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Application of Web 2.0 Tools in Medical Librarianship to Support Medicine 2.0

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Abstract

It is almost a decade that social networking technology along with its tools such as blogs, wikis, slidesharing/videosharing and photosharing softwares, podcasts, RSS feeds, mashups, folksonomies, and bookmarks has developed its influence on all human fields of study/activity. It is obvious that these tools are increasingly growing, in different languages, regions and fields, due to social dynamic and liberal characteristic of Web 2.0 technologies. Medical sciences and library science also are not exception to this influence. Consequently, library 2.0 and newly coined concepts of Medicine 2.0, and Health 2.0 have become the buzzwords in the Internet culture. In spite of proliferation of such social tools listed above, there is no aggregation and harmony for the utilization of the potential of these technologies in specific subject areas and the sources of information on the Web is almost proliferating and uncontrolled. This gives rise to the problem of webliographic control due to which the information seekers find difficulties in information retrieval. The paper presents application of Web 2.0 in medical libraries to support Medicine 2.0 emphasizing the above-mentioned problems. Considering the nature of an original article the experience of the authors, as a medical librarian and a faculty member in Library and Information Science, through observation of the needs, problems and prospects, played an important role in forming the idea and presentation. The study also used secondary data collected from related literatures. Standardization and webliographic control would solve the problem. In addition, governmental support and creating awareness at the management level in the organizations is also crucial.

Keywords

Introduction

The concept of medicine 2.0 is the direct result of utilization of Web 2.0 technologies in medical science. According to *Highlight Health Blog carnival Medicine 2.0*, year 1 edition 10 "Medicine 2.0 is the science of maintaining and/or restoring human health through the

study, diagnosis, and treatment of patients utilizing Web 2.0 Internet based services, including Web based community sites, blogs, wikis, social bookmarking, folksonomies (tagging) and Really Simple Syndication (RSS), to collaborate, exchange information and share knowledge."

When medicine shifts to medicine 2.0 to meet its consumers health care needs, consequently medical librarianship also should turn to this new direction and take the health information resources and services to new environment utilizing Web 2.0, social networking and community building tools.

Modern medicine is patient-centered approach (Laine & Davidoff, 1996; Kemper & Mettler, 2002) in contrast with traditional doctor-centered approach. In new medical practice and health care system, doctors always care about their patients' needs and preferences. Nowadays, traditional information delivery, even health delivery is out of vogue. People sit at their home, office and 3rd place searching for health care facilities and health information. Johan Seidman (2008) states, "The time we've been spending in the exam room shadowing clinicians and patients has been invaluable. But it's also important that we observe how consumers are using HIT [Health Information Technology] applications in their homes-after all, for most people, more than 99% of the time they are outside of traditional care delivery settings." McLean, Richards and Wardman (2007) emphasize the revolutionary role of Web 2.0 in medical practice and education by posing a question "Darwikinian evolution or folksonomic revolution?"

The more striking change is happening by Web 2.0 and that is participation of patient in health information formally and informally. Patients as health consumers in medicine 2.0 and users or participants in Web 2.0 are writing and publishing their own experiences in their blogs, they exchange their experiences with the patient society. They comment on health information and doctors advise and user comment functionality, at sites like Patient UK, which patients can use to record their experiences; Patient UK readers can also rate existing 'Patient Experience' entries, and report any unsuitable or offensive entries they might come across (Boulos & Wheeler, 2007)

However, lack of medical knowledge and proliferation of health information make patients misinformed. It neither ensures the patient safety nor improves patient peace of mind. Nowadays, the information age encounters with new diseases and new patients such as "Information Syndrome" and "Cyberchondriac, a person who imagines they have a particular disease because their symptoms match those listed on an Internet health site" (Cybercondriac, 2008). The problem refers to the negative effects of information. It also may refer to the idea that free floating of information is not always desirable. But, as Ranganathan (1931) propounded his ever lasting law of library science, "*Every book its reader*", any piece of information is useful and miraculous just to its special reader/user. Sometime, it may either be useless or harmful to others. The story is similar to the old story of the "medical School Syndrome, in which Medical Students after studying particular diseases suddenly believe that they have all symptoms and signs of certain diseases" (Healthbolt, 2008). Nowadays, it has distributed in Internet community and may be described as Information Syndrome, in which people who read health information, in any format but mostly through the Internet due to its simple and easy navigation that makes abundant information available for professionals as well as amateurs and public, believe that s/he or a loved one has the same symptoms and signs of certain diseases. Of late, Web 1.0 and specially Web 2.0 and open accessibility of information have created equal opportunities for all nations and people in advance countries as well as developing countries. Therefore as the advantages of the technology benefit the global community the disadvantages also gradually and equally have their adverse effects. Srivastav (2008) in an issue of Sunday Times of India states that "doctors agree that equations with tech-savvy

patients have changed. There is a rift between the patient community and doctors." He reports that Dr P Vinay Kumar, surgical gastroenterologist from Apollo hospital says, "describing them as e-patients, patients often step into clinics with a preconceived idea about their diagnosis and treatment option."

Although, sometimes it is called risky e-information, as described in the earlier report, but it seems that it is not at least as risky as ignorance. Let us think positive and accept that as new waves of technology emerge and involve communities there is a need to adapt to the cultural and lifestyle change.

Therefore, it is the time to make a collaborative and a community building health information society, in which informationists, patients, health providers are working together following standards to make the dreams of the healthy society come true. Medical librarians should utilize social Web tools in order to meet the changing needs and preferences of the user community and to help the right flow of information.

How medical librarians can support medicine 2.0

Medical librarians always support the health providers, as well as the consumers' information needs. Library science is naturally a community-building field, which is always adaptive to change in consonance with the changing needs and behavior of its user community. However, to keep in tune with new environment, medical librarianship also needs to focus on the patient information needs as well as physicians. The present attitude of the users is that they seek a lot of information on the social Web. Librarians' blogs, wikis, information delivery pages endeavor to give right information to support the flow of relevant information as their mission.

Social networking technologies offer new opportunities for health care consumers there are studies that deal with the advantages extended by Web 2.0. the document entitled "*Web 2.0 and chronic illness: new horizons, new opportunities*" by Seeman (2008) opines that Web 2.0 heralds a breakthrough opportunity for empowering healthcare consumers of all types, and especially for those suffering from different forms of chronic illness.

The medical librarianship through Web 2.0 can be transformed as follows:
Medical Libraries, as any other conventional libraries, have transformed themselves by developing new services from time to time. In the beginning, they rendered conventional services now they endeavor to render the non-conventional services.

Conventional services

The libraries have been in the process of transformation since their inception by developing new services and practices. The libraries that were rendering conventional services such as Circulation (Lending service) and Reference service have developed neo-conventional services to suit the needs of the industrial society and the emerging information society.

Neo-conventional services

To meet the changing needs and preferences of the users, libraries have developed a variety of information services that can be categorized as neo-conventional services due to which they have transformed themselves into information centers in the post industrial society and throughout the information society. The neo-conventional services could emerge due to the application of information and communication technologies (ICT). Libraries are one of the forerunners in application of new technologies. Thus by applying new technologies they have developed the following information and other supportive

services:
Current awareness services, Selective Dissemination of Information (SDI) services, Inter-Library Loan (ILL) services, Referral services, Document Delivery services, Reprographic services, Translation Services, and Documentation services.

The above-mentioned services led to second stage transformation of the libraries. In the Internet era and the Web environment, libraries have ample scope of transforming themselves into community building information centers through their non-conventional services? Further, all the above neo-conventional services can be more efficiently rendered through the non-conventional methods or services.

Non-conventional services

By applying advanced information technologies and Web 2.0 technologies libraries are transforming themselves into digital libraries, virtual libraries and community building information centers. The non-conventional services that can be rendered, by libraries in general and medical libraries in particular, in the Internet era and Web 2.0 environment are: Digital library services, evidence-based medicinal information services, information therapy services and online services through social networking including: medical blogs, wikis, slide shares, video shares, really simple syndication (RSS), and folksonomy.

Blog as a "first of the social software" (Giustini, 2006) which is also described as "chronological social web site" (Blog, 2008). Blogs have become a very popular, easy and social platform to exchange information, and gradually are becoming a more acceptable reference sources even in peer reviewed publications. Contrary to the earlier situation where citing the blogs did not add value to the research work, of late they have gained their due value. For instance some of the recent documents available through PubMed and Google Scholar contain references of blogs. A citation analysis in the references of an article about "Web 2.0" gives a right image of trend. In addition, proliferation of blogs is considerable. A search for blogs in specific field shows that there are many blogs on the Web offering news and trends in the specific fields of human knowledge.

A simple search by using Google for medical blogs with the search query 'allinurl: medicine blog' resulted in the retrieval of about 38,000 blogs. While searching for medicine in the title of blogs it gave 48,900 with the search query 'allintitle: medicine blog'; and a search for "med" in the blogs' URL retrieved about 37,000 hits with the search query 'allinurl: med blog'. Basically, blogs are not created by group of people as wikis are created. But it is a collaborative source because readers can comment and publish their own ideas about the topic, or ask more information. Blogs can be considered a very useful and good source of information to find information about the trends and debates in specific field, although the evaluation of source should not be ignored. Therefore, neo-conventional library services like current awareness service can be provide effectively through the blogs.

In this connection, specialization of the blogs plays a crucial role in timeliness, perfection, and accuracy of blogs. Specialization saves the time of the users while searching through massive amount of uncontrolled information if every field is mixed up. Specialization is a best way to optimize the potential use of blogs if they are provided through non-conventional library services and information delivery.

Information therapy, patient education, patient guides in hospitalization, patient discharge information, as well as doctors time schedule, doctors list based on specialty, insurance and information about diseases caused by climate changes, common diseases, prevention of common diseases, seasonal diseases, can be presented and shared through medical/hospital library blogs.

Wikis are the other popular tool of Web 2.0, which is a suitable platform for reference and information services in medical library and information centers. The collaborative nature of wiki provides opportunity for instantaneous revision as well as to develop an efficient repository of new information. In Medical sciences, case studies as a source of evidence play a vital role while they are not categorized in formal sources of information like books, thesis, journal, etc. hence most of the time they are being left without being organized. The only chance for utilizing case studies is when they are reported through a journal. Wiki can be used as an open-source depository of case studies and finally a best source of evidences. Medical librarians can create a special case study wiki for any specialty of medicine, then medical science students, physicians, and librarians can collaborate and send related case studies to the wiki editorial board. Then they can be evaluated and added to wiki according to the terms and conditions. Medical librarians can easily support, medicine 2.0, evidence based medicine and information therapy approach through wikis as well as other representative of Web 2.0 such as slide shares, video shares or picture shares. Wikis can also be used for patient story or patients' autoillography (the story(ies) written by patients about their illness/disease).

Slide shares, Video shares and Photo shares are appropriate community tools to share medical images, atlases, educational video clips in medical libraries. They can be created and shared by consumers as well as professionals. Librarians can digitalize the images embedded in atlases and books to share the pictures with educational purposes such as atlases of Skin Diseases, atlases of Heart operation/surgery that can be used to make a slide show or video clip, about operation and chronicle/revolving process of a disease. There are good examples of application of slide share and video share in Mayo Clinic web site, such as slides of Brain anatomy, Exercises for osteoporosis, Causes of back pain videos relating to CT scan, How cancer spreads.

Podcasts as one of the facets of Web 2.0 have great impacts in education (Savel et al., 2007). Nowadays, podcasts are being used in patient education. USA education system values the podcast method in the educational process. Several American universities, including Drexel and Duke, have recently distributed iPods to their students, and have experimented with podcasting (Barsky, 2006). Presently, several organizational Web sites offer patient education audio/ video clips and podcasts through their web site such as eMedicineHealth, Patient UK (a comprehensive, free, up-to-date health information as provided by GPs to patients during consultations), Mayo Clinic, Better Health, UK National Health System, BUPA.

Really Simple Syndication (**RSS**) gives the possibility of being informed about new items added to the interested site. Librarians can utilize the RSS feeds to catch up trends and changes of desired medical specialty, and simultaneously to give the same opportunity to user community to keep themselves up-to-date. RSS feeds act as the neo-conventional library services of sending alert to users about new items added to the library holding, or sending table of contents of interested journals to specific users. In a way it serves as an effective SDI services.

Perpetual searching for the specific information and given source for information is always tiresome for medical professionals/individuals as well as librarians when they want to send SDI services to their user. RSS feed is a social tool that ensures easy, fast and certain accessibility of specific up-to-date information.

Furthermore, not only Web 2.0 applications are useful in information services but they are also applicable in organization of information through tools like folksonomy.

Folksonomy, among all the tools of Web 2.0, the more debatable one in the library science area is the folksonomy. It is for several decades that library science advocates use of

controlled vocabulary, thesaurus, taxonomy and authority control in classifying, storing and retrieving information on the Web. While user constructed tag or folksonomy (Folksonomy, 2008) is something different even more arbitrary than natural language. Since users may use slangs, inefficient and incomplete words and sometime irrelevant words for tagging the created documents, which causes irrelevant and misleading information retrieval. But it is a very appropriate way to carry out user studies to find out the preferences of the users in information searching as well as information tagging. The study of user behavior in using key words in their queries will enable librarians/ information specialists to organize the information efficiently and support the search engines, indexing tools, folksonomy-based systems like Del.icio.us on the Web and digital era in an appropriate way based on the users' preferences and approaches. On the other hand as Guy and Tonkin (2006) argue in their article that "One useful approach might be to examine users' motivations when adding tags, see why they decide on particular words, observe how many tags they add and compare how the same items are classified by different users. It might also be helpful to see how feedback affects tag use and how users modify tags in the light of the behavior of others." It is obvious that standardization is indispensable to better utilization of folksonomy system. However, it should not create restrictions for users (e.g., bloggers) to apply controlled vocabulary system. As discussed in an editorial note of *Webology*, it is the folksonomy-based system that should use a thesaurus (Noruzi, 2007).

Discussion

The above services will certainly have immense effect on the medical librarianship and these services; need to be rendered by the medical libraries in the medicine 2.0 environment. There is high expectation that these services would revolutionize the medical librarianship and thereby extend better support to medicine 2.0 practices.

Health librarians/health informationists have knowledge of handling, organizing, searching, finding, locating and delivering accurate, reliable and relevant information. They know how to give timeline information to doctors as well as patients, and they know how to find the right information from this jungle of information. They know when it is necessary to/and how to develop a system to coordinate folksonomy with thesaurus, controlled vocabulary, taxonomies to meet the authority control and in order to better match the users' /patients' information needs, doctor recommended information and make the best evidence available. They know where the right information can be found and where the RSS feeds should be embedded.

It seems that presently both medicine and medical libraries use Web 2.0 technologies inadequately and inharmoniously. As a result there are scattered, disorganized and uncontrolled sources of information that are leading to issues relating to webliography control. Studies show that in this condition, as the popularity of these resources among public increase the doubt and worry in professionals. Schneider (2002) states that "while consumers have embraced information on the health Internet with great enthusiasm, physicians and health care organizations have been more ambivalent." Boulos, Maramba and Wheeler (2006) describing the Web 2.0 collaborations paradoxical pointed out that "Some of their [Web 2.0] disadvantages also relate to their openness and ease of use. With virtually anybody able to alter, edit or otherwise contribute to the collaborative Web pages, it can be problematic to gauge the reliability and accuracy of such resources."

The optimal utilization of Web 2.0 in medicine and medical library services requires a movement in the health system. This should be realized through a clear set of rules and policies to bring all the sections of the profession together and to standardize the practices and use of Web 2.0 tools. In addition to the need for standardization and governmental

support, there is a necessity to create awareness at the management level. So that they will be informed, learnt and get involved with the process of application of new technologies and encourage and support libraries and librarians.

Therefore, an effective team-working for collaboration among health providers, information providers and patients is crucial. This collaboration should have support by the concerned State or Federal Government in order to gain formal authority and status in the society. It would certainly ensure information organization and control on the Web giving rise to Webliographic control. The Webliographic control should take care of quality of the information published on the Web and also the metadata organization and control. The collaboration may take place in virtual or physical world but the rules and regulations should be clear. Public and private hospitals should work collaboratively in the program as health providing agencies.

Conclusion

Medicine 2.0 is the latest approach to ensure better health system and well-being of the humanity, in other words, *health for all*, and a *healthy community*. The development of medicine 2.0 grossly depends on the application of Web 2.0 technologies. Librarians have a better role to play in the process. They have to coordinate the efforts of all sections of medical or health system. They are the better professionals to coordinate different sections of the communication system, as they are familiar with the information work as information workers. For this, the governments and the management of the concerned institutions should support and encourage the libraries and librarians by framing necessary policies, developing standards and procedures and encouraging specialization, with an emphasis on Webliographic organization and control, so that the medical librarians will be enabled to render more productive and efficient services.

It is quite evident that there are numerous blogs that contain a lot of duplicate information. If such duplication of efforts is avoided by aggregation and standardization of all the sources there will be availability of unique and original information and the problem of rehash can be mitigated.

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