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Abstract

Background: Capabilities offered by Web 2.0 tools have attracted many academic libraries. The present study aimed to identify factors affecting the use of Web 2.0 tools in selected Iran medical university libraries including Iran, Tehran, and Shahid Beheshti universities of medical sciences.

Methods: The study was conducted through a survey distributed among librarians working in the libraries of Iran, Tehran, and Shahid Beheshti universities of medical sciences. The data was collected using a questionnaire which examined the factors affecting the use of Web 2.0 technologies in terms of three general categories: factors related to librarians, users, tools/technology, and organizations. In order to ensure the content validity, the opinions of 10 medical library and information science faculty members were used. Further, the reliability of the questionnaire was confirmed by calculating the Cronbach's alpha.

Findings: The results of the study indicated that among the librarian-related factors, the greatest impact was related to the teaching Web 2.0 applications to the librarians with the average of 4.19. Considering user-related factors, the users' need to use these tools had the greatest impact with an average of 4.4. Regarding the tools/technological-related factors, Internet speed, Internet bandwidth, and filtering some Web 2.0 tools, with an average of 4.62, had the most inhibitor effect to adopt these tools. Finally, the support of library managers was the most influential factor for adopting Web 2.0 tools in libraries in terms of organization-related factors.

Conclusions: Identifying the factors influencing the adoption of Web 2.0 tools and planning to control the inhibitor factors in using these tools can help libraries to appropriately adopt and use these technologies.

Keyword: Web 2.0 technologies, Librarians, Academic libraries, Medical libraries

Introduction

The emergence of new technologies has affected all organizations including libraries and information centers. The use of these technologies provides better services to the library community (Ahn & Berardino, 2016). In line with the advancement of new technologies, library and information centers should use these tools to provide more efficient services to their users in order to acquire their satisfaction (Aqil, Ahmad & Siddique, 2011). Nowadays, Internet is

regarded as one of the basic tools for providing library services and as an information platform it plays an influential role in exchanging information in library services (Eze, 2016). Web 2.0 is one of the new technologies, which has been experiencing rapid and growing developments over the last two decades. With the advent of this technology, libraries have used this tool for better and more up-to-date services (Dickson & Holley, 2010).

By using Web 2.0 technologies in library services, a new generation of libraries were appeared, Library 2.0, a library where active users are the most important part of the library and users can participate in library affairs such as book selection, information storage, and especially in the process of organizing web-based knowledge (Dickson & Holley, 2010). The most important features of the Library 2.0 can be referred to the user-centered, multimedia based, socially rich, and collective innovation of knowledge (Ahn & Berardino, 2016). Library 2.0 is able to utilize technologies such as weblogs, wikis, R.S.S., podcasts, social networks, and photo and video sharing sites to meet the needs of users better and faster (Burhanna, Seeholzer, & Salem, 2009). Each of these tools can have their own function in the library.

Several studies indicated that the use of Web 2.0 tools has been increased in libraries, especially in academic libraries. Now, many libraries of universities in United States, Europe, and Asia use these tools (Ebrahimzadeh Pirshahid et al, 2016). However, the literature shows that the use of these tools in Iranian academic libraries is low. For example, the findings from a survey on the use of Web 2.0 tools in Iranian academic libraries showed that the use of wikis and R.S.S tools were 4.4% and 8.8% in these libraries, respectively, and were limited to only three university libraries. In addition, none of these libraries had used podcasts in their library services. This low level of use was due to the lack of hardware and software infrastructures, and also lack of sufficient knowledge of librarians about the use of Web 2.0 tools in library services (Ebrahimzadeh Pirshahid et al, 2016).

The use of new technologies such as Web 2.0 seems more necessary in medical university libraries, regarding the importance and urgency of providing information services to medical community. Using Web 2.0 tools enable libraries to provide information services to their users in a more desirable and accessible way beyond the physical boundaries (Abdekhoda, & Mohammadi, 2011). Web 2.0 tools provide access to up-to-date information and knowledge, independent of time and space, for the users in medical libraries (Al-Kharousi et al, 2016).

Thus, it is necessary to identify and examine the influential factors, including encouraging and inhibiting factors affecting the use of Web 2.0 technologies in academic libraries. Therefore, the present study aimed to identify these factors in selected Iran medical universities. In particular, this study seeks to respond to the following questions.

- What are the factors influencing the adoption of Web 2.0 tools regarding the librarian-related factors from the librarian's viewpoint?
- What are the factors influencing the adoption of Web 2.0 tools regarding the user-related factors from the librarian's viewpoint?
- What are the factors influencing the adoption of Web 2.0 tools regarding the tools/technological-related factors from the librarian's viewpoint?
- What are the factors influencing the adoption of Web 2.0 tools regarding the organization-related factors from the librarian's viewpoint?

The findings of the study can help to take a step toward expanding the services of academic medical libraries by providing the ground for optimal adoption and use of these technologies.

Methodology

The method of the study was a survey and a questionnaire was used to collect data. The questionnaire items were derived from some related studies . The questionnaires were distributed among 115 librarians, of which 91 were returned. To determine the content validity of the questionnaire, the opinions of 10 medical library and information science faculty members were sought. In addition, the reliability of the questionnaire was verified by calculating the Cronbach's alpha, which its value was 0.98, indicating the internal consistency of the questionnaire was acceptable. Finally, the data analysis was performed using an SPSS software.

Research findings

The results indicated that among the 91 participants in the study, the majority of them were women (73%) while 18% were men. In terms of academic status, the highest percentage of the participants (58.8%) had a bachelor's degree, while the lowest percentage (6%) had a diploma. None of the participants had Ph.D. degrees. The participants were aged from 29 to 61 years, which were classified into several age groups. It should be noted that no one was in the age

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group under 25 years. The largest number of the respondents belonged to the age group of 36-45. Considering the work experience of the participants, the highest frequency was related to the employees with a job experience of more than 10 years (67%), while the lowest frequency was for employees with a job experience fewer than 5 years (2%).

Table 1. Demographic characteristics of the study participants

Variable		Frequency (percentage)
Gender	Female	73 (80.2)
	Male	18 (19.8)
Education level	Diploma	6 (6.6)
	Associate	17 (18.7)
	Bachelor	53 (58.2)
	Master	15 (16.5)
	26-35	28 (30.76)
	36-45	35 (38.46)
Age group	46-55	26 (28.57)
	56-upper	2 (2.19)
Work experience	Less than 5 years	2 (2.2)
	5-10 years	28 (30.8)
	More than 10 years	61 (67)

The factors affecting the adoption of Web 2.0 tools in library and information centers were divided into four categories: librarian-related, user-related, tools/ technological-related and organization-related. Each of these factors could contribute to the adoption of these tools by librarians, and the present study identified these factors in order of importance. Table 2 indicates the factors affecting the adoption of these tools based on the selected priority by the participants of this study.

Table 2. Librarian-related factors affecting the adoption of Web 2.0 tools from the librarian's viewpoint

Rate	Librarian-related factors	Frequency/ percentage					Mean	Standard deviation
		Very	High	Moderate	Low	Very		

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			high			low		
1	Training librarians on using these tools	46 (50.5)	23 (25.3)	16 (17.6)	5 (5.5)	1 (1.1)	4.19	4.19
2	Skills in using Web 2.0 tools	38 (41.8)	32 (35.2)	16 (17.6)	5 (5.5)	0 (0)	4.13	4.13
3	Librarians' awareness about these tools	33 (36.3)	34 (37.4)	24 (26.4)	0 (0)	0 (0)	4.10	0.79
4	Beliefs and attitudes of librarians about these technologies	27 (29.7)	46 (50.5)	15 (16.5)	3 (3.3)	0 (0)	4.07	0.77
5	Librarians' English language skills to use these tools	34 (37.4)	24 (26.4)	23 (25.3)	8 (8.8)	2 (2.2)	3.88	0.74
6	Achievement of goals through these tools	25 (27.5)	40 (44.0)	19 (20.9)	4 (4.4)	3 (3.3)	3.88	3.88
	Total						4.04	2.94

Table 1 presents the factors affecting the adoption of Web 2.0 tools regarding the librarian-related factors from the librarians' viewpoints working in the libraries of Iran, Tehran, and Shahid Beheshti universities of medical sciences. Among the factors mentioned, training librarians to use these tools (M= 4.19) has the most impact compared to other factors, while the achievement of job goals through these tools has the lowest effect (M=3.88).

Table 3. User-related factors affecting the adoption of Web 2.0 tools from the librarians' viewpoint (n = 91)

Rate	User-related factors	Frequency/ percentage					Mean	Standard deviation
		Very high	High	Moderate	Low	Very low		
1	The users' need to use these tools	54 (59.3)	21 (23.1)	14 (15.4)	2 (2.2)	0 (0)	4.40	0.82
2	Training users about using these tools	30 (33.0)	31 (34.1)	22 (24.2)	7 (7.7)	1 (1.1)	3.90	0.98

Rate		Very high	High	Moderate	Low	Very low	Mean	Standard deviation
3	Beliefs and attitudes of users towards these technologies	29 (31.9)	27 (29.7)	31 (34.1)	4 (4.4)	0 (0)	4.10	0.91
4	Participation of users in using these tools	26 (28.6)	35 (38.5)	22 (24.2)	7 (7.7)	1 (1.1)	3.86	0.96
5	Familiarity of users with the capabilities and applications of these tools	22 (24.2)	35 (38.5)	25 (27.5)	9 (9.9)	0 (0)	3.77	0.93
	Total						3.96	0.67

Table 2 shows the factors affecting the adoption of Web 2.0 technology tools regarding the user's factors from librarians' viewpoint in the libraries of Iran, Tehran, and Shahid Beheshti universities of medical sciences. The results of the comparison of frequency and mean of the above factors indicate that among the factors mentioned in the librarian's view, the need of users to use these tools has the most impact on other factors with an average of 4.40. The familiarity factor of users with the capabilities and applications of Web 2.0 technologies has the least impact on the adoption of Web 2.0 tools in library services (with an average of 3.77) compared to other factors from the librarians' viewpoints.

Table 4. Tool technological-related factors affecting the adoption of Web 2.0 tools from the librarians' viewpoints (n = 91)

Rate	Tools/ technological-related factors	Frequency/ percentage					Mean	Standard deviation
		Very high	High	Moderate	Low	Very low		
1	Internet speed and bandwidth	70 (76.9)	11 (12.1)	7 (7.7)	2 (2.2)	1 (1.1)	4.62	0.81
2	Filtering some social networking sites such	66 (72.5)	19 (20.9)	3 (3.3)	2 (2.2)	1 (1.1)	4.62	0.75

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Rate		Very high	High	Moderate	Low	Very low	Mean	Standard deviation
	as Facebook and Twitter							
3	Number of computers or other communicational tools	18 (19.8)	29 (31.9)	24 (26.4)	10 (11.0)	10 (11.0)	3.38	1.23
	Total						4.62	0.60

Table 3 represents the factors affecting the adoption of Web 2.0 tools regarding the tools/ technological-related factors from librarians' viewpoints in the libraries of Iran, Tehran, and Shahid Beheshti universities of medical sciences. Among the factors mentioned, Internet speed, Internet bandwidth and the filtering of some social networking sites such as Facebook and Twitter have the highest impact on the adoption of Web 2.0 tools (M=4.26). On the other hand, the number of computers or other communication tools (M= 3.38) has the least average and therefore, the lowest impact among the tools/ technological-related factors affecting the adoption of Web 2.0 tools from the librarians' viewpoints.

Table 5. Organization-related factors affecting the adoption of Web 2.0 tools from librarians' viewpoints (n = 91)

Rate	Organization-related factors	Frequency/ Percentage					Mean	Standard deviation
		Very high	*High*	*Moderate*	*Low*	*Very low*		
1	Support from managers	54 (59.34)	19 (20.87)	12 (13.18)	6 (6.59)	0 (0)	4.33	0.61
2	Developing clear policies for using these tools in libraries	44 (48.35)	26 (28.57)	15 (16.48)	2 (2.19)	3 (3.29)	4.15	1
3	Cost of adopting these tools for the	37 (40.65)	34 (37.36)	13 (14.28)	4 (4.39)	1 (1.09)	14.04	0.57

	library							
4	Attitudes of library managers and university officials towards these tools	26 (28.57)	41 (45.05)	17 (18.68)	4 (4.39)	1 (1.09)	3.97	0.75
5	Appropriate link of using these tools to the organization needs	24 (26.37)	42 (46.15)	22 (24.17)	2 (2.19)	0 (0)	3.96	0.76
6	Managers' risk-taking for adopting new technologies	25 (27.47)	39 (42.85)	14 (15.38)	7 (7.69)	3 (3.29)	3.87	1.03
7	Copyright issues-in Web 2.0 environment	13 (14.28)	21 (23.07)	38 (41.75)	14 (15.38)	4 (4.39)	3.25	1.02
	Total						4.12	1.04

Table 4 indicates the factors influencing the adoption of Web 2.0 tools regarding the organization-related factors from librarians' viewpoint in the libraries of Iran, Tehran, and Shahid Beheshti universities of medical sciences. The results show that among the factors mentioned, support from library and university managers in adopting these tools in the library (M= 4.33) has the highest impact. However, the managers' risk-taking about using new technologies (M=3.87) has the least average and accordingly the lowest impact among the organization-related factors mentioned in the adoption of Web 2.0 tools from the librarians' viewpoints.

Discussion and conclusion

The present study showed that the adoption of web 2.0 tools in libraries are affected by various factors such as librarian-related, user-related, tools/technological-related and organization-related factors. The findings indicated that training both librarians and users can help appropriately adopt and use these tools in libraries. Web 2.0 applications enable users to satisfy their educational and research needs through interaction with librarians   MuneJa and Abungu emphasized the empowerment of librarians to get familiar with the application of new technologies to enhance customer services. They concluded that the use of modern technology tools by librarians in information centers has led to new developments in the field of information dissemination (Muneja, Abungu, & Makori, (2012). The results of Tella and Soluoku's research also showed that increasing the skills of library users in using Web 2.0 tools in order to meet their information needs has a significant impact on information dissemination and retrieval, and therefore it helps information services to be effectively provided through the collaboration of users and librarians (Tella, & Soluoku, 2016).

Based on the results, tools/ technological related factors, especially those related to access to the Web 2.0 tools, are among the factors influencing the adoption and implementation of new technologies in libraries. In this regard, the speed of the Internet and filtering some social networking sites (e.g. Facebook and Twitter), commonly with an average of 4.62, have the greatest impact on the lack of using these tools in Iranian medical university libraries. In Mathew's study, among the influential factors in the adoption of Web 2.0 tools in libraries and information centers, the Internet speed was considered as the main inhibitor factor (Mathews, 2007). Baro and Asaba concluded that the constant internet access is necessary to access and adopt web 2.0 tools to in libraries (Baro, Edewor, & Sunday, 2014). Ramana proposed that using Web 2.0 tools in library services can be helpful in assisting information seekers to access their information and introduced the lack of filtering and bandwidth as a requisite for using these technologies in libraries (Ramana, 2009).

According to the results of this study, the organization-related factors including the support from library managers and developing clear policies are of great importance in adopting web 2.0 tools in libraries. Abarghoian and Hashemian also asserted that the proper planning, adequate support from managers and creating the proper mechanism for using these tools are the most important factors in adopting Web 2.0 tools in libraries (Abarghoian et al, 2017).

Therefore this study suggest that Iranian medical university libraries need to remove the obstacles and problems associated to adopting the Web 2.0 tools in by library services. It is also necessary for libraries to provide classes for students and librarians to become familiar with web 2.0 tools and their application in library services. Finally, it is worth noting that further research need to be conducted on assessing the quality of services provided through Web 2.0 tools in academic libraries and also how to enhance the skills related to using these tools in libraries. In addition, using the plans, ideas, and experiences of top university libraries around the world can be helpful for Iranian medical university libraries to appropriately adopt and use web 2.0 tools in library services. Thus, university librarians and policy makers can use the results of this study to develop and revise their programs in order to carry out reforms in their strategic plans.

Acknowledgments

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