

A Webometric Study of the Websites of Public libraries

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Abstract - *The paper attempts to webometrically analyse the websites of seven public libraries administered by the Ministry of Culture, Government of India. The scope is limited to web link structure analysis. It analyse the domain and page authority, internal links, external links, link equities, established links, and three types of web impact factors namely simple, internal and external. It was found that out of the seven libraries, the website of Central Secretariat library is having the highest simple as well as external web impact factor (115.8) and hence the best web presence among all. The website of RRRLF is the only websites which is having all its internal (55) as well external (4183) links as equity passing links. The website of National Library has the highest number of external and total links (6009) while that of Thanjavur Maharaja Serfoji's Sarasvati Mahal Library consists of highest number of internal (465) links and highest IWIF of 24.25.*

Keywords: Webometrics analysis, Public libraries, Web Impact Factor

1. Introduction

The term “webometrics” was coined by Almind and Ingwersen in 1997. Webometric is combination of two words 'web' and 'metric', web is a collection of web pages or text documents including images, video, audio etc. interconnected by hyperlinks and metric means measurement, hence, webometrics is the measurement of web, its structure and application. According to Björneborn, Webometrics is “The study of the quantitative aspects of the construction and use of information resources, structures and technologies on the Web drawing on bibliometric and informetric approaches. This definition thus covers quantitative aspects of both the construction side and the usage side of the Web embracing four main areas of present webometric research: (1) Web page content analysis; (2) Web link structure analysis;(3) Web usage analysis (including log files of users’ searching and browsing behavior); (4) Web technology analysis (including search engine performance).(Björneborn and Peter Ingwersen, 2004). In this article, the focus is on the link structure analysis of the websites of seven public libraries administered by the Ministry of Culture, Government of India in order to know their web presence on the internet.

Web impact factor

Web impact factor was developed by Peter Ingwersen to quantify the impact of a website by the number of links received. It is a quantitative tool for computing, ranking, evaluating, categorizing and comparing websites. The WIF is a form of measurement used to determine the relative standing of websites in particular fields or a country or institutes. It is a measure

of frequency with which the average webpage in a website has been linked at a given point of time. The higher the WIF, the greater is the reputation of the website. (Babu, 2010)

Three types of links and WIF are calculated in the following way:

- i) The simple web impact factor(SWIF) = A/D
- ii) The external web impact factor (EWIF) = B/D
- iii) The internal web impact factor (IWIF) = C/D

Where,

A: Total number of links

B: Total Number of external links

C Total Number of internal links

D: Total number of webpages published in the website which are indexed by search engines.

2. Review of Related Literature

Elgohary (2008) examined the web impact factor of 99 Arab universities using AltaVista search engine. The author conducted two rounds for data collection to retrieve the links as well as the web presence of the included universities. The findings of the paper said, Jordanian universities represent 40% the top ten universities with the revised web impact factor. There are also some limitations of the study which include some universities not having own website. **Didegah & Erfanmanesh (2010)** examined the performance of 20 Malaysian public universities on the web accessible on Malaysia government website. To conduct the study, webometric and correspondence analysis were used to analyze the attribute of websites. The result of the paper show that Malaysian public universities functioned very well on the web. The University of Malaya functions accurately in almost all but University Pertahanan National Malaysia has not performed very well in whole evaluation criteria. The Correspondence analysis classified the all selected universities websites into three groups which were related based on some attributes. **Jowkar & Didegah (2010)** evaluated Iranian newspapers' web sites by the method of Alexa search engine using correspondence analysis. To conduct the study 24 newspaper websites were selected from Iranian Magazines Information Bank. On the basis of data collected by Alexa, Iran newspaper has the highest traffic rank and websites have largest number of links among others. Bashirmazandaran newspaper has largest number of foreign users on the other hand there is no foreign user of Karvakargar newspaper. The finding of the study show that most newspaper web sites' visitors come from the US. Correspondence analysis classified 24 websites into three grouping. **Niazi & Kamran (2016)** evaluated Iranian state university websites by using Web quality evaluation method. To conduct the research, combination of a descriptive survey and Delphi technique were used. The sample of the paper includes 100 Iranian state university websites. Data collection was done using the checklists prepared by WebQEM. The findings of the paper said Iranian state university websites met the four main criteria considered in WebQEM; reliability, efficiency and functionality were in a "good" condition, and usability was in a "middle" condition. The finding of the paper also said 60% websites were in good and 37% were in middle condition. Ferdowsi University of Mashhad was ranked in the first place. **Verma & Brahma (2017)** examined the number of web pages, link pages and Web impact factor of the national libraries in south Asian countries. The study used an online tool open site explorer. It was found that National library of India have highest domain authority and page authority and received the highest external Equity-Passing Links and total equity passing links. The national library of Sri Lanka got the

highest equity-Passing link. The national library of India have highest web impact factor followed by national library of Sri Lanka and National library of Bhutan.

3. Objectives

- To determine the domain and page authority of websites under study.
- To determine the just discovered and established links to these websites.
- To examine the equity links in websites of under study.
- To find out internal and external link pages of websites of Institutional Repository of under study.
- To calculate the web impact factors of the websites.

4. Methodology

To conduct the study, the list of public libraries was taken from the website of Ministry of Culture, Government of India. The **ministry of culture exercises administrative supervision over seven public libraries and these libraries are taken for the present study.** To fulfill the above objectives, the information regarding these websites was collected and tabulated using open site explorer (www.opensiteexplorer.org). The data was collected on 29th august 2017. The scope of webometrics in this study is limited only to web link structure analysis.

5. Data Analysis

Table 1 list out the year of establishment, location and the websites of the seven public libraries administered by Ministry of Culture, Government of India. Rampur Raza library is the oldest of all being established in 1774.

Table 1: List of libraries

S. No.	Name of Library	Year of establishment	Location	Websites
1.	National Library	1953	Alipore, West Bengal	http://www.nationallibrary.gov.in/
2.	Delhi Public Library	1951	Delhi,	http://dpl.gov.in/
3.	KhudaBaksh Oriental Public Library	1891	Patna, Bihar	http://kblibrary.bih.nic.in/
4.	Rampur Raza Library	1774	Rampur, UP	http://razalibrary.gov.in/Razalibnew/index.html
5.	Central Secretariat Library	1891	Delhi	http://www.csl.nic.in/
6.	Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	1918	Thanjavur, Tamil Nadu	http://sarasvatimahal.in/
7.	Raja Rammohun Roy Library Foundation	1972	Kolkata, West Bengal	http://rrrlf.nic.in/index.asp

Table 2 tabulates the domain and page authority of the public libraries websites. Domain authority is a score out of 100 which tells how well a website will rank on search engine result pages (SERPs). Similarly, page authority is also a score that predicts how well a specific page will rank on search engine result pages (SERP). These were developed by Moz, a software as a service (SaaS) company based in USA. The score depend on many factors. It is seen from the table that the website of KhudaBaksh Oriental Public Library having domain authority of 62 ranks highest while that of Thanjavur Maharaja Serfoji's Sarasvati Mahal Library ranks lowest by obtaining 15 out of a total of 100 points. In the case of page authority, the website of National Library of India ranks first with page authority score of 63 followed by the KhudaBaksh Oriental Public Library having score of 56. Again the least score (20) is obtained by the Thanjavur Maharaja Serfoji's Sarasvati Mahal Library.

Table 2: Domain and Page Authority

S. No.	Name of Library	Domain Authority	Page Authority
1.	National Library	55	63
2.	Delhi Public Library	41	50
3.	KhudaBaksh Oriental Public Library	62	56
4.	Rampur Raza Library	38	39
5.	Central Secretariat Library	38	48
6.	Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	15	20
7.	Raja Rammohun Roy Library Foundation	41	48

Table 3 shows the just discovered and established links. Just discovered links are the links that the website have got in the last 60 days as found by the OpenSiteExplorer tool whereas established links are those which have crossed minimum 60 days and are now recognized ones. This number helps in measuring the effectiveness of the content created for the website in order to improve the position of a web site in the search engine results page (SERPs). Followed Linking Root Domains are the number of authoritative unique domains pointing to a website and also pass link juice or SEO (search engine optimization) power (i.e. are well-known, established and recognized ones). Total Linking Root Domains or established links are the total number of websites linking to you (which pass and do not pass the link juice). Linking C Blocks defines the uniqueness of the external links. If the number of Cblock is equal to the number of websites linking to a particular website, it would mean that every link is from a different website. Links from a wide range of domains from different C-blocks is valuable over a wide range of links from the domains belonging to one C-block.

Except the two libraries, namely Rampur Raza Library and Thanjavur Maharaja Serfoji's Sarasvati Mahal Library, all the libraries have been linked(i.e. cited) by 5 websites in the last 60 days. The number of established links to the National Library is the highest that means 135 domains are containing at least one link to the website of National library. Out of 135, only 121 are reputed ones or pass link equity (followed linking root domains) and further 116 links are from different C blocks or unique domains. This is followed by the DPL, which has got 44 established links. Out of these 41 are followed linking root domains and 40 are from different C blocks. Websites of Rampur Raza Library (12 out of 12), Central Secretariat Library (10 out of 10), Thanjavur Maharaja Serfoji's Sarasvati Mahal Library (1 out of 1), and Raja Rammohun Roy Library Foundation (8 out of 8) have all the followed linking root domains as established links.

Table 3: Just Discovered, Established Links, Followed links and linking C Blocks

SNo	Name of Library	Just Discovered (in 60 days)	Established Links (Total Linking Root Domains)	Followed Linking Root Domains	Linking C Blocks
1	National Library	5	135	121	116
2	Delhi Public Library	5	44	41	40
3	KhudaBaksh Oriental Public Library	5	28	25	23
4	Rampur Raza Library	0	12	12	10
5	Central Secretariat Library	5	10	10	9
6	Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	0	1	1	1
7	Raja Rammohun Roy Library Foundation	5	8	8	7

Table 4 illustrates the number of internal links, internal- equity passing links, external links, external-equity passing links, total links and total equity passing links. Link equity is a

ranking factor based on the idea that certain links pass value and authority from one page to another. This value is dependent on a number of factors, such as the linking page's authority and popularity, trustworthiness of the linking domain, relevancy of the content between the source page and the target page, HTTP status of the link, location and prominence of link on the page, the anchor text used in the link, and more. Links that pass equity are one of many signals that the search engines use to determine a page's rankings in the SERPs. Internal links are the total number of links between the pages on a website while internal-equity passing links are those internal links which pass a certain value from one page to another page on the same website. On the other hand, external links are those links which point to a given website from another domain or vice versa. And equity links are the most relevant and authoritative external links which pass the link equity. A sum total of internal-equity and external-equity passing links is the total equity passing links and a total of all the internal and external links forms total links to the website.

The Thanjavur Maharaja Serfoji's Sarasvati Mahal Library's website consists of highest number of internal (465) links followed by the website RRRLF. In case of number of external links. National Library ranks first with 6009 links pointing to its website out of which 5,985 pass the link equity or are the external equity passing links. Also it has the highest number of total links (6009) but zero internal links. This is followed by the website of Central Secretariat Library website which is having 5559 external links all of which pass link equity and 5559 total links but zero internal links. In case of Delhi public library's website, 7 out of 7 internal links pass link equity while 4237 out of 4241 external links pass link equity. It has a 4248 total links out of which 4244 are total equity passing links. KhudaBaksh Oriental Library is having 25 internal links but only 6 are useful and 19 are futile. Also, 5392 external links are found in the website out of which 5384 are equity passing links. In total, 5417 links are present and 5390 are authoritative. Rampur Raza Library's website contains zero internal links and 4233 external and hence total links. Out of these 3 are not useful. The website of Raja Rammohun Roy Library Foundation is the only website among all the websites which have all the links (4238) passing the link equity.

Table 4: Link Analysis

S. No.	Name of Library	Total Internal Links	Internal-Equity Passing Links	Total External Links	External-Equity Passing Links	Total Links	Total Equity-Passing links
1.	National Library	0	0	6009	5985	6009	5985
2.	Delhi Public Library	7	7	4241	4237	4248	4244
3.	KhudaBaksh Oriental Public Library	25	6	5392	5384	5417	5390
4.	Rampur Raza Library	0	0	4233	4230	4233	4230
5.	Central Secretariat Library	0	0	5559	5559	5559	5559
6.	Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	465	465	0	0	465	465
7.	Raja Rammohun Roy Library Foundation	55	55	4183	4183	4238	4238

Table 5 gives the Web impact factor of the websites of the public libraries under study. It includes the simple web impact factor, internal web impact factor and the external web impact factor. An external web impact factor is a measure of the extension of the attractiveness of a given site. The website of Central Secretariat Library ranks first with highest EWIF as well as SWIF of 115.8 each. Rampur Raza Library has second highest EWIF and SWIF of 108.5 followed by KhudaBaksh Oriental Public Library. The websites of these three libraries is well presented on the web as compared to others. In case of internal web impact factor, Sarasvati Mahal Library ranks one with IWIF of 23.25.

Table 5: Web Impact Factor

S. No.	Name of Library	SWIF	IWIF	EWIF
1.	National Library	95.4	0	95.34
2.	Delhi Public Library	84.9	0.1	84.8
3.	KhudaBaksh Oriental Public Library	96.7	0.4	96.3
4.	Rampur Raza Library	108.5	0	108.5
5.	Central Secretariat Library	115.8	0	115.8
6.	Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	23.25	23.25	0
7.	Raja Rammohun Roy Library Foundation	88.3	1.1	87.1

6. Findings

1. The website of KhudaBaksh Oriental Public Library having the highest domain authority of 62 while that of National Library has second highest (55).
2. The website of National Library of India ranks first with page authority score of 63 followed by the KhudaBaksh Oriental Public Library having score of 56.
3. Websites of all the libraries have been linked(i.e. cited) by 5 websites in the last 60 days except the Rampur Raza Library and Thanjavur Maharaja Serfoji's Sarasvati Mahal Library.
4. The number of established links to the National Library is the highest (135) out of which only 121 are reputed ones and further 116 links are from different C blocks or unique domains
5. The Thanjavur Maharaja Serfoji's Sarasvati Mahal Library's website consists of highest number of internal (465) links and highest IWIF of 24.25.
6. In case of number of external links National Library ranks first with 6009 links pointing to its website out of which 5,985 are the external equity passing links. Also it has the highest number of total links (6009).
7. The website of Raja Rammohun Roy Library Foundation is the only website among all the websites which have all the 4238 links (55 internal link and 4183 external links) passing the link equity.
8. The website of Central Secretariat library ranks first with highest EWIF as well as SWIF of 115.8 each.

7. Conclusion

From the study we can see that the library's presence on the web is much more important nowadays in order to be more accessed by the users both physically as well as virtually. Almost every user checks for a library on internet first, before actually visiting it. A good website will reach to the geographically dispersed users and prompt them to visit the library and access its resources. Though Thanjavur Maharaja Serfoji's Sarasvati Mahal Library is one of the most remarkable library in India as quotes by The Encyclopaedia Britannica, its web presence is not up to the mark. Out of the seven libraries, the websites of Central Secretariat library, Rampur Raza Library and KhudaBaksh Oriental Library has the best web presence. Libraries should work on to improve their link structure analysis in order to be reflected in the first page of search engine's results and hence improve their web presence and reach the desired end.

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