Web 2.0: A New Basis for E-Government?

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Abstract

Web 2.0 applications gain in importance in today's society and cannot be ignored by the public sector, because they can take the evolution of E-Government in new directions. These developments raise some questions we will try to answer in this paper:

● What is the context in which E-Government and Web 2.0 can be placed?
● What kind of Web 2.0 applications can be found in the Netherlands and what are the characteristics and functions of these applications?
● What are the expected opportunities and threats of Web 2.0 for the public sector?

First, we explore the notions of E-Government and Web 2.0 and discuss these concepts in the broader context of two developments that are increasingly being interwoven with each other, namely societal – technological developments and the evolution of a different physical and a new virtual world. We state that the focal point of these two developments is the so-called Second Society. Against this background we present a framework to classify Web 2.0 applications, namely a classification based on distinguishable characteristics (generic versus specific; static versus dynamic; closed versus open and personal versus collective) and the functions that the applications fulfill (sharing of information, mobilisation, meeting, supporting and transactions). Then we will discuss six Dutch examples of Web 2.0 applications and put them in the classification framework. We discuss the opportunities and threats of Web 2.0 to the public sector as well. We conclude our paper by stating that Web 2.0 applications can be seen as a new basis for E-Government.

When we consider the investigated Dutch examples we can conclude that Web 2.0 applications have much potential for the public sector in terms of interaction, participation and transparency. However, when we take into account the four developing stages of E-Government (presence, interaction, transaction and transformation), we have to conclude that none of the investigated Dutch examples has transaction or transformation characteristics. So it is still too early to speak about a virtual state. In order to realize these final two stages of E-Government, it is important to take into account the potential risks of Web 2.0 applications (isolation, exclusion, privacy and risks of misuse of information).

Key words: Web 2.0; E-Government; Second Society.

I. INTRODUCTION (HEADING 1)

Potential candidates for the presidential elections in the United States have embraced YouTube to get into contact with their potential voters and to debate about political issues. In the Netherlands scholars have used MSN and the network site hyves to organize massive protests against the education hours norm in the Netherlands. These examples are an indication that Web 2.0 applications gain in importance in today's society. This unclear concept evokes a lot of associations and high expectations. Web 2.0 is often presented as a revolutionary way of gathering, organizing and sharing of information. Well-known examples of Web 2.0 applications are Google, Weblogs, Wikipedia, YouTube, MySpace and Second Life. Despite the fact that some people embrace Web 2.0, some critical sounds can be heard as well. Within the critical camp Web 2.0 is seen as an exaggerated hype and according to them it is still a question whether the potential of Web 2.0 will be realized in practice. Nevertheless Web 2.0 developments cannot be ignored by the public sector, because they can take the evolution of E-Government in new directions [1]. Nowadays a lot of governments experiment with different technological applications in order to improve the provision of services or to stimulate the communication with and participation of citizens.

These developments raise some questions we will try to answer in this paper. The research questions to be answered in this paper are:

● What is the context in which E-Government and Web 2.0 can be placed?
● What kind of Web 2.0 applications can be found in the Netherlands and what are the characteristics and functions of these applications?
● What are the expected opportunities and threats of Web 2.0 for the public sector?
The paper is organized as follows. In section 2 we explore the notions of E-Government and Web 2.0 and discuss these concepts in a broader context. Against this background we present a framework to classify Web 2.0 applications. Section 3 presents six examples of Web 2.0 applications in the Netherlands. These cases will be placed in the Web 2.0 framework that we have developed. In section 4 we discuss the opportunities and threats of Web 2.0 for the public sector. In section 5 we draw some conclusions.

II. E-GOVERNMENT AND WEB 2.0

In this section we will explore the notions of E-Government and Web 2.0. We take the view that these notions should be placed in a broader context. Against this background we present a framework to classify Web 2.0 applications.

Nowadays the public sector is facing two developments that are increasingly being interwoven with each other, namely societal – technological developments and the evolution of a different physical and a new virtual world.

First, we observe that technological and societal developments are interweaving. The development of technology is impressive. Nowadays we can realize some dreams of the past. An example is the success of Google Earth. Geographical Information Systems (GIS) are becoming more important in daily life, for example navigation systems (“TomTom”) and location-based information for tourists (“mobile city guides”). Mobile applications are becoming more important too. Modern mobile phones are advanced and multifunctional instruments. The number of multimedia applications is increasing as well. Examples are YouTube and voting by mobile during television programs. All these new technologies have societal implications. They will change the way citizens interact with each other and with governments. Examples are the YouTube videos about the presidential candidates in the United States and the popularity of digital diaries (“weblogs”) of citizens and politicians. These technological developments have impacts too on the provision of services by governments. Some authors say that in the future one can speak about a user generated state.

Second, we observe that the physical and virtual world are interweaving. More and more governmental and business services are delivered on line. Nowadays websites can be used for digital banking (“telebankieren” in Dutch), shopping, dating, chatting and sharing interests with others. New virtual communities, organizations and networks are developing. An example is Second Life. The interweaving of the physical and virtual world brings news risks and challenges for governments too. The number of government services available on-line is growing steadily in the Netherlands [2]. Virtual worlds like Second Life raise new questions too, for example how to deal with taxes and virtual unwelcome activities. Recently Dutch police offers have arrested a guy for the theft of virtual furniture (physical value was 4000 Euro) on Habbo Hotel, which is a popular virtual platform for young teenagers.

In this paper we state that the focal point of these two developments is the so-called Second Society. See figure 1.

**Figure 1: The Second Society as the central focus point**

![Diagram of the Second Society with three interwoven circles: Techological developments, Virtual world, Second Society, Fysical world, E-Government, Societal developments.]

Figure 1 makes clear that the Second Society is the central focus point of the interweaving of the virtual and physical world and the interweaving of technological and societal developments. The Second Society can be approached on a macro level (like a state or global community), but on a micro level as well (like a district in a city). The developments of the Second Society bring new challenges and threats for the public sector in and outside the Netherlands. Under the label of E-Government governments are undertaking different activities that are directly related to these developments.

**E-Government**

In contrast with Web 2.0, the notion of E-Government [3,4,5] is commonly used within the public sector.

E-Government is a prominent item on the Dutch and European agenda [2,6]. The European i2010 eGovernment Action Plan was adopted in April 2006. The five main goals of this Action Plan are inclusive eGovernment, efficient and effective eGovernment, high impact services, putting key enablers in place and eParticipation [6]. E-Government can be described as:

“The use of modern information and communication technologies, especially internet and web technology, by a public organization to support or redefine the existing and/or future (information, communication and transaction) relations with ‘stakeholders’ in the internal and external environment in order to create added value” [3].

More and more E-Government is being approached in a practical way, namely a government that provides cheaper services and performs better. Sometimes the notion E-governance is used as well [7]. In this paper we approach E-governance as a set of necessary conditions to realize E-Government [8].
Seifert distinguishes four development stages of E-Government, namely presence, interaction, transaction and transformation.

(1) The presence stage is typified by a simple information-providing Web site of a passive nature, sometimes described as “brochureware”, indicating the same level of functionality as a paper brochure.

(2) The interaction stage offers simple interactions between government and citizens (G2C), government to business (G2B), or government agency to government agency (G2G). Interaction stage Web sites provide e-mail contact and interactive forms that generate informational responses.

(3) The transaction stage enables transactions such as paying for license renewals online, paying taxes or fees, or submitting bids for procurement contracts.

(4) The (highest) transformation stage, most closely aligned with the concept of governance, involves a reinvention of how government functions are conceived and organized [7]. In this stage we can speak about the virtual state [7].

The next question is how Web 2.0 can be approached.

**Web 2.0**

The term Web 2.0 was used for the first time on a conference in Silicon Valley that was held at the end of 2004. Web 2.0 is not a uniform concept, but a generic term or metaphor for new internet technologies and applications. Web 2.0 can be seen as a revival, intensification, renewal or even as a second generation of the internet in which user generated content has a central place. It is not easy to define Web 2.0 because of the broadness of this concept. For that reason Web 2.0 is often approached by general descriptions instead of specific definitions. Osimo and Burgelman [9] state that Web 2.0 is about both technology and attitude. Others describe Web 2.0 as follows:

“Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an architecture of participation and going beyond the page metaphor of Web 1.0 to deliver rich user experiences” [10].

In this description Web 2.0 is compared with Web 1.0. In order to get a better understanding of Web 2.0, we will discuss the distinction between Web 2.0 and Web 1.0 in more detail. Web 1.0 is the era of Netscape. Important catchwords are the World Wide Web and the digital highway. Websites play an important role. The users of the information play a passive role and consume information. The information on websites has a static content. The level of interaction between providers and users of information is limited. Providers of information are mainly focused on publishing information. Finally in Web 1.0 information is organized by taxonomies, which are top-down classification systems designed by specialists.

Web 2.0 is the era of Google. Important catchwords are the social web and virtual communities. Web logs play an important role. The users of information play an active role. They are not only consuming information, but adding and sharing information as well. Wikis play an important role to generate and share information. We can state that the user is the producer [11]. Users can make use of different web applications. The information on websites has a dynamic content. The level of interaction on the web is high. It is not possible to make a sharp distinction between providers and users of information. In Web 2.0 the focus is shifting from consuming to participation. Finally in Web 2.0 information is organized by folksonomies, which are bottom-up classification systems created by users by adding keywords. The most striking differences between Web 2.0 and 1.0 are presented in figure 2.

**Figure 2: Differences between Web 1.0 and Web 2.0**

<table>
<thead>
<tr>
<th>Web 1.0</th>
<th>Web 2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encyclopaedia Britannica</td>
<td>Wikipedia</td>
</tr>
<tr>
<td>Personal Web sites</td>
<td>Blogs (Web logs)</td>
</tr>
<tr>
<td>Publishing</td>
<td>Participation</td>
</tr>
<tr>
<td>Directories (“taxonomy”)</td>
<td>Tagging (“folksonomy”)</td>
</tr>
<tr>
<td>Stickiness</td>
<td>Syndication</td>
</tr>
<tr>
<td>Netscape</td>
<td>Google</td>
</tr>
<tr>
<td>Digital highway</td>
<td>Virtual communities</td>
</tr>
<tr>
<td>Domain name speculation</td>
<td>Search engine optimalization</td>
</tr>
<tr>
<td>Screen scraping</td>
<td>Web services</td>
</tr>
<tr>
<td>Content management systems</td>
<td>Wikis</td>
</tr>
<tr>
<td>Consuming</td>
<td>Co-producing</td>
</tr>
</tbody>
</table>

Figure 2 is partly derived from Miller [9]; O’Reilly [12] and Boulos and Wheelert [13].

Despite the fact that there are differences between Web 1.0 and Web 2.0 it is important to state that Web 2.0 is a new stage in the technical development and no replacement of Web 1.0 [13]. Woods [1] states that Web 2.0 is best understood as the latest phase in the evolution of the internet and the Web. Both Web 2.0 and Web 1.0 have rhetoric elements that have to be considered as well. We have to consider too that our actual frames of reference are different from the frames of references we had in the past. Interaction by sending e-mails in Web 1.0 has for example a different character then interaction in virtual communities in Web 2.0. When we focus on the characteristics of Web 2.0 we can conclude that Web 2.0 has the potential to make the goals of E-Government accessible.

**Classification of Web 2.0 applications**

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Web 2.0 applications can be classified in different ways. In the first place we can make a classification based on distinguishable characteristics.

**Generic versus specific**
Web 2.0 applications can have a general character. An example is Google Earth. At the other hand Web 2.0 applications can have a specific character too, like an interactive website of a specific district within a city. A Dutch example is the website www.ede-west.nl.

**Static versus dynamic**
Web 2.0 applications can have a static character. An example is YouTube (www.youtube.com). On this website one can watch self made movies created by other users. These movies have to be put on the website first, before it can be viewed by other people. At the other hand Web 2.0 applications can have a dynamic character too. An example is MSN, on which one can have live chats and pictures or documents can be exchanged.

**Closed versus open**
Web 2.0 applications can be operational in a closed environment. An example is Netvibes, that makes it possible to create a personal webpage. At the other hand Web 2.0 applications can be open. An example is Google Maps that makes it possible to search for information in specific geographical locations.

**Personal versus collective**
Web 2.0 applications can be personal. An example is weblogs, on which people can share personal experiences with other interested people. The number of blogs in the public sector is growing at a rapid rate [14]. At the other hand Web 2.0 applications can also serve collective interests. A Dutch example is the website www.vlieghinder.nl that aims to protect the interests of the people who suffer from the noise of airplanes. See figure 3.

**Figure 3: Characteristics Web 2.0 applications**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic</td>
<td>Google Earth</td>
</tr>
<tr>
<td>Specific</td>
<td>Interactive website of districts: <a href="http://www.ede-west.nl">www.ede-west.nl</a></td>
</tr>
<tr>
<td>Static</td>
<td>YouTube</td>
</tr>
<tr>
<td>Dynamic</td>
<td>MSN</td>
</tr>
<tr>
<td>Closed</td>
<td>Netvibes</td>
</tr>
<tr>
<td>Open</td>
<td>Google Maps</td>
</tr>
<tr>
<td>Personal</td>
<td>Weblogs</td>
</tr>
<tr>
<td>Collective</td>
<td>Protection of interests: <a href="http://www.vlieghinder.nl">www.vlieghinder.nl</a></td>
</tr>
</tbody>
</table>

Second, we can classify Web 2.0 based on the functions that the applications fulfill [15].

**Sharing of information: new source of knowledge**
Web 2.0 applications can be used as a new way to share and exchange information, like pictures, movies, news and music. Governments can use Web 2.0 applications to inform citizens, for example by means of GIS. Dutch examples are “Almere in Map” (www.almere.nl) and “Rotterdam in Map” (www.rotterdam.nl).

**Mobilisation: new ways of participation**
Web 2.0 applications can be developed bottom-up to make other people aware of some unwelcome situations, for example unsafe locations in cities. By tagging people can mark these locations on digital maps. On the website www.landroof.nl one can mark nature areas that are at risk because of building plans. The government and politicians can also use Web 2.0 applications for their purposes. An example are the potential American president candidates who try to reach their voters by movies placed on YouTube.

**Meeting: virtual platforms**
Web 2.0 applications can be used to meet each other (“virtual platform”). These social activities can be restricted to contacts in virtual worlds (for example MySpace and Second Life) but also be a base for real meetings. These social contacts can be without obligations (“fun”), but can have functional goals. Examples are the bringing together of people with shared interests of the same professional background in communities.

**Supporting: provision of services**
Web 2.0 applications offer new ways of delivering services. Several cities in the Netherlands offer digital maps with information about locations of public organizations, like hospitals, libraries, nursery and schools. Some cities (like Nijmegen en Brugge) offer information about the history of houses, building licenses and so on.

**Transactions: digital market**
Web 2.0 applications can offer new ways of doing business (“transactions”) by offering new services or by matching supply and demand in innovative ways. An example is eBay. A Dutch example is the website www.marktplaats.nl. On this virtual market everybody can sell and buy goods. Another example is www.lula.com. This website offers the possibility to publish and distribute documents in an active way. The authors can be publisher, printer and/or shopper. See figure 4.

**Figure 4: Functions of Web 2.0 applications**

<table>
<thead>
<tr>
<th>Function</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharing of information</td>
<td>International: YouTube, Podcast&lt;br&gt;Dutch: <a href="http://www.mijnalbum.nl">www.mijnalbum.nl</a></td>
</tr>
<tr>
<td>Mobilisation</td>
<td>International: movies of potential presidential candidates in US on YouTube&lt;br&gt;Dutch: <a href="http://www.landroof.nl">www.landroof.nl</a></td>
</tr>
<tr>
<td>Meeting</td>
<td>International: MySpace, Second Life</td>
</tr>
</tbody>
</table>
In the next section we will discuss some Dutch examples in more detail.

III. OVERVIEW OF WEB 2.0 APPLICATIONS IN THE NETHERLANDS

In this section we will discuss six Dutch examples of Web 2.0 applications and put them in the framework of characteristics and functions of Web 2.0 as described in section 2.

Police corps Haaglanden: www.hoeveiligismijnwijk.nl

In April 2006 police corps Haaglanden launched the website www.hoeveiligismijnwijk.nl. An important goal of this website is to provide citizens a ‘realistic overview’ of the local safety situation. On this GIS-based website eleven categories of reported crimes within a city or district can be visualized on a map. It is also possible to compare actual crimes with previous crimes (“monitoring”). The website provides citizens with advices to prevent these crimes too.

Region of Castricum: www.vlieghinder.nl

In June 2003 the Platform of Nuisance by Airplanes Region of Castricum (Platform Vlieghinder Regio Castricum in Dutch) was established. The Platform aims to support people who claim to suffer from noise by airplanes using the Poldertrack of Airport Schiphol. The goal of the PVRC is to reduce the level of noise by airplanes by gaining publicity (www.vlieghinder.nl). In order to ground their complaint the Platform has developed (together with Geluidsnet) a system to measure the sound of airplanes on different locations. By means of a GIS application it is possible to monitor the movements of airplanes in real-life (www.radar.vlieghinder.nl).

City of Groningen: www.hoogkerk.groningen.nl

In November 2005 the website of Hoogkerk was launched. Hoogkerk is a village that belongs to the municipality of Groningen. The goal of the website is to stimulate the cohesion and the mutual commitment of the citizens in Hoogkerk. Other goals are stimulating the interactions between governmental organizations and citizens and to increase the provision of services. The website informs citizens about actual developments in Hoogkerk. Citizens can discuss with each other on a digital forum. Since January 2007 people can chat every Wednesday in the afternoon with police officers during “digital consulting hours”. The website offers WijkTV too. This application contains video impressions made by citizens in Hoogkerk.

City of Helmond: www.virtueelhelmond.nl

In 2004 Helmond has developed a GIS application aimed at stimulating the participation of citizens (www.virtueelhelmond.nl). In VirtuoCity one can walk in the virtual and 3D centre of this city. In this virtual world the planned urban renewal projects have been realized already. The website offers a forum on which citizens can discuss their opinions about the urban renewal projects. For some projects it was possible to vote for different alternatives. More then 200 people have voted on the website.

City of Nijmegen: www.dewijkwebsite.nl

The (renewed) website of district Nijmegen-Oost was launched in 2006. This website aims to intensify the interactions between the citizens. The website contains a lot of information about the district and its history. The district calendar (“wijkagenda”) informs citizens about activities in Nijmegen-Oost. The website offers a forum too, so that citizens can discuss with each other. Citizens can sell goods on the digital ‘prikbord’. Finally, the website contains video movies about events in the district (WijkTV).

City of Nijmegen: www.nijmegen.nl/hetarchief

The city of Nijmegen celebrated its 2000th anniversary. In this year Nijmegen was the first city that has develop a ‘digital historical @tlas’. With this GIS-application visitors of the website can have a detailed look at historical objects in the centre of Nijmegen (www.nijmegen.nl/hetarchief). For the city of Nijmegen this application is a new step in the further improvement of the provision of services.

Figure 5 contains the characteristics of the discussed Dutch Web 2.0 applications.

Figure 5: Characteristics of Dutch Web 2.0 applications

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic</td>
<td>Website of district (Groningen; Nijmegen)</td>
</tr>
<tr>
<td>Specific</td>
<td>Monitoring sound of airplanes (Region Castricum); 3D impression of urban renewal projects (Helmond)</td>
</tr>
<tr>
<td>Static</td>
<td>Historical maps (Nijmegen)</td>
</tr>
<tr>
<td>Dynamic</td>
<td>District Calendar (Nijmegen); Live radar maps (Region Castricum)</td>
</tr>
<tr>
<td>Closed</td>
<td>Registration to enter digital forum (Nijmegen)</td>
</tr>
<tr>
<td>Open</td>
<td>Reported crime maps (Haaglanden)</td>
</tr>
<tr>
<td>Personal</td>
<td>Digital consulting hours (Groningen)</td>
</tr>
<tr>
<td>Collective</td>
<td>Mobilization of citizens (Region of Castricum)</td>
</tr>
</tbody>
</table>
The next step is to describe the main functions of the Dutch Web 2.0 applications. See figure 6.

**Figure 6: Functions of Dutch Web 2.0 applications**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoogkerk</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helmond</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haaglanden</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vlieghinder</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nijmegen-Oost</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When we consider figure 6 we can conclude that sharing of information is the most important function of the investigated Dutch Web 2.0 applications. Meeting is an important function too. Less important functions are the delivery of services, mobilisation and transactions. Transaction is a function in only one investigated Dutch Web 2.0, namely publishing advertisements on the website of Nijmegen-Oost in order to sell goods.

IV. **Opportunities and threats of Web 2.0.**

Especially business-literature highlights the advantages and opportunities of Web 2.0 applications. However, we should concentrate on the threats of Web 2.0 to the public sector as well.

**Social interaction versus isolation**

Web 2.0 can stimulate social interactions and communication between different people all over the world. The number of virtual networks is expanding. At the same time the number of people who are addicted to the internet is increasing again. Some people feel lonesome on the web, because they isolate themselves from the real world.

**Participation versus exclusion**

Web 2.0 can stimulate people to participate in society and the process of self-organization. That is not only good for their personal development and social skills, but beneficial for the society and democracy too. At the same time we have to consider that some people are not using internet for several reasons (“digital divide”). Examples are the elderly, handicapped people and people with limited financial resources or skills to use Web 2.0 applications [7]. In the Netherlands 66 in 100 inhabitants used the internet in 2005 [2]. In general Web 2.0 is mainly a reality for the well-educated young generation in the developed part of the world. For that reason it is important to consider the balance between different channels of communication [1].

**Quantity versus quality data**

Web 2.0 offers the possibility to generate, combine, visualize and share high amounts of information by organizing “collective intelligence” [9]. This process can make reality more transparent. Web 2.0 applications can be used for several educational goals too (“E-learning”). At the other hand Web 2.0 raise serious questions about the reliability, accuracy and the authority of information [16]. Carr [17] states that Web 2.0 generates superficiality and results in the “the hegemony of the amateur”. For these reasons it is important to reflect about possibilities to certify the quality of information. The risk of information-overload is a relevant concern too.

**Information sharing versus information protection**

Web 2.0 applications make it easy to share information. The risk is the (whether or not deliberate) violation of copyrights. An example is the illegal downloading of songs. At the other hand the access to information can be restricted on different grounds, like safety, privacy or cultural considerations [7]. In general both businesses and governments are reserved in sharing and distributing information. Technical barriers can play a role. Standardization and the integration of information systems are important points of attention [18].

**Information use versus information misuse**

Web 2.0 applications can be important sources of information. Some people share a lot of (personal) information on the internet. At the other hand we have to consider the risks of sharing personal information, namely the possible abuse of personal information, the risk of viruses, hacking and stalking. Personal information can also be misused to send unwanted email messages (“spam”). Privacy is for that reason an important point of concern.

**Assessment versus digital pillory**

Web 2.0 applications play an important role in the assessment of products and services. Examples are websites that contain personal assessments about books, digital cameras, hotels and restaurants. Some websites contain assessment about people too, for example teachers by their students. An international example is the website www.ratemyprofessors.com that contains ratings of over 1 million academic staff working in over 6000 institutions in the USA and Canada. A Dutch example is the website www.beoordeelmijnleraar.nl. The risk of these assessments is that people, organisations or companies can be damaged without fair reasons, because it is difficult to find out if assessment are fair or the result of personal resentment.

**Unlimited ambitions versus limited possibilities**

Web 2.0 applications can raise high expectations and feed high ambitions. Nevertheless different barriers can prevent new applications for being introduced. We can think about the lack of qualified employees, political resistance against big changes in organizations or a lack of financial resources.

V. **Conclusions**

As result of this study four main conclusions can be drawn.
The Second Society can be seen as the central focus point of the interweaving of the virtual and physical world and the interweaving of technological and societal developments. Within this point of reference E-Government and Web 2.0 can be positioned in front of each other.

In the four stages of E-Government we can (indirectly) observe a shift from the so-called Web 1.0 to Web 2.0. Web 2.0 is not a uniform concept, but a generic term for new internet technologies and applications. Important characteristics of Web 2.0 applications are virtual networks, sharing of information, active users that influence the products and the dynamic content of information. When we focus on the provision of services by governments Web 2.0 applications can be seen as a new basis for E-Government.

Web 2.0 applications can be classified in different ways. In this paper we made classifications based on distinguishable characteristics (generic versus specific, dynamic versus static, closed versus open and personal versus collective) and functions (sharing of information, meeting and transactions) of Web 2.0 applications.

This framework has been used to analyze some examples of Web 2.0 applications in the Netherlands. At the one hand we can conclude that these applications have much potential for the public sector in terms of interaction, participation and transparency. However, when we take into account the four developing stages of E-Government, we have to conclude that none of the investigated Dutch examples has transaction or transformation characteristics. So it is still too early to speak about a virtual state. In order to realize these final two stages of E-Government, it is important to take into account the potential risks of Web 2.0 applications (isolation, exclusion, privacy, the risk of misuse of information and unfair damaging of people or organizations.

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