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A Webometric Analysis of Institute of Management Technology and Birla Institute of Technology & Science Libraries' Websites in Asia

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The present study examines the websites of different IMT Campuses Library and BITS Pilani Campuses Libraries in India and the United Arab Emirates. There are 4 Campus libraries of IMT and BITS Pilani in different States of India and the United Arab Emirates. All the campus libraries in India and abroad are having their websites. The study analyses the web pages, domain authority, equity-links, internal, external links, and web impact factor totaling to rank it. Out of 8 library websites, 6 websites have .ac domain extensions. A search engine optimization tool called link explorer (<https://moz.com/link-explorer>) developed by Moz.com is used to help to track the links leading to the website. Based on the overall WIF, BITS Pilani Hyderabad Campus Library stands at the first position with 1476417.08 SWIF followed by the BITS Pilani Campus Library website which is in the second place with 1307683.71 SWIF.

1 INTRODUCTION

Institutions have their websites to mention all the information related to that Institution. The library is an integral part of any institution so; library website of any institution has become a vital information resource for the academic people. Library websites play an important role to communicate the

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academic world through the providing of fruitful & relevant information. Libraries are using the latest available technologies to collect & preserve information and adopting “websites in the era of technology boom”¹. It is assumed that the websites of libraries function as “the gateway to information resources and internet being the medium of communication”. As the gateway to “information resources and Internet”, the academic library websites are the modern medium of communication. A library website is its virtual public face², by acting “as a front door, signage, pathfinders, doors to the collections, services, and to an extent, its people”.

As the library websites are the parallel “host of other Internet services and organizations for clientele”, by capturing and motivating the user; “provide useful, innovative and interactive services and products; give the library some form of identity; and encourage repeat visitation while holding the interest of users and simplifying their tasks”² in the LIS profession webometric has become a main area of research. During the past few years, several webometric-based researches with the help of webometric tools have been conducted to evaluate different institutions and libraries’ websites. This paper is an attempt to evaluate the IMT Campuses library and BITs Pilani Campuses library websites and rank them on their WIF orderly basis.

1.1 WEBOMETRICS

The term ‘webometrics’, first coined and invented by Almind & Ingwersen^{3,4} in 1997, allows studying “the quantitative aspects of the construction and use of information resources, structures and technologies on the Web drawing on bibliometric and informetric approaches.” As defined by Björneborn and Ingwersen⁵, Thelwall⁶ has been introduced the second definition of webometrics “the study of web-based content with primarily quantitative methods for social science research goals using techniques that are not specific to one field of study” which has given weightage to the development of various applied methods for application in the field of social sciences.

Webometrics has become a useful methodology in many fields, such as the creation of ranking of organizations/ Institutions/ libraries in the world based on webometrics. Researches in this field imply the creation of discoveries that are based on the structure of the World Wide Web, analyses of numbers and types of hyperlinks, and patterns of usage of the web as a mass communication medium and exchange of information⁷.

1.2. INSTITUTE OF MANAGEMENT TECHNOLOGY

Shri Mahendra Nath founded The D.K. Nath Public Trust to create and support trade schools and institutes of higher education. The trust helped to establish IMT with financial support from the Lajpat Rai Educational Society in 1980. IMT got the approval of AICTE in 1983 and became an autonomous, not-for-profit Management Institution offering postgraduate programs in management for over the past forty years. After the success of IMT Ghaziabad, IMT has expanded its branches in different parts of India as well as abroad. IMT has expanded and established its branches in IMT Nagpur (2004); IMT Dubai (2006) and IMT Hyderabad (2011)⁸.

1.3. BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI (BITS PILANI)

Birla Education Trust was offering postgraduate courses in 1929. Then, a Masters's program in electronics initiated in 1955. It became a Deemed University as per the UGC Act in June 1964 and the Birla Colleges of Humanities, Commerce, Engineering, Pharmacy, and Science came together to form the Birla Institute of Technology and Science.

Backed by the Aditya Birla Group, Institute was established in its present form in 1964. BITS extended and established its other campuses in Dubai (2000), Goa (2004), and Hyderabad (2008). With the extension of a campus in Dubai, it has become the 1st international deemed university, leading in engineering, science, and research with 15 academic departments and 4 established campuses. It mainly concentrates on research and higher education in engineering and sciences. Its wealth, history, influence, and endowments have made it one of India's most esteemed universities⁹.

Sl. No.	Library	Website	Place	Year of Establishment
1	IMT Ghaziabad Library	https://www.imt.edu/library/	UP	1980
2	IMT Nagpur Library	https://www.imtnagpur.ac.in/LRC	Maharashtra	2004
3	Dubai Library IMT	http://library.imt.ac.ae/	United Arab Emirates	2006
4	IMT Hyderabad Library		Telangana	2011
5	BITS Pilani Campus Library	https://www.bitspilani.ac.in/library	Rajasthan	1964
6	BITS Pilani Dubai Campus Library	http://library.bits-dubai.ac.ae/	United Arab Emirates	2000
7	BITS Pilani Goa Campus Library	https://www.bits-go.a.ac.in/Library/Index.aspx	Goa	2004
8	BITS Pilani Hyderabad Campus Library	https://www.bits-pilani.ac.in/library	Telangana	2008

2 LITERATURE REVIEW

Ingwersen⁴ investigated the reliability and feasibility of calculating impact factors for websites, called Web Impact Factors (Web-IF). The study analyzed a selection of seven medium and small-scale national and four large web domains as well as six institutional websites over a series of snapshots taken of the web during a month. Thelwall⁶ discussed that the value of webometrics quickly became established through the Web Impact Factor, the key metric for measuring and analyzing website hyperlinks. Link analysis became more focused on link impact analysis and link network analysis, taking the number of links as a reflection of research productivity or prestige. Gadhavi¹⁰ conducted a study, which is based on the content analysis of library websites of 8 institutes of national importance in Gujarat. Various aspects related to the content of the library websites have been examined which are “collection, services, online resources, technology usage (especially social media), etc. Muthuraja and Veerabasavaiah¹¹ conducted a study to evaluate the Kannada language newspaper websites. The 10 leading Kannada language newspaper websites from the state of Karnataka were taken for evaluation with the help of Alexa databank and relevant data including traffic rank, pages viewed, speed, links, and bounce percentage, time on site, search percentage, and percentage of Indian/foreign users were collected and these data were tabulated and analyzed”. It was observed that that Vijayakarnataka has 2,255 the highest traffic rank in India Udayavani has 27,903 the highest traffic rank in global. Vijaya Karnataka has 7.32 having the highest number of average pages viewed per day and 12:40 estimated daily time spent on site by the visitor. ¹² evaluated “websites of the top-ranked management institutes in the country listed by National Institutional Ranking Framework (NIRF)” in 2017. The basis of this webometric analysis was Calculates the Web Impact Factor, number of WebPages, domain authority, and links. It was found that IIT Kharagpur has “the highest domain authority (75), page authority (699), and external equity-passing links (EE-PLs) (700) whereas IIT Kanpur has the highest internal equity-passing links (IE-PLS) (6643) and total passing links (6869)”. With the 149.30 WIF, the IIT Kanpur library website was ranked first, which has been followed by IIM Kashipur with 73.66 WIF and IIT Roorkee with 71.27 WIF. Ramanayaka, Chen, and Chi¹³ conducted research and concluded that “a library website plays an enhanced role compared to its traditional physical library while providing a wide variety of library services to its users. Evaluation of library websites is a key to realize the extent of user acceptance of the website and to improve the overall quality of the website”. With the help of “a framework for ranking university library websites in Sri Lanka based on two standard webometric

methods”; and the framework consists of “quantitative web presence measuring attributes namely; size, visibility, rich files and scholars along with simple and comprehensible mathematical calculations”. The effective presence of library websites on the internet has an impact regarding the “permeability through web search tools” and accordingly the quantity of received external links. Brahma and Verma¹⁴ examined the websites of 9 selective influential and iconic public libraries of India. The study analyzed the total number of “WebPages, domain authority, equity-links, internal and external links and web Impact factor” and explored that the National Library of India topped with highest Page Authority, Total Linking Root Domains, “highest External Equity- Passing links, Total Equity- Passing Links, Total External Links, Total Links, Followed Linking Root Domains and highest Linking C Blocks”. The overall WIF of the National Library of India Topped with 92.90 SWIF & EWIF, on the other hand, Nehru Memorial Museum and Library stood second place 15.82 SWIF and 15.35 IWIF among 9 selected Iconic Public libraries of India. Stephen¹⁵ conducted a research and found “the traffic rank in India, especially Central Universities of North East Region, the best ranked Central University of North East Region are NEHU and TU with traffic ranks of 8484 and 8511 respectively. In this study it was discerned that Nagaland University has the highest number of average pages viewed by users per day”, followed by Sikkim University which had “highest upstream site of Google among other Central Universities of North East Region in India”, and it is observed that North-Eastern Hill University (NEHU) and Sikkim University (SU) belong to the higher rate of bounce percentage.

3 SIGNIFICANCE AND SCOP

A significant number of webometric analyses study have been conducted in India as well as abroad on different institute websites/ library websites to analyze and evaluate the websites, but no detailed study has been conducted on private management institutes library websites. Thus, a webometrics study was planned of Institute of Management Technology and Birla Institute of Technology & Science Pilani Libraries’ websites in Asia which have multi city branches and each branch institute have independent library and library website to fulfill the research gap. The study covers the webometric analysis of the Institute of Management Technology and Birla Institute of Technology & Science Pilani Libraries’ websites in Asia.

4 OBJECTIVES

1. Analyze the URL of Institute of Management Technology and Birla

Institute of Technology & Science Pilani Libraries' websites in Asia

2. Calculate the number of Webpages, domain authority & Total links of Institute of Management Technology and Birla Institute of Technology & Science Pilani Libraries' websites in Asia
3. Find out the internal and external link pages of the Institute of Management Technology and Birla Institute of Technology & Science Pilani Libraries' websites in Asia
4. Calculate the WIF of Institute of Management Technology and Birla Institute of Technology & Science Pilani Libraries' websites in Asia

5 METHODOLOGY

To discern closely in the research area, an observation method was applied for research methodology to collect research data from the selected library websites of Institute of Management Technology and Birla Institute of Technology & Science Pilani' in Asia by using a search engine optimization tool called link explorer (<https://moz.com/link-explorer>) developed by Moz.com that helps to track the links leading to the website. The data was collected on 15th December, 2020. As one of the significant tools to provide data richness by "gathering, sorting and exporting link data easier", has been possible due to speed and accessibility for data collection while the researcher looks forward to the vast amount of data, information connected by a big number of hyperlinks.

5.1 METHOD OF CALCULATING WEB IMPACT FACTOR

Various impact factors such as the Simple web impact factor, Internal web impact factor, and External web impact factor have been visualized as the result of the web impact factor. Ingwersen introduced one relatively straightforward measure, Web Impact Factor (WIF) in 1998. The WIF measure may be defined as the number of web pages in a website receiving links from other websites, divided by the number of web pages published in the site that are accessible to the crawler.

The following formula has been applied for the calculation of "Distribution of Data by SWIF":

$$SWIF = \frac{\text{Total No. of Links}}{\text{Total No. of Webpages}}$$

Calculation of "Distribution of Data by IWIF" as the formula was applied:

$$IWIF = \frac{\text{Total No. of Internal Links}}{\text{Total No. of Webpages}}$$

The following formula has been used for the calculation of “Distribution of Data by EWIF”:

$$\text{EWIF} = \frac{\text{Total No. of External Links}}{\text{Total No. of Webpages}}$$

6 DATA ANALYSIS

6.1. URL Analysis of Institute Of Management Technology and Birla Institute Of Technology & Science Pilani Libraries’ Websites In Asia

Table 6.1 shows the domain extensions which are used by the eight library websites which were taken for the study. Out of 8 library websites, 6 websites of IMT Nagpur Library, IMT Dubai Library, BITS Pilani Campus Library, BITS Pilani Dubai Campus Library, BITS Pilani Goa Campus Library, BITS Pilani Hyderabad Campus Library (75%) websites have .ac and 2 websites of IMT Ghaziabad Library and IMT Hyderabad Library (25%) have .edu extensions.

Table: 6.1. TLDs of Institute of Management Technology and Birla Institute of Technology & Science Pilani Libraries’ websites in Asia

Sl. N o.	Library	Uniform Resource Locator (URL)	Domain Extensions
1	IMT Ghaziabad Library	https://www.imt.edu/library/	.edu
2	IMT Nagpur Library	https://www.imtnagpur.ac.in/LRC	.ac
3	IMT Dubai Library	http://library.imt.ac.ae/	.ac
4	IMT Hyderabad Library	https://www.imthyderabad.edu.in/learning-resource-center-lrc	.edu
5	BITS Pilani Campus Library	https://www.bits-pilani.ac.in/library	.ac
6	BITS Pilani Dubai Campus Library	http://library.bits-dubai.ac.ae/	.ac
7	BITS Pilani Goa Campus Library	https://www.bits-go.a.ac.in/Library/Index.aspx	.ac
8	BITS Pilani Hyderabad Campus Library	https://www.bits-pilani.ac.in/hyderabad/bitsLibrary	.ac

6.2. DOMAIN & PAGE AUTHORITY OF INSTITUTE OF MANAGEMENT TECHNOLOGY AND BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE PILANI LIBRARIES’ WEBSITES IN ASIA

The domain authority measures the strength of entire domains or subdomains of the website and the page of the website helps the predictive ranking strength of a single webpage. Table 6.2 shows the domain authority

and page authority of the Institute of Management Technology and Birla Institute of Technology & Science Pilani Libraries' websites in Asia. The website of BITS Pilani Campus Library and BITS Pilani Hyderabad Campus Library with 53, followed by IMT Ghaziabad Library with 41 and IMT Nagpur Library, IMT Hyderabad Library website with 32. BITS Pilani Dubai Campus Library website is at the lowest rank with 26. In terms of page authority, the website of BITS Pilani Campus Library and IMT Ghaziabad Library are at the first rank with 35, followed by BITS Pilani Goa Campus Library with 32. IMT Hyderabad Library and IMT Hyderabad Library website is at the lowest rank with 21.

Table:6.2. Domain & page authority of Institute of Management Technology and Birla Institute of Technology & Science Pilani Libraries' websites in Asia

Sl. No.	Library	Domain Authority	Page Authority
1	IMT Ghaziabad Library	41	35
2	IMT Nagpur Library	32	21
3	IMT Dubai Library	29	28
4	IMT Hyderabad Library	32	21
5	BITS Pilani Campus Library	53	35
6	BITS Pilani Dubai Campus Library	26	31
7	BITS Pilani Goa Campus Library	25	32
8	BITS Pilani Hyderabad Campus Library	53	31

6.3. INTERNAL FOLLOWED LINKS, EXTERNAL FOLLOWED LINKS, AND TOTAL LINKS

Table-6.3. represents the total links of 8 library websites of the Institute of Management Technology and Birla Institute of Technology & Science Pilani Libraries' websites in Asia. Total internal links of the BITS Pilani Campus Library and BITS Pilani Hyderabad Campus Library with 4,53,99,087 are the highest. IMT Hyderabad Library website occupies the second rank with 3,29,859 internal links and the IMT Ghaziabad Library website is at the 3rd rank with 2,07,809. Total external links of BITS Pilani Campus Library and BITS Pilani Hyderabad Campus Library website with 3,69,843 are the highest followed by IMT Ghaziabad Library with 1,30,157. BITS Pilani Campus Library and BITS Pilani Hyderabad Campus Library websites get the highest total links with 4,57,92,272 followed by IMT Ghaziabad Library website with 3,42,405 and IMT Hyderabad Library website with 3,41,379. BITS Pilani Goa

Campus Library website is at the lowest place with 15,139.

Table: 6.3. Internal followed links, external followed links, and total links of Institute of Management Technology and Birla Institute of Technology & Science Pilani Libraries' websites in Asia

Sl. No.	Library	Internal Followed Links	External Followed Links	Total Links
1	IMT Ghaziabad Library	2,07,809	1,30,157	3,42,405
2	IMT Nagpur Library	41,286	6,823	49,686
3	IMT Dubai Library	34,379	2078	44,501
4	IMT Hyderabad Library	3,29,859	5,537	3,41,379
5	BITS Pilani Campus Library	4,53,99,087	3,69,843	4,57,92,272
6	BITS Pilani Dubai Campus Library	5,945	18,663	25,112
7	BITS Pilani Goa Campus Library	4,416	6,949	15,139
8	BITS Pilani Hyderabad Campus Library	4,53,99,087	3,69,843	4,57,92,272

6.4. WEB IMPACT FACTOR OF INSTITUTE OF MANAGEMENT TECHNOLOGY AND BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE PILANI LIBRARIES' WEBSITES IN ASIA

Table-7.4. represents the Web Impact Factor (WIF) of selected 8 library websites of ICSSR and calculates the Simple Web Impact Factor (SWIF), External Web Impact Factor (EWIF), and Internal Web Impact Factor (IWIF) and shows that the BITS Pilani Hyderabad Campus Library occupies the first place with 1464486.67 IWIF followed BITS Pilani Campus Library which is at the second position with 1297116.77 IWIF and IMT Hyderabad Library with 1297116.77 IWIF. In ranking based on External Web Impact Factor (EWIF), BITS Pilani Hyderabad Campus Library website is in the first place with 11930.41EWIF followed by BITS Pilani Campus Library website which is at the second rank with 10566.94 and IMT Ghaziabad Library website with 3718.7EWIF. Based on the Simple Web Impact Factor (SWIF), BITS Pilani Hyderabad Campus Library occupies the first position with 1476417.08 SWIF followed by BITS Pilani Campus Library website which is at the second place with 1307683.71 SWIF and IMT Hyderabad Library is in third position with 15971.27SWIF. IMT Dubai Library occupies the last position with 302.03 followed by BITS Pilani Goa Campus Library with 355.15.

Table: 6.4. Web Impact Factor of Institute of Management Technology and Birla Institute of Technology & Science Pilani Libraries' websites in Asia

Sl. No.	Library	Internal WIF	External WIF	Simple WIF
1	IMT Ghaziabad Library	5937.4	3718.7	9656.1
2	IMT Nagpur Library	1966	24.9	1991
3	IMT Dubai Library	227.82	74.21	302.03
4	IMT Hyderabad Library	15707.57	263.7	15971.27
5	BITS Pilani Campus Library	1297116.77	10566.94	1307683.71
6	BITS Pilani Dubai Campus Library	191.77	602.03	793.8
7	BITS Pilani Goa Campus Library	138	217.15	355.15
8	BITS Pilani Hyderabad Campus Library	1464486.67	11930.41	1476417.08

6.5. RANKING OF RESEARCH LIBRARIES BASED ON WEB IMPACT FACTOR

Table 6.5. represents the ranking of research institutes based on WIF. Here, overall WIF is taken for analysis. Based on the overall WIF, BITS Pilani Hyderabad Campus Library stands at the first position with 1476417.08 SWIF followed by BITS Pilani Campus Library website which is at the second place with 1307683.71 SWIF and IMT Hyderabad Library is in the third position with 15971.27 SWIF. BITS Pilani Goa Campus Library occupies the last position with 355.15.

Table: 6.5. Ranking of Research Libraries based on Web Impact Factor

Sl. No.	Institute	WIF
1	BITS Pilani Hyderabad Campus Library	1476417.08
2	BITS Pilani Campus Library	1307683.71
3	IMT Hyderabad Library	15971.27
4	IMT Ghaziabad Library	9656.1
5	IMT Nagpur Library	1991
6	BITS Pilani Dubai Campus Library	793.8
7	BITS Pilani Goa Campus Library	355.15
8	IMT Dubai Library	302.03

7 DISCUSSION

The webometric study is all about studying the web pages, information resources, structures, and technologies. It is an important segment in the field of library and information science, where many studies have already been conducted on various aspects of webometrics by many information professionals. The bibliometrics, scientometrics, informetrics, and webometrics studies are interrelated to each other. The content analysis which is a study of web documents in the website is also a part of webometrics. The present study focuses on the websites of IMT and BITS Pilani Campuses Libraries of India and Dubai and it is found that Websites of BITS Pilani Library and BITS Pilani Hyderabad Campus Library are famous among 8 IMT and BITS Pilani Campus Libraries. It is observed that the Internal Web Impact Factor of BITS Pilani Hyderabad Campus Library and BITS Pilani Campus Library is very high. It is also observed that the Web Impact factor of IMT Dubai Campus Library, BITS Pilani Goa library, and BITS Pilani Dubai Library are very low. These three Campus Library needs to be improved. The page authority of IMT Nagpur Library and IMT Hyderabad Library Website needs to be improved to get the higher page score rank. Nowadays, any well-reputed higher educational Institutions' websites have become an integral and pivotal part of providing basic and relevant information among academic people and play a vital role in communicating useful and current information. In this digital age, academic institutions should have attractive Websites, so that users need to gather the information within a second.

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