

## Webometric Analysis of Universities in Gujarat

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### Abstract

*It has been observed that web-based resources of information have great role to play in academic and research activities. Millions of users are using the web as primary source of information, communicating and sharing the knowledge. University websites are gateways of the virtual location and important information regarding the admissions, various academic announcements, infrastructure and facilities, information related to examination and results, news and views etc. for their students and patrons. University websites are more and more used for extensive purposes, such as to upload and download a brochure, access e-library and catalogue, promote research groups, latest publications, to access electronic databases etc. Therefore, there is an essentiality and need to study concerning websites of educational institutes in general and Indian perspective. This study aims to evaluate contents of websites of various universities in Gujarat through webometrics method. There are total 43 universities in Gujarat which includes 21 state governments', five central governments' including two private aided and 17 private universities. In this study, 21 state government universities were considered. Webometrics is concerned with measuring aspects of the websites, web pages, parts of web pages, words in web pages, web traffic rank, PageRank etc., and its various contents considered for evaluation.*

**Keywords:** Webometrics, internet, information resources, universities, websites, higher education, Indian universities, traffic rank, www

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### INTRODUCTION

Websites are an essential form in today's communication and used as an equipment by individuals, organizations, academic institutions etc. They not only to prop up their skills and expertise, but also to offer services to their patrons. There is huge information accessible on websites on this day and age and these websites are gateways of the virtual world. The website is a collection of web pages connected to each other via hyperlinks. Users can swing from one webpage to another webpage located on different servers by just clicking on the hyperlinks.

Universities' websites are gateways of the virtual location and important information regarding the admissions, various academic announcements, infrastructure and facilities, information related to examination and results, library resources, news and views etc. for their students and patrons. This study aims to examine the web impact factor (WIF). In this

type of research, the webometrics method is applied to process of link analysis. In this process, number of web pages, number of self link web pages, external link web pages, in link web pages and various web impact factors of the universities' websites are taken under the study.

### CONCEPT OF WEBOMETRICS

Quantitative studies of the web have been named as webometrics [1]. Bojerneborne and Ingwersen defined webometrics as 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 [2]. The world wide web has now become one of the main sources of information on academic and research activities, and therefore it is an excellent platform to test new methods of evaluating webometric activities [3]. Webometric covers research of all network based communication using information or

other quantitative measures [4]. Webometrics is concerned with measuring aspects of the web: domain, web sites, web pages, and parts of web pages, words in web pages, hyperlinks, self links, external links, inlinks, web search engine results and web impact factor etc. [5].

In keeping view of the above mentioned definitions, the subsequent four key areas of webometrics study are:

- (i) Webpage content analysis,
- (ii) Web link structure analysis,
- (iii) Web usage analysis including log of users' searching and browsing behavior, and
- (iv) Web technology analysis including search engine performance.

Where web page content analysis is a kind of subject analysis based on the content of the website. Web link structure analysis means citation analysis that provides links to other webpages/sites. Web usage analysis is part of a more general user and usage research and web technology analysis refers to information systems evaluation.

## REVIEW OF LITERATURE

Sujithai and Jeyshankar's study shows that among the four web pages (LWP, SLWP, ELWP and ILWP) of 16 IIT websites, the external link pages stand-in important to increase the number of webpages [6]. Shukla and Poluru examined the web of 173 Indian state universities [7]. This study explores that several state universities have more visibility compared to their counter parts. The tools like blogs, social networking sites for academic and scientific communication of universities emerge the raise of use of websites. Maintaining institutional repositories, open access, and collaboration with other universities, online communication etc. help to increase the visibility of the particular website, has been indicated.

Thanuskodi study focused on the webpage content analysis of institutes of national importance libraries in India and in addition, study concentrated in evaluation of contents and not on the link structures and other research areas in webometrics [8]. It is found that general information about homepage features are more in IITs and less in ISICAL and IISC. According to Kothainayaki and

Gopalakrishnan, total of 54 agricultural universities in India were considered which includes 44 state agricultural universities, five deemed universities and five central universities with agriculture faculty [9]. Govind Ballabh Pant University of Agriculture & Technology, Sam Higginbottom Institute of Agriculture, Technology & Sciences holds a position in top 10 universities in Alexa Traffic Rank and Google PageRank. Jeyshankar reveals the rank distribution of 27 nationalized banks of India according to their simple link web impact factor, self link web impact factor, external link web impact factor, revised link web impact factor. It has been observed from the above study that the 27 nationalized banks' websites are linked with each other.

Babu *et al.* studied the web pages and web impact factor of 41 central universities in India [10]. The study states about the domains of university websites and the link-network diagram of such websites in addition to the status of NWP, LWP, SLWP, ELWP, ILWP and the WIF of each website of central universities [11]. The study of 34 state agricultural universities' websites in India shows that the domain systems of the websites, examined the number of web pages and link pages, and considered the simple, self link, external link and revised web impact factor. Payne and Thelwall examined the relationship between university inlinks and research productivity over time and identify reasons for individual universities experiencing significant increases and decreases in inlinks over the last six years [12].

Park traced the South Korean web pages' hyperlinking pages hosted in Taiwan, using a search engine [13]. It was found that the hyperlink network was very sparsely connected in terms of the number of South Korean webpages hyperlinking to the pages of the other country. Thelwall tried to extend the concept of impact factor for web-based resources and to use the power of search engines to cover other domains on the internet [14]. A survey was conducted in order to test the coverage of search engines to calculate WIF [15]. The WIF was developed to measure the impact of websites by the number of links it receives. He added the WIF, which can be

defined as the ratio of links made to a websites to the number of pages at the website. According to him, there are three types of WIF such as simple, overall and external WIFs. Among them, external WIF appears to be the best valid measures of impact factor.

### OBJECTIVES OF THE STUDY

The main objective of the study is to study the webometrics of the state government universities' websites in Gujarat. The other objectives include:

- To calculate the Alexa Traffic Rank of the universities websites in Gujarat.
- To calculate the Google Page Rank of the universities websites in Gujarat.
- To calculate the rich files taking into account the .pdf, .ppt, and .doc files only.
- To find out link-network diagrams of the state universities in Gujarat.

### SCOPE OF THE STUDY

The study carried out a webometric analysis of websites of state government universities in Gujarat. There are total 43 universities in Gujarat which includes 21 state governments', five central governments' including two private aided and 17 private universities (<http://gujarat-education.gov.in/education/alluniversity.htm>).

In this study, 21 state government universities were considered. There are two state universities which were not considered:

- (i) Shree Somnath Sanskrit University, Veraval: URL was blocked due to potential security risk.
- (ii) New established Kamdhenu University: there is no own website. The study aimed to establish a sort of academic ranking of these websites by measuring their WIF. The study of the ranking will help the user to compare and identify state universities' websites in Gujarat by their WIF.

### METHODOLOGY

The study used Alexa Traffic Rank of each website for the study. The Google search engine has been used to calculate the Google PageRank for the university websites under study. The rich files were calculated using Google Scholar and tabulated. The rich files of

the state government universities in Gujarat are calculated from the Google Scholar by: e.g. site: www.gtu.ac.in. filetype:pdf; www.gtu.ac.in file type: ppt; www.gtu.ac.in.net file type: doc; www.gtu.ac.in.net file type: xls.

### Alexa Traffic Rank

A ranking system set by alexa.com, a subsidiary of amazon.com, essentially audits and creates community the frequency of visits on various web sites. The algorithm, Alexa traffic ranking is calculated, based on the amount of traffic recorded from users, over a period of three months. This traffic is based on parameters such as reach and page views. The reach refers to the number of Alexa users who visited a particular site in a day. Page view, as its name shows, is the number of times a particular page (URL) is viewed by a user. Alexa.com makes it clear through that, if a particular user visits the same URL multiple times on the same day, all those visits will be counted as one. The least the Alexa Traffic Rank, the more heavily visited is the site [16].

### Google PageRank

PageRank is a link analysis algorithm, named after Larry Page, used by the Google internet search engine that assigns a numerical weighting to each element of a hyperlinked set of documents in the world wide web, with the purpose of "measuring" its relative importance within the set [17].

### Rich Files

The rich files require corresponding software for viewing. These readers are mostly the ones who are widely used all across the world, or can be downloaded from the link given alongside the links to the file itself. Also, many of the files were provided in different formats so that the user can access the file in desired format.

### ANALYSIS AND DISCUSSION

The data are collected from the Google search engine of its wide coverage and convenience. Excel, Google Scholar, Pajekwiki are used for data analysis [18].

**Table 1: Universities' Websites and their Website Addresses.**

Sr. No.	Name of University	Year of Establishment	URL
1	Gujarat University (GU), Ahmedabad	1949	<a href="http://www.gujaratuniversity.org.in">http://www.gujaratuniversity.org.in</a>
2	Sardar Patel University (SPU), Vallabh Vidyanagar	1955	<a href="http://www.spuvvn.edu">http://www.spuvvn.edu</a>
3	Veer Narmad South Gujarat University (VNSGU), Surat	1965	<a href="http://www.vnsgu.ac.in">http://www.vnsgu.ac.in</a>
4	The Maharaja Sayajirao University (MSU), Baroda	1949	<a href="http://www.msubaroda.ac.in">http://www.msubaroda.ac.in</a>
5	Saurashtra University (SU), Rajkot	1967	<a href="http://www.saurashtrauniversity.edu">http://www.saurashtrauniversity.edu</a>
6	Bhavnagar University(MKBU), Bhavnagar	1978	<a href="http://www.mkbhavuni.edu.in">http://www.mkbhavuni.edu.in</a>
7	Hemchandracharya North Gujarat University (HNGU), Patan	1986	<a href="http://www.ngu.ac.in">http://www.ngu.ac.in</a>
8	Krantiguru Shyamji Krishna Verma Kachchh University (KSKVKU), Kachchh	2004	<a href="http://kskvku.digitaluniversity.ac">http://kskvku.digitaluniversity.ac</a>
9	Dr. Babasaheb Ambedkar Open University (BAOU), Ahmedabad	1994	<a href="http://www.baou.edu.in">http://www.baou.edu.in</a>
10	Children's University Gujarat (CUG), Gandhinagar	2009	<a href="http://www.cugujarat.ac.in">http://www.cugujarat.ac.in</a>
11	Gujarat Forensic Sciences University (GFSU), Gandhinagar	2008	<a href="http://www.gfsu.edu.in">http://www.gfsu.edu.in</a>
12	Raksha Shakti University (RSU), Ahmednagar	2009	<a href="http://www.rakshashaktiuniversity.edu.in">http://www.rakshashaktiuniversity.edu.in</a>
13	The Indian Institute of Teacher Education (IITE), Gandhinagar	2010	<a href="http://www.iite.ac.in">http://www.iite.ac.in</a>
14	Gujarat Technological University (GTU), Ahmedabad	2007	<a href="http://www.gtu.ac.in">http://www.gtu.ac.in</a>
15	Gujarat Ayurved University (GAU), Jamnagar	1967	<a href="http://www.ayurveduniversity.com">http://www.ayurveduniversity.com</a>
16	Anand Agricultural University (AAU), Anand	2004	<a href="http://www.aau.in">http://www.aau.in</a>
17	Navsari Agricultural University (NAU), Navsari	2004	<a href="http://www.nau.in">http://www.nau.in</a>
18	Sardarkrushinagar Dantiwada Agricultural University (SDAU), Dantiwada	2004	<a href="http://www.sdau.edu.in">http://www.sdau.edu.in</a>
19	Junagadh Agricultural University (JAU), Junagadh	2004	<a href="http://www.jau.in">http://www.jau.in</a>

(Source: <http://gujarat-education.gov.in/education/alluniversity.htm>)

From the above Table 1, it is noted that state government universities are established after 1950s. Among the total 21 state government universities, 10 universities were established between 2001 and 2010.

Table 2 shows that, seven types of 'domain extensions' were observed in this study.

Almost one third of the universities web sites have '.ac.in' (31.57%) extension, followed by '.edu.in' (26.32%), '.in', '.edu', '.ac' (10.53%) and '.com', '.org.in' (5.261%). This phenomenon explains that there is no homogeneity among the state government universities' websites.

**Table 2: Classifications of Universities Websites by the Domain Extensions.**

Sr. No.	Domain	No. of University (N=19)	Percent (%)
1	.com	1	5.26%
2	.in	2	10.53%
3	.edu	2	10.53%
4	.edu.in	5	26.32%
5	.org.in	1	5.26%
6	.ac	2	10.53%
7	.ac.in	6	31.57%
	Total	19	100%

**Table 3: Universities' Websites and their Alexa Traffic Ranks.**  
(As on 25.01.2015)

Sr. No.	Name of University	Place	Global Alexa Traffic Rank	Rank	Indian Alexa Traffic Rank	Rank
1	Gujarat Technological University	Ahmedabad	31697	1	2947	1
2	Krantiguru Shyamji Krishna Verma Kachchh University	Kachchh	60379	2	6605	2
3	Gujarat University	Ahmedabad	105372	3	14965	3
4	Navsari Agricultural University	Navsari	173716	4	15933	4
5	Dr. Babasaheb Ambedkar Open University	Ahmedabad	184019	5	30980	7
6	Saurashtra University	Rajkot	216697	6	44096	9
7	Veer Narmad South Gujarat University	Surat	225551	7	16860	5
8	Hemchandracharya North Gujarat University	Patan	255636	8	48147	10
9	Anand Agricultural University	Anand	274869	9	28287	6
10	Sardarkrushinagar Dantiwada Agricultural University	Dantiwada	368112	10	85490	13
11	The Maharaja Sayajirao University	Baroda	371876	11	36100	8
12	Sardar Patel University	Vallabh Vidyanagar	466818	12	102288	15
13	Junagadh Agricultural University	Junagadh	472597	13	49113	11
14	Bhavnagar University	Bhavnagar	659612	14	96923	14
15	Raksha Shakti University	Ahmedabad	708205	15	69596	12
16	The Indian Institute of Teacher Education	Gandhinagar	878749	16	Not Available	-
17	Gujarat Forensic Sciences University	Gandhinagar	1274732	17	Not Available	-
18	Gujarat Ayurved University	Jamnagar	2703353	18	Not Available	-
19	Children's University Gujarat	Gandhinagar	4537227	19	Not Available	-

In Table 3, the Alexa traffic global and Indian ranks are calculated for the state government universities. The least the traffic ranks, the more heavily visited is the site [16]. Accordingly, the universities' websites are ranked based on Alexa global and Indian traffic rank. Gujarat Technological University, Krantiguru Shyamji Krishna Verma Kachchh University, Gujarat University, and Navsari Agricultural University achieved 1st, 2nd, 3rd and 4th positions respectively in both ranks.

Veer Narmad South Gujarat University, Anand Agricultural University, and the Maharaja Sayajirao University occupy good Indian ranks compared to global ranks 5–7, 6–9, 8–11 respectively. Dr. Babasaheb Ambedkar Open University, Saurashtra University, Hemchandracharya North Gujarat University, and Sardarkrushinagar Dantiwada

Agricultural University achieved a good rank in global rank but have gone down the Indian rank compared to global rank 5 to 7, 6 to 9, 8 to 10 and 10 to 13 respectively. At last, four universities' websites have not been ranked by Indian Alexa Traffic Rank.

PageRank of the state government universities' websites calculated according to Google PageRank has been given in Table 4. The Maharaja Sayajirao University and Gujarat Technological University, both are achieving 1st rank with 6 points out of 10 points. There are 10 universities which share 2nd rank with 5 points out of 10 points, 4 universities got 3rd rank with 4 points out of 10 points, 2 universities caught 4th rank with 3 points out of 10 points. Sardarkrushinagar Dantiwada Agricultural University has not obtained any PageRank.

**Table 4: Universities' Websites and their Google PageRanks.**  
(As on 25.01.2015) [19]

Sr. No.	University	Place	Google PageRank	Rank
1	The Maharaja Sayajirao University	Baroda	6	1
2	Gujarat Technological University	Ahmedabad	6	1
3	Gujarat University	Ahmedabad	5	2
4	Sardar Patel University	Vallabh Vidyanagar	5	2
5	Veer Narmad South Gujarat University	Surat	5	2
6	Saurashtra University	Rajkot	5	2
7	Bhavnagar University	Bhavnagar	5	2
8	Dr. Babasaheb Ambedkar Open University	Ahmedabad	5	2
9	The Indian Institute of Teacher Education	Gandhinagar	5	2
10	Anand Agricultural University	Anand	5	2
11	Navsari Agricultural University	Navsari	5	2
12	Junagadh Agricultural University	Junagadh	5	2
13	Hemchandracharya North Gujarat University	Patan	4	3
14	Children's University Gujarat	Gandhinagar	4	3
15	Gujarat Forensic Sciences University	Gandhinagar	4	3
16	Gujarat Ayurved University	Jamnagar	4	3
17	Krantiguru Shyamji Krishna Verma Kachchh University	Kachchh	3	4
18	Raksha Shakti University	Ahmedabad	3	4
19	Sardarkrushinagar Dantiwada Agricultural University	Dantiwada	None	-

**Table 5: Numbers of Rich Files in Websites of Universities of Gujarat.**  
(As on 25.01.2015)

Sr. No.	University	Place	.pdf	.doc	.ppt	.xls	Total
1	Gujarat Technological University	Ahmedabad	7990	133	0	57	8180
2	Krantiguru Shyamji Krishna Verma Kachchh University	Kachchh	6090	25	2	29	6146
3	Gujarat University	Ahmedabad	3880	16	0	8	3904
4	Bhavnagar University	Bhavnagar	3840	6	0	5	3851
5	Hemchandracharya North Gujarat University	Patan	2750	90	0	28	2868
6	Navsari Agricultural University	Navsari	2200	20	0	5	2225
7	Veer Narmad South Gujarat University	Surat	2070	49	0	23	2142
8	Dr. Babasaheb Ambedkar Open University	Ahmedabad	1880	1	0	0	1881
9	Saurashtra University	Rajkot	1790	20	5	1	1816
10	Sardar Patel University	Vallabh Vidyanagar	1620	4	1	1	1626
11	The Maharaja Sayajirao University	Baroda	345	38	2	4	389
12	Children's University Gujarat	Gandhinagar	279	0	0	0	279
13	Raksha Shakti University	Ahmedabad	212	18	0	7	237
14	Sardarkrushinagar Dantiwada Agricultural University	Dantiwada	190	47	0	0	237
15	Gujarat Forensic Sciences University	Gandhinagar	111	69	0	0	180
16	The Indian Institute of Teacher Education	Gandhinagar	54	3	0	0	57
17	Junagadh Agricultural University	Junagadh	1	1	1	0	3
18	Gujarat Ayurved University	Jamnagar	0	1	0	0	1
19	Anand Agricultural University	Anand	1	0	0	0	1





- Gujarat Technological University, Krantiguru Shyamji Krishna Verma Kachchh University, Gujarat University, and Navsari Agricultural University achieve 1st, 2nd, 3rd and 4th positions respectively based on both Alexa global and Indian traffic ranks.
- The Maharaja Sayajirao University and Gujarat Technological University, both are achieving 1st rank with 6 points out of 10 points according to Google PageRank.
- Gujarat Technological University leads the list of state government universities having 8180 rich files. Krantiguru Shyamji Krishna Verma Kachchh University secured 2nd place with 6146 rich files, followed by Gujarat University which came 3rd with 3904 files.
- The Indian Institute of Teacher Education, Gujarat Forensic Sciences University, Gujarat Ayurved University, and Children's University Gujarat need to improve awareness and usability of the websites; and use rich files for communication to improve traffic rank.

## CONCLUSION

The websites of universities in Gujarat is an uncharted area of webometric research. This study presents a fair thought about the information provided by the websites of the 19 universities of Gujarat. These findings open the door to further studies of other new areas of the web. The Alexa Traffic Rank global and Indian, of the academic websites within the country could also be calculated and compared. This study could be extended further by comparing inter-state universities within the country or by comparing institutions between countries.

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