions for private practitioners, which has been an issue concerning digital solutions. However, 80 pst of practitioners offices have now implemented the private service solution PasientSky (PatientCloud), encompassing my vaccines, my prescriptions and dialogue options.

By 2016, the agency's department of e-health will be established as a new directorate.

www.helsedir.no

6.4.9 Ministry of Labour and Social Affairs (Arbeids- og sosialdepartementet)

The ministry governs NAV, the Directorate for Work and Welfare.

www.regjeringen.no/asd

6.4.9.1 Labour and Welfare Administration (NAV Arbeids- og velferdsetaten)

NAV consists of the Norwegian Labour and Welfare Administration (NAV) and the Norwegian work and welfare directorate. NAV consists of both municipal and state services, and its governance model is based on this joint ownership.

NAV serves a broad participatory role in the world of work and society, and contributes to the financial security of the individual. This depends on close interaction with the user, working life and local authorities, and a sharper focus on people with special needs in relation to the labour market and others in a challenging life situation.

Nav.no portal is a general provider of e-Services to individuals and enterprises. NAV is also participating in the www.sua.no partnership, providing a one-stop-shop for migrating individuals looking for work or work permits.

www.nav.no

6.4.10 Norwegian Association of Local and Regional Authorities (KS)

KS is an association of municipalities aiming, in cooperation with its members, to contribute

to ICT development as follows: Protecting the municipal sector's interests with respect to central authorities, suppliers and other interest groups; contributing to the development of standards and requirement specifications for the exchange of information, integration of solutions and joint tools, ideally in cooperation with central authorities; inspiring and contributing to competence development in the municipal sector through proposals and recommendations, benchmarking, development of guidelines and establishing experience exchange networks.

KS holds regular meetings with the Ministry of Local Government and Modernisation, at political and administrative levels. KS also participates in several boards, committees and working committees in other ministries and various government departments that deal with ICT issues.

KS has its own strategy for public sector ICT in municipalities⁸⁷, it does not however have any regulatory means in this area.

Recently, a joint program named KommIT, inspired by Danish KOMBIT was initiated, but this has not been regarded as a success, and the subject area of expertise has been taken back in general line in KS. KS has established a KommIT advisory board, consisting of municipality representatives.

www.ks.no

6.4.11 Norwegian centre for ICT in Education (Senter for IKT i utdanningen)

The main objective of the center's work is the use of ICT for improving the quality of education and improving learning outcomes and learning strategies for children in kindergarten, pupils in schools and apprentices in primary and secondary education, as well as students in teacher-training programs.

The center is under the auspices of the Norwegian Ministry of Education and Research. They are not a core policy developer; they do however have some common services, notably:

- FEIDE, electronic ID used only in school, education and universities.
- Common recommendations, frameworks and advisory for ICT infrastructure and solutions in education.

www.iktsenteret.no

⁸⁷ <http://www.ks.no/contentassets/d041fb5b7a6c483c88e68e31afd7b55a/ks-digitaliseringsstrategi.pdf?id=14946>

6.4.12 Norwegian NGOs

6.4.12.1 ICT-Norway (IKT-Norge)

ICT-Norway is an association representing the country's ICT industry, and act as an influential political lobbyist on behalf of its members.

Its overall strategy is to create good business environment and development opportunities for its members, to promote their interests and to provide effective, value-added services. It also acts as a problem solver and a network, an information-, contacts- and resource provider.

www.ikt-norge.no

6.4.12.2 Abelia

Abelia is a trade and employers association associated with Norway's largest employers' organization; the NHO (Confederation of Norwegian Business and Industry).

Abelia is dedicated to improving the business environment for its member companies in the knowledge- and technology based sector, and to promoting the industry's contribution to economic growth and social progress. By influencing policy, Abelia aims to improve business opportunities for members.

www.abelia.no

6.4.12.3 NorStella - Foundation for e-Business and Trade Procedures

Established in 2003, and formerly appointed by the Norwegian Government as the national contact point for all international standardization activities in the field of electronic business and trade facilitation. It is an independent, non-profit, private foundation located in Oslo. Its predecessor was Norwegian EDIPRO, established in 1994 to implement EDIFACT for transport messages, and to use EDIFACT for customs clearance. NorStella deals with Internet-based standards like ebXML, Core Components, UBL and semantic technologies, and covers all kinds of industries.

www.norstella.no

6.4.12.4 Public Sector Dataforum – (Offentlig sektors dataforum)

This is a network and forum for public sector ICT. They work to create arenas for development for its members, such as workshops, conferences and the "Lighthouse price" – an award for outstanding ICT-solutions in public sector.

www.dataforum.no

6.4.12.5 Norwegian Standards (Standard Norge)

Norwegian Standards is a private and independent membership organization, open for businesses, organizations and agencies. They develop and decide standards and standard products for general purpose and interest. Its board represents a broad part of public and private sector interests. Other adjoining companies in the area of standards are the Norwegian Electrotechnical Committee (Norsk Elektroteknisk Komite), who

are responsible for standards in the electrotechnical area, and Standard Online AS, who is their common customer front for sales.

www.standard.no

6.4.12.6 Banking Networks

Norwegian banks have a strong tradition of self-regulated common solutions. These are notably coordinated through the BSS Banking standardization office, and until recently jointly run the operation Nets, which provides digital authentications services. Nets is now owned by international actors, but still operates in the Nordic countries as before

www.bsk.no

6.5 The actors of Sweden

6.5.1 Ministry of Enterprise and Innovation (Näringsdepartementet)

Operational and policy responsibility for digital society and services lies with the Minister for Housing and Urban Development.

<http://www.regeringen.se/sveriges-regering/naringsdepartementet/>

6.5.1.1 Legal, Financial and Administrative Services Agency and National Procurement Services (Kammarkollegiet)

Kammarkollegiet is responsible for a broad range of in-house administrative services in government. It houses National Procurement Services, which manage and coordinate public procurement aspects in the area of ICT. The agency has furthermore been mandated to explore and develop ways of improving the use of electronic procurement in the public sector.

www.kammarkollegiet.se

6.5.1.2 Swedish Agency for Public Management (Statskontoret)

The agency's main tasks are developing governance policies through analysis and studies. It is also instructed to identify strategic governance development opportunities and needs.

It is also tasked with providing support to the central Government and to agencies in the ICT field, in order to help modernise public administration through the use of ICT. In this regard, they also conduct studies and evaluations, upon request of other branches of government.

www.statskontoret.se

6.5.1.3 Swedish Agency for Economic and Regional Growth (Tillväxtverket)

The agency's mission is to promote and support enterprise growth and development, and to carry out the Structural Funds programs from the EU.

It is furthermore instructed to provide simple, user friendly and coordinated information to enterprises, and to guide towards relevant information with other authorities, and to coordinate regional growth initiatives.

www.tillvaxtverket.se

6.5.1.4 Swedish Companies Registration Office (*Bolagsverket*)

Bolagsverket examines registers and informs to ensure easy entrepreneurial activities and legal security for the trade and the business industry. It coordinates and develops services for enterprises and entrepreneurial activities.

It is responsible for maintaining the Swedish business registers. Digital services are found through virksamt.se. in collaboration with the Tax Authorities and the Swedish Agency for Economic and Regional Growth. The office is also taking lead in the work on eGovernment Program (eSamverkansprogramt), which is the eGov Delegation follow-up consortium.

Activities are not financed by public funding, and they charge their products and services.

www.bolagsverket.se

6.5.1.5 The E-identification Board (*e-legitimationsnämnden*)

The Swedish E-identification Board is an authority under Ministry of Enterprise. E-identification for citizens are issued by private sector - mainly through banks and a large telecommunication providers. The public sector purchases validation control of the e-identification issuers on a commercial basis. However, the Tax Authorities is hosting the e-identification board, with personnel, offices and administrative services.

6.5.2 The Swedish National Financial Management Authority (*Ekonomistyringsverket - ESV*)

The ESV is assigned to develop efficient financial management for central government agencies, and analyse and make forecasts of central government finances. The entity is a central administrative agency under the Ministry of Finance.

On the matter of eProcurement, ESV recently recommended making eInvoicing to public sector mandatory by 2018, based on PEPPOL-standards.

The authority is coordinating part for the Swedish e-SENS consortium. ESV, the Agency for Economic and Regional growth, the Swedish Companies Registration and eGovlab are active in the consortium. It has been instructed to focus on building blocks eIdentification, eSignature and Semantics within eProcurement and Business registration.

ESV is furthermore responsible for HERMES, a central government administrative support system for common business processes, such as budget, revision, reporting and so on.

Finally, ESV operates <http://nationellautvecklingsportfoljen.se>, created through the eGov Delegation. The portal provides an overview of status and contact information for digital development projects.

www.esv.se

6.5.3 The Tax Authorities (Skatteverket)

The Tax Authorities has been assigned by the government to coordinate and promote the common governmental development for eGovernment solutions for individuals. Prominently, the eDelivery service "Mina meddelanden" is run by Tax. Swedish Public Employment Agency (Arbetsförmedlingen), Social Insurance Agency (Försäkringskassan), Pensions Agency (Pensionsmyndigheten) and The Transport Agency (Transportstyrelsen) cooperates in the development.

The Tax Authorities also share responsibility for virksamt.se with the Agency for Economic and Regional growth and the Swedish Companies Registration. The Tax authorities finally operate NAVET, the Tax Authorities system for distribution of people registration data to society.

www.skatteverket.se

6.5.4 CERT SE (Myndigheten för samhällskydd och beredskap)

CERT-SE is the National CERT of Sweden, and the constituency consists of the Swedish society, including but not limited to, governmental authorities, regional authorities, municipalities, enterprises and companies. In addition, CERT-SE is also the governmental CERT of Sweden and have additional responsibilities as such.

www.cert.se

6.5.5 The National Archives (Riksarkivet)

The archives operate Digisam, a secretariat for national coordination of digitalization, digital preservation and digital access to cultural heritage. The State Treasury evaluation 2014 states that Digisam has been successful in bringing the 24 relevant culture institutions together.

www.riksarkivet.se

6.5.6 Data Protection Authority (Datainspektionen – DPA)

DPA's task is to protect individual's privacy in the information society. They work to prevent encroachment upon privacy through information and by issuing directives and codes of statutes. They also handle complaints and carries out inspections. By examining government bills the they have an important role in ensuring that new laws and ordinances protect personal data in an adequate manner.

www.datainspektionen.se

6.5.7 Swedish Post and Telecom Authority (Post- och telestyrelsen)

The authority works in the areas of telephony, ICT, radio and postal services and aims to ensure that everyone in Sweden has access to communications services that are efficient, secure and offer good value for money.

www.pts.se

6.5.8 Inera

Inera coordinates municipalities and regions' common eHealth developments and services for individuals, hospitals and health personnel. Recently, it has also been decided that Inera may provide services towards private sector systems/service providers, i.e not to private health institutions, but to their systems providers, to enhance interoperability.

Decisions on developments are made through the "Programkontoret" which prepares and studies new possibilities and ideas, and identifies architectural consequences. Final decisions are made in Ineras program board, where the municipalities are represented.

Inera is governed by a business board consisting of two politicians (one position, one opposition) from each of the five hospital regions.

www.inera.se

6.5.9 The Swedish eHealth Agency (eHälsomyndigheten)

The agency was formed on 1 January 2014 and is still in its start-up phase. It is governed by the Ministry of Social Affairs. Its task is to contribute to improved healthcare, care and the nation's public health by pursuing development of a national e-health infrastructure.

- The agency stores and transfer electronic prescriptions issued in Sweden, according to national e-Prescription format NEF. The agency is instructed to specifically see to the continuation of cross border prescription in the Nordic countries, and to report on this by end of October 2015⁸⁸.
- The agency is responsible for developing the HälsaFörMig service. This is a personal health account where individuals, can view, save and manage details about their health.

www.ehalsomyndigheten.se

6.5.10 eGovernment Program (eSamverkansprogrammet)

eSamverkansprogrammet is a new initiative, developed from the former "e-Delegationen". Where the "eDelegationen" was a committee with a specific task from the government, eSamverkansprogrammet is a separate initiative, driven by its members. The goals are still the same: To accomplish the government's goals on simple, open and efficient eGovernment, with a user centric approach.

⁸⁸ <http://www.ehalsomyndigheten.se/Global/Dokument/df38e5f7.pdf>

The members agencies of the program are:
the Mapping, Cadastral and Land Registration Authority, the Public Employment Service, CNS (student loan), the Police Authority, the Swedish Companies Registration Office, the Customs Authority, the Tax Authorities, the Transport Agency, the Social Insurance Agency, the Pensions Agency, The National Archives and the Swedish Association of Local Authorities

The member's directors are the board of the program. The program will be coordinated through a position at the Pensions Agency. It is still early days to conclude the role of this consortium, but it clearly encompasses the right agencies, and there should be possibilities to achieve national coordination.

<https://www.bolagsverket.se/om/oss/nyheter/arkiv/2015/e-samverkansprogramt-nytt-samarbete-mellan-myndigheter-kommuner-och-landsting-1.11862>

6.5.11 Swedish National Land Survey (Landmäteriet)

The Land Survey is responsible for the coordination of geo data, and all other issues concerning locating and using real property information. Among core priorities in their strategy is to contribute to new solutions, develop processes in cooperation with other central and local government authorities and the private sector.

The entire process for registration matters is now digital, and researchers, students and cultural workers receive free access to geodata (alongside and in collaboration with data from Swedish Maritime Administration, Statistics Sweden and Swedish Transport Administration)

www.lm.se

6.5.12 Swedish Association of Local Authorities (Sveriges Kommuner och Landsting)

SKL follows up on digitalization policies, but does not exert authority in these matters. However, they do take part in coordination committees such as those mentioned on eHealth and eGovernment.

www.skl.se

6.5.13 VINNOVA

VINNOVA is the Swedish government agency for innovation.

Notably, VINNOVA is instructed to make efforts for a digitalized industry, to improve the power to innovate and compete. It will also conduct a mapping, and make a strategy and action plan for digitising Swedish industry.

Furthermore, VINNOVA is instructed to make priorities and conduct special efforts within eHealth in collaboration with innovation programs Swelife and Medtech4health.

www.vinnova.se

6.5.14 eGovlab / Stockholm University

eGovlab is an eGov innovation and test bed, located at Stockholm University. Its board is chaired by Magnus Enzell from Regeringskansliet. Amongst other projects, the eGovlab is tasked to facilitate and conduct the eSens pilot on Business Life Cycle.

www.egovlab.eu

6.5.15 National Board of Health and Welfare (Socialstyrelsen)

The board is a government agency under the Ministry of Health and Social Affairs, with a very wide range of activities and many different duties within the fields of social services, health and medical services, patient safety and epidemiology.

The board develops national health standards based on legislation and information.

eHealth council (E-hälsorådet) counsels on common information structure and its usability in hospitals and care.

www.socialstyrelsen.se

6.5.16 Swedish Competition Authority (Konkurrensverket)

The authority's main task is to work for efficient competition in the private and public sectors for the benefit of the consumers as well as for the efficient public procurement for the benefit of the society and the participants in the markets.

Much of eProcurement responsibilities are handed over to the Agency for Public Procurement. The Competition Authority used to represent Sweden in EU-commission expert group on public procurement; this is also likely to change.

www.konkurrensverket.se

6.5.17 The National Agency for Public Procurement (Upphandlingsmyndigheten)

The agency is part of the Ministry of Finance. It should provide support on all aspects of public procurement including promoting innovation procurement and contributing to the procurement of strategic importance for the public sector is strengthened.

The agency has taken over the Competition Authority's task on finding means to improve uptake of digital solutions for the entire procurement process, analyze market maturity, and estimate economic consequences. It shall produce a decision support for an action plan for a fully digital procurement process. Work is scheduled to be completed by 31 December 2015.

www.upphandlingsmyndigheten.se

6.5.18 Swedish NGOs

6.5.18.1 Swedish IT and Telecom Industries (IT&Telekomföretagen)

IT and Telecom industries is a member organization for businesses within IT and telecoms. They have provided focus and vision for 2020: A world class competitive

and innovative IT and telecom business, which takes full advantage of the potentials of digitalization. The foundation actively participates in policy processes.

www.itotelekomforetagen.se

6.5.18.2 The Swedish forum for usability and accessibility in ICT (Användningsforum)

The forum is a temporary group mandated by the Swedish government to establish dialogue on accessibility and usability in ICT solutions, based on networks in NGOs, businesses and research. The forum will end its business December 2015.

<https://www.anvandningsforum.se>

6.5.18.3 Health Hack Academy

This joint project is organized by partners interested in developing the digital health care scene: Veryday, EIT ICT Labs, Stockholm Science City and Digital / Health Days. They organize major hackathons in the field of health services and internet of things.

<http://healthhackacademy.se>

6.5.18.4 Oppnadata.se

This webpage is the collaborative result of projects mainly financed by Vinnova to make data available. A study by PwC⁸⁹ in 2014 concluded that the potential is far from fulfilled, as very much data is not available, and not all data is accessible. Report concludes that the initiative should be continued and strengthened.

<http://oppnadata.se>

6.5.18.5 IDG / CIO Lägesrapport

The IDG media house is active within ICT and governance news and communications. They produce a yearly state of play report, and news page accordingly (cio.idg.se). They also organize the annual CIO Awards, a one day conference and gala for Swedish CIOs.

<http://cio.idg.se>

6.5.18.6 PSI-datakollen

This is a web portal used for scanning and making visible to what degree public authorities make good on recommendations to have a page titled “/psidata” for making data available.

www.psidatakollen.se

⁸⁹ <https://www.pwc.se/sv/publikationer/assets/pdf/oppna-data-i-sverige-2014-low.pdf>

6.5.18.7 Trafiklab

Trafiklab is a community for open traffic data, where developers can access data and APIs. The community is a collaborative effort of a number of state and regional traffic authorities.

www.trafiklab.se

6.5.18.8 Viktoria Swedish ICT

Viktoria is a non-profit IT-research institute located at Lindholmen in Gothenburg in Sweden. They focus on automotive and transport informatics and employ approximately 30 researchers. Projects are mainly directed towards application areas closely connected to the Automotive and Transport industries, and they are involved in work on Trafiklab.

<https://www.viktoria.se>

6.5.18.9 Stockholm Legal Hackers

They do not organize hackathons, but are rather active in organizing meetups and discussing solutions for government actions and e-government.

<http://legalthackers.org/2014/09/welcome-to-stockholm-legal-hackers/>

Appendix 2

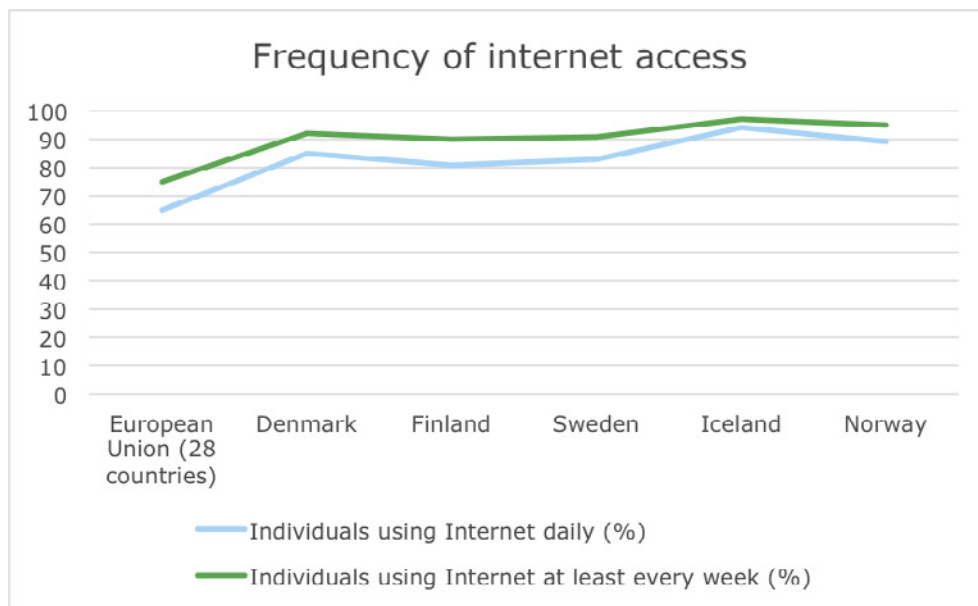
Maturity and Receptiveness of the Nordics

7.1 Rankings and comparisons

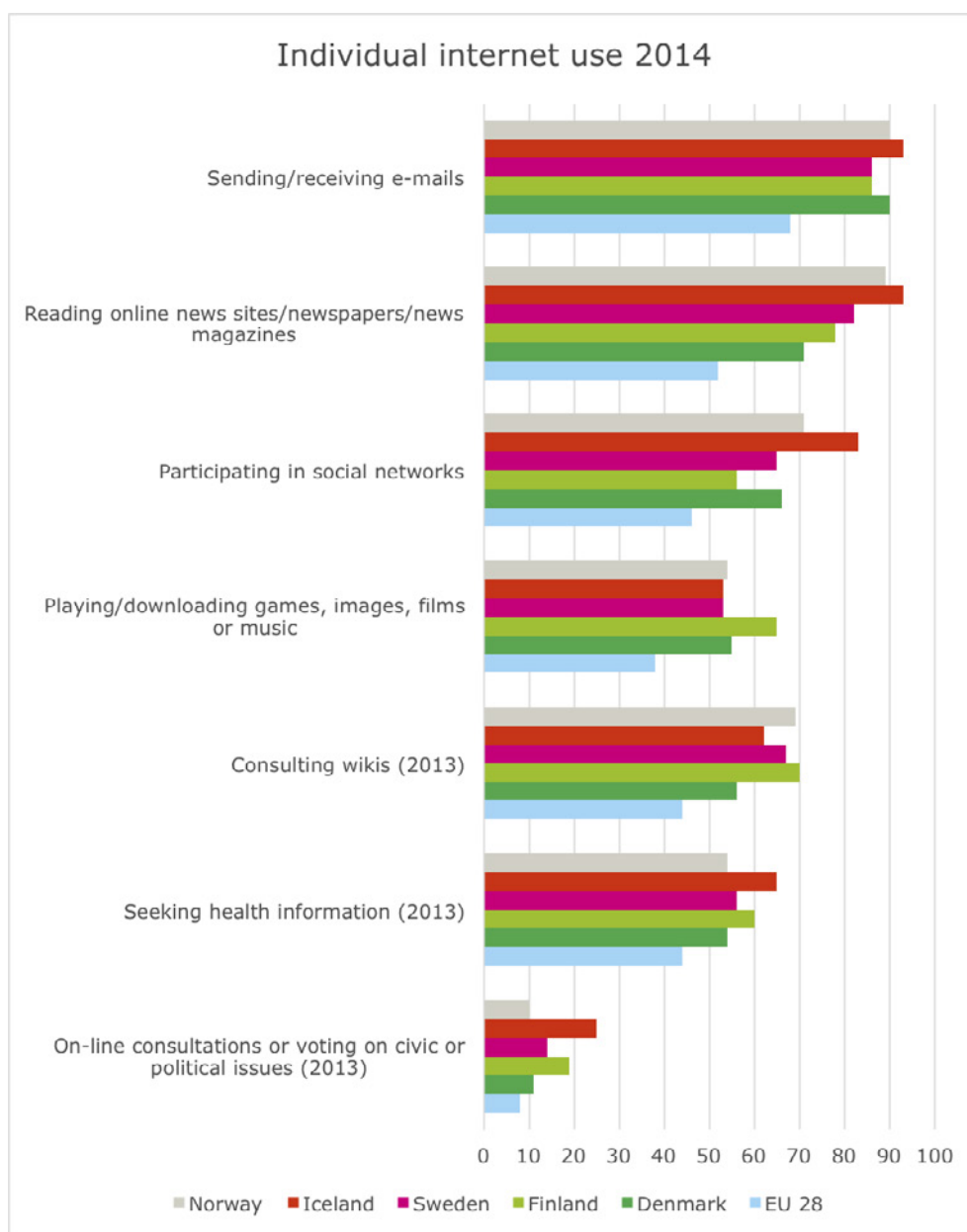
Rankings and measurements of eGovernment levels and information society preparedness are maturing on a general level. The following synopsis is based on EU Information Society indicators and eGovernment Benchmark (Eurostat raw data), OECD Governance studies, World Economic Forum NRI-Index, UNPAN studies and the Waseda International e-Government ranking.

7.1.1 EU Information Society Indicators - individuals

EU Information Society indicators provide an overview of individuals' and enterprises' use of and activities concerning internet services. This provides a descriptive overview of potential and quality, but no professional assessment. Firstly, we will look at individual use and activities.

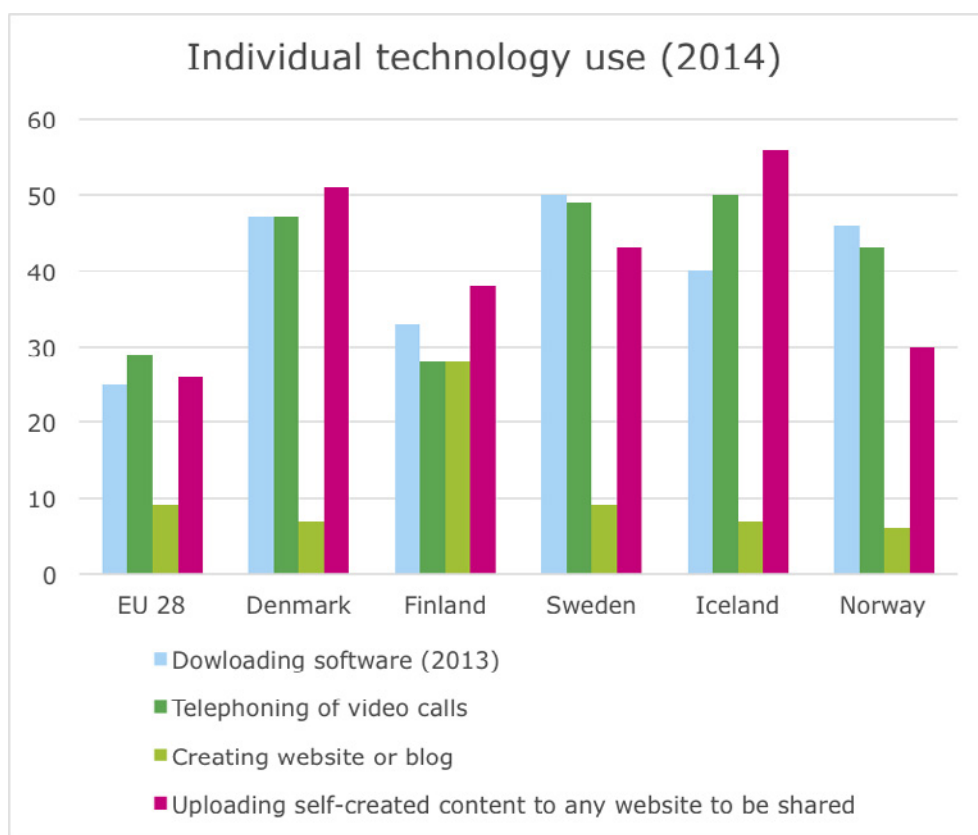


Internet access is generally not an issue, and there are no relevant differences between the Nordic countries. The general picture, as we will see, is also that Nordic individuals in particular are more active online than the EU norm.



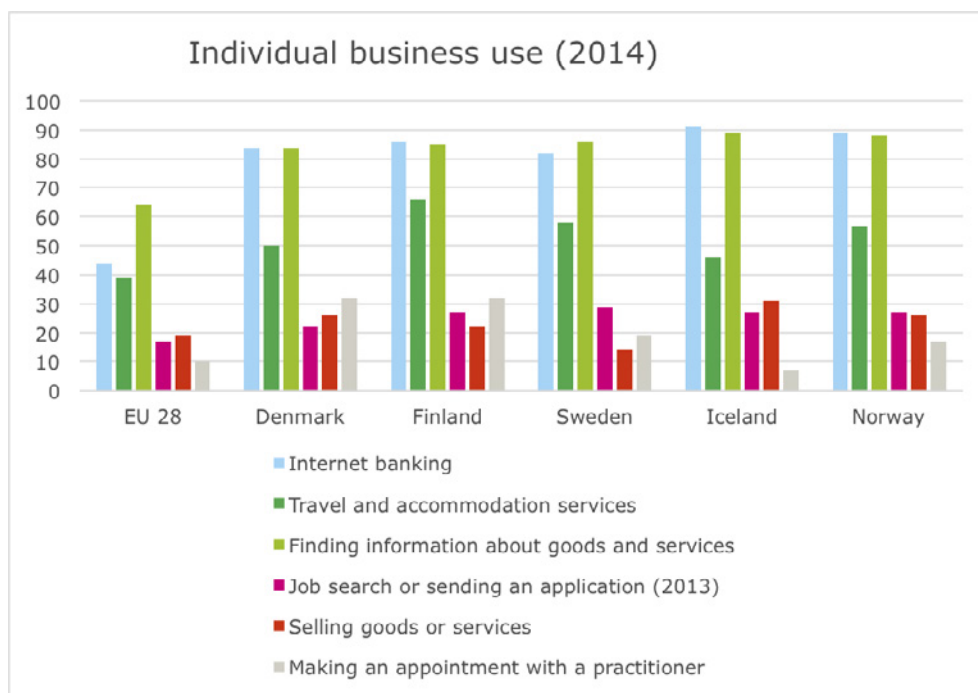
Looking at personal internet use, and what it is used for, we again see a general picture in which Nordic citizens are generally fairly similar in use, and generally somewhat more active than EU citizens overall. Some Nordic differences are worth mentioning:

- Differences in reading news online should also be seen in light of historic differences also in (non-digital) newspaper consumption.
- Icelanders are more active in online engagement and social media.



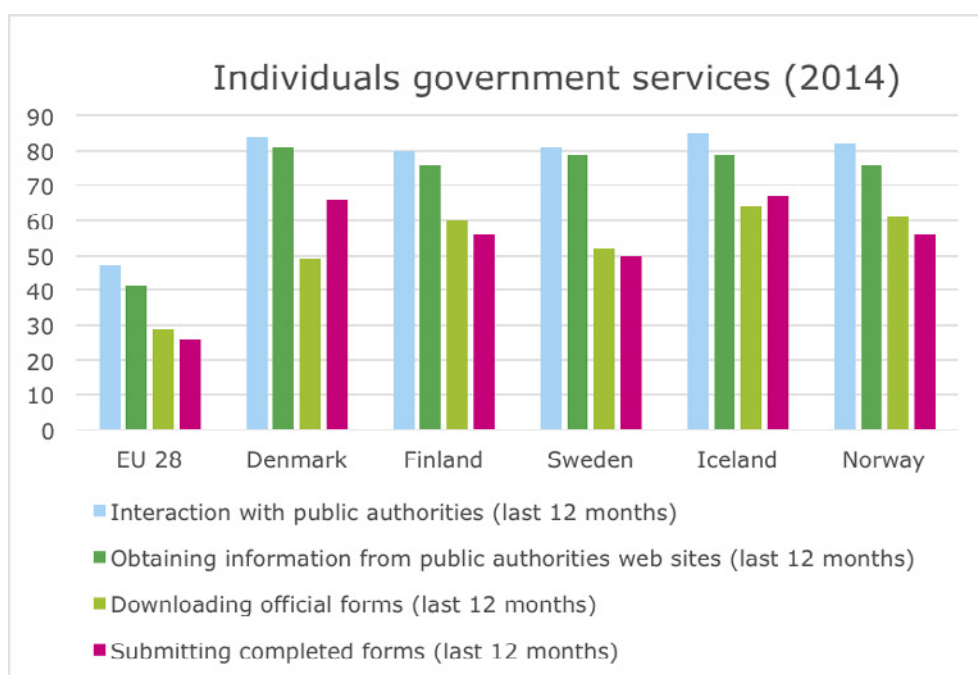
The above figure demonstrates use that may, to a further extent, indicate individuals' skills or participatory competence online. Again, Nordic citizens are well above the EU mean values, however there are some striking differences.

- Finns are significantly more active in creating websites or blogs.
- There is great variation in percentage of the population that uploads for sharing, from Norway at a low 30 per cent, to Denmark and Iceland at above 50 per cent.
- There are also surprising national variations in internet telephone/video use and downloading of software, with Finnish citizens least active.



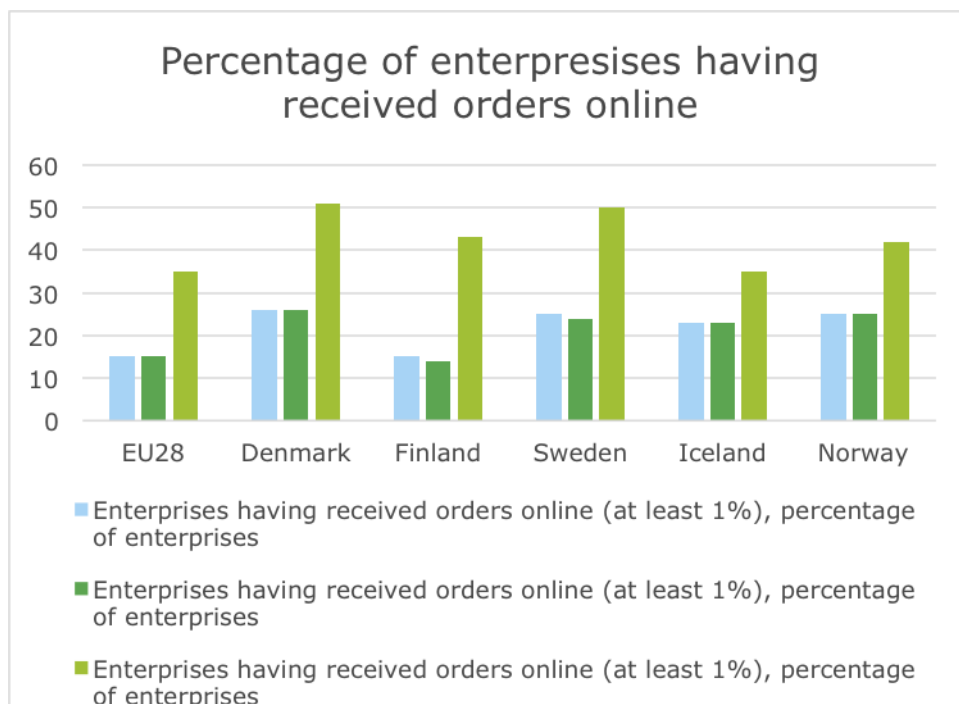
We have also compared “non-leisure” use of internet services. Here the pattern repeats, with similar tendencies in the Nordic countries, somewhat above EU norms.

- The amount of people selling goods or services online is approximately double in Norway, Iceland and Denmark compared to Sweden.
- Sweden, Finland and Norway have the most active citizens' travel and accommodation services online.
- All Nordic countries are far above EU mean values in internet banking.



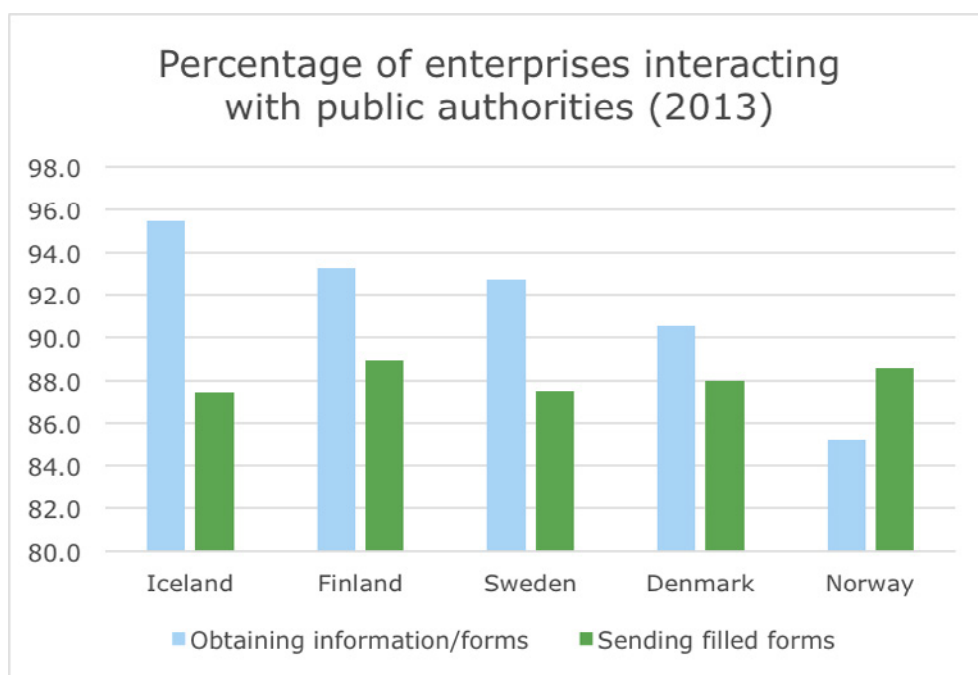
Individuals' use of government services is where we find the most striking difference between Nordic countries and the EU. In Nordic countries, online interaction with government is the norm. The major difference between the countries is in the area of submitting completed forms online. Denmark and Iceland outrank the other three countries in this area.

Turning to enterprises' use and activities, internet access used to be an important indicator, but this is no longer relevant, as almost all enterprises have internet access. A relevant addition to the enterprises' use of the internet is, however, the percentage of enterprises receiving online orders:



There are some important differences. Denmark and Sweden see the largest amount of online orders. In Finland there is a substantial difference in the amount of online orders between SMEs and enterprises of more than 250 employees.

To compare, the OECD Government at a glance report (more details below) reports the following figures on businesses using the internet to interact with public authorities (2013 numbers):



A note here on the graph is that scores are between 86 and 96 per cent, so variations are not great. Significantly fewer Norwegian businesses use the internet to obtain information. However, as we see it, the most important factor here is sending forms – as internet access is not an issue. Still, this might imply that clarity and availability of online information is less than ideal in Norway.

7.1.2 EU eGovernment Benchmark 2014⁹⁰

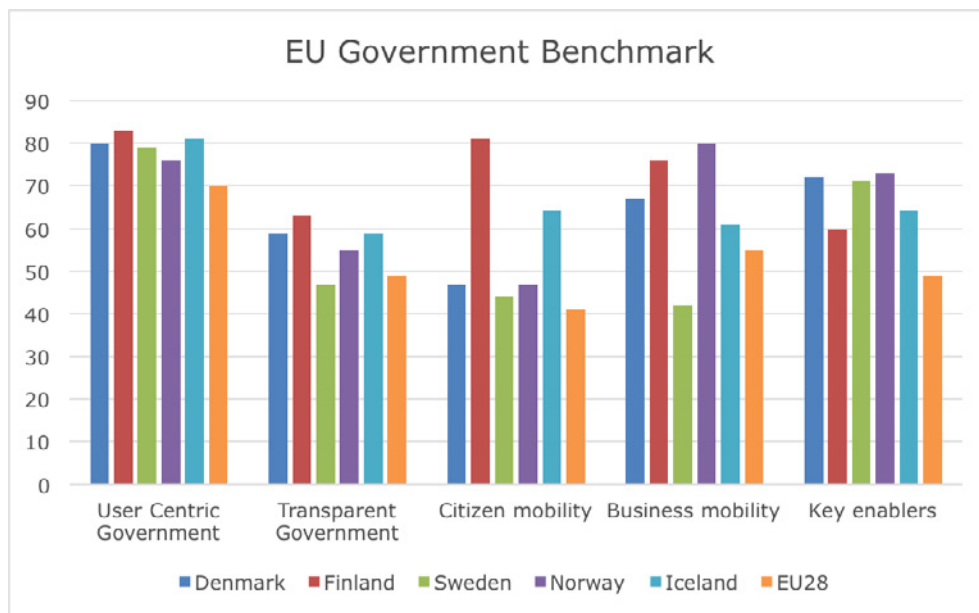
The EU eGovernment Benchmark 2014 is a complete measurement of online public services according to the 2012-2015 eGovernment Benchmark Framework. It is older than the other studies (most data is from 2012-2013), however it is not based on user reports, but rather the mystery shopping technique which is used to recreate citizens' journeys through government websites and services.

The study measures seven different "life events", namely (1) Business start Up, (2) Losing and finding job (2), Regular business operations (3), Studying (4), Moving house (5), Owning and driving a car (6) and Starting a small claims procedure (7). In this summary we have omitted comparisons regarding studying.

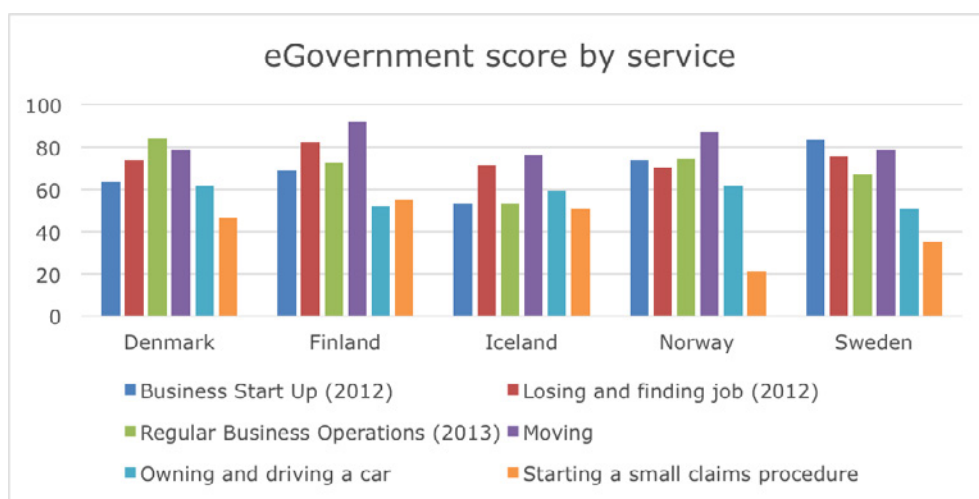
These seven life events are measured in four areas:

- User centricity: the overall user experience by assessing usability, ease and speed of use.
- Transparency: the extent to which governments are transparent about their own responsibilities and performance, the service delivery process, and the personal data involved.
- Cross-border mobility: Giving businesses and citizens seamless access to online public services when they are away from their home country.
- Key enablers; the availability of five technical elements which are essential for public services: electronic identification (eID), electronic documents (eDocuments), authentic sources, electronic safe (eSafe) and single sign on (SSO).

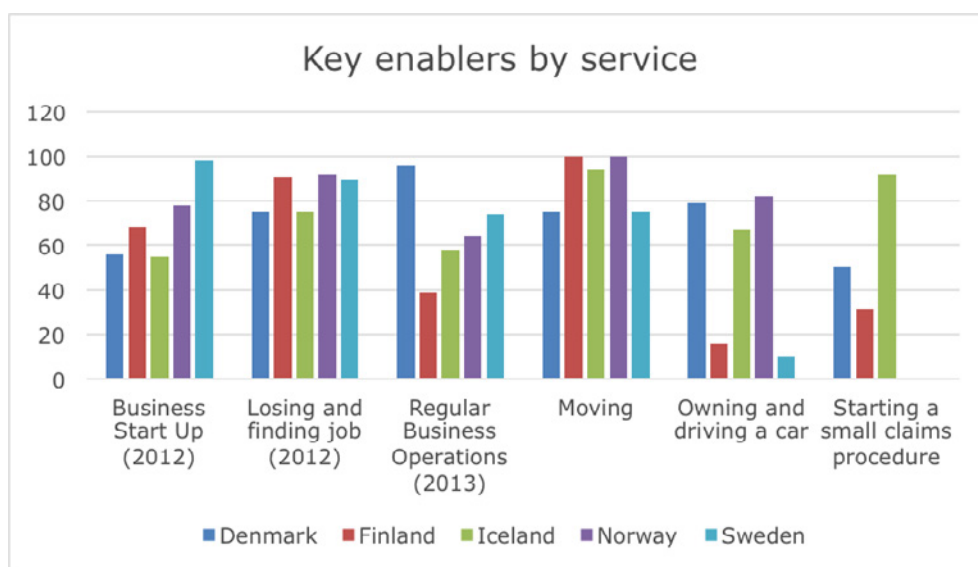
⁹⁰ <http://ec.europa.eu/digital-agenda/en/news/eu-egovernment-report-2014-shows-usability-online-public-services-improving-not-fast>



The above figure gives the general picture. Again, the Nordic countries generally compare well with the EU overall, especially concerning key enablers. In other words this means that basic, underlying infrastructure is probably more mature. However, we see some major variations concerning mobility, which we will look into below. Firstly, however, a look at the general scores for each life event:

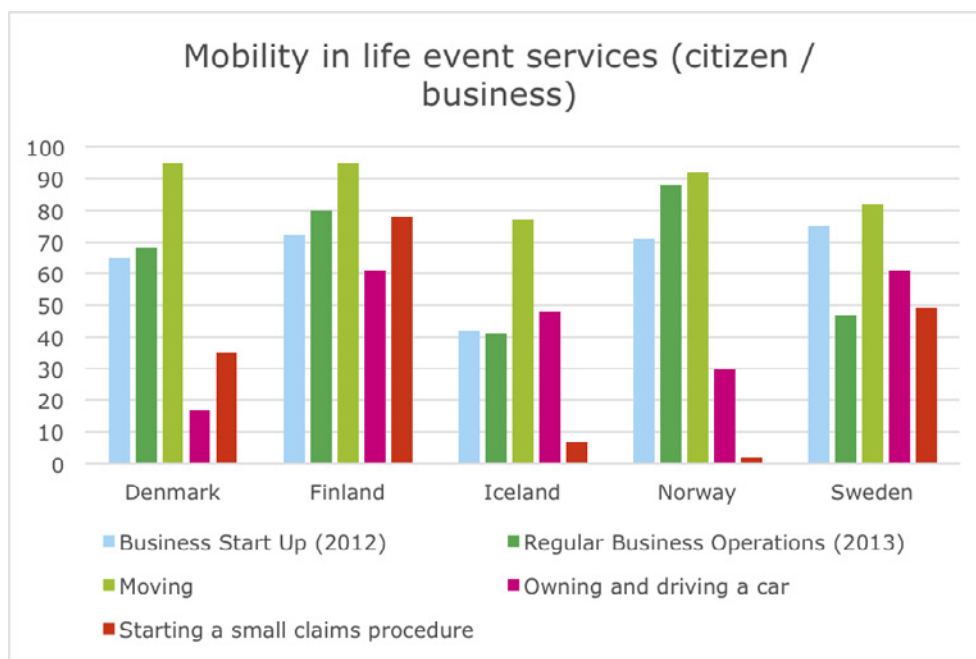


The figure above shows general eGovernment scores for each of the six (out of seven) life events investigated. Take note of the differences in scores for business start up, where Sweden is clearly best, and small claims procedures, where Norway is far behind. We will now go briefly into detail on differences in key enablers and business mobility, as these are most relevant for this report. In the following, we look into key enablers and business mobility, as these are most relevant to this report.



Here we find the likely explanation of better general scores for business start up in Sweden; far better prevalence of key enablers, compared to Denmark and Iceland in particular. In regular business operations the picture is very different, with Denmark scoring almost 100 points. Finland scores less favorably on regular business operations and owning and driving a car. On starting small claims procedures, Norway and Sweden have no relevant service and score zero. These differences should probably be seen in light of the division of responsibilities amongst government actors, and priorities within sectors, and are essential details in assessing the likelihood of success of common solutions.

Finally we will look at differences in mobility, that is, the possibility to access services from abroad:



Business startup data is from 2012, the rest is 2013 data. There are some noteworthy differences. Still, it should be mentioned that the potential is good, the level of mobility is generally good compared to EU countries, but less so in the area of mobility than other areas.

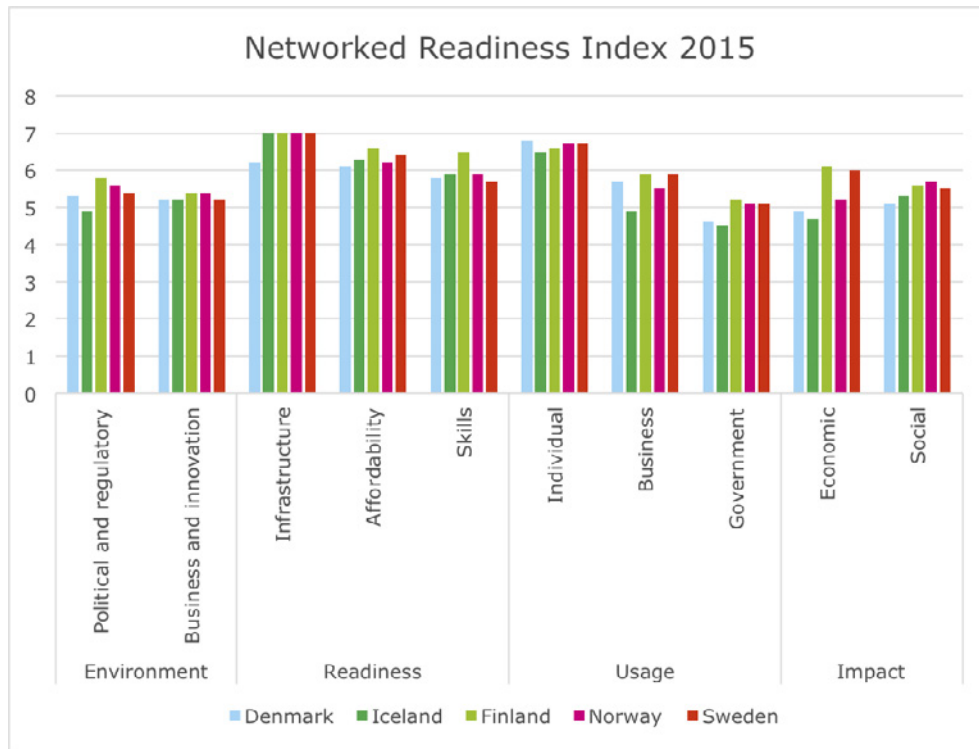
The citizen life event of “moving” is similar in all five countries. Finland has the most all-round mobility in services. Denmark and Norway have high scores in business mobility services. Sweden and Iceland have clearly less mobility-oriented services in regular business operations, but Swedish services score comparatively well in business start up. Sweden and Finland are the only countries providing relevant mobility services concerning vehicles and small claims procedures.

7.1.3 World Economic Forum / Networked Readiness Index (NRI) 2015

The NRI is, compared to the Eurostat data, a more aggregated and analytical index, targeting measures to indicate levels relating to societal readiness, the environment and usage of ICT. The NRI is part of The Global Information Technology Report, and “assesses the factors, policies and institutions that enable a country to fully leverage information and communication technologies (ICTs) for increased competitiveness and well-being.”⁹¹

Generally, the Nordic countries are in the lead in most areas in this index.

⁹¹ <http://reports.weforum.org/global-information-technology-report-2015/>



Some national variations should be expanded on.

- Firstly, the lower score for infrastructure readiness in Denmark is due to mobile coverage. This is an ongoing issue in Danish politics.
- Finland outscores its neighbors on citizens' skills.
- Finnish and Swedish businesses more readily apply ICT solutions in new services (economic impact)
- Icelandic businesses and government fall slightly behind its neighbors when it comes to usage.

The main picture is still of a very general uniformity in network readiness. Norway, Sweden and Finland generally score in the top five for readiness. Iceland and Denmark fall slightly behind mainly due to government usage (priorities in general strategies), economic impact (enterprise ICT solutions) and mobile coverage (Denmark), differences that should probably not be over-emphasized.

7.1.4 OECD Government at a glance

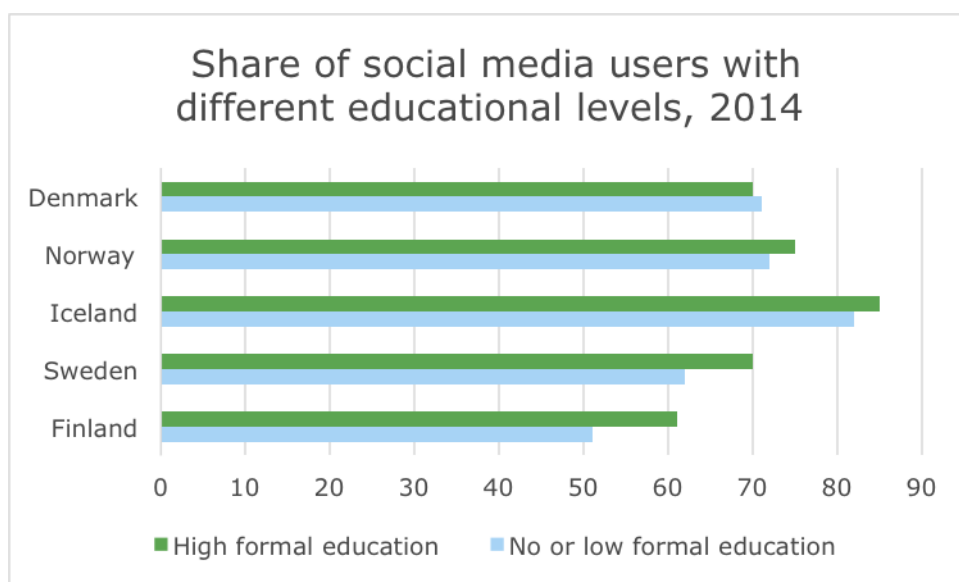
OECD publishes the substantial bi-annual report "Government at a Glance". The latest report, published in July 2015⁹², covers a broad range of key indicators assembled with the goal of contributing to the analysis and international comparison of public sector performance. Chapter 10 covers Digital government, including social media use, digital government performance, open government data and use of eGovernment services by individuals and businesses. The part on individuals' and businesses' usage

⁹² http://www.oecd-ilibrary.org/governance/government-at-a-glance-2015_gov_glance-2015-en

of eGovernment services is contained elsewhere in this chapter. Also, there is a sub-chapter on eProcurement, which will be referred to here. Note that which countries are included varies.

7.1.4.1 Social media use

The study looks at government social media strategies, in terms of both internal use and measurement. Only Finland has a strategy and reportedly uses social media internally, but does not use any metrics or indicators. The study also includes statistics on social media users, by level of education. Unsurprisingly, the Nordic countries stand out as having low levels of socio-economic difference in social media use.



7.1.4.2 Digital government performance

The main source of measurement is share of total direct financial benefits from ICT investments that OECD governments report. In this area there is a gap between Denmark, with 75-100 per cent benefit, and the other countries with 0-25 per cent benefit. This may be seen in light of the upcoming Waseda study on digital governance in Denmark compared to other Nordic countries.

7.1.4.3 Open government data

Open government data is described through reported practices and the OURdata index on availability of data

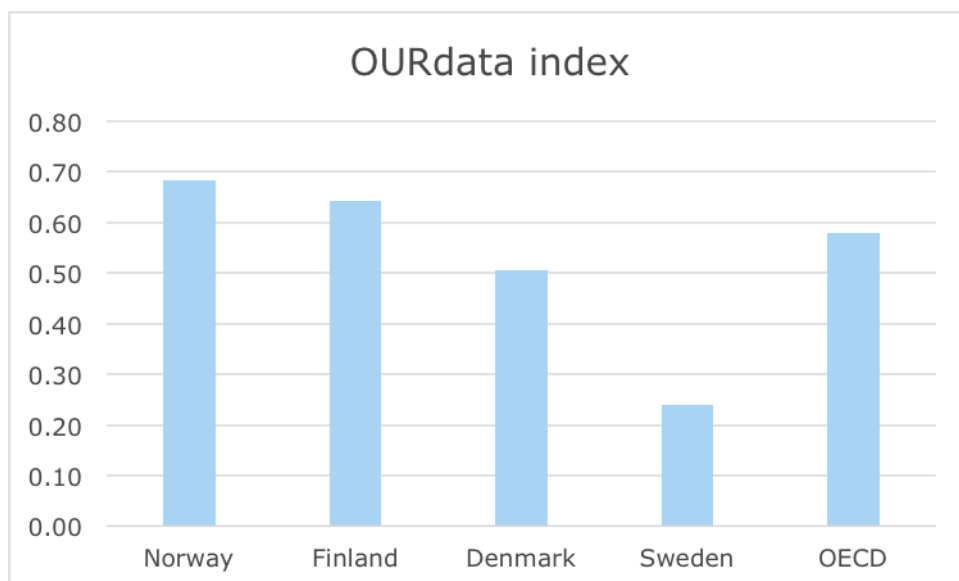
10.7. Central/federal government support for open government data (2014)									
	Strategy/Infrastructure		Consultations	Support and promotion for data re-use		Data accessibility on the national portal			
	Single central/federal OGD strategy	Existence of a national OGD portal	Regular consultation of users' needs for data release	Organization of co-creation type events (e.g. hackathons)	Training for civil servants to build capacities for data analysis and re-use	Data released in CSV format (machine readable)	Systematic provision of metadata	User feedback section	Possibility to receive notification when datasets are added
Denmark	○	●	○	□	□	■	○	●	●
Finland	●	●	●	■	□	■	○	●	○
Norway	●	●	●	■	□	■	●	●	○
Sweden	●	●	●	..	..	■	○	●	○
Total OECD	25	29	24				20	22	11
	●	Yes		■	Often/ generally		..	Missing data	
	○	No		□	Sometimes		x	Not applicable	
				□	Never				
Source: 2014 OECD Survey on Open Government Data									

● Yes ○ No ■ Often/Generally ◇ Sometimes □ Never .. Missing data x Not applicable

The overview provides a few basic insights:

- All countries except Denmark have a single/federal OGD (Open Government Data) strategy. Accordingly, there is no regular consultation of users' needs in Denmark.
- Finland and Norway report regular hackathons, Denmark less frequently.
- All countries release data in CSV format.
- Only Norway performs systematic provision of metadata.
- Only Denmark provides the option of notification when datasets are added.

The OURdata index covers the following dimensions: data accessibility and data availability on the national data portal, and government's efforts to support data re-use.



The index is based on three core dimensions of good Open Data practices:

- Data availability: Providing a wide range of data produced by the public sector in open format.
- Data accessibility: Providing such data in a user-friendly way, which includes the provision of metadata and machine readable format (e.g. CSV).
- Proactive support from the government to foster innovative re-use of the data and stakeholder engagement.

It is unsurprising that Denmark falls slightly behind the other countries, given the lack of a core coordinating actor. We do not know, however, what the reason is for the very low score for Sweden.

7.1.4.4 eProcurement

With regard to eProcurement services, this is possibly one of the areas where cross-border services are beyond the proof of concept stage. Looking at what is available nationally today, there are a few variations

Functionalities provided in e-procurement systems, 2014

	Mandatory and provided	Not mandatory but provided	Not provided
Publishing procurement plans	DNK, NOR	FIN, ISL, SWE	
Announcing tenders	DNK, FIN, NOR, SWE	ISL	
Provision of tender documents	FIN, NOR, SWE	DNK, ISL	
Electronic submission of bids (excluding by e-mails)		DNK, FIN, NOR, SWE	ISL
e-tendering		DNK, FIN, NOR, SWE	ISL
e-auctions (in e-tendering)		DNK, FIN, NOR, SWE	ISL
Notification of award	DNK, FIN, NOR, SWE		ISL
Ordering		DNK, FIN, NOR, SWE	ISL
Electronic submission of invoices (excluding by e-mails)	DNK, FIN, SWE	ISL, NOR	
Ex-post contract management		DNK, FIN, NOR, SWE	ISL

Source: OECD (2014) Survey on Public Procurement

Almost all areas are identical, except Iceland, which lags behind in this field. On the publishing of procurement plans, there are differences in legal requirements between Finland, Iceland and Sweden on the one hand, and Denmark and Norway on the other, with this publishing being mandatory in the latter. Electronic invoicing is mandatory in Norway, and is not in Sweden, contrary to what is stated in the OECD report.

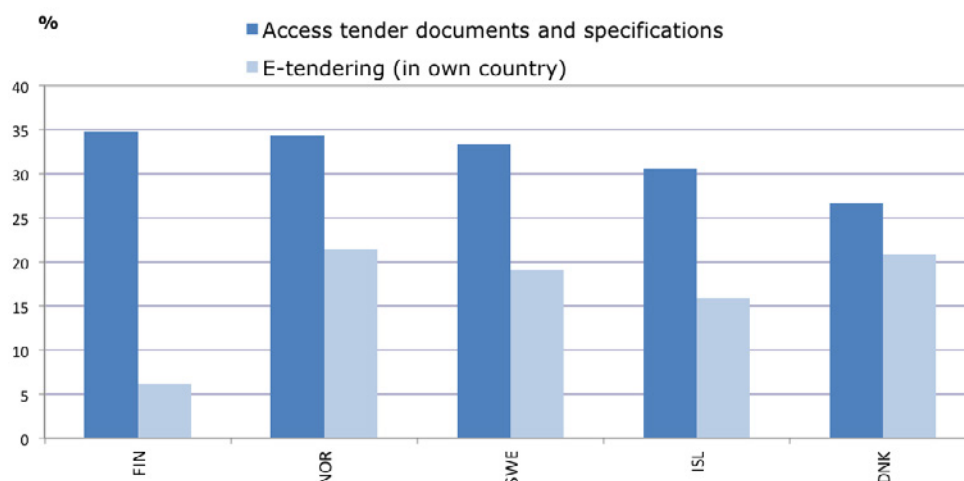
Main challenges to the use of e-procurement systems, 2014

	Low knowledge/ ICT skills	Low knowledge of the economic opportunities raised by this tool	Low innovative organizational culture	Difficulties in understanding or applying the procedure	Difficulties in the use of functionalities	Do not know
Denmark	○	○	○	●	●	◆
Finland	x	x	x	x	x	◆ ●
Norway	○	◆ ●	●	○		x
Sweden	x	x	x	x	x	◆ ●
OECD total						
◆ Procuring entities	14	11	13	x	x	10
● Potential bidders/suppliers	14	12	10	13	13	8
○ Not a major challenge	8	11	10	12	12	x

Source: OECD (2014) Survey on Public Procurement

● Yes ○ No ■ Often/Generally ◆ Sometimes □ Never .. Missing data X Not applicable

The main picture is that the challenges are related to potential buyers / bidders, and generally to do with the understanding of procedures. Looking into businesses' usage of electronic procurement systems, we find the following pattern:



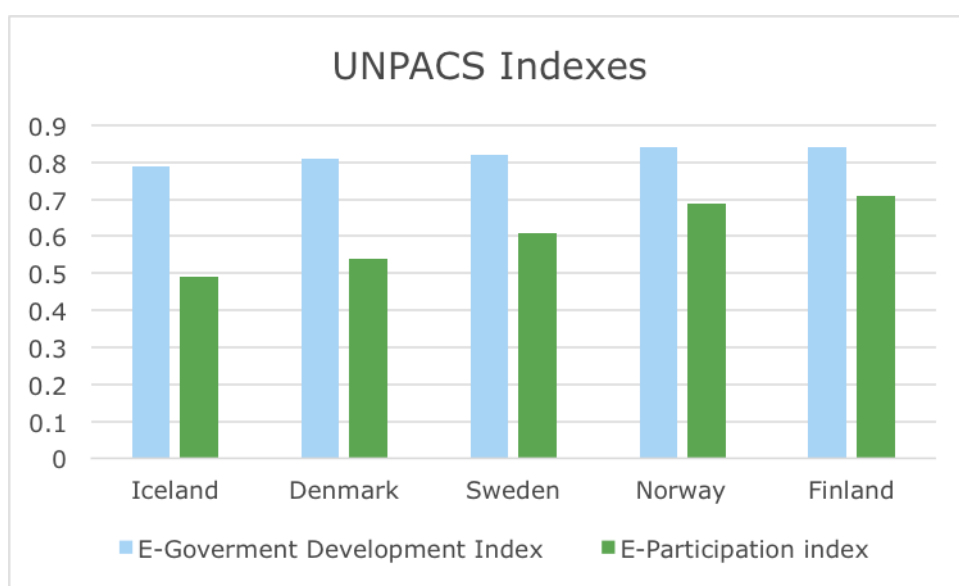
Unsurprisingly, the percentage of businesses accessing tender documents online is lower in Denmark and Iceland, where the provision of these documents online is not mandatory. The very low percentage of Finnish businesses using e-tendering in Finland is worth noting, and the study does not offer an explanation for this.

7.1.5 UNPACS e-Government and e-Participation indexes (2014)⁹³

The United Nations Public Administrations Country Studies (UNPACS) publishes two important studies, one on e-Government (EGDI) and one on e-Participation (EPI)

The e-Government Development Index is produced from an assessment of website development patterns in a country and access characteristics, such as infrastructure and educational levels. The EGDI is a composite measure of three important dimensions of e-Government, namely: provision of online services, telecommunications connectivity and human capacity.

The e-Participation index (EPI) is derived as a supplementary index to the UN e-Government Survey. It extends the dimension of the survey by focusing on the use of online services to facilitate provision of information by governments to citizens ("e-information sharing"), interaction with stakeholders ("e-consultation"), and engagement in decision-making processes ("e-decision making").



E-Government scores are similar and do not provide any new information. The e-Participation index shows some striking differences in the Nordic countries, with Norway and Finland scoring comparatively higher than Iceland and Denmark, with Sweden in between. There are a number of initiatives in this area at present, and it will be interesting to see if these differences remain one or two years from now.

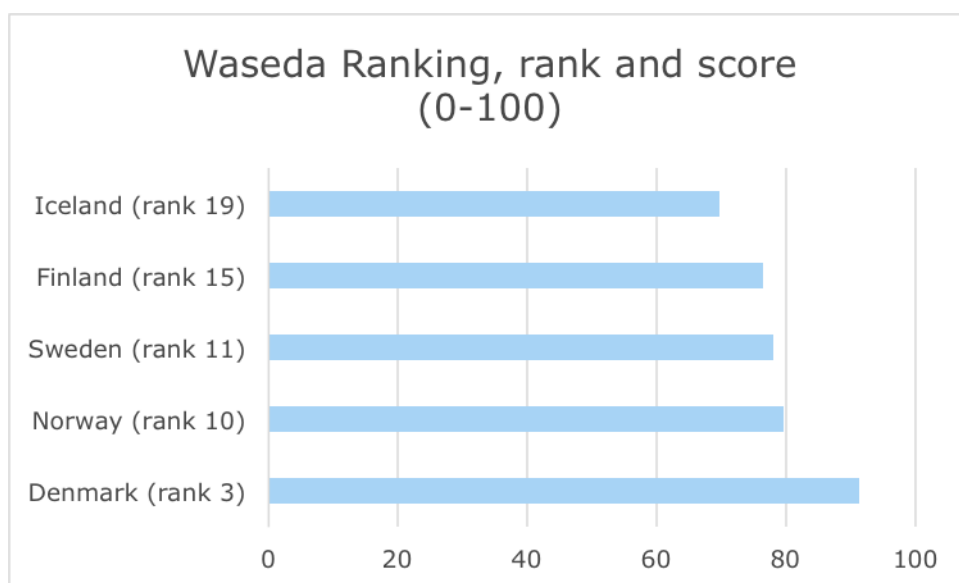
7.1.6 Waseda – IAC International e-Government ranking survey (2015)⁹⁴

The Waseda ranking is published by the Waseda University, Institute of e-Government. It differs from the other rankings in that it is more analytical in its approach, and based

⁹³ <http://unpan3.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2014>

⁹⁴ <https://www.waseda.jp/top/en-news/28775>

on workshops and dialogues with CIOs and stakeholders. The research evaluates the development of websites and ICT deployment in governments, and also looks into real operations, such as management optimization, internal processes, online services, and new trends in e-Government development, as well as the relationship between governments and their stakeholders. This focus on management optimization and processes is the reason why we will find that Denmark is some way ahead of its neighbors in this ranking.



The 2015 report does not provide general statistics on each of the indicators, other than the top ten countries, which we can use as an indicator of areas with higher or lower levels of development.

	Denmark	Sweden	Finland	Iceland	Norway
Network Preparedness	TOP TEN		TOP TEN	TOP TEN	TOP TEN
Management Optimization	TOP TEN				
Online Services	TOP TEN		TOP TEN	TOP TEN	
National Portal	TOP TEN	TOP TEN			TOP TEN
Gov CIO mandate	TOP TEN				
e-Government Promotion	TOP TEN	TOP TEN			
e-Participation	TOP TEN				
Open Government	TOP TEN				
Cyber Security	TOP TEN				TOP TEN

As we can see, only Denmark is in the top ten ranking in all indicators. Except Sweden, all countries are ranked in the top ten for network preparedness, but others generally lag behind in management optimization, Government CIO mandate, e-Participation and open government. This is in contrast to the OECD index and reporting on open data, and which study provides the most relevant analysis is open for debate.

7.2 Assessment of Nordic governments' maturity

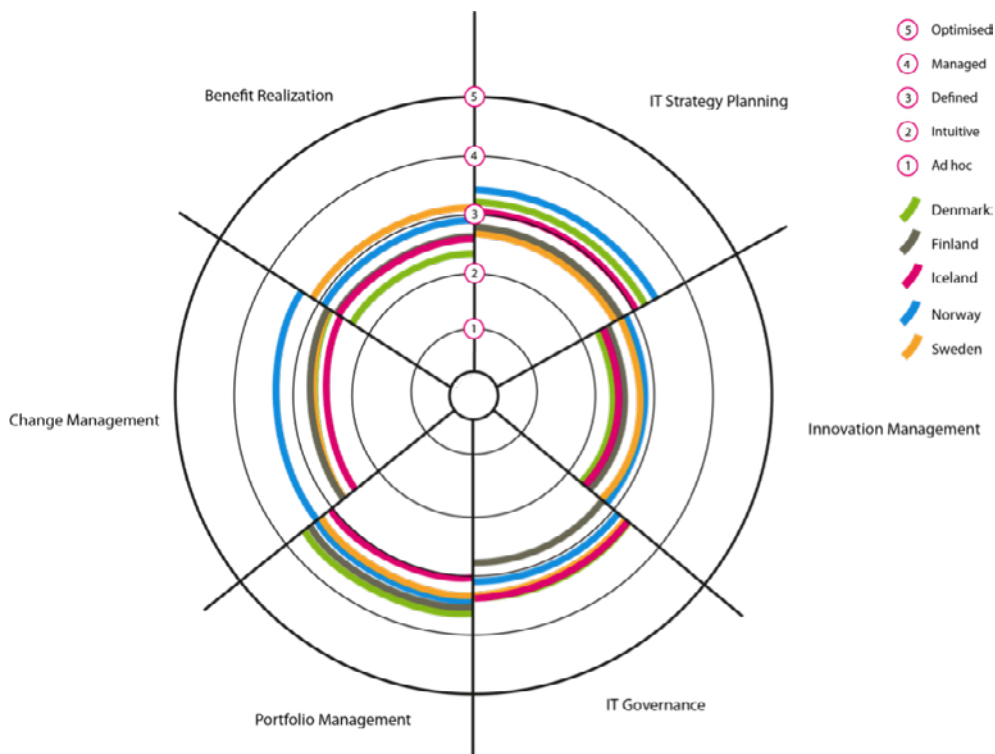
To further delve into the similarities and relative differences in the Nordic region, Rambøll has performed a maturity assessment of the countries.

A maturity assessment can provide useful information on an organization's capabilities to adapt to organizational and technological changes and innovation. In this case we have tried to assess the collective state of each Nordic country, as a basis for a comparison. To do so we have applied a simplified and adapted version of the Capability Maturity Model (CMM), as administered and marketed by Carnegie Mellon University

The purpose of the analysis is to see whether the Nordic countries have a level playing field for collaboration. We have chosen what we believe are six core capabilities in the modernization of government: (1) IT-strategy planning, (2) innovation management, (3) IT governance, (4) portfolio management, (5) change management and (6) benefit realization.

The exercise is based on self-assessment by key players in the digitalization of the public sector in the Nordic countries. The response rate (28%) influences the reliability and validity of the analysis. Nevertheless, the survey provides a glimpse into the respondents' view of their organization's capabilities. Looking at the figure below, one sees that the Nordic countries differ by less than one level of maturity on most variables.

The assessment confirms the assumption that the Nordic governments are relatively mature in terms of managing and planning their IT strategy and portfolio, with the countries values ranging between "defined" and "managed". As a starting point for collaboration, this is good. Knowing what IT systems you have, why you have them and how to prioritize between them makes it easier to determine if, and where, there could be benefits from collaboration.



If we look at the differences between the countries, the picture varies.

The Danish stand out as the masters of formal IT governance. Surprisingly, they rank themselves as poor at benefit realization. Few countries have had as much focus on this issue as Denmark, and one could expect this to lead to a high ranking compared to the other countries. This may, in effect, show a methodological weakness of the survey. Insight into a subject may lead to a more critical view of one's own performance than those who have less insight.

The assessment shows some diversity in which is the leading country in the different areas. The Norwegians come out best on change and innovation management and IT strategy, the Danish on IT governance and portfolio management. Sweden ranks highest on benefit realization. Iceland is a high achiever at IT governance. The Finns rank themselves highly on portfolio management, but at the lower end of the scale in the other areas.

Description of the maturity levels:

Ad hoc	Intuitive	Defined	Managed	Optimised
The organization does not work with this issue, or only in certain cases, and it has no actual tools, methods or practice. The work is neither formalized nor broadly coordinated. Experience is not systematically collected to form a basis for improvement.	Close cooperation to organize and execute successful projects. Simple metrics are used to underpin project execution and employee performance. Apart from project planning tools, the organization uses only a minimum of management tools, techniques and methods.	The organization uses a standard, cohesive approach/ methodology that supports business strategy delivery, is defined and described in the form of models/ procedures and is broadly accepted and widely complied with. Experience/ learning are continuously translated into improvements. Results and successful deliverables are clear objectives.	The organization uses a fully developed, structured and documented approach/ methodology that is systematically adjusted on the basis of experience and consistently complied with. The organization uses quantitative and statistical techniques to improve performance, quality and predictability. Metrics ensure a clear connection with the business strategy.	Quantitative and statistical control techniques are the foundation for the completely systematic implementation of process, quality and best practice improvements as a basis for continuously perfecting work and decisionmaking procedures in a targeted manner. The approach is fully integrated into the company's overall strategic planning.

Description of the

- ***IT strategy planning:** Describes whether the IT strategic work is closely related to the other strategic work in the organization, either as parallel or custom processes.
- ***Innovation management:** Describes how an organization manages its processes, structures and systems that promote innovation in the business.
- ***IT governance:** Describes the extent to which IT-management is part of the business, and how it is practiced.
- ***Portfolio management:** Describes how the organization coordinates and manages investments in change initiatives (such as projects, programs, etc.) required for the organization to achieve its strategic objectives.
- ***Change management:** Describes the process, tools and techniques to manage the people-side of change in a way that enables the organization and individuals to realize planned and unplanned benefits.
- ***Benefit realization:** Describes the process ensuring that potential benefits arising from a change are actually realized (identification, definition, tracking, realization and optimization of benefits)

7.3 Summary of recent reports, benchmarks and assessments

Studies from the EU, OECD, World Economic Forum, UN and the Waseda Institute of e-Government together provide a nuanced picture of the similarities and differences between the countries. There are some, but not many, inconsistencies, most notably between the UNPACS e-Participation index and the Waseda ranking on e-Participation and Open Government. These matters are not an exact science, and choices in design of indicators will affect results. The main picture is still quite clear:

Nordic citizens and businesses are mature and fairly similar.

In most areas, citizens and businesses are active online both as consumers and producers, and use government and private services far more than the EU norm. Notable national differences are found in the areas of online sales (SE less), travel and accommodation (SE + FI more), making appointments (IS less), submitting forms online (DK + IS more) and businesses receiving orders online (FI less).

The World Economic Forum Networked Readiness Index (NRI) confirms this picture of a general high level of maturity and similarity in levels, especially with regard to infrastructure readiness and individual usage.

Finland and Sweden's populations use less social media, and class differences are more prevalent here with regard to social media use.

Government services are generally good and have high uptake.

There are still individual areas where there are major differences. Finland in particular outranks its neighbors on mobility-enhancing services, whilst Sweden is below the normal EU value. Sweden is ahead on business start-up services. Turning to the presence of key enablers by service in the EU benchmark, there are some very big differences that might be barriers to common solutions. All five countries score equally well on key enablers and user-centric government. This is also confirmed in the UNPACS e-Government Development Index.

Transparency and sharing

are common goals, and also reflect similar government traditions, but with important variations. The UNPACS e-Participation index concludes that Norway and Finland are far ahead of Denmark and Iceland in online stakeholder interaction and decision-making processes. The OECD OURData index finds similar results concerning data accessibility and availability for Finland and Norway, but that Sweden is lagging behind. This is likely due to lack of data use and promotion following the OECD study.

Government set-up for e-Governance has significant variations.

According to the Waseda ranking, all countries except Sweden are in the top ten for network preparedness, but only Denmark is in the top ten for all variables considered by Waseda to improve the ground for better e-Government services.

Self-reported results partly confirm these studies.

The results of our maturity study also show similarities, but also that Denmark, as Waseda found, stands out in formal IT governance. Here, there are also some general patterns with regard to how stakeholders assess different areas when compared: In all countries there is reported to be less maturity in innovation management compared to other areas, which is reported as the strength varying.

Table of Abstract

Series title, number and report code of publication: Nordic Innovation Publication 2015:08	
Authors: Lars van Marion, Jon Honerud Hovland	
Organisation: Rambøll Management Consulting, Red Tape Crossing	
Title: The Nordic Digital Ecosystem Actors, Strategies, Opportunities	
ISBN ISBN 978-82-8277-080-4 (Print) ISBN 978-82-8277-079-8 (Digital) (URL: http://norden.diva-portal.org)	Language: English
	Date: December 2015
	Pages: 125
Publisher: Nordic Innovation Stensberggata 25, NO-0170 Oslo, Norway Phone: +47 – 47 61 44 00 info@nordicinnovation.org www.nordicinnovation.org	Contact: Ramboll Hoffsvæien 4, NO-0213 Oslo, Norway Phone: +47 22 52 59 03 www.ramboll.com

