Application of Emerging Web Technologies for Research and Development in Higher Educational Institution: A Study

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With the commencement of the Covid-19 pandemic in 2020, social distancing rules and nationwide lockdowns have led to an inevitable increase in the use of digital technology, and this is becoming the need of the hour. People and organizations around the world adapted to new ways of working and living because they were supported by digital resources. Digitization options enabled companies and educational institutions to migrate to work from home and overcome seemingly impossible situations. The lockdown has allowed people to use the internet and internet-based services to communicate, interact and continue their job responsibilities from home. Whatever the situation may be, the role and support of web technologies is very crucial. We are all familiar with the journey of the web through Web 1.0, Web 2.0, Web 3.0 and so on. This study explores the web 2.0 services provided by libraries. The study also focused on the use of Web technologies as an innovation tool for research and development in Higher Education Institutions. Researchers have used primary as well as secondary data collection methods to complete the study. Researchers collected primary data using questionnaires and for secondary data we used library web pages, journals, articles and other e-materials.

Introduction

The COVID-19 widespread had constrained governments around the world to put their nations in full or halfway lockdown to contain the spread of the infection. In any case, these lockdowns came with extreme financial and social results, which has too displayed one-of-a-kind challenges within the instructive division and has constrained not fair understudies but moreover arrangement producers and benefit suppliers counting the custodians to adjust and embrace innovation as a reasonable and profitable choice to guarantee satisfaction of the instructive needs of the partners and in overcoming different obstacles in this widespread time. “India, on 30 January 2020, reported its first positive case of the novel coronavirus (COVID-19) from the state of Kerala with a student, who was studying in Wuhan University and had travelled to India” (Perappadan, B. S. 2020) and it had spread rapidly. In this context many impossible things have become possible with the addition of technology, offices have started from home, school and college classes have started to be held at home. The concept of work from home and online classes has emerged. The black board was replaced by resources such as laptops and mobiles. All the sectors were sustained and the economy of the country was affected but education was not disrupted like this sector with the help of Information and Communication Technology (ICT).

In the wake of the rapidly evolving situation of the Covid pandemic, the University Grants Commission (UGC), the apex body of India’s higher education system, had launched an online system to monitor the

academic progress of students. This situation challenged the work of scholarly libraries. Due to the suspension of personnel administration and the move towards physical collections in institutions' libraries, fewer students, staff and librarians have emerged looking for innovation as a way to manage challenging times. In fact, library professionals have demonstrated their expertise, compassion and flexibility during the lockdown to respond to the rapidly escalating situation. And in such a case a website is a basic and dynamic step to connect and serve customers. But innovation cannot do it alone. In this type of and urgent situation it is very important to prepare the part of library specialists especially the part that runs innovative institutions keeping in mind the offices and administrations they provide to their clients.

In the cutting-edge generation of facts explosion, all of us are strolling after facts, however they no longer recognise a way to gather facts and proportion facts one to at least one and one to many at a time. Web-based and Web-enabled services have generated tremendous energy today to refer to Web advancements for research and development. Delivering various goods to business end users is a unique challenge and opportunity. Computerized portfolios on the web and net have determined variables for professional inquiry and mechanical organization worldwide. Indeed, government administration and e-governance are using web media that are computationally evolving. Apart from those facts, ICT and its associated aids have modified the position of facts experts withinside the cutting-edge facts age. Furthermore, ICT has delivered awesome achievement withinside the shape of making social community websites for cease-to-cease alternate of facts. The part of research within the economic development of a nation could be a well-known reality. Inquire about alludes to the imaginative work attempted by clearly organizing a stock of information. An ace of instruction, he addresses instructive issues and settings in a logical and consistent way. India's research and development sector is dynamic with existing web advances and higher institution frameworks playing a vital part. This appears to be the way of advancement from a created country. Today we cannot imagine ourselves without this technology. Emotional, educational and financial growth was not allowed to stop, classes started to fill through Zoom, working from home i.e., office work from home with laptop PC, video conference, dissemination of knowledge through webinars became popular. The availability of the web made it possible to do things with patience in difficult situations. Web innovation refers to the various devices and strategies that are used in the preparation of communication between certain types of gadgets on the web. A web browser is used to access web pages. Content, information, pictures, animations and videos show on the web. Hyperlinked assets on the World Wide Web can be accessed using the program interfacing provided by a web browser.

2. Objectives

- To know about Web Technologies and how it is related to library.
- To know what Web 2.0 tools are used for research and development in higher educational institutions.
- To know the importance of using Web Technologies Tools for research and development.
- To analysis the usage of Web 2.0 tools in university libraries of Mumbai.

2.2 Scope and Limitation of the Study

The current study, which examined the application of the Web technologies in higher education institutions, was limited to the chosen three institutions in Mumbai, while it might have included all higher education institutes in Mumbai or all universities in India. Graduate, post-graduate, and research scholar students were the respondents; however, the survey might have included faculty, library personnel, and college students as well. The study's main focus was on how Web 2.0 technologies were used in Higher education Institutes. This means that the scope of this research study is the university libraries in Mumbai. New methods of collaboration, communication, and information sharing have emerged as a result of the rapid changes in technology.

3. Web Technology and Libraries

The history of the web and the changes it has brought to education and research are remarkable advances. The use of Web technologies in advanced data communication presents challenges for higher institutions and research scholars for gathering and disseminating data. There's no question that libraries are moving from collection to get to within the current situation. Due to expanding online applications, users are more mindful of web innovations and request libraries to fulfil all their data needs. The role of the library is very important in higher education, if the researcher gets good support from the library service in his research, his research work becomes more bearable.

Web 2.0 terminology asserts itself when the terms web technologies or emerging technologies come up. It also has a major impact on the research and development process in a higher education institution.

3.1 Concept of Web 2.0

Tim Berners-Lee launched the Web and Web 1.0 technologies in 1989; these technologies are referred to as First Generation Web. Darcy Di Nucci first introduced Web 2.0 technology, sometimes referred to as the second-generation Web, in 1999. Early in 2004, the phrase "Web 2.0 technology" gained popularity. Web 2.0 is the current buzzword. The concept of Web 2.0 originated with a conference brainstorming session between O'Reilly and MediaLive International. Dale Dougherty, web pioneer and O'Reilly V.P., noted that far from having 'crashed', the web was more important than ever, with exciting new applications and sites popping up with surprising regularity" (O'Reilly, 2005). Web 2.0 refers to websites and programmes that employ user-generated content.

Greater user participation and involvement, wider network connectivity, and improved communication channels are characteristics of Web 2.0. The development of Web 2.0 offers tremendous opportunities for library professionals to communicate. Web 2.0 apps on websites are seen as a sign of high-quality library websites. The information community at large understands the value of user participation. In order to provide services that focus on readers and delight their customers, there is an increasing need for librarians to involve users in the day-to-day operations of the library. He believes that by using Web 2.0 technology on websites, user interaction can be facilitated.

Examples of web 2.0 tools: RSS, Wikipedia, Social Networking sites, etc.

3.2 Features Of Web 2.0

Web 2.0 is a technique by which services can release data that is not available on a particular web page to be read by the public and then reused. As a result, there has been an explosion of information. Some of the key features of Web 2.0 are as follows.

- Web 2.0 provides two-way communication through web applications. Instead of getting their information from a single source, Web 2.0 will enable common people to communicate and share ideas.
- Web 2.0 is a smart and innovative tool that can gather user knowledge and provide customized solutions to their desires.
- The capability of producing constantly updated information for the platform's continually evolving, integrated activity. Iterative content is created when people revise each other's work, as well as articles and comments that are occasionally gathered.

3.3 Library 2.0

Kankana Chakrabort (2020), stated on paper 'Benefits of using Social networking sites in college libraries', "Library is the place where any kind of information stored disseminates and preserved for the future. 'Library' derives from the Latin word "Libra" which means a book. And in France "Libraire'' which means book shop. So we can say that a library is a storehouse of knowledge and information for the future generation".

Library 2.0 is a broad paradigm for contemporary types of library service that represents a change in the way services are provided to users in the library environment. Emphasis is placed on user-centered transformation, community engagement, and content development. "Library 2.0" refers to Web 2.0 concepts and technologies applied to library services and collections. This is a perception that goes against the grain of new types of library services designed to meet the demands and expectations of today's library patrons. The term "Library 2.0" was originally coined by Michael Casey on his Library Crunch blog. Libraries today can take advantage of Web 2.0 elements to enhance their services. The term "Library 2.0" describes the use of interactive, collaborative and multimedia web-based technologies for web-based library services and collections. Web 2.0 elements are centralized, multimedia supported, communally innovative and socially rich.

Web 2.0 which provides more services than the traditional web. While the earlier web was only made up of websites and tools like search engines, Web 2.0 is a shared, two-way network that is used everywhere. While traditional online has had a positive impact on libraries, Web 2.0 appears to have a greater impact. This underscores the disconnect between the library and its patrons. In the current environment, libraries are effective in providing new and improved services to their patrons because Web 2.0 tools and library services already exist. As time changes, so does technology. When technology changes, the shape, path, or style changes in response to user expectations. Technology is one of the tools through which libraries

serve their patrons and meet their needs. To keep up with demand, libraries must incorporate new technologies. Libraries must choose it in the Web 2.0 era. Characteristics of Web 2.0 services in library environment are –

- While doing research, context-based retrieval has been the main focal point thus web technologies provide context-based retrieval of information.
- Easy and effective way of interactive communication with the end users.
- Sharing information is very easy due to web 2.0.
- More mobile accessibility because of Web 2.0 and its superior quality.
- Helps to share information using a variety of features like pictures, videos, etc.
- Promote e-learning because of e-databases, virtual classrooms, etc.

4. Application of Web Technologies in Libraries

Web technologies include Blogs, wikis, RSS, Tagging and Social Bookmarking, Podcast & Vodcast, Social Networking, etc.

4.1 Blogs

The concept of a blog was first used in the late 1990s. While blogs initially functioned as personal diaries. As the number of users and usage of blogs has increased, they have started to take different forms and shapes to suit many demands. "A weblog, also called a blog, is an online website that continuously publishes web links and/or comments on a specific topic or subject rather than in the form of brief articles arranged chronologically from most current to oldest. Weblogs are pages that contain numerous postings per page. or bits of information, added information. Librarians need to be proactive in spreading the word about their services and resources. It's hardly surprising to see librarians using blogs to spread the message online. Blogs are a new tool that astute librarians are using to promote libraries and their services. The following examples highlight the broad appeal of blogs.

Examples:

- Indian Library Review, National Library of India - http://natlibcc.blogspot.in/%20%20
- Library of Congress, USA- http://blogs.loc.gov/loc/
- National Library of Australia blog- http://www.nla.gov.au/blogs%20%20

4.2 WIKIS

Recently, wikis have been used in libraries to assist a variety of collaborative tasks. Wikis have existed since the middle of the 1990s, but it has only been recently that they have proliferated. If readers so want, elevate their standing to that of content writers and editors. The most well-known illustration is Wikipedia. Wikis are simply public web pages that can be edited, published, and modified by anyone with a wiki account. The

problem for librarians is the absence of peer review and editing. The future of libraries includes wikis as collection items and useful guidance for users in evaluating them. Wikis are a relatively quick way to integrate library services and collections into Web 2.0. By making the creation of page links almost effortless and indicating whether the desired target page is present, it encourages meaningful topic linkages between different pages. Additionally, it aims to involve visitors in a continuous process of creation and participation that continuously improves the look and feel of websites.

A library wiki as a service can also enhance social interaction between staff members and users, essentially replacing the study group room online. In a wiki, as users exchange information, users ask questions, librarians respond to inquiries, and so on, a record of these interactions can be saved indefinitely. In addition, the library can use these transcripts as reference material. Wikis are the modern iteration of group study spaces.

Example:

- Wikibooks - https://en.wikibooks.org/wiki/Main_Page

4.3 RSS

In March 1999, Dan Libby and Ramanathan V. Guha developed Rich Site Summary, the initial iteration of RSS. Dave Winer published RSS 2.0 in September 2002 under the new name Really Simple Syndication. In order to resolve the incompatibilities between RSS versions, a new syndication system called ATOM was planned and developed in 2003. At the time, there were several RSS formats due to compatibility issues" (Verma & Verma, 2014)

Users can syndicate and republish content on the web using RSS feeds and related technologies. RSS is an acronym for Really Simple Syndication. Users aggregate content from other websites and blogs into one place, repost content from other websites or blogs to their own websites or blogs, and purportedly compress the web for their own use. This Web 2.0 technology has already impacted libraries and has the potential to do so in a significant way is content syndication. The use of RSS feeds in libraries provides Selective Dissemination of Information, Current Awareness Service, Bibliographic Service, Bulletin Board Service, etc.

Examples:

- IIT Bombay RSS - https://www.library.iitb.ac.in/feed/
- Mediawiki RSS feed- https://www.mediawiki.org/wiki/Extension:RSS

4.4 Tagging and Social Bookmarking

A tag is a non-express key-word or time period used to discover a chunk of statistics in on line pc structures which includes an inner bookmark. When surfing or searching, this type of metadata allows characterising an item and makes it easy to discover it again. Depending on the system, tags are commonly randomly and

arbitrarily decided on with the aid of using the item's writer or with the aid of using its observer. A collection of tags assigned by a user creates a small population also known as a persona.

Social bookmarking gear assists customers tag their favourite gadgets which includes websites, photos, books, or even blogs. It allows categorization, indexing of bookmarks. Tagging allows humans to place bookmarks in two categories, making it hierarchical and inclusive.

Social bookmarking enables the distribution of reference lists, bibliographies, documents and other sources among friends or students. Library catalogs and databases rely on managed vocabularies, and traditional concern syllabus and pathfinders often handle a wide range of accessibility, tags allow library staff to assign appropriate hyperlinks to certain tags. Tagging in libraries is frequently controversial, especially due to the fact that no authority can handle the inclusion of key phrases from sources. But libraries using del.icio.ous and different social bookmarking gear can use the lack of a curated vocabulary to their advantage.

Examples:

- Diggs-http://digg.com/about/
- Twitter- http://twitter.com/
- Delicious - http://www.delicious.com

4.5 Podcast & Vodcast

The word "Podcasting" is derived from two words "broadcasting" and "iPod" whereas "The "VOD" in Vodcasting stands for "video-on-demand" (Arora, 2009). It is identical to podcasting is- "the technique of recording audio digital-media files that can be transmitted over the Internet using RSS feeds for playback on portable media players as well as computers." Users can subscribe to these feeds and automatically download the files to their PC's audio management software. Podcasts are immediately downloaded to the user's portable audio device when they sync with their personal computer. Podcasting is used to deliver audio files, while vodcasting is used to deliver video content. Keeping librarians up-to-date with archival topics and library and information science podcasts is a must

Illustration: By designing a webpage, the University of Kentucky Library, UK allowed users to access audio-video files of conferences, lectures, scientific debates and sessions held at the university. Files are categorized and downloadable

4.6 Social Networking Sites (SNS)

According to Anwar, Muhammad (2019), "social media is a collection of Internet-based communities that allow users to interact with each other online. This includes web forums, wikis, and user-generated content (UGC) websites". Social media is playing a crucial role in reaching out to users and potential users. Over the past few years, a substantial amount of recordings have been moved from one pole to the other pole of the globe. Social media is the most popular alternative of the twenty-first century, and it is quickly evolving. The

sharing of millions of recordings occurs one to one and one to many at the same time and on the same channels. This socializing can entail looking over other members' profile pages and possibly getting in touch with them. To accommodate users' demand, libraries are looking into using social media in the future. To spread the information quickly, social media was used in many different ways inside the libraries. Among the SNSs used by librarians, Facebook, WhatsApp, LinkedIn, Twitter, Skype, and YouTube are the most common. The librarians also used other social networking sites including "Researchgate" and "online forums." Libraries use SNSs for a variety of reasons, including marketing their services, sharing information about their resources, and spreading news about them. Additionally, such as engaging with friends and family, seeking and navigating via various SNSs, using information responsibly, and the capacity to judge some SNS information as being more reliable than others.

5. Application of Web Technologies for Research and Development

Use of Web technologies in university libraries in Mumbai such as SNDT Women's University, NMIMS and IIT, Bombay are amongst those pinnacles ranked institutions, which play a huge position in better training systems.

5.1 Profile of the respondent in HEIs

Table 1 : Profile of the respondents

Details of the respondents	Category	No of the respondents	(%)
Gender wise	Male	31	62%
	Female	19	38%
	Total	**50**	**100%**
Education qualification	Graduate	2 4%	
	Post Graduate	37	74%
	Post-Doctoral Research Scholar	11	22%
	Total	**50**	**100%**
University	SNDT women's University	20	40%
	NMIMS	17	34%
	IIT Bombay	13	26%
	Total	**50**	**100%**

Table 1 reveals the profile of the participants, where 19 females and 31 male participants provided responses. Due to the fact that universities are regarded as institutions of higher learning, 74% of participants (n=37) and 22% of post-doctoral research scholars (n=11) are postgraduates. 40 percent of respondents were from SNDT Women's University, followed by 34 percent of NMIMS students and 26 percent of IIT Bombay respondents.

5.2 Awareness of Web Technologies

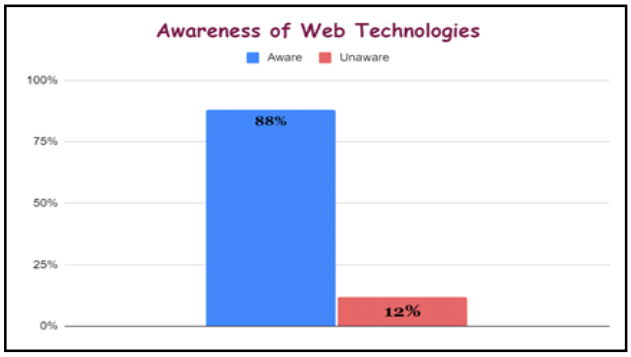

Figure 1: Awareness of web technologies

Most users (approximately 88 percent) were found to be aware of Web 2.0 technologies during the study, compared to only 12 percent of respondents who were not. Users are more likely to use Web 2.0 technologies when their awareness is high.

5.3 Web Technologies Used by The Higher Education Institute (HEIS)

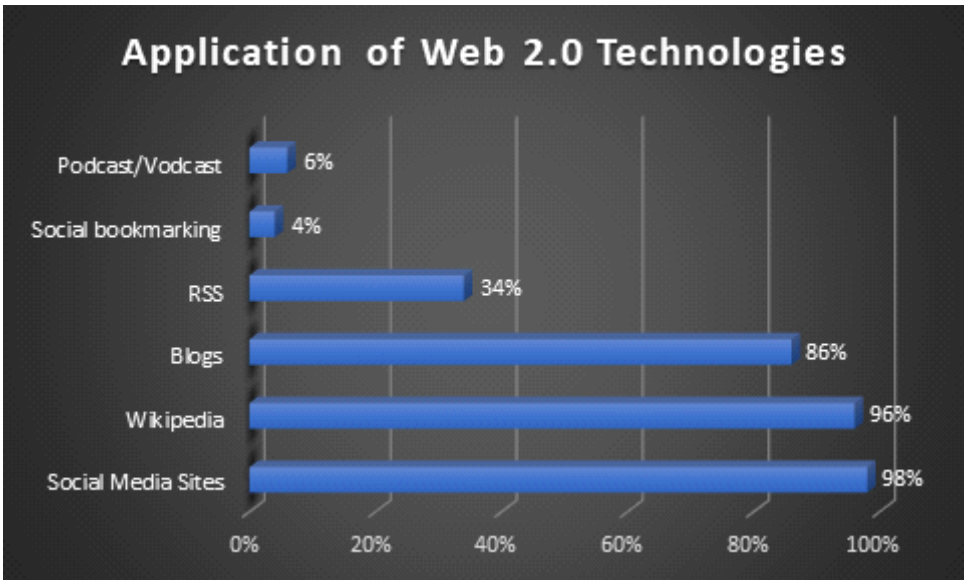

Figure 2: Web technologies used by HEIs

The response demonstrates the application of web technologies such as social media is much higher than any other advances. 98% were using social media; while 96% were using Wikipedia, 86% of the respondents were mindful about blogs, Uses of the RSS, Podcast/Vodcast and Social bookmarking was 34%, 6% and 4% respectively.

5.4 Application of Web technologies in Higher Education Institute as a Learning tool

Table 2: The Application of Web technologies as learning tools by Higher Education Institution

Web Technologies	Always use	Partially Use	Rarely use	Sometime use	Never use
Social Media	92%	4%	4%	0	0%
Wikipedia	10%	36%	28%	26%	0%
Blogs	8%	28%	20%	32%	12%
RSS	2%	8%	8%	12%	70%
Social bookmarking	4%	2%	0%	0%	94%
Podcast/Vodcast	0%	2%	2%	0%	96%

The study conducted on usage of web 2.0 tools where the majority of participants (92%) always used social media sites for learning purposes, following 10%, 8% & 2% participants always used Wikipedia, Blogs and Social Bookmarking for learning purposes. 36% & 28% responses stated that they partially used wiki and blogs for learning purpose and at the same time 28% and 20% responses stated that they rarely used wikis and blogs for teaching and learning purpose. Also, 96%, 94%, and 70% of participants have never used podcasts/vodcasts, social bookmarking, and RSS for learning purposes respectively.

5.5 Use of Web Technologies in research and development purpose

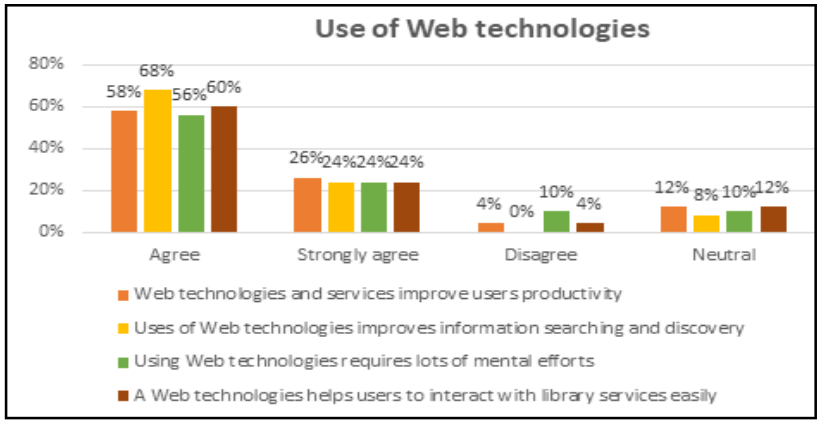

Figure 3: Uses of web technologies

68% of the respondents agreed that web technologies are useful in 'improving information search and discovery' whereas only 8% were neutral. 60% of the respondents agreed that web technology helps users to easily interact with library services, whereas only 24% respondent strongly agreed with the same. Further 58% and 56% of the respondents agreed that web technology and services are productive for users and require a lot of mental effort. At the same time very few respondents disagreed with all this statement.

5.6 Advantage of web technologies in research and development in HEIs

Table 3 : Advantages of Web Technologies in Research & Development

Advantages of Web technologies	Agree	Strongly agree	Disagree	Neutral	Total
Quick and easy communication	22 44%	28 56%	0 0%	0 0%	50 100%
SKIP (Semantic Knowledge Index Platform)	30 60%	12 24	3 6%	5 10%	50 100%
Up-to-date, innovative, informative and information	24 48.00%	23 46.00%	0 0.00%	3 6.00%	50 100%
SHARE (Semantic Health and Research Environment)	28 56.00%	13 26.00%	3 6.00%	6 12.00%	50 100%

Table no.3 Reveals the benefits of using web technology for research and development in higher education institutions. Majority of respondents i.e., 60% agreed that web technology is Semantic Knowledge Index Platform (SKIP) which is the main advantage of using web 2.0 technology; Whereas 56% of the respondents strongly agreed that web technology provides faster and easier communication. 6% of respondents disagreed that economic health and research environment is an advantage of Web 2.0 technology; Whereas 56% of the respondents agreed with the statement. 48% of respondents indicated that they agree with the statement that Web 2.0 technology is up-to-date, innovative, informative, and beneficial for information; While 46% of respondents strongly agreed, followed by 6% as neutral respectively.

5.7 Challenges of Using Web technologies in Higher Education Institution for research and Development.

Table 4: Challenges of using Web Technologies in HEIS

Challenges of using Web technologies	**Agree**	**Strongly agree**	**Disagree**	**Neutral**	**Total**
Technological barriers/Communication barriers	14 28%	4 8%	16 32%	16 32%	50 100%
Time and Resources	16 32%	2 4%	14 28%	18 36%	50 100%
Guidelines and training	19 38%	5 10%	4 8%	22 44%	50 100%
Privacy	10 20%	3 6%	15 30%	22 44%	50 100%
Interpersonal communication	13 26%	1 2%	22 44%	14 28%	50 100%

The table no.10 exhibits the challenges faced by the respondents while using Web 2.0 technologies; whereas the respondents asked to indicate their degree of concern with the statement of challenges/demerits of using Web 2.0 technologies and services. Very limited respondents strongly agreed with the challenge of using Web 2.0 technologies such as 'technological/communication barrier'(8%) and 'interpersonal communication(2%) whereas 44% of the respondents were neutral with the 'Guideline and training' and 'Privacy issue 'challenge.

6. Findings

The findings of the study as follows-

6.1 Awareness and Application of web technologies in Higher Education Institution

Most of the responders are familiar with Web 2.0 technologies. 88 percent of respondents, or more than half, are aware of Web 2.0 innovation and governance.

The results of the study demonstrate that university i.e., Higher Education Institutions are becoming more aware of Web 2.0 technology. In particular, the study attempted to analyse six (6) distinct Web 2.0 technologies, including Blogs, RSS, Wikipedia, Social bookmarking, Podcast/Vodcast and social media.

The survey shows how knowledgeable users are about Web 2.0 technologies. Responses show that the use of web technologies such as social media is far greater than any other advancement, while the use of RSS, podcasts/vodcasts and social bookmarking is very often used at 34%, 6% and 4% respectively.

6.2 Application of web technologies as a Learning tool

Each library uses web technology to provide library services; whereas users use library services for academic, learning, teaching etc. One of the objectives of libraries is to use web technology for research and development; which encourages learning habits among users.

The fact that people utilize social media constantly means that they use it to access all library content. In comparison to other technologies, social media sites like Facebook, Twitter, YouTube, etc. play a big part in the learning process. These technologies are always used when there is a demand for learning. One significant channel that consumers can use at any time to obtain any information they require is social media. Among all, social media is the most well-liked. Social media is one of the best Web technologies, or you would say, major components, for offering library services. Users in the university libraries in Mumbai claimed to be very adept at using social media for learning purposes.

Another extremely practical Web 2.0 technology is Wikipedia. Users who use Wikipedia as a tool can access material, modify it, and add to it for a variety of educational purposes. It is employed as the main tool for concept elucidation or simple comprehension. All of the respondents, according to the study, utilise Wikipedia. Wikis are one of the elements that can be used to improve the learning process, according to this study. Similarly, blogs and wikis are Web 2.0 elements that can be used as educational resources. Even though IM, RSS, Social Bookmarking, Podcast/Vodcast and other Web 2.0 technologies are working in their library, more than half of the respondents do not use them.

6.3 Uses of Web Technologies in HEIs for research and Development

The use of Web technologies for research and development is evident in this study. The study found that respondents use Blogs RSS, Wikis, social media, and other technologies for learning, as well as research & development. There are many uses of web technology, one of which is that it "makes it easier for patrons to connect with library services." Almost the majority of the respondents agreed with this statement. Web technology has succeeded in bridging the gap between libraries and library users. Users can quickly retrieve library services, saving them time. The use of Web technology increases the productivity of users," agreed university library users.

6.4 Advantage of web technologies in research and development in HEIs

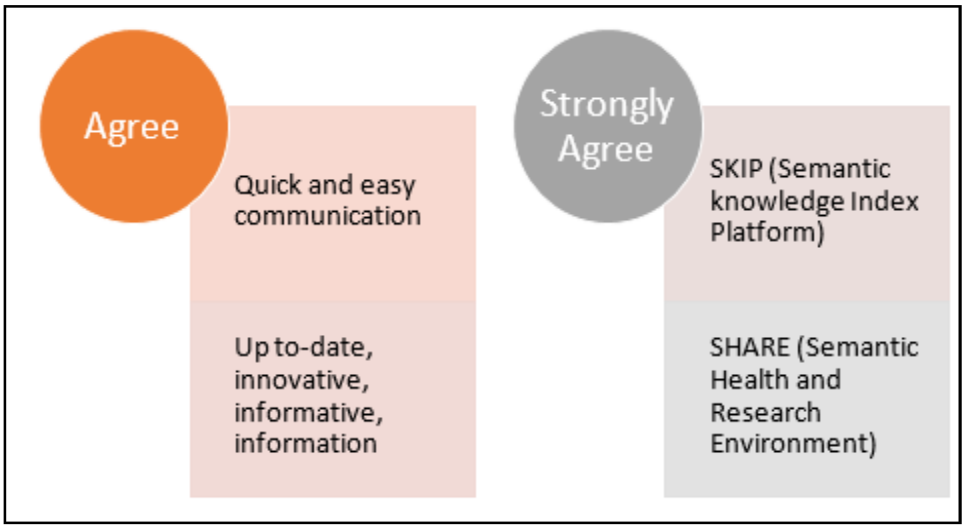

Figure: 4 Advantages of Web Technologies

The study focused on the benefits of utilising Web technologies. The majority of respondents, according to the study, "strongly agree" that one of the most significant benefits of Web 2.0 technologies is "rapid and easy communication." Web 2.0 technologies allow libraries to provide their users a variety of services, and users can utilize these technologies to access any information they need whenever they want without visiting the library. The second-most significant benefit obtained by users of Web 2.0 technologies is shared by the Semantic Knowledge Index Platform and Semantic Health and Research Environment) technologies. The majority of respondents "agreed" with these benefits. The next benefit of Web 2.0 technology is "Up-to-date, innovative, interesting information.

6.5 Challenges of using Web Technologies in HEIS

While examining the communication difficulties faced by users of web technologies, the findings of the study revealed that the biggest problem faced by library users is "guidance and training".

Other difficulties include issues related to technology, communication with others, and privacy. Few of the respondents agreed or expressed no opinion about the above-mentioned difficulties.

7. Conclusion

Clarity is one of the main goals of offering web services in higher education institution libraries. One of the goals of web technology is to make these services available to end users. Users are able to use library services for teaching and learning as well as research and development. Using web technology, libraries provide a range of services and maintain standards.

Higher education institutions should embrace future technologies and changes in existing technologies. HEIs and Libraries should maintain consistency in their service delivery and daily updates. They should ensure consistency and transparency in performance when evaluating web technologies. The purpose of this study is to explore the benefits of using web technology in the research and development process in libraries of higher education institutions. An attempt has been made to complete the study with an emphasis on Web. Higher education institutions were studied in the research and the respondents are highly qualified such as postgraduates or research scholars.

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