DEMO-net

D14.3 The role of Web 2.0 technologies in ePartication

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The ePartication Network

Information Society Technologies

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DEMO-net : D14.3 The role of Web 2.0 technologies in eParticipation

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Abstract: The present document investigates the potential of the emerging Web 2.0 principles and technologies when applied to the eParticipation field and eParticipation websites. For this purpose, after a brief overview of Web 2.0 and the presentation of some exemplary Web 2.0 sites and Web 2.0 eParticipation sites, an assessment template for Web 2.0 eParticipation sites is proposed and utilised. Finally, are identified the participation areas that are mostly impacted by eParticipation tools and technologies.

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Table of Contents

Executive Summary

Web 2.0 is a concept that appeared in October 2004. One of the key enablers for Web 2.0 is the emergence of a new generation of technologies and standards. This has been underpinned by the idea of the "Web as a platform", where umbrella software services run in a browser, communicating with the network and other remote servers.

The present document aims to investigate the potential of Web 2.0 principles and technologies when applied to the eParticipation field and more specifically, to eParticipation websites.

For this reason, after a short introduction to the eParticipation field, this report provides a brief overview of Web 2.0; summarizes patterns, characteristics, advantages and disadvantages and briefly describes the Web 2.0 tools and technologies.

Furthermore, a small number of indicative websites that capitalize on Web 2.0 capabilities are presented including Wikipedia, Delicious, Technorati, Flickr, Trivop, Eventful, Amazon, Google maps and Digg. In addition, a number of good practices of Web 2.0 – enabled eParticipation sites are presented including Open Politics, Le blog de Netpolitique, Désirs d'avenir, Scottish Parliament e-petitions and Participatory Budget of Berlin-Lichtenberg.

In order to determine how Web 2.0 acts beneficially to the eParticipation field, the presented eParticipation Web 2.0 sites are being compared based on an assessment template that is proposed. The template aims to identify how Web 2.0 adds value to participation and enhance communication and collaboration among citizens, but also between citizens and the state.

The results indicate that "Désirs d'avenirs" includes most of the available Web 2.0 characteristics, followed by "Open Politics" and "Participatory Budget of Berlin-Lichtenberg", while "Scottish Parliament e-petitions" and "Le blog de Netpolitique" could incorporate more Web 2.0 features to enhance even more citizens' participation.

Finally, it is ascertained that Web 2.0 tools and technologies have significant potential in a number of eParticipation areas including Campaigning, Deliberation, Discourse, Polling, Voting and Policy process.

1 Introduction

The Web before 2000 (also termed version 1.0) was characterized by [3]:

- static HTML pages that were rarely or maybe never updated
- the use of search engines and
- surfing from one web site to another.

The fall of 2001 represented a turning point for the Web, characterized of the bursting of the "dot-com bubble", which is sometimes labeled "Web 1.5". This is characterized by dynamic HTML pages created from content databases that can be updated more easily [3]. Both these versions (i.e. version 1.0 and version 1.5) refer to the initial form of the Web, which was totally or merely, static and unchangeable.

In October 2004 during a conference brainstorming session between O'Reilly and MediaLive International the concept of ***"Web 2.0"*** appeared for the first time. Tim O'Reilly and Dale Dougherty, both pioneers in themes related to the Internet, mentioned how important is Internet today, even if many people believe that its collapse is not far away at all [27][28].

According to O'Reilly, Web 2.0 is much more than changing user's interface of old applications and introducing a new one. On the contrary, it is a totally new way of thinking, with a number of basic effects that help us in better defining its concept and determining its main characteristics. These effects are [27]:

- Databases grow up, as more people interact with them.
- Applications become smarter, as more people use them.
- Marketing is based on users' experiences.
- Applications interact with each other, creating a computing platform.

The main objective of this booklet is to investigate the potential of the use of Web 2.0 in the field of eParticipation. This will enable investigating the degree that this emerging technology is able to enhance communication and collaboration between citizens and the state.

The rest of the booklet is structured as follows:

Section 2 provides an overview of the eParticipation field. This includes a working definition of eParticipation and a framework that introduces three layers: areas, tools and technologies.

Section 3 provides an overall description of Web 2.0, referring to its definition, its main patterns, its characteristics and its main advantages and disadvantages.

Sections 4 and 5 provide an overview of Web 2.0 technologies and tools respectively.

Section 6 presents some indicative exemplar websites that have incorporated the Web 2.0 tools, technologies, features and characteristics.

Section 7 presents five eParticipation websites that capitalise on Web 2.0 technology along with an assessment of their overall Web 2.0 readiness. More specifically, subsection 7.1 presents the eParticipation sites and subsection 7.2 introduces a template for assessing the Web 2.0 readiness of the sites.

Section 8 describes how Web 2.0 can add value to the various eParticipation areas.

Section 9 proposes some future scenarios about incorporating more Web 2.0 features to eParticipation sites, with the aim to enhance citizens' participation, while Section 10 sums up the conclusions and the results of the deliverable.

2 ePartiCipation overview

During the last few years eParticipation is a rapidly evolving field, where the applying technology has many impacts and benefits [22].

Within the DEMO-net project [7] a working definition of eParticipation has been elaborated. According to this definition,

> "eParticipation describes efforts to broaden and deepen political participation by enabling citizens to connect with one another and with their elected representatives and governments, using Information and Communication Technologies (ICT)".

In order to properly understand the field of eParticipation, we have to bring together eParticipation research and the ICT development field. Tambouris et al. [31] proposed a framework, which suggests that there are three main layers of analysis for the field of eParticipation: eParticipation Areas, Categories of ICT Tools and ICT Technologies.

eParticipation areas, refer to the specific areas of citizens' involvement in the democratic process, through the use of ICT. These include consultation, deliberation, campaigning, poling, community building etc.

ICT tools refer to software applications, products and tools that are used in eParticipation projects. These include Weblogs, Web Portals, Search Engines, Podcasting, Mailing lists/Newsgroups, Chatrooms, Wikis, Online Survey Tools, Deliberative Survey Tools, Content Analysis Tools, Content Management Tools, Collaborative Management Tools, CSCW, Collaborative Environments, Consultation Platforms, Argument Visualization Tools, Natural Language Interfaces.

ICT technologies refer to diverse technologies that eParticipation tools are based on. These include E-mail, Instant Messaging, File Sharing, RSS, Streaming Media Technologies, CSCW/Groupware, Semantic Web Technology, Web Services, XML, Security Protocols, Agent Technologies, Data Mining, Ontological Engineering, Computational Linguistics, NLP, Identity Management and Filtering Technologies.

The use of these tools and technologies in the domain of eParticipation empowers citizens and democracy itself [31], while it also enhances the field of eParticipation [32].

3 Overall description of the Web 2.0

Some of the ICT tools and technologies that were mentioned in the previous section are representative examples of the Web 2.0 concept. In this section we provide an overview of the main points of Web 2.0, with the aim to determine how these tools and technologies enable enhancing eParticipation.

3.1 Web 2.0 definition

It has been argued that Web 2.0 is an industry buzzword and like any other buzzword, it does not hold a universally accepted definition [35].

According to Wikipedia "*O´Reilly Media coined the phrase Web 2.0 in 2004 to refer to a supposed second-generation of Internet-based services that let people collaborate and share information online in perceived new ways — such as social networking sites, wikis, communication tools, and folksonomies*" [37].

Two years after, O´Reilly attempted a brief definition of the Web 2.0 concept. Web 2.0 is defined as "*the business revolution in the computer industry, caused by the move to the internet as platform, and an attempt to understand the rules for success on that new platform*" [27].

Ian Davis suggested that Web 2.0 is "*an attitude, not a technology*" [5] in an attempt to capture the importance of the changes that Web 2.0 encapsulated – changes that were lost in discussions of supporting technologies, such as RSS and AJAX, and blogs and APIs.

The main idea of Web 2.0 is referred as "*Web as a platform*". In the past, applications ran in a specific computer that has a specific operating system. In opposition to this, Web as platform means that umbrella software services run in a browser, communicating with network and other servers [2].

It is important to make clear that Web 2.0 represents the maturation of the Internet and is nothing more than the evolving Web that exists today. Using the term Web 2.0, is a recognition that Internet is not stable, but changes every day, introducing electronic cooperation and collaboration.

3.2 Web 2.0 main patterns

Taking into account the Web 2.0 definition that was described in the previous section, we are able to predicate that the concept of Web 2.0 is referred to a second-generation of Web-based services that emphasize online collaboration and sharing among users. As a result, Web 2.0 represents the evolution and maturation of the Internet during the last years. To understand and navigate better the Web 2.0 era, O'Reilly Media identified eight core patterns as follows [28]:

1. Leveraging the Long Tail

   Chris Anderson's economic model of the Long Tail is referred to the opportunities that exist today. More precisely, the model describes

the shift from a world with limited choices and mass markets, to a different world, which is characterized of unlimited choices and niche markets.

The Long Tail model is presented in Figure 1 and depicts the relationship between *product popularity* and *product choice*. The left part of the diagram represents the most popular products that are also very limited. The slope leads to a much broader part of the market, the *Long Tail*. In this right part of the diagram products do not sell many items, but the total number of niches represents market opportunities.

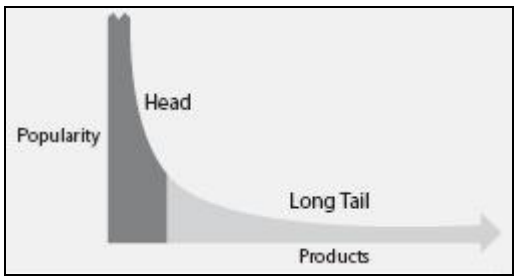

Figure 1: Long Tail model (from [28])

After analysing the model, we can see that Internet and Web 2.0 technology are leveraging the Long Tail. The main reasons for this situation are:

- The infinite self space that Internet has
- The existence of micro-markets
- The distribution, inventory and sales advantages.

2. Data Is the Next "Intel Inside"

   According to the concept of Web 2.0, applications are driven from the data. As a result, in order to achieve a competitive advantage, an enterprise should seek for data that are unique and hard to recreate. This way, the enterprise will be able to become the "Intel Inside" for the Web 2.0 era, where data is as important as functions.

3. Users add value

   The open source development model is followed. According to this model users should not be restricted by software, but rather participate actively in software development, by adding their own data. Consequently, combining users' best experiences and knowledge, new opportunities are created that result to enhanced user satisfaction, competitive advantage and continuous software improvement.

4. Network effects by default

   As only a small percentage of the users would try to add value to the applications, all network effects should be set by default for aggregating user data as a side-effect of their use of the application.

5. Some rights reserved

   Applications should be designed, focusing on "hackability" and "remixability". This means that when benefits come from collective adoption it should be ensured that barriers to adoption are low, by following existing standards and utilising licenses with as few restrictions as possible.

6. Perpetual Beta

   The traditional cycle of packaged software (design-develop-test-ship-install) is ending. Software has now become a service that is always on and always improving.

   Nowadays, success relies on the adoption of the perpetual beta development model. According to this model, software is continuously improved, users become co-developers and the feeding of online services becomes a core competency.

7. Cooperate, Don't control

   Web 2.0 creates "an architecture of participation" that involves the users implicitly and explicitly in adding value to applications. As a result, web services interfaces and content syndication should be offered to others, while the data services of them should be also reused.

   Moreover, by adopting a lightweight scalable model, many costs can be reduced because:

   - less capital is required,
   - large software development teams are not needed,
   - large budgets are not needed,
   - e-commerce components do not have to be created internally,

   and as a result, products and businesses are able to be built very quickly and with the minimal cost.

8. Software Above the Level of a Single Device

   Personal computers are no longer the only device available to a user to access Internet and Internet applications. As a result, Internet software should not be referred to a single device, but correspond to all devices that are Internet-connected, as applications that are limited to a single device are less valuable than those that are connected.

3.3 Web 2.0 characteristics

Although the eight aforementioned patterns are unique, they are not independent from each other. The truth is that they are interdependent. As a result, Web 2.0 includes some basic characteristics and principles that are able to support these patterns. These characteristics are the following [37]:

- Web is presented as a platform that delivers applications and allows users to use them, entirely through a browser.
- Users own the data on the site and have a total control of them.
- An architecture of participation and democracy is developed. According to this, users add value to an application, as they use it.
- User interface changes and becomes more friendly and interactive.
- Web 2.0 reveals the social aspects of networks and Web in general.
- Web 2.0 enhances graphical interfaces, by adding gradients and rounded corners.

It is very important to make clear that the "Web 2.0" concept is nothing more than the Web that is already developed and exists today. The difference that guides us to use term "2.0", is detected on the problems, technologies and all other issues that we will examine in the rest of this document. Moreover, term "Web 2.0" is a recognition that the Internet changes perpetually, and it introduces a new season of collaboration in World Wide Web.

Taking into account all these main points of the Web 2.0 technology, we can figure out that Web 2.0 does not have hard boundaries, but a core in the centre surrounded by all its main features. In Figure 2 we are visualizing Web 2.0 as a "*set of principles and practices that tie together a veritable solar system of sites*", demonstrating those principles at a varying distance from the core [28].

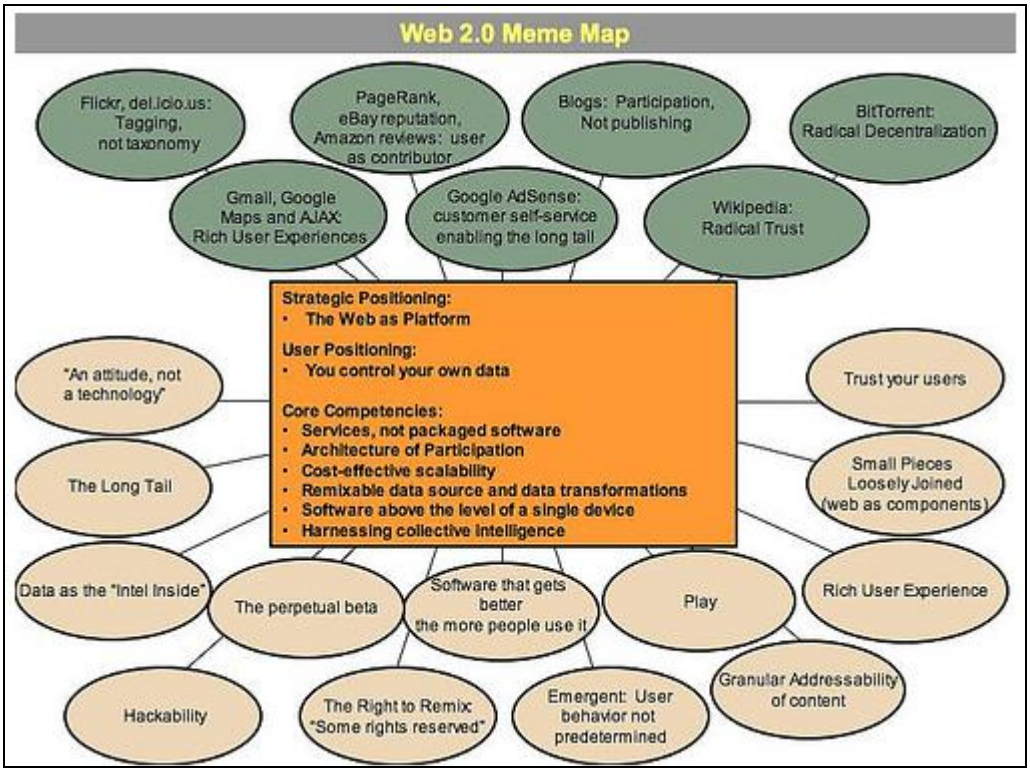

Figure 2: Web 2.0 – Meme Map (from [28])

3.4 Web 2.0 advantages and disadvantages

As Web 2.0 is becoming an increasingly popular term, a number of researchers have tried to weight its advantages and disadvantages. Even if there are too many users that are defenders of the Web 2.0 technologies, there also exist those who believe that serious problems can be caused by its usage.

The main advantages are the following [14]:

- Information flows freely.
- People can express their ideas without any fear.
- Internet becomes a democratic system.
- Users become more informed, as they receive their information from multiple sources.
- Users are allowed to make better decisions as they have in mind many aspects of a subject.
- Communication is enhanced, as Internet is one of the greatest communication mediums.
- Web 2.0 services facilitate experimentation and testing [4].
- Web 2.0 technologies do not require any special technical effort [4].

However, a number of disadvantages of Web 2.0 technologies also exist, even if they are not usually mentioned and discussed much. These include [14]:

- Legal problems come up when users share copyrighted information.
- Security problems are caused while web services are offered for free and become an easy target to hackers.
- Lack of reliance on third parties since there are not any contractual agreements.
- Users' dependence on the Internet, as it represents the main source of any information.
- The potential of a data loss. For this reason all files have to be kept in a hard copy form.

4 Web 2.0 technologies

One of the most important factors that contributed to the development of Web 2.0 is a new generation of Web-related technologies. This was enforced by the new idea that we already mentioned earlier, namely ***Web as platform***. In the past, applications run in a specific computer that had a specific operating system. In opposition to this, Web as platform means that umbrella software services run in a browser, communicating with the network and other servers [2].

In order to achieve the idea of the Web as a platform, the browser technology moved towards a new stage that introduces Rich Internet Applications (RIA). RIAs include some characteristics of traditional applications, but additionally transfer everything that is needed to the Web client, keeping the bulk of the data back to the application server [2].

In this section, the main Web 2.0 technologies are briefly presented.

4.1 Ajax

The term Ajax (Asynchronous JavaScript + XML) was first coined by Jesse James Garrett in early 2005 [2] and is referred to a group of technologies that help in creating richer and more responsive web applications [28].

Ajax replaces the "click, wait and refresh" requests. This was the main problem that traditional web pages had, and refers to the time that is spent waiting for pages to reload when a user has chosen an option or has clicked on a link [30]. Several attempts were made to solve this problem, without having a real result, until Ajax was developed and succeeded on it. With Ajax, when a webpage is loaded, only small amounts of information pass to and from the server, while all other items can be asynchronously updated in real-time, without reloading the whole page.

Although Ajax relies heavily on JavaScript and XML, it includes many more technologies as follows [2]:

- HTML / XHTML: the traditional way of presenting information within a browser.
- CSS (Cascading Style Sheets): a stylesheet language used to describe the presentation of a document written in a markup language.
- DOM (Document Object Model): a way of dynamically controlling a document.
- XML (Extensible Markup Language): a general-purpose markup language that enhances data interchange and manipulation.
- XSLT (Extensible Stylesheet Language Transformations): an XML-based language used for the transformation of XML documents that enhances data interchange and manipulation.
- XMLHttpRequest: an API that is used by JavaScript and other web browser scripting languages, to retrieve asynchronous data from the server.

- JavaScript (or ECMA script): a scripting language based on the concept of prototype-based programming.

4.2 Really Simple Syndication (RSS)

RSS is referred as the most significant technology of the Web, being often characterised as "the incremental web" or even "live web". RSS does not allow someone just to link to a page. On the contrary, users are able to subscribe to it and get notified every time the page changes [28].

RSS is an acronym that corresponds to one of the following standards, depending on the RSS version that we speak about [28]:

- Really Simple Syndication (RSS 2.0)
- Rich Site Summary (RSS 0.91, RSS 1.0)
- RDF Site Summary (RSS 0.9 and 1.0)

RSS files are also called *"RSS feeds"* or *"RSS channels"* and are XML text-based files, used for serving users' frequently updated content. RSS files contain a list of items. Each item contains a title, a summary, a link to a URL and sometimes other information, such as the date or the creator's name. RSS files are utilised by news-sites or any other websites that offer reverse-chronologically ordered information [15].

The most popular use for RSS is in "feed readers" or "feed aggregators". Feed readers are software programs that are used by RSS users. The user subscribes to a feed by entering the link of the feed into the reader program. The reader then checks the user's subscribed feeds to see if any of those feeds have new content since the last time it was checked. If something has changed, retrieves that content and presents it to the user [28].

4.3 Atom

Atom is an XML-based document format, quite similar to RSS. It was created by people that were seeking for improvements to RSS or those that disagreed with some of its politics [37].

Since February 2004, Atom version 0.3 has a stable format and many benefits, despite its drawbacks.

The main differences with RSS, is that Atom is more complex, able to carry more complex information than RSS feeds and very consistent across the syndication, storage, and editing of information [15].

4.4 Microformats

Microformats include a set of XHTML extensions that are used by developers to express a greater semantic meaning within a web page. Programs can extract meaning from a web page that is marked up with one or more microformats.

Adding microformats to a regular HTML web page allows machines to process HTML text and load data into remote databases. This allows programs called *"web crawlers"* to find items such as contact information, events, and reviews on web pages.

One may notice that the described process is already accomplished by the Web search engines. Search engines scan a website or blog, and index its content so that other people are able to locate it. The difference is that microformats provide additional information for these types of services [2].

Several microformats have been developed to enable semantic markup of particular types of information [23]:

- **hAtom** – for marking up Atom feeds
- **hCalendar** – for events
- **hCard** – for contact information
- **hReview** – for reviews
- **hResume** – for resumes or CVs
- **rel-directory** – for distributed directory creation and inclusion
- **rel-tag** – for decentralized tagging
- **xFolk** – for tagged links
- **XFN** – for social relationships
- **XOXO** – for lists and outlines

Of course many ideas have come up about future microformats, such as microformats for citing references, for amounts of money, for places, or names of living things.

4.5 SOAP

SOAP is a protocol that acts as a key element for the Web 2.0 infrastructure. The protocol involves posting XML-based messages over computer networks, normally using HTTP [3].

The whole process is not indefinite, but it includes a set of quite complex pre-defined instructions to be followed. There are several different types of messaging patterns in SOAP, but the most common is the *Remote Procedure Call (RPC)* pattern. In this pattern the client sends a request message to the server, and the server immediately sends a response message to the client [37].

4.6 REST (Representational State Transfer)

REST is an architectural style for distributed hypermedia systems. The term was first defined officially in 2000 by Roy Fielding (one of the authors of the original HTTP specification), but the style itself existed even earlier [22].

Every web architecture has a specific architectural style that can be described with a set of constraints. According to REST, more constraints can be added, developing this way a new architectural style that is more appropriate to the modern Web architecture. As a result, in order to develop this architectural style, a specific process has to be followed. The process includes a set of steps as described below [16]:

1. Starting with the Null Style: when a designer starts to develop software, the whole system has no boundaries and no constrains.
2. Client-Server: the constraints of the client-server architectural style are the first constraints that are added.
3. Stateless: communication between the client and sever must be stateless.
4. Cache: cache constraints are added to our network, in order to improve network efficiency.
5. Uniform Interface: a uniform interface is applied between components.
6. Layered System: layered system constraints are added to the system, developing an architecture that is composed of hierarchical layers.
7. Code-On-Demand: client is allowed to be extended, by downloading and executing code in the form of applets or scripts.

Summarizing the above, we present in Figure 3 a graphical depiction of all REST constraints that have been described earlier. These constraints are the ones that have to be applied in order to develop the new modern architectural style.

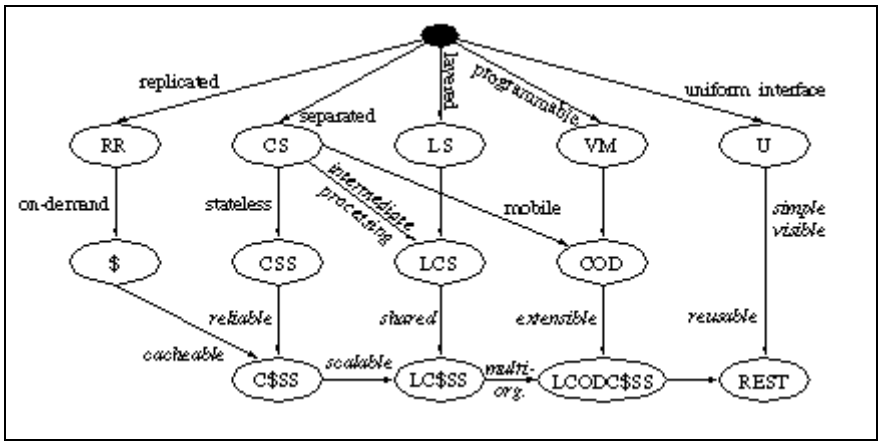

Figure 3: REST Style Constraints [16]

4.7 Mashups

The term mashup is something that probably was first heard in the context of music. There, a mashup is what you get if you mix one song with another. The end result of this process is a whole new song that has parts of both.

The web version of a mashup is pretty similar as in this occasion what we mix up is map data, photos, video, news feeds, blog entries, etc [37].

The term mash-up refers to a new breed of Web-based applications created by hackers and programmers, to mix at least two different services of disparate or even competing websites. A mash-up, for example, could overlay traffic data from one source in the Internet over maps from Yahoo, Microsoft, Google or any content provider.

This capability, to mix and match data and applications from multiple sources into one dynamic entity, is considered the promise of the Web service standard and is also referred as *"on-demand computing"* [37].

Next, some of the most popular mashups are presented:

1. Amazon Web Services [1]
2. del.icio.us [6]
3. digg [9]
4. eBay [11]
5. Flickr [17]
6. Google API's [18]

4.8 Open APIs

APIs provide to programmers mechanisms to use the functionality of some modules, without having access to the source code. When this procedure can be done without giving a license or any other royalties to the programmer, the API is called *"Open API"*. Open APIs helped a lot the development of Web 2.0 services [2].

5 Web 2.0 tools

In this section we introduce a number of key tools that are used in Web 2.0 applications and sites, namely blogs or weblogs, wikis, tags and podcasts [2] [27].

5.1 Blogs (weblogs)

A blog or weblog is a website consisted of paragraphs of opinion, information, or personal diary entries. These features are presented chronologically from the most recent post to the older one.

The first blogs were called "online diaries" and appeared in 1994. The term weblog was invented from John Barger in December 17, 1997. A weblog is comprised of text, images and links to other blogs or webpages and offers news or comments to a specific subject [10].

There are many different types of blogs depending on the way that its content is written or delivered from a user. For example, a blog may be determined from the type of elements that is constituted of. So, there is *vlog*, if the blog has a video, *linklog*, if the blog includes links to webpages or other blogs, and *photolog* if the blog has photos. A blog may also be characterised by the way that it was written. For example, *moblogs* are the blogs that are written in a mobile appliance such as a mobile phone or a PDA. Finally a blog may be characterised by its main issue. As a result we can have *political blogs*, *career blogs*, *travel blogs* etc.

Each entry in a blog has some main characteristics. These characteristics are:

- The title of the post.
- The main content of the post, referring to news, comments, politics, or whatever the issue of the post might be.
- The permalink, which is the URL of the entire article that the post is referred to.
- The date and time that the specific entry was sent.

Optionally, other information can also be included, such as comments, corrections, some tags with relative issues, links to relative webpages etc.

In order to create blogs, users should work with some specific tools that have been developed. Some of these are Ecto, Qumana, BlogJet, Zoundry, w.bloggar, Popst2Blog, etc. All these tools and also blog hosting is provided from web hosting enterprises, Internet services institutions and Internet gates [18].

5.2 Wikis

Wiki is a webpage or set of webpages that allows access for editing to users in order to enhance, remove or change its content. Its name derives from the Hawaiian word *wiki* which means that something is very quick, representing how quickly the user performs all changes.

The first wiki was called WikiWikiWeb. It was developed by Ward Cunningham in 1994 and uploaded to Internet on March 25, 1995.

Wiki can be considered as a tool of collaborative writing, as different users can write on it, even simultaneously. For example, if a user makes a mistake, another user is able to correct it. Moreover, adding new information to the webpage improves and updates it continually. For these reasons, an edit button is displayed, which is used as an editing tool to add, change or even delete the contents of a webpage.

Most wikis are open to all users, without the need to make an account and register to it. However, there are also wikis, where access is not free. In this case, users have to acquire a "wiki-signature" that will permit them to perform the content changes. What is common in both cases is that all changes are made in real-time and results appear directly to the wiki, without any delays.

Wikis generally have two main characteristics:

- A *history function*, which allows previous versions of the webpage to be examined
- A *rollback function*, which restores previous versions.

These characteristics enable users to correct possible mistakes and even more, react positively to the ideas of the open access and flexibility of a wiki [12].

Of course, this level of openness resulted in certain problems that may lead to system abuse. As a result, wikis suffer from problems of malicious editing and vandalism from not trusted users. However, considering its benefits, these problems may be overcome by restricting access to registered users only.

Some of the most important wikis that exist today are:

- WikiWikiWeb - the first wiki, written in Perl. It contains various topics and discussions about software engineering.
- Wikipedia - a multilingual, web-based, free content encyclopedia project, which is written collaboratively and voluntarily by anyone who has access to the Internet [37].
- World66 – it was a Dutch company which embraced the open content idea and tried to transform it into a profitable business. It is now owned to El Segundo, California, based on Internet Brands, Inc which acquired it in April 2006 [39].
- Wikitravel - a project that creates an open content, complete, up-to-date, and reliable world-wide travel guide [38].
- Wikinfo - formerly known as Internet-Encyclopedia. It is an online encyclopedia and a fork of the English language, initiated by Fred Bauder in July 2003 [36].

5.3 Tags

A tag is a keyword linked with an element such as a website, a picture or a video, as a mean of classification. The classification system is not formal

as tags are selected subjectively, from the person that creates it. This style of classification is called *"folksonomy"* (instead of taxonomy), in order to describe a collaborative categorization of sites, using labels and tags.

One of the most important and popular applications of tagging is the *"social bookmarking phenomenon"*. Social bookmarking systems allow users to create lists of their favorite tags, in order to classify them and have a direct access to them. Bookmarks are stored in a remote system and not in the client's browser, while at the same time the user can share them with others. A bookmark may be classified and belong to more than one category. This means that a user may access it from more than one tags.

The idea of tagging has been expanded even more and "*tag clouds*" were invented. Tag clouds are groups of tags from different users of a tagging service. This service collects information about how frequent each tag is used. This information is depicted as a *cloud* and the bigger the cloud is, the higher is its use-frequency and the tag is displayed in a larger text.

Some of the most important tagging webpages that exist today are:

- http://del.icio.us/ - a social bookmarking web service for storing, sharing, and discovering web bookmarks. It was founded by Joshua Schachter and is now part of Yahoo [6].
- http://www.flickr.com/ - a website for digital photo storage, sharing and organization [17].
- http://www.technorati.com/ - an Internet search engine for searching blogs that competes with Google, Yahoo and IceRocket. On April 2007 included over 75 million weblogs [33].
- http://eventful.com/ - a web service that helps users to search for events and share information about them [13].

5.4 Podcasts

Podcasting is a method that creates multimedia files (usually in MP3 format), such as video or music files and distributes them via the Internet, using RSS technology or Atom syndication.

Podcast is a composite word, invented in 2004. More precisely, it is a combination of two words: iPod and broadcasting. Even if the name is not literal and many alternative solutions have been proposed, this name is still in use. In fact, the name was not selected totally by chance. It was invented due to the Apple iPod, which was very popular the time that podcasting started to become known.

A podcast is employed by following three main steps:

- A multimedia file is created (usually in the MP3 format)
- The multimedia file is uploaded to a host server in the Internet
- Using RSS technology, users become aware of file's existence.

When this process is completed, the created RSS file includes a URL link to the multimedia file and also directions to the file's location to the host

server. According to RSS technology, users subscribe to RSS feeds and when a new podcast is edited, users receive the corresponding information [26].

As a result, the distribution of a multimedia file is a very simple process, as the most complicated step of the process is the production of a multimedia file of good quality.

6 Web 2.0 examples

This section briefly presents a number of websites which are often considered as exemplary with regards to the use of Web 2.0 ideas.

6.1 Wikipedia

Wikipedia [37] is a multilingual, web-based, free content encyclopaedia that is written by volunteers collaboratively. Many of its articles can be edited by anyone who has access to the Internet and its URL is http://www.wikipedia.org/.

The English edition of the website was first uploaded on the Internet on January 15, 2001. Until now, Wikipedia has more than 7.3 million articles in 252 languages, while 1.8 million of them are written in English. It is a very popular site, as it has instant access to any information that a user may need, and nowadays is considered to be among the top fifteen most-visited websites worldwide.

On the other side, Wikipedia has been many times criticized for reliability, accuracy, uneven quality, vandalisms and inconsistencies in its editorial process. The truth is that due to its open policy, vandalisms are a usual phenomenon to Wikipedia and also other similar sites. What is very encouraging to this problem is that studies have shown that vandalisms are generally short-lived and that sites like Wikipedia can normally continue their operation without problems.

6.2 Delicious

The official website of Delicious [6] is http://del.icio.us/ and in simple words this website may be described as a collection of users' favourites. Delicious is a social bookmarking website with some main functions that include:

- keep links to favourite files and access them from any computer via the Internet,
- share those files with other people and the del.icio.us community and
- discover new things about different topics, as everything that is collected is favourites choice of users.

More precisely, del.icio.us stores user's bookmarks online for the users, to access them or add any other bookmarks, from any other computer. To achieve this, tags are used, a technology that is much more flexible than folders.

Finally, del.icio.us can be used from users to share links with other people, see the interested links that they have bookmarked or even search for bookmarks that attract them, according to their interests.

6.3 Technorati

Technorati [33] is the recognized authority on what's happening on the World Live Web, right now. The Live Web is the dynamic and always-

updating portion of the Web. It involves searching, surfacing, and organising blogs and other forms of independent, user-generated content (photos, videos, voting, etc.).

In other words, Technorati is an Internet search engine that is used for searching blogs. It has been establihed by Dave Sifry and its official website is http://www.technorati.com/. It is a very popular website and according to studies on April 2007, it indexes over 75 million weblogs.

Technorati utilises open source software;iIt has an active software developer community for the development and management of the site. It also includes a public developer's wiki, where developers and contributors collaborate, as well as various open APIs.

The site won the SXSW (South by Southwest) 2006 awards for Best Technical Achievement and also Best of Show.

6.4 Flickr

Flickr [17] (http://flickr.com) is a photo sharing website and an online community platform. It was developed by Ludicorp, a Canada-based company and was launched on February 2004.

In the early years Flickr was focused on a multi-user chat room that was called FlickrLive and its main purpose was to exchange photos in real time. Also, photo exchange was focused mainly on images from the Internet, rather than photographs taken by users.

Nowadays, Flickr is considered almost certainly the best online photo management and sharing application in the world, and has two main goals:

1. *help people make their photos available to other people* – it gets the photos that come from web, mobile devices or personal computers and pushes them out, in as many ways as possible: on the website, in RSS feeds, by email, by posting them to outside blogs etc.
2. *enable new ways of organizing photos* – it helps users to organize their photos, trying an other way, except albums that are suitable for just a few photos. As a result, the user gives photos, adding the corresponding comments, notes or even tags and the system organizes them in the most suitable way.

6.5 Trivop

Trivop [34] (http://www.trivop.com/) is the first videoguide to be established for the hotel industry. It is a mashup with video, map and comments from users (through trip advisor). Trivop is a media company that offers:

- To travellers: the transparency they need for booking a hotel through on-line video feeds and hotel-finders.
- To hotels: a video platform dedicated to the hotel industry.

Its main goal is to change the way people choose their hotel before travelling. In the main page of the site, a map is depicted. The user

selects the place that he wants to stay and the hotels that exist in this place are depicted in the map. The user selects a hotel and a stream video presenting the hotel starts playing.

Trivop aims to become a site that will give travellers the transparency they need before travelling and booking. Its services today are very limited as just a few videos are uploaded to the site. Moreover, videos are not sufficient enough to cover all the needs that users may have about their accommodation.

6.6 Eventful

Eventful [13] (http://eventful.com/) is a service of Eventful, Inc., of San Diego, California. It is a leading events website which enables its community of users to discover, promote, create and share events throughout the world.

Eventful includes a number of main objectives that have led to its development. These objectives are:

- Find events that people care about,
- share and syndicate user's discoveries with other persons,
- search for future events that have not been announced yet and
- create grassroots campaigns for specific events to happen.

6.7 Amazon

Amazon is an American e-commerce company that was found by Jeff Bezos in 1995 and is based in Seattle, Washington.

Amazon.com [1] (http://www.amazon.com/) began as an online bookstore. Very soon it diversified its product lines, adding DVDs, music CDs, computer software, video games, electronics, apparel, furniture, food, toys and more. This resulted to the fact that the company nowadays is considered as "The Earth's Biggest Bookstore".

Amazon.com has 59 million customer accounts, representing one of the best examples of a successful Web 2.0 enterprise that has adopted many recognizable techniques.

6.8 Google maps

Google Maps [19] is a free web mapping service application and technology that is provided by Google. It includes many map-based services that are: the *Google Maps website*, *Google Ride Finder* and *embedded maps on third-party websites via the Google Maps API*.

It offers street maps, a route planner, and an urban business locator for numerous countries around the world.

When a user launches http://maps.google.com, a map is presented to him. The user may navigate by dragging the mouse, or using the mouse wheel to zoom in or out. With Google maps users are also able to create and share personalized maps. More precisely, one is able to:

- mark favorite places on the map

- draw lines and shapes to highlight paths and areas
- add text, photos and videos
- publish a personal map to the web
- share personal maps with friends and family

Moreover, users are able to search for a specific area, thanks to Google Local. Through Google Local users are able to find a variety of services that may need for that place.

Zooming in and out, the user is able to find every place he may look for, in the map. The maps have two views:

1. *map view*, depicting streets and roads for almost every region in the world and
2. *satellite view*, for the most urban areas in the world.

6.9 Digg

Digg [9] (http://www.digg.com) is a user-driven social content website that gives emphasis mainly on technology and science, but also on other topics such as politics or entertainment.

Digg started as an experiment in November 2004 by Kevin Rose, Owen Byrne, Ron Gorodetzky and Jay Adelson. At first, the main idea was that the site would be free of advertisements. Meanwhile, when the site started to become popular, Google AdSense, was added and the site updated to version 2.0. On June 2006, version 3.0 of the site was developed and site's interests were reduced in specific categories including Technology, Science, World & Business, Videos, Entertainment, Gaming and a mixed category.

Digg website combines all basic Web 2.0 technologies and characteristics, such as social bookmarking, blogging, tagging, RSS feeds, democratic editorial control.

The functionality of the digg site is quite simple. All users have the right to view all the stories that are submitted to the website. When a story receives many "diggs" it is moved in the main page of the site and when a problem is reported or "diggs" are not enough the story may be removed.

The access to the site is free, but a registration is needed, for actions like voting, submitting a story or making comments.

7 ePartication websites and Web 2.0

This section presents some indicative examples of eParticipation websites that capitalise on Web 2.0 technologies, emphasising on the services that they offer to their visitors. Furthermore, a comparison of the websites is conducted based on a template that is developed for this purpose.

7.1 Examples of Web 2.0 – enabled eParticipation websites

7.1.1 Open Politics

Open Politics [24] (http://openpolitics.ca) is a project of the Open Politics Foundation that combines the aspects of free software and open content. It was initiated in March 2005, with initial funding from the Fabian Trust, to develop a wiki technology for public policy applications. More precisely, the purpose of this site is to provide an open forum for collaboration and deliberation on political issues, trying to support the open exchange of ideas via the Internet.

Open Politics is a political wiki that:

- Makes it easy for someone to read summaries of all issues
- It enhances deliberation and collaboration rather than debate

The site has a good design and as a result it is very easy for someone to navigate it and learn how to use it. Content reflects the community's thoughts and is added by registered and anonymous contributors to almost every page of the site.

The main actions that users can do, after their registration to the site are:

- Edit a page with a specific issue
- Make a comment to a page (agreeing, disagreeing or making a general comment)
- Raise an issue
- Take a position on an issue, referring what should be done

Add an argument for or against a position.

7.1.2 Le blog de Netpolitique

Netpolique [20] (http://www.netpolitique.net) is a website that enhances interactive communication and also political and public communication.

Netpolitique.net has a double objective:

- To describe, analyze and enhance the innovative idea of online political and social communication.
- To promote the use of communication and information technologies to the profit of the political and public communication.

As a result, Netpolitique is characterized as a new communication method for citizens, by using the emerging Web 2.0 tools and technologies.

Netpolique is a project that started from Stanislas Magniant on February 2000. Since that date, Netpolique manages to inform users and promote

the use of communication and information technologies to the profit of the political and public communication. What is really meaningful is that no lucrative goals justify the implementation and existence of the site netpolitique.net.

Access to all content of this site is free to any person and all citizens are able to edit or make comments on any political issue that interests them.

7.1.3 Désirs d'avenir

Désirs d'avenirs [8] (http://www.desirsdavenir.org) is the official website for the campaign of Ségolène Royal, the socialist candidate to the 2007 French presidential election. The project was initiated by Désirs d'avenirs, a non-profit organisation set up by Ségolène Royal to back her candidacy independently from the Socialist Party.

One of the mottos of Royal campaign was the modernization of the French political system through the development of participative democracy.

The goal of the site is to develop a new form of campaigning based on the active participation of all voters. Indeed, this goal has been realised to some extend, as more than 150.000 contributions were posted and about 50.000 unique citizens visited the site daily on average, making it the most popular eParticipation initiative in France.

The software is open source and the site allows different levels of participation. As a result, a user is able to:

- read news
- contribute posts
- rate posts or blogs
- discuss issues relating to campaigning
- share documents, templates or videos,

having as a general goal to promote cooperation, sharing and exchange among its users.

To take part in general discussion forums, users should register by providing a valid e-mail address and no other personal information. Personal information is needed only if the user would like to take part more directly in the campaign.

7.1.4 Scottish Parliament e-petitions

"Scottish Parliament e-petitions" [29] is a project that started by the International Teledemocracy Centre (ITC) at Napier University in Edinburgh and was first launched on February 11, 2004, five years after its pilot implementation.

Responsible for the whole system and its processes is the Scottish Parliament, cooperating with the ITC for electronic or technical issues. Its official website is http://epetitions.scottish.parliament.uk.

The system promotes community democracy, enables citizens to interact actively with the political process and provides them the ability to influence the political agenda. More precisely, the "ePetitioning System" enables citizens to the following functionalities:

- Raise a petition, live on the Internet, rather than just on paper, describing analytically its content.
- Support a petition, by adding name and address online (personal signature).
- Petition the Parliament.
- Make their own comments for every issue that is presented, while the system gathers similar comments in order to produce overall reports.
- View statistical results of specific issues.
- Visitors and signatories can discuss every petition, through the discussion forum, which is post-moderated.

The main page of the project "Scottish Parliament e-petitions" includes information about e-petitions and some guides about the e-petitioning system.

Similar examples that are related to e-petitions are:

- *http://www.bristol.gov.uk/item/epetition.html*
- *http://e-petitions.kingston.gov.uk/list_petitions.asp*
- *http://itc.napier.ac.uk/e-Petition/bundestag*.

7.1.5 Participatory Budget of Berlin-Lichtenberg

The project [25] was initiated by the borough assembly of Berlin-Lichtenberg and was piloted in 2005. Its aim was to increase the transparency and citizens' knowledge about financial matters and raise the level of effectiveness and fairness of budgeting.

The internet platform allows citizens to gather information about budgeting and the consultation process and allows them to submit, deliberate and revise the submitted proposals conjointly. Moreover, the platform supports eInforming, eConsulting and eCollaborating.

After making a registration (using login name and e-mail address), the participation platform provides the citizens with a set of different options, such as:

- Getting informed by an information section
- Participate in the forum
- Contribute posts
- Make comments
- Participate in proposal-wikis
- Participate in polls
- Use a budget-calculator
- Receive newsletters
- Subscribe to RSS feeds.

7.2 Web 2.0 readiness of eParticipation websites

In order to asses the Web 2.0 readiness of eParticipation websites, we first collected all those Web 2.0 features that help to overcome a number of relevant eParticipation challenges, e.g. Social Complexity, Integration and Responsiveness, Tools and Techniques in Context, Interactivity and Scalability, Analysis and evaluation [21]. Consequently, we categorised these features into sever groups which are:

1. Blog creation, contribution of posts, forums
2. Ability to make comments and rate contributions
3. File sharing (documents, videos, photos, templates), podcasts
4. Tags and tagclouds, social bookmarking
5. Wikis
6. Mashups
7. RSS, microformats

The next step would be to determine whether these features are used in eParticipation websites.

It should be noted here that the main purpose of this assessment is not to rate the websites or determine which one is "better". Instead, the whole process aims to assess the Web 2.0 capabilities of the sites and determine how Web 2.0 technologies add value to the sites and enhance participation.

In Table 1 we present the results of assessing the Web 2.0 readiness of the five eParticipation websites presented in sub section 7.1.

	Open Politics	*Le blog de Netpolitique*	*Désirs d'avenirs*	*Scottish Parliament e-petitions*	*Participatory Budget of Berlin-Lichtenberg*
1. Blog creation, contribution of posts, forums	X	X	X	X	X
2. Ability to make comment and rate, contributions	X	X	X	X	X
3. File sharing (documents, videos, photos, templates), podcasts			X	X	X
4. Tags and tagclouds, social bookmarking	X	X	X	X	X
5. Wikis	X	X	X		X
6. Mashups	X		X		
7. RSS, microformats	X	X	X		X

Table 1: Web 2.0 readiness matrix for five eParticipation sites

According to Table 1, we can make the following observations:

1. The eParticipation site that employs most Web 2.0 features is "Désirs d'avenirs". This site includes all seven Web 2.0 features that an eParticipation site may use.

2. "Open Politics" and the "Participatory Budget of Berlin-Lichtenberg" are also remarkable examples, as they employ almost all Web 2.0 features that enhance communication and collaboration between the citizens.
3. The "Scottish Parliament e-petitions" represents a complete Web 2.0 site, as the features that does not include refer to multimedia files, something that may not correspond to its objectives.
4. Finally, "Le blog de Netpolitique" employs some Web 2.0 features, but actually less than the other four. For example, it would probably be useful for users to have a forum to discuss political issues or the ability to rate posts or other contributions.

The analysis of the eParticipation websites further allowed us to appreciate the use of Web 2.0 features in practice.

For example, with the implementation of Web 2.0 features, information flows freely and citizens are able to cooperate and communicate about the political issues they are concerned.

Everyone is allowed to express their ideas using blogs or contributing posts, but also using other multimedia formats (via podcasts or mashups), with the aim to have a better view of these ideas.

Citizens are able to discuss their ideas, problems or other general political issues with other persons in forums. Moreover, by making comments or rating the posts they are able to express their agreement or disagreement, transforming this way the Internet in a democratic system.

Finally, communication is enhanced via the Internet and the population becomes more informed, as they receive information from multiple sources via wikis and are aware of any change or modification through RSS feeds.

All these features and remarks describe a situation that is much liberal and democratic, and which attracts even people that are defenders of the traditional democratic processes.

In conclusion, the five sites we have presented have been proved to be exemplars with regards to the employment of Web 2.0 features in eParticipation websites.

8 Current use of Web 2.0 to enhance eParticipation

This section provides a brief overview of the current use of Web 2.0 in various eParticipation areas. The full list of areas is obtained from the DEMO-net booklet [7] and, according to this list, we have determined the areas that are impacted the most by Web 2.0 tools and technologies. These areas are the following:

- ***Campaigning*** – Web 2.0 technologies may support political campaigns for candidates, during elections or even before and after them. Candidates are able to inform citizens about their personality and political scope but also share photos and videos through podcasts. On the other side, citizens are able to read news, contribute to posts or create blogs, in order to share their opinion about the political situation in general, the specific candidate, or even discuss their political problems through forums. Two remarkable examples on this area are:
  - Désirs d'avenirs – the official website for the campagne of Ségolène Royal and
  - http://www.techpresident.com/taxonomy/term/75 - the official blog for the campaign of John Edwards. It represents the first shop in virtual world Second Life.
- ***Deliberation*** – Citizens are able to exchange opinions on political issues through blogs or posts and, in this way, form specific collaborative solutions for them.

  The aforementioned Open politics website is a remarkable example that enhances communication and collaboration about political issues between the citizens.
- ***Discourse*** – Similarly, citizens may exchange opinions and form solutions through blogs and posts or using open forums. Moreover, all these can contribute to the transmission of political views or problems to elected representatives, so that the solutions proposed, become materialized.

  Participatory Budget of Berlin-Lichtenberg, is an example that incorporates many features that enhance the Discourse area and also the Deliberation area.
- ***Polling*** – Government may measure public opinion about several political issues. Through polling, citizens are able to publish their opinion that would be used as input to government's decisions (for example the website of Participatory Budget of Berlin-Lichtenberg).
- ***Voting*** – Government may conduct public voting in many different political issues, but also in national or any other type of elections.

A corresponding example is NetVoiting.org[1], where citizens have the ability to vote for a number of different issues, including politics.

- ***Policy Process*** – This involves participation of citizens in the policy-making cycle. Citizens are able to get informed about any political changes through RSS feeds. Also, through blogs and posts they can exchange opinions about challenges or new opportunities, decide for actions to be taken and develop a collaborative plan to implement their decisions and transmit them to government representatives.

  As eParticipation is an evolving field, the majority of current political websites do not approach the participation field in depth. However, Web 2.0 provides promising opportunities for building more eParticipation-enabled sites in the future.

[1] http://www.netvoting.org/

9 Potential use of Web 2.0 to enhance eParticipation

This section introduces a number of suggestions on the use of Web 2.0 to enhance eParticipation.

In eParticipation websites, citizens take part in discussion forums or contribute to blogs or posts on different political issues. Until now, there are only a few tools and technologies that can track similar issues and group them together. An example is the "semantically interlinked online communities" (SIOC) project[2]. In general however different discussion issues are found in different locations although they are highly related. Therefore, pioneer tools which would be able to identify and group the repeating ideas could be further developed. These tools should allow identifying and grouping together those issues that are more likely to have a solution, those issues that were dismissed and/or those issues that have been already concluded (e.g. solved).

One other major problem to the eParticipation field is that new ideas, problems, or solutions are not taken further or converted into actions by government executives, even if the main objective of eParticipation is communication and collaboration between the citizens and the state. A very interesting solution would be the development of a tool that would ensure effective communication about the emerging political issues for both parties (after they are grouped in categories), combining a number of Web 2.0 features.

Above all, it is very important to preserve the good quality of the content in eParticipation websites, in order to improve their functionality and popularity. For this reason, it would be useful to develop and use improved tools, which would effectively filter out "junk ideas" or offensive content, in order to provide valid information to the citizens.

On the other side, considering website comparison and assessment performed in the current booklet, future work could also include:

- further study of the Web 2.0 features we already referred to, in order to expand or improve the assessment template that was proposed,
- analysis of more eParticipation websites, in order to conclude in better results,
- creation of a guide that will be used for website development. Using this guide, web developers would be able to create functional websites that enhance the idea of eParticipation and provide communication and collaboration.

[2] http://sioc-project.org/

10 Conclusions

The purpose of this booklet is to study the role of Web 2.0, investigating the potential of its principles, tools and technologies when applied to the eParticipation field and eParticipation websites.

The booklet makes an introduction to the main features, patterns and characteristics of Web 2.0. After this introduction, Web 2.0 tools (blogs, wikis, tags, podcasts) and technologies (Ajax, RSS, Atom, microformats, SOAP, REST, mashups, open APIs) are presented, with the aim to formulate a complete view of the Web 2.0 concept.

Based on all these features, some exemplar Web 2.0 sites and eParticipation Web 2.0 sites are presented. The Web 2.0 sites presented include Wikipedia, Delicious, Technorati, Flickr, Trivop, Eventful, Amazon, Google maps and Digg. The eParticipation sites presented include "Open Politics", "Le blog de Netpolitique", "Désirs d'avenir", "Scottish Parliament e-petitions" and "Participatory Budget of Berlin-Lichtenberg".

As our main purpose was to determine how Web 2.0 acts beneficially to the eParticipation field, a Web 2.0 readiness assessment template for eParticipation sites was proposed. The template is derived from a set of Web 2.0 features that address a number of relevant challenges when adopted by eParticipation websites. The aim of the template is not to determine which website is better, but rather how Web 2.0 technologies add value and enhance participation.

The template was utilised to assess the Web 2.0 readiness of the five eParticipation websites presented. The results suggest that these sites employ many Web 2.0 features that enhance communication and collaboration among citizens, but also between the citizens and the state. More specifically, "Désirs d'avenirs" is the most integrated Web 2.0 example, followed by "Open Politics" and "Participatory Budget of Berlin-Lichtenberg". "Scottish Parliament e-petitions" includes all the Web 2.0 features that are important for its purposes, while "Le blog de Netpolitique" employs some Web 2.0 features, but actually less than the other four that were examined.

By analysing various Web 2.0 sites, it is evident that information flows easier as citizens are able to express their ideas through blogs and posts, discuss emerging issues with other people, or share information by interchanging documents or other multimedia files. Moreover, through wikis and RSS feeds, the citizens are in time and well-informed about every issue of their interest.

Finally, we suggested that a number of eParticipation areas are enhanced from the Web 2.0 tools and technologies. It seems that the areas that are mostly impacted include Campaigning, Deliberation, Discourse, Polling, Voting and Policy process.

References

1. Amazon Web Services, Available online at: http://www.amazon.com/AWS-home-page-Money/b/ref =sv_hp_4/105-9375395-9292457?%5Fencoding=UTF8& node=3435361
2. P. Anderson, "What is Web 2.0? Ideas, technologies and implications for education", JISC Technology and Standards Watch, February 2007.
3. A QA Focus document, "An Introduction to Web 2.0", Available online at: http://www.ukoln.ac.uk/qa-focus/documents/briefings/briefing-92/html/
4. A QA Focus document, "Risk Assessment For Use Of Third Party Web 2.0 services", http://www.ukoln.ac.uk/qa-focus/documents/briefings/briefing-98/html/
5. I. Davis, "Talis, Web 2.0 and All That", Internet Alchemy, 4-7-2005, Available online at: http://internetalchemy.org/2005/07/talis-web-20-and-all-that.
6. Delicious, http://del.icio.us/
7. DEMO-net, "Introducing eParticipation", DEMO-net booklet series, no. 1, 31-5-2007. Available online at http://www.demo-net.org
8. Désirs d'avenirs, http://www.desirsdavenir.org
9. Digg, http://digg.com/
10. Doctorow C., Dornfest F., Johnson J. S., Powers S., "Essential blogging", O'Reilly, 2002.
11. eBay, http://www.ebay.com/
12. A. Ebersbach., M. Glaser, R. Heigl, "Wiki: Web Collaboration", Springer-Verlag: Germany, 2006.
13. Eventful, http://eventful.com/
14. Exforsys Inc, "The Advantages and Disadvantages of Web 2.0", http://www.exforsys.com/tutorials/web-2.0/advantages-and-disadvantages-of-web-2.0.html
15. Fagan Finder, "All about RSS", http://www.faganfinder.com/search/rss.php
16. R. T. Fielding, "Architectural Styles and the Design of Network-based Software Architectures", University of California, Irvine, 2000, http://www.ics.uci.edu/~fielding/pubs/dissertation/rest_arch_style.htm
17. Flickr, http://www.flickr.com/
18. Google APIs, http://code.google.com/apis/
19. Google Maps, http://maps.google.com/
20. Le blog de Netpolitique, http://www.netpolitique.net
21. A. Macintosh, "eParticipation in Policy-making: the Research and the Challenges", eParticipation Research Challenges workshop in conjunction with the eChallenges 2006 conference, October 27, 2006.
22. A. Macintosh, A. Whyte, "Evaluating how eparticipation changes local democracy", eGoverment workshop 2006, Brunel University, West London.
23. Microformats, Official website, http://microformats.org/blog/category/hCalendar/
24. Open Politics, http://openpolitics.ca

25. Participatory Budget of Berlin-Lichtenberg, http://www.buergerhaushalt-lichtenberg.de/index.php

26. L. Patterson, "The Technology Underlying Podcasts", IEEE Computer Society, 2006.

27. T. O'Reilly, "Web 2.0 Compact Definition: Trying Again", 12-10-2006, Available online at: http://radar.oreilly.com/archives/2006/12/web_20_compact.html.

28. T. O'Reilly, "*What is Web 2.0: Design Patterns and Business Models for the next generation of software*", 2005. Available online at: http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

29. Scottish Parliament e-petitions, http://epetitions.scottish. parliament.uk

30. Shin S., *"Ajax Basics"*, Sun Microsystems, Inc, 2006, Available online at: http://www.javapassion.com/ajax/AJAXBasics_speakernoted.pdf

31. E. Tambouris, N. Liotas, K. Tarabanis, "A Framework for Assessing ePericipation Projects and tools", 40th Hawaii International Conference on System Sciences, 2007.

32. E. Tambouris, N. Liotas, D. Kaliviotis, K. Tarabanis, "A Framework for Scoping eParticipation", 8th Annual International Digital Government Research Conference, Philadelphia, Pennsylvania, USA, 2007.

33. Technorati, http://www.technorati.com/

34. Trivop, http://www.trivop.com/

35. K. Voelker, "Web 2.0", March 28, 2007, Available online at: http://kvoelker.blogsome.com/

36. Wikinfo, http://www.internet-encyclopedia.org/index.php/ Main_Page

37. Wikipedia - www.wikipedia.com

38. Wikitravel, http://wikitravel.org/en/Main_Page

39. World66, http://www.world66.com/

The Demo-Net Consortium consists of:

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University of Leeds	Coordinator	United Kingdom
Örebro University	Partner	Sweden
University of Koblenz-Landau	Partner	Germany
Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V.	Partner	Germany
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