**E-Government Services**

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**Abstract**

E-government services have similarities to commercial e-services, but also a number of basic differences being public services that should be available to everyone. E-government services are evolving from one-way operations with a supply-side and technical orientation to two-sided operations with a demand-side and a social drive. Service development goes from information services, download and upload services, transaction services, participation and communication services to integrated services (one-stop services and portals). In this way the focus transforms from traditional administration to modern communication between governments and citizens or companies.

**Key words**

*E-government, E-government services, public service, digital divide, accessibility of services, usability of services, digital skills, channel choice, channel steering, self-service, pro-active service, personalization of services, open data*

**Introduction: backgrounds**

E-Government services are *online* *public services delivered by a government or semi-government (partnership) organization to citizens following the laws and regulations of a nation state describing rights and duties*. This definition already shows some basic differences with commercial e-services. These services are public, not private and they follow legal rights and duties, not prices. However, in their design contemporary e-government services clearly are modelled on commercial services. E-commerce has preceded e-government and has governments shown the way to modernize their services. Their main goal in developing these services is to increase the effectiveness and efficiency of government operations in this domain. In their turn, citizens and companies have learned to use e-services by means of online shopping and Internet banking. Increasingly, they demand from their governments the same kind of service provision they have become used to in the commercial sector.

To describe the nature and opportunities of e-government services it is instructive to first list the differences and agreements with commercial e-services. To start with the differences it is evident that with e-government services there is only one provider (the government); there is no competition. Citizens cannot move to another, perhaps better government. A related difference is that particular e-government services, such as tax services are obligatory and not voluntary. They are duties. Conversely, citizens also have rights to receive particular services. Most of them are free, some of them require a small fee, but everybody should be able to afford them.
 Another difference is the bigger complexity of e-government services as compared to commercial services. E-government services are a consequence of the laws and regulations of a particular country or municipality. Usually, these rules are very complicated and have many details and exceptions for particular groups of citizens. This makes it very difficult to translate rules and procedures in terms of information and communication technology and in simple and straightforward services every citizen is able to understand. Filling an order form for a product in e-commerce is far easier than filling the average form of a government service that is a right or a duty.
 A fourth difference is that the citizen as a user of e-government services often has to deal with more than one service or service desk. Many e-government services are provided by a chain of government departments and not by a single company as with commercial services. Traditionally, citizens were often directed to another desk or department when they could not find their way. This bad experience has motivated the development of integrated one-stop services in e-government services.
 A final difference is that citizens need most e-government services, such as the renewal of a passport or the reception of a birth certificate only occasionally, while commercial services such as buying a product or Internet banking are used on a weekly or even daily basis. The consequence is that for citizens it is far more difficult to learn to use e-government services than commercial services. The next time they need a particular permit, the e-service concerned might have become organized and designed completely different.

 Of course, we can also list similarities of e-government and commercial services. The experience and satisfaction of being served is equal for both citizen customers and purchasing customers. Both kinds of services aim to improve the quality of service. The accessibility and usability of e-services and the findability of information require the same kind of service characteristics.

These similarities have even inspired a number a new models of (e-)government (Pollitt & Bouckaert, 2000, Kettl, 2002, Kamarck, 2007) that have showed the way in developing e-government services. Never before in history there was so much talk about a customer orientation in government or public services as in the last twenty-five years. In the 1970s and 1980s *New Public Management* (NPM) arrived as a type of government operation modelled after private sector management in a spirit of entrepreneurship and with the inspiration to develop, organize and supply services apart from politicians and policy makers (Hood, 1991). Despite the differences just listed, e-government services could be organized in the same way as commercial services by separate service departments. In the 1990s the Clinton-Gore Administration in the U.S. was inspired by this perspective to launch a more moderate form of NPM, called *Reinvented Government* (Osborne and Gaebler, 1992). It was supposed to be government that is run as much like a private-sector business as possible. This was done among others by introducing performance measures for government services acting as market proxies.
 Reinvented government still involved a significant amount of government as we knew before. *Government by Market* (see Kamarck, 2007) went more to the extremes in completely privatizing government services. In this way they could be offered as much as possible like commercial services under the condition of particular norms defined by the government. This was a very common practice in neo-liberal Western governments from the 1990s onwards.
 The most recent models of (e-)government are *Government by Network* (Goldsmith and Eggers, 2004, Kamarck, 2007) and the *New Public Governance* (Osborne, 2010). In this perspective a network of joined-up government departments, public-private institutions, completely private businesses and organizations of citizens is increasingly realizing government operations. In these models multiple interdependent actors contribute to the delivery of public services. Even the citizens as consumers of e-government services are involved. These new models have inspired the authors of this entry most in explaining the evolution of e-government services. It will be shown that these services are evolving from traditional one-way administrative operations to communicative practices involving two-way interactions and transactions between government service providers of all kinds and citizens.

**Types and evolution of e-government services**

The following types of e-government services can be distinguished:

* Information services
* Download and upload services
* Transaction services
* Participation and communication services
* Integrated services (one-stop services and portals)

The United Nations Public Administration Network has developed an index that describes e-Government Readiness in offering these types of services (United Nations, 2012). It is a comparative ranking of the countries of the world according to the state of e-government readiness. Figure 1 maps the available relative scores for the UN members. This is based on a composite index of the level of advance in online services index, a telecommunication infrastructure index and a human capital index. The top ten of this list mainly consists of countries from North-Western Europe, the United States, Canada and Singapore. These countries have been forerunners in the past decade. African countries are still in the early phase of developing e-government services.

 **Figure 1: World E-government Readiness Rankings According to the UN (2012)**

The current state-of-the-art of the electronic government did not emerge overnight but is the result from a process that has developed over decades. Orlikowski (1992) and DeSanctis & Poole (1994) point out that the outcome of this process is the result from the interaction between users, their organizational environment and the technology.

Several developmental schemes are proposed in the e-government literature to describe this process (for an overview see Lee, 2010). Best-known is the scheme of Layne and Lee (2001). They posit four stages of a growth model for e-government: (1) cataloguing, (2) transaction, (3) vertical integration, and (4) horizontal integration. These four stages are explained in terms of complexity involved and different levels of integration.

In this entry a communication and citizen-centred service perspective is chosen to describe the development of e-Government services. These services evolve from supply-side oriented information services published in a one-way direction by governments to a demand-side oriented exchange of participation and personalized communication services in two directions. This evolution is portrayed in Figure 2.



**Figure2: Evolution of e-Government Services in a Communication and Service Perspective**

The following phases can be described:

* *Phase I - Top-down Information Provision*: The evolution has started with information services, primarily on websites that originally were no more than electronic presentations of printed brochures and administrative forms. In the first phase top-down information provision is the focus of all activities. Services are implemented while using the existing governmental infrastructure. The goal is to reach effectiveness and efficiency gains by 24/7 provision of information. Beside web presence, large investments in the ICT backbone have been made in this early phase. These investments are necessary to enter the following phases.
* *Phase II - More User/ Citizen Orientation*: In the second phase, the attention shifts to service provision. Building upon the lessons learnt from e-commerce, the reinvention of government and New Public Management, governments attempt to develop a more corporate way of working. A user or citizen orientation acquires the focus of attention. Governments start to listen to citizen needs in the domain of services. After some time with a focus on downloading and uploading forms to complete, it becomes possible to perform real-time online transactions. However, in this phase front offices and back-offices are not yet connected. It keeps being difficult to understand user behavior and develop technology while taking a user perspective into account.
* *Phase III - Delivery on User Demand*: In this third phase services start to be delivered on user demand. So, governments do not only listen to citizen and company needs but also develop a supply of services following the actual demands of citizens and companies. This means the registration of the actual use of services, an activity that was neglected before in the supply-side orientation of governments. One of the instruments is to develop multifunctional portals. By clustering services in portals, governments hope to connect more closely to the real demand of citizens and companies. The aim is to develop services that can both support citizens and companies in their relation with the government as well as services that allow law enforcement or compliance. However, efficiency gains keep being low as the relation between front-office and back-office work remains weak, leading to multiple coordination problems.
* *Phase IV - Personalization*: In the fourth phase personalization becomes central. Governments are developing personalized portals where users can perform all their transactions with multiple government agencies. The aim of this phase is to achieve cost reductions through a decrease of the administrative burden of governments and an increase of self-service by citizens and companies. The provision of personalized and pro-active services is an innovative way to increase effective and efficient governmental processes. The final goal is to create a networked government in which all parties seamlessly exchange data, information and services. In practice, it proves to be difficult to remove unnecessary links in the chain. So-called shared service centres working for several departments are given too little autonomy to work effectively. The main reasons are that governmental departments do not collaborate very well and that the question what standards to use keeps dominating the discussion.
* *Phase V - Communication between Governments and Citizens*: In the fifth and final stage two-directional communication between governments, citizens and organizations is anticipated. For example, social media offer new possibilities to support this interaction. The goal in this phase is twofold: to improve service quality by means of citizen feedback and participatory design of new services and to advance democracy and citizen participation through e-participation. Early experiments show that on average citizens are less interested in forms of classical political participation and more in asking for solutions and offering suggestions that help to improve their own daily life and environment.

**Communication and policy aspects of e-government services**

*Access and skills*

A primary communication and policy aspect of e-government services is the problem how to reach all citizens with these services. Many still do not have access and lack the skills to use these services in an appropriate way. This problem is sometimes called *the digital divide*. Four types of access to the digital media can be defined as a number of successive stages in the appropriation of this technology by people: (1) the motivation to use computers, the Internet and other digital media, (2) physical access to these media, (3) the skills or the literacy to use them and finally (4) the actual use of these media (van Dijk, 2005).

Let us start with *motivation*. Many citizens do not want to use e-government services because they are familiar and more or less satisfied with the traditional supply of services. They routinely go to their municipal offices, use the phone or fill printed forms. Many public services are rather complicated (insecurity about rules and exceptions) and they tend to use overly difficult bureaucratic language a large part of the population cannot comprehend. Transforming these services in digital shapes first of all produces new difficulties for many people. It is no surprise that many citizens want oral explanations and that they cannot find their way on government websites. The answers they find searching on these sites often lead to new questions that subsequently have to be solved by service desks and call centers.

In rich and developed countries *the physical access* problem to computers and the Internet is gradually being solved. However, in developing countries access still lags far behind. Here only a small minority of the population has access to e-government services. Yet, even in the most developed high-access countries particular groups of the population still have far less access than others. On almost every occasion it concerns seniors (above the age of 65 or even 55), low educated people (high school or less), very poor people, migrants and particular ethnic minorities (some of them illiterates). A group with special access problems in almost every country are the disabled. While the handicapped of several kinds could benefit a lot of online services because of their mobility problems, they in fact have less access than others. They need aids such as extra font configurations, services that read the content of pages and visual aids for signs. Considering websites most countries in the world are just starting to apply the so-called Web Content Accessibility Guidelines defined by the World Wide Web Consortium (United Nations, 2012).

The following type of access to e-government services is the need to develop *the skills* to use them. Several kinds of digital skills can be distinguished (van Deursen, 2010, van Deursen & van Dijk, 2011). The first skills needed are the operational skills to handle digital media (so-called ‘button knowledge’). The second are formal skills such as navigating and browsing the Internet, among others required to find the way on government websites. These media-related skills on average are performed better by young people than by seniors. To benefit from e-government services also a number of so-called content-related skills are needed. They are the information skills to select and evaluate the government information looked for and the strategic skills to find the information and services most appropriate for a particular citizen (pursuing a goal orientation on the Internet). In the context of e-government a citizen not only needs citizenship competencies (knowing ones rights and duties) but also how to achieve these rights and duties in the context of e-government services. People with higher education on average have better information and strategic skills on the Internet. However, more surprising is that middle-aged and senior people perform better in these skills than young users (van Deursen, 2010). Provided that they have sufficient operational and formal skills they benefit more from e-government services. This is not only a matter of skills, but also of motivation and usage: people need more e-government services when they get older, start a family, get a job and find a house.

The last type of access is the goal of the entire process of appropriation of technology: usage. It is a striking fact that in most countries the demand of e-government usually lags far behind supply. A rough estimation shows that, for instance in the EU only half of the capacity of e-government services is actually used (van Deursen, van Dijk & Ebbers, 2006). Governments have a supply-side orientation in offering these services. They neglect demand perspectives, among others the actual needs of particular groups of citizens. Those at the right side of the digital divide (the higher educated and the affluent middle-aged) are using these services much more than those at the wrong side (the lower educated, the poor, the elderly and migrants). In developed countries gender usage differences in using e-government services on average are small while they tend to be bigger in most developing countries (van Dijk, 2005, United Nations, 2012).

All types of access have to be improved to produce effective e-government services. As it is highly unlikely that this will be fully realized in the following decades a multi-channel strategy (offering traditional next to digital channels) is required

*Channel supply strategy*

At first, during the mid-1990s, many government agencies had high expectations about the usage of E-Government services. Inspired by the revolutionary growth of e-commerce in those days, governments throughout the world seemed convinced that new media channel usage would easily replace traditional media usage. However, almost twenty years later usage patterns still show that citizens think and act otherwise than governments expect when they choose a channel. This is unfortunate because for governments electronic channels are ideal in terms of cost-efficiency. As such, governments try to steer channel choice and channel usage, as they still face high numbers of contacts via more traditional channels, such as telephony and desk services.

Channels choice can be regarded as the first step in an overall process of channel behavior. Channel choice is followed by actual channel usage and channel evaluation by users. In turn, evaluation influences future channel choices. Finally, channel choice and usage can be manipulated by channel steering. See Figure 3.

Channel Steering

Channel evaluation

Channel Usage

Channel Choice

Experience

**Figure 3: Steps of channel behavior and steering of channel behavior**
(source: Pieterson and van Dijk, 2007 and Teerling and Pieterson, 2011)

Channel choice

Research has often observed a gap between the communication channels governments prefer and those that citizens prefer. Governments are guided by rational arguments like the cost efficiency of channels, while many citizens often choose traditional channels that are more customer-friendly, but also more costly. Many citizens simply have different interests that lead to different choices. Below are four important factors influencing a citizen’s channel choice:

1. Task characteristics: when using e-government services citizens have to complete certain tasks, for instance file their taxes. Citizens perceive such tasks as more or less complex and ambiguous. When perceiving a task as simple (such as looking for an address) many people prefer a website. However, with ambiguous tasks (like problem solving ) many people prefer real life conversations at the front desk. Of course, all citizens differ in their opinion on what is to be perceived as simple or as difficult.
2. Channel characteristics : different channels have different traits. These traits can be both objectively and subjectively defined. Objective traits are characteristics such as one way or two-way and using text or images. Subjectively defined traits are for example the extent to which channels are perceived as personalized, interactive, easy to use or expensive. As with task characteristics, citizens differ in their opinions on these traits. Their perceptions influence their evaluations and their experiences. Thus often turning channel choice into a habit based exercise no matter if objectively spoken it is wise to choose otherwise.
3. Personal characteristics: people are different, they differ for instance in age, gender or education. Generally spoken, the higher educated and younger tend to have higher preferences for electronic channels. Lower educated and elderly people tend to prefer traditional channels.
4. Situational factors: several factors determine the situation of channel choice and use. When it comes to channel choice, time, distance, and availability play an important role. When acting out of habit, citizens tend to use choose channels that are proximate or that provide them with the quickest answer.

There are two basic strategies when choosing channels. The first is based on habits and experiences, the second one is based on reason. As long as there is no need to do otherwise, people base their channel choice on habits and experiences. However, when a problem occurs, for instance when a channel is not available or too expensive, citizens may confine to a second strategy based on reason. Meaning they go for the best match between tasks (characteristics) and channel (characteristics). For example, when a task is complex and someone is in a hurry, it is best to use a channel with immediate feedback: the telephone.

Channel steering

In order to close the gap between what government organizations think is the best choice and what citizens prefer, governments can try to influence channel choice and channel behavior in channel steering as was illustrated in Figure X.

In the first place, governments can try to impose a problem or challenge thus forcing citizens to trade a habit based strategy for a strategy based on reason. In the second place, governments can tell people which channels are best to use in a particular situation, and they can improve the quality of certain channels. Basically there are four types of instruments. The first two instruments impose problems or challenges for citizens that rely on habits, whereas the last two help citizen to make the best match, i.e. a strategy based on reason.

1. Legal or restrictive instruments focus on changing citizen behavior through rules, regulations and restrictions. In contrast to the other categories they are compulsory.
2. Economic instruments are directed towards changing citizen behavior through financial incentives. This category relies on the assumption that citizens weigh the costs and benefits of various channels.
3. Communication instruments are characterized by the transfer of information from government to citizens, such as mass media information campaigns, personal communication or public relations in order to increase knowledge about channels, first of all the new digital channels.
4. Service or product instruments aim to differentiate the quality of service across various channels in order to change citizen channel choice. The use of a particular channel can be made more attractive, for instance by better accessibility, usability and personal assistance.

Contemporary experience suggests that instruments focusing on changing behavior through restrictive and economic instruments have proved to be relatively successful (Wijngaert et al. 2011).

*Self-service and pro-active services; open data provision*

As already mentioned, e-government services are evolving from traditional one-way communicative practices to two-way interactions and transactions between government service providers and citizens. Contemporary services worldwide are still primarily engaged with top-down information provisioning and only gradually encompass ‘delivery-on-user-demand’, ‘personalization and ‘government-to-citizen communication’.

Self-service of pro-active services?

The sequential stages of the e-Government evolution are a result of continuous technological innovation and an everlasting ambition to keep improving services. The ‘delivery-on-user-demand’ stage typically contains so-called self-service delivery. These kind of services afford citizens to select and assemble what they need from a menu in a set of information, communication or transaction services. The advantage is that citizens can choose what they need and fill forms with up-to-date information. However, the disadvantage is that not all citizens are able to make the right selection, thus possibly missing out on important messages, duties, benefits, etc. Therefore the more recent ‘personalization’ stage contains so-called pro-active services. Meaning that government takes over and makes itself the selections and assemblies thought to be appropriate for the citizen in a given set of different services. This is done on the basis of personal user profiles of citizens owned by the government on the one hand and of the obligations governments think need to be met given their statutory duties on the other hand. These pro-active operations have a strict precondition. They only work when governments collect and use a vast amount of personal data and then start connecting all those data with common standards of registration.

In the stages of delivery on demand and personalization it is assumed that the associated services are indeed what people need. However, only little independent research has been conducted on user needs and wishes of citizens and companies that are willing to use e-government services (van Velsen, et al., 2008). So from a citizen perspective it remains unclear whether self-service or pro-active service is best. A third strategy offers some kind of combination: *co-creation* in service delivery. This could already start with citizen involvement in the design process of services from the very start. This is an instance of so-called participatory design. Subsequently, the act of service could be realized by an exchange of pro-active, prefilled files and additions or corrections by citizens and companies. Of course, co-creation is not without problems. Asking citizens to participate in the design of services and complete forms requires that they are representative for a (particular part of the) population. Supplemental information by citizens needs to be controlled for validity and reliability and individual citizens should have the right to correct the personal information stored by the government.

Privatizing public sector service delivery?

Why should all e-government services be supplied by the government itself? Isn’t it possible to have them executed by commercial service providers according to the rules and regulations of the government? Commercial providers might have more experience with efficient, effective and customer-friendly services than traditional governments. Additionally, from the knowledge and experience in their domain they might be able to find opportunities for new service applications not seen by governments. This possibility is suggested in the contemporary policy of so-called ‘open data ‘. The open data policy acknowledges that public bodies belong to the largest creators and collectors of data in many different domains, e.g. demographic data of citizens, official data of companies, geographic data, weather information etc. These data are considered to be indispensable to realize all kinds of services, both government and commercial services. But they also have a value in their own right that can be expanded beyond the needs of government. At the moment governments all over the world are opening up and presenting public and government data for all kinds of apps developed by the private sector. For instance via the US- or UK- *data-gove* sites. The open data policy enables private companies to assemble public private services and add value to already existing public services. On the other hand, when the private sector would take full control in public service delivery, privacy and social inclusion could be under pressure. This could happen when commercial service organizations with lower standards and legal obligations to protect personal data acquire privacy-sensitive citizen data or create such data coupling government data to their own data bases. The result could also be that originally free services are charged for, among others because they are supposed to contain a so-called value-added service. So the question remains, which sections of the public sector service delivery are suitable for privatization, and which sections are not.

**Future directions: from administration to communication**

In this entry we have seen that e-government services have evolved from traditional one-way administrative operations to communicative practices involving two-way interactions and transactions between government service providers and citizens or companies. This is an epochal change. Traditionally, it was the task for politicians, members of parliament and the political government in charge to communicate with citizens. The administrative departments were their executioners that were closed institutions and did not directly talk to people, with the exception of social and public service providers. Now these departments also have to communicate with citizen and company clients because online services are becoming ever more interactive and because they also start to use social media, e-mail and mobile communication to relate to these clients.

In this evolutionary shift government service provision is gradually moving form a supply-side and technical orientation to a demand-side and more social orientation. During this shift they learn from the customer perspective that commercial service providers have always used in order to keep in business. However, they also experience that there are basic differences between government and private service provision as they were listed in the introduction. In the starting phases of the evolution of e-government services governments were able to simulate a business-like customer orientation. In the latter phases focussing on personalization and communication the undeniable political and administrative aspects of e-government services return. Citizens are able to directly complain about the meaning, design, price and quality of services while using these services that in the meantime have become interactive. As they have no market competitor to go to, they are supposed to address political representatives to have their rights. Only, this will not happen very often as the civil servant working with e-services is much closer. When they are allowed to use social media, e-mail and telecommunication they easily force civil servants that are supposed to (only) execute laws and regulations, to react with expressions that frequently contain a political load.

A main conclusion of this entry is that e-government service provision is experiencing the same transition as commercial service provision in the private sector. While the private sector demonstrates a reversal of the so-called value chain, in which consumers become ‘prosumers’, partly composing their own products, the public sector and the government show a reversal of the administrative process with citizens co-creating both services and related policies. For example when they use a digital service channel to indicate when their garbage should be collected from the sidewalk they are able to add that the whole street is dirty and that the responsible city department should clear this problem. This easily leads to a contribution in environmental politics. Politics is always close in future e-government services.

A second main conclusion is that the evolution of e-government services as portrayed here cannot be realized without a network organization of services. This has an internal government dimension and an external one in the relationship of governments with citizens and companies. Delivery on demand, personalization and communication cannot be realized without a government that is organized as a chain of service providers. This means the long-term prospect of a realization of joint-up government and public-private partnership networks (Goldsmith & Eggers, 2004). Externally, in the direction of citizens and companies this means a vast increase of the use of all kinds of Internet applications of interactive communication by the national and local government, such as social media, co-created services, e-mail and mobile telephony.

**References**

Ebbers, W., Pieterson, W., & Noordman, H. 2007. Rethinking service and channel strategies after the hype. In J. Makolm & Orthofer (Eds.), Etaxation state & perspectives. Linz: Trauner Druck.

Ebbers, W., Pieterson, W., & Noordman, H. 2008. Electronic government: Rethinking channel management strategies. Government Information Quarterly, 25(2), 181-201.

Goldsmith, Stephen. and Eggers, William. 2004*. Governing by Network, The New Shape of the Public Sector*. Washington D.C.: Brookings Institution Press.

Janssen, K. 2011. The inﬂuence of the PSI directive on open government data: An overview of

recent developments. Government Information Quarterly 28 (2011) 446–456.

Kamarck, Elaine. 2007. *The End of Government…. As we know it. Making Public Policy Work*. Boulder, Colorado: Lynne Riener Publishers.

Kettle, Donald .2002. *The Transformation of Governance, Public Administration for Twenty-First Century America.* Baltimore and London: John Hopkins University Press.

Osborn, David and Gaebler, Ted. 1992. *Reinventing Government How the Entrepreneurial Spirit is Transforming the Public Sector*. Reading MA Addison/Wesley.

Osborne, Stephen (Ed.). 2010. *The New Public Governance? Emerging perspectives of the theory and practice of governance*. London and New York: Routledge.

Layne, K., & Lee, J. 2001. Developing fully functional E-Government: A four stage model. *Government Information Quarterly, 18(2)*, 122−136.

Lee, J. 2010. 10 year retrospect on stage models of e-Government: A qualitative meta-synthesis. *Government Information Quarterly 27*, 220–230

Pieterson, W., & van Dijk, J. 2007. Channel choice determinants; an exploration of the factors that determine the choice of a service channel in citizen initiated contacts, Proceedings of the 8th annual international conference on Digital government research: bridging disciplines & domains. Philadelphia, PA.

Pieterson, W., & Ebbers, W. 2008. The use of service channels by citizens in the Netherlands; implications for multi-channel management. International Review of Administrative Sciences, 74(1).

Pieterson, W., Teerling, M., & Ebbers, W. 2008. Channel perceptions and usage: Beyond media richness factors. Lecture Notes in Computer Science, 5184, 219-230.

Teerling, M.L., Pieterson W.J. 2011. How to improve e-government use: An empirical examination of multichannel marketing instruments, Information Polity 16, 171 - 187.

van Deursen, Alexander J.A.M. 2010. *Internet Skills. Vital assets in an information society.* Doctoral Thesis. Enschede: University of Twente.

van Deursen, Alexander, van Dijk, Jan, & Ebbers, Wolfgang. 2006. Why E-government usage lags behind: explaining the gap between potential and actual usage of electronic public services in the Netherlands. In *Lecture notes in Computer Science Lecture notes in computer science* (pp. 269-280). Krakow: Springer-Verlag

van Deursen, A.J.A.M. & van Dijk, J.A.G.M. 2011. Internet skills and the digital divide. *New media and society, 13*(6), 893-911.

van Dijk, Jan. 2005*.* *The Deepening Divide, Inequality in the Information Society*. Thousand Oaks, London, New Delhi: Sage.

van de Wijngaert, L., Pieterson, W.J. & Teerling, M.L. 2011. Influencing citizen behavior: experiences from multichannel management pilot projects, International Journal of Information Management vol. 31 issue 5 October, 2011. p. 415-419.

van Velsen, L., Van der Geest, T., Ter Hedde, M. & Derks, W. 2008. Engineering User Requirements for e-Government Services: A Dutch Case Study. In M.A. Wimmer, H.J. Scholl & E. Ferro (Eds.), Electronic Government 2008, LNCS 5184 (pp. 243-254). Heidelberg: Springer.