

Why E-government Usage Lags Behind: Explaining the Gap between Potential and Actual Usage of Electronic Public Services in the Netherlands

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Abstract. Most of the EU-15 countries illustrate a gap between potential usage and actual usage of electronic public services. Using a model of four successive kinds of access to digital technologies a number of explanations are sought. They are tested in the case of current Dutch electronic governmental service usage. Motivational access indicates that there is a part of the Dutch population that doesn't have sufficient motivation for using computers and the Internet. It also appears that even in the Netherlands, a top country regarding Internet and broadband connections, physical access cannot be taken for granted. Insufficient digital skills produce serious problems as well. But the most striking facts are found in the context of usage access. Here we have observed a lack of user orientation in Dutch e-government services. It appears that the Dutch government doesn't know what citizens want, how they use ICT and what the consequences for citizens are.

1 Introduction

As a result of increasing development and use of the Internet over recent years, almost all public authorities of the European countries have waged efforts to offer electronic services. These efforts have reached different degrees of sophistication in European countries [1]. While some countries have already developed services of full online transaction, communication and service handling, others are only offering basic information. Increasingly, entire procedures are planned or designed in such a way that they can be settled fully electronic [2]. Both public authorities and citizens are able to benefit from online services. For governments potential advantages are increased competition, increased efficiency by reduced redundancy and system integration, a stimulation of democratic principles by more transparency of governmental processes and the improvement of service provision for citizens and companies [3].

Potential advantages for citizens of electronic government are summarized by Michael Cross (Guardian Online 16.07.98): Round the clock government,

one-stop shops (tell the government only once instead of form filling for different departments), electronic benefits (no more queuing and information-sharing across departments reducing fraud) and open and cheaper government (better public access to information encouraging efficiency and democracy). A necessary condition for citizens to make use of these advantages is physical access to the Internet. In Table 1 the percentages of individuals in the EU-15¹ who accessed the Internet in the three months prior to a Eurostat survey are summarized.

Table 1. Percentage of individuals who used the Internet in the three months prior to the survey

Country	DK	DE	EL	ES	FI	IE	LU	NL	AT	PT	SE	UK
2003	71	54	16	37	66	31	53	64	41	26	77	61
2004	76	61	20	40	70	34	65	69	52	29	82	63

Source: Eurostat

Table 1 shows the potential number of individuals that could make use of the electronic government services offered. In Table 2 the actual use of the internet for obtaining information from public authorities' websites is summarized.

Table 2. Percentage of individuals who used the Internet in the three months prior to the survey for obtaining information from public authorities' websites

Country	DK	DE	EL	ES	FI	IE	LU	NL	AT	PT	SE	UK
2003	39	23	6	20	39	10	25	15	14	10	41	19
2004	43	31	7	22	43	11	36	17	18	10	36	20

Source: Eurostat

Interesting findings are exposed while comparing Table 1 with Table 2. The tables show that none of the EU-15 countries have a 100% match between potential and actual usage of online governmental information. There are several possibilities to explain this discrepancy. In some countries geographical distances may encourage citizens to use e-government services, other countries may have a successful multichannel approach that divert citizens from the web to call centers and service desks. And last but not least, variables such as quality and user friendliness of e-government services may influence the take up of e-government usage. However, these factors mainly address the supply side of electronic governmental services. We would primarily search the reasons for the gap between potential and actual use of these services more close by, that is at the demand side and with the actual access by users to the technology required.

In this article we will demonstrate that a model of successive kinds of access to digital technologies [4,5] is able to serve as a framework for a number of explanations of the actual choice and usage of electronic government channels

¹ Belgium, France and Italy are excluded in Table 1 and 2 because of unavailable data for these countries.

in the case of the Netherlands. This model presupposes a broad conception of access as a full appropriation of technology by users, from the motivation to use the technology to its actual usage. The choice of the Netherlands is particularly interesting because according to CBS Statline (2005), only 24% of the Dutch citizens used the Internet for visiting public authorities' websites in 2004. The low level of usage in the Netherlands is remarkable considering the fact that this country is the second country of the world in broadband diffusion, after South Korea [6]. The Internet diffusion in this country is comparable to, for example, Denmark, but in Denmark the use of public authority electronic services is more than two times as high!

The next section introduces the model of successive kinds of access to digital technologies, followed by a large section that elaborates the Netherlands as a case study. Finally, section four contains the concluding remarks.

2 A Model of Successive Kinds of Access to Digital Technologies

To explain the discrepancy described in the previous section we will focus on the different kinds of access that are required for using electronic services. A model of successive kinds of access to digital technologies is introduced the figure below.

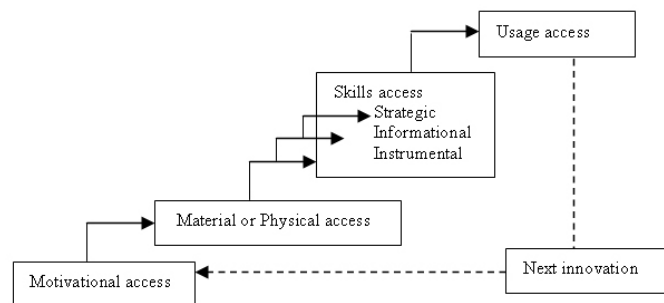


Fig. 1. A cumulative and recursive model of successive kinds of access to digital technologies [4,5]

In figure 1 van Dijk [4,5] distinguishes four kinds of access that are necessary to obtain full access to a specific digital technology. The model is called accumulative and recursive because the types of access follow on top of each other (e.g. motivation is a condition for the purchase of physical access) and because the whole process recurs with every distinct new innovation in digital technology. The first condition, motivational access, is an adequate level of motivation of potential users to adopt the technology. This mental barrier varies from little interest in or need of the technology, to real computer anxiety. The second condition is material or physical access. People need enough material resources to

acquire the necessary hardware, software and services. Evidently, public opinion and public policy are strongly pre-occupied with this kind of access. After motivational and physical access users need to have an adequate level of digital skills to handle the services offered. The final type of access is usage access. This primarily means the number, type and diversity of applications used. When someone has a computer and Internet access, and is able to work with them, it is not at all granted that this person will actually use them. This will only happen when a particular application is needed. In this context, usage access will not explain the exact statistical figures of the gap between potential and actual usage, but it can help to shed light on the restraints that the usage statistics suggests, the most important restraint being actual need or a supply of applications that meets demand. This will be demonstrated in section 3.4. The kinds of access are not just simply present or absent. The measure of presence, for example the level of digital skills attained and the diversity of applications used also is important.

According to this model the gap between potential and actual usage might be explained by aspects of the following types of access that will specify the paragraphs in the following section: Motivational access, Material access, Digital skills, Usage access;

3 The Dutch E-government Usage Case

The development of electronic public services in the Netherlands is rather ambitious. In 1996 the Ministry of Internal Affairs introduced the OL2000-project, that was developed to realize provision of services controlled by the demands of citizens and companies and not by the supply-side view and organization of traditional government departments. Many other programs were introduced to promote and advance the development of electronic services. For example the 'Actieprogramma Elektronische Overheid' (Action Program Electronic Government), issued in 1998, proposed and realized a 25% online availability of all public services in 2002. In 2003 this program proposed to extend this result setting the next objective at an electronic settling of 65% of all public services in 2007. Driven by the opportunities of the technology, the goals of government such as a realization of New Public Management objectives, attention in the media and the supposed needs of citizens, a lot of governmental information was presented online and several services were offered electronically. But, as the gap to be explained clearly demonstrates, the policy to offer as much as possible online does not match actual demand.

To (partly) explain the gap between the big and fast growing supply of electronic public services and the demand that is lagging behind the four types of access discussed will serve as a framework for the presentation of relevant usage data. Our analysis is based on a number of national studies published earlier and on data we received from several national and municipal governmental departments. It needs to be emphasized that many of the government organisations addressed did not appear to collect user data and were not able to deliver useful information.

4 Motivational Access

The first access condition is motivation. Research in the Netherlands that explores motives whether or not to use the Internet is scarce. Citizens that lack motivation to use computers and the Internet have several reasons as shown in Table 3. This lack of motivation might be induced by shortcomings in confidence, a lack of interest or need, or it might be due to computer anxiety [4,5].

Table 3. Reasons not to use Internet at home 2002-2004 (amongst non-possessors)

	2003	2004
Not interested, not useful	33	34
No suitable PC	30	29
Too expensive	17	16
Thinks he or she is too old	10	11
Lack of knowledge, skills	9	9
Has Internet access elsewhere	8	10
Other	21	21

Source: CBS Statline

Most of the respondents indicate that they simply are not interested in using the Internet. Another group indicates that they don't have a suitable PC. Other barriers for using the Internet at home are that it is too expensive or that they lack the knowledge or skills required. If we specify Internet access further to the use of governmental sites, there is no relevant research considering motivational access. Some municipalities did surveys amongst their inhabitants but this has produced only superficial reasons, such as the citizens of Dordrecht that never used the municipal website because they did not need it (56%) or because they did not have access to the Internet (32%).

It won't be easy to close the motivational gap in using governmental sites on the Internet. People that consider access too expensive can be motivated by providing physical access in public places or, in some cases, subsidize the purchase of computers and connections [4,5]. However, just granting physical access will not be sufficient. Without in-depth knowledge about the citizens motives to (still) prefer traditional channels instead of electronic channels, the government will not be able to take the necessary steps to meet the preferences of citizens.

Although little research has been done for the motivation to use electronic government services in the Netherlands one can safely say that motivational access is a problem because it is a general reason for not having access to the Internet. So, it also might be a first potential explanation for the discrepancy described. However, we don't think it is the main problem when we consider electronic *government* services. According to Table 2 usage of governmental websites in Finland and Denmark is high, while there is no obvious reason to assume that the people in these countries differ from the Dutch in motivations for using the Internet. According to the international comparison of cultures by Hofstede [7]

Dutch and Scandinavian culture are rather similar. The same goes for the nature of the welfare state and the political system of the countries concerned. So, although a part of the Dutch inhabitants lacks motivation, the causes of the discrepancy considering electronic public services probably has to be sought elsewhere.

4.1 Physical Access

According to Table 1 the amount of Internet users in Netherlands is among the highest. In international perspective the Netherlands has a very high penetration of broadband Internet access, just under leader South Korea. In Table 4 the Internet possession of households and individuals is summarized.

Table 4. PC-ownership with Internet access of the Dutch population over 12 years of age (2000-2004)

	PC-ownership with Internet access				
	2000	2001	2002	2003	2004
% per household	38	48	55	59	64
% per person	45	56	64	68	73

Source: CBS Statline

Although the percentages of possession are quite promising, statistics about the actual usage of computers and the Internet differ considerably. In Table 5 ICT usage is illustrated for Dutch citizens that have access to computers and the Internet.

Table 5. ICT usage in the Netherlands of persons over 12 year of age (%)

	2003	2004
Used a PC	72	74
Used a PC (% of PC owners)	83	84
Frequency PC usage at home (% van PC-bezitters)		
daily	40	45
once a week	35	33
once a month	8	7
not at all	17	16
Uses Internet at home (% of Internet owners)	79	81
Frequency Internet usage at home (% of Internet owners)		
daily	32	37
once a week	38	37
once a month	9	6
not at all	21	19

Source: CBS Statline

According to Table 5, only 81% of the people that have Internet access at home actually use this medium. This is divided in 37% daily, 37% once a week and 6%

once a month, indicating that only 74% of Internet owners can be considered as regular users. Nineteen percent of the people that have Internet access at home (73% in 2004) do not use this medium at all. Thus, only 59% of the Dutch population in 2004 used the Internet more or less, and 41% not at all.

This lack of usage exists not only among the usual groups lagging behind, seniors and people with low education. Young people also are different in physical access and actual usage. Particularly considering the extent and variety of usage low educated youngsters and youngsters living in low income households spent less time on the Internet. The assumption of some governments that the Internet is a commonly available channel, or will be in some years, is not valid and it is dangerous. There still are deep divides in the possession of computers and Internet connections in Europe [8]. The main demographics explaining these differences are age, education, income and ethnicity [5] [8].

Even though the Netherlands is one of the top countries in the number of Internet connections, a more thorough examination proves that this does not mean that all those connected actually use the Internet. So, physical access is an important aspect one should not take for granted. However, this also goes for a series of other countries in Table 3 that reveal a much higher use of electronic government websites than the Netherlands.

4.2 Skills Access

The next potential cause is a lack of digital skills. According to the model in figure 1 van Dijk [4,5] divides digital skills in operational skills (the ability to operate a computer, network connection and websites or web applications), informational skills (the ability to find, select and process electronic information) and strategic skills (the ability to use electronic information and services to realize a specific goal and to improve ones social position).

Table 6. Digital skills of the Dutch population divided by social-economic position, people aged 18-65, 2001 (means) on a *ninepoint*-scale

	Employed	η/R^1	Unemployed	η/R^1	Unemployable	η/R^1	Housewife/man	η/R^1	Total	η/R^1
Male	6,13	0,20	5,02	0,16	3,31	0,28	2,20	0,03	5,80	0,28
Female	4,76		3,82		1,59		1,87		3,81	
18-29	6,52	-0,23	5,47	-0,35	5,82	-0,22	4,02	-0,37	6,55	-0,39
30-39	5,94		4,54		2,14		3,10		5,46	
40-54	4,91		3,06		2,29		1,75		4,27	
55-64	4,14		1,52		1,96		0,92		2,35	

1. η (eta) is an association measure for nominal variables (sex), R is the linear effect of an ordinal variable (age). Source: CBS

Table 6 points out that specific groups of citizens, like seniors (55+) and housewives/men that have computer access, do not, or barely have the necessary skills to operate their computers according to self-reports in a survey. The skills measured in these self-reports were a combination of mainly operational skills

and some information skills. If these groups score low on these general skills, it might be reasonable to expect that they will not be able to use specific electronic government services, when the design of these services is not appropriate for them. These services presuppose not only that citizens possess operational and informational digital skills but also particular knowledge about the workings of government and its uses of information technology and the strategic skills to use this knowledge for own purposes.

Research that tries to estimate the level of digital skills of Dutch citizens is very scarce and it is often based on self evaluation. Performance tests of actual skills possessed are better. In a Ph D project Eszter Hargittai [9] [10] practiced such performance tests of a number Internet tasks among experimental subjects. Giant differences of success or failure of these tasks and the time required to finish them were recorded among subjects with different age, educational background and sex. This is alarming since people will be inclined to finish the task they are charged with in an experimental environment. When they cannot find or accomplish something in the real life of Internet use people will stop searching and using the application much earlier.

Just like we did with motivation and physical access, we have to conclude here that the Internet is not (yet) a generally accessible information, communication and transaction channel for citizens. Van Dijk [5] claims that people with higher social class, higher education, males and youngsters are the first and best in developing digital skills. According to Claeys and Spee [11] experienced Internet users have developed a further set of complex skills for finding and processing information, in this way increasing the chance that the gap deepens between early and skilled users and the late majority and laggards that only possess basic skills.

The problem of being short of skills becomes urgent when governments suppose that citizens are able to do about everything on the Internet. There are recent examples in Dutch government communication that indicate this. For example the municipality of Nijmegen sent its citizens a letter about the real estate appraisal-value of their houses. This letter referred to the Internet for more specific information about the value of their houses and comparative real estate used for the appraisal. This led to huge problems, not only because the website wasn't ready on the date specified, but also because a lot of citizens didn't have the skills to access their real estate information on the municipality's website.

Again, there is not much reason to think that the digital skills of the Dutch population are so much inferior to those of the Scandinavian peoples, or other people from countries with more frequent public authority website use, that they would be able to explain the difference. So, we will have to look further.

4.3 Usage Access

The last kind of access is usage access. This section covers the types of electronic public services that people choose or do not choose to use. It doesn't provide a statistical proof, but it might help to discover the deeper causes of the gap between potential and actual use. To gain more insight in the type of services

used and in the level and diversity of usage, we gathered information on both the national and municipal level. The availability of information often was limited to simple web statistics that do not carry much information about actual usage. We discovered that different organisations used different methods for keeping up with their data. Organisations that could provide the most useful and reliable information are included in this section. But as mentioned before, we found that many government organisations did not appear to collect user data at all.

Bongers et al. [12] conducted research to get a clear overview of the desires, expectations, conditions and experiences of citizens in relation to e-government. They concluded that Dutch citizens do not undertake as much activities on governmental websites as on other websites, for instance in e-commerce. Online facilities such as using interactivity (e.g. asking questions or giving opinions), sending forms or performing transactions are scarcely used. Most people only use online public services to gather information about products or services.

On the municipal level usage is extremely varied. There still are small municipalities that only have one webmaster who can spend 16 hours a week on site development, while other bigger municipalities are granted large amounts of money for the development of electronic services. In Eindhoven, one of the bigger municipalities that have put much effort in the development of electronic services, almost 45% of the visitors of their website were searching for addresses of municipal institutions [13]. The main reasons for visiting the website were searching for information, reading news (25%), searching for contact (7%) and visiting the digital service counter (2%). The few people that did use the electronic counter mainly used it for passing on removals and applying for forms [14].

In Amsterdam one of the main conclusions was that 41% of their website visitors were searching for general information. A large part (29%) was only looking for opening hours of the office. In the municipality of Dordrecht 18% of citizens used the digital service counter on the website in 2003. Users were asked for the purpose of their visit. Most people were searching for information (67%). Another part visited in order to make service desk appointments for their driving license or passport. The most important reasons for citizens of Sint Michielsgestel for using the website were searching for opening hours, reading current news and curiosity. Most services that the website offers are hardly ever used. From the people that use the Internet, only 44% is aware of the fact that their municipality offers a digital counter desk. Seventy percent of this group never used products and services available on the website.

Enschede is one of the municipalities that is financially supported for developing electronic services by national government. This resulted in a broad variety of online services. However, most of these services are barely used. Only a few products seem to be appropriate for online settlement. In Table 7 three of these services are shown. This table indicates that even in one of the most successful municipalities the most frequent services are still used occasionally, despite the fact that these are still simple services and that citizens were given a discount for retrieving birth register statements online.

Table 7. Comparison between electronic and traditional channels for three products in 2004

	Electronic	Traditional
Births	426	2.454
Divorces	34	276
Birth register statement	1130	18.991

Source: Municipality of Enschede.

In the municipality of Beverwijk 15% of the website visitors also visited the product catalogue of which only 6% eventually used a form. A direct comparison with traditional services is not available but the municipality indicates that the proportion of traditional services to electronic services is roughly 95 to 5 percent.

On the national level the Belastingdienst is one of the success stories regarding public electronic service delivery. The Belastingdienst is the Dutch Tax and Customs Administration. The number of electronic tax declarations is reasonably high, what is also caused by the fact that Dutch citizens are obliged to fill tax forms themselves. Unfortunately, very few data are available that show who performs the declarations, citizens or their financial advisers. Table 8 contains the percentage of electronic declarations from 2000 until 2004.

Table 8. Number of electronic declarations (%)

	2000	2001	2002	2003	2004
Total % of electronic tax declarations	31	35	76	81	81
By disk	26	44	59	50	40
By modem	74	56	41	50	60

Source: Belastingdienst

Table 9. Number of users of the different channels of the Informatiebeheergroep

	2001	2002	2003	2004
E-mail	204.000	227.000	237.000	260.000
Internet visits	1.500.000	2.100.000	3.000.000	4.300.000
Modifications using the by Internet	37.000	77.000	123.000	187.000
Question and answer module	232.000	538.000	859.000	1.480.000
My IB-Groep new users	-	17.600	72.000	100.000
My IB-Groep consultations	-	23.000	184.000	378.000

Source: Informatiebeheergroep

Another successful Dutch public institution regarding electronic services is the Informatiebeheergroep, which is responsible for the execution of several services such as student grants. The website counted 4.3 million visitors in 2004, a large number compared to earlier years. A third of the visitors used the FAQ (almost doubled compared to 2003). Table 9 illustrates the number of users of the different channels. The UWV is the Dutch body responsible for paying social benefits such as unemployment benefits. In 2004 the website added a FAQ module that

seems to have satisfied an important need. The amount of questions rose from 7.000 in April to 54.000 in December 2004. At least 400.000 customer questions were answered using the FAQ in 2004.

The main conclusion in this section is that as far as statistics show the largest part of the Dutch citizens only use simple electronic government services, both on the national and the municipal level. On municipal websites citizens appear to mainly search for information like addresses and telephone numbers. On the national level FAQ modules are popular. So, the main function of online public service delivery in the Netherlands is providing information. Other, more advanced services, are hardly used. This means that the more advanced services that are supplied do not meet demand. One of the few exceptions are the popular transactions of the electronic tax declaration. Others might become popular as well, but the problem is that the Dutch government does not know what advanced services of communication and transaction the different sections of the Dutch citizenry want. Dutch e-government is strongly supply-side oriented. A recent EU survey showed that the Dutch are in the forefront of using e-commerce on the Internet (CBS Statline, 2005). Table 3 shows that they are in the middle or the back accessing e-government. This strange contradiction can only be explained by a unsatisfactory match of government supply and citizen demand, in our view. This is a matter of usage access as potential usage is not realized because of insufficient popular usage opportunities.

5 Conclusion and Further Research

In this article we have shown that insufficient access to digital technologies might explain the conspicuous gap of potential and actual usage of electronic government services in the Netherlands. A lack of motivation, physical access and digital skills is very important for the general lag of usage of these services. However, they cannot explain the large differences of the actual use of electronic government services between the Netherlands and, for example, Scandinavian countries and the surrounding countries of Germany and Luxemburg, comparable countries regarding physical Internet access. Dutch e-government gets stuck in problematic usage access, a mismatch of the supply and demand of services. Dutch government organisations pay a lot of attention to supply, offering as much electronic services as possible. This quantitative approach goes at the expense of a more qualitative approach that tries to identify the specific services different segments of the Dutch population are interested in and tries to focus supply on this demand. Such a quantitative approach would be unthinkable in e-commerce, but apparently e-government can get away with it . . . for some time. Possibly, the gap between potential and actual usage of electronic government services in some other European countries, as revealed in the comparison between Table 1 and Table 2, also is to be explained by a mismatch of supply and demand. Generally speaking, a supply orientation dominates European e-government policy as exemplified by the benchmarks for e-government such as those offered by Accenture and the European Union. These benchmarks reveal

a strong preference for the supply of the most advanced and extended electronic public services. The attention for the actual demand and usage of services by European citizens is only secondary, to put it mildly. Further research has to investigate whether a mismatch between supply and demand also exists in these countries. Or that the other types of access (motivation, physical access and digital skills) are comparatively more important. In a much larger international comparison of all important supply and demand factors of electronic government services in Europe it would be important to also pay attention to the supply side factors of the social, technological, political and public administration systems in these countries. All these factors taken together might give a full explanation of the conspicuous gap between the potential and actual use of electronic government services in Europe.

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