Chapter 2

Web 2.0
1. WHAT IS WWW?

World Wide Web (WWW) is a computer-based network of information resources that combines text and multimedia. The information on the World Wide Web can be accessed and searched through the Internet (global computer network). It is often referred to simply as the Web. The Web started to become a popular resource after 1993 when the first widely distributed browser provided a convenient way to access a variety of information on the Internet. The Web uses multimedia, which means that information can be displayed in a wide variety of formats. Users can read text, view pictures, watch animation, listen to sounds, and even explore interactive virtual environments on the Web. A user can move seamlessly from a document or Web page stored on the computer to a document or Web page stored on another computer.

The Web offers a place where companies, universities and other institutions, and individuals can display information about their products, services, facilities, or research, or their private lives. Only a small percentage of information on the Web is restricted to subscribers or other authorized users. The majority of Web pages are available to anyone who can access a computer that connects to the Internet. The Web has become a marketplace for many companies selling products or services, and a forum for people to exchange opinions and information. Museums, libraries, government agencies, and schools post information on the Web to make it available to others.[1]

Internet can be termed as the interconnection of the variety of networks and computers. Internet makes use of the internet protocol and the transmission Control protocol. Internet opened the doors of communication between the various stations. Internet facilitates storing and transmission of large volumes of data. The internet is one of the most powerful communication tools today. In the 1990’s internet gained popularity in the masses. People started becoming aware of the uses of internet. Internet helped the people to organize their information and files in a systematic order. Various
researches were conducted on internet. Gopher was the first frequently used hypertext
interface.

The difference between the Web and the Internet is similar to the difference
between a trucking service and a highway system. The Internet corresponds to a highway
that allows traffic to flow between computers, and the Web corresponds to a service that
uses the highway to move information from one computer to another. Confusion about
the difference between the Web and the Internet has arisen because the Web has become
extremely popular and currently accounts for the majority of Internet traffic. However,
other services also use the Internet to carry their traffic. For example, the Internet’s
electronic mail (e-mail) service permits users to send and receive textual messages, and
the file transfer service allows a user to transfer a copy of a file from one computer to
another.¹

In 1991, a network based implementation with respect to the hypertext was made.
The technology was inspired by many people. With the advent of the World Wide Web
search engine the popularity of internet grew on an extensive scale. Today, the usage of
internet is seen in science, commerce and nearly all the fields. There are various ways
and means to access the internet. With the advancement in technology people can now
access internet services through their cell phones, play stations and various gadgets.

Today there has been a great development in World Wide Web (WWW)
technology and almost every part of the globe is influenced by it as new techniques and
tools have evolved with the advances in technology. In September 1994, Berners-Lee
founded the World Wide Web Consortium (W3C) at the Massachusetts Institute of
Technology with support from the Defense Advanced Research Projects Agency
(DARPA) and the European Commission. It comprised various companies that were
willing to create standards and recommendations to improve the quality of the Web.
Berners-Lee made the Web available freely, with no patent and no royalties due. The
World Wide Web Consortium decided that their standards must be based on royalty-free
technology, so they can be easily adopted by anyone.
The continuous development has revolutionized the World Wide Web and the concept of web 2.0 came out and it became popular but the rate of development in World Wide Web is expanding and developing continuously. Continued extension of the World Wide Web has focused on connecting devices to the Internet, coined Intelligent Device Management. As Internet connectivity becomes ubiquitous, manufacturers have started to leverage the expanded computing power of their devices to enhance their usability and capability. Through Internet connectivity, manufacturers are now able to interact with the devices they have sold and shipped to their customers, and customers are able to interact with the manufacturer (and other providers) to access new content. [2]

2. HISTORY OF WEB 2.0: OVERVIEW

Tim Berners-Lee’s vision of the World Wide Web is a tool which created and gathered knowledge through human interaction and collaboration. Web 2.0 is a stage of development in which the Web is progressing towards a new goal. Most analysts define Web 2.0 in terms of the tools that foster online participation in content creation and social interaction. Web 2.0 developments organize the information on the Web by categorizing a series of applications associated with it; blogging, wikis, networking sites etc. However, what has become clear is that these tools have many similarities and overlapping characteristics; mapping each of them out separately is fairly repetitive and perhaps not that analytically useful. [3]

Beginning in 2002, new ideas for sharing and exchanging content adhoc, such as Weblogs and RSS, rapidly gained acceptance on the Web. This new model for information exchange, primarily featuring DIY (user-edited and generated websites), was coined Web 2.0. The Web 2.0 boom saw many new service-oriented startups catering to a new, democratized Web. Some believe it will be followed by the full realization of a Semantic Web. [2]
3. INTRODUCTION WEB 2.0

The concept of "Web 2.0" began with a conference brainstorming session between O'Reilly and MediaLive International. Dale Dougherty, web pioneer and O'Reilly VP, noted that far from having "crashed", the web was more important than ever, with exciting new applications and sites popping up with surprising regularity. What's more, the companies that had survived the collapse seemed to have some things in common. Could it be that the dot-com collapse marked some kind of turning point for the web, such that a call to action such as "Web 2.0" might make sense? They agreed that it did, and so the Web 2.0 conference was born. The phrase "Web 2.0" became popular after the first O'Reilly MediaWeb 2.0 conference held in 2004.

There's still a huge amount of disagreement about just what Web 2.0 means, with some people decrying it as a meaningless marketing buzzword, and others accepting it as the new conventional wisdom.¹⁴

Web 2.0 provides many more opportunities for reading and writing. It follows that online learning communities would naturally transform to use a similar approach.

Tim O'Reilly has given a meme map trying to define web 2.0 in a very systematic way. He defined the following three core points -

1. Strategic Positioning.
2. User Positioning.
3. Core Competencies.
Figure 1 - Tim O'Reilly's Web 2.0 'Meme Map' [5]
4. KEY PRINCIPLES OF WEB 2.0

Tim O'Reilly listed important principles that distinguish Web 1.0 (the "old" web) and Web 2.0:

- **The Web as a Platform**
  
  Web sites can be used to offer social networking, information sharing, and creative activities to ALL internet users.

- **Harnessing Collective Intelligence**
  
  Many applications have been created to help web owners to share the knowledge wealth, so to speak. Hyperlinking, directories, wikis, photo and video sharing, folksonomies, blogs, open source software, all contribute to this attribute.

- **Databases are Critical**
  
  Database information and applications are key to the smooth operation of Web 2.0 and are "built-in" with many of the social networking softwares available.

- **End of the Software Release Cycle**
  
  Updates should be seamless, users can be co creators.

- **Lightweight Programming Models**
  
  Simple programming models are the key.

- **Software above the Level of a Single Device**
  
  This means software can be accessed via a PC, plus other media such as iPods, cell phones.

- **Rich User Experiences**
  
  Use of new techniques can enhance the users' experience with visuals, sound, access control. \[6\]

He also gave the following list in his initial brainstorming; he formulated his sense of Web 2.0 by example:
Britannica Online | Wikipedia
---|---
personal websites | Blogging
Content management systems | Wikis
directories (taxonomy) | tagging ("folksonomy")
stickiness | Syndication

The list went on and on. But what was it that made him identify one application or approach as "Web 1.0" and another as "Web 2.0"? (The question is particularly urgent because the Web 2.0 meme has become so widespread that companies are now pasting it on as a marketing buzzword, with no real understanding of just what it means. The question is particularly difficult because many of those buzzword-addicted startups are definitely not Web 2.0, while some of the applications he identified as Web 2.0, like Napster and BitTorrent, are not even properly web applications!). He began trying to tease out the principles that are demonstrated in one way or another by the success stories of web 1.0 and by the most interesting of the new applications. [4]

5. WHAT IS WEB 2.0?

Over the past three years there has been an increasing interest in the new generation of web-based technologies, tools and services under the labels Web 2.0 and social software or social media (Bryant, 2007) [7] Web 2.0 tools are Internet based services. The phrase “Web 2.0” became popular after the first O’Reilly Media Web 2.0 conference in 2004 and provides now more than 76 million hits in Google. The fourth Web 2.0 Summit that took place in San Francisco, California, in November 2008 highlighted the importance of these developments. However, there is “still a huge amount of disagreement about just what Web 2.0 means, with some people decrying it as a meaningless marketing buzzword, and others accepting it as the new conventional wisdom” (O’Reilly, 2005). [8]

Oberhelman (2007) [9] notes that “Web 2.0 refers generally to web tools that, rather than serve as a forum for authorities to impart information to a passive, receptive
audience, actually invite site visitors to comment, collaborate, and edit information, creating a more distributed form of authority in which the boundaries between site creator and visitor are blurred. Web 2.0 has been referred to as:

- technology (Franklin and Van Harmelen, 2007) [10]
- second generation of web-based tools and services (Guntram, 2007) [11]; and
- community-driven online platform or an attitude rather than technology (Downes, 2005) [12]

Downes (2005) [12] a Canadian researcher, believed that the emergence of Web 2.0 is a social revolution rather than a technological revolution. Web 2.0 tools and services foster new modes of connectivity, communication, collaboration, sharing of information, content development and social organization. Bryant (2007) [7] called this new way of living as the “always on” culture where distinctions between learning, working and entertainment are beginning to blur.

However, the new user-centered paradigm in which users are, at the same time, both producers and consumers of content and services has evolved from previous web developments. The web before the dot com crash is usually referred to as Web 1.0. O’Reilly (2005) [8] cites a number of examples of how Web 2.0 can be distinguished from Web 1.0, such as Web 1.0 was mainly a platform for information, but Web 2.0 is also a platform for participation.

Many authors refer to the Britannica Online as a typical example of Web 1.0, and to the Wikipedia as a typical example of Web 2.0. Thus, Web 1.0 is characterized as “read only Web” and Web 2.0 as “read-write Web” which “enables the users to add, share, rate or adjust information” (Drachsler et al., 2007) [13]

Some of the typical features of Web 1.0 are: static and non-interactive web pages; content management systems; portals and taxonomy. Web 2.0 is about blogs, wikis, RSS (Really Simple Syndication) and social tagging. Blogging is one of the most highly favoured features of the Web 2.0. A weblog, or blog, is just an online diary where entries are displayed in reverse chronological order and in addition to text messages; postings
can include photos, links, video and audio. Tools, like Blogger and WordPress, make the creation of blogs very easy. Wiki is a web site creation and authoring tool that allows a group of people collaboratively to edit web site content. RSS is a format for syndicating content on the web. RSS is based on XML and allows bloggers to send their content to subscribed readers. Instead of checking web sites daily for updates, people can subscribe to the site’s RSS feed and get a notification every time new information is posted to the web site. Services based on RSS feeds can be used to update web sites continually with thematically relevant content. Tagging is an open and informal method of categorizing that allows users to associate keywords or “tags” with online content (Downes, 2005; Farkas, 2007).

The trend for the informal consumption, creation, communication and sharing of knowledge via ICTs looks set to increase with the emergence of so-called ‘Web 2.0’ applications and learners' growing use of such ‘read/write’ web activities at home. In particular the notion of Web 2.0 highlights the growing popularity of so-called ‘social software’ where users are connected to and collaborate with each other in a variety of group interactions (Shirky 2003).

Indeed Timothy O’Reilly (2005), generally accepted to be the originator of the notion of Web 2.0, has been keen to stress that it refers primarily to what can be termed ‘the network effect’ of current internet applications – i.e. the principle that the value and usefulness of web activity is now contingent on the number of participating users, with communities of users adding value to web applications in collaborative and creative ways which would not be possible on an individual basis. In this sense the worldwide web of Web 2.0 is what O’Reilly terms an active ‘architecture of participation’ rather than site of passive consumption. In theory at least, the web can be seen as a vast network of interconnected services that allows users to move their content across and between a variety of applications and contexts.
6. EXAMPLES OF WEB 2.0

However, Web 2.0 is not restricted to these tools and services. Some of the popular examples of Web 2.0 include:

- YouTube – which allows members to upload videos for everybody to see and vote on their popularity;
- Social networking sites, such as Facebook, Orkut, Linkedin and MySpace, with hundreds of millions of users which allow subscribers to create web spaces where they can share their thoughts, music, videos and pictures;
- Flickr’s photo collecting, tagging, and distribution service;
- Sites like del.icio.us that allow users to bookmark favorite sites and share those bookmarks with others;
- Free Audacity Software for recording and editing sounds that allow users to record talk and music which, when combined with RSS, become podcasting; and
- Tools such as CiteULike allow scholars to share their personal bookmarks (Downes, 2005).[^12]

However, the above are just some examples. These types of sites have become incredibly popular.

Reding (2006)[^16] notes that blogs have doubled every five months for the last two years; social networking web sites usage is multiplying year on year; over the past three years peer-to-peer has become the largest source of traffic on the internet and FON, the Wi-Fi-sharing network, has become the largest Wi-Fi network in the world in just one year (www.fon.com/en/info/whatsFon). The rapid evolution of Web 2.0 applications offers rich user experiences where the process of knowing is a community-based, collaborative endeavor (Alexander, 2006).[^17]

7. NEED AND IMPORTANCE OF WEB 2.0

“Web 2.0” describes the changing trends in the use of World Wide Web technology and web design that aim to enhance creativity, communications, secure information sharing, collaboration and functionality of the web. Web 2.0 concepts have led to the development and evolution of the culture communities and hosted services,
such as social networking sites, video sharing sites, wikis, blogs, and folksonomies. All the technology are essential for today's advance society and it is also important to good web environment. [18]

8. DEFINATIONS

Following are some important definitions given by different authors-

(1) The term 'Web 2.0' was coined by technology commentator Tim O'Reilly who tried to define it as follows: “Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an ‘architecture of participation’ and going beyond the page metaphor of Web 1.0 to deliver rich user experiences” (O'Reilly, 2005). [19]

(2) “Web 2.0...is about making the Internet useful for computers”- Jeff Bezos.

(3) “Distributed technologies built to integrate, that collectively transform mass participation into valuable emergent outcomes.” - Ross Dawson, Future Exploration Network.

(4) “A collection of technologies - be it VoIP, Digital Media, XML, RSS, Google Maps...whatever .... that leverage the power of always on, high speed connections and treat broadband as a platform, and not just a pipe to connect.”- Om Malik.

(5) “An emerging network centric platform to support distributed collaborative and cumulative creation by its users.”- John Hagel.

(6) “Ongoing transition of the World Wide Web from a collection of websites to a full-fledged computing platform serving web applications to end users” – Wikipedia. [20]

Web 2.0 may also be defined as the innovative use of the World Wide Web to expand social and business outreach to and exploit collective intelligence from the community.
9. FEATURES OF WEB 2.0

Web 2.0 has the following major features-

(i) Search

The ease of finding information through keyword search which makes the platform valuable.

(ii) Links

Guides to important pieces of information. The best pages are the most frequently linked to.

(iii) Authoring

The ability to create constantly updating content over a platform that is shifted from being the creation of a few to being the constantly updated, interlinked work. In Wikis, the content is iterative in the sense that the people undo and redo each other's work. In blogs, content is cumulative in that posts and comments of individuals are accumulated over time.

(iv) Tags

Categorization of content by creating tags that are simple, one-word descriptions to facilitate searching and avoid rigid, pre-made categories.

(v) Extensions

Automation of some of the work and pattern matching by using algorithms e.g. amazon.com recommendations.

(vi) Signals

The use of RSS (Really Simple Syndication) technology to notify users with any changes of the content by sending e-mails to them.

10. WEB 2.0 CHARACTERISTICS

The following web 2.0 characteristics take the common technologies together and describe well what is new about them.
(i) Participation
Every aspect of Web 2.0 is driven by participation. The transition to Web 2.0 was enabled by the emergence of platforms such as blogging, social networks, and free image and video uploading, that collectively allowed extremely easy content creation and sharing by anyone. Participatory architecture is an architecture where user can add or edit value to the application according to their requirement. Contrary to the traditional web which was somewhat one-sided, with a flow of content from the provider to viewer, Web2.0 allows the users to actively participate online.

(ii) Standards
Standards provide an essential platform for Web 2.0. Common interfaces for accessing content and applications are the glue that allows integration across the many elements of the emergent web.

(iii) Decentralization
Web 2.0 is decentralized in its architecture, participation, and usage. Power and flexibility emerges from distributing applications and content over many computers and systems, rather than maintaining them on centralized systems. It is about communication and facilitating community.

(iv) Openness
The world of Web 2.0 has only become possible through a spirit of openness whereby developers and companies provide open, transparent access to their applications and content.

(v) Modularity
Web 2.0 is the antithesis of the monolithic. It emerges from many, many components or modules that are designed to link and integrate with others, together building a whole that is greater than the sum of its parts. Users are able to pick and choose from a set of interoperating components in order to build something that meets their needs.
(vi) User Control

A primary direction of Web 2.0 is for users to control the content they create, the data captured about their web activities, and their identity. This powerful trend is driven by the clear desires of participants.

(vii) Identity

Identity is a critical element of both Web 2.0 and the future direction of the internet. We can increasingly choose to represent our identities however we please, across interactions, virtual worlds, and social networks. We can also own and verify our real identities in transactions if we choose. [21]

11. WEB 2.0 IN AN EDUCATIONAL CONTEXT

The use of web 2.0 tools has grown considerably in the education sector in the last few years. Several authors believe that the development and growth of the web has been a major driver of educational change and offers new perspectives and challenges to education at all levels (Steeples and Jones, 2002). [22]

It is suggested that Web 2.0 supports constructivist approaches to learning and has great potential to socialize online learning to a greater extent than we have previously seen (Bryant, 2007). [7] These tools and services can support much flexibility in the learning processes and allow for easy publication, sharing of ideas and re-use of study content, commentaries, and links to relevant resources in information environments that are managed by the teachers and learners themselves (Guntram, 2007, p. 23). [11] Web 2.0 is well suited to active and meaningful learning and collaborative knowledge building. Mejias (2006) [23] describes it in this way-It exhibits three comparable advantages to those associated with problem-based learning:

- It engages students in learning to learn by having them assume some of the responsibility for integrating and maintaining the social software systems that allow learning to happen.
- It promotes the benefits of working co-operatively with tools that facilitate the aggregation and organization of knowledge while at the same time
demonstrating that the diversity of individual research interests enhances learning for all.

➢ It helps students develop practical research skills that they need in a world where knowledge construction and dissemination make increasing use of online information networks.

Web 2.0 is suitable for educational and lifelong learning purposes in our knowledge society, because our modern society is built to a large degree on digital environments of work and social communication, and educational practices must foster a creative and collaborative engagement of learners with this digital environment in the learning process (Guntram, 2007, p. 17). However, open educational practices require a decisive shift away from the teacher-centred knowledge-transfer model and highlight active, constructive and collaborative engagement of students with authentic and complex real world problems. A new educational culture and mind-set as well as overcoming considerable organizational barriers are important prerequisites (Geser, 2007; Guntram, 2007).

The use of Web 2.0 technologies in higher education is still a new phenomenon and its integration into teaching and learning is in the initial phase. The report Open Educational Practices and Resources. OLCOS Roadmap 2012 (Guntram, 2007) which is based on research work, expert workshops and other consultations with many international projects that promote the creation, sharing and re-use of open educational resources, concludes that “new educational approaches are not easily found and their implementation will be difficult if they require considerable transformations of current educational frameworks and practices”. The current focus in education is mainly on providing access to more content in digital formats and there is little consideration of whether this will promote real innovation in teaching and learning (Guntram, 2007, p. 31).

However, there already exists experimentation with Web 2.0 and social software tools and services at universities, colleges and schools. Wikis probably take the lead and also weblogging, or blogging, has seen some interesting uses. Blogs have been used to support group discussions, extend the boundaries of the classroom and encourage
students in looking for information. Wikis have been used to support the development of teamwork skills and consensus building as well as sharing of information and ideas. Educators have also taken an interest in podcasting (Guntram, 2007, p. 30). Recently, researchers have been focusing more on how to incorporate the new web trends into the learning process and how to apply Web 2.0 concepts to create new learning experiences and learning across communities (Chatti et al., 2007).

It is also recognized that technology alone does not deliver educational success. It only becomes valuable in education if learners and teachers can do something useful with it (OECD, 2001, pp. 24-5). It is suggested that an area which can make education and lifelong learning more effective and efficient is e-learning. Unfortunately, there has been a tendency for many e-learning models just to imitate previous educational paradigms (Guntram, 2007). However, the growth of the open source movement and social networking, and use of new web-based tools and services among a new generation of students has questioned the previous models of e-learning. To highlight new developments in e-learning based on Web 2.0 and social networking the phrase “e-learning 2.0” was coined by Downes (2005) who believes that this new world of e-learning reflects very much the ideas of “a community of practice” suggested by Wenger (1998).

In this model, students form networks according to their interests, they collaborate and learn together, they develop and share content using various tools and resources, and re-use and organize content according to their preferences and needs.

12. WEB 2.0 TOOLS
Some Web 2.0 “tools” that are thought to be of interest for an e-learning 2.0 are:

- Social software for easy publishing and sharing of ideas, content and links. In particular blogs, wikis, social bookmarking and content sharing web sites such as Flickr. Increasingly also collaborative authoring and other interactions in real time (examples include Writeboard, Writely, SynchroEdit).
Collaborative filtering: discovery of the “most interesting” resources through filtering techniques, but also ongoing conversations, recommendations and cross-linking of resources in social networks.

Open Application Programming Interfaces (APIs) of web service applications (e.g. Google Maps API, Flickr API) for creative re-use (i.e. “mashups”) of services and content.

Many services based on RSS feeds as well as the personal libraries of end users with information about, and a link to, available them automatically relevant content (which can also be podcast or videocasts).

The content on Web 2.0 web sites which is often licensed as open content (e.g. Creative Commons) (Guntram, 2007, p. 24) \[11\]

The authors of the report Open Educational Practices and Resources. OLCOS Roadmap 2012 (Guntram, 2007, p. 30)[11] conclude:

Therefore, it is expected that by 2012 a stronger shift towards e-learning will take place that will build on tools and services for collaboratively creating and sharing content while also drawing on many larger and smaller publicly funded educational and other e-content repositories, including offerings of private-public partnership.

Web 2.0 is also playing an important role in distance education. distance education may different learning forms as e-learning, web based learning, online learning and virtual learning, providing interaction has always been an important issue. Distance education has a vital role shaping the knowledge society. With the gaining speed of technological changes, a paradigm shift in distance education could be occurred. New kinds of information and communication technologies are being used in distance education. Social software and Web 2.0 are the new and popular concepts in distance education. \[6\]

13. TOOLS OF WEB 2.0

Following are the tools of Web 2.0

1. Blogs
2. Wikis
3. Really Simple Syndication (RSS)
4. Instant Messaging (IM)
5. Social Networking
6. Podcasting
7. Tagging

14. CONCLUSION

In a nutshell, what was happening was that the web was shifting from being a medium, in which information was transmitted and consumed, into being a platform, in which content was created, shared, remixed, repurposed, and passed along. And what people were doing with the web was not merely reading books, listening to the radio or watching TV, but having a conversation, with a vocabulary consisting not just of words but of images, video, multimedia and whatever they could get their hands on. And this became, and looked like, and behaved like, a network Web 2.0 is influencing the way in which people learn, access information and communicate with each other. Although the term suggests a new version of the World Wide Web, it does not refer to an update to Web technical specifications, but to changes in the ways software developers and end-users use the web as a platform.

As we know that web has been shifted from one stage to another stage as this study is concern about web 2.0 how it is shifted from web 1.0 to web 2.0. In this web 2.0 era people are in better position to communicate with each other they are also using rich internet applications, the web 2.0 is one of the major revolution in this era of world wide web, but as we all are well aware that change is the law of nature, so the concept of web 3.0 is emerging rapidly with new tools and techniques. We can also see how the web era has changed from the following points:-

1. Pre-Web.

2. Web 1.0-Linked documents.

3. Web 2.0-User-generated and dynamic content.
4. Web 3.0-Link data, devices and people across the web. \(^{[28]}\)

The web 3.0 includes: Semantic Web, Video on the Web, Mobile Web and Ubiquitous Web. The Semantic Web provides a common framework, based on URIs that allows data to be linked, shared and reused across applications, enterprises, and community boundaries. Although the definition for the term Web 3.0 is still in process, the truth is that most of the technologies and paradigms that experts are talking about have been around for quite some time.
REFERENCES

1. Introduction; A Web of Computers; How the Web Works; Who Uses the Web; History; Future Trends. available at:

2. “History of the World Wide Web”. available at:

3. “History of Web 2.0: Overview” available at:
http://www.charlesleadbeater.netcmsxstandardWeb2.0_OVerview.pdf [Accessed on 22-7-09]


