E-Services for Citizens: The Dutch Usage Case

Jan van Dijk[1], Willem Pieterson[1], Alexander van Deuren[1], and Wolfgang Ebbers[2]

[1] University of Twente, Research Program Governments and ICT
Department of Media, Communication and Organisation
P.O. Box 217, 7500 AE Enschede, The Netherlands
{jan.vandijk,w.pieterson,a.j.a.m.vandeursen}@utwente.nl
[2] Telematica Instituut, The Netherlands
Wolfgang.Ebbers@telin.nl

Abstract. In most countries, the maturity of eService delivery is measured by the supply of electronic service delivery. However, in many countries there is a gap between the supply and demand of eServices. We studied the actual use of eServices and the potential use of eServices in the Netherlands. We found a gap between the actual and potential use of eServices. Main explanations for this gap are the lack of knowledge about the availability of eServices, the media use characteristics and the social characteristics of the (non)users. Conclusions of our study are that the potential usage is high and second, simply putting services online is not enough. People have to get to know the services and need the skills to use them. Implications for future research are that we need a deeper understanding of factors that underlie the use of eServices, since supply alone will not lead to use of eServices.

Keywords: eServices, service usage, citizens, electronic service delivery.

1 Introduction

Almost all public authorities in the European countries have waged efforts to offer services electronically. Several programs are introduced to promote and advance the development of electronic services. In the eEurope 2005[1] program one of the objectives was that "the Member States should have ensured that basic public services are interactive, where relevant, accessible for all, and exploit both the potential of broadband networks and of multi-platform access". Nowadays, the Netherlands aims at offering 65% online availability in 2007 [1]. In sum, in policy plans, the supply of eServices is dominating. According to van Deursen et al. [2] the attention for the actual demand and usage of services by European citizens is only secondary. They described the existence of a gap between supply and demand of online services and discovered that a lack of motivation, physical access and digital skills are very important for the general lag of usage of online public services. However, these factors cannot explain the large differences of the actual use of electronic government services between the Netherlands and, for example, Scandinavian countries (comparable countries regarding physical Internet access).

[1] (Com(2002) 263; eEurope 2005: An information society for all).

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The gap between supply and demand of eServices just described calls for more understanding of the use of eServices and the characteristics of the eServices user. Currently, we lack knowledge about the use of services and about users, mainly because government's own recorded data are fragmented and incomplete [3], so no complete picture can be drawn.

In this paper we explore the use of eServices from the perspective of the Dutch citizen. We present the main results of a nationwide survey of current (2006) use of eServices in the Netherlands. We focus on the actual usage of eServices, on both the local and the national level. Furthermore, we take a closer look at the characteristics of the eService users and the non-users. By doing so, we try to gain more insight in the factors that my help or hinder the future development of eServices.

First we draw the background of the study describing the development of eServices in the Netherlands in the European context, the different typologies of eServices and the existing knowledge of the field. We conclude this section with a number of research questions. After a description of the methodology used section four contains the results of the study. In the next part we draw conclusions regarding the research questions. We end our paper with some points of discussion and suggestions for future research.

2 Background

The Netherlands have always been ambitious when it comes to the development of electronic public services. In fact, the Netherlands was among the first European countries having eGovernment programs. In 1994, the first national ICT-action program was being introduced. In 1998, the 'Actieprogramma Elektronische Overheid' (Action Program Electronic Government), was launched. This program proposed and realized coverage of electronic public services that reached 25% of total services in 2002. Subsequently, in the 2003 program 'Andere Overheid' (Different Government) the objective was an electronic coverage of 65% of all services in 2007.

Nowadays the eServices situation is fairly complex in the Netherlands. On the one hand there are areas in which developments in the field of eServices (supply) continue to go at a high pace. The IB-Groep, responsible for the study grants in the Netherlands is among the European front runners when it comes to both the supply and demand of eServices. The same applies for the Dutch Tax and Customs Administration, which received 82 percent of the income tax filings electronically by 2005. On the other hand, some drawbacks can be observed. When it comes to the use of service channels, including those needed to prepare electronic income tax payment, the traditional channels, such as telephone and front desk, remain the most important means of interaction, despite the efforts of the government to persuade the citizens in using the electronic rather than the traditional channels [4, 5]. Finally, and most important, as mentioned previously, there is a large gap between the supply and demand of eServices [2]. Many of the services being offered online in the Netherlands are hardly being used and only a few services are responsible for the bulk of the eservice usage in the Netherlands.

In reaching the targets of online availability of eServices, what should be classified as a service and when is a particular service fully online? To answer these questions a

number of operational definitions and models to distinguish public eServices have been proposed [e.g. 6, 7]. The most popular model is used by the EU for benchmarking eEurope [8]. It consists of a set of indicators. Two of them concern eGovernment: the percentage of basic public services available online and the use of online public services by the public for information purposes or for the submission of forms. The following stages are applied in several countries to specify these indicators and measure the level of online sophistication of services:

Stage 0	No information;
Stage 1	Information: online information about public services;
Stage 2	Interaction: downloading of application forms;
Stage 3	Two-way interaction: uploading of application forms;
Stage 4	Transaction: case handling; decision and delivery.

Though this model and the others referred to reveal a supply-side orientation - they depart from the capacities of the eservice or website supplied - this EU benchmarking model also offers the opportunity to observe to which level citizens actually use eServices: do they only retrieve information or do they also engage in two-way interactions and transactions? Therefore this model is used as one of the analytical instruments in describing eservice use in the Netherlands.

2.1 Research Goals and Questions

The primary goal of our research was to deliver a descriptive overview of the actual usage of the most important, most widely used electronic services in the Netherlands in 2006. These are the services offered by municipalities (local level), by ministries and by their executive authorities (national level). Services from provinces and regions, as well as semi-public and fully privatized organizations are outside the scope of this research. Furthermore, we wanted to gain insight in the potential use of the eServices, considering the internet connectivity of the population and the intention to use the Internet. The secondary goal was to gain more insight in the characteristics of the eServices users and the knowledge of the availability and the attitude towards the use of eServices.
These two aims result in five research questions:

1. *What is the actual usage of eServices by Dutch citizens?*
2. *What is the potential usage of eServices by Dutch citizens?*
3. *What are the attitudes towards use of eServices of Dutch citizens?*
4 *What is the level of knowledge about the availability of eServices of Dutch citizens?*
5. *Who are the users in terms of social characteristics and of media or channel use of services?*

To answer these questions, we conducted a nationwide survey. To ensure that both people with and without a computer and Internet connection would participate in our study, we used a two step research approach. In the first step, the telephone was used to select respondents for the main-questionnaire. Citizens with a computer and Internet connection were asked to fill an online questionnaire; citizens without them were interviewed by telephone. Citizens were also offered the possibility to have a personal face-to-face interview at their homes.

From the 4151 Dutch citizens that were contacted by telephone, 1896 agreed on participating. Eventually a total of 1225 persons completed the questionnaire. Formally, this is a response rate of 30 percent. Among the respondents 21% (n=255) appeared to be people without access to computers and/or the Internet. This percentage is close to the 19% reported by the Dutch Bureau for Statistics (see www.statline.nl, retrieved August 2006). The ultimate sample appeared to have an overrepresentation of seniors, women and people with higher education. To have our sample reflect the (demographic) characteristics of the Dutch population we weighted our data. However, the data did not significantly change by this operation.

The main questionnaire contained all questions related to the use of electronic services by citizens. For the group of respondents without computer and/or Internet connection, a special questionnaire was constructed. Questions about the use of eServices which they couldn't use were omitted and questions about reasons for not having a computer and Internet connection were added.

We measured the use of government eServices on two levels; the local level (municipalities) and the national level (various authorities). First we asked some general questions about the use of services (visiting websites and the use of e-mail) on both levels and than we turned to the use of more specific services. Next to services delivered by municipalities, we asked the respondents about services of the following national authorities: SVB (Social Insurance Agency), CWI (Centre for Work and Income), UWV (Employees' Insurance and Social Benefits Agency) and the IB-Groep (responsible for student grants). The services are displayed in Table 2. We only included services that were available electronically on a national level. This wasn't possible on the local level, since no service (except e-mail) is being offered on a 100% scale nationwide. Table 1 shows the levels of availability of the local services included in the study. These levels are based on the eEurope [8] model. For reasons of simplicity, we distinguish between information and transaction services in this Table.

We only asked the respondents about the use of a particular eservice when this service was relevant for them. For example, we only asked the students if they had applied for a study grant electronically.

Table 1. Availability of the five most frequently used eServices in Dutch municipalities[9]

eService	Availability in percentage of municipalities	
	Information (level 1)	Transaction (level 4)
Notification of the need of waste collection	85.0	6.6
Application for a building permit	24.8	71.1
Appointment to apply for a passport	89.7	2.8
Request for a certificate of birth or citizenship	54.0	15.0
Notification of address change	26.3	8.4

According to the figures in Table 1, the availability of different levels of eServices in the 467 Dutch municipalities is quite different. After e-mail (since 2005 available in all Dutch municipalities) the availability of services at the information level is especially high for making an appointments to apply for a new or prolonged passport (90%) and information about the collection of waste (85%). The availability of the

application for a permission to build is very high at the level of transaction (71%). Reason for this is that most municipalities simply link their website to the website of the Ministry of Housing enabling people to upload the form they retrieve from the municipal website.

3 Results

The following section will describe the results of the study. First, we describe the results of the first two (use and intention) research questions. In the second part, we present the results regarding the third, (attitude towards use), fourth (knowledge of the availability), and fifth (social and media use characteristics) research question.

3.1 The Actual and Potential Use of Public eServices by Dutch Citizens

Table 2 shows the general indicators of eGovernment usage by Dutch citizens in 2006, website visits and usage of e-mail. Of all Dutch citizens, 56% ever used an eService of the government. For Internet users this is 71%. The use of eServices by Dutch citizens addresses the local government (the municipality) more than the national government and visiting websites is more popular than sending an e-mail. Off all Dutch citizens 57% has ever visited a website of a municipality (Internet users: 71%) and 21% has ever sent an e-mail to the local government (Internet users: 27%).

Table 2. General indicators of eServices use by Dutch citizens 2006

		Internet Population	Total Population
Question	Answer	%	%
Did you ever use an electronic service of the government ?	Yes	71.0	56.2
	No	29.0	43.8
Did you ever visit a website of the local or national government?	Yes, local government	23.7	19.0
	Yes, national government	11.8	9.3
	Yes, local and national government	47.7	37.7
	No	15.7	33.1
	Don't know	1.1	.9
Did you ever send an e-mail to the local/national government?	Yes, municipality	16.1	12.7
	Yes, national government	10.7	8.4
	Yes, municipality and national government	11.0	8.6
	No	59.1	67.8
	Don't know	3.1	2.5

Table 3 illustrates the actual and potential (intentional) usage of more specific information and transaction eServices at the local and national levels.

Viewing the two columns of actual use we can draw the conclusion that most services are only moderately used in the Netherlands with percentages below 30 in 2006. This particularly goes for the electronic municipal and police services (between 12 and 36). The main exceptions are the most successful national eServices in the Netherlands, the income tax return and the job vacancy service for the unemployed

that reaches the big majority of this sub-sample. – With all services we first assessed whether the particular service was potentially needed by the particular category of people the respondent belonged to at the time the questionnaire was conducted. - The income tax return is used by 68.5% in our sample and by 82% of the population of actual tax payers as more narrowly defined by the Dutch Tax Administration. Job vacancy searches and applications are used by 87% of the unemployed because in practice this is almost obligatory in this country.

Table 3. Actual and Potential (Intended) Use of eServices in the Netherlands, 2006

		Actual use		Intentional use	
eService	n(*)	Yes	No	Yes	No
Municipal Services					
Notification of the need of waste collection	92	22.8	77.2	74.8	17.5
Application for a building permit	127	32.3	67.7	78.0	13.3
Appointment to apply for a passport	100	36.0	64.0	74.8	20.6
Request for a certificate of birth or citizenship	50	12.0	88.0	70.2	22.1
Notification of address change	141	19.9	80.1	86.7	9.3
E-mail service	967	28.1	69.5	76.5	15.1
Police Services					
Electronic report harm and offences	578	15.7	84.1		
Tax Services					
Income tax return	935	68.5	31.5		
Health care subsidy	537	24.2	75.8		
House rent subsidy	432	6.9	93.1		
Childcare subsidy	116	34.5	65.5		
Social Services and Benefits					
Unemployment benefit – information	544	23.9	75.7	81.2	10.9
Unemployment benefit – transaction	402	3.7	96.3	60.1	25.3
Vacancies/job search CWI – information	16	87.5	12.5	75.0	25.0
Vacancies/job search CWI – transaction	15	86.7	13.3	70.0	30.0
Study grant – information	36	77.8	22.2	100	-
Study grant – transaction	32	31.3	62.5	86.1	5.6
Old Age Pension – information	114	34.2	65.8	69.4	25.6
Old Age Pension – transaction	72	16.7	83.3	44.2	40.9
Child benefit – information	258	27.1	71.7	76.6	18.4
Child benefit - transaction	232	9.9	86.6	69.6	22.3
National Government Information Services					
Postbus 51.nl (public information site)	967	28.6	70.3		
Overheid.nl (national information portal)	967	25.6	70.5		
Websites of Ministries	967	41.9	50.8		
DigiD (citizenship number, optional)	511	43.2	56.8		

Note: * n = number of sub-sample potentially needing the service (967 = total Internet population)
For reasons of visual clarity Do Not Know percentages (remaining part, adding to 100) not exposed

Looking at the two columns of intended use we see that the potential of use of almost all of these services is much higher. Usually it reaches percentages between 70 and 80 (see table 3). We have measured this by asking a couple of questions right after the question of actual use of the particular eService. For those answering ‘no’, we asked whether they would use this service when it was available and at the time they needed it. When they answered ‘no’ this was conceived as the lowest level of

intention to use the service. When they answered 'yes' this was interpreted as a medium level of intention. Actual use of the particular service was labeled as the highest level of intention. This distinction between actual and intended use enabled a more or less exact determination of the potential of the use of eServices. Adding the measures of intention of all local and national services we found that there was an overall correlation of +0.542 (on a regression scale from – 1.0 to + 1.0) between actual and intended use. For the local services this correlation was only +0.383. This means that the potential of growth for municipal eServices in the Netherlands is higher than that for the national services.

For several reasons, containing too much detail to explain them here, we did not choose to measure the intention of use of all eServices in the Netherlands in the same direct way. See the blank spots in the two right columns of Table 3. Here reasons for use and not use were measured in an indirect way that was not comparable to the direct way. However, the services that are used for the quantitative measure of potential are a cross-section of comparable local and national services.

3.2 Attitudes Towards Public eServices

The general attitude of the Dutch population towards public or government eServices was found to be very positive.. The statement that 'Internet services are an improvement of government service' reached a support of 7.2 on a 10-point scale. The statement 'It is a right thing that the government offers Internet services' even received a mark of 8.2. The opposite statement of 'Interne services of the government are not attractive to use' was rejected with a mark of 4.7. The same goes for: 'In general the Internet services of the government are not user-friendly' (4.6).

However, the attitude of the part of the sample that has no access to computers and the Internet was significantly less positive. The same was observed among those groups generally found to be at the 'wrong side' of the digital divide: seniors (above 65), people with low education and those with few computer- and Internet experience. Positive attitudes systematically increase with educational level and 'digital' experience and decrease with age. No significant gender differences were observed.

3.3 Knowledge of the Availability of eServices

One of the most striking results of the survey was the high number of respondents with Internet connections that revealed to be not informed about the availability of particular eServices. This appeared to be especially true for municipal eServices. In general, more than 70% of municipal eServices were not known by the Internet users (see table 4). When taking into account that in many Dutch municipalities particular services are not available yet, or only available at a particular level (information or transaction), the results hardly varied. Even when we asked Internet users in municipalities with high-level transaction eServices, a full alternative to traditional transactions, we could still find a majority of potential users not knowing the service.

The only service being 100% available in the Netherlands (e-mail), was not known by 32% of Internet users while 16% gave the wrong answer claiming that this service did not exist.

Evidently, the lack of information about the availability of services is a prime reason for the gap between potential and actual use of eServices in the Netherlands.

Table 4. Do-not-know Answers about the Availability of Municipal eServices

	Do not know (all conditions)	Do not know when service is offered at level 1: information	Do not know when service is offered at level 4: transaction
Notification of the need of waste collection	72.4	73.6	62.7
Application for a building permit	77.3	75.3	77.5
Appointment to apply for a passport	73.3	75.7	59.9
Request for a certificate of birth or citizenship	84.4	83.2	85.1
Notification of address change	79.0	79.8	78.6
Email service	48.0 *		

Note: * Do not know answers (32%) added with Wrong answers (existence of service denied): 16%

3.4 User Characteristics

Social characteristics of users. In this paragraph users are described in terms of social characteristics. Actual usage was classified in terms of no or little, medium and high usage. The same classification is used for usage intention. See Table5.

Table 5. Usage and intention of use of eServices by users with different social characteristics

	Usage			Intention		
Social Characteristics	No/little	Medium	High	No/little	Medium	High
Age:						
≤ 30	39	56	5	28	42	30
31-45	68	26	6	14	60	26
46-55	65	32	4	22	54	24
56-65	76	24	0	53	36	12
65+	90	9	1	82	10	8
Social Position:						
Employed	61	34	5	17	53	30
Self employed	56	39	5	21	53	27
Unemployed	25	54	21	19	50	31
Disabled for work	76	22	2	51	42	7
Retired	84	15	1	68	26	8
Students	44	56	0	24	57	19
Housewife/Houseman	85	15	0	48	49	3
Education:						
Low	80	19	2	57	32	19
Middle	66	31	4	33	47	55
High	61	35	4	10	21	26

Table 5 shows that all differences between social categories of the population considering physical access and use of digital media known form digital divide

research [10, 11] are expressed in the distributions of actual and intended use of government eServices. Considering age elderly people score significantly lower on actual and intended usage than younger people. This particularly goes for seniors above 65, but decline already starts at the age of 55.

Analyzing the social positional background large differences appear between those inside the labor process or schools and those outside (retired, disabled and housewives/men) with the only exception of the unemployed that have to use the Internet for job vacancies and applications. Actual and intended use of students is perhaps lower than expected for the 'digital generation' but this is to be explained by the lower need students still have for government eServices. A related result not presented in Table 5 is that families with children are the most frequent users of eServices among household types.

Finally, educational level appears to be a strong predictor of the actual and potential use of government eServices. Both types of use grow with level of education, with intention even stronger than with actual use.

Media use characteristics. The general results of the survey show that media use, including service channel use is perhaps the most important factor in explaining the gap. In our definition, media use is a combination of possession of and experience with digital media (in this case the Internet and computers) and the preference for the usage of different service channels for contact with the government.

Table 6. Use of eServices by people with different Media Use Characteristics

	Usage		
Media Characteristics	None/little	Medium	High
Possession of digital media:			
No internet and computer at home	97	3	0
Only possession of computer/laptop	91	9	0
Possession of computer and internet	69	36	4
Experience with digital media:			
No experience	98	2	0
Low/little experience	93	6	1
Moderate experience	64	33	3
High experience	48	46	6
Preferred medium for contact with the government:			
Front Desk	83	16	2
Telephone	68	29	3
Post/paper forms	80	19	0
Website	42	50	7
E-mail	43	49	10

It is evident that people with no possession of the digital media required scarcely use government eServices. See Table 6 below. Apparently, public provisions in public buildings do not contribute much to the total use of these services. As revealed above, in this survey 21% of the Dutch population appeared to have no possession of a computer and an Internet connection and no experience with them. They are often called digital illiterates. To this number one should add approximately 15% of the population that formally does have a connection to the Internet but never uses it.

When we add 20 and 15 percent we reach a total of one third of the Dutch population that in fact has no access to government eServices as an individual citizen.

The difference between people with low and high experience of using the digital media in using government eServices is even more striking. See Table 6. The same goes for those preferring traditional channels of service provision and those preferring the use of websites and email.

However, the survey also shows that that while the Internet (both websites and email) are the most preferred channel of government service provision in the Netherlands, the telephone (29.7%) and the service desk (22.8%) are still the most frequently used channels, as compared to 18.4% for websites and 7.8% for email.

4 Conclusions

This article is based on a large quantitative (n=1225) study about the usage of online public services by Dutch citizens. Although the Netherlands is the country with the highest broadband penetration in Europe and a high usage of ecommerce services we must conclude that the actual usage of government eServices more moderate than we could expect. Despite the positive attitude of the Dutch population at large towards online government services, they are only moderately used. There is a big gap between actual use and intentional use. While the intention in terms of citizens wanting to use a service (if provided, when needed) is high; actual usage is lagging behind. This gap subscribes a large potential for future usage.

Especially for Dutch municipalities there is a lot to gain, mainly because the knowledge of the availability of services is very low. Probably this is a consequence of a supply side orientation to provision of online services. One cannot expect that simply launching these services on government websites without sufficient research for user needs and user behavior and without large scale information campaigns will be successful.

Table 7. High and low usage groups of eServices in the Netherlands compared

High usage:	None/little usage:
Employers, employees, unemployed, students	Pensioners, disabled, housewives/-men
Parents aged 30-45 years	Elderly people (65+, 55+)
Higher educated	Lower educated
Experienced with digital media	Inexperienced with digital media
Channel preference: digital	Channel preference: traditional

The main other factors described in this article to account for this gap are social and media characteristics. They reflect existing knowledge produced in digital divide research. We have shown that presently online government services in fact only reach two thirds of the Dutch population. These two thirds use these services to a very different degree. We have social categories with comparatively high usage and groups with low usage as summarized in Table 7. Citizens do not exchange traditional channels of service provision for electronic channels as fast as some government suppliers seem to think. Anyway, the objective of the eEurope 2005 program that

European countries "should have ensured that basic public services are interactive, where relevant, and accessible for all" is far from being realized even a country with high Internet connectivity and a moderate number of electronic transaction services such as the Netherlands.

5 Discussion

While the focus in most existing literature is still on the availability of online public services, this paper covers the actual usage and the (non-)users of eServices. In this way some insights in the potential for future usage of online government services are produced.

However, some limitations should be noted. Not all available online public services have been measured. Compared to the number of available services, the number of services of municipalities investigated was low (only frequently used services have been measured). Further, it has not been the purpose of this report to present an inexhaustible list of variables and characteristics determining the gap between actual and potential usage. There are also other variables creating this gap, e.g. frequency of contacts with the government required.

We hope the findings of this report are encouraging for future research and for monitoring the usage of online public services in other countries and in other service fields. We also hope our research encourages fellow scholars and research funds abroad to investigate the situation in their countries, as we merely focused on the Netherlands. International comparative research in the field of actual and potential use of government eServices from a user or demand perspective would be very useful and inspiring. Unfortunately, current European, among others EU research mainly investigates the supply and the level of innovation of government eServices.

Future research should also focus on the underlying motivators of citizens to decide whether or not to use electronic government services. Why do they use some electronic government services more than others? When do they prefer traditional service channels and when do they choose online channels? What role does experience with certain government organizations play in using electronic services? Our results indicate that looking for a job vacancy can be very important driver in using particular electronic government services. Research will have to point out whether there are other motivators.

In the results of this survey we have observed the important role of computer and Internet experience. Therefore we strongly believe that digital skills also influence the take up of government services.

A lot could be learned from behavioural research: how do citizens use electronic government services? Do they easily find their way through government websites or do they get lost? How do they use search engines, electronic forms, and so forth and so on. How do they rate their experiences while browsing government websites? Are they pleased or do they get annoyed? And how do these experiences affect future usage? Both direct and indirect observations are needed to find the answers. Indirect observations are possible by means of key logging and website logging. Direct observations are possible for instance by camera observation and video analyses.

Ultimately, all the future research should address the one big question that really matters to practitioners such as policy makers and decision makers within government; namely how do they raise government eServices usage? The best way to answer this question is to turn to more user centered research, first of all of the actual use of eServices by citizens.

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