

First Choice, Free Choice or No Choice

Differences in Secure Digital Post in the Scandinavian Countries

Arild JANSEN ^{a 1)}, Jesper B. BERGER ^{b)}, Göran GOLDKUHL ^{c)}

^a University of Oslo, arildj@jus.uio.no,

^b Årø Kommune, jbb@aeroekommune.dk

^c Linköping University, goran.goldkuhl@liu.se

Abstract. As part of their e-government plans, many countries aim at digitizing their communication with its citizens and the business sector. The effects of e-government depend on particular policy and design decisions. The aim of this paper is to compare the enactment of particular policies in supposedly similar contexts. The comparative case constitutes digital communication between public sector and citizens in the Scandinavian countries. From a grounded approach, we have described the policy, design and effects elements of the three case settings. Our study indicates that apparently similar solutions in comparable contexts may be enacted in rather different ways and have quite different effects. The three countries operate on a scale of coercion from mandatory (Denmark), over nudging (Norway) to voluntary (Sweden).

Keywords: e-government, digital communication, policy, design, effect

1 Introduction

Digitization of communication between public administration and citizens seems to be a global trend in societies' developments. Personal meetings and ordinary mail are replaced by digital channels for communication. There are great challenges in designing and implementing digital communication, often labelled as "digital by default" or "digital first choice" [14,22]. The ambitions are that citizens and businesses should choose digital means first. It must however be questioned if "digital first choice" always is a real choice. What is the effect of different national strategies for implementing digital communication? We want to address these questions through a comparative study of strategies and architecture for digital post in the three Scandinavian countries.

Denmark, Norway and Sweden have rather similar political systems, it is lot of cooperation between them, and they are actively participating in the European Information Society projects. We would expect that their ICT policies resemble a lot. However, there are a number of differences, related to their specific history and distinct traditions. This is also reflected in their different digitization strategies [see 14, 19, 22]. Although the overall goals in all three countries are similar in that digital communication should be the preferred channel, each country has defined rather different digital channel strategies.

1.1 Research framework "From policy to design and effects"

Our research framework departs from a simple model for e-government research consisting of three notions: policy, design and effects [10]. Central in the model is

¹ Corresponding Author

design process and designed products of e-government artefacts. Design is in this context considered to be a process of policy implementation, following a distinct strategy, where the policy background is seen as essential context to the design process. The third element; the effects are the specific results (of e.g. use) of and corresponding consequences for actors involved. The analysis in this paper will focus on three levels:

1. The national policy level, including identifying goal, legal and organizational measures, but limited to what is relevant for the specific cases.
2. The design level, meaning how digital channel strategy is implemented as e-government architecture and the supporting information infrastructure, including analyzing technical and organizational characteristics, business model, etc.
3. The effect level, comprising citizens' and public institutions' responses to the policy and implementation through their adoption, use and the consequences.

These three projects are analyzed in our study: “*Digital Post*” in Denmark, “*Sikker Digital Post*” (English: Secure Digital Post)ⁱⁱ in Norway and “*Mina meddelanden*” (English: My messages)ⁱⁱⁱ in Sweden. Other solutions exist; however, these projects constitute the major national initiatives. Our research framework is depicted in figure 1.

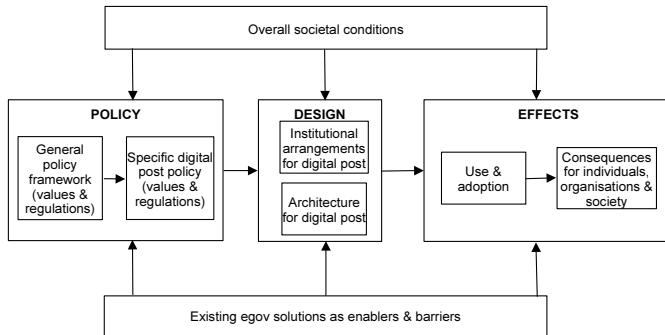


Figure 1. Basic conceptualization of study domain

Our research is on the whole based on a qualitative approach, including analysis of policy documents, strategies and project descriptions as well as relevant revisions in laws and regulations, etc. We have adopted a sort of “grounded” approach as no specific theories or propositions guided the analysis [6]. However, we have used a set of factors related to policy and design as show in Table 2 & 3 below in comparing our three cases.

2 Policy

2.1 Denmark

The policy papers that regulate digital communication with public sector in Denmark comprise: 1) the national e-government strategy, 2) legal regulations and 3) legal agreements between the Danish government and subordinate public institutions.

The Danish national e-government strategy 2011-2015: *The digital path to future welfare* [22], underpins a new e-government paradigm. According to Jæger and Löfgren [13] Danish e-government has developed since the 1990ies from “Danish values” like democracy, citizens’ IT rights, transparency, button-up experimental approaches, citizens’ empowerment and social inclusion, to more centrally controlled e-government,

primarily to increase public sector efficiency. The current 2011–2015 strategy carries the slogan that “those that can, must [be digital]” and it is clearly stated that “it will be mandatory to use digital solutions in written communication with public sector” [22, p. 5] for both businesses (from 2013) and citizens (from 2014). The coercive strategy is a result of lack of tangible benefits from former e-government strategies.

2.2 *Norway*

Norway is a rather sector-oriented and decentralized, but unitary state where the municipalities have autonomy within the national legal framework. One implication is that Norwegian reform processes might be more segmented and sector-oriented than in other countries. The Minister for Modernization, which coordinates public sector reforms, launched a new digitization program in 2016, focusing on efficiency and user-oriented services, but also on innovation in private sector, continuing former strategies.

The new program is strengthening “Digital as first option” as an overall principle, meaning that “Digital communication is to be the general rule for contact with the public sector. Paper-based solutions will still be an option, but communication will be digital by default” [14]. All citizens and businesses will receive mail from the public sector as certified digital mail, using secure eID for authentication.

2.3 *Sweden*

The initiative for digital post in Sweden did not come from a political-ministerial level. It was a public authority initiative around 2009: The Swedish Tax Agency, which had extensive communication with tax payers on tax declarations and other taxation issues. The cost reduction for switching to digital post was estimated to be high.

This initiative was discussed within an authority committee for “business set up and operation”, consisting of several public authorities. These authorities had become responsible owners of the Swedish national business link portal *verksamt.se*, which was launched 2009. There was an interest (from the Agency for Economic and Regional Growth and the Swedish Companies Registration Office) to have digital post as an integrated part of this business link portal, but the Tax Agency had a strong incentive in getting one digital solution that covered both citizens and businesses. Instead, a separate digital solution was chosen called “Mina meddelanden” (my messages). The development of this joined-up digital communication service has been influenced by different policy statements on e-government development in Sweden.

3 **Digital architecture**

3.1 *Principles for digital post architectures – certified mail systems*

In 1999, the standardization sector of the International Telecommunication Union published the recommendation X.400, which defines the generic system architecture of Message Handling Services, MHS [20]. This architectural model has been adopted with minor changes by many mailing systems today, including most CMS (Certified Mail Systems). It includes a generic infrastructure: Mail Transfer System (MTS) that contains Message Transfer Agents (MTA) and can connect with User Agents (UA); furthermore Message Stores (MS) and Access Units (AU), which can be devices that convert digital messages to physical mail. The functional model of the generic X.400 MHS is illustrated in figure 2 below.

3.2 Denmark

All public institutions can register as sender and recipient. All persons age 15+ are automatically registered as recipients based on their unique person ID (CPR). Citizens can apply for exemption. Citizens can register phone no. and e-mail for notification. Public institutions send messages from various application systems (UAs). The citizen can initiate messages through the UA, which the MTA delivers as a secure e-mail or via a web service to the public institution. There is one authorized MTS-provider.

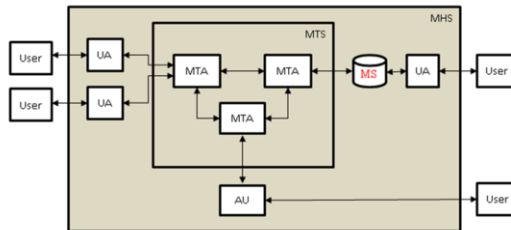


Figure 2. Systems architecture of the generic X.400 MHS, called CMS (from Tauber [20])

The citizen UA consist of the national eID, the citizen portal (Borger.dk) and the Digital Post front-end system. The recipient has the responsibility to provide access to a device that can run the national portals, Internet access and an active eID to be able to communicate with public institutions, and to be able to receive messages that may have legal or economic consequences. The government made it mandatory for public institutions to offer Digital Post as a communication channel for citizens already in 2010. Digital Post was launched in 2010, but by the time the Law was passed in 2012, almost no businesses had registered and less than one of five citizens.

3.3 Norway

The Norwegian CMS is based on a simplified and asymmetric version of the generic MHS model. The citizens that accept to use a digital communication channel are offered the option to choose between two mail boxes: Digipost by Posten Norge and e-Boks by e-Boks AS. The intention is that they shall receive mail from public agencies in the same mailbox as from private senders. Receipt and storing of digital mail from public agencies are free of charge for the citizens, as are the use of ID-portal to log on.

A citizen may however interact with public agencies in different ways. The most typical scenario is when a citizens complete a “digital form” available from a public agency, normally by using a secure login/authentication service provided by the national eID. If the citizen is registered in the exemption register, a paper-based message shall be sent. All public institutions have to register as sender in CMS. All persons age 15+ can register as recipients based on their unique person ID, but they do not have to.

3.4 Sweden

Public institutions that qualify can register as sender in My Messages. Businesses (legal entities) and citizens can register, based on their unique business/citizen ID as recipients. Recipients must register a phone no. and e-mail for notifications. Public institutions send messages from various application systems (UAs) to MTA. These messages can be dispatched from these application systems (e.g. case handling systems), using different techniques, into the message transfer system. The Tax Agency is responsible for this architecture and the provision of the main infrastructural components). There are procedures of organizational, contractual and technical

affiliation. The specific type of message needs also to be registered. National agencies and municipalities can be affiliated to this message transfer service. There is one mail-box (“Min myndighetspost” administered by the Tax Agency) that handles only messages from the public sector. Besides this mail-box, there exist at the moment two commercial digital mail-boxes that are certified to distribute messages from the public sector. A citizen can choose to receive messages from the public sector digitally or by ordinary mail. The digital choice must be an active choice. If no such choice is registered, the default option is ordinary mail. The citizen can also choose which mail-box operator to use for digital post; i.e. the public digital mail-box or one of the commercial ones. It is also possible to choose not to receive messages from some dispatching public agencies; i.e. deselecting some public agency from digital post

4 Adoption and effects

4.1 Denmark

The number of registered citizens and yearly messages are shown in table 1, showing clearly how mandatory e-government boosts adoption and use. An evaluation of the Digital Post business case for 2013 and found that public institutions had realized less Digital Post, thus less postal cost reduction than expected, see Berger and Andersen [4]. Since the State budget was reduced beforehand, the authors estimated that public institutions had had a direct deficit of more than 100 Million DKK. The business case was also evaluated for 2014 for local governments and showed again a direct deficit of 38 Million DKK (79 Million DKK in 2013). Especially small business owners were frustrated about the implementation process, the complexity of the solution, and that they had to pay to be supported along with the lack of support resources. Civil servants experienced increased workload with Digital Post due to its complexity, lack of interoperability and the increased demand for assistance from especially vulnerable citizens [1]. Civil servants report that citizens lose welfare rights and benefits because they are not able to access Digital Post. Elderly and vulnerable citizens, that depend on public benefits, may also suffer from techno anxiety [e.g. 11]. Social workers stated that forcing citizens to be digital worked against their treatment of the client.

The public institution that handles child support started sending confirmation letters in 2013 to single parents in Digital Post. More than 300 single parents did not see the Digital Post, subsequently they lost child support. The Council of Appeal ruled, on behalf of several complaints, that the decision should be reversed [21]. The turbulence of implementing Digital Post were criticised in Danish media [12].

4.2 Norway

Some state agencies have offered a simple digital post service to citizens, based on uncoordinated and rather insecure solutions. The Tax directorate has used the digital mail service offered by Altinn since 2005 to inform citizens about the assessment of taxes. In 2015, 93 % of all tax payer received digital notice from through Altinn.

DIFI put its first version into operation fall 2014 and has the overall responsible for operating the solution. In municipal sector, a common digital mail service has been offered since 2013, based on a solution developed by Bergen municipality in 2011. The Contact and reservation register and Digipost were put into operation late 2014, while E-Boks was available spring 2015. By April 2016, 21% are users of CMS, while 2.3 % are registered for exemption. However, about 90.5 are registered in the CRR, and will

receive “unsecured” digital messages, but not necessarily by SDP. Other state agencies use their own mailbox system for unsecure mail. Table 1 below show some data on the adoption of Digital post in the three countries.

Table 1. E-government policy attributes for the Scandinavian countries

		2010	2011	2012	2013	2014	2015
DK	Citizens registered (%)	n/a	16%	21%	30%	89%	89%
	Citizens exempt (%)	n/a	n/a	n/a	0%	11%	11%
	Public institutions (#)	171	165	152	202	216	205
	Messages G2C (Million per year)	2,57	6,89	8,47	12,61	32,15	88,52
NO	Citizens registered with SDP (%) In CCR)					n/a	21 % (90%)
	Citizens exempt (%)					n/a	2.1 %
	Public institutions (state + municipal)				Some	5+10	121+ 200
	Messages G2C (Million per year)				n/a	n/a	2.3
SE	Citizens registered with SDP					n/a	260 K
	Public institutions (state + municipal)					n/a	9+2

4.3 Sweden

The existence of the digital infrastructure of My Messages is mandatory. The Tax Agency is the single, obliged provider of this infrastructure. The use of it is, however not mandatory for either public organizations or citizens/businesses. The deployment of this digital post solution in Sweden has thus been highly dependent on the interests by public organizations, citizens and businesses. However, the numbers of sending and receiving users are progressing fairly slowly. By Dec. 2015, there were only 9 national authorities that use My Messages. In 2014 a deployment process started for the municipalities. At the moment there are only few municipalities that use My Messages.

5 Comparative analysis

The digitization approach of the three Scandinavian countries has proven to be rather dissimilar, which is clearly depicted in the three slogans for the e-government strategies: DK: “Those than can must”; NO: Digital as first choice; SE: As simple as possible for civil servants and citizens. Below, we compare the three different approaches related to policy, design and effect.

5.1 Policy

The Danish, Norwegian and Swedish e-government policies can be placed on a continuum from mandatory to voluntary. Denmark exerts a mandatory strategy, centrally controlled by the Ministry of Finance in a much closed manner, primarily seeking central government cost reductions by legal means towards citizens.

Norway, other the other hand exerts a softer strategy; digital communication is the default option, but citizens can still choose to communicate by physical mail. In Sweden, the citizens may choose freely whether the will receive digital mail or not.

Table 2. E-government policy attributes for the Scandinavian countries.

	Denmark	Norway	Sweden
Characteristics	Centralized, top-down, government-centric.	Centralized, top-down/ bottom-up, citizen-centric	Centralized, bottom-up, institution-centric.
Political anchor. of e-gov. strategy	Ministry of Finance, Dig. Agency (DIGST)	Min. for Modernization& DIFI +Min of Finance	Ministry of Trade, the Tax Agency.
Goals of strategy	Reduce public sector costs.	Efficiency, effectivity and innovation	Reduce public sector costs, improve security.
Means	Legal means towards citizens and businesses.	Mix of legal means and nudging of citizens.	Nudging of public institutions.
Citizens' rights	Digital by default. Citizen cannot choose.	Digital by default, but citizens can choose	Digital is voluntary. Citizens can choose,
Citizens' demands	Cannot demand digital communication.	Conditionally yes; if digital com. is supported	Cannot demand digital communication.
Implementation	Rapid, fixed period, specific targets.	Slower, no fixed period, no specific targets.	Digital comm. evolves incremental, dynamic.

The public institution has the responsibility to ensure that the digital message has been communicated and every public institution is obliged to comply with the digital communication strategy. Even softer, the Swedish approach has been developed bottom-up through the needs of public institutions to reduce costs communicating with citizens. This strategy has been that digital communication should be voluntary and simple to use for both public institutions and citizens.

While citizens cannot demand digital communication in Denmark or Sweden, Norway has a more citizen-centric approach, where citizens actually can demand digital communication if this is supported by the individual agencies. Denmark has chosen a rapid implementation period, aiming at digitizing 80% of public communication within 3 years. Further, Denmark has reduced central (state) funding of public institutions according to anticipated cost reductions prior to the implementation period. Norway has chosen a softer implementation strategy: comply or explain why not; whereas digital communication in Sweden evolves dynamically according to needs and opportunities.

5.2 Design

The design choices may also be partly grounded in the overall approaches of the three countries, depicted in the three slogans above. While exemption for citizens can only be granted in the Danish case if citizens actively meet at town hall and declare that they do not possess a computer, Norwegian citizens can be exempt only by omitting to register their email address. Contrary, the Swedish citizens that want to communicate digitally actively need to register. For the businesses sector, in both Denmark and Norway, businesses are obliged to communicate digitally without possibility of being exempt. A recent Danish investigation of user-friendliness of business-oriented digital solutions revealed that big companies find Danish Digital Post (e-Boks) too restricted for instance due to lack of internal operations of messages and lack of role-based user profiles; whereas one-person companies find the solution to complex [25]. The Norwegian Government has followed a more transparent approach, specifying the requirements in the legal documents. The private company e-Boks A/S (that operated the Danish MTS) was authorized in Norway, but had to adjust the Danish version of the solution to be able to comply with Norwegian requirements [15]. The Swedish solution lacks requirements' transparency since the development was an in-house project.

Table 3. E-government design attributes for the Scandinavian countries

	Denmark	Norway	Sweden
How many digital solutions must citizens cope with	Few other solutions. The Ombudsman has that only one SDP is promoted.	2 Secure solutions A variety of different unsecure solutions.	A variety of different solutions.
Degree of choice	Citizens have no choices, only one MTA, UA and eID	Citizens can choose between 2 MTAs, 4 eIDs	Citizens have no choice of MTA, but choose 3 UAs
Exemption for citizens to receive digital messages	Citizens are registered as digital by default; they must apply for exemption	Citizens must actively register to be digital and can be exempt.	Digital communication is voluntary so no need for exemption.
Business model, public institutions	Central gov. provides support by reducing State fund. Fee for using CMS.	Each institution has to pay for implement. costs for integration with CMS	Each institution has to pay for implement. Cost for integration with CMS.

5.3 Effects

The three countries have progressed differently in the implementation processes. Hence, a comparison of effects cannot be made directly. The adoption in Denmark developed slowly the first years, as shown in table 1. The majority of public institutions were registered in 2010, however the number of sent messages were low initially, but have increased in the two last years. The Norwegian development resembles somewhat the first years of the Danish implementation process, see also table 1. However, there has been initiated a public campaign to accelerate the adoption rate. Similarly, Sweden has a fairly slow pace of uptake due to voluntariness.

The direct economic benefits of the Danish Digital Post project has not been officially evaluated, but since the Government has reduced the State funding of public institutions from beforehand, the project has reduced public costs from 2013 to 2015 by more than 800 Million DKK. An evaluation in 2013 found a direct deficit of more than 100 Million DKK due to public institutions not being able to send as many digital posts as anticipated. The Norwegian or Swedish projects do not have this automatic reduction of State funding and benefits from the digitization project has not been estimated.

A recognized problem in the Danish case is that citizens and businesses do not access their digital communication. For instance, the share of non-held mandatory vehicle inspections was raised by 50% when Danish Police started using digital communication and plate-removal of vehicles doubled [17]. Civil servants report that citizens perceive both positive and negative consequences, and that some civil servants find the digital service to citizens so poor that they refrain from using it [5]. Even in 2014 civil servants perceive an increased work load due to digital communication.

6 Conclusions

The continual shift to digital communication in societies is apparent in the three Scandinavian countries. Digital post solutions have been implemented to push communication between public institutions and citizens/business to such digital channels. There are similarities between the three countries, but as has been shown in this paper, there are also significant differences. All three countries are driven by the idea of a “digital first choice”, which means that citizens should primarily use digital means for their communication with the public sector. But when such a “choice” is made mandatory, as in Denmark, there is actually no choice. In Norway, there are policy and infrastructural arrangements to make the use of digital post as a first, but still real choice. In Sweden, there are only non-coercive policy declarations about digital

first choice. An infrastructure for digital post has been rolled out, but the strategy is to let public institutions and external users to choose freely how to communicate. To choose digital post in Sweden must be an active choice.

References

1. Berger, J.B. *Mandatory e-government has arrived: The silent protest from staff calls for the committed scholar – resistance must never be futile! in The 25th Australasian Conference on Information Systems*. 2014. Auckland, New Zealand.
2. Berger, J.B., *E-government harm: An assessment of the Danish coercive Digital Post strategy*. 2015, Roskilde University.
3. Berger, J.B. and K.N. Andersen, *Digital communication with the public sector: Main results from the study on response and response times in municipalities, counties, State agencies and State departments (Danish)*. 2013, Aalborg University.
4. Berger, J.B. and K.N. Andersen, *More than 100 milion gone with the mail (Danish)*, C. Burchardt, Editor. 2014: Roskilde University.
5. Berger, J.B., M. Hertzum, and T. Schreiber, *Does local government staff perceive digital communication with citizens as improved service?* "Government Information Quarterly, in press".
6. Corbin, J. and A. Strauss, *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Washington DC, 2008. **20083**.
8. Fribo, A., *Serious critique of digital post: Public institutions can make changes in your in-box (Danish)*, in *Version2*. 2013 : <https://www.version2.dk/artikel/professor-daarligt-design-underminerer-tilliden-til-digital-post-55137>.
9. Fribo, A., *The Ombudsman investigates whether Digital Post violates the law - for the second time in four months (Danish)*, in *Version2*. 2014. <https://www.version2.dk/artikel/ombudsmanden-undersoeger-om-digital-post-er-i-strid-med-loven-anden-gang-paa-fire-maaneder>
10. Goldkuhl, G. *From policy to design and effects: A framework for e-government research*. in *9th Scandinavian Workshop on E-Government, 9-10 February 2012 Copenhagen, Denmark*. 2012.
11. Guldagger, M., *Single father: Overseen digital post costed me DKK 2800 (Danish)*, in *Politiken*. 2013.
12. Henriksen, H.Z., *Scrutinizing Open Government Data to Understand Patterns in eGovernment Uptake*, in *Electronic Government*. 2015, Springer. p. 144-155.
13. Jæger, B. and K. Löfgren, *The history of the future: Changes in Danish e-government strategies 1994-2010*. Information Polity: The International Journal of Government & Democracy in the Information Age, 2010. **15**(4): p. 253-269.
14. Kommunal- og moderniseringsdepartementet, *Digitaliseringsrundskrivet (Norwegian)*. 2015, see <https://www.regjeringen.no/no/dokumenter/digitaliseringsrundskrivet/id2462793/>.
15. Lundström, E., *Danish e-Boks is delayed in Norway: Not good enough to the Norwegians*, *Version2* 2014 <https://www.version2.dk/artikel/dansk-e-boks-forsinket-i-norge-ikke-god-nok-til-nordmaendene-75361>.
16. Møllerhøj, J., *Experts: Tax Agency should use Digital Post to mitigate phishing (Danish)*. *Version2*. 2014.
17. Sandal, J.S., *Car owners do not check Digital Post for mandatory vehicle inspections (Danish)*, in *Version2*. 2015 <https://www.version2.dk/artikel/bilejere-tjekker-ikke-digital-post-synsindkaldelser-463536>
18. SFS, *Regulation on State authorities' application of digitization (Swedish)*. 2003.
19. Statens Offentliga Utredningar, *As simple as possible for as many as possible - e-government from strategy to action (Swedish)*, SDU, Editor. 2010.
20. Tauber, A., *A survey of certified mail systems provided on the Internet*. *Computers & Security*, 2011. **30**(6): p. 464-485.
21. The Council of Appeal on Health and Safety at Work. *It was wrong to cancel child payment (Danish)*. principle decisions 2014 At: <http://ast.dk/nyheder/nyheder/ankestyrelsen-forkert-at-stoppe-bornetilskud>.
22. The Danish Government, Danish Counties, and Local Government Denmark, *The Digital Path to Future Welfare* 2011: The Danish Ministry of Finance.
25. The Danish National Audit Agency, *Report to the Public Accounts Committee on the usability of public digital self-service for companies (Danish)*. 2015.

ⁱ See <http://www.digst.dk/Loesninger-og-infrastruktur/Digital-Post>

ⁱⁱ See <http://www.norge.no/nb/velg-digital-postkasse>.

ⁱⁱⁱ See <http://www.minameddelanden.se/http://www.minameddelanden.se/mm/digitalpostfranmyndigheter.html>