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Brij Mohan Gupta Dr

National Institute of Science, Technology & Development Studies, CSIR, nEW dELHI 110012, iNDIA,
bmgupta1@gmail.com

Surinder Mohan Dhawan Dr

National Physical Laboratory, CSIR, New Delhi 110012, smdhawan@yahoo.com

Jivesh Bansal Dr

Panjab University, A.C.Joshi Library, Chandigarh-160014, jivesh@pu.ac.in

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Library 2.0: A Bibliometric Assessment of Global Literature during 2004-14

B.M.Gupta*, S M Dhawan**, Jivesh Bansal***

**National Institute of Science, Technology & Development Studies,
Dr K.S.Krishnan Marg, New Delhi 110 012, India

bmgupta1@gmail.com

*National Physical Lab., New Delhi, India

smdhawan@yahoo.com

***Panjab University, A.C.Joshi Library, Chandigarh – 160 014

jivesh@pu.ac.in

Abstract

The present study looks at the composition and growth of world publications output on Library 2.0. The total world output on Library 2.0 during 2004-14 cumulated to 186 papers; and the world output witnessed 6.67% quinquennial growth from 2004-2009 to 2010-14, There were 1183 citations to 186 papers since their publication. In all 65.31% publications received 1 to 30+ citations per paper during 2004-14. Top 10 most productive countries, (out of forty) contributed 80.1% publication share and 94.77% citation share. Social sciences accounted for the highest publications share (79.57%), followed by computer science (46.77%), business, management & accounting, arts & humanities, engineering and medicine and decision science (less than 5% share each) during 2004-14. Top 31 most productive organizations (out of 163) and top 34 most productive authors (out of 180) contributed 39.78% and 39.25% publications share respectively and their citations share was 40.41% and 32.97% respectively during 2004-14. Amongst 186 global publications on Library 2.0, 151 had appeared in 74 journals during 2004-14. Among the 30 highly cited publications (citations per paper from 10 to 139), the largest number (14) came from the USA, 6 from the U.K., 3 from Spain, 2 each from India and China, and 1 each from Finland, Slovenia, Swaziland, Australia, Germany, Norway and Pakistan. These 30 highly cited publications involved 65 authors, 41 organizations and were published in 23 journals.

Keywords: Library 2.0, world, publications, scientometrics, bibliometrics, Web 2.0

1. Introduction

Web 2.0 is now widely viewed as a second generation web development designed to facilitate communication, information sharing, interoperability, user-centered collaboration on the world-wide web. It characterizes open communication, participation, collaboration and content creation [1]. Web 2.0 has been in usage since 2005, when it was first defined by Tim O'Reilly and Dale Dougherty [2]. According to Miller [3], (i) Web 2.0 has brought about "a freeing of data, allowing it to be exposed, discovered and manipulated in a variety of ways, (ii) Web 2.0 is participative. Unlike the traditional web, which is one-sided from the content provider to the user, web 2.0 allows the users to share information and personal views and reviews, (iii) Web 2.0 applications are modular, with developers and users able

to pick and choose from a set of interoperating components in order to build something that meets their needs, (iv) Web 2.0 is about communication and facilitating community, (v) Web 2.0 is about remix. Increasingly, we can unambiguously reference and call upon the service, document or snippet that we require; incorporating it into something new that is both ours and the original contributors', (vi) Web 2.0 is smart. Applications will be able to use knowledge about us, where we have been and what we are doing to deliver services that meet our needs, (vii) Web 2.0 opens up the Long Tail making it increasingly cost-effective to service the interests of large numbers of relatively small groups of individuals and to enable them to benefit from key pieces of the platform while fulfilling their own needs, and (viii) Web 2.0 is built upon Trust, whether that trust is placed in individuals, in assertions, or in the uses and reuses of data.

Web 2.0 simply refers to the emergent generation of web tools and applications that allow content creation, content curation and sharing in a social engagement. Since its debut in 2005, Web 2.0 applications made a significant impact on the information landscape. According to Miller[4], it is a technology, a philosophy, a business plan, a behavior and a participatory model to engage users, which led Michael Casey to coin the term Library 2.0 [5]. The term Library 2.0 was introduced by Michael Casey through the LibraryCrunch blog (<http://www.librarycrunch.com>) launched in 2005, who expressed his views about the possible benefits of applying the emerging Web 2.0 to “make libraries better” [6].

Discussion about the new concept of Library 2.0 gained momentum which was replicated in other blogs and websites and in October 2005 the term was introduced as “Internet Librarian” in a speech by Michael Stephens [6], who used it to refer to the application of Web 2.0 tools in the offering of library services. Library 2.0 is generally perceived as the application of the interactive, collaborative and multi-media based technologies to library services and collections [7]. Farkas [8] admits that defining the Library 2.0 concept is a difficult task; the definitions suggested often being dependent on the respondent’s perspective and context. According to him, some people define Library 2.0 as being primarily about technology being available at the point of need, providing library services online where the users are creating more interactive library systems that capitalize on the collective intelligence and developing more useable library systems. Other people would focus more on service orientation (than technologies), such as user centered services, surveying users, constantly re-evaluating library collections and services, meeting the extremities of need, as well as the main bulk of distribution; and the list continues. Iser [9] defines Library 2.0 as the expression that captures the practical and focused efforts to use Web technologies - Web 2.0 in particular is to connect to and create relationships with

library patrons. In her view, librarians use Library 2.0 to bring libraries closest to people through information driven social media. According to Farkas [10] the idea of Library 2.0 represents a significant paradigm shift in the way people view library services. It describes a seamless user experience where usability, interoperability, and flexibility of library systems are vital. She adds that it is about library being more present in the community through programming, community building (both online and physical) and outreach via new communication technologies, such as Integrated Messaging (IM), screen-casting, blogs and wikis. She also explains that Library 2.0 is really about allowing user participation through writing reviews and tagging in the catalogue and discussion through blogs and wikis.

Thus, Library 2.0 describes a subset of library services designed to meet user needs precipitated by the direct and peripheral effects of Web 2.0 [11-14]. In the words of Walter [15], Library 2.0 is a commitment to assess, improve, integrate and communicate library services using the newest information technology and the tried and true “human technology”. It is any service, physical and virtual, that successfully reaches users, is evaluated regularly and makes use of customer input. It has the necessary power of emerging technology and communication technology to create a dynamical physical and /or virtual library platform which is defined and controlled by users and librarians and which facilitates the delivery of superior library experience to users at anytime, anywhere and anyhow.

Library 2.0 model is commonly perceived to be founded on the following four principles: (i) the library is everywhere; (ii) the library has no barrier; (iii) the library invites participation and (iv) the library user flexible best of breed systems. Chao [16] explains that 2.0 model libraries exhibit unique characteristics; they embrace their communities and change along with them, adopt user-centered content and services maximizing the library online presence, recognize the fact the role of librarian and users are not always clear and are dynamic and create a multi-media experience for collections and services. They are also socially rich and encourage two-way communication environment between the users and libraries. Chao [16] also asserts that Library 2.0 is a transition within the library world in which programs and services are delivered to the users through new and innovative methods. Library 2.0 looks at how library services fit into the new user-centered world created by Web 2.0 technologies; where dynamic web based tools, online communities and the ability to customize and personalize everything drive the development of personal computing environment.

It is evident from the forgoing views that Library 2.0 emerged from Web 2.0 and it is a way of thinking and a way of operation [13]. It is not just about access but the sharing of information (Albanese, 2004,

Maness, 2006). Library 2.0 is a movement to establish and promote elegant, useful and usable tools and services which are customizable and collaborative [17]

1.1 Literature Review

According to Boxen [18] the professional literature written on Library 2.0 witnessed growth in articles. These articles focused on Library 2.0 implementation in academic reference departments, the integration and introduction of services such as blogs, wikis, social networking Websites, RSS, and podcasting. This article reviewed the content of published literature to ascertain which of the articles had demonstrated a qualitative or quantitative impact on libraries. Padma and Ramasamy [19] have sought to describe the current trends and identified leading areas of research on Library 2.0 using bibliometric evaluation of publications associated with research on Library 2.0 during 1999-2013, by using data from Web of Science database. The article focused on trends in publications output, journal pattern, country of publication, prolific authorship, language, geographical and organizational productivity. Surulinathi, Prasannakumari, Duraipandi and Nandhini characterized Library 2.0 research output during 2001-13 by using data from Engineeringvillage2 Database. The authors analyzed the research output on Library 2.0 by country of publication, organizations and authors, etc. The present research study is also a scientometric assessment of global literature on Library 2.0, but it seeks to present a more comprehensive view on the subject using a series of bibliometric indicators based on publications output count, citations count, and international collaborative share in the publications output.

2. Objectives

The main objectives of this study are to study the performance of global research on Library 2.0 published during 2004-14, based on publications data sourced from Scopus database. In particular, the study is focused on the following objectives:

1. To study the growth of world literature and its distribution by type of documents and sources;
2. To study the citation pattern of the global research output;
3. To study the contribution, global share and citation impact of top 10 most productive countries;
4. To study the distribution of global research output by broad subject areas and identification of significant keywords;
5. To study the publication productivity and citation impact of most productive organizations and authors;
6. To identify leading medium of communication and to study the characteristics of highly cited papers

3. Methodology

The study retrieved and downloaded the world publication data on Library 2.0 from the Scopus database (<http://www.scopus.com>) covering the period 2004-14. The study also downloaded publications data of 10 most productive countries. In order to search global publication data, the study used 'Library 2.0' as the keyword in "title, abstract and keyword" tags along with "date range tag" restricted to period 2004-14. This search string was further restricted to 10 most productive countries one by one in "country tag", as shown below to download publication data by select country. The main search string was further restricted to "subject area tag", "country tag", "source title tag", and "affiliation tag", to download publications data by subject, collaborating countries, organization-wise and journal-wise, etc. The citations data was collected from the Scopus database from the date of publication till the end of June 2015.

4. Analysis

The annual publications output on Library 2.0 during 2004-14 cumulated to a total of 186 papers. The first publication on Library 2.0 had appeared in 2004. The output per year increased from 1 in 2004 to 11 publications by 2014, averaging 24.36% CAGR growth. Quinquennial publications output on Library 2.0 increased from 90 (during 2004-09) to 96 papers (during 2010-14), registering 6.67% quinquennial growth. The citations to global publications on Library 2.0 averaged to 6.07 citations per paper during 2004-14; its quinquennial citation average dropped from 8.27 (during 2004-09) to 4.01 citations per paper (during 2010-14) (Table 1). Of the total publications on Library 2.0, 129 had appeared as articles, 26 as conference papers, 14 as reviews, 6 as book chapters, 4 as editorials, 2 each as books and notes and 1 each as conference review, erratum and short survey during 2004-14

Table 1. Annual Growth of Publications and Citations on Library 2.0 during 2004-14

Period	TP	TC	ACPP
2004	1	13	13
2006	9	323	35.9
2007	27	140	5.19
2008	24	119	4.96
2009	29	189	6.52
2010	26	182	7.00
2011	24	129	5.38
2012	11	41	3.73
2013	24	41	1.71
2014	11	6	0.55
2004-09	90	784	8.71
2010-14	96	399	4.16
2004-14	186	1183	6.36
TP=Total Papers; TC=Total Citations;			

ACPP=Average Citations Per Paper

4.1 Distribution of Citations

Citations to 186 global publications on Library 2.0 during 2004-14 were examined since publication of papers till June 2015. During this period, there were 1183 citations to 186 publications, an average of 6.07 citations per publication. There were no citations to nearly one-third (34.69%) of total publications. In regard to the remaining (65.31%) publications output, citations to them varied from 1 to 30+ per paper. Segment wise analysis reveals that citations to 50% publications (which contributed 29.84% citations share) varied from 1 to 10 per paper; citations to 9.18% publications (which contributed 21.47% citations share) varied from 11 to 20 per paper; citations to 2.55% publications (which contributed 11.50% citations share) varied from 21 to 30 per paper; the remaining 3.06% publications (which contributed 25.44% citation share) varied from 30 to 139 per paper, during 2004-14 (Table 2, Figure 1).

Table 2: Citations Received by Global Publications on Library 2.0 during 2004-14

Citation Range	No. of Papers	No. of Citations	Share of Papers	Share of Citations
0	68	0	34.69	0
1-10	98	353	50.00	29.84
11-20	18	254	9.18	21.47
21-30	5	136	2.55	11.50
31-40	2	72	1.02	6.09
41-50	1	45	0.51	3.80
51-100	3	184	1.53	15.55
>100	1	139	0.51	11.75
Total	186	1183	100	100

Figure 1: Distribution of Papers on Library 2.0 by Citations

	09	14	14	09	14						
USA	45	31	76	122	79.03	562	7.39	10	13.16	12	40.86
U.K.	11	7	18	126	75.35	160	8.89	5	27.78	8	9.68
Spain	1	13	14	14.8	179.9	98	7.00	4	28.57	6	7.53
Australia	3	6	9	68.9	129.2	39	4.33	2	22.22	4	4.84
China	5	4	9	115	86.11	65	7.22	4	44.44	4	4.84
India	1	4	5	41.3	155	69	13.80	1	20.00	3	2.69
Canada	4	1	5	165	38.75	13	2.60	3	60.00	3	2.69
Greece.	1	4	5	41.3	155	8	1.60	1	20.00	2	2.69
Finland	2	2	4	103	96.88	40	10.00	1	25.00	3	2.15
Germany	1	3	4	51.7	145.3	16	4.00	0	0.00	1	2.15
Total of 10 Countries	74	75	149			1070	7.18	31	20.81	4.6	
World	90	96	186			1129					
Share of top 10 countries in global output	82.22	78.12	80.1			94.77%					
TP=Total Papers; TC=Total Citations; ACP=Average Citations Per Paper; ICP=International Collaborative Papers; RCI=Relative Citation Index; HI=H-Index											

4.3 Subject-Wise Distribution of Papers

The global-publications on Library 2.0 published during 2004-14 were classified under seven sub-fields (as reflected in Scopus database classification). The publications share (79.57%) was highest for social sciences, followed by computer science (46.77%), business, management & accounting (4.30%), arts & humanities, engineering and medicine (3.23% each) and decision science (2.69%) during 2004-14. The research activity index for computer science, arts & humanities, engineering and decision science witnessed increase in its value, in contrast to drop in its value for social sciences, business, management & accounting and medicine computed on quinquennial basis from 2004-09 to 2010-14. Amongst these seven subjects, citation impact per paper (40.20) was the highest for decision science, followed by engineering (9.17), computer science (7.0), social sciences (6.84), business, management & accounting (1.50) and arts & humanities (0.5) during 2004-14 (Table 4)

Table 4. Subject-Wise Break-up of Global Publications Output on Library 2.0 during 2004-14

Name of the Subject	Number of Papers			Activity Index		TC	ACPP	HI
	2004-09	2010-14	2004-14	2004-09	2010-14			
Social Sciences	74	74	148	101	99.33	1013	6.84	15
Computer Science	36	51	87	83.3	116.5	609	7.0	11
Business, Management & Accounting	4	4	8	101	99.33	12	1.5	2
Arts & Humanities	2	4	6	67.1	132.4	3	0.5	1
Engineering	2	4	6	67.1	132.4	55	9.17	1
Medicine	5	1	6	168	33.11	33	5.50	3
Decision Science	2	3	5	80.5	119.2	201	40.2	3
Total of the World	74	75	149					
TP=Total Papers; TC=Total Citations; ACP=Average Citations Per Paper; HI=H-Index								

4.4 Significant Keywords

The 186 global publications on Library 2.0 generated 160 keywords. Top 34 most frequently used keywords (along with their frequency of occurrence) on global literature on Library 2.0 were identified (Table 5). The frequency of occurrence (84) was the largest for the keyword 'Library 2.0', followed by Web 2.0 (63), digital libraries (22), libraries (21), academic libraries (18), world wide web (18), etc.

Table 5: Frequency Distribution of Most Significant Keywords on Global Literature on Library 2.0 during 2004-2-14

Name of Keyword	Frequency	Name of Keyword	Frequency
Library 2.0	84	University Libraries	6
Web 2.0	63	Wikis	6
Digital Libraries	22	Information Technology	5
Libraries	21	Library Services	5
Academic Libraries	18	Social Software	5
World Wide Web	16	Tagging	5
Social Media	13	Communication Technology	5
Social Networking	12	Information Retrieval	4
Information Services	11	Library Management	4
Blogs	11	Library Users	4
Public Libraries	10	Participatory Library	4
Internet	9	Medical Libraries	3
Information Literacy	8	Podcasts	3
Marketing	8	Social Networks (Online)	3
Librarian 2.0	7	User Generated Contents	3
Semantic Web	7	Web 3.0	3
Web Services	7	Bookmarking	2

4.5 Profile of Top 31 Most Productive Organizations

In all 163 organizations affiliated to authors contributed to global literature on Library 2.0 during 2004-14. Productivity per organization varied from 1 to 5 papers in 11 years; 134 organizations contributed 1 paper each, 24 organizations 2 papers each, 5 organizations 3 papers each, 1 organization 4 papers and 2 organizations 4 papers and 1 organization 5 papers. Top 31 most productive organizations contributed 2 to 5 papers each and together they contributed 39.78% (74) publications share as well as 40.41% (478) citation share during 2004-14. The scientometric profile of top 31 organizations is presented in Table 6.

Table 6. Scientometric Profile of Top 31 Most Productive Organizations on Library 2.0 during 2004-14

S.No.	Name of Organization	TP	TC	ACPP	ICP	%ICP	HI
1	Queensland University of Technology, Australia	5	28	5.6	0	0	3
2	University of Wisconsin, Milwaukee, USA	4	4	1	1	25	1
3	University of California, Berkeley, USA	4	2	0.5	0	0	1
4	University of Illinois, USA	3	8	2.67	1	33.3	1
5	Universssidad Politecnica de Valencia, Spain	3	23	7.67	0	0	3

S.No.	Name of Organization	TP	TC	ACPP	ICP	%ICP	HI
6	Abo Akademi University, Finland	3	32	10.7	2	66.7	1
7	Alexander Technological Education Institute of Thessaloniki, Greece	3	6	2	2	66.7	1
8	University of North Carolina at Chapel Hill, USA	3	9	3	1	33.3	1
9	Santa Cruz Public Libraries, California, USA	2	6	3	0	0	1
10	Yazd University, Iran	2	1	0.5	1	50	1
11	University of Colorado, Boulder, USA	2	137	68.5	0	0	1
12	Southeastern Louisiana University, USA	2	7	3.5	0	0	1
13	Yale University, USA	2	15	7.5	0	0	0
14	University of Sheffield, U.K	2	0	0	0	0	1
15	Szent Istvan University, Jaszbereny, Hungary	2	3	1.5	0	0	1
16	University of KwaZulu-Natal, South Africa	2	2	1	0	0	1
17	Persian Gulf University, Iran	2	2	1	1	50	1
18	San Jose State University, USA	2	1	0.5	1	50	1
19	Universidad de Extremadura, Spain	2	1	0.5	1	50	1
20	Washington State University, Pullman, USA	2	1	0.5	0	0	1
21	University of Ulster, U.K.	2	37	18.5	0	0	2
22	The Citadel Military College of South Carolina, USA	2	21	10.5	0	0	1
23	Universidade de Brasilia, Brazil	2	0	0	0	0	0
24	Mississippi State University, USA	2	0	0	0	0	1
25	Heinrich Heine University, Germany	2	15	7.5	0	0	1
26	Universidad Complutense de Madrid, Spain	2	0	0	0	0	2
27	Universidad de Granada, Spain	2	60	30.0	0	0	2
28	University of Malaya, Malaysia	2	5	2.5	0	0	2
29	Wuhan University, China	2	40	20.0	1	50	2
30	Rutgers, The State University of New Jersey, USA	2	0	0	0	0	1
31	University of Sevilla, Spain	2	12	6	2	100	1
	Total of 31 organizations	74	478	6.46	14	18.9	1.19
	Global total	186	1183				
	Share of 31 organizations in global total	39.78	40.41				
TP=Total publications; TC=Total citations; ACPP=Average citation per publication; ICP=International collaborative publications; HI=h-index							

Of the top 31 organizations is presented in Table 6, eight organizations published papers above the group average of 2.39: Queensland University of Technology, Australia (5 publications), University of Wisconsin, Milwaukee, USA and University of California, Berkeley, USA (4 publications each), University of Illinois, USA, Universidad Politecnica de Valencia, Spain, Abo Akademi University, Finland, Alexander Technological Education Institute of Thessaloniki, Greece and University of North Carolina at Chapel Hill, USA (3 publications each) during 2004-14. Citations to nine organizations were above the group average (6.46 citation per publication) of 31 organizations: University of Colorado, Boulder, USA (68.5), Universidad de Granada, Spain (30.0), Wuhan University, China (20.0), University of Ulster, U.K (18.5), Abo Akademi University, Finland (10.67), The Citadel Military College of South Carolina, USA (10.5), Universidad Politecnica de Valencia, Spain (7.67), Yale University, USA (7.5) and Heinrich Heine University, Germany (7.5) during 2004-14, H-index of seven organizations was above the group average (1.19) of all 31 organizations: Universidad Politecnica de Valencia, Spain and Queensland University of Technology, Australia (3 each), Universidad de Granada, Spain, Wuhan University, China, University of Ulster, U.K., University of Malaya, Malaysia and Universidad Complutense de Madrid, Spain

(2 each) during 2004-14. International collaboration share of eleven organizations was above the group average share (18.90%) of all 31 organizations: University of Sevilla, Spain (100.0%), Abo Akademi University, Finland and Alexander Technological Education Institute of Thessaloniki, Greece (66.67%), Wuhan University, China, Persian Gulf University, Iran, Yazd University, Iran, San Jose State University, USA and Universidad de Extremadura, Spain (50.0% each), University of North Carolina at Chapel Hill, USA and University of Illinois, USA (33.33%), and University of Wisconsin, Milwaukee, USA (25.0%) during 2004-14..

4.6 Profile of Top 34 Most Productive Authors

In all 180 authors contributed to 186 global publications on Library 2.0 during 2004-14. Publication productivity per author varied from 1 to 4 papers; 146 authors contributed 1 paper each, 30 authors 2 papers each, 3 authors 3 papers each and 1 author 4 papers during 2004-14. Top 34 most productive authors published 2 to 4 publications each and together they contributed 39.25% (73) publication share and 32.97% (390) citation share to the global output on Library 2.0 during 2004-14. The scientometric profile of top 34 authors is presented in Table 7. Four authors published papers above the group average (2.15): M.F.Zimmer (4 publications), H. Patridge, E. Connor and E. Garoufallou (3 publications each) during 2004-14. Citations to ten authors were above the group average (5.34 citation per publication): M. Murray, K Curran and M. Christian (30.0 each), I. Huvila, M.Kronqvist-Berg and K.Holmberg (17,5 each), G. Wuden-Wuldd (15.0), H. Patridge (7.67), E. Connor (7.0) and N.G.. Fernandez-Villavencencio (6.0) during 2004-14, H-index of thirteen authors was above the group average (1.26) of all 34 authors during 2004-14: M. Murray, K Curran, M. Christian, I. Huvila, M.Kronqvist-Berg, K.Holmberg, G. Wuden-Wuldd, H. Patridge, S.L..Edwards, L.C.Nguyen, E Herrera-Viedma, A Abrizah and E. Garoufallou (2 each). International collaborative share of ten authors was above the group average share (20.5%) of all 34 authors: G. Wuden-Wuldd, A.C. Cervero, S.G. Baptista and D.V.Vieira (100.0%), E. Garoufallou (66.70%), S Alavi, A Hazari, and M.Sarrafzadeh (50.0%), E. Connor (33.3%), and M.F.Zimmer (25.0%) during 2004-14.

Table 7. Scientometric Profile of Top 34 Authors on Library 2.0 during 2004-14

S.No	Name	Affiliation	TP	TC	ACPP	ICP	%ICP	HI
1	M.F.Zimmer	University of Wisconsin, Milwaukee, USA	4	4	1	1	25	1
2	H. Patridge	Queensland University of Technology, Australia	3	23	7.67	0	0	2
3	E. Connor	The Citadel Military College of South Carolina, USA	3	21	7	1	33.3	1
4	E. Garoufallou	Alexander Technological Education Institute of	3	6	2	2	66.7	2

S.No	Name	Affiliation	TP	TC	ACPP	ICP	%ICP	HI
		Thessaloniki, Greece						
5	T. Koltay	Szent Istvan University, Jaszbereny, Hungary	2	3	1.5	0	0	1
6	A Abrizah	University of Malaya, Malaysia	2	5	2.5	0	0	2
7	M. Murray	University of Ulster, U.K.	2	40	20	0	0	2
8	A.C. Cervero	Universidad Complutense de Madrid, Spain	2	1	0.5	2	100	1
9	S.G. Baptista	Universiidad de Brasila, Brazil	2	1	0.5	2	100	1
10	S Alavi	Persian Gulf University, Iran	2	1	0.5	1	50	1
11	I. Huvila	Abo Akademi University, Finland	2	35	17.5	0	0	2
12	T. Kwanya	University of KwaZulu-Natal, South Africa	2	3	1.5	0	0	1
13	E Herrera-Viedma	Distance Learning University of Spain, Madrid, Spain	2	6	3	0	0	2
14	W Crawford	Not Available	2	5	2.5	0	0	1
15	A Hazari	Yazd University, Iran	2	1	0.5	1	50	1
			2	8	4	0	0	1
16	M Blandzic	Queensland University of Technology, Australia	2	40	20	0	0	2
17	K Curran	University of Ulster, U.K.	2	35	17.5	0	0	2
18	N.G.. Fernandez-Villavincencio	University of Serville, Spain	2	0	0	0	0	0
19	M.Kronqvist-Berg	Abo Akademi University, Finland	2	40	20	0	0	2
20	S Davidson	University of Illinois, USA	2	9	4.5	0	0	2
21	M. Christian	University of Ulster, U.K.	2	35	17.5	0	0	2
22	S.L..Edwards	Queensland University of Technology, Australia	2	1	0.5	0	0	1
23	K.Holmberg	Abo Akademi University, Finland	2	0	0	0	0	0
24	E.T. Lwoga	Muhimbili University of Health & Allied Scienhces, Tanzania	2	9	4.5	0	0	2
25	S.Matheson	University of Illinois, USA	2	1	0.5	1	50	1
26	L.C.Nguyen	Queensland University of Technology,	2	3	1.5	0	0	1

S.No	Name	Affiliation	TP	TC	ACPP	ICP	%ICP	HI
		Australia						
27	M.Sarrafzadeh	Charles Stuart University, Australia	2	7	3.5	0	0	1
28	C Stilwell	University of KwaZulu-Natal, South Africa	2	3	1.5	0	0	1
299	H.L.H. Titangos	Santa Cruz Public Library, USA	2	1	0.5	2	100	1
30	P.G.Underwood	University of KwaZulu-Natal, South Africa	2	0	0	0	0	0
31	D.V.Vieira	Universidade de Brasilia, Brazil	2	30	15	2	100	2
32	S.L.Weibel	Not Available	2	1	0.5	0	0	1
33	G. Wuden-Wuldd	Abo Akademi University, Finland	4	4	1	1	25	1
34	T.K. Huwe	University of California, Berkley, USA	3	23	7.67	0	0	2
	Total of 34 authors		73	390	5.34	15	20.5	1.26
	Total of world		186	1183				
	Share of 34 authors in global output		39.25	32.97				
TP=Total publications; TC=Total citations; ACPP=Average citation per publication; ICP=International collaborative publications; HI=h-index								

4.7 Medium of Communication

Of the 186 global publications on Library 2.0, 151 publications had appeared in journals, 10 as trade publications, 9 in book series, 8 as books and in conference proceedings during 2004-14. The 151 journal publications appeared in 74 journals, of which 1 publication each appeared in 43 journals, 2 publications each in 12 journals, 3 publications each in 5 journals, 4 publications each in 9 journals, 5 publications each in 2 journals, 6 publications each in 2 journals and 12 papers in 1 journal. Top 19 most productive journals publishing 3 and above publications per journal is shown in Table 8. The largest number of publications (12) has appeared in *Electronic Library*, followed by *Journal of Web Librarianship* and *Program* (6 publications each), *Library Journal* and *Library Management* (5 publications each) etc during 2004-14.

Table 8: Distribution of Research Papers on Library 2.0 in Top 19 Journals, 2004-14

S.No	Name of Journal	# of Papers	S.No	Name of Journal	# of Papers
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1	Electronic Library	12	11	Medical Reference Service Quarterly	4
2	Journal of Web Librarianship	6	12	New Review of Information Networking	4
3	Program	6	13	Proceedings of the ASIST Annual Meeting	4
4	Library Journal	5	14	Webology	4
5	Library Management	5	15	International Journal of Information Management	3
6	Journal of Library Administration	4	16	Library Review	3
7	Internet Reference Services Quarterly	4	17	Library High Tech News	3
8	Journal of Librarianship & Information Science	4	18	Library Philosophy & Practice	3
9	Legal Reference Service Quarterly	4	19	Serials Librarian	3
10	Libraries High Tech	4		Total	85

4.8. Highly Cited Papers

Of the 186 global publications on Library 2.0, only 30 were highly cited papers with 10 to 139 citations per paper. Together these papers received 820 citations, with an average of 27.3 citations per paper. The distribution of 30 highly cited papers by country of publication is skewed; 14 were from USA, 6 from U.K., 3 from Spain, 2 each from India and China and 1 each from Finland, Slovenia, Swaziland, Australia, Germany, Norway and Pakistan. Of the 30 highly cited papers 4 were international collaborative ones, 7 national collaborative ones and the rest 20 were single-institution papers. These 30 highly cited publications involved 65 authors and 41 organizations. Of the 30 highly cited papers, 25 were articles, 4 review papers and 1 conference paper. These 30 highly cited papers had appeared in 23 journals; 3 were published in *Program*, 2 each in *Electronic Library*, *International Journal of Information Management*, *Journal of Academic Librarianship*, *Library Hi Tech* and *Library Journal* and 1 paper each in *D-Lib Magazine*, *Information Sciences*, *Information Technology and Libraries*, *International Information and Library Review*, *Internet Reference Services Quarterly*, *Journal of Documentation*, *Journal of Library Administration*, *Journal of Librarianship and Information Science*, *Library Management*, *Library and Information Science Research*, *Library Resources and Technical Services*, *Medical Reference Services Quarterly*, *New Review of Information Networking*, *Online Information Review*, *Reference Librarian*, *Science and Technology Libraries* and *Webology* during 2004-14.

5. Summary and Conclusion

Even as there exists a broad recognition to the view that Library 2.0 is a subject of major potential to libraries, but Library 2.0 is yet to emerge as a popular and widely sought after topic for research. The total body of literature on Library 2.0 that had appeared in 11 years during 2004-14 is too small in size, comprising just 186 publications. The literature output on Library 2.0 displayed quinquennial growth at a slow rate of 6.67%, increasing in absolute numbers from 90 publications during 2004-09 to 96 during

2010-14, The slow growth rate belies expectations of fast growth in the subject in immediate future. The literature on Library 2.0 averaged a low citations rate of 6.07 citations per paper in 11 years. Nearly one-third (34.7%) publications output did not receive even a single citation since their publication in journals. The distribution of research output by country-of-publication is highly skewed; top 10 countries (out of 42) accounting for as much as 80% research output share. The distribution of cited publications is also skewed; top 10 countries alone accounted for 94.77% citations to papers since publication during 2004-14.

The issue for debate is what can revitalize research in Library 2.0. Given the fact that Library 2.0 is more of a service model with potential to bring about change in library services and usher user-centered change, the scope of large-scale growth in research on Library 2.0 in near future seems rather limited. Nevertheless, implementation and integration of Library 2.0 in libraries and evaluation of impact of such services on user communities may continue to provide hope for greater amount of research in the field.

Top 10 most productive countries in Library 2.0 are USA, U.K., Spain, Australia, China, India, Canada, Greece, Finland and Germany. Secondly, The citations per paper (13.80) were the highest for India, followed by Finland (10.0), U.K. (8.89), USA (7.39), China (7.22), Spain (7.00), Germany (4.0), Canada (2.60) and Greece (1.60) during 2004-14. The publications output was highest in social sciences (79.57%), followed by computer science (46.77%), business, management & accounting (4.30%), arts & humanities, engineering and medicine (3.23% each) and decision science (2.69%) during 2004-14. Decision science registered the highest citations per paper (40.20), followed by engineering (9.17), computer science (7.0), social sciences (6.84), business, management & accounting (1.50) and arts & humanities (0.5) during 2004-14.

The distribution of research output by organizations (affiliated to authors) is scattered widely. Top 31 most productive organizations (out of 163) accounted for just 39.78% publications share as well as 40.41% citation share since publication of papers during 2004-14. Top 34 most productive authors (out of 180) accounted for 39.25% publications share as well as 32.97% citation share during the same period. The productivity per top organization averaged to 2.39 papers, with an average of 6.46 citations per paper, an average of h-index of value 1.19, and an average share of 18.90% international collaborative papers during 2004-14. The productivity per top author averaged to a low of 2.15 papers in 11 years, with an average of 5.34 citations per paper, low average h-index of value 1.26, and low average share of 20.5% international collaborative papers during 2004-14.

Table 9: Top 10 Highly Cited Papers on Library 2.0 during 2004-14

Name of Authors	Affiliation of Authors	Title of Papers	Source of Publications	No. of Citations,
J.M Maness	University of Colorado at Boulder, CO, USA	Library 2.0 theory: Web 2.0 and its implications for libraries (Article)	<i>Webology</i> , 2006, 3 (2),	139

Name of Authors	Affiliation of Authors	Title of Papers	Source of Publications	No. of Citations,
M.E. Casey and, L.C. Savastinuk	Gwinnett County Public Library, Lawrenceville, GA, USA	Library 2.0 (Review)	Library Journal 2006, 131(14), 40-42	72
Y.-M. Kim and J. Abbas.	University of Oklahoma, School of Library and Information Studies, OK, United States	Adoption of Library 2.0 Functionalities by Academic Libraries and Users: A Knowledge Management Perspective (Article)	<i>Journal of Academic Librarianship</i> , 2010, 36 (3), pp. 211-218	57
J. Serrano-Guerrero, E. Herrera-Viedma, E., J. A. Olivás, A., Cerezo and F.P.Romero, F.P.	University of Castilla-La Mancha, Spain and University of Granada, Spain	A google wave-based fuzzy recommender system to disseminate information in University Digital Libraries 2.0 (Article)	<i>Information Sciences</i> , 2011, 181 (9), 1503-1516.	55
N.S. Harinarayana and, N.V., Raju	University of Mysore, Mysore, India and Government First Grade College, Periyapatna, India	Web 2.0 features in university library web sites (Article)	<i>Electronic Library</i> , 2010, 28 (1), 69-88	45
C. Xu, F.Ouyang and,H. Chu	Long Island University ,Palmer School, Library and Information Science, , NY, USA and Wuhan University , School of Information Management, Wuhan, China	The Academic Library Meets Web 2.0: Applications and Implications (Article)	<i>Journal of Academic Librarianship</i> , 2009, 35 (4), 324-331	40
G. Chowdhury, A, Poulter and D. McMenemy.	University of Strathclyde , Deptt of Computer & Information Sciences, , Glasgow, U.K	Public Library 2.0: Towards a new mission for public libraries as a "network of community knowledge" (Article)	<i>Online Information Review</i> , 2006, 30 (4), pp. 454-460.	32
K. Holmberg, I. Huvila, M. Kronqvist-Berg and G.Widén-Wulff	Åbo Akademi University, Deptt.of Information Studies Åbo, Finland	What is Library 2.0? (Article)	<i>Journal of Documentation</i> , 2009, 65 (4), 668-681	30
P. Miller.	Technology Evangelist, Talis, United Kingdom	Coming together around library 2.0: A focus for discussion and a call to arms (Review)	<i>D-Lib Magazine</i> , 2006, 12 (4), 5-15	29
T. Merčun, T and M. Žumer	University of Ljubljana, Ljubljana, Slovenia	New generation of catalogues for the new generation of users: A comparison of six library catalogues (Article)	<i>Program</i> , 2008, 42 (3), 243-261.	28

A total of 151 publications out of 186 on Library 2.0 were journal articles which appeared in 74 journals during 2004-14. The largest number of papers (12) had appeared in *Electronic Library*, followed by *Journal of Web Librarianship and Program* (6 publications each), *Library Journal* and *Library Management* (5 publications each) etc during 2004-14. Among the 30 top cited papers (receiving citations from 10 to 139), 14 were reported from USA, 6 from U.K., 3 from Spain, 2 each from India and China, and 1 each from Finland, Slovenia, Swaziland, Australia, Germany, Norway and Pakistan. The top 30 highly cited publications involved 65 authors, 41 organizations and were published in 23 journals. The top 10 highly cited publications are listed in Table 9.

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