INTEGRATION OF SOCIAL MEDIA AND WEB 3.0 TOOLS IN LIBRARY OPERATIONS AND SERVICES

By

Umar Ibrahim, PhD, FNLA, CLN
University Librarian, Kaduna State University, Kaduna
GSM: 08037022011, e-mail: umarahim2003@yahoo.com

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Abstract

The focus of this paper is threefold: Internet web services, social media networking and library operations and services. In discussing web, the paper provided an overview of web development; from web 1.0 where static, "read-only" dump of information websites were made available, to a more interactive "read-write" web 2.0, and now to the "read, write and execute" web 3.0. The paper highlights different social media tools and how they can be utilized in the social networking environment. Discussing library operations and services, and following the integration of web 2.0 into library service, which gave birth to Library 2.0, the paper further discussed how web 3.0 social media networks, such as network computing, open technologies, intelligent applications, etc. could also be integrated into library operations and services. In conclusion, the paper provides some guidance for effective integration of social media and web technologies into library operations and service provision

Keywords: Internet Web 2.0 Web 3.0, Social Media Networks, Library Operations, Library and Information Services

1.0 INTRODUCTION

The journey has just began; from pre-web internet to www or Web 1.0, then to web 2.0, and now web 3.0. Preparations are already on for web 4.0, and it goes on. The rate at which ICT revolution is going on is very remarkable. Sometime before a new creation is understood and put to use, a new version of it is already out. The Webs – 1.0, 2.0, 3.0, etc. no doubt have significant roles to play in library and information services, just like any other sector. As such, Scottish Library and Information Council (SLIC) and Chartered Institute of Library and Information Professionals (CILIPS) believe that social media websites have great potential to enhance the delivery of library services and to contribute to the professional development of library staff. As users increasingly come to expect interactive online services in all spheres of life, libraries must keep pace with developments elsewhere in order of ensuring a responsive service for the future.

It is therefore important that libraries adapt to these new innovations in order to keep up with users' demands and expectations. If libraries do not, so warn CILIPS and SLIC (2015), keep up with emerging technologies, continuously striving to provide responsive services, it will become increasingly difficult to catch up. Thus, libraries could be at risk of providing out-of-date and irrelevant services that appeal to a decreasing user group. Therefore, in order to avoid this, library can be a part of webs by harnessing the concept, principles and technologies for rendering exemplarily services to user in electronic world.

It's a framework for incorporating all changes made at all levels in the management of library.

2.0 AN OVERVIEW OF WEB DEVELOPMENT

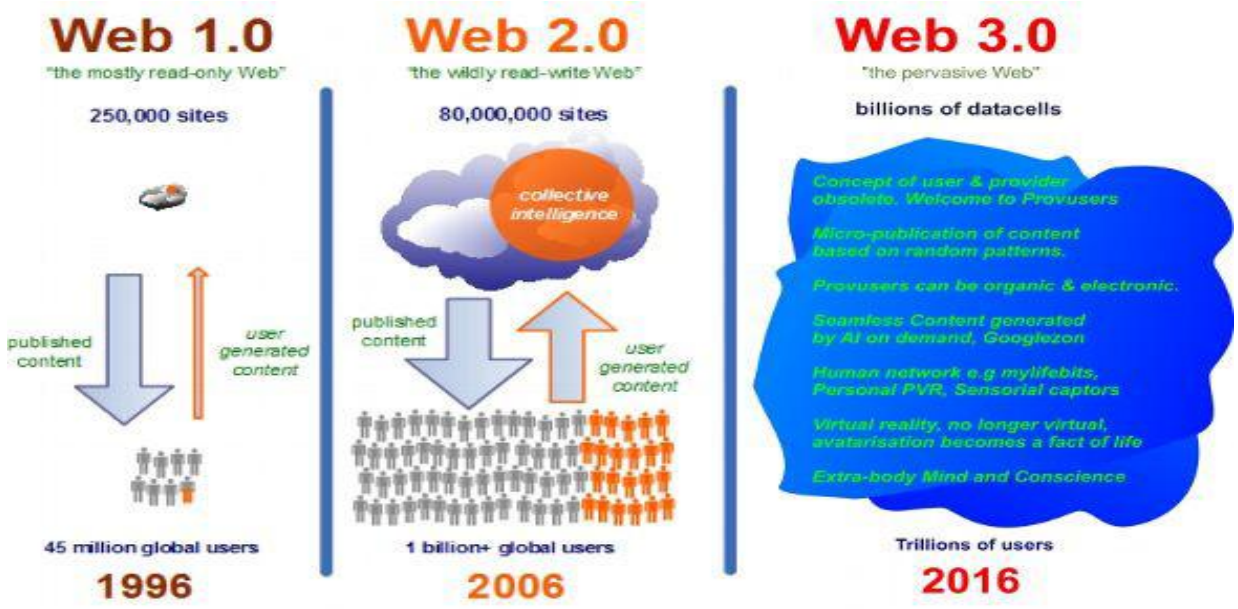
To understand where the Web is going, there is the need to take a quick look at where it began. Invented by Sir Tim Berners-Lee, the World Wide Web (WWW) was created using hypertext system called the "Mesh and was powered by the release of the mosaic browser. It is a system of interlinked, hypertext documents accessed via the Internet which consist of web pages that may contain text, images, videos, and other multimedia that navigates between them using hyperlinks. The first implementation of this web represents the Web 1.0 and was, according to Berners-Lee (2008) and Richardson (2009) right from the beginning invented with the vision of "a collaborative medium, a place where user could all meet and read and write". Thus was born the dot-com boom, followed shortly thereafter by ..... the dot-com bust.

The Web became an increasingly important resource in many aspects of life: education, commerce, government, employment, health care, recreation, and much more. Consequently, it is widely embraced by academia, business communities, organizations, and librarians especially, who recognize a great information delivery system in it. Though found very useful, Web 1.0 nevertheless had the disadvantage of being a static information dump where people read websites but rarely interacted with them, what Berners-Lee described as "read-only" web.

As the Internet evolved to encapsulate unlimited services, resources, objects, and devices, user interfaces (e.g. Web browsers & email clients) no longer suffice. Therefore, in order to provide the user with efficient instruments to handle the abundance and variety of information available on the Internet, new interfaces were created. Hence, the need to provide these new interfaces prompted progressive advancements on two major fronts: virtual reality and user interactivity, and the aim of these advances is to provide optimal usability of the Internet. It is this development that gave birth to the second web tagged Web 2.0. Therefore, the term Web2.0 according to O'Reilly (2005) refers to the development of online services that encourage collaboration, communication and information sharing. It represents a shift from the passive experience of static "read only" web pages to the participatory experience of dynamic and interactive web pages.

Web2.0 according to Naik and Shivalingaiah (2008) is a vision of the web in which information is broken up into "microcontent" units distributed over dozens of domain, which make the web of documents morphed into a web of data. Accordingly, Web 2.0 makes use of latest technologies and concepts in order to make the user experience more interactive, useful and interconnecting. It has brought yet another way to interconnect the world by means of collecting information and allowing it to be shared effectively through, as pointed out by Chris (2008) uploading and downloading. Therefore, Naik and Shivalingaiah conclude that Web 2.0 is about connecting people putting the "I" in user interface, and the "we" into a web of social participation. Hence, Web 2.0 allows users to interact and collaborate with each other in a social media dialogue as creators of user-generated content in a virtual community, thus, again leading, Berners-Lee to label this web as "read- write" .

The ongoing transformation of Web 2.0; a full-fledged computing platform serving web applications to end users into web usage and interaction that includes transforming the Web into a database is already heading to the evolution of a third web generation called Web 3.0. According to Jeffrey (2008) by extending Tim Berners-Lee's explanations, the Web 3.0 would be something akin to a "read-write-execute" web where high-quality content and services produced through web 2.0 technologies enabling platform could be distributed and shared. Naik and Shivalingaiah (2008) provide an excellent pictorial and tabular comparison between the 3 webs as below:



S/N	Web 1.0	Web 2.0	Web 3.0
1	1996	2006	2016
2	The Web	The Social Web	The Semantic Web
3	Tim Berners- Lee	Tim O'Reilly	Sir Tim Berners- Lee
4	Read only web	Read and write web	Read, write and execute web
5	Information sharing	Interaction	Immersion.
6	Millions of users	Billion of users	Trillion of users
7	Ecosystem	Participation	Understanding itself
8	Connect information	Connect people	Connect knowledge
9	Brain and Eyes (=Information)	Brain, Eyes, Ears, Voice and Heart (= Passion)	Brain, Eyes, Ears, Voice, Heart, Arms and Legs (= Freedom)
10	The Hypertext/CGI Web. (the basics)	The Community Web (for people: apps/sites connecting them).	The Semantic Web (for machines).
11	Pushed web, text/graphics, based flash	Two way web pages, Wikis video, pod casts, shading, Personal publishing, 2D portals	3D portals, avtar representation, Interoperable profits, multi-user virtual environment (MUVEs), Integrated games, education and business, all media flows in and out of virtual Web worlds

3.0 THE WEB 3.0

Web 3.0 is a transformational version of Web 2.0. The difference between the two is that Web 3.0 is the next fundamental change both in how websites are created and, more importantly, how people interact with them. According to Steve (2008) Web 3.0 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, what Tim Berners-Lee coined Giant Global Graph (GGG). All these transformations according to Mind (2008) will make Web 3.0 a web where the concept of website or webpage will disappears, where data isn't owned but instead shared, where services show different views for the same web/the same data.

Those services can be applications (like browsers, virtual worlds or anything else), devices or other, and have to be focused on context and personalization, and both will be reached by using vertical search. Jonathan (2015) observed that in using Web 3.0, instead of multiple searches, you might type a complex sentence or two in your Web 3.0 browser and the Web will do the rest. The Web 3.0 browser will analyze your response, search the Internet for all possible answers, and then organize the results for you.

That's not all, as Jonathan further observes, many experts believe that the Web 3.0 browser will act like a personal assistant. As you search the Web, the browser learns what you are interested in. The more you use the Web, the more your browser learns about you and the less specific you will need to be with your questions. Eventually you might be able to ask your browser open questions like "where should I go for lunch?" Your browser would consult its records of what you like and dislike, take into account your current location and then suggest a list of restaurants.

Apart from the already existing Web 2.0 tools that can be used for Web 3.0, which include, Facebook: Social networking site; Flickr: Web based photo sharing site; Twitter: Micro-blogging/social networking service; Wordpress: Blogging service, Nova (2012) provides several major complementary technologies and processes which will reach new levels of maturity simultaneously with web 3.0. He listed these as:

- **Transformation** of the Web from a network of separately soloed applications and content repositories to a more seamless and interoperable whole.
- **Ubiquitous connectivity**, broadband adoption, mobile Internet access and mobile devices;
- Network computing, software-as-a-service business models, Web services interoperability, distributed computing, grid computing and cloud computing;
- **Open technologies**, open APIs and protocols, open data formats, open-source software platforms and open data (e.g. Creative Commons, Open Data License);
- **Open identity**, OpenID, open reputation, roaming portable identity and personal data;
- **The intelligent web**, Semantic Web technologies such as RDF, OWL, SWRL, SPARQL, GRDDL, semantic application platforms, and statement-based datastores;
- **Distributed databases**, the "World Wide Database" (enabled by Semantic Web technologies); and
- **Intelligent applications**, natural language processing, machine learning, machine reasoning, autonomous agents.

4.0 SOCIAL MEDIA NETWORKING AND USER-GENERATED CONTENTS

The term "Social Networking" according to Mishra (2015) refers to a range of web-enabled/it-enabled software programs that allow users to interact and work collaboratively with other users. It includes ability to browse, search, invite friends to connect and interact, share film reviews, comments, blog entries, favorites, discussions, events, videos, ratings, music, classified ads, tag and classified information, and more. Therefore, a social network allows individual to join and create a personal profile, then formally connect with other users of the systems as social friend.

The Internet of Services is leveraging on individuals and virtual communities to develop content and services. The largest source of data on the Internet is now user generated. For example, as revealed by Wikipedia (2010) Facebook's 41 million active users (with 105 new users every day) have uploaded 1.8 billion photos and created 1,800 applications. Additionally, user generated content will grow as the world's 4+ billion applications - such as cameras, phones or PCs - increase by 50% by 2010. Newer types of devices have also come onto the market such as the iPhone, Amazon Kindle and road navigation devices which will be able to digest and produce richer Internet content. It is expected that user generated services will follow the same trends and patterns as seen around user generated.

5.0 LIBRARY OPERATIONS AND SERVICES

The library is generally known to offer several different information services produced through several executed operations. The services offered by library can be grouped under three broad areas: Knowledge generation/acquisition, knowledge organization and knowledge distribution. Today, all of these services are being impacted by new technologies. Thus, libraries are leveraging the power of these technologies to provide better and more relevant services to their patrons. Hence, by integrating web technologies services into their web presence, libraries can easily and effectively enhance the provision of their services through Mobile Online Public Access Catalog (MOPACs), Mobile Version of Website and Database, Mobile Circulation, Library Short Message Services (SMS)/SMS Reference service and marketing. The implementation of these services have huge implications for how libraries now and in the future will stay relevant to their communities and how they will face the next generation of new information technology.

6.0 INTEGRATING LIBRARY OPERATIONS AND SERVICES USING SOCIAL MEDIA NETWORKS AND WEB TOOLS

Libraries and librarians have ever since embraced the wind of change and transformation happening in the information and communication technology era. Libraries have been automated, converted into electronic format and digitalized. Also, in an effort to offer effective services and retain users in very competitive information milieu, the libraries have joined the bandwagon of deploying various ICTs into their operations and service delivery. The internet with its various services was integrated into the library and in line with this the library webpages and portals were created and used to interact with users. This development made Abram (2008) to observes that libraries have started using different features to enhance their web portals and let patrons personalize their research and learning experiences, that we are on the 'beachfront' of this trend and the future holds a greater, inherently richer experience for library users and researchers.

Consequently as Web 2.0 services are becoming part of users' primary activities online when accessing information, libraries are already embracing Web 2.0 technologies. Sperring (2008) discusses this issue in his article about how Web 2.0 fits into the library paradigm and states that library users are there for one common reason, to find information, and he cautioned that if we don't provide them with that they will go elsewhere to find it". According to Oguche (2012) much of the technology leveraged in the Web 2.0 framework is geared toward gathering information for individuals and collecting it for them to absorb at their leisure, when they have time. Because, as explained by Brown, (2009) that Web 2.0 technologies can be used with other essential communication tools to help a library's reach go even further, Michael Casey coined the term Library 2.0, which is now synonymous with Web 2.0 services. According to Michael Casey "Library 2.0 is a user-centered model for library services that encourages user participation in the creation of both the physical and digital services, supported by the consistently evaluating services". The concept of Library 2.0 is the generation of a social network interface, where the users exploiting RSS feeds, wikis, tags can't only search for books and other material, but communicate and share knowledge. Libraries are already moving into Web 2.0 and according to Maness (2006) the move has only just begun. Collaborating this, Ezeani and Eke (2010) acknowledged the fact

that there is now a transition within the library world in the ways services are offered to patrons

Bradley (2007) notes that there are many types of Web 2.0 technologies integrated into library as Library 2.0 that can be used in combination to provide better services in academic libraries. One of the most useful combinations of these is social bookmarking and RSS feeder services. Social bookmarking allows for library staff and users to 'tag' specific information on a website so that other users and staff could find similar useful resources. Where this would be extremely useful would be on library subject resources page. By using specific, standard tags on this subject resources page and having patrons use RSS feeders, the subject specialist librarian could instantly update their subscribers as to new and useful resources or pertinent information related to that subject. Libraries should therefore try to create more value with social networking profiles by, according to Farkas (2007), offering a space for patron to give feedback, providing news and information, or providing a portal to library services". This in the opinion of Bradley (2007) would allow for more patron interaction where the patron may feel more comfortable and willing to give more candid feedback about library services. Also, by engaging students and patrons within an online social network, academic libraries can keep in touch with the informational trends and needs of these groups.

Another of these technologies and one that easily fits into library's reference services paradigm is instant messaging. This allows library patrons remote access to a librarian while conducting their research. The librarian can send informational links or database web addresses via the instant messaging system. Moreover, instant messaging provides faster access to information in most cases, allowing both parties to see the reference related questions, and having this service available to patrons gives library's reference services the ability to have a constant presence on their website and within their patron's chat software, if the patron chooses to add the reference services to their address book, Bradley (2007).

Bradley further notes that a library's reference services would also benefit from using a 'weblog' or blog on their subject specialists' pages. By combining a weblog and an RSS aggregator, a subject specialist could gather "content from many different sources". This is extremely useful because of its ability to gather a small amount of generally useful

information from other internet sites and resources onto one page for library's users, generally researchers at an academic library. The subject specialist could go a step further and have an area of the page where researchers could add their own useful resources, thereby encouraging more peer to peer collaboration. Similarly, King (2009) notes that by combining an RSS feed reader and podcasts, libraries can access and deliver audio commentary and instructions to patrons wherever they are located. Another combination is a RSS feed from the videocast, a RSS reader for the patron, and creating videos for your patrons to view for help with accessing library resources or even upcoming library events. In fact as noted by Ezeani and Eke (2010) there are many academic libraries that have already begun to successfully implement these same types of activities.

Web 3.0 is just around the corner and from all indications it is going to be yet another revolution, especially in information dissemination and sharing. As point out by Naik and Shivalingaiah (2008) in Web 3.0, search engines will hopefully retrieve micro content texts tagged automatically. This implies translating billions of Web 2.0 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. This will allow people build applications that they can interact with and companies build platforms that let people publish services by leveraging the associations between people or special content (e. g. FaceBook, Google Maps, My Yahoo!); thought to be the future – where the Web is more interactive with users, leading to a kind of artificial intelligence Web 3.0. Instead of Blogs, Wikis, Wikipedia, Google personalized, DumpFind, Hakia use by Web 2.0, Web 3.0 will use; Semantic Blogs: SemiBlog, Haystack, Semblog, Structured Blogging and Semantic Wikis: Semantic MediaWiki, SemperWiki, Platypus, dbpedia, Rhizome. The Web 3.0 uses ontological language that allows machines to reason about information and make new conclusion, not simply match keywords

Therefore very soon, following the integration of Web 2.0 into Library 2.0, the Library 2.0 will be transformed into Library 3.0 using Web 3.0 technologies. By the time this is achieved, libraries would accomplish very robust information service delivery. The integration will be another library paradigm of services. The paradigm shift will have a lot of new features where the user could use a "my library space", potentially creating a 'one-stop-shopping' experience, which would give the user the options of bookmarking or saving

specific searches and sharing and creating content by using blogs, wiki's, and podcasts. Also, researchers can have personalized online library accounts where, through a journal subscription, they are able to 'subscribe' via RSS to certain topics and have the new research pushed to them, instead of having to seek it out through the now standardized library web site's database searches. This, as speculated by Lui (2008) would change major academic research as we know and it is well on its way.

6.1 STRATEGIES FOR THE INTEGRATION OF SOCIAL MEDIA AND WEB TOOLS INTO LIBRARY OPERATIONS AND SERVICES

Although social media tools are designed for broad appeal and are, therefore, very easy to use, cheap, often free and their applications very beneficial to libraries, properly implementing of Web technologies is a long term commitment and therefore careful planning is highly required. Below are some strategies that needs to be adopted for proper integration.

- Libraries should try to have clear purpose for integrating social media networks into the library. It is easy to be drawn in by the latest tool, especially high profile sites like Twitter, without proper consideration of targets and expected outcomes. Therefore, libraries should try to match the service to information need rather than using just for the sake of it.
- It is also important for libraries to know that they cannot possibly integrate all the social media networks at once. It is therefore important for the libraries to determine the most popular Web services and chose the ones that provide the greatest values of services and are most sustainable. For instance, a library may just start with facebook and wordpress for blogging services. However, in choosing the ones to start, the library will have to decide what it wants to achieve and who its target will be, as well as the user group that will be most interested in the information sharing
- Libraries would also need to liaise with other library authorities to identify the services that have been adopted and the associated pros and cons
- Libraries would have to be responsive. This is because most Web2.0 services are interactive, involving sustained input and communication; libraries should take time to always reciprocate users' responses.

- The open and instantaneous nature of Web2.0 services means that communication can be particularly informal, hence libraries should be prepared for informality, less formality may help to engage potential users and even update the image of your service.
- Libraries should embark on improving library users' awareness skills in the use of internet by paying greater focus on how social media networks can be integrated into the curricula to advance learning process
- The capacity of library staff, especially in the area of social media networking should be enhanced otherwise they may not be able to cope with the challenges of web revolution.

7.0 CONCLUSION

The Web offers so many opportunities to people, especially scholars and researchers and a strong web presence, including representation on social media sites, improves awareness of library services and contributes to a progressive and modern image, which may in turn lead to increased physical visits. With regard as to why libraries and librarians need to be mindful of and work to integrate these technologies into their services, it is simply because they have to, library services would be made useless otherwise.

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