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Author(s)	Choi, STP; Chu, SKW; Cheng, MMY; Koo, PLH; Leung, DW; Fung, SMH
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APPLYING WEB 2.0 IN MEDICAL-RELATED ORGANIZATIONS

STEPHEN TSZ-PING CHOI
The University of Hong Kong, Pok Fu Lam Road, Hong Kong
E-mail:bsim.stephen@gmail.com

SAMUEL KAI-WAH CHU, MIFFY MAN-YEE CHENG, PEGGY LAM-HON KOO, DAVID
WILCK LEUNG AND STEPHEN MAN-HONG FUNG
The University of Hong Kong, Pok Fu Lam Road, Hong Kong
E-mail:samchu@hkucc.hku.hk, bsim.miffy@gmail.com,bsim.peggy@gmail.com,
oberst@hkusua.hku.hk,hkstephen2005@hotmail.com

This study investigated the application of Web 2.0 to medical-related organizations. Thirty organizations participated in an online survey asking their perceived purposes, benefits and difficulties in using Web 2.0. The selected organizations fell into three categories: university medical libraries, hospitals, and non-profit organizations. Fourteen (46.7%) organizations were currently using Web 2.0, ten (33.3%) planned to use it in the future and six (20%) would not consider using it. A phone interview was further conducted with eight organizations (26.7%) about their opinion on Web 2.0. Results showed that most participants found the application of Web 2.0 beneficial to their organizations. Implications of this study for helping medical-related organizations make decisions regarding the use of Web 2.0 technologies in their organizations are discussed.

1. Introduction

Web 2.0 is a term used to herald the second wave of the World Wide Web (Deshpande, & Jadad, 2006). Instead of referring to a new technical standard or natural progression in the development of Web technologies (Murray, 2008), it provides a new way of using the Internet for collaborative and interactive purposes (McLean, Richards & Wardman, 2007). Nowadays, using the internet is not only limited to information searching. With the advancement of Web 2.0 tools such as blogs, wikis, RSS (Really Simple Syndication), podcasting, social bookmarking, social networking, feeds and Google functions, everybody can participate in the internet world, creating and contributing information by publishing content (Churchill, 2007).

This exploratory research aims to investigate whether medical-related organizations find Web 2.0 beneficial in improving their practice. Qualitative and quantitative data were analyzed based on the results of 30 medical-related organizations This study hopes to provide a reference for medical-related organizations in the application of Web 2.0.

2. Literature Review

2.1 *Background of Web 2.0*

The term 'Web 2.0' was officially coined in 2004, but there has not been any official definition for the term so far (O'Reilly, 2005). Richardson (2006) describes Web 2.0 as a read-write Web, while Boulos and Wheelert (2007) view it as a social Web. On the other hand, Churchill (2007) portrayed the rapid development of Web 2.0 as a metaphor for a spectrum of existing novel Internet applications and Sethi (2008) specified this as democratization of knowledge. The ongoing and common key services of Web 2.0 include RSS (Really Simple Syndication), blogs, wikis and podcasts. (McLean et al., 2007)

2.2 *Past studies on Web 2.0*

Crusoe, Nourse, and Whitney's (2008) study revealed the satisfaction of non-profit organizations with the use of Web 2.0. This indicated that non-profit organizations have realized the significant contributions of Web 2.0 in organizing events, forwarding news about the organization or even recruiting volunteers or staff members. Their study also recommended that through careful planning, management and iterative execution, Web 2.0 will provide a positive return on investment.

McKinsey's study on the implementation of Web 2.0 in the business sector showed more than 75% of companies planned to maintain or increase their investments in Web 2.0 (Bughin & Manyika, 2007). A large proportion of survey participants commented that the combined use of Web 2.0 tools have strengthened their companies' internal capabilities of maintaining their marketing position, particularly in breaking down hierarchical and functional boundaries (Bughin & Manyika, 2008). At the same time, it is noteworthy that companies apply Web 2.0 both for internal and external purposes because Web 2.0 has been reported as being helpful in encouraging collaboration within their companies for knowledge development and fostering interaction between customers and business partners (Bughin & Manyika, 2008).

Web 2.0 is also universally applied in the education sector. In Chu's (2008) study on undergraduate students' use of TWiki in doing their projects, it was found that TWiki was perceived as effective in improving student collaboration and work quality. Chu (2008) argued that Wiki is an enabling technology for knowledge management which can be used widely in the future. In another study, Chu (2009) conducted a survey on 60 selected universities worldwide on the use of Wikis in academic libraries. The survey result revealed that a large number of academic libraries using Wiki perceive that the benefits outweigh the costs in the long run.

According to Murray (2008), Web 2.0 particularly benefits health professionals and patients by facilitating open access to information, in order to share ideas and questions. Web 2.0 also enables medical organizations to link different medical professionals with a similar expertise in a virtual environment and to form a community of practice for sharing common topics (Murray, 2008). Medical contents for public educational purposes are also delivered through Podcasts and Videocasts (Hanson, Thackeray, Barnes, Neiger, & McIntyre, 2008). Hardey (2008) also found that tagging is used to allow patients to indicate their information, including age, sex, starting date of sickness symptoms on the Google Map for medical follow-up and reference.

The success and satisfaction with applying Web 2.0 were expressed through the past surveys and studies. Most studies about Web 2.0 have been conducted on libraries, business entities, and educational institutions. However, there were only a few which focused on the application of Web 2.0 in the medical field (Boulos, Maramba & Wheeler, 2006). This research aims to fill this gap by studying the use of Web 2.0 among medical-related organizations worldwide.

3. Research Methods

This study reports on the findings of an online survey and a follow-up phone interview. Both qualitative and quantitative methods were employed to answer the research questions. This mixed-methods approach is expected to generate a better understanding of the phenomenon (Creswell, 2008).

The embedded mixed methods approach shown in Fig.1 was used in this study. (Creswell, 2008) This method allowed us to build on the strengths of both quantitative and qualitative data.
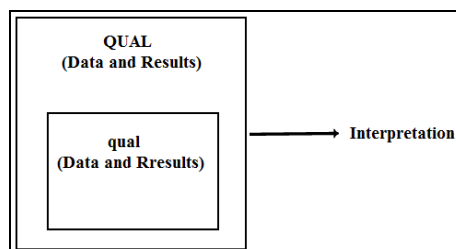

Figure. 1: Embedded Mixed Methods Designs

3.1 *Research Questions*

The main research question of this study is: Do medical organizations find the application of Web 2.0 beneficial? The following are the research sub-questions:

1. What are the trends in the application of Web 2.0 in medical-related organizations?
2. What are the purposes of applying Web 2.0 in the area of medical practice?
3. How do medical organizations perceive the benefits and difficulties of applying Web 2.0?

3.2 *Participants*

One hundred forty organizations were initially selected, and they were categorized into three fields: university medical libraries, public hospitals, and non-profit medical organizations. Selected organizations are of considerable scale and are well-recognized in their base countries. Of the 140 selected organizations, 30 responded and answered the surveys. Eight organizations consented to being interviewed on phone. The interviews were audiotape recorded and transcribed.

3.3 *Data Collection Procedures*

All organizations were initially invited by email to complete the online questionnaire. Follow-up phone reminders were only made when no response was heard from them. This ensured that all organizations were informed about our research.

Before the completion of the questionnaires, participants were invited to participate in a follow-up interview. The phone interviews were integrated together with the completed questionnaires for data analysis by qualitative and quantitative means. Each participant was assigned an alphanumeric ID number (R1 - R30) when referring to his/her quotes.

4. Findings and Discussion

4.1 *Overview of the applications of Web 2.0*

In this study, 30 out of 140 participants responded (21.4%). Among them, 14 (46.7%) were currently applying Web 2.0, 10 (33.3%) were planning to use it in the future and 6 (20%) did not consider using Web 2.0 (see Table 1). Eighty percent of the participants are currently using or are planning to use Web 2.0 in the future, implying that Web 2.0 may be a useful tool for effective information/knowledge management and sharing. (Barsky & Giustini, 2007; McLean et al., 2007; Murray, 2008). Also, 33.3% of participants indicated the intention to use Web 2.0 in the near future, which supports the view of Churchill (2007) that Web 2.0 is developing rapidly. See Table 1 for a summary of the results.

Table 1. Application of Web 2.0 in medical-related organizations

	No of responses	No. of org using Web 2.0	No. of org not using Web 2.0 but plan to use	No. of org not using Web 2.0 and not plan to use
Total	30	14 (46.7%)	10 (33.3%)	6 (20%)

4.2 *Types of Web 2.0 applications*

Participants who were currently using Web 2.0 were asked the question, "Which of the following Web 2.0 application(s) does your organization currently use?" Participants who were not using Web 2.0 currently were asked, "Which of the following Web 2.0 application(s) does your organization plan to implement?" Eight choices (Blogs, Wikis, Google Document, Podcasting, RSS, Media Sharing, Social Bookmarking, Social Networking) and "Others" options were provided. 14 participants who were currently using Web 2.0 responded to the first question, and 10 out of 16 participants who were planning to use Web 2.0 responded to the second question, as shown in Table 2.

Table 2. Type of using Web 2.0 applications

	No. of orgs. currently using (n_1=14)	No. of orgs. planning to use (n_2=10)	Total (n_3=24)
RSS (Really Simple Syndication)	11 (78.6%)	7 (70.0%)	18 (75.0%)
Blogs	7 (50.0%)	8 (80.0%)	15 (62.5%)
Social networking (e.g. Facebook,	10 (71.4%)	5 (50.0%)	15 (62.5%)

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MySpace, Second Life, LinkedIn)			
Wikis	9 (64.3%)	5 (50.0%)	14 (58.3%)
Social bookmarking (e.g. Delicious)	7 (50.0%)	2 (20.0%)	9 (37.5%)
Others	6 (42.9%)	3 (30.0%)	9 (37.5%)
Podcasting (e.g. YouTube, iTunes)	3 (21.4%)	4 (40.0%)	7 (29.2%)
Media sharing (e.g. Flickr)	3 (21.4%)	1 (10.0%)	4 (16.7%)
Google Document	2 (14.3%)	0 (0.0%)	2 (8.3%)

Note: 14 participants were currently using Web 2.0; 10 out of 16 participants planned to use it 24 participants in total were currently using or planning to use Web 2.0. Participants could select more than one choice.

RSS (75.0%), Blogs (62.5%), Social networking (62.5%) and Wikis (58.3%) were the applications adopted by the largest number of respondents. RSS and Blogs were the most commonly used applications used by organizations which are using Web 2.0 (78.6%) and those planning to use Web 2.0 (80.0%) respectively. These results are consistent with the findings of Bughin and Manyika (2007, 2008) that among the many Web 2.0 tools, Wikis, Blogs, and RSS technologies were the most commonly used tools because most users found it beneficial to their companies. Based on the interview, R4, R8 and R11 mostly used them in their organization to foster information or knowledge sharing, and communication.

64.3% of the respondents currently using Web 2.0 and 50.0% of those planning to adopt Web 2.0 are using Wikis. This finding is in line with the report of Foley and Chang (2006), which claimed that Wiki technology has been in limited use for several years, but is now gaining widespread use with the popularity of Wikipedia since it facilitates group work and creation of information resources. The social networking application is popular among respondents. It is adopted by 71.4% and 50% of the respondents who are currently using or planning to use Web 2.0. It is shown that the number of medical organizations using social networking technologies via network-accessed computers or handheld devices that have wireless network connectivity has the potential to increase, which is similar to Churchill & Kennedy's (2008) research results in the educational sector.

The rating for usage of Social Bookmarking (37.5%) and Podcasting (29.2%) are relatively low, which is consistent with the findings of Baumbach (2009) that over 40 percent of the respondents have heard of, but never used, podcasting. However, in our study, Media Sharing (16.7%) and Google Document (8.3%) were the most rarely used tools. 37.5% participants reported the use of other tools such as Toolbar, Ajax, LibGuides, Online Chat, Feednavigator, Screencasting, etc. These tools function similarly as Web 2.0 applications in information sharing, communication and collaboration.

4.3 *Length of using Web 2.0*

Table 3 shows how long the respondents have been using Web 2.0 tools. It was found that 38.5% of respondents have started using Social Bookmarking and Social Networking less than 1 year ago, while many of them have used Blogs (30.8%), Wikis (23.1%) and RSS (23.1%) for 1-2 years already. Around 15% of the respondents have even used Wikis, Podcasting and RSS for 3-4 years. These findings are consistent with the two previous studies. In Baumbach's (2009) study, the majority of participants have heard of Blogs, Wikis, Photo Sharing, Video Sharing, Social Networking and Podcasting and but only around half of them have heard of RSS. Studies of Bughin & Manyika (2008) also consistently revealed that a large proportion of participants were currently using or planning to use Blogs, Wikis, Social Networking, Peer-to-peer Networks (for sharing

music, video, etc) and Collaborative Tools (for sharing information and knowledge). Organizations usually take technology effectiveness as an essential adoption factor, and that the best practice models were needed for them to see the benefits of these tools that may be brought to their organizations (Murray, 2008). It appeared that although Web 2.0 is relative new, more organizations are willing to apply Web 2.0 in their organizations as long as they perceive the benefits it brings.

Table 3. Length of using Web 2.0 applications

	Less than 1 yr	1-2 yrs	3-4 yrs	More than 4 yrs
Blogs	3 (23.1%)	4 (30.8%)	1 (7.7%)	0 (0.0%)
Wikis	4 (30.8%)	3 (23.1%)	2 (15.4%)	0 (0.0%)
Google Document	1 (7.7%)	0 (0.0%)	1 (7.7%)	0 (0.0%)
Podcasting (e.g. YouTube, iTunes)	0 (0.0%)	1 (7.7%)	2 (15.4%)	0 (0.0%)
RSS (Really Simple Syndication)	3 (23.1%)	3 (23.1%)	2 (15.4%)	1 (7.7%)
Media sharing (e.g. Flickr)	2 (15.4%)	1 (7.7%)	0 (0.0%)	0 (0.0%)
Social bookmarking (e.g. Delicious)	5 (38.5%)	1 (7.7%)	1 (7.7%)	0 (0.0%)
Social networking (e.g. Facebook, MySpace, Second Life, LinkedIn)	5 (38.5%)	1 (7.7%)	1 (7.7%)	0 (0.0%)
Others	0 (0.0%)	2 (15.4%)	0 (0.0%)	1 (7.7%)

Note: 13 out of 14 participants who are currently using Web 2.0 responded to this question. Participants could select more than one choice.

4.4 *Purpose(s) of applying Web 2.0*

Table 4 shows the views by participants who were using Web 2.0 application in their organizations on the purposes of using Web 2.0 applications.

Table 4. Organizations rating of the purpose(s) of using Web 2.0 applications

	No. of responses
Fostering information sharing	12 (85.7%)
Promoting existing services	11 (78.6%)
Fostering knowledge sharing	10 (71.4%)
Achieving better teaching and learning	10 (71.4%)
Developing new services	8 (57.1%)
Motivating collaboration across organization	6 (42.9%)
Enhancing organizational culture	6 (42.9%)
Training	4 (28.6%)
Archiving	1 (7.1%)
Others	1(7.1%)

Note: Participants can choose more than one purpose and the percentage is calculated by dividing the rating by the total number of participants

More than 70% of respondents chose fostering information sharing (85.7%), promoting existing services (78.6%), fostering knowledge sharing (71.4%) and achieving better teaching and learning (71.4%) as the main purposes of applying Web 2.0. Approximately half of the participants used Web 2.0 applications to develop their new services (57.1%), motivate collaboration across the organization (42.9%) and enhance organizational culture (42.9%). Apart from this, one of the respondents specified the purpose of using Web 2.0 applications as promoting online help.

Based on these findings, most organizations implement Web 2.0 for fostering information and knowledge sharing. Results of this study are consistent with previous

findings. According to Murray (2008), Web 2.0 tools will increasingly allow for the development of new models of collaboration and group practice in medicine, nursing, and other health professions. The new forms of collaboration will provide opportunities for developing new ways of working, based on the easier access to information. Some of the interviewees commented that Web 2.0 could help to achieve those purposes. For instance, R11 explained that fostering information sharing is their main purpose in using Web 2.0 because they aim to share product information and provide services through their blog.

The participants applied Web 2.0 mostly for promoting existing services and achieve better teaching and learning. It has been suggested that Web 2.0 enhances sharing, and increases users' networking with each other (Ovaska & Leino, 2008). People could be informed of the existing services of different organizations when the organizations apply Web 2.0 to promote their services. It has been found that Wiki is a powerful tool in constructivist learning environments that involve collaborative learning (Notari, 2006). Franklin and van Harmelen (2007) also gave some examples of areas and approaches where Web 2.0 tools can be used as learning materials for students. For instance, social networking systems were used at a professional level for community learning and potential models for educational use and most of the organizations aim at promoting existing services and achieving better teaching and learning using Web 2.0.

A number of participants have reported using Web 2.0 to develop their new services, reflecting the situation mentioned by Boulos et al. (2006), which is to carry the potential of complementing, improving and adding new engaging features and collaborative dimensions to the many Web-based medical, health education and research services currently in existence. Another interviewee, R4, pointed out that with the use of Web 2.0, the existing library services (e.g. online catalogue) can be enhanced. He pointed out that "users like to use new tools, such as social networking, tagging to get what they want. When they are using new tools, they believe they are happy and do better research for a longer period or more about it, if they enjoy doing it."

4.5 *Benefits of applying Web 2.0*

Table 5 shows the responses of participants' about the perceived benefits of applying Web 2.0 in medical related organizations.

Table 5. Comparison of benefits of applying Web 2.0 between current and potential users

	Current users Mean/(SD) (n_1=14)	Potential users Mean/(SD) (n_2=5)	Overall Mean/(SD) (n_3=19)
Share information efficiently	3.42(.51)	3.20(.45)	3.37(.50)
Provide better communication platform	3.36(.63)	3.00(.71)	3.26(.65)
Share knowledge efficiently	3.38(.51)	3.20(.45)	3.33(.49)
Encourage information sharing	3.31(.48)	3.20(.45)	3.28(.46)
Encourage knowledge sharing	3.36(.50)	3.20(.45)	3.31(.48)
Enhance collaboration	3.17(.58)	3.00(.00)	3.11(.49)
Save money	2.23(.83)	2.67(.58)	2.31(.79)

Note: For every option, participants were asked to answer according to a scale of 1-4, with 1 as strongly disagree and 4 as strongly agree. Organizations can also choose "don't know" to indicate they neither agree or disagree the options.

As shown in Table 5, among all benefits, sharing information efficiently (3.37) received the highest rating. This reveals that the majority of participants thought Web 2.0 helps in achieving efficient information sharing. In addition, five other items, i.e. to provide better communication platform, to share knowledge efficiently, to encourage information sharing, to encourage knowledge sharing and enhance collaboration have the average ratings above 3.0. This indicates that participants view Web 2.0 as generally helpful in achieving these purposes.

These results show that participants were positive about applying Web 2.0 as it provides a communication platform where they could share and manage information and knowledge efficiently. Similar findings have also been reported in two similar studies by Bughin and Manyika (2007, 2008). Results from these studies revealed that most of the commercial organizations were extremely or very satisfied with Web 2.0 for managing knowledge, information and for interacting with customers and business partners. Furthermore, Crusoe et al. (2008) also conducted a similar survey in nonprofit organizations. According to their results, a large proportion of participants indicated large success in using Web 2.0 for organizing event, spreading updated content and other promotional purposes which are closely related to information sharing, which concurs with Murray (2008)'s result that the use of medical blogs facilitates knowledge sharing, reflection and debate and Boulos et al. (2006)'s finding that Wiki can be used for obtaining information and knowledge and for engaging users in learning with each other. Web 2.0 offers opportunities for medical related organizations to have open access to information so that they can share ideas, questions and opinions (Murray, 2008).

The constant improvement of Web-based material mentioned by Boulos et al. (2006) and Murray (2008) greatly enhances learning experiences in the digital environment. The findings indicate that the majority of participants do agree that Web 2.0 brings the aforementioned benefits to their organizations. Although many of the organizations were not currently using Web 2.0, the findings show that with the increasing successful examples of applying Web 2.0, more organizations may plan to use it.

It is also noteworthy that while participants in this study rated Web 2.0 as encouraging for information sharing, only a small proportion of them strongly agreed or agreed that it was cost efficient. Boulos et al. (2006) also pointed out that establishing Web 2.0 within an organization requires lots of input, such as human resources, technologies (both software and hardware), time for its implementation and user training. It is interesting to find that fewer participants agreed with that Web 2.0 can save money. This reveals that cost may be one of the major concerns for Web 2.0 implementation in an organization. When asked about the reason, R12 reported that Web 2.0 can improve services, but one has to pay to establish the services. The above comments show why some organizations showed more concern about Web 2.0 than others, and cost may be one of the major concerns while considering the implementation of Web 2.0.

The results have also illustrated that Web 2.0 is an effective tool for communication. The majority of the participants replied that the main achievement of applying Web 2.0 is facilitating communication. R17 mentioned that using RSS in Wiki's New Books aims to strengthen promotion and communication. R11 also said that blog and the online media sharing websites were very convenient in sharing information among the patrons and communicate with them quickly. In addition, due to the current difficulties in the economy, Web 2.0 can be effective when meeting in person is difficult (R8).

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The emergence of Web 2.0 has provided new ways of using the Internet as a platform for collaborative and interactive purposes (McLean et al. 2007). Since students grouped in a common community can contribute and share their content, they would develop a sense of belonging to the community (R4), with Web 2.0 providing them the necessary platform to do so. Web 2.0 plays a critical role in medical libraries as each tool has its own way of fostering information or knowledge sharing. Web 2.0 allows users to create contents for sharing; in other words, they are no longer passive consumers of the content, such that Web 2.0 enhances communication between medical libraries and their users (R2). The findings also reveal that the application of Web 2.0 would allow medical libraries to serve their users in better ways, such as facilitating user participation and creativity, reaching out to new audiences and to make efficient use of existing resources (Anderson, 2007).

Web 2.0 is an effective tool for service promotion (Ovaska & Leino, 2008). R10 commented that as a lot of students use Facebook and other social networking sites, it is great way to promote the medical library using the online platform. Its convenience in collaborative creating, editing and sharing helps in facilitating information and knowledge sharing. Comments by other participants also illustrate their awareness of the benefits that Web 2.0 may bring to their organization, as most of them indicated Web 2.0 is an excellent technology for enhancing communication among different users (R2, R4, R10, R12 and R17). These findings have reflected an increasing awareness of Web 2.0 in facilitating effective communication. Among the participants surveyed, it is expressed that Web 2.0 brought the organization closer to its users. This eventually encourages medical-related organizations to use Web 2.0.

4.6 *Difficulties of applying Web 2.0*

Table 6 shows the comparison of the perceived difficulties between the current and potential users of Web 2.0. The overall mean ratings of all options are higher than 2.0. Among the nine options, 'time-consuming' and 'low staff engagement' were rated above 2.5. This indicates that the majority of the participants agreed these two options were the major difficulties in using Web 2.0.

Table 6. Comparison of difficulties of applying Web 2.0 between current and potential users

	Current users Mean/(SD) (n₁=14)	Potential users Mean/(SD) (n₂=10)	Overall Mean/(SD) (n₃=24)
Time consuming	2.86(.66)	3.10(.57)	2.96(.62)
Low staff engagement	2.29(.83)	3.10(.32)	2.63(.77)
Lack of technological support	2.33(.89)	2.50(.85)	2.41(.85)
Need substantial training	1.86(.86)	2.50(.53)	2.13(.80)
Lack of support from the management	2.07(1.07)	2.10(.32)	2.08(.83)
Budget constraint	2.08(.79)	2.50(.53)	2.27(.70)
Security risk	2.00(.63)	2.60(.70)	2.29(.72)
The content may be changed by people easily	1.92(.49)	2.22(.44)	2.05(.49)
Difficult to learn	2.00(.89)	2.33(.50)	2.13(.71)

Note: For every option, participants were asked to answer according to a scale of 1-4, with 1 as strongly disagree and 4 as strongly agree, items rated higher than 2.5 are considered real/perceived difficulties. Organizations can also choose "don't know" to indicate they neither agreed or disagreed the options.

When comparing the numbers between current users and potential users among the options, it is obvious that many of the options show higher rating from potential users than current users. These indicate that the potential users perceive more difficulties than current users in applying Web 2.0, which may explain why they would implement Web 2.0 later than the current users. However, as the current users have actually experienced the difficulties of using Web 2.0, their ratings might be more convincing than the non-current users.

In the phone interview, participants were asked about the strategies they used to overcome the difficulties in applying Web 2.0. Most of them were optimistic. R17 commented that his organization was confident enough in using the tools after they have discussed them for a certain period of time. R11 replied that they would explain the problem to the IT staff because they are responsible for solving technical problems. From the point of view of the technical staff, R10 replied that they would continue trying, implementing and working out what would be the best for every client. Library manager, R12, perceived the difficulties in another perspective. He said that they push people to use the services without allowing them to choose.

"Time-consuming" and "low-level staff engagement" are reportedly the two most common difficulties described by the respondents. This result echoes Bughin & Manyika's (2007) study on 2,847 business executives worldwide, which revealed time limitations and limited staff engagement as some of the major barriers in applying Web 2.0 successfully in the business sectors. In addition, some of the participants also explained the reasons further. For example, R2 explained, "For every software development, time is needed for design, planning, getting user's requirements and development, keeping blog up-to-date is really time consuming." R4 added, "As an IT team, time is needed to do customization with the system." R17 commented on the low staff engagement saying "what attracts users is not technology but how you make use of the technology so that they can fully utilize the tools to accomplish things they want." On the other hand, R2 explained one of the reasons why many organizations disagree that the content may be changed by people easily is because, "Wikis are opened to staff only; only our staffs are permitted to edit the content on wiki." External factors also affect the decision making. For instance, R17 suggested, "If there are some literatures and trial examples about them to show that they are worth to be used, we would consider to adopt them and to serve our users."

Time constraint and staff engagement may not be independent of each other. Given that the staff does not have enough spare time,, they would not be able to put in effort in the implementation of Web 2.0, which in turn would lead to less staff engagement in the applications. In addition, as many organizations may find Web 2.0 new to them, it would be challenging for them to apply it to work without prior experience, especially when they lack the time and manpower to handle the problems.

5. Implications

As the benefits of applying Web 2.0 are rated higher than the difficulties, it is shown that Web 2.0 tools would benefit the medical-related organizations. To solve the two major difficulties of time constraint and low staff engagement, it is recommended to raise the staff's awareness in using Web 2.0 applications. Training can be provided as it helps equip potential users with the necessary skills (Chu, 2009). To reduce the adaptation time

of the applications, university students can be invited for summer internships, where their knowledge in the field can help facilitate the implementation of the applications.

Although Web 2.0 has a large effect on all kinds of organizations, there are some challenges facing people applying Web 2.0 in the medical field. Careful consideration and trial period are needed for some organizations because of unfamiliarity towards the tools. However, as shown in this study, medical-related organizations which have become familiar with the Web 2.0 tools would find it useful in their field.

6. Limitations

The number of responses was much lower than anticipated. Only 30 out of 140 participants responded to the online survey. With a small sample size, it was difficult to provide adequate data for further deep analysis. It may also affect the precision of the data analysis and conclusion. A long-term study involving more participants would be helpful as a larger sample size could be obtained for more significant results.

7. Conclusion

Web 2.0 has provided brand new ways of using the Internet for collaborative and interactive applications (McLean et al., 2007). This attracts medical-related organizations, such as medical libraries, hospital and non-profit organizations to apply Web 2.0 in their organizations. In this new information era, where people emphasize the collaboration between internet and users, it is common to see an increasing number of organizations are applying or planning to apply Web 2.0. This research provides insight and information about the trends of application of Web 2.0 in medical-related organizations in the world. The results have shown that although participants may think time and staff adaptation of the new tools as major difficulties, Web 2.0 greatly encourages information and knowledge sharing when one gets familiar with it. With more positive comments supporting the use of Web 2.0, we conclude that the benefit will outweigh the difficulties in the long run. Hopefully, this study may help decision makers in medical-related organizations to make more informed decisions in regards of applying Web 2.0 technologies in their organizations.

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