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# Web 3.0 in Library services: An Utilitarian effect

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## ABSTRACT

*This paper aims to discuss the concept of web 3.0, and possibilities to use these tools and technologies in library and Information Science. The internet has changed the way we think of information and technology. The web of documents has morphed into a web of data. The semantic wave embraces three stages of internet growth. The first stage, Web 1.0, was used as a Read only medium. Web 2.0 started as Read and Write medium. Now the current version of web i.e. Web 3.0 is the semantic web which allow the users to Read, Write and Execute web. This paper briefs upon Web 3.0 and also its application in library and information science which is known as Library 3.0. This paper discusses the definitions of Web 3.0 and its characteristics. Next, it discusses applications of Web 3.0 and its technologie,then the paper briefs about Library 3.0 which is powered by the Semantic Web and their application to enhanced library services.*

**KEYWORDS:** *Web 1.0, Web 2.0, Library 3.0, Semantic Web,*

## INTRODUCTION

The world of information Technology is undergoing rapid changes in the history of civilization. With the big advance in technology and the growth of the amount of content on internet, it has become difficult for users to find and utilize information and for content providers to classify and catalogue documents. It was very time consuming for users to browse and to get the required information from the net. Google initiated the idea of sitemaps which is a supplementary of listing the content available on a website in a simple, open and crawler friendly format. Because sitemaps exhibits some limits, the need for implementation of artificial intelligence in making search engines more efficient is very imperative and is expected to be one of the feature of Web 3.0.

Now-a-days there can be communication and interaction between machines, computers and devices over the internet using a software system known as Web Service. So for communicating and interfacing, we use Application Programming Interface, that is, rules and specifications to be followed by the software system. YouTube, Flicker, Facebook, Twitter are the examples of Web 2.0 social networking

websites that provide a service for searching, sharing and connecting with people and communities. Combining the features of Web 2.0, semantic web and other web services, Web 3.0 will dominate the existing web services.

## WEB 1.0, 2.0 AND 3.0

Since the 1990's when the World Wide Web was established it has evolved from the earlier versions, *viz*, Web 1.0 to Web 2.0 and finally is evolving into the newest version i.e. Web 3.0.

**Web 1.0 (1991-2003):** The traditional version of Web i.e. Web 1.0 is a system of interlinked, hypertext documents accessed via the internet. The first implementation of the web represents the Web 1.0 which could be considered the "read only web". In other words the early web allowed us to search for information and read it. There was very little in the way of user interaction or content contribution. The primary focus of Web 1.0 was one way communication. However, this is exactly what most website owners wanted. Their goal for a website was to establish an online presence and make their information available to anyone at any time.

**Web 2.0 (2004- present day):** The term Web 2.0 is commonly associated with web applications that facilitate interactive information sharing, interoperability, user-centred design and collaboration on the World Wide Web. A Web 2.0 site gives its users the free choice to interact or collaborate with each other in a social media dialogue as creators of user generated content in a virtual community, in contrast to websites where users are limited to the passive viewing of content that was created for them. Examples of Web 2.0 include social networking sites, blogs, wikis, video sharing sites etc.

**Web 3.0:** Web 3.0 is a web where the concept of website or webpage disappears, where data is not owned but instead shared, where services show different views for the same web/ the same data. Those services have to be focused on content and personalization, and both will be reached by using vertical search. Web 3.0 is the next evolution of the internet. Some hypothesize that Web 3.0 will combine the best bits of both Web 1.0 and WEB 2.0 but will be a more user focused , personalized, intelligent, controlled or semantic web experience. Furthermore the web is set to become more mobile too, as demonstrated through recent trends in the marketplace whereby smart phones and the iPhones are improving the web experience for those accessing through a mobile phone.

## DEFINITIONS OF WEB 3.0

The term Web 3.0 was first coined by John markoff of the New York Times in 2006 and first appeared significantly in early 2006 in a Blog article "Critical of Web 2.0 and associated technologies such as Ajax " written by Jeffrey Zeldman. There is complete agreement among the experts about how Web 3.0 will evolve.

According to **Nova Spivack**, the Chief Executive officer at Radar Networks, "Web 3.0 is a set of standards that turns the web into a big database." While **Steve spadling** defines Web 3.0 as "highly specialized information silos, moderated by a cult of personality, validated by the community, and put into content with the inclusion of met-data through widgets." **Conrad Wolfram** stated "Web 3.0 is

where the computer is generating new information, rather humans" **Eric Schmidt**, Google's CEO, stated about 3.0 "Web 3.0 is a series of combined applications. The core software technology of Web 3.0 is artificial intelligence, which can intelligently learn and understand semantics. Therefore, the application of Web 3.0 technology enables the internet to be more personalized, accurate and intelligent."

From these definitions we can understand that Web 3.0 will be about semantic web, personalization, intelligent search and behavioural advertising.

## FEATURES OF WEB 3.0

Web 3.0 or semantic web is an extension of the current web in which information is given well-defined meaning, better enabling computers and people to work in cooperation. The word 'stands for 'the meaning of', and therefore the semantic web is one that is able to describe things in a way that computers can better understand. The basic features of Web 3.0 are as below:

**Intelligence:** The most promising feature of Web 3.0 will be Web with intelligence i.e. intelligent web. Applications will work intelligently with the use of human-computer interaction and intelligence. An application based on Web 3.0 can directly do intelligent analysis, and then optimal output would be possible, even without much intervention of the user. Documents in different languages can be intelligently translated into other languages in Web3.0 era. Web 3.0 should enable us to work through natural languages. Therefore, users can use their native language for communication with the others around the world.

**Interoperability:** In the context of Web 3.0, the terms interoperability, collaboration and reusability are basically interrelated. Interoperability implies reuse, which is again a form of collaboration. Web 3.0 will provide a communicative medium for knowledge and information exchange. When a person or a software programme produces information on the web and this information is used by another, then the creation of new form of information or knowledge takes place. Web 3.0 applications would be easy to customize and they can independently work on different kinds of devices. An application based on Web 3.0 would be able to run on many type of Computers, Microwave devices, Hand-held devices, Mobiles TV's, automobiles and many others.

**Personalization:** Another feature of Web 3.0 era is Personalization. Personal or individual preferences would be considered during different activities such as information processing, search, formation of personalized portal on the web. Semantic Web would be the core technology for personalization in Web 3.0.

**Virtualization:** Web 3.0 would be a web with high speed internet bandwidths and high end 3D Graphics, which can better be utilized for virtualization. The trend for future web refers to the creation of virtual 3-Dimensional environments. An example of the most popular 3-D web application of Web 3.0 is Second Life.

## TECHNOLOGY USED IN WEB 3.0

In Web 3.0 search engines will hopefully retrieve micro content texts which were tagged automatically. This implies translating billions of Web 1.0 macro contents

into micro contents. The result could be more precise search because tagging can solve part of the ambiguity that homonyms and synonyms introduce into the process of search. The term Web 3.0 is used to describe various evolutions of Web usage and interaction among several paths. These include transforming the web into a database, a move towards making content accessible by multiple non-browser applications, the leveraging of artificial intelligence technologies, the semantic web, the Geospatial Web or the 3D web

There are various technologies of computer and internet that would be used by the Web 3.0 like Artificial Intelligence, Automated Reasoning, Cognitive architecture, Composite applications, Distributed computing, knowledge representation, Ontology, Recombinant text, Scalable vector graphics, Semantic Web, Semantic Wiki, Software agents.

## APPLICATION OF WEB 3.0 IN ACADEMIC LIBRARY SYSTEM

Web 3.0 is a term used to describe the future of the World Wide Web. Some pioneers believe that emerging technologies such as the Semantic Web will transform the way the web is used, and lead to new possibilities in artificial intelligence based applications. Other visionaries suggest that increase in internet connection speeds, modular web applications, or advances in computer graphics will play the key role in the evolution of the new version of World Wide Web. Some of the applications of Web 3.0 will look like as follows:

**Personal Desktop and Web spaces:** It will allow bookmarking and tagging which will be browser independent. By just logging into your account it will offer space of 5 GB or more i.e. virtual directory for personal browser data or other private data anywhere in this world.

**Remote Control:** You can control your PC from distance about 1000 miles or ever more by just using internet. It is just like windows remote desktop control.

**Mobile Web:** Internet is not just limited to computers but to your mobiles. It will be operating system independent i.e. we will be able to use applications of Android, Blackberry, Apple, iPad, OVI, windows etc. simultaneously and will support Gigabytes of bandwidths.

**Surface PC:** It will support Personal Computers, Laptops, touch screen PC's and Surface PC's. Personal computers interact with the users through monitor and keyboard whereas Surface PC will interact through the surface of any object.

**Internet Radio:** This will be the audio streaming major in Web 3.0 with having digital quality sound and playing thousands of radio stations.

**E-Learning:** Improvements can be brought in teaching-learning process using online learning, its resources and innovative pedagogy.

In recent time, there is a dramatically changes in the library and information service due to technical changes in computing, communication and collection. At the same time the librarians also striving to cope with these changes to meet their user's needs. Already many libraries have made encouraging advances in their electronic offerings by providing access to top quality databases, downloadable

audio books and music, and instant messaging reference services.

Currently libraries have a tendency to plan, implement and forbid the outdated service culture. Library 2.0 and Library 3.0 attempt to change this regularly soliciting customer feedback and evaluating and updating services. Both new and existing library services should be revisited routinely to ensure that they are still meeting expected goals. Even older or traditional library services should be reviewed with a fresh eye to determine if any aspect needs updating.

Digital libraries now become multidimensional in today's world of fast growing information society. Semantic digital library i.e. Library 3.0 is the next step in the evolution of current generation of digital library management systems. Its main features are:

- Anyone can use it.
- All knowledge is accessible here.
- We can access it anytime and anywhere
- It features a user-friendly, multimodal user interface
- It provides efficient and effective ways to access it
- It makes use of multiple and interconnected devices

The semantic digital library is made of hyperbooks instead of traditional e-documents such as PDF or HTML files, Hyperbook or hypertext book, is a term that is commonly used to refer to a hypertext that has some of the characteristics of a printed book. The main distinction between a traditional digital library and a semantic digital library is the disappearance of the monolithic nature of a book or an article. A hyperbook, once inserted into a library, will automatically enrich itself by connecting to fragments of other books. Thus, a semantic digital library of hyperbook is not a mere collection of hyperbooks, It provides a semantic interconnection among the hyperbooks.

**Semantic Web** : Semantic web will provide us with the option to share, unite, search and organize the web information in easy manner. Sharing and organizing information available in every corner of the web, which is the main aim of this generation and expected to be achieved with the help of semantic web technologies. Semantic web requires librarian and information professionals to not only move beyond the physical and virtual document, which has been the focus of much of their attention up until now. It also requires them to start thinking of interacting with the data on the web as a large information resource, rather than in individual data repositories.

**Real World Web** : Connection between the web and the real world are not only possible through the increased sophistication of mobile phones, but also platforms that enable real- time updates from world objects. Mobile phones with high processing power, high-specification cameras and GPS receivers, offer a new way to provide information services. This can be a sophisticated augmented reality, overlaying a real image of the world with additional information from the web. A way to provide information services might be scanning simple 2D barcodes such

as QR (Quick response code) codes to make connections between the objects in the real world and the web. Although the technology for reading QR codes has been around for a number of years, and its use is widespread in Japan, it has only relatively recently started to be adopted more globally. For example, Bath University Library in the UK has recently incorporated QR codes into its library catalogue. This enables users to save the author, title, and shelf number of the works they are interested in onto their mobile phone. The floor plan also includes QR code links to an MP3 audio tour.

**Ontologies :** The classification systems for book classification has been changed into ontologies to represent domain knowledge in machine processable form. These are the techniques to give riches semantic relationship between terms and thoughts of knowledge. These give more standardization in managing the web contents instead of merely indexing the terms. Ontology aims at how the information is organized rather than organizing the information. Librarian can adopt various ontological techniques to define the web contents in more professional as well as personal manner.

**Metadata :** The Metadata is data about data. The Cataloguing codes have taken shape of Metadata Schema for the description of web resources. There is wide variety of metadata schemas available for different kind of digital resources. In the classification table for metadata, Kashyap and Seth has categorized the various types of metadata under the following broad categories.

- Contents independent metadata
- Content dependent metadata
- Direct content-based metadata
- Content descriptive metadata
- Domain independent metadata
- Domain specific metadata

OPAC : In library 3.0, Web OPACs of various libraries which are forming a part of visible or invisible web would be brought together. Metadata of contents (contents in any format) would seamlessly accessible and searchable from singly use friendly interface, Just the way a "Portal" provides one stop shop for various contents in present generation.

**Ubiquitous contents :** The ubiquitous computing offers various contents which can be used or re-used frequently and will also not get absolute in near future. The contents of this generation need to be created in various formats and can also be easily shared, transferred and accessible through all modes of communication. Ubiquitous contents are the personal contents of the people persistently stored on the web inform of movies, blog posts, RSS feeds, wikis, stories, articles, music, games, etc. These are always there on the web and accessible from everywhere over the internet through all mobile and internet accessible devices.

**Search and Browsing Services** : An important part of the full text search is the ability of the search engine to refine the query to reflect a user's expectations.

During the query expansion step all words provided by the user are mapped to one or more types, e.g. a topic, a keyword, or a person; each type is refined using different types of properties. Each of new concepts is ranked according to the user's interests expressed in the social semantic collaborative filtering (SSCF) profile; the ranking values associated with SSCF categories are propagated to the resources bookmarked in those categories, and further to person, thesauri and keyword concepts.

**Geo Tagging**: This helps users to find specific information located at specific location. It is simple a marking of various media or digital contents like images, photographs, video websites or RSS feed etc. Most of the cell phones and mobile devices have GPS (Global Positioning System) facilities, which allowing users to add metadata exactly where the data or image or video was created. So tagging helps users to mark their information in which they are interested for.

**Social Bookmarking:** Usually, when a user browses a digital library, some articles and materials seem to him more valuable than others. Common practice is to bookmark those resources. Recently collaborative bookmarking such as del.icio.us has become more and more popular. Users want to see the bookmarks of their friends, and use the knowledge collected by them.

**Virtual Reference Service:** Since technology is developing very fast in all domains. Librarians are more determined to serve the users who are away from the libraries. In virtual references service, apart from helping the users in personal or telephonic way, librarian, are now developing the contents which can easily be transferable are readable in cell phones and other mobile devices to help the users at any point of time.

**Blog**: The next generation Internet is a convergence between social communication and semantically-rich information; digital libraries can no longer be only libraries; in order to serve the next generations of users they need to become isomorphic with other Internet services, such as blogs or wikis. Blog allows users to extend the information space related to each resource with their own comments and thoughts. Current readers can easily deliver new knowledge for future readers; furthermore, the knowledge created by the users along with the library resources can also be find and used outside the library world.

The most important sphere of library 3.0 is to establish a semantic relationship between all available web contents to ensure seamless accessibility, search ability, availability and usabili8ty. Librarians need to be more inclined towards the use of latest tools and technology to create virtual library system. But basic aim remains the same i.e. right information to the right users at the right time.

## CONCLUDING REMARKS:

The faster and meaningful information retrieval has been the driving aim for the information retrieval systems since the beginning of automated information retrieval. During the database information systems, Artificial intelligence, and other computer-aided retrieval systems have made a very optimistic start. In the Internet era, Semantic Web came as a model of semantic retrieval in the web environment. Traditional libraries are in a stage of transition towards making the library without boundary with global access with Internet.

Applications of mash up technologies will give us the virtual world of information in which web will be strengthen with more computing and analyzing powers through artificial intelligence. In Web 3.0 all created profiles and browsing history of an individual put together, on basis of analyzing the contents, computer will come out with the result needed by that particular individual. Web 3.0 stet up the linking between data, various devices to exchange, analyze and find the data and finally establishes the linking between all users of web.

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