

Use of Web Technology Tools and Services by the Research Scholars of Science Discipline at Mangalore University: An Analytical Study

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Abstract

Today the Web technologies has turn out to be one of the most significant technological advancements in the history of humanity. The study investigated the awareness and use of Web technology tools and services by the research scholars of science discipline at Mangalore University. The objectives of the study is to know the awareness and use of Web technology tools and services by the research scholars and to explore its effect on their research work. The research design was survey method and based on the structured questionnaire, interview, observation and some related documents, the data are collected for the study. The findings revealed that, research scholars are aware and using one or the other type of Web technology tools and services for their day-to-day activity. Most of them are aware of instant messaging, streaming media, plagiarism detection tools whereas many of the respondents are not aware of tools like database management tools, social bookmarking, content management, RSS feeds, and mashup. Maximum of the respondents are using Web technology tools and services for communication, teaching and learning, for overall activities of professional development. Majority of the respondents suffer from poor internet connectivity to use Web technology tools and services effectively.

Keywords: Web Technology, Web Technology Tools, Web based Services, Research Scholars, Science and Technology

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I. Introduction

Development and inventions in ICT has facilitated or even facilitating the transfer of knowledge on wider scale. Web technologies are one such solution which is an increasingly important resource in many aspects of life: education, employment, government, commerce, health care, recreation, and more. The web is a system of interlinked, hypertext documents accessed via the Internet. Web was first created by Tim Berners-Lee in 1989 at CERN (European Council for Nuclear Research) which was first version of web known as Web 1.0. Web 1.0 then evolved to Web 2.0 and Web 3.0. The transition from Web 1.0 to Web 2.0 was a significant phase in terms of information because Web 1.0 is all about one-way information, while Web 2.0 is a two-way model. The next generation Web, known as Web 3.0, is the combination of the features of both the phases and contains a few more features i.e. it support read, write and also execute. Web technology is a comprehensive and new technology which means the interpretation of a range of technologies and applications that enable designing, scripting and uploading, sharing and accessing, an object, idea, information or set of information instructed formats with uniformity and interoperability. Web technology is generally used for the various technologies that are not only to put content on the web, but also organize structure and make it accessible on the web. For successful function of the web technologies different other technologies are also functioning in an integrated manner. Web is an ideal media for providing information. These technologies includes Client-Server Technologies, Web Browser document markup languages like HTML.

The application of web technologies has become a challenge before the library and information professionals for storing and dissemination of information in the library services. The libraries are shifting from traditional collection and storage system to modern access method. Librarian can not only deliver user centric

services but also create collaborative and participative environment by using Web technologies that would lead to creation of new resources and built up existing ones using collective intelligence of users. New generation of library services and activities can be designed or built with active participation and feedback from user community to fulfil the needs and expectations of today's library users. Web technology encompasses so many new technologies which can be used for a variety of undertaking in libraries such as library websites, OPAC, blogs, Wikis, social bookmarking, calendaring, collaborative authoring, video sharing, social networking, file and image sharing as well as communication and discussion forums etc.

Web Technology Tools and Services

Web Technology tools refers to the various ICT tools and techniques that are utilized in the process of communication between different types of devices over the internet. Web services are the latest application in technology for computing. Web service provides an opportunity to allow a user to establish a client application to access their desired functionality. A web service is nothing but a software system designed to support from computer to computer interaction over the internet. There are numerous tools present on the Internet, but all are not compatible to use by research scholars. Few important Web technology tools and services that are predominantly used/accessed are considered for the present study.

Sl. No.	Web Technology Tools	Sl. No.	Web Technology Services
1.	Academic Writing Tools	1.	Asynchronous JavaScript and XML (Ajax)
2.	Cloud Computing	2.	Blogs
3.	Collaborative Writing	3.	Instant Messaging
4.	Content Management Tools	4.	Online Video Conferencing
5.	Database Management	5.	Podcasting/ Vodcasting
6.	File Sharing	6.	Short Message Services (SMS)
7.	Mashup	7.	Social Bookmarking
8.	Online Survey Tools	8.	Social Networking
9.	Plagiarism Detection Tools	9.	Streaming Media
10.	Project Management Tools	10.	Wikis
11.	Reference Management Tools		
12.	RSS Feeds		
13.	Widgets and Gadgets		

Background of the studies

The present study focuses on web technology tools and services that are used or accessed for various purposes. In connection to this, the author has reviewed few relevant literature that are useful for the present study.

Amrohi, Garg, & Chauhan (2015) describes the application of Web technology in special libraries and the role of library professionals in implementing these technologies in their library. Authors finds that, use of web technologies in special library has altered with the advancement of information technology. Web applications can enable libraries, simpler system customization and integration.

Naik (2017) presents the use of web enabled library resources and services provide by the university libraries in Karnataka. The study observes that the university libraries considered in the study is equipped with good resources, large number of ICT facilities with internet connectivity. In Karnataka some libraries provide only minimal information about their resources, facilities and their library services, while many offer more library services like Web OPACs, access to online databases, e-resources, electronic reserves, Web-based user education tools, e-gateways, consortium, etc.

Raj (2014) analyses the awareness and usage of Web technologies among library professionals in Tamil Nādu and Karnataka. Author finds that, the library professionals in general are aware of the Web technologies and its relevance in information processing and management. Blogs, wikis, e-learning systems and social networking tools are of popular Web technology applications. Federated search, Web conferencing, reference management and social bookmarking are not familiar to majority of the library professionals.

The attempt has been made to trace some literature that relevant to the present study are:

- Internet and Web technology for library in digital environment with reference to college libraries of Guwahati (Deka & Singh, 2007)
- Use of web technology in providing information services by south Indian technological universities as displayed on library websites (Balaji & Kumar, 2011)
- Comparative Study of Web 1.0, Web 2.0 and Web 3.0 (Naik&Shivalingaiah, 2008)
- Scholarship 2.0: Analysing scholars' use of Web 2.0 tools in research and teaching activity (Calvi&Cassella, 2013)

- Use and satisfaction level of web based services among library and information science research scholars' of Babasaheb Bhimrao Ambedkar University Lucknow, Uttar Pradesh (Jigyshu&Mahawar, 2020).
- Awareness and use of Web resources and services among the faculty members and researchers of Bangalore University: a study (Sushma&Ramesha, 2022)
- A study on the role of web technology in enhancing research pursuance among university academia (Hussain & Durrani, 2012).
- Impact of web technologies on library and documentation centres (Thomas, 2017)

Objectives of the study

The main objective of the present study are:

- to know the level of awareness of Web technology tools and services by the research scholars;
- to identify the purpose of using Web technology tools and services;
- to explore the effect of Web technology tools and services on research work;
- to determine the problems faced by the research scholars while using/accessing the Web technology tools and services; and
- to suggest improvement measures based on the inferences drawn from the study.

II. Methodology

Web technology is a cutting-edge development in the communication technology which have made great effect on information generation, distribution, and access which is very much warranted by the research and higher academic organizations. In order to collect the required primary data for the present study questionnaire based survey method is followed. Based on the structured questionnaire, interview, observation and some related documents, the data are collected for the study. The collected data analysed based on the analysis tools like MS Excel and Statistical Package for Social Sciences (SPSS) statistical tools. As per American Psychological Association (APA) standard styles used for interpretation and citation. As per the records maintained in the respective departments of the university, the number of fulltime research scholars pursuing doctoral degree as on June 2022 is 119.

Table 1: Questionnaire Distributed and Response Received

Total Population	Questionnaire distributed	Response received	Percentage
119	119	115	96.63%

As per the data presented in Table 1, it is clear that, out of total questionnaire distributed (119), 115 users are responded with the response rate of 96.63%.

Data Analysis and Interpretation

Table 2 clearly indicates that, out of the total respondents (115) examined for this study, 70 (60.9%) of the respondents are male whereas 45 (39.1%) of the respondents are females.

Table 2: Gender Wise Distribution of Responses

Gender	Number	Percentage
Male	70	60.90
Female	45	39.10
Total	115	100.00

Table 3: Stage of Research

Stage of research	Number	Percentage
Initial	57	49.60
Middle	29	25.20
Completion	29	25.20
Total	115	100.00

The stage of research plays an important role in research work. Table 3 depicts that, 57 (49.6%) of the researchers are in initial stage, equal percentage of the researchers i.e. 29 (25.2%) of them in middle and completion stage.

Table 4: Level of Awareness of Web Technology Tools

Sl. No.	Web Technology Tools	5 Point Likert Scale				
		5	4	3	2	1
1.	Academic Writing Tools	21	38	31	25	0

Sl. No.	Web Technology Tools	5 Point Likert Scale				
		5	4	3	2	1
		(18.3)	(33.0)	(27.0)	(21.7)	(0.0)
2.	Cloud Computing	8 (7.0)	19 (16.5)	31 (27.0)	57 (49.6)	0 (0.0)
3.	Collaborative Writing	35 (30.4)	28 (24.3)	29 (25.2)	23 (20.0)	0 (0.0)
4.	Content Management Software	7 (6.1)	10 (8.7)	30 (26.1)	60 (52.2)	8 (7.0)
5.	Database Management Systems	4 (3.5)	16 (13.9)	10 (8.7)	75 (65.2)	10 (8.7)
6.	File sharing	39 (33.9)	39 (33.9)	21 (18.3)	16 (13.9)	0 (0.0)
7.	Mashup	6 (5.2)	17 (14.8)	26 (22.6)	27 (23.5)	39 (33.9)
8.	Online Survey Tools	38 (33.0)	43 (37.4)	17 (14.8)	17 (14.8)	0 (0.0)
9.	Plagiarism Detection Tools	18 (15.7)	46 (40.0)	29 (25.2)	22 (19.1)	0 (0.0)
10.	Project Management Tools	16 (13.9)	25 (21.7)	35 (30.4)	34 (29.6)	5 (4.3)
11.	Reference Management Systems	18 (15.7)	52 (45.2)	33 (28.7)	12 (10.4)	0 (0.0)
12.	RSS feeds	7 (6.1)	17 (14.8)	24 (20.9)	60 (52.2)	7 (6.1)
13.	Widgets and Gadgets	14 (12.2)	18 (15.7)	28 (24.3)	55 (47.8)	0 (0.0)

Note: Figure in the parentheses denotes percentage to the total number of respondents (5 = Extremely aware, 4= Aware, 3 = Moderate aware, 2 = Not aware, 1= Not at all aware)

Based on 5-point Likert scale respondents' awareness level of Web technology tools was assessed and presented in Table 4. It is evident from the table that, 52 (45.2%) users are aware of reference management system whereas 75 (65.2%) of the respondents are not aware of database management system followed by 60 (52.2%) of the respondents' not aware of content management system and RSS feeds. The overall findings are in line with the study conducted by Garoufallou&Charitopoulou (2011) found little awareness and use of tools such as RSS, Podcast, Mashups, Social bookmarks and Tagging.

Table 5: Awareness of Web Technology Services

Sl. No.	Web Technology Services	5 Point Likert Scale				
		5	4	3	2	1
1.	Asynchronous JavaScript and XML(AJAX)	3 (2.6)	17 (14.8)	13 (11.3)	58 (50.4)	24 (20.9)
2.	Blogs	27 (23.5)	34 (29.6)	30 (26.1)	24 (20.9)	0 (0.0)
3.	Instant Messaging	85 (73.9)	23 (20.0)	6 (5.2)	1 (0.9)	0 (0.0)
4.	Online Video Conferencing	54 (47.0)	47 (40.9)	12 (10.4)	2 (1.7)	0 (0.0)
5.	Podcasting/Vodcasting	39 (33.9)	16 (13.9)	35 (30.4)	25 (21.7)	0 (0.0)
6.	Short Message Services(SMS)	65 (56.5)	14 (12.2)	21 (18.3)	15 (13.0)	0 (0.0)
7.	Social Bookmarking	4 (3.5)	14 (12.2)	29 (25.2)	64 (55.7)	4 (3.5)
8.	Social Networking Sites	55 (47.8)	47 (40.9)	14 (12.2)	9 (7.8)	0 (0.0)
9.	Streaming Media	77 (67.0)	34 (29.6)	4 (3.5)	0 (0.0)	0 (0.0)
10.	Wikis	56 (48.7)	36 (31.3)	19 (16.5)	4 (3.5)	0 (0.0)

Note: Figure in the parentheses denotes percentage to the total number of respondents (5 = Extremely aware, 4= Aware, 3 = Moderate aware, 2 = Not aware, 1= Not at all aware)

Table 5 shows the level of awareness of Web technology services. 85 (73.9) of the respondents are extremely aware of instant messaging whereas 64 (55.7%) of the respondents are not aware of social bookmarking sites. All of the respondents are aware of streaming media. Also the results of the study conducted by Oni, Momoh&Amugo (2018) indicates that social networking sites and instant messaging are the most used Web 2.0 applications.

Table 6: Frequency of Using Web Technology Tools and Services

Frequency access	Number	Percentage
Daily	79	68.70
Weekly	20	17.40
Fortnightly	1	0.90
Monthly	1	0.90
Occasionally	0	0

As per the Table 6, it is clear that 79 (68.7%) of total respondents are using Web technology tools and services daily and only 1 (0.9%) of the respondents are using fortnightly whereas no respondents are using on monthly basis.

Table 7: Purpose of Using Web Technology Tools and Services

Sl. No.	Purpose of Using Web technology Tools and Services	Yes		No	
		Number	%	Number	%
1.	To keep abreast with the latest development	100	87.0	15	13.0
2.	For own publications	97	84.3	18	15.7
3.	For research work	111	96.5	4	3.5
4.	For teaching and learning	113	98.3	2	1.7
5.	To use online databases	107	93.0	8	7.0
6.	To consult electronic resources	105	91.3	10	8.7
7.	To know forthcoming events-conference/seminar /workshops etc.	110	95.7	5	4.3
8.	For career information	106	92.2	9	7.8
9.	For communication (e-mail, social network etc.)	114	99.1	1	0.9
10.	To discuss with friends/colleagues	110	95.7	5	4.3
11.	To get current information	110	95.7	5	4.3
12.	Express opinion, share ideas, thoughts and views(Social interaction)	107	93.0	8	7.0
13.	For overall activities of professional development	113	98.3	2	1.7

Table 7 presents the purpose of using Web technology tools and services. The study conducted by Ranagattimath&Chavan (2014) revealed that, 67.39% of the respondents use web tools to update on related topic of interest whereas in the present study maximum (99.1%) of the respondents are using Web technology tools and services for communication (e-mail, social network etc.), followed by 113 (98.3%) are using for teaching and learning and for overall activities of professional development.

Table 8: Effect of web Technology Tools and Services on Research Work

Sl. No.	Effect of web Technology Tools and Services on Research Work	5 Point Rating				
		5	4	3	2	1
1.	Can solve research related problems through experts	32 (27.8)	55 (47.8)	26 (22.6)	0 (0.0)	2 (1.7)
2.	Easy to discover experts/authors on the similar area of research	57 (49.6)	37 (32.2)	18 (15.7)	2 (1.7)	1 (0.9)
3.	Reading habit has been improved	33 (28.7)	41 (35.7)	37 (32.2)	4 (3.5)	0 (0.0)
4.	Keeps up-to-date on my research field/ area	56 (48.7)	31 (27.0)	27 (23.5)	1 (0.9)	0 (0.0)
5.	Citations have been improved	46 (40.0)	27 (23.5)	29 (25.2)	8 (7.0)	5 (4.3)
6.	Number of publication have increased	32 (27.8)	36 (31.3)	31 (27.0)	11 (9.6)	5 (4.3)

Effect of Web technology tools and services on research work presented in Table 8. 57 (47.8%) of the respondents opined that web technology has highly impacted (5 rate) in discovering experts / authors on the similar area of research followed by 56 (48.7%) of the respondents in keeping up-to-date on their research field/area and 55 (47.8%) in solving research related problems through experts. 11(9.6%) of the respondents opined that impact of Web technology in increase of number of publication is less.

Table 9 presents the problem faced while using Web technology tools and services. It is pretty clear that, majority of the respondents 92 (80.0%) faced the problem of poor Internet connectivity or slow download speed.

Table 9: Problem Faced While Using Web Technology Tools and Services

Sl. No.	Problem Faced While Using Web Technology Tools and Services	Yes		No	
		Number	%	Number	%
1.	Time constraint	61	53.0	54	47.0
2.	Fear of misuse of personal information	79	68.7	36	31.3
3.	Poor Internet connectivity/ slow download speed	92	80.0	23	20.0
4.	Lack of training	70	60.9	45	39.1
5.	Lack of security and privacy	74	64.3	41	35.7
6.	Lack of availability of academic/research information	60	52.2	55	47.8
7.	Information overload	64	55.7	49	42.6
8.	Lack of quality resources	57	49.6	58	50.4
9.	Lack of skilled manpower	60	52.2	55	47.8
10.	Denied access	80	69.6	35	30.4
11.	Lack of computer literacy	44	38.3	71	61.7
12.	Unwanted notice from others	59	51.3	56	48.7
13.	Overloading of ads/classifieds	59	51.3	56	48.7

III. Discussion

The findings of the study reveal and provide clear insights to awareness, use and their satisfaction level of using Web technology tools and services. The major findings are:

- Out of 115 respondents, 70 (60.9%) are male and 45(39.1%) of the respondents are females.
 - With regard to the awareness of Web technology tools and services, it is observed that maximum of the respondents are extremely aware of instant messaging like WhatsApp (73.9%) and streaming media like YouTube (67.0%) whereas many of the respondents not aware of latest Web technology tools like database management tools (65.2%), social bookmarking (55.7%), content management tools and RSS feeds (52.2%) and 33.9 % of the respondents not at all aware of mashup.
 - Majority of the respondents are using Web technology tools and services for communication (e-mail, social network etc.)(99.1%), teaching and learning (98.3%), for overall activities of professional development (98.3%).
 - Most of the researchers opined that, Web technology has great impact in finding experts or authors in the similar areas of research (49.6%), keeping up-to-date in their research field (48.7%), and can solve their research related problems using Web technology tools and services (47.8%).
 - Majority of the users i.e. 92 (80.0%) of them faced the problem of poor Internet connectivity while accessing Web technology.
- Electronic tools and markup languages are important in providing users with the best web technology tools and services. The way electronic devices communicate with each other using markup-languages for get better web technology tools and services.
- The authority is suggested to facilitate high-speed Internet bandwidth to overcome the problem of low speed Internet to access Web technology tools and services.
 - Theory and practical aspects of Web technology tools and services should be included in the curriculum at the post-graduation level.
 - Library is suggested to provide various research support services to use Web based research support tools such as project management tools, academic writing tools, reference management tools etc.

IV. Conclusion

The continuous evolution of the Internet has opened unimaginable opportunities and challenges in web based education and learning. From the study, we can sum up that Web technology can be treated as a useful instrument for improving academic research activities. The responses received from the survey reveals that Web technologies are slowly being introduced in the academics and respondents are less aware of many of the tools and services like RSS feeds, database management systems, Social bookmarking tools etc. that can be utilized for their day to day activities. Thus some important measures can be taken to create awareness of these tools and services among academicians. Libraries can also utilise these tools to provide better and improved library services.

References

- [1]. Amrohi, R. A., Garg, A., & Chauhan, P. (2015). Application of Web Technology in Special Libraries: A Challenge Before Library and Information Professionals in Digital Era. *International Journal of Digital Library Services*, 5(3), 43-53.
- [2]. Balaji, P., & Kumar, V. (2011). Use of web technology in providing information services by south Indian technological universities as displayed on library websites. *Library Hi Tech*, 29(3), 470-496.

- [3]. Calvi, L., & Cassella, M. (2013). Scholarship 2.0: Analysing scholars' use of Web 2.0 tools in research and teaching activity. *Liber Quarterly*, 23(2), 110-133.
- [4]. Deka, P. K., & Singh, S. K. (2007). Internet and web technology for library in digital environment with reference to college libraries of Guwahati. Paper presented at the 5th Convention PLANNER -2007, Guwahati. Retrieved from <https://ir.inflibnet.ac.in/handle/1944/1020>
- [5]. Garoufallou, E., & Charitopoulou, V. (2011). The use and awareness of Web 2.0 tools by Greek LIS students. *New Library World*, 112(11/12), 490-498.
- [6]. Hussain, I., & Durrani, M. I. (2012). A study on the role of web technology in enhancing research pursuance among university academia. *i-manager's Journal of Educational Technology*, 9(3), 32-40.
- [7]. Jigyshu, O. K., & Mahawar, K. L. (2020). Use and Satisfaction Level of Web Based Services among Library and Information Science Research Scholars' of Babasaheb Bhimrao Ambedkar University Lucknow, Uttar Pradesh. *Compliance Engineering Journal*, 11(3), 52-59.
- [8]. Naik, U. (2017). Web Enabled Library Resources and Services: A Comparative Study of University Libraries in Karnataka State. *International Journal of Library Science and Research (IJLSR)*, 7(5), 1-10.
- [9]. Naik, U., & Shivalingaiah, D. (2008). Comparative Study of Web 1.0, Web 2.0 and Web 3.0. Paper presented at the 6th International CALIBER -2008. International Conference on From Automation to Transformation, University of Allahabad, Allahabad.
- [10]. Oni, O., Momoh, A. U., & Amugo, J. E. (2018). Application of Web 2.0 Tools for the Provision of Library Services for Teaching, Learning and Research in Polytechnics. *Journal of Pedagogical Research*, 2(3), 203-211.
- [11]. Raj, M. A. L. (2014). Awareness and Usage of Web Technologies among Library Professionals in Tamilnadu and Karnataka: A Study. Available from Shodhganga: a reservoir of Indian theses @ INFLIBNET.
- [12]. Ranagattimath, A., & Chavan, S. (2014). Awareness of Web 2.0 Among the Faculty Members of Science Colleges, Dharwad City: A Survey. *International Journal of Information Sources and Services*, 1(1), 1-11.
- [13]. Sushma, H. R., & Ramesha (2022). Awareness and use of Web resources and services among the faculty members and researchers of Bangalore University: a study. *Journal of Indian Library Association*, 58(4), 115-126.
- [14]. Thomas, R. (2017). Impact of web technologies on library and documentation centres. *International Journal of Library & Information Science (IJLIS)*, 6(5), 27-37.

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