

Web 2.0 and Beyond—Participation Culture on the Web

August-Wilhelm Scheer

Institute for Information Systems (IWi), Germany

Pavlina Chikova

Institute for Information Systems (IWi), Germany

Torben Hansen

Institute for Information Systems (IWi), Germany

Katrina Leyking

Institute for Information Systems (IWi), Germany

Christian Seel

Institute for Information Systems (IWi), Germany

INTRODUCTION: FROM WEB 1.0 TO WEB 2.0

The emergence of what we call today the World Wide Web, the WWW, or simply the Web, dates back to 1989 when Tim Berners-Lee proposed a hypertext system to manage information overload at CERN, Switzerland (Berners-Lee, 1989). This article outlines how his approaches evolved into the Web that drives today's information society and explores its full potentials still ahead.

The formerly known wide-area hypertext information retrieval initiative quickly gained momentum due to the fast adoption of graphical browser programs and standardization activities of the World Wide Web Consortium (W3C). In the beginning, based only on the standards of HTML, HTTP, and URL, the sites provided by the Web were static, meaning the information stayed unchanged until the original publisher decided for an update. For a long time, the WWW, today referred to as **Web 1.0**, was understood as a technical mean to *publish* information to a vast audience across time and space. Data was kept locally and Web sites were only occasionally updated by uploading files from the client to the Web server. Application software was limited to local desktops and operated only on local data.

With the advent of dynamic concepts on server-side (script languages like hypertext preprocessor (PHP) or Perl and Web applications with JSP or ASP) and client-side (e.g., JavaScript), the WWW became more

dynamic. Server-side content management systems (CMS) allowed editing Web sites via the browser during run-time. These systems interact with multiple users through PHP-interfaces that push information into server-side databases (e.g., MySQL) which again feed Web sites with content. Thus, the Web became accessible and editable not only for programmers and “techies” but also for the common user. Yet, technological limitations such as slow Internet connections, consumer-unfriendly Internet rates, and poor multimedia support still inhibited a mass-usage of the Web. It needed broad-band Internet access, flat rates, and digitalized media processing to catch on.

Technological and social developments brought about a new concept of everyday Internet computing that is difficult to grasp and can be characterized best by some tendencies:

- *Client- and server-side computing*—formerly strictly separated concepts—get integrated with each other. Ordinary users keep their personal data (e.g., pictures) on central Web storages. Search engines search locally stored data. Desktop application access the Web for updates.
- *Roles of publishing and consuming* information through the Web—the former once reserved to the technology-skilled—blur. Even inexperienced users contribute to Web content, shifting their private zone into public Web space. The Web of publishing becomes a Web of participation.

- Enabled by easy-to-use Internet technology, everyone can provide (small) bits to the whole, leveraging synergies of *collective intelligence and social networks*.

A TECHNOLOGICAL PERSPECTIVE ON WEB 2.0

This new concept is called “Web 2.0,” which is characterized by U.S. publisher Tim O’Reilly (2006) 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.” Millard and Ross (2006) define “interaction, community and openness” as key characteristics.

Within Web 2.0, the content of the WWW is increasingly created by the users themselves, so a “writable Web” evolves from the “read only” approach of the old Web (Kaye, 2006). Web 2.0 allows passive readers to become actively involved authors and thus establishes a world of give-and-take which is also called social computing (Hinchcliffe, 2006). The emergence and integration of the so called social software is frequently mentioned as a facilitator of the phenomenon of Web 2.0 (AMR Research, 2006). All this is facilitated by new kinds of interactive Web applications, enriching the overall Web technology. From a technical point of view, Web 2.0 is to a certain extent a combination of more or less old traditional approaches which were developed at the end of the 90s. The technologies, on which Web 2.0 is considered to be primarily based, are outlined in the following:

- **Web service API:** Application programming interface (API) in general refers to an interface of a software system which enables potential connections to other systems. Primarily, the APIs of Web services like Google are of relevance in the context of Web 2.0. Web service APIs have existed since 1998 (Gosnel, 2005).
- **AJAX:** Asynchronous JavaScript and XML (AJAX) is a newer Internet technology, whose concept and underlying technologies have also existed since approximately 1998. Until 2005, the main concept has often been referred to as “XMLHttpRequest.” By means of AJAX, a Web site can be partially updated which improves the speed of the site updates and allows for bet-

ter user interaction. AJAX-enhanced Web sites almost look like native applications and—given a sufficient access speed—offer comparably fast response times (Zakas, McPeak, & Fawcett, 2006).

- **RSS:** Today, RSS stands for “really simple syndication.” Originally, it was developed by Netscape to publish news in an in-house portal, but in the meantime it has established itself as a standard. It is XML-based and enables Web feeds for the purpose of simple and fast syndication of digital content (e.g., texts, audio, or video data). Users can subscribe to those feeds by using their feed readers. If a feed has new content, the reader automatically retrieves it (Finkelstein, 2005).

The introduction of these new kinds of software technology and a frequent repetition of related buzzwords in the mass media led to a hype and an altered perception of the Internet around 2005. The partially observable and partially assumed or evoked direction of development can be shortly outlined, following the key principles of Web 2.0 by O’Reilly and John Battelle (O’Reilly, 2005).

The main principle of Web 2.0 is that the Web evolves to a platform replacing the local desktop or that the Web and the desktop seem to merge into each other. The gap between local and central Web-based data management and applications seems to disappear. Browsers become the universal interface for more and more services and applications, replace proprietary client software, and even the technologically average-skilled user starts to use the Web as a data repository, for example, for photos (Korica, Maurer, & Schinagl, 2006). If Web 2.0 applications continue to replace local applications, this potentially implies the end of the software life-cycle as the run-time of Web sites is characterized by dynamic changes, formerly known as updates. Therefore, O’Reilly (2005) calls Web 2.0 “the perpetual beta.”

The traditional role allocation of **Web 1.0** between information provider and information user has been broken up. Technological skills are no longer the critical point to create content online and even the average user can become an editor and participate in the formerly media-dominated processes of sharing information and opinions. This evolution leads to massive networking effects between users. It creates an architecture of participation in which user-generated content dominates.

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