Research Article

Webometric Analysis of Websites of Autonomous Colleges Under Mahatma Gandhi University, Kottayam: A Study

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ABSTRACT

The World Wide Web, also known as the Web, is a technologically breakthrough creation. In recent years, web traffic has expanded exponentially due to the rising use of websites as conduits for interpersonal contact. Utilising metrics, it is possible to estimate the number of people connected to the internet and the material they share and find engaging. The websites of educational institutions can disseminate a wide variety of information to the user community through the development and maintenance of attractive and well-designed institutional websites. Developing standards for designing educational institutions' websites is a basic necessity. A quality institution's website provides implicit instruction and conveys essential images of the institution. The current study is a novel attempt to explore the websites of selected autonomous colleges under Mahatma Gandhi University and to assess those websites based on various webometric indicators. The result of the study will help in self-assessment of the functioning of college websites to re-frame, re-restructure and learn from the competitors' website.

Keywords: Autonomous Colleges, NAAC, Webometrics, Web Impact Factor, Link Analysis.

INTRODUCTION

Webometric analysis aids in enhancing the functionality of the website when appropriate updates, redesigns, additions and alterations are made. Web Impact Factor is becoming a more trustworthy indicator for measuring the scientific value of websites on a global scale. Numerous studies have been conducted to determine the various Web Impact Factor categories for websites, particularly academic websites. The college website is one of the important tools for publishing the activities of the college, which gives information related to courses, admission, syllabus, examination, fees, faculty, rules and regulations, placements, research and publications, library facilities, resources and services (Hugar, 2019).

As far as the college website is concerned, it is very important for college fraternity and works as a primary source for prospective students who seek information about academic programs and colleges in the decision-making process for admission (Peker *et al*., 2016). Website hosting has become a basic necessity for all academic institutions for public visibility and to provide useful information about academic events and programs.

College websites can serve as a communication link between institutions' accomplishments and their audiences' services. College websites are important as a form of popular media and to make them helpful and accessible for everyone, website designers should pay close attention to them and try to minimize any issues or drawbacks to satisfy users. An attractive and good website, capable of providing relevant information not only satisfies the viewer but also helps in securing quality grades in NAAC. This helps in raising the status of academic institutions to the level of autonomy and even deemed to be universities. Webometrics, the quantitative study of web-related phenomena, originated in the realization, that methods originally designed for bibliometric analysis of scientific journal article citation patterns, could be applied to the web with commercial search engines providing raw data (Thelwall, 2005). The main focus of webometric studies is on the web impact of academic institutes. An attempt has been made in this study to analyze the web impact of selected National Assessment and Accreditation Council-accredited autonomous colleges of Mahatma Gandhi University in Kerala with the help of appropriate webometric indicators.

LITERATURE REVIEW

Dhar and Gayan (2022) evaluated International Library Association websites based on various webometric indicators. It aims to discover the web impact of the website and also the domain authority and page authority of the website. Eight websites are selected for the sample. Data is collected using a

link analysis tool from https://moz.com/.The highest simple web impact factor and external web impact factor were found to belong to the International Association of Law Libraries. Every website investigated in this study is hosted on a server with the. org domain. According to the survey, the Domain Authority and Page Authority of the main websites of worldwide library associations are both below 50.

Meghwal *et al.* (2022) examined NIRF 2021 rankings in India inside university websites. A checklist was created and webometric analysis was performed, looking at the domain name, domain age, parameter analysis of web impact factors, Alexa traffic rank of websites, etc. Based on observation, the top 10 university websites in India were chosen for the study. Various SEO tools were used for data collection. Findings showed that the Amrita Vishwa Vidyapeetham university website has the oldest domain and currently holds the top spot in SWIF and IWIF. It also maintains the top place in both the international and Indian Alexa rankings. The University of Hyderabad is ranked top in the EWIF. The Indian Institute of Science University website has the highest Domain Authority score of 62. Jawaharlal Nehru University obtained the highest page authority scores. 70% of universities use the.ac.in domain extension for their websites. According to the report, three universities from Karnataka were among the top 10 NIRF-ranked universities in India.

Ghosh and Bijan Kumar (2022) studied several aspects of link analysis and website visibility of African agricultural digital repositories. The link between the WIF and WISER indicators of a few African agricultural repositories has been investigated. For the study, 21 OpenDOAR and 18 ROAR repositories were chosen. In this study, the digital presence of African agricultural repositories was analyzed and measured using Google search engines. The outcome reveals that the Kenya Agricultural Research Institute's (KARI) electronic repository holds the top position with SWIF. The University of Nairobi's Digital Repository websites came in 1st place for total web pages. The AgriSearch Repository website is at the top of the list for external links, ELWIF, RWIF and link pages. Additionally, there is a significant correlation between WISER score and In-link WIF.

Gaurav *et al.* (2022) assessed and evaluated the performance of the content and design of the libraries' websites at the Indian Institutes of Technology (IITs). 23 IITs in India were chosen as samples in the study. The study used online surveying and observation techniques using a few chosen checklists and parameters. The performance and design of the websites were examined using GTmatrix tools. The majority of the websites had basic usability elements like page images, page sizes, page load times and general library information, services and retrieval tools. They also had Web 2.0 apps. IIT Delhi has the highest accessibility ratings as per the study. Research assistance tools including plagiarism detector software and writing assistance tools are available on 83% and

78%, of library websites. On the websites of all IIT libraries, e-resources can be found.

Abdulrahman *et al.* (2022) evaluated three of the lowermost university websites in the KRG/Iraq according to the Ranking Web of Universities using user-based testing and questionnaires (webometrics). Software such as Snagit and Camtasia were used to record user data. Excel and SPSS were also used for the analysis. Based on the analysis, the University of Raparin, University of Halabja and University of Garmian websites' accuracy rates are identified as 86.7%, 79.5% and 61.1%. Additionally, the customer satisfaction rating for the University of Raparin is 3.59, while the ratings for the Universities of Halabja and Garmian are 3.24 and 3.01, respectively.

OBJECTIVES

To analyze the domain and domain age of autonomous college websites.

To find out the domain authority and page authority of the website.

To identify and analyze the links of autonomous college websites.

To find out the number of web pages available on the website.

To calculate the Web Impact Factor of the websites.

To calculate the Revised Web Impact Factor.

To find out the Alexa Global Rank of the autonomous college websites and to compare it with the NAAC ranking.

To find out the website's load time, page size and SEO Score.

METHODOLOGY

Data for the current study is gathered from five autonomous college websites of Mahatma Gandhi University in Kerala from 1 December 2022. There is a total of 10 autonomous colleges under Mahatma Gandhi University. The colleges chosen are determined by their NAAC ranking status till 2022. Information is collected from websites by searching the websites of the institutions. To gather raw data, this study uses Semrush, Small SEO tools, duplichecker, Alexa Rank checker and Google Search Engine. Distribution of data by Web Impact Factor is calculated by using the formulae:

$$SWIF = \frac{\text{Total number of links}}{\text{Total number of Webpages}}$$

$$EWIF = \frac{\text{Total number of external links}}{\text{Total number of Webpages}}$$

$$IWIF = \frac{\text{Total number of Internal links}}{\text{Total number of Webpages}}$$

$$RWIF = \frac{\text{Total number of Backlinks}}{\text{Total number of Webpages}}$$

HYPOTHESIS

The perception of the website's reputation increases with increasing impact factor. Websites with greater impact factor is thought of as more prestigious or of higher quality than websites with lower impact factor and thus show a positive relation to NAAC ranking.

RESULTS AND FINDINGS

Table 1 shows the websites of selected autonomous colleges under Mahatma Gandhi University in Kottayam, Kerala with their respective NAAC grades and points. Rajagiri College of Social Sciences, Kalamassery is the one having oldest domain registered in 2000. St. Theresa's College has the 2nd highest domain registered on 2003. The 3rd highest domain is owned by Sacred Heart College dating back to 2004 and the 4th position with respect to domain age is held by Mar Athanasius College. Saint Berchmans College possesses the newest domain registered on 2014.

The Table 1 also depicts web domain of the autonomous colleges. The current analysis found three different kinds of domain extensions. 60% of the college websites have the domain .ac. 20% of the autonomous college website have .edu domain and the remaining 20% of the autonomous college website have the domain extension .in.

Domain Authority and Page Authority

The Table 2 shows the individualized domains of autonomous college websites under Mahatma Gandhi University in Kottayam,

Kerala. Domain and page authority (SERPs), which predicts a website's position on search engine result pages, assigns a website a search engine ranking score of 100. A single DA score is created by combining a number of factors, such as the total number of links and connected root domains. In the WIF analysis, a strong authority is a topic page that is well-linked and popular. The result viewed that rajagiri.edu/ with the domain authority of 32.00 is the highest. shcollege.ac.in/ possesses the 2nd highest domain authority of 31.00. 3rd position is held by teresas.ac.in/ with a domain authority of 26.00. The final position is shared by macollege.in/ and sbcollege.ac.in/ with a domain authority of 23.00. In respect to the page authority rajagiri.edu/ holds the 1st position with a value of 43 and macollege.in/ with the lowest page authority of 36. teresas.ac.in/ and shcollege.ac.in/ holds the same page authority of 41.00 in the 2nd position. 3rd position is occupied by sbcollege.ac.in/ with a page authority of 38.00.

The Table 3 depicts the total links of the autonomous college websites under Mahatma Gandhi University in Kottayam, Kerala. Total links serves as the nominator in the calculation of Simple Web Impact Factor. Total links are obtained by adding the internal links and external links of a website. Here it is found that St. Theresa's College is in the 1st position in terms of total links with 626 links. Sacred Heart College, Saint Berchmans College and Mar Athanasius College obtained the 2nd, 3rd and 4th position with total links 320, 259 and 185 respectively. Rajagiri College of Social Sciences, Kalamassery holds the final position with 170 links.

Table 1: Autonomous College Websites Under Mahatma Gandhi University Kottayam, Kerala and the Web Domain.

Sl. No.	Name of the Institution	College Website	NAAC Grade and Point	Domain Registration Date	Web Domain Possessed
1	Rajagiri College of Social Sciences.	https://rajagiri.edu/	3.84-A++	05-02-2000	.edu
2	St. Theresa's College.	https://teresas.ac.in/	3.57-A++	05-04-2003	ac.in
3	Sacred Heart College.	https://www.shcollege. ac. in/	3.50-A+	19-01-2004	ac.in
4	Mar Athanasius College.	https://www.macolleg e.in/	3.52-A+	20-04-2007	.in
5	Saint BerchmansCollege.	https://sbcollege.ac.in/	3.41-A	21-05-2014	ac.in

Table 2: Domain Authority and Page Authority.

Sl. No.	Linking Root Domains	Domain Authority	Page Authority
1	rajagiri.edu/	32.00	43.00
2	teresas.ac.in/	26.00	41.00
3	shcollege.ac.in/	31.00	41.00
4	sbcollege.ac.in/	23.00	38.00
5	macollege.in/	23.00	36.00

The Table 3 reveals the in links or backlinks and referring domains of autonomous college websites under Mahatma Gandhi University in Kottayam, Kerala. The term "backlink" refers to a link to a website that was found on another website. It is observed that Sacred Heart College obtained 1st position with 50766 (69.255%) back links. Rajagiri College of Social Sciences holds the 2nd position with 11447 (15.616%) back links. St. Theresa's College and Saint Berchmans College holds the 3rd and 4th position with 5791 (7.900%) and 2552 (3.481%) backlinks. It is found that Mar Athanasius College holds the least number of backlinks with 2552 (3.481%).

Table 3 depicts the webpages of autonomous college websites under Mahatma Gandhi University in Kottayam, Kerala. St. Theresa's College is found to have 1st position having maximum number of webpages i.e. 15600 (57.39%). Rajagiri College of Social Sciences, Kalamassery secured 2nd rank with 3840 (14.12%) webpages and Sacred Heart College obtained 3rd position with 3550(13.06%) webpages. 4th position is held by Saint Berchmans College with 2630 (9.67%) webpages. Mar Athanasius College has the lowest number of webpages with 1560 (5.73%).

The Table 4 shows the Web Impact Factor of website of autonomous colleges under Mahatma Gandhi University. In terms of Simple Web Impact Factor, 1st position is obtained by Mar Athanasius College and last position is obtained by St. Theresa's College. Mar Athanasius College occupies 1st position in Internal Web Impact Factor and St. Theresa's College occupies the last position among the other four college websites. With respect to External Web Impact Factor Sacred Heart College is in the 1st position whereas St. Theresa's College obtains the final position.

The Table 4 presents the Revised Web Impact Factor of website of autonomous colleges under Mahatma Gandhi University. It is found that Sacred Heart College has the highest Revised Web Impact Factor of 14.300. The 2nd position is held by Rajagiri College of Social Sciences, Kalamassery having a Revised Web Impact Factor of 2.980. Mar Athanasius College has the 3rd highest Revised Web Impact Factor of 1.635. Saint Berchmans College obtained the 4th position with a value of 1.044. St. Theresa's College is in the final position with respect to Revised Web Impact Factor i.e. 0.371. Inlinks are more important than selflinks because selflinks are used simply for navigational purpose within the website but inlinks provide useful access to contents. In addition, inlinks increase a website's online visibility and possibly its traffic,

Table 3: Internal Links, External Links, Total Links, Back Links and Webpages.

Sl. No.	Name of the College	Internal Links	External Links	Total Links	Back Links	Number of Webpages
1	St. Theresa's College.	595	31	626	5791	15600
2	Sacred Heart College.	236	84	320	50766	3550
3	Saint Berchmans College.	208	51	259	2747	2630
4	Mar Athanasius College.	173	12	185	2552	1560
5	Rajagiri College of Social Sciences.	151	19	170	11447	3840

Table 4: Web Impact Factor.

Sl. No.	Name of the College	SWIF	IWIF	EWIF	RWIF
1	Rajagiri College of Social Sciences.	0.044	0.039	0.004	2.980
2	St. Theresa's College.	0.040	0.038	0.001	0.371
3	Sacred Heart College.	0.090	0.066	0.023	14.300
4	Mar Athanasius College.	0.118	0.110	0.007	1.635
5	Saint Berchmans College.	0.098	0.079	0.019	1.044

Table 5: Autonomous College Websites and their Global Alexa Rank.

Sl. No.	URL	Global Rank
1	shcollege.ac.in	228627
2	sbcollege.ac.in	289395
3	teresas.ac.in	457079
4	macollege.in	462289
5	rajagiri.edu	666264

Table 6: Load Time, Page Size and SEO Score of Websites of Autonomous College Websites.

Sl. No.	Name of the College	Load Time (s)	Page Size (kb)	SEO Score (100)
1	Rajagiri College of SocialSciences.	0.0021	106.7178	77
2	St. Theresa's College.	0.0053	351.8223	52
3	Sacred Heart College.	0.004	207.4004	73
4	Mar Athanasius College.	0.0073	83.5020	59
5	Saint Berchmans College.	0.0022	113.8994	43

as well as its coverage via web search engines and its position in list items.

The Table 5 displays Alexa global ranks for the top 5 NAAC ranking autonomous colleges under Mahatma Gandhi University in Kottayam, Kerala. Website popularity is determined by Alexa rank. With an Alexa Rank of 1, the most popular website among millions, IT ranks them in order of popularity. A valuable KPI for benchmarking and competitive analysis, Alexa Rank shows how a website is performing in relation to all other websites. According to Alexa, a website's score depends on how well it has performed in comparison to all other websites over the last three months. The result shows that Sacred Heart College is 1st in Alexa Rank globally (228627). Saint Berchmans College has 2nd rank with the value of (289395) The 3rd and the 4th ranking is held by the websites of St. Theresa's College (457079) and Mar Athanasius College (462289). Rajagiri College of Social Sciences, Kalamassery has received the lowest Alexa Rank globally (666264).

The Table 6 shows the Load Time, Page Size and SEO Score of the college websites. "Website Speed" is also known as "Website Load Time" and refers to the amount of time it takes a user to display an entire web page's content. It is also the time it takes for a web browser to retrieve the data from the server. The Rajagiri College of Social Sciences, Kalamassery website loads in 0.0021 sec, which reflects the shortest load time delay and highest user satisfaction. Mar Athanasius College website with 0.0073 sec load time delay is worst among all. Website of St. Theresa's College is the heaviest with page size of 351.8223 kb and Mar Athanasius College website has the lowest page size (83.5020). Rajagiri College of Social Sciences, Kalamassery ranks at the top with SEO score of 77 out of 100 among all the institutes. Saint Berchmans College is in the final position with an SEO score of 43 out of 100.

TESTING OF HYPOTHESIS

The perception of the website's reputation increases with increasing impact factors. Websites with greater impact factors is thought of as more prestigious or of higher quality than websites with lower impact factors and thus show a positive relation to NAAC ranking.

Web Impact Factor is not the ultimate measure of the quality of a website. It considers certain other factors such as age, popularity, language and visibility of the website. In the study, the results show that websites with higher NAAC grades obtained the 4th and 5th position in the Web Impact Factor and websites with lower NAAC grades showed a higher Web Impact Factor. Hence, the hypothesis is proved to be wrong.

DISCUSSION AND SUGGESTIONS

The quality of a website is dependent on its domain authority. To improve domain authority quality backlinks should be created and it is advised to develop unique and relevant content. The domain age is another factor impacting the domain authority. Mar Athanasius College and Saint Berchmans College with the lowest domain authority should increase the domain authority.

Colleges with a restricted amount of web pages can increase the number of their pages that are indexed by search engines, making it easier for users to access the information.

To improve the quality and relevance of the webpage, it is recommended to provide as much information and External links as possible for improved user communications. It is advisable for the competitors to refer to the website of Sacred Heart College having highest external links.

Colleges should also strive to construct a substantial number of inbound links or backlink, which would result in a higher inlink Web Impact Factor and a greater website's visibility on the World Wide Web.

In order to improve the backlink, it is suggested to recover the broken links, improve the website SEO by creating high quality and unique content and analyze the methods of the competitors in building backlinks.

Eventhough, Colleges with higher NAAC grade have lower impact factor, it have relevant and quality contents on their webpage, so websites having lower NAAC grade should refer to the quality contents of the competitors website. So, it is advisable to refer to the website of Rajagiri College.

In order to increase the google page speed, it is recommended to use appropriate image size, compression tools for larger files and a minifier tool for HTML, CSS and Java Script for optimizing a website. A highspeed website helps to generate revenue and increase site traffic. College websites with less speed is advised to utilize the above information.

Colleges' websites keep users informed of the most recent news and announcements, policy changes, the introduction of new courses and services and the installation of new facilities. These must be brought to the attention of website visitors as soon as possible.

Only a few websites have a date of last update. However, the date of last update speaks to the currency of a website and therefore, all websites should include this information. This is essential for an individual citing a webpage as a source of information and it also informs clients of the currency of the information they are using.

Standards for designing websites must be developed. It is essential for educational websites to reflect the high quality of the services and information resources they provide. The websites' future depends on the excellence of their web presence. It can be accomplished by maintaining certain standards and periodically evaluating websites accordingly.

It is suggested that when designing a website, one should ensure that the graphic quality is excellent, so as to improve the aesthetic quality of the webpages.

It is also advisable for the Saint Berchmans College, Mar Athanasius College and Sacred Heart College to provide links for library in the Home page itself.

CONCLUSION

It is found that the popularity and reputation of a website is not dependent on its impact factor. No institutional website is identified as the best satisfying all the webometric indicators and is distributed among different college websites that excel in particular prospects or area. Some college websites show a development in certain aspects of the web and other college websites which lack in the particular indicator should adopt methods to improve and perform better from the competitor's website especially in the quality of content. Eventhough, the website exhibits a low impact factor Rajagiri College of Social Sciences which is in the higher NAAC grade depicts a content rich and relevant website compared to the rest of the college websites. Similarly, St. Theresa's College which holds the 2nd position in NAAC ranking status obtained the final position in Simple Web Impact Factor, Internal Web Impact Factor as well as External Web Impact Factor. However, load time of the website and SEO score shows a positive relation towards the NAAC ranking with Rajagiri College of Social Sciences in the 1st position. On the other hand, the global Alexa Ranking shows a negative relation with Rajagiri College of Social Sciences on the final position and Sacred Heart College on the 1st position.

The significance that the library receives is also evident from the websites. The colleges with lower NAAC ranking have not included the links to the library in the home page itself. The priority given to the library is of great importance in determining the relative ranking of colleges. It is identified that Sacred Heart College, Mar Athanasius College and St. Berchmans College have not provided the links to the library on the homepage. Only Rajagiri College of Social Sciences and St. Theresa's College having higher NAAC rank have included links to the library on the home page indicating the quality and relevance of the website.

The Web Impact Factor, as described above, is a useful instrument for evaluating websites, but it must be used discreetly. Considerations include the number of web pages or other forms of content published on a website and the website's content. The status of a website's inclusion in search engine databases and the occurrence of a domain name change are also extremely essential. The WIFs are never accurate and are always approximations. The WIF of a website is unstable due to the fact that each day, some administrators remove old outlinks to other websites while others add new ones. The link impact is primarily a measure of scientific utility, not scientific quality and hence the WIF is still far from being a quality indicator. For the evaluation of scientific quality, there appears to be no alternative to qualified specialists perusing the website's materials. Therefore, those who are compelled to use this instrument for direct website comparisons should be encouraged to maintain an open mind and a sense of prudence, being mindful of its inherent limitation.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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