

Mypage and Borger.dk - A Case Study of Two Government Service Web Portals

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Abstract: This case study investigates the development of national portals offering online public services to citizens. Norway and Denmark are leading the way in developing online public services for citizens. In this study the development of the citizen portals Borger.dk in Denmark and Mypage in Norway will be examined. At present, documented research on national citizen portals is limited. Comparing the similarities and differences of citizen portals is an important part of e-government development. We have used a framework for comparing the portals. The research questions to be answered in this case study are; Why are citizen portals created? How does one deal with matters of security? How is portal development organized? This study is also intended to bring to light factors that have led to the differences in the development of Borger.dk and Mypage. The study is based on published and unpublished reports from the two countries in question, together with interviews with key persons.

Of additional interest, in conducting this study, is the opportunity to gain greater insight into the development of online services provided by the public sector. This case study also raises further questions relating to e-government to be used in future research.

Keywords: e-government, e-services, framework for comparing citizen portals, citizen portal, online public services, Borger.dk, Mypage.

1. Introduction

Governments are now positioning themselves to be part of the internet revolution (Butt and Persuad, 2005). As e-commerce matures and its tools and applications improve, greater attention is being given to its use to improve the business of public institutions and governments (Turban *et al.*, 2006). Around the world, a variety of e-government initiatives are being taken to improve the efficiency and effectiveness of internal operations, communication with the public and engagement in transactional processes with individuals and organizations (Warkentin *et al.*, 2002).

This research project has been carried out as a case study. Case study is a useful method when how, who and why questions can be asked about a contemporary set of events (Remenyi *et al.*, 1998; Yin, 1994). Case studies can be used to explain and understand complex phenomena, and allow for meaningful exploration of real-life events (Remenyi *et al.*, 1998). We considered case study a suitable research method because we wanted insight and in-depth understanding about the two citizen portals. The research questions defined for our study are formulated as why and how questions. We focus on simultaneous activities and have no control over behavioral events in the two projects. By using case study as a method we were able to get a deeper insight into the topic citizen portals in a controlled and limited manner, within a short period of time. A case study can also bring us to formulate new research questions.

Our research is based on interviews with key persons in the Borger.dk and Mypage projects. In addition a document and literature review has been performed. National e-government strategies and plans from Norway and Denmark have been undergoing thorough reading in the literature and document review. Evidence to answer our research questions was collected through the interviews and literature and document review. The findings are presented in section 4.

The structure of this paper is as follows; firstly, we present our understanding of the term *e-government*, followed by a description of the framework used to compare Borger.dk and Mypage. We then use this framework to compare the two portals and give a conclusion. Accordingly, in section 2 we provide a literature review to give an understanding of the term *e-government* and different maturity models of e-government. Section 3 describes our framework for comparing two citizen portals. In section 4 we present the cases and compare the portals, using the framework described in the previous section. Section 5 contains a conclusion. At the end of the paper in section 6, we address the possible limitations of our study and also propose focus for future research in this area.

2. Literature review

Before we begin to describe the framework for comparing the two portals, we will examine topical literature in order to define the term *e-government*, and to ascertain which agents are involved in e-government and at what stages of maturity e-government can be placed.

2.1 Definitions of e-government

E-government (electronic government) is a global phenomenon which is of interest for many operators; public administrations, politicians and citizens. There are many definitions of e-government, and these stress different aspects of governments' use of ICT.

It has been argued that e-government has many similarities with a socio-technical information system (Heeks, 2006), and that it consequently is not a new phenomenon. E-government can also be defined as the application of e-commerce technologies to government and public services for citizens and businesses (Chaffey, 2007). Heeks (2006) argues that it is not possible to transplant private sector ideas into the public sector. Governments are not businesses and are not investing in ICT to make a profit (Bannister and Walsh, 2002).

Definitions of e-government vary from having a narrow focus on use of ICT (and particularly the Internet), to delivering better governmental services, to wider definitions focusing on transforming government (Grant and Chau, 2005). From a set of identifying characteristics they define e-government as follows:

"A broad-based transformation initiative, enabled by leveraging the capabilities information and communication technology; (1) to develop and deliver high quality, seamless, and integrated public services; (2) to enable effective constituent relationship management; and (3) to support the economic and social development goals of citizens, businesses, and civil society at local, state, national and international levels." (Grant and Chau, 2005, p 9)

The European Union (EU) also has a focus on e-government. In the eGovernment action Plan there are five objectives for eGovernment (EU, 2005):

- No citizen left behind
- Making efficiency and effectiveness a reality
- Implementing high-impact key services for citizens and businesses
- Putting key enablers in place
- Strengthening participation and democratic decision-making

Grönlund and Ranerup (2001) found, in a review of definitions of e-government, that these definitions typically mention three goals: 1) better information and services to citizens, 2) improved citizen involvement in democratic processes, and 3) more efficient government.

E-government can involve relationships between government and different levels of constituents. The relations can be between:

- government and businesses (G2B)
- government and other government institutions (G2G)
- government and employees (G2E)
- government and citizens (G2C). (Long and Siau, 2006; Hiller and Bélanger, 2001).

There are many operators in e-government; from the individual citizen as a private person, to a business which has interests in the governments' priorities for the private sector.

2.2 Stages of integration

Various benchmarking studies have been carried out in order to monitor the development of e-government (Accenture, 2005; CapGemini, 2004). These studies use different indicators for evaluation, and the studies are not necessarily comparable.

A number of e-government maturity models exist, focusing on how far integrated governmental services are. Various levels of e-government reflect the degree of technical sophistication and integration with users (Hiller

and Bélanger, 2001). The models range from two to five maturity stages, and the names of the stages vary from model to model (Hiller and Bélanger, 2001; Reddick, 2004; Layne and Lee, 2001; Kaylor *et al.*, 2001). The models indicate that e-government differs in complexity and levels of integration. An often referred-to maturity model is Layne and Lee's model, which operates with four stages;

- Catalogue (online presence, catalogue presentation, downloadable forms)
- Transaction (services and forms online, databases supporting online transactions)
- Vertical integration (local systems linked to higher level systems, within similar functionalities)
- Horizontal integration (systems integrated across different functions, real one stop shopping).

Hiller and Bélanger (2001) introduce political participation as a fifth stage in their model. Moon (2002) also use a fifth stage model with political participation in his study of e-Government in municipalities. As a step in making information and services available to citizens, many nations establish a citizen portal which, among other things, will render government information and services easily accessible. Offering citizens a one-stop-shopping operation, with both horizontal and vertical integration, seems to be a suitable goal to work towards.

3. A framework for comparing citizen portals

A portal can be described as a web site that offers numerous services such as e-mail, search engines, news and local information (Davis and Benamati, 2003). A portal often serves as the user's initial home page. A distinction is often made between horizontal and vertical portals. Horizontal portals define their market space to include all users of the Internet, and vertical portals are focused around a particular subject matter or market segment (Laudon and Traver, 2001). A citizen portal can be viewed as both a horizontal and vertical portal. Horizontal because it aims at reaching all citizens and vertical because the portal is restricted to the delivery of information and services from the government.

The two portals can both be described as citizen portals, it is the relationship between the government and the citizen that are in focus. The citizen can have different relations to the government (and to different parts of government). The citizen can act as a taxpayer and in other settings the citizen can act as a parent.

In our comparison, we have used a framework influenced by different sources. We have a bottom-up approach since our comparison is based on an application; a citizen portal, and subsequently this is seen in relation to specific strategy.

In a comparison of citizen portals there are many factors that can be compared. Our starting point was to see the citizen portal in relation to the authorities strategic focus on e-Government. We could however have looked at the success of the citizen portals, and used the model of IS success from DeLone and McLean (1992). They created six categories of IS success (1) system quality, (2) information quality, (3) use, (4) user satisfaction, (5) individual impact and (6) organizational impact. The model has later been updated. Intention to use is included, individual impact and organizational impact are replaced by net benefits. Service quality is also included in the updated DeLone and McLean model of IS success (DeLone and McLean, 2003).

Another starting point could be to compare on the basis of the development process of the citizen portals, from not integrated e-services to integrated e-services gathered in a citizen portal.

In the following section we will give an account of the factors we have used in comparing the two portals.

3.1 Strategic level

The initiative for national plans for e-government may originate from different parts of the government, depending on the national organization. Likewise the focus on e-government will vary according to political priorities.

E-government can be thought of in terms of three distinct spheres; the administrative sphere, the civil society sphere, and the formal politics sphere (Grönlund, 2005). Since the three spheres are interrelated, a change can influence all spheres. E-government strategies have impact on the way governments interact with citizens (Chen *et al.*, 2006). The development and implementation of e-government also causes impact and change in the structure and functioning of public administration (Snellen, 2000).

Establishing a citizen portal can be one of many ways in achieving strategic goals.

3.2 Main focus areas for a citizen portal

Larger departments and local authorities often have a portal established for citizens to access information and self-service operations. The inhabitant must have prior knowledge concerning who offers which service and then find the right portal. The establishment of portals may be cost efficient for governmental agencies, and they can introduce a higher service level for the citizens.

The focus on and establishment of portals can be part of a marketing process (Marche, 2003). The portal can play a role in making the department known to citizens. The citizen on the other hand, may first and foremost want to find information or carry out a service, without necessarily knowing who is offering the service. The administrative focus has gradually changed to become customer-focused, serving citizens and trading partners directly by providing electronic services, information and transactions online through the Internet (Devadoss et al., 2002). This together with the desire to co-ordinate and simplify aspects of government, has led to many countries establishing a national citizen portal.

The establishment of a citizen portal is a comprehensive task. A well developed infrastructure, culture and resources to undertake the task is among other things necessary to get it done. In addition, internal organizational changes in the departments may be required to gain full benefit from offering electronic services and information to the customer, i.e. the citizens. The citizens' adoption of electronic services also depends on many different factors, and extensive research exists in this area (Ajzen and Fishbein, 1972; Davis, 1989; Rogers, 1995).

Citizen portals can be pure information portals that give citizens access to public information and links to services. At the other end of the scale one finds portals requiring authentication and providing access to personalized services. It is our opinion that most citizen portals are somewhere between these extremities and offers a combination of information and services requiring authentication.

The establishment of a citizen portal may have both a democratic perspective and the perspective of the participant. The portal may create opportunities for easy contact and communication between citizen and government. A citizen portal can also be a step in improving privacy protection, because it can give citizens opportunities to access information and administrative processes concerning themselves.

3.3 Characteristics of citizen portals

A citizen portal can be viewed as an information system which is established as a step by authorities towards more focus on e-government. As with other information systems, a citizen portal cannot be seen in isolation, without connection to its surroundings. A model of an e-government system can be as follows:

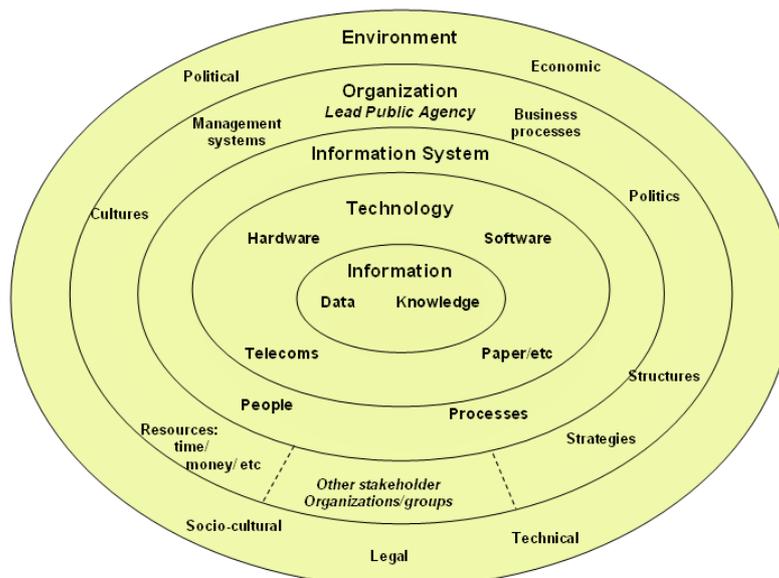


Figure 1: Full model of e-government systems (Heeks, 2006, p 5).

We choose to view a citizen portal as an information system. Heeks make arguments for the same case in his work (Heeks, 2006). Therefore it is possible to look at specific characteristics of an information system as a basis for our comparison. Figure 1 show the different elements of an e-government system, where

elements of Heeks checklist are included. Our checklist, or characteristics of citizen portals, is adapted from Heeks, and presented in table 1. The list of characteristics in table 1 is influenced by what Heeks call the *ITPOSMO-checklist* (Heeks, 2006). In short, these are elements used to describe and understand an e-government system and stakeholder’s organizational context. The key items Heeks describe are Information, Technology, Processes, Objectives and values, Staffing and skills, Management systems and structures, and Other resources (Heeks, 2006).

Table 1: Adapted checklist for use in this case study

Keyword	Description
Goals	What are the articulated goals for a citizen portal?
Information	We are interested in the content of the citizen portal. What kind of services does a portal contain? We will also look at how the services are gathered and presented. In addition, it is of interest to examine the demands to make services available on the portal. A citizen portal can be viewed as a collection of information and services from numerous service suppliers. A lot of information has to be exchanged between these operators. The number of services on the citizen portal may be a result of this exchange of information.
Technology and security	Details of security and technology are usually not available to the general public. It is therefore not our purpose to go in-depth in relation to technical details in this research. Authentication is required to access personal information and services. How is this solved in the two citizen portals?
Processes (the organization of development)	The establishment of a citizen portal may involve changes to many of the processes which involve its various users and operators. The citizens will acquire new channels for carrying out a service or finding information. The government may have to change internal processes when its contact with the public is moved to new channels. Internal tasks will be changed as a result of offering services and information through the portal. Because of the high number of potential users and service suppliers, and because of their diversity, it will be difficult to say something with exactitude about the processes among the different users and operators. We have focused on the process of system development through which the two citizen portals have been established. It is of interest to look at the various participators and their respective roles in the projects.
Administration and operation	After the development process is completed and the citizen portal is deployed, there will be a need for an administration of the everyday management of the portal. How is the administration of the citizen portals arranged after implementation?
Implementation	We use the term <i>implementation</i> in connection to the introduction of the citizen portal to the public. This is of interest to us because it can tell us something about the government’s active role and priorities in the launching of the citizen portal. What steps has the government taken to promote the citizen portal?

4. Cases and comparing

In our comparison we use the framework described in chapter three with subchapters. The content of table 2 is a brief account of our framework, and the table will be described in the sections following. Finally, under each point in the framework, we will say something about the differences between the two countries.

Table 2: Comparing citizen portals – a brief account

	Borger.dk (Denmark)	Mypage (Norway)
Strategic level (Ref. chapter 3.1)	Effective and coordinated public sector, high service quality, central focus on citizens and the private sector.	Knowledge society, exploit the potential of ICT, an easier life for individuals and businesses, value creation, best possible services for available resources.

Main focus area (Ref. chapter 3.2)	A more complete user experience, overview over the new Denmark, easier and faster for the citizen, promote use and access to digital citizen service, insight into public sector.	An easier everyday life for citizens, common entry to electronic services and dialogue with the public sector, access to own information.
Characteristics of citizen portals: (Ref. chapter 3.3, table 1)		
Goals	Making contact with the public sector on the Internet easier.	A public service office on the Internet, electronic services with secure authentication.
Information	Thematically based information plus a self-service solution. Those who deliver the service are responsible for it.	Thematically based structure with access to personalized services. Those who deliver the service are responsible for it.
Technology and security	Authentication with digital signatures. Single sign-on. A minimum of stored information.	Authentication with pin-codes. Single sign-on. A minimum of stored information.
Processes	Local authorities were an important partner in the first phase. Subsequent development as a cooperation project between Ministry of Science, Technology and Innovation (VTU) and KL (our explanation: federation of local authorities).	Developed in cooperation between many public departments, lead by Ministry of Government, Administration and Reform (FAD).
Administration and operation	A coordinating editorial office and a contact center	An administration organization established.
Implementation	Staff at libraries and municipal service as ambassadors.	Press releases and advertisements in media.

4.1 Strategic level

The strategy for digital government in Denmark is written in *Strategy for Digital Government 2004-2006* (Regjeringen *et al.*, 2004). This strategy was discontinued at the end of 2006, and Denmark is now working on a new strategy with duration to 2010. The vision for digital government is:

"Digitalization shall contribute to an effective and coordinated public sector with high service quality, where citizens and the private sector are in the center." (Regjeringen *et al.*, 2004, p 4, our translation)

The Danish strategy is regulated by five prescribed target areas with goals for each area (Regjeringen *et al.*, 2004). Keywords for the five target areas are:

- The public sector shall deliver coordinated services with focus on citizens and the private sector
- Digital government shall lead to increased service quality and release resources
- The public sector shall cooperate and communicate digitally
- Digital governments shall have a coordinated and flexible ICT-infrastructure
- Public leaders shall lead the way in ensuring that their organization can carry out the vision

The responsibility for e-government in Denmark is exercised through a set of institutional arrangements overseen by the Joint Board of eGovernment. The Board is chaired by the Parliamentary Secretary to the Ministry of Finance, with membership from state, regional and municipal government. The Board leads the national e-government program, *Project e-government*. Delivery of the project is the joint responsibility of *The Digital Taskforce* (OECD, 2005).

The establishment of Borger.dk is not explicitly mentioned in the strategy for 2004-2006. The first version of Borger.dk is a result of cooperation between VTU and KL.

In Norway the strategy on e-government can be found in the document *eNorway 2009 – the digital leap*. There is no detailed vision proclaimed here, but the main thoughts are:

"The government wishes to create a knowledge society in which everyone can participate and which exploits the potential of information technology. Norway's advanced use of technology shall provide its

population and businesses with an easier life and contribute to promoting value creation, thereby ensuring prosperity and welfare for future generations. Information technology shall support the advance of a public sector that provides the best possible services, based on resources it has at its disposal. The needs of its population, its businesses and industry shall be at the heart of the development of the digital Norway.” (Moderniseringsdepartementet, 2005, p 2)

The plan continues the previous eNorway plans, and it describes three target areas (Moderniseringsdepartementet, 2005):

- The individual in digital Norway
- Innovation and growth in businesses and industry
- A coordinated and user-adapted public sector.

The establishment of a citizen portal as a step in offering digital services to citizens is described in the plan. The Government has recently presented a report to Parliament concerning information society and e-government (Fornyings- og administrasjonsdepartementet, 2006b).

The Government's coordination of ICT policies is the responsibility of FAD. Responsibility for telecommunication politics, ICT research and the ICT industry is divided between several departments. It is up to each ministry and department to translate the common vision into concrete plans. A few coordinating forums in the ICT-sector have been established and one of these is the Coordinating body for E-government.

FAD (previously known as the Ministry of Modernization) is responsible for establishing the Norwegian citizen portal Mypage.

As we see it, Denmark emphasizes the importance of having a coherent public sector. Norway wishes to use technology to make everyday life less complex and to promote the building of value capacities, whilst digital administration in Denmark shall provide increased quality of service and release resources. Both visions are oriented towards businesses and citizens.

4.2 Main focus areas for a citizen portal

In 2005 a comprehensive survey was carried out in Denmark to give an account of digital communication between the public sector and the general public (Videnskabsministeriet, 2005). The survey revealed that citizens want public information to be presented to them with their life situations as starting point, rather than the governmental organization.

As a result of this it was decided that a citizen portal should be established and replace the municipal portal Netborger.dk and the governmental portal Danmark.dk. In Denmark it is emphasized that the process of developing a citizen portal is a long-term activity constituting several phases and milestones. The current Borger.dk version is a milestone in a course planned to end in 2010 with a 100% complete Borger.dk (Den Digitale Taskforce, 2006), similar in function to Mypage.

The vision of Borger.dk is to give a more coherent user experience of public digital services and to provide a view of the new Denmark as a result of the municipal reform. The vision is also to make it faster and easier for the citizen to become self-served through the Internet, to encourage the use of and the knowledge of digital citizen services, and to give an insight into the public sector and its democratic work (IT- og Telestyrelsen, 2006). By 2008 Borger.dk will according to the plan consist of a citizen guide and a Mypage-unit with coordinated and coherent access to digital self-service solutions and the individual citizen's own data.

Mypage was launched in December 2006, after two years of intensive work. The vision of Mypage is to contribute to a simpler and more effective dialogue between citizens and the public sector. Another aim is to give an overview of what information the individual departments have concerning the individual citizen (Moderniseringsdepartementet, 2005). Mypage is part of Norway.no, which acts as a gateway to the public sector in Norway.

The vision for the Danish citizen portal may look broader than the Norwegian vision. Denmark has recently completed a municipal reform that was implemented in January 2007, and the citizen portal is to be a navigational aid after the reform. The Danish portal also emphasizes the promotion of digital self-service and

insight into the public sector, while the Norwegian portal emphasizes insight into and access to the public sector's information about the individual.

4.3 Characteristics of citizen portals

This section references keywords presented in chapter 3.3, table 1.

4.3.1 Goals

Both portals have their articulated goals. The goals shall support the vision for the citizen portal and for the nation's vision for e-government in general.

The superior object with Borger.dk is to simplify citizens' contact with public government.

According to the eNorway-plan, Mypage shall be an online electronic public service, allowing the general public to access services from a personalized window with a secure logon. Mypage shall be a user-defined service in which relevant information about each individual is available in one place (Moderniseringsdepartementet 2005, p 10).

We wish to point out that the given objectives for Borger.dk are based on the present version, and that these are likely to be elaborated with the introduction of the customized Mypage- part of the portal, in the new strategy for digital government. While the Danish portal intends to simplify communication with public government through the Internet, the Norwegian portal has elaborated its objectives, in the sense that the pages are customized and the citizen can access electronic services with a secure logon. The reason why this is not mentioned in the Danish vision is probably a result of the fact that Denmark is at an earlier stage than Norway, regarding implementation of the personalized part of the portal.

4.3.2 Information

The Danish Borger.dk currently contains an information section about public administration. The information is structured thematically, with 18 topics, but the user can choose to view it alphabetically. In addition to this the portal contains a self-service component where the user can link up to different public authorities and agencies that offer interactive services. Self-service can vary from printing out a form, to electronically reporting relocation to a new address in the national register. The service also includes an option for selecting municipality. The personalized part of the Danish portal will be organized thematically, and will include themes like *MyPension*, *MyHouse* etc.

The menu in Mypage consists of different topics, each containing different services. Mypage offers different types of services, such as *register* and *transaction* services. Transaction services allow the user to carry out an actual service linked to an agency or local authority. The register services will display information stored about the citizen in various departmental registers. Examples of such information are *MyAddress*, *MyProperties* or *MyFamilyDoctor*. In Mypage you can select one or more municipalities and a link to the municipality's home site and services. Mypage does not contain public information, as its function is to give access to personalized services, while the *mother portal*, Norway.no¹, contains public information and functions as a guide to such information.

Both register and transaction services will be carried out on the agencies own website (a municipal or governmental website). The owner of the service has full responsibility for it.

In Norway the task of getting more municipalities and agencies to take part and make their services available on Mypage is given continuous priority. The idea being that the more services that are included in Mypage, the more value Mypage will have for the citizen.

The Danish portal secretariat experiences that municipal and governmental agencies take a strong interest in having links to Borger.dk, seeing their role as partners that can help citizens in search of the right information. The integration of new services is not a particular focus, since the portal is under development.

¹ For this purpose we refer to the main portal Norge.no as Norway.no. This is not completely correct as Norway.no really is only a partly translated version of the main portal. Still we find it best to call the portal by its English name in this article. For interested resources we therefore recommend them to visit www.norge.no, as www.norway.no will show other information.

4.3.3 Technology and security

According to the initial Norwegian plan, authentication and logon to Mypage should be based on a common public security portal. However, the business model was not accepted by the vendors of PKI (public key infrastructure), and the general agreement concerning security portal services was discontinued. Instead, it was replaced by a temporary solution based on PIN-codes from the Directorate of Taxes (Fornyings- og administrasjonsdepartementet, 2006a). A revised strategy on eID and e-signatures in public sector is out on hearing by February 2007.

At Borger.dk, authentication for the self-service operations requires the user's PIN-code or digital signature, and the service vendor decides which authentication is required. When the Mypage- section is integrated in Borger.dk, authentication will be solely through digital signature.

Both portals are based on single sign-on, and the citizen can use all the services that reside in the portal. The amount of data stored in the portals is kept to a minimum.

Privacy protection has been given high priority during the development of Norwegian Mypage, and it has also been focused on during the development of Borger.dk. The major difference regarding authentication is that while Denmark has chosen digital signatures, Norway is still searching for a permanent solution.

4.3.4 Processes

The development of Mypage in Norway has been organized as a reception and a vendor project. The vendor project consists of the vendor developing the technical solution. The reception project, directed by the Ministry of Government Administration and Reform, comprised representatives from a number of public agencies. These were responsible for the specification and clarification of all circumstances tied to the project solution.

In Denmark, the further development of Borger.dk will be supervised by a broadly based project group, directed by the Ministry of Science, Technology and Innovation, and KL. The project group will be responsible for specification, deliveries and coordination (Den Digitale Taskforce, 2006).

Common to both cases is that a broad compound collaboration has been established between the authorities and the various agencies. The municipalities however do seem to have been involved to a larger extent in Denmark than in Norway.

4.3.5 Administration and operation

An administration has been established to manage, operate and further develop Mypage, with close links to the public service that operates Norway.no. Tasks will include adding new services to the portal, and maintaining contact with vendors and government.

In Denmark there are plans for establishing a coordinating editorial office and a contact center for user support and guidance. These two units will work with editorial guidelines for the citizen portal, cooperation with municipalities and agencies, and user support and guidance (Den Digitale Taskforce, 2006).

4.3.6 Implementation

The Danish Borger.dk had approximately 250 000 users two weeks after the portal had been deployed (Borger.dk, 2007), while Norway's Mypage had 100 000 users three weeks after being deployed (Fornyings- og administrasjonsdepartementet, 2007). In Denmark, users of the old portals, Netborger.dk and Danmark.dk, are redirected to Borger.dk. This may be one of the reasons for the higher numbers in Denmark. The difference may also be ascribed to the fact that Mypage does not include public information, as is the case with Borger.dk.

In Denmark there are plans for assigning staff at libraries and municipal service centers the task of being ambassadors for Borger.dk (Den Digitale Taskforce, 2006).

When Norway's Mypage was launched, an information letter and PIN-codes was distributed to 4 million citizens, and this was followed by press releases and advertisements in the media.

5. Conclusion

We have compared two citizen portals similar in the sense that they both provide services to the public. The Norwegian Mypage is a collection of personalized services, where authentication is required in order for the individual user to access his or her own services. Denmark has chosen to gather both public information and self-service operations in one portal; Borger.dk.

Why are citizen portals created? Our findings indicate that citizen portals are developed to give a more open government administration and to give citizens easy access to public information and services.

How does one deal with matters of security? Denmark wants to use digital signature for authentication, and there is a long-term strategy that supports this as one of many common components in the citizen portal. Norway is still working towards a mutual security solution for public sector. There is a strategy on PKI in public sector, and an ongoing strategy work on eID and e-Signatures. A temporary system for authentication is in use on Mypage at present time.

How is portal development organized? The development of the two portals has been organized in much the same way. In both countries the projects have been broadly based, with participants from the authorities and different underlying agencies. It seems that greater attention has been paid to the municipalities in Denmark than in Norway.

6. Limitations and future research

We have compared the portals as they were at the time we undertook the comparison. In Norway, Mypage is already developed and deployed. In Denmark, the Mypage part of the portal is still being developed. It may be important for the result of our comparison that there are differences in stage of development, with regards to the personalized part of the citizen portals.

Our research has been performed as a case study. The case study evidence was used in presenting and comparing the citizen portals. Interviews and other types of documentation are inevitably colored to a certain extent by the views of the interviewee and those who have written the documentation. Our subjective interpretation of statements and literature will also characterize our presentation. We also bring with us a predisposed attitude because of our involvement in the development of the Norwegian portal. We have, however, aimed at objectivity regarding our findings and our presentation in general.

We have focused on only two citizen portals, and these two have many similarities. Our focus has been to compare only parts of the portals, excluding other aspects such as infrastructure, technical construction, and the transition from development to administration. We can in no way generalize our findings to be valid for anything other than the two specific citizen portals. With more time and resources available to compare a larger number of citizen portals we believe it is possible to create a more comprehensive and credible research result.

In future research we therefore recommend that a larger study with comparison of a larger number of portals is conducted. In doing so one might receive findings that can be generalized in a broader way. A possible future research on our own part is to continue developing the initial framework presented in this paper, and then conduct a more comprehensive study.

We believe future research should undertake a study with focus on portal users. Possible research questions might be: Are there differences in the number of users, frequency of use, the attitude of the users and/or the various services used? What might be the reasons behind differences discovered? It could also be interesting to find out if there are connections between development and initial deploying activities, and citizens' adoption of the portals.

We are under the impression that there have not been any comprehensive studies of citizen portals earlier. Future research should therefore focus on specific public services and different aspects of these services. One could also look at service providers in the portals as a starting point and look at their role in the development of electronic services. We believe a study of the different operators and stakeholders in the development of citizen portals also could make an interesting case. Another phase of interest in such a study could be the implementation phase.

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