

## **Webology: An Analysis of Citation Pattern**

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### **Abstract**

Efforts were made to analyze 5807 citations of Webology published during 2004 to 2019. The citations were classified on the basis of type of material which clearly indicates that periodicals and web resources were the most popular type of resources used by the authors for writing research papers. The study found that out of 5807 citations 2580 citations were authored by the single author and single authorship pattern was found as the most popular authorship pattern among the authors. The study finds the two oldest citations were from the books which were published before 1900. The findings of the study show the notable change in the use of type of resources being used for writing the research papers. The results of the study shoes that use the of periodicals and web resources for writing research papers was increased from 1951 and onward. The study also presented the list of the twenty five highly cited journals, ten highly cited authors, fifteen highly cited web links and five highly cited books.

### **Keywords**

SoMa, Pla, Sch.

### **Introduction**

Citation Analysis is an important statistical technique that is used to evaluate the quantitative growth of a specific discipline in a particular direction by arranging the citations in a systematic rank or order. Citation Analysis is used to analyze the structure and growth of the particular subject in specific direction, author effectiveness and publication trend. Haridasan and Kulshreshta (2007) elaborated that Citation Analysis as a statistical technique to identify the core documents in a particular subject or discipline.

Citation Analysis is also used to find out the relationship among the cited and citing documents in the context of the scholarly community in geographical proximity. This statistical technique is useful to rank the cited material with their relative importance. Citation Analysis is also used to measure the impact of an author, article or publication by examining pattern and frequency of citations. Eugene Garfield a pioneer of the Bibliometrics opined that Citation Analysis provides quantitative picture of the journal utility. In short Citation Analysis is an important tool used to evaluate the progress in a specific subject or discipline.

Journal is an important source of information for evaluating the growth of a specific subject in a particular direction. Thousands of the journals are being published worldwide in the area of Library and Information Science and in such circumstances is an difficult task to opt a particular journal for the citation analysis. This issue was sorted out by the authors by deciding to opt LIS journal which is indexed in international citation database and also indexed in reputed international LIS databases. Considering this criteria and availability as an open source journal, the authors opted the *Webology*, one of the core international journals in the field of Library and Information Science for the citation analysis. For the citation analysis. An attempt was made to analyze the direction of the Library and Information Science research with the citation analysis of *Webology*, one of the core international journals in the field of Library and Information Science.

### **About the Source Journal**

*Webology* is an international peer reviewed open access journal dedicated to the research areas in the field World Wide Web in particular and research areas in the field of the Library and Information Science in general. The source journal is indexed in the important and reputed international databases e.g. SCOPUS, LISTA, ProQuest, EBSCO etc. The source journal is also listed in the UGC- Consortium for Academic Research and Ethics (CARE).

### **Methodology**

The study was conducted with the total 40 issues published from the year 2004 to 2019 including 203 articles with 5807 citations of the *Webology* by using descriptive statistical method for citation analysis. The citations were analyzed according to the source of information, age distribution of references, authorship pattern, highly cited journals, highly cited papers, books and web links and highly cited authors. Total 5807 citations were analyzed.

### Year Wise Distribution of Articles and their Citations

Table: 1 presents the data about year wise distribution of the articles published in the Webology from 2004 to 2019. It is clear from the table that 203 articles were published with 5807 citations and an average 28.60 citations per article. The highest number of articles i.e. 27 were published in the year 2019 and with highest number of citations i.e. 895. The lowest number of articles i.e. 07 and 08 were published in the year 2009 and 2004 respectively. An average 12.68 articles were published per year with an average 28.60 citations per paper.

**Table 1 No of articles and their Citations: Year wise distribution**

Sr No	Year	Quantum of Articles	Quantum of Citations	Citations received per Paper
1	2004	8	158	19.75
2	2005	13	236	18.15
3	2006	14	394	28.14
4	2007	14	349	26.84
5	2008	16	462	28.87
6	2009	7	161	23
7	2010	9	217	24.11
8	2011	11	312	28.36
9	2012	10	380	38
10	2013	12	296	24.66
11	2014	15	435	28.93
12	2015	12	405	33.75
13	2016	10	231	23.1
14	2017	9	403	44.78
15	2018	16	473	29.56
16	2019	27	895	33.15
<b>Total=</b>		<b>203</b>	<b>5807</b>	<b>28.60</b>

### Quantum Wise Distribution of the Citations

An attempt was made to know the quantum wise distribution of the citations. Table 2 contains the data regarding quantum wise distribution of the citations.

**Table 2 Quantum wise distribution of the citations**

Sr No	No of Citations	No of Articles	Total Citations
1	1-10	25	188
2	11-20	67	1016
3	21-30	45	1130
4	31-40	30	1038
5	41-50	16	698
6	Above 50	20	1737
<b>Total=</b>		<b>203</b>	<b>5807</b>

It can be observed from the above table that out of 5807 published articles only 67 articles were having citations between 11-20. Whereas only 20 articles were having more than 50 citations.

### Classification of the Citations According to the Type of Material

Efforts were made to know the distribution of citations according to the type of material. The data presented in the table 3 clearly indicates that the highest number of citations i.e. 2759 (47.51) were from the periodicals and which was followed by the web resources with 1366 citations (23.52). Whereas books ranked on the third position with 772 (13.29) citations. The lowest numbers of citations were from interview, seminar and workshops. It can be concluded from table 3 that periodicals and web resources were the most popular sources used by the authors for writing the research papers.

**Table 3 Classification of the Citations According to the Type of Material**

Sr No	Type of Materials	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
1	Periodicals	77	94	122	106	163	80	93	134	116	128	212	194	107	333	264	536	2759
2	Web Resources	64	89	113	90	124	54	63	123	175	83	39	56	52	53	79	109	1366
3	Books	4	26	84	61	84	16	35	29	59	49	87	45	49	10	45	89	772
4	Conference Proceedings	8	18	35	50	77	7	15	19	21	25	81	92	11	6	65	113	643
5	Report	3	3	23	20	3	1	2	3	6	6	4	2	1	0	3	8	88
6	Thesis	1	2	3	3	3	1	5	4	2	3	6	5	9	0	5	9	61
7	Workshop	1	0	4	3	3	1	1	0	0	0	2	7	0	0	1	11	34
8	Seminar	0	3	3	3	1	0	2	0	0	1	2	1	0	0	0	0	16
9	Interview	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	4
10	Others	0	0	4	13	4	1	1	0	1	1	2	3	2	1	11	20	64
Total=		158	236	394	349	462	161	217	312	380	296	435	405	231	403	473	895	5807

### Authorship Pattern of the Citations

The data regarding authorship pattern of the citations is presented in table 4. It is clear from the table 4 that out of 5807 citations 2580 citations were authored by the single authors. Whereas 1418 citations were authored by the two authors and 860 citations were authored by the three authors. It can be concluded from the table 4 that single authorship pattern was the most popular type of authorship pattern.

**Table 4 Authorship pattern of the citations**

Sr No	Type of Materials	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
1	Without Author	6	8	22	15	15	2	1	4	8	6	3	5	2	8	5	15	125
2	Single Author	86	142	243	213	248	95	120	180	251	140	166	102	119	83	154	238	2580
3	Double Author	32	62	81	60	109	44	66	70	66	71	125	131	61	95	132	213	1418
4	Triple Author	23	13	29	36	48	12	19	40	40	47	85	85	22	100	89	172	860
5	More than Three	11	11	19	25	42	8	11	18	15	32	56	82	27	117	93	257	824
Total=		158	236	394	349	462	161	217	312	380	296	435	405	231	403	473	895	5807

### Age Distribution of the Citations

The citations were distributed according to the year of publications to know the latest oldest citations. It can be seen from the table 5 that there were two citations from the books which were published before the year 1900. Also it can be observed that the use of periodicals and web resources was increased from the year 1951 and onwards.

**Table 5 Age wise distribution of the citations**

Sr No	Type of Materials	No of Citations						Total
		Year not Mentioned	Year before 1900	Year 1901-1950	Year 1951-2000	Year 2001-2010	Year 2011-2019	
1	Books	3	2	11	311	311	134	772
2	Interview	2	0	0	0	2	0	4
3	Periodical	20	0	8	495	1179	1057	2759
4	Conference Proceedings	4	0	0	101	339	199	643
5	Report	0	0	0	22	56	10	88
6	Seminar	0	0	0	5	11	0	16
7	Thesis	0	0	0	11	31	19	61
8	Web Resource	79	0	2	168	795	322	1366
9	Workshop	0	0	0	8	16	10	34
10	Other	1	0	0	13	27	23	64
<b>Total=</b>		109	2	21	1134	2767	1774	<b>5807</b>

### Highly Cited Journals

The data regarding highly cited journals is presented in table 6. It is clear from the table 6 that Scientometrics is the highly journal which obtained 112 citations and it was followed by Expert System with Applications and Journal of the American Society for Information Science and Technology with 69 and 53 citations respectively.

**Table 6 Highly cited journals**

Sr. No	Name of Periodical	No of Citations
1	Scientometrics	112
2	Expert Systems with Applications	69
3	Journal of the American Society for Information Science and Technology	53
4	Journal of Documentation	48
5	Journal of Information Science	31
6	Journal of the American Society for Information Science	30
7	Computers in Human Behavior	28
8	Information Processing & Management	27
9	Decision Support Systems	27
10	Procedia Computer Science	27
11	Information Processing and Management	25
12	Communications of the ACM	21
13	Online Information Review	20
14	MIS Quarterly	19
15	Government Information Quarterly	18
16	Knowledge-Based Systems	17
17	The Electronic Library	16
18	Library & Information Science Research	16
19	Library Hi Tech	15
20	Library and Information Science Research	14
21	Library Trends	12
22	IEEE Transactions on Knowledge and Data Engineering	12
23	Research Policy	12
24	PLoS ONE	12
25	Information & Management	11

### Highly Cited Papers

An attempt was made to know the names of highly cited papers in the Webology. Table 7 contains data about highly cited papers in Webology during 2004 to 2019. There were four papers which are cited for four times. Whereas there were total eleven (11) papers which were cited for three times. Out of 15 highly cited papers, seven (07) papers were authored by the single author. Whereas five (05) papers were authored by the double author and three (03) papers were authored by the more than two authors.

**Table 7 Highly cited papers**

Sr No.	Title	No of Citations
1	Smith, A.G., A tale of two Web spaces: Comparing sites using Web Impact Factors, Journal of Documentation	4
2	Subrahmanyam, K., Reich, S. M., Waechter, N. and Espinoza, G. Online and offline social networks: Use of social networking sites by emerging adults, Journal of Applied Developmental Psychology	4
3	Katz, J.S. and Martin, B. R. What is research collaboration? Research Policy	4
4	Kleinberg, J., Authoritative sources in a hyperlinked environment, Journal of the ACM	4
5	Spink, A., Wolfram, D., Jansen, B. J. and Saracevic, T. Searching the Web: the public and their queries, Journal of the American Society for Information Science	3
6	Björneborn, L. and Ingwersen, P., Perspectives of webometrics, Scientometrics	3
7	Holscher, C. and Strube G., Web search behavior of internet experts and newbies, Computer Networks	3
8	Ingwersen, P., The Calculation of Web Impact Factors, Journal of Documentation	3
9	Kousha, K. and Horri, A., The relationship between scholarly publishing and the counts of academic inlinks to Iranian university web sites: Exploring academic link creation motivations, Journal of Information Management and Scientometrics	3
10	Golder, S. A. and Huberman, B. A., Usage patterns of collaborative tagging systems, Journal of Information Science	3
11	Kleinberg, J. , Authoritative sources in a hyperlinked environment, Journal of the ACM	3
12	Pritchard, A., Statistical bibliography or bibliometrics, Journal of Documentation	3
13	Subramanian, K.,Bibliometric studies of research collaboration: A review, Journal of Information Science	3
14	Liu, Z., Reading behaviour in the digital environment: Changes in reading behaviour over the past 10 years, Journal of Documentation	3
15	Fedushko, S., Peleschyshyn, O., Peleschyshyn, A.and Syerov, Yu., The verification of virtual community member's socio-demographic characteristics profile, Advanced Computing: An International Journal (ACIJ)	3

### Highly Cited Authors

Table 8 presents the data regarding highly cited authors. It is clear from the table 8 that Thelwall, M. is the highly cited author with 49 citations and it is followed by Spink, A with 48 citations. Vysotska, V ranked on the third position with 39 citations.

**Table 8 Highly cited authors**

Sr No	Name of the Author	No of Citations
1	Thelwall, M.	49
2	Spink, A.	48
3	Vysotska, V.	39
4	Jansen, B. J.	31
5	Lytvyn, V.	27
6	Fedushko, S.	23
7	Vysotska, V	19
8	Nahl, D.	18
9	Kumar, A.	17
10	Peleschyshyn, A.	16

### Highly Cited Web Links

Efforts were made to know the highly cited web links citations. Table 9 contains the data about highly cited we blinks.

**Table 9 Highly cited web links**

Sr No	Web Link	No of Citations
1	<a href="http://www.webology.org/2006/v3n2/a25.html">http://www.webology.org/2006/v3n2/a25.html</a>	4
2	<a href="http://www.webology.org/2014/v11n1/a117.pdf">http://www.webology.org/2014/v11n1/a117.pdf</a>	4
3	<a href="http://www.webology.org/2014/v11n2/a126.pdf">http://www.webology.org/2014/v11n2/a126.pdf</a>	4
4	<a href="http://www.webology.org/2004/v1n2/a4.html">http://www.webology.org/2004/v1n2/a4.html</a>	3
5	<a href="http://sherlock.berkeley.edu/asis96/asis96.html">http://sherlock.berkeley.edu/asis96/asis96.html</a>	3
6	<a href="http://www.cindoc.csic.es/cybermetrics/articles/v1i1p1.html">http://www.cindoc.csic.es/cybermetrics/articles/v1i1p1.html</a>	3
7	<a href="http://www.ariadne.ac.uk/issue45/miller/">http://www.ariadne.ac.uk/issue45/miller/</a>	3
8	<a href="http://www.dlib.org/dlib/january06/guy/01guy.html">http://www.dlib.org/dlib/january06/guy/01guy.html</a>	3
9	<a href="http://www.webology.org/2014/v11n1/a118.pdf">http://www.webology.org/2014/v11n1/a118.pdf</a>	3
10	<a href="http://www.w3.org/History/1989/proposal.html">http://www.w3.org/History/1989/proposal.html</a>	2
11	<a href="http://dictionary.reference.com/search?q=logy">http://dictionary.reference.com/search?q=logy</a>	2
12	<a href="http://www.searchenginewatch.com/sereport/00/06-realnames.html">http://www.searchenginewatch.com/sereport/00/06-realnames.html</a>	2
13	<a href="http://www.ukoln.ac.uk/metadata/presentations/circe/birmingham.html">http://www.ukoln.ac.uk/metadata/presentations/circe/birmingham.html</a>	2
14	<a href="http://www.dlib.org/dlib/july96/07weibel.html">http://www.dlib.org/dlib/july96/07weibel.html</a>	2
15	<a href="http://dublincore.org/documents/1999/07/02/dces">http://dublincore.org/documents/1999/07/02/dces</a>	2

### Highly Cited Books

Efforts were made to find out the highly cited books in the citations. Table 10 presents the data about highly cited books. The five laws of library science by Dr.S.R. Ranganathan was found as a mostly cited book and it was followed by the Relationships in the organization of knowledge and Graph theory.

**Table 9 Highly cited books**

Sr No	Details of the Book	No of Citations
1	Ranganathan S R, The five laws of library science, 1931, Madras Library Association, Madras	5
2	Bean, C.A. and Green, R. (Eds.), Relationships in the organization of knowledge. Dordrecht: Kluwer Academic Publishers	4
3	Biggs, N., Lloyd, E. and Wilson, R., Graph theory, oxford: Oxford University Press	4
4	Kohonen, T., Self-Organizing Maps, Springer-Verlag, New York, USA	3
5	Russell, S.J. and Norvig, P., Artificial intelligence: A modern approach, Prentice Hall, 2009	3

### Conclusion

- It has been observed that Webology publishes the quality articles on the recent trends in the subject Library and Information Science. The journal is indexed in the reputed international databases like SCOPUS, LISTA, ProQuest, EBSCO etc. It is listed in the UGC- - Consortium for Academic Research and Ethics.
- The contributing authors of the Webology are from across the world and from the well known institutions.
- Total 203 articles were published in the Webology during 2004 to 2019 with 5807 citations and an average 28.60 citations per article. The highest number of articles i.e. 27 were published in the year 2019 and with highest number of citations i.e. 895. The lowest number of articles i.e. 07 and 08 were published in the year 2009 and 2004 respectively.
- The single authorship pattern was found as the most popular among the authors and more than 50 percent articles were single authored.
- The two oldest citations were from the books which were published before 1900.
- Use the of periodicals and web resources for writing research papers was increased from 1951 and onward and It can be concluded that the authors mostly preferred periodicals and web resources for writing their research papers.



- Scientometrics was found the highly cited journal whereas Thelwall, M and Spink, A. were the highly cited authors.
- The five laws of library science was found as the mostly cited book.

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