

## **DIFFERENT VIEWS ON WEB 2.0: AN OVERVIEW**

**Johannes Reiter**

Erasmus Student of Computer Engineering  
Faculty of Science and Technology  
University Fernando Pessoa, Porto, Portugal  
[19768@ufp.edu.pt](mailto:19768@ufp.edu.pt)

**Luis Borges Gouveia**

Associate Professor  
Faculty of Science and Technology  
University Fernando Pessoa, Porto, Portugal  
[lmbg@ufp.edu.pt](mailto:lmbg@ufp.edu.pt)

## **ABSTRACT**

Web 2.0 is nowadays a popular concept. This concept was introduced in 2004 and it fast became widely used. It also produced a number of changes in the way we use and interact with the World Wide Web. From a more technologic oriented view, the Web 2.0 introduced a more distributed and functional approach based on people, in contents and in interaction between groups of individuals.

This paper presents the Web 2.0 from a number of perspectives, aiming to show the broad impact that Web 2.0 can achieve as a concept proposal based on the value it can provide to the Internet user.

## **KEYWORDS**

Web 2.0, Internet tools, information society, digital technology

## **RESUMO**

A Web 2.0 é um conceito em voga. Introduzido durante o ano de 2004 rapidamente se tornou bastante popular e produziu mudanças significativas na forma como a Internet e em especial a World Wide Web é explorada. De uma perspectiva mais tecnológica, a Web 2.0 introduziu uma preocupação mais distribuída e funcional, assente em pessoas, nos conteúdos e na interacção proporcionada a grupos de indivíduos.

Este trabalho apresenta a Web 2.0 de acordo com diversas perspectivas, demonstrando o impacte alargado que a Web 2.0, enquanto conceito, pode proporcionar ao utilizador da Internet.

## **PALAVRAS-CHAVE**

Web 2.0, ferramentas da Internet, sociedade da informação, tecnologia digital

## 1. INTRODUCTION

The term Web 2.0 showed up the first at a Conference which was held in the year 2004. It was defined as

**Web 2.0 is the business revolution in the computer industry caused by the move to the Internet as a platform, and an attempt to understand the rules for success on that new platform**

and described more detailed in an article written and published by Tim O'Reilly, the owner of O'Reilly Media in the year 2005. This article is used as a basic definition for the topic Web 2.0. But up to now no exact definition of the term Web 2.0 exists, so there can be different views, which depend on the viewer's side on the term.

This paper tries to describe four different views, the technological view, the economical view, the social view and the political view. The technological view describes the basic techniques which enabled the creation of Web 2.0 Applications. For this purpose the terms Ajax, RIA, SLATES, and CMS get analyzed. These basic technologies enabled the creation of new applications, which are used on one side for the economical view named Enterprise 2.0, which is a new way for enterprises to deal with the topic World Wide Web and which is also described in this paper.

On the other side they are also very useful for the social view which can be divided into social software and private data distribution. Social software enables a person to interact with every other person in the world using Web 2.0 technologies. There exist different networks for private and business collaboration. The term private data distribution means that a person can access his data from everywhere in the world. The last part of this paper tries to summarise the political view which describes the problems that can occur with personal data stored in the internet. A big problem nowadays is the demolition of data privacy because of inadequate company policies. A big problem for the future will be the balance between governors and governors. The conclusion tries to figure out a solution for this problem.

## 2. TECHNOLOGICAL VIEW

The combination of different already existing technologies enabled the creation of new applications which are now covered under the term Web 2.0. The following chapter describes some of the main technological conditions that contribute to the success of the Web 2.0 as growing phenomena.

The term **Ajax** (Asynchronous JavaScript and XML) covers desktop-like applications such as internet interfaces or rich text applications which are realized through asynchronous data transfer from the web server to the client in the background of the application (O'Reilly). The term Ajax was used the first time in 2005, but the basic technology behind it, the asynchronous data transfer was already introduced in 1996. Ajax applications use normally the following technologies (WP-Ajax):

- XHTML (Extensible HyperText Markup Language) in combination with CSS (Cascading Style Sheets) for the layout and the presentation of the website;

- DOM (Document Object Model) for accessing the different parts on the website;
- XML (Extensible Markup Language) for the manipulation of the website content and the exchange of data;
- The XMLHttpRequest protocol is used for the asynchronous communication between the server and the client, which is normally the internet browser;
- JavaScript is the scripting language in the background of the Ajax application and is used for connecting the different technologies.

Out of these five technologies which are much older than the term Web 2.0, a frameset for the development of **WebApps** (Web Applications) was created. In the field of software engineering a WebApp is defined as an application that is accessed via a web browser over a network such as the Internet or an Intranet. It is also a computer software application that is coded in a browser-supported language (such as (X)HTML, JavaScript, Java, etc.) and reliant on a common web browser to render the application executable (WP-WebApp).

Web applications are popular due to the ubiquity of a client. The ability to update and maintain web applications without distributing and installing software on potentially thousands of client computers is a key reason for their popularity.

The combination of different technologies as described previously enabled the development of Rich Internet applications (RIA) which are defined as web applications that have the features and functionalities of traditional desktop applications. RIAs typically form a stateful client application with a separate services layer on the backend. RIAs typically run in a web browser, which means that they do not require a software installation and they run locally in a secure environment called a sandbox which is equal to a high security level of the application (WP-RIA).

The Harvard Professor Andrew McAfee defined some more basic technologies referring to Web 2.0. He published an article in which he defined the abbreviation SLATES (McAfee):

- **S**earch: fast information retrieval through a keyword search makes a program valuable;
- **L**inks: guide to the important pieces of information;
- **A**uthoring: the ability to create constantly updated content like wikis or blogs;
- **T**ags: categorization of content by one-word descriptions to facilitate searching;
- **E**xtensions: automation of work and pattern matching by using algorithms;
- **S**ignals: the use of RSS technology to notify users with any changes of the content.

**RSS** (Really Simple Syndication) is a service on websites which contains headlines, a short passage of the text and the hyperlink to the original site formatted as a news ticker. RSS should be replaced by Atom which is a derivative of RSS 2.0, but is not compatible to it and stands in competition with the old RSS format (WP-RSS).

These requirements are normally fulfilled by Content Management Systems (CMS). CMS enable the collaborative creation and administration of content. Content is defined as data which has a value for the user. CMS are usually implemented as a Rich Internet Application and they include the common Web 2.0 applications, which are used for collaboration and communication and are described in the following two sections (Bodendorf) and (Koop).

### 3. ECONOMICAL VIEW

The Web 2.0 technologies and tools are used to improve the existing management models for companies or the presentation of the company in the World Wide Web to gain new customers or to improve the efficiency and productivity of the company.

A narrow definition of Enterprise 2.0 is the use of emergent social software platforms within companies, or between companies and their partners or customers. A wider definition of Enterprise 2.0 means the use of all Web 2.0 applications for project management, knowledge management and internal and external communication in a company (Geiger). The Web 2.0 applications support the exchange of knowledge and content between the employees. But Enterprise 2.0 is not only a term which describes the tools it is also a trend to change the culture within a company, from the old hierachic, central management model towards an autonomic control of teams moderated by the managers.

Enterprise 2.0 can be divided into two main areas (McAfee). The first area is the sharing-think business versions of Wikipedia, MySpace, and Flickr. This means blogs, wikis, RSS feeds and Content Management Systems are used within companies for collaboration. Instead of mass mailing with new information a wiki can be used as the start page in the company's intranet. But that is only interesting for companies which have complex processes or a huge number of information to exchange.

The second area is voice and messaging, where VoIP (Voice over Internet Protocol), instant messaging, presence and video-conferencing are used for internal and external communication. In companies where several employees work together in a project and because of that have to write documents together, share appointments and tasks, tools like messengers or group editors can tighten the processes.

Some discrete companies, mostly represented in the financial sector, ignore the movement towards Enterprise 2.0. They are in risk of losing their competitiveness in the next years, because rich, collaborative software platforms that include a slate of technologies like wikis, blogs, integrated search, and unified communications will be the norm (Hoover).

The attraction of new business contacts over special social networks for companies like XING is also part of the field Enterprise 2.0. The advantage out of social networks for companies is that the regional limit is bridged over (Wolff).

Companies can also improve their website by using the Ajax technology. An E-Commerce-Shop can attract customers if it contains the following parts (Geiger):

- Correct and regular updated content;

- A possibility to show the information incrementally;
- Photos and diagrams instead of or in addition to technical descriptions;
- A shopping cart or a basket for saving products enlarge the customers comfort;
- A intuitive user-interface to navigate on the website.

The following table shows the results of a survey, which was held in the year 2006. Business technology professionals were asked for their opinion about useful Web 2.0 tools.

**Table 1.** Useful Web 2.0 Tools for Enterprises (Hoover, 2007)

<b>Which Tools are very useful?</b>	
Instant messaging	69%
Collaborative content tools	61%
Integrated search tools	56%
Unified communications	49%
Wikis	47%
Mashups	43%
Ajax-powered Web portals	39%
RSS feeds	38%
Blogs with partners or customers	31%
Presence awareness	31%
Business social networks	30%
Click-to-call communication	27%
Blogs among employees	26%

Note: % of respondents, based on a 1-5 scale where 4 and 5 are very useful

Data: InformationWeek Research survey of 250 business technology professionals

## 4. SOCIAL VIEW

The term social software is usually used for systems which are designed for communication, collaboration within and integration of people into a community. The problem with this definition is that every system which involves more than one user can be defined as social software, for example an E-Mailing or **Enterprise Resource Planning** (ERP) System, which covers more than one department of a company. To limit the term an additional criterion was introduced. Social software must support the creation, the self-management and the regulation of communities (Alby).

A community is characterized by social interaction of the participants, which is generally the exchange of information. The community members have shared interests and targets and they meet each other on a shared place, which can be also in the World Wide Web (Alby).

Examples for social networks which have a community with millions of participants are for private persons Facebook and MySpace and for companies XING and Plaxo.

A big advantage out of the social view is the Wisdom of Crowds which is also named Collective Intelligence. It is normally realized with a Wiki-System. A Wiki is a hypertext-system in

which content can be inserted and updated online. This is normally realized by a light CMS which is called the Wiki-Engine. To create and edit content on a Wiki it is necessary to learn the Markup-Language of the Wiki-System. Wikis can be implemented as a Desktop-Wiki on a local computer, in a LAN (Local Area Networks) or in the Internet. Wikis in a **LAN** are often used for Knowledge Management and can be classified into Company-/Department- and Project-Wikis. Desktop-Wikis are used for the organization of the personal information of an individual (WP-Wiki).

A different part in the social view on the topic Web 2.0 is the distribution of data of an individual over different types of media; normally via the internet. The possibility to store data either online, on flash drives, on **MP3** (MPEG-1 Audio Layer 3)-Players, on mobile phones or on a **PDA** (Personal Digital Assistant) makes it difficult for users to keep the overview over their private data. An alternative which will get more important in the near future is the storage of data in the internet.

The most basic related problem is that the process of data distribution can cause different risks for the user. The two most important problems, the data protection and the missing balance between govern and governors are described in the following section.

## 5. POLITICAL VIEW

Considering the political view, dealing with information can be an issue: especially if this information is about people and may have implications in current controversial topics (which is why it is called information in the first place...). As a result, data protection ranks high within political concerns. As defended by (Meyers), Data Protection means that

**the characteristics of information processing and information storing systems are created with the objective to secure the confidentiality, the availability and the integrity through a good design of the processing, storing and communication.**

Different reasons can harm the data protection of the social view applications. One risk is a possible change in the data protection laws of countries. Some companies moved their headquarters to countries with weak or even nonexistent data protection laws. The personal data can be linked to big data collections.

Another possibility is that a company which provides Web 2.0 applications alters its policies for data protection and because of that; the possibility of selling personal information to others is created.

**You agree that by posting any material or information anywhere on the ICQ Services and Information you surrender your copyright and any other proprietary right in the posted material or information. You further agree that ICQ Inc. is entitled to use at its own discretion any of the posted material or information in any manner it deems fit, including, but not limited to, publishing the material or distributing it. (ICQ).**

In the field social networking platforms two other risks can arise. In some platforms the option for deleting personal data or the complete user account is missing. Personal data still

can be stored in a database even if the user is not an active part of community anymore. An open-source-tool called libSNA offers the possibility to analyse the data in social networks, which opens the door for personalized marketing and advertisement out of the individual interests of a person.

The German social networking platform StudiVZ changed their general business terms. The owner company wanted to use the data of the members to show them personalized advertisement on the website to enlarge their incomes in this sector. The formulation of the business terms fits to the current data security law in Germany, but law experts and data protection officers warned the users to accept the changes. The users' reaction was the creation of Fake-Accounts, which are accounts without useful information, or a removing of their personal data. The social network community forced the provider to offer a possibility to completely delete all stored data and the account which was not possible before (W3Projekt) and (Wieschowski).

A complete other field which can cause problems in the near future is the missing control authority for companies which provide Web 2.0 services. The following problems can occur with providers who store data in the internet:

The economical situation of the provider causes insolvency. There are two possibilities for this scenario. Another company buys the provider and all the stored data or the provider goes bankrupt and all data gets lost. Another problem is the liability. Normally when important data gets lost somebody is liable for it and has to pay a compensation for it. Is it the same for this kind of service? Storage media has only a limited life cycle. If an initial error occurs, can it be replaced through a new access/gather operation. What happens with the old storage media? Is Data which is on it destroyed or can another person take possession of it. How secure is the transmission way from the personal input device to the storage. The existing internet infrastructure is protected through security protocols on the network layer. Are these protocols used for the transmission or can personal data be written from a third person? And there is always the field of data privacy which was described before. Who guarantees for the privacy of the data? (Kremp)

It is not possible to answer these questions at the moment because a governor for this special field in the Internet business is missing, although some attempts are appearing in more advanced countries as the case of USE and Obama's administration Internet Kaiser recently created post. In the final remarks section two possible solutions to set up such a regulation authority are presented.

## 6. FINAL REMARKS

A number of issues related with the use of digital information and Web 2.0 style are still open and deserve further discussion. Some level of control and regulatory scheme may become needed in order to provide a trust structure for available information – this can include some sort of a directory of trusted information sources as part of such infrastructure. The first possibility to introduce a regulation authority is to create such an authority on an international level, for example for the whole **European Union** (EU). Laws which regulate and answer the questions which were asked before in this paper have to be created. The working principle of the regulation can be similar to financial auditors. The companies are evaluated once a

year and if something concerning to the law is not correct the company loses the license to provide the service any longer. The data has to be returned to the customer or moved to another provider which has the license. The country where the company has its headquarters is responsible for the sending of the auditors.

The second possibility is the creation of a standardization process comparable to the ISO (International Organization for Standardization) 9001 - Quality Management Systems - Standard. Companies which fulfil the previously defined requirements to security and liability are audited by the national standards authority and get the certain ISO certificate. This certificate is a sign for customers that the company has a high level in these fields and so they are attracted. The market will regulate itself and the companies which don't have the certificate will lose market shares or disappear from the market.

Base on this introductory essay, the authors defend that more research is needed and must be considered a priority for further improvement and assessment of the Web 2.0 tools within the use of information and information services to support society.

## **ACKNOWLEDGEMENTS**

The authors want to acknowledge the comments provide by reviewers who help to improve this text with many excellent suggestions.

## **BIBLIOGRAPHY**

- Alby, T. *Web 2.0 Konzepte, Anwendungen, Technologien*. Munich: Carl Hanser Verlag, 2006.
- Bager, J. „Google-der Datenkrake.“ *Heise Zeitschriftenverlag: Ct* 10 (2006): 168. Internet. 3 Dec. 2009. <<http://www.heise.de/ct/06/10/168>>.
- Bodendorf, F. *Daten- und Wissensmanagement*. Berlin ; Heidelberg: Springer Verlag, 2003.
- Daniel, Caroline, and Maija Palmer. „Google's Goal: to Organise Your Daily Life.“ *FT.com*. 22 May 2007. Internet. 3 Dec. 2009. <<http://www.ft.com/cms/s/2/c3e49548-088e-11dc-b11e-000b5df10621.html>>.
- Geiger, Jörg. «Ihr Unternehmen 2.0.» *CHIP Online*. 7 Nov. 2008. Internet. 3 Dec. 2009. <[http://www.chip.de/artikel/Web-2.0-im-Unternehmen\\_33312650.html](http://www.chip.de/artikel/Web-2.0-im-Unternehmen_33312650.html)>.
- Hoover, N. «Most Business Tech Pros Wary About Web 2.0 Tools In Business.» *Information Week*. 24 Feb. 2007. Internet. 3 Dec. 2009. <<http://www.informationweek.com/story/showArticle.jhtml?articleID=197008457>>.
- “Terms of Use.” ICQ. 2007. Internet. 3 Dec. 2009. <<http://www.icq.com/legal/policy.html>>.
- “ISO 9000 Essentials.” *International Organization for Standardization*. Internet. 3 Dec. 2009. <[http://www.iso.org/iso/iso\\_catalogue/management\\_standards/iso\\_9000\\_iso\\_14000/iso\\_9000\\_essentials.htm](http://www.iso.org/iso/iso_catalogue/management_standards/iso_9000_iso_14000/iso_9000_essentials.htm)>.

Koop, H., et al. *Erfolgsfaktor Content Management: Vom Web Content bis zum Knowledge Management*. Braunschweig ; Wiesbaden: Vieweg Verlag, 2001.

Kremp, M., „Datenspeicher Internet.“ *Spiegel Online*. 2006. Internet. 3 Dec. 2009. <<http://www.spiegel.de/netzwelt/tech/0,1518,452958,00.html>>.

McAfee, A. „Enterprise 2.0: The Dawn of Emergent Colloboration.“ *MIT Slogan Management Review* Spring 47.3 (2006). 1 Apr. 2006. Internet. 3 Dec. 2009. <<http://sloanreview.mit.edu/smr/issue/2006/spring/06/>>.

O'Reilly, Tim. "What Is Web 2.0: Design Patterns and Business Models for the next Generation of Software." *O'Reilly Media*. 30 Sept. 2005. Internet. 3 Dec. 2009. <<http://oreilly.com/web2/archive/what-is-web-20.html>>.

"Soziale Netzwerke Des Web 2.0 Contra Datensicherheit." *W3Projekt.com*. 2008. Internet. <<http://w3projekt.com/soziale-netzwerke-des-web-20-contra-datensicherheit.html>>.

Wieschowski, S. "Studenten demonstrieren gegen das SchnüffelVZ." *Spiegel Online*. 2007. Internet. 3 Dec. 2009. <<http://www.spiegel.de/netzwelt/web/0,1518,523906,00.html>>.

Wolff, Tanja. «Sieben Vorteile Von Web 2.0.» *CIO*. 2008. Internet. 3 Dec. 2009. <<http://www.cio.de/index.cfm?webcode=831149>>.