# World Wide Web: From Web 1.0 To Web 4.0

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**Abstract-** *The fast track toward the improvement of Web is instituted to be as an out and out marvel in the today's general public with joined utilization of present day inventive innovation and reclassifying the method for sorting out, conveying and teaming up with person which in wording lead us to blend of fantastic triumphs and disappointments This paper provides a background of the evolution of the web from web 1.0 to web 4.0.*

**Keywords**- Web 1.0, Web 2.0, Web 3.0, Web 4.0.

## I. INTRODUCTION

The World Wide Web (commonly known as the web) and Internet is not the same.WWW is larger collection of interconnected documents or content. The Web, or World Wide Web, is basically a system of Internet servers that support specially formatted documents. The documents are formatted in a markup language called HTML (Hypertext Markup Language) that supports links to other documents, as well as graphics, audio, and video files.

The Internet is a global system of interconnected computer networks. In contrast, the World Wide Web is one of the services transferred over these networks. It is a collection of text documents and other resources, linked by hyperlinks and URLs, usually accessed by web browsers, from web servers

Web was established by Tim Burners-Lee in late 1989 (Getting ) He outlook of the abilities of the World Wide Web was expressed by three improvements, typically associated with three points that is, the Web of documents (Web 1.0), the Web of people (Web 2.0) and the Web of data (the still-to-be-realised Web 3.0) (Anderson, 2007). Advanced Research Project Agency (ARPA) the USSR initiated first artificial earth satellite 'Sputnik' in 1957. In 1958 United States funds the ARPA within the Department of Defence and in 1969 ARPANET started. ARPANET is first packet-switch network and connected four universities. In 1970 ARPANET used the Network Control Protocol (NCP) and in 1971 fifteen sites linked universities and research organisations. In 1984 Jon Postel and Paul Mockapertis introduced Domain Name System (DNS) and first registered domain is symbolic.com. In 1983

NCP is changed Transmission Control Protocol/Internet Protocol (TCP/IP) (Leiner et al 2009).

### 1.1.    Related Works

The main contribution of this paper is to provide a comprehensive overview of the evolution of the World Wide Web from web 1.0 to web 4.0. It compares characteristics and technologies of the web generations and tries to show progress of the web during past two decades.

### 1.2.    Growth of Internet

Internet users around worldwide 40 per cent of the peoples have an internet connection today. In 1995 Internet users are worldwide less than 1%. Internet users' year by year has improved from 1999 to 2013. The internet users initially billion was achieved in 2005, second billion was reached in 2010 and the third billion was successfully reached in 2014. Worldwide   internet user's nearly 2.1 billion are in the top twenty countries. China is the most internet users (642 million in 2014) in the world and the next three countries are United States, India and Japan. Table-1 below show the number of global internet users per year since 1977.

| Year | Host |
|------|------|
| 1977 | 111 hosts on Internet |
| 1981 | 213 Hosts |
| 1983 | 562 Hosts |
| 1984 | 1,000 Hosts |
| 1986 | 5,000 Hosts |
| 1987 | 10,000 Hosts |
| 1989 | 100,000 hosts |
| 1992 | 1,000,000 hosts |
| 2000 | 414 million hosts |
| 2005 | 1030 million hosts |
| 2010 | 2023 million hosts |
| 2016 | 3424 million hosts which is about 46% of the world population |

http://www.internetlivestats.com

**Table 1: Internet users in the world from 1977 to 2016**

## II. WEB 1.0

In 1989, Tim Burners-Lee suggested creating a global hypertext space in which any network- accessible information would be referred to by a single Universal Document Identifier (UDI). The dream behind of the web was to create a common information space in which people communicate by sharing information [7].

Web 1.0 was mainly a read-only web. Web 1.0 was static and somewhat mono-directional. The idea behind of the web 1.0 was to make a common information space within the internet user's and exchanging of communication through sharing information.

## III. WEB 2.0

The term web 2.0 was officially defined in 2004 by Dale Dougherty, vice-president of O'Reilly Media, in a conference brainstorming session between O'Reilly and MediaLive International [7]. Tim O'Reilly defines web 2.0 on his website1 as follows:

"Web 2.0 is 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. Chief among those rules is this: Build applications that harness network effects to get better the more people use them."

Web 2.0 is also known the wisdom web, people-centric web, participative web, and read-write web. With reading as well as writing, the web could become bi-directional. Web 2.0 is a web as a platform where users can leave many of the controls they have be used to in web 1.0. In other words, the users of web 2.0 have more interaction with less control. Web 2.0 is not only a new version of web 1.0; Flexible web design, creative reuse, updates, collaborative content creation and modification were facilitated through web 2.0. One of outstanding features of web 2.0 is to support collaboration and to help gather collective intelligence rather web 1.0.

The web 2.0 included technologies and services and it consist blogs, Audio, Chats, Bookmarking, Calendar, E-commerce, E-mail, Games, E-learning, communication, Forums, Mapping, Multimedia Wiki, Portals, really simple syndication (RSS), Mashups, Tags, etc., (Hassan, Sarhan, & El-Dosouki, 2012 Table 1 compare web 1.0 and web 2.0 in some features simplicity.

| Web 1.0 | Web 2.0 |
|---|---|
| Tim Berners Lee | Tim O'Reilly |
| Reading | Reading/Writing |
| Companies | Communities |
| Client-Server | Peer to Peer |
| HTML, Portals | XML, RSS |
| Connect information | Connect people |
| Netscape | Google |
| Web forms | Web applications |
| Dialup | Broadband |
| Hardware costs | Bandwidth costs |
| Lectures | Conversation |

Table 1. A Comparison of web 1.0 and web 2.0

## IV. WEB 3.0

John Markoff of the New York Times recommended web 3.0 as third era of the web in 2006 [14]. The fundamental thought of web 3.0 is to characterize structure information and connection them so as to more compelling revelation, computerization, reconciliation, and reuse crosswise over different applications [5].Web 3.0 tries to interface, incorporate, and dissect information from different information sets to acquire new data stream; It can enhance information administration, bolster openness of versatile web, reproduce innovativeness and advancement, support variable of globalization marvels, upgrade clients' fulfillment and arrange coordinated effort in social web.

Web 3.0 is also known as semantic web. Semantic web was thought up by Tim Berners-Lee, inventor of the World Wide Web.

The current web is a web of documents, in some ways like a global file system that the most important problems about it are included: The web of documents was designed for human consumption in which primary objects are documents and links are between documents (or parts of them). Semantics of content and links are implicit and the degree of structure between objects is fairly low [2, 15, 16]. Figure 1 represents the structure of web of documents in simple [15].
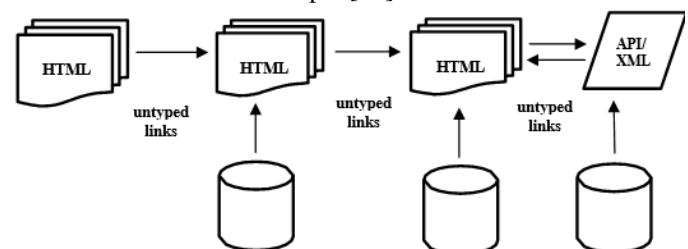


Figure 1. Web of Documents

Semantic web is being to be developed to overcome the problems of current web. Semantic Web can be defined a web of data, in some ways like a global database that most its features are included: The aim of design web of data is machines first, humans later. Primary objects are things so links are between things. Semantics of content and links are explicit and the degree of structure between objects is high based on RDF model [2, 15, 16].

The main difference between web 2.0 and web 3.0 is that web 2.0 targets on content creativity of users and producers while web 3.0 targets on linked data sets. Table 2 compares some differences between web 2.0 and web 3.0.

Table 2. A Comparison of web 2.0 and web 3.0

| Web 2.0 | Web 3.0 |
|---|---|
| Read/Write Web | Portable Personal Web |
| Communities | Individuals |
| Sharing Content | Consolidating Dynamic Content |
| Blogs | Lifestream |
| AJAX | RDF |
| Wikipedia, google | Dbpedia, igoogle |
| Tagging | User engagement |

### V. WEB 4.0

Web 4.0 is still an underground idea in progress and there is no exact definition of how it would be. Web 4.0 is also known as symbiotic web. The dream behind of the symbiotic web is interaction between humans and machines in symbiosis. It will be possible to build more powerful interfaces such as mind controlled interfaces using web 4.0. In simple words, machines would be clever on reading the contents of the web, and react in the form of executing and deciding what to execute first to load the websites fast with superior quality and performance and build more commanding interfaces.

Although there is no exact idea about web 4.0 and its technologies, but it is obvious that the web is moving toward using artificial intelligence to become as an intelligent web.

### VI. CONCLUSIONS

This paper provided an overview from the evolution of the web. Web 1.0, web 2.0, web 3.0 and web 4.0 were described as four generations of the web. The characteristics of the generations are introduced and compared. It is concluded web as an information space has had much progress since 1989 and it is moving toward using artificial intelligent techniques to be as a massive web of highly intelligent interactions in close

future. Future work on this paper will focus on the deeper and broader research about the semantic web and its issues.

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