

WEBOMETRIC ANALYSIS OF WEBSITES OF CENTRAL UNIVERSITIES OF EASTERN INDIA: A STUDY

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Abstract

The study presents the webometric analysis of the websites of 7 Central Universities of the Eastern India region. The study aims to identify and evaluate the web presence, domain name, Domain Authority, Page Authority, Google PageRank, Rich files, Language, and Social Media presence of the selected websites under study. To accomplish the objectives of the study, the Google search engine, some search engine optimization (SEO) tools, and manual website visits have been used to analyse the websites under study. Major findings of the study include that all universities' websites have the same Google PageRank value i.e. 4, the website of Visva Bharti has the highest Domain Authority, Central University of Jharkhand's website has the highest Page Authority, the website of Nalanda University is the single website which uses only one language, i.e. English. All universities have their presence on social media at different platforms. The study is unique and latest in the website analysis category. Very few webometric studies have been conducted on the universities of the Eastern region of India. This study is an effort to fill this gap. The present study concluded with some suggestions that will be helpful for Policy-makers and Website developers to enhance their websites and their visibility on the Web.

Keywords: Webometrics; Web Analysis; Domain Analysis; Search Engine Optimization; Moz; Rich Files; Academic Institutions

1. Introduction

After Bread, Cloth, Shelter, and Library, the Internet has become the need of today's information society. Nowadays, the Internet is a significant and fastest medium of communication and information transmission. The World Wide Web (WWW) has become a crucial source of information for study, research and academic activities. It is the outcome of Information and Communication Technology (ICT). The World Wide Web is the reason behind the emergence of Webometrics. Earlier, people mostly used the Internet for

scholarly communications, which increased the range and slowly vanished the geographical boundaries in the distribution of research publications. We get any information from the Web through websites. A website gives 24/7 accessibility and convenience in accessing from anywhere, at any time. It is also useful for remote users to know about the organization without visiting physically, and it increases credibility among the users or visitors. To evaluate the websites, 'Webometric' is a widely used form of

bibliometric approach which deals with the metrics of websites.

In 1997, Tomas C. Almind and Peter Ingwersen first used the term "Webometrics". "Webometrics" consists of two words 'web' and 'metrics'. Webometrics is concerned with measuring aspects of the Web i.e. websites, web-pages, words in web-pages, parts of web-pages, hyperlinks, web search engine results etc. In the Webometric study, analysis of websites is performed in various ways. The characteristics and capabilities of the websites are also checked to satisfy the end-users globally through the Web. The webometrics study helps both Computer Science and Information Science.

2. Literature Review

Dinda & Rahman (2023) did a webometric analysis of the websites of 9 Library and Information Networks in India. Various data from the websites including page structure, quality, performance score, SEO score, external and internal links, domain analysis and website traffic were evaluated for the study. It was found that INFLIBNET, NICNET, ERNET, ADINET, and NKN are the most popular networks in India among them.

Meghwal, Chaparwal & Rajput (2023) studied the top 10 University Websites in India according to NIRF (National Institute of Ranking Framework) Ranking 2023. The major findings of the study were that the Indian Institute of Science University website had the highest Domain Authority (DA) score of 62 out of 100, and the website of Amrita Vishva Vidhyapeetham University has the oldest Domain Name (PA).

Nandi, Das & Mandal (2023) did a webometric study of National level Divyangjan Institutes of India. Some webometric indicators such as total web page count, in-links, out-links, bounce rate, number of rich files, etc. were used to conduct the study. Institute NILD is the highest-ranked Web Impact Factor (in-link). According to Web Indicators for Science, Technology and

Innovation Research (WISER), the NIEPMD institute had the highest webpage value.

Paul & Singh (2023) evaluated the websites of 24 Indian Institute of Information Technologies (IIITs). The web presence, domain authority, page authority, and Google PageRank were investigated in the study using search engine tools Moz and Google PageRank. It was found that IIIT, Allahabad has the highest domain and page authority among all, and all websites had the same domain name of ".ac.in".

Uttkarsh, Sen & Kritika (2022) analysed the websites of 64 Indian Council of Agricultural Research (ICAR). Researchers checked the web presence, websites' languages, analysed the domain and drew a network diagram of linked ICAR-Institutions. For visualization of websites, ScoSciBot4 were used and it was found that ICAR ICAR Central Institute of Freshwater Aquaculture (CIFA), Bhubaneswar was linked with 6 other institutes' websites.

Uttkarsh & Sonkar (2021) did a webometric analysis of National Importance Libraries and Archives of India. Researchers analysed the websites on the basis of rich files, network diagram, social media presence and languages. Google Search Engine, SocSciBot4, and Alexa Internet tools were used in the study to collect the required data. The study found that Tibetan Studies has the lowest bounce rate (50%), and the National Archives of India has the highest number of rich files, i.e. 506. The National Archives of India is connected to 4 other websites.

Verma & Brahma (2017) examined the websites of 10 Central Universities situated in North-East India. The study analysed the Web Impact Factor (WIF) and calculated the link and web pages of the websites of Central universities in North-East India. The study found that Tezpur University secured 1st place with the highest Domain and Page Authority. Meanwhile, Mizoram University leads with the highest Total Internal Links and Internal Equity-Passing Links. The WIF of Mizoram University was the highest among all.

3. Scope of the Study

The scope of the present study is limited to the websites of the central universities of the eastern states of India. Presently there are seven (7) central universities situated in the eastern states,

including Bihar (4), Jharkhand (1), Odisha (1) and West Bengal (1) [Source: (https://www.ugc.ac.in/oldpdf/Consolidated_CENTRAL_UNIVERSITIES_List.pdf). These seven universities with their respective states are given below in Table 1:

Table 1: Showing the List of Central Universities of Eastern India

Sl. No.	States of Eastern India	Central University
01.	Bihar	Central University of South Bihar, Gaya
02.		Mahatma Gandhi Central University, Motihari
03.		Dr. Rajendra Prasad Central Agricultural University, Samastipur
04.		Nalanda University, Nalanda
05.	Jharkhand	Central University of Jharkhand, Ranchi
06.	Odisha	Central University of Odisha, Koraput
07.	West Bengal	Visva Bharati University, Shantiniketan

4. Objectives of the Study

- (i) To identify the web presence of the universities under study.
- (ii) To identify the domain of the universities' websites under study.
- (iii) To rank the websites on the basis of Rich Files using Google query syntax.
- (iv) To evaluate the number of Domain Authority (DA), and Page Authority (PA) of the websites.
- (v) To find out the Google PageRank of the websites under study.
- (vi) To find out the languages used by university websites under study.
- (vii) To find the presence of the universities on social media and their engagement on social media.

5. Methodology

The current study is intended to analyse the 7 websites of Central Universities of Eastern India. Manual website visits, Google search engine advanced query syntax

(www.google.com), Search Engine Optimization (SEO) tools viz., Link Explorer (<https://moz.com/link-explorer>) and Check PageRank (<https://checkpagerank.net/>) were used to collect the required data. The data required for the present study was collected from January 08, 2024 to January 10, 2024.

6. Results and Discussion

6.1 Web Presence

The online existence of any individual, organisation, institution, company, or any other entity on the World Wide Web (WWW) is known as their web presence. This web presence can be made in numerous ways and by numerous people, thus to distinguish them from one another. Each web presence has its own unique web address known as Uniform Resource Locator (URL). Table 2 presents all seven central universities with their website URLs, which shows their presence on the World Wide Web or simply the Web.

Table 2: Availability of Websites of Central Universities of Eastern India

S. N.	Universities	Website Links
1.	Central University of South Bihar (CUSB)	https://www.cusb.ac.in/
2.	Mahatma Gandhi Central University (MGCU)	https://mgcub.ac.in/
3.	Dr. Rajendra Prasad Central Agricultural University (RPCAU)	https://www.rpcau.ac.in/
4.	Nalanda University	https://nalandauniv.edu.in/
5.	Central University of Jharkhand (CUJ)	https://cuja.ac.in/
6.	Central University of Odisha (CUO)	https://cuo.ac.in/
7.	Visva Bharati University	https://visvabharati.ac.in/index.html

From Table 2, it is observed that all central universities of eastern India have their web presence with their own website. After visiting all individual websites, it is also found that all websites are properly functional and updated.

6.2 Domain Analysis

A domain name is the unique name of a website. It is an easy-to-remember address used to access websites on the World Wide Web (WWW).

Top-Level Domain (TLD): In Domain Name System (DNS), a top-level domain (TLD) is the last part that comes just after the ‘dot’ in the domain name or simply any URL. TLD is the last segment of text that follows the final dot (.) of a domain name. For example, in the domain names ‘facebook.com’ and ‘wikipedia.org’, “.com” and “.org” are the TLDs respectively. Similarly, ‘.edu’, ‘.net’, ‘.gov’, ‘.ac.in’, and ‘.nic.in’ are the other popular examples of TLDs. Top-level Domain is also known as suffixes. Each and every TLD

has its own registration under the Internet Corporation for Assigned Names and Numbers (ICANN).

There are different types of TLDs, but it is mainly categorized into two parts: -

i. Generic Top-Level Domains (gTLDs):

Generic top-level domain is one of the most popular TLDs. gTLDs are available for registration. ICANN used to heavily restrict the creation of new gTLDs, but in 2010 these restrictions were relaxed. Now there are hundreds of lesser-known gTLDs, such as ‘.xyz’, ‘.top’, and ‘.loan’. Earlier, there were only seven generic top-level domains (gTLDs), including .com, .gov, .edu, .net, .org, .int, and .mil.

ii. Country-code Top-Level Domains (ccTLDs):

Country-code Top-level domain used for the representation of country. Each ccTLD is associated with a specific country. Some examples of ccTLDs are ‘.in’ for India, ‘.au’ for Australia, ‘.uk’ for the United Kingdom, and ‘.jp’ for Japan.

Table 3: URL Domain Analysis of the Websites of Central Universities of Eastern India

S.N.	Universities	Website Links/URL	Top-Level Domain (TLDs)	
			gTLDs	ccTLDs
1.	CUSB	https://www.cusb.ac.in/	.ac	.in
2.	MGCU	https://mgcub.ac.in/	.ac	.in
3.	RPCAU	https://www.rpcau.ac.in/	.ac	.in
4.	Nalanda University	https://nalandauniv.edu.in/	.edu	.in
5.	CUJ	https://cuja.ac.in/	.ac	.in
6.	CUO	https://cuo.ac.in/	.ac	.in
7.	Visva Bharti	https://visvabharati.ac.in/index.html	.ac	.in

gTLD= Generic Top-Level Domain; ccTLD= Country Code Top-Level Domain

Table 3 shows the domain name or Top-Level Domains (TLDs) of the websites of central universities of eastern India. Here, gTLDs and ccTLDs are two sub-divisions of the TLDs. Among all these seven universities, six universities use the same Generic Top-Level Domain (gTLD) name of ".ac", while only Nalanda University uses ".edu". All these universities are situated in India, so they use ".in", Country Code Top-Level Domain (ccTLD). The domain name ".ac.in" represents the academic institutions' websites in India, and the domain name ".edu.in" represents the educational institutions' websites in India.

6.3 Rich Files

Rich files are various types of file formats of electronic documents. For this study, there are four rich file formats: viz. '.doc', '.pdf', '.ppt', and '.ps' were selected, retrieved and tabulated. Google, which is the largest and most popular search engine, was used to collect raw data for this research to analyse the rich files of the selected websites. Google provides some query syntax to extract data from the Web. The four syntaxes used to acquire the necessary data are shown in Table 4.

Table 4: Google Query Syntax for Rich Files

S. N.	Types of Files	Syntax
1.	Microsoft Word (.doc)	site: URL filetype:doc
2.	Adobe Acrobat (.pdf)	site: URL filetype:pdf
3.	Microsoft PowerPoint (.ppt)	site: URL filetype:ppt
4.	Adobe PostScript (.ps)	site: URL filetype:ps

.doc= word document files; .pdf= portable format files; .ppt= power point presentation; .ps= PostScript

Table 5: Rich Files of the Websites of Central Universities of Eastern India

S. N.	Universities	.doc	.pdf	.ppt	.ps	Total	Rank
1.	CUO	4,670	24,80,000	3	0	24,84,673	1
2.	CUJ	189	1,82,000	0	1	1,82,190	2
3.	Visva Bharti	41	82,900	0	0	82,941	3
4.	CUSB	3	21,900	0	0	21,903	4
5.	MGCU	1	7,860	0	0	7,861	5
6.	RPCAU	8	7,300	0	0	7,308	6
7.	Nalanda University	3	2,060	0	0	2,063	7

Table 5 is explicit that most of the rich files are pdf format files. Central University of Odisha (CUO) with a total number of 24,84,673 rich files, placed in the first rank which include 24,80,000 pdf files, 4,670-word (.doc) files and only 3 ppt files. The second rank was secured by the Central University of Jharkhand (CUJ) with a total number of 1,82,190 rich files, including 1,82,000 pdf files, 189-word (.doc) files and single .ps files. Similarly, Visva Bharti ranked third with a

total of 82,941 rich files, including 82,900 pdf files and 41 doc files.

6.4 Data Collection through Open Site Explorer

Open Site Explorer is a product of Moz.com. It is a free search engine optimization (SEO) tool. Link Explorer (<https://moz.com/link-explorer>) is the current version of Open Site Explorer, and it uses new tools to analyse the links. Link Explorer uses a

“Dotbot” crawler to crawl the Moz collection of Google Search Engine Result Pages (SERPs). Using Open Site Explorer, the data of domain authority and page authority of 7 central universities’ websites under study was collected on January 08, 2024.

Domain Authority measures the strength of entire domains or websites; while Page Authority measures the ranking strength of a single page of the website. Both metrics are calculated using the same algorithm or methodology. Google does not consider Domain Authority and Page Authority for website ranking.

6.4.1 Domain Authority

Domain Authority (DA) provides the rank or performance of any specific website on Google search engine result pages (SERPs) at the domain level. Domain Authority score ranges from 1 to 100. Thus, the websites with high domain authority will be on the top of SERP. The websites having high-quality external links score high domain authority. Webmasters use domain authority to compare their own websites with other competitive websites.

Table 6: Domain Authority of the Websites

S. N.	Universities	Domain Authority	Rank
1.	Visva Bharati University	42	1
2.	Nalanda University	39	2
3.	Central University of Jharkhand	36	3
4.	Mahatma Gandhi Central University	35	4
5.	Central University of Odisha	35	4
6.	Central University of South Bihar	34	5
7.	Dr. Rajendra Prasad Central Agricultural University	34	5

The rank of 7 websites of Central Universities of Eastern India as per Domain Authority (DA) is shown in Table 6. Visva Bharati University got the first rank with the highest domain authority of 42; after that, Nalanda University got the rank 2 with domain authority of 39, and Central University of Jharkhand got the third rank with domain authority of 36. Mahatma Gandhi Central University and Central University of Odisha both got the rank fourth with domain authority of 35. The Central University of South Bihar

and Dr. Rajendra Prasad Central Agricultural University both ranked fifth with the lowest domain authority value of 34.

6.4.2 Page Authority

Page Authority (PA) is a score developed by Moz. It provides the rank or performance of a specific page of any website on Google search engine result pages (SERPs) at the page level. Page Authority scores range from 1 to 100. Thus, the specific page that has a high Page Authority will be on the top of SERP.

Table 7: Page Authority of the Websites’ Homepage

S. N.	Universities	Page Authority	Rank
1.	Central University of Jharkhand	46	1
2.	Nalanda University	45	2
3.	Visva Bharati University	45	2
4.	Central University of Odisha	44	3
5.	Central University of South Bihar	43	4
6.	Mahatma Gandhi Central University	42	5
7.	Dr. Rajendra Prasad Central Agricultural University	42	5

The rank of 7 Central Universities of Eastern India websites as per Page Authority (PA) of their homepages is shown in Table 7. The Central University of Jharkhand got the first rank with the highest Page Authority of 46. Nalanda University and Visva Bharti both secured the second rank with Page Authority of 45; then Central University of Odisha got the third rank with Page Authority value of 44. The Central University of South Bihar got the fourth rank with Page Authority of 43. Mahatma Gandhi Central University and Dr. Rajendra Prasad Central Agricultural University both got the fifth rank with the lowest Page Authority value of 42.

6.5 Google PageRank

Google PageRank was developed by Larry Page and Sergey Brin, who were the co-founders of the American multinational giant technology company Google. Google

PageRank is useful in ranking web-pages on Google search result pages. The algorithms of Google PageRank consider hyperlinks from numerous websites to a single particular website as a vote of the popularity of that particular website, so that website will have high PageRank on the scale of Google PageRank, which ranking is based on the range or scale from 1 to 10.

Google PageRank was patented in the year 1998 but Google has not renewed the patent after the expiration of the patent in the year 2018. Thus, there are a number of websites that provide Google PageRank using the algorithm that is used by Google to calculate PageRank of the websites on Google search result pages. Here, Check PageRank (<https://checkpagerank.net/>) is used to calculate the PageRank of the 7 websites of central universities of eastern India.

Table 8: Google PageRank of the Websites of Central Universities of Eastern India

S. N.	Universities	Google PageRank
1.	Central University of South Bihar (CUSB)	4/10
2.	Mahatma Gandhi Central University (MGCU)	4/10
3.	Dr. Rajendra Prasad Central Agricultural University	4/10
4.	Nalanda University	4/10
5.	Central University of Jharkhand (CUJ)	4/10
6.	Central University of Odisha (CUO)	4/10
7.	Visva Bharati University	4/10

Table 8 shows the Google PageRank of the websites of the central universities of eastern India. It is found that all university websites under study have the same Google PageRank of 4 out of 10.

6.6 Language

India is a land of a wide range of cultural, religious and linguistic groups, each of which speaks a different language. It makes India a multilingual nation in the world. There

are approximately 1500 languages, including dialects spoken throughout the country and among these 22 scheduled languages approved by the constitution of India to use any of them as an official language.

The websites of central universities may have visitors from all over India as well as abroad. So, the websites of central universities need to have multilingual content, as it will be beneficial for visitors from different regions, nations and parts of the globe.

Table 9: Language of the Central Universities' Websites of Eastern India

S. N.	Name of Universities	Languages		
		English	Hindi	Other
1.	CUSB	✓	✓	✗
2.	MGCU	✓	✓	✗
3.	RPCAU	✓	✓	✗
4.	Nalanda University	✓	✗	✗
5.	CUJ	✓	✓	✗
6.	CUO	✓	✓	✓
7.	Visva Bharti	✓	✓	✓

Table 9 depicts the record of language used on the websites of central universities of eastern India. In the above table, we have categorized the languages into three categories as: English, Hindi, and Others. It was found that the websites of all universities under study are in English language. Out of 7 universities' websites, except Nalanda University all six universities were also using Hindi language content on their websites, and only two universities, namely Visva Bharti and Central University of Odisha (CUO) were also using other languages on their website to reach out to the maximum people. CUO has some content in Odia language on its website; while Vishwa Bharti uses a multi-language option service on its website. So, it was easy to view content in many regional as well as foreign languages on the Visva Bharti website. The website of Nalanda University is the single website among the all which is available in English language only. Thus, it was also found

that English is the most dominant language on the websites of the universities, and after that, Hindi stands in the second position.

6.7 Social Media Presence

Social media helps organisations in building relations with their audiences. Social networking sites like Facebook, YouTube, Twitter, and Instagram have become vital tools for communication in the present Information Communication Technology (ICT) era. Today, most people use social media for their various purposes. So, universities, organizations, institutions, government bodies, and others use social media to reach out to their audiences quickly throughout the globe without any geographical limitations.

For the social media presence of the selected universities on Facebook, YouTube, Twitter, Instagram, and LinkedIn are considered for the study as these social platforms are highly used.

Table 10: Social Media Presence of Central Universities of Eastern India

S. N.	Universities	Facebook	YouTube	Twitter	Instagram	LinkedIn
1.	CUSB	6.6K	2.48K	2,942	1,904	-
2.	MGCU	15K	1.73K	6,916	-	2K
3.	RPCAU	6.8K	2.74K	322	-	735
4.	Nalanda University	10K	-	5,184	1,595	-
5.	CUJ	5.8K	411	1,160	-	-
6.	CUO	1.9K	-	2,121	-	242
7.	Visva Bharti	9.1K	5.38K	500	-	-

From Table 10, it was found that out of 7 selected universities, all universities have their presence on Facebook and Twitter while 5 universities have their presence on YouTube. 3 universities including MGCU, RPCAU, and CUO have their presence on LinkedIn and only 2 universities, CUSB and Nalanda University have their presence on Instagram. With 10K followers, Nalanda University has the highest number of followers on Facebook. Mahatma Gandhi Central University (MGCU), Motihari has the highest number of followers on Twitter and LinkedIn, i.e. 6,916 and 2K respectively. Vishwa Bharti has the highest number of followers or subscribers on YouTube, i.e. 5.38K and Central University of South Bihar (CUSB), Gaya has the highest number of followers on Instagram, i.e. 1,904.

7. Major Findings

- All central universities of eastern India have a web presence. All universities have a properly functional and up-to-date website.
- Among all 7 websites of central universities of eastern India, 6 universities' websites namely CUSB, MGCU, RPCAU, CUJ, CUO, and Visva Bharti have ".ac.in" Top-Level Domains (TLDs). Only Nalanda University has ".edu.in" TLD comprising '.edu' as generic TLD (gTLD) and '.in' as Country Code TLD (ccTLD).
- The pdf file format is the most dominant rich file. The Central University of Odisha ranked first with a total number of 24,84,673 rich files including 24,80,000 pdf files. Nalanda University ranked last with the least rich files.
- The Domain Authority of Visva Bharati University is the highest with 42 and ranked first among the websites; followed by Nalanda University with Domain Authority 39, which ranked

second; and Central University of Jharkhand with 36 ranked third.

- The Central University of Jharkhand is at the top most with 46 Page Authority, ranked first among the websites; followed by Nalanda University and Visva Bharti with 45 and both ranked second. The Central University of Odisha ranked third with Domain Authority value of 44.
- All university websites have the same Google PageRank value of 4 out of 10.
- English is the dominant language among the websites. English is used by all the universities' websites. Nalanda University does not use the Hindi language, rest of the universities use the Hindi content on their websites.
- Nalanda University has the highest number of followers on Facebook i.e., 10K. Visva Bharti has the highest number of followers or subscribers on YouTube i.e., 5.38K. Mahatma Gandhi Central University has the highest number of followers on Twitter and LinkedIn viz. 6,916 and 2K respectively. Only Central University of South Bihar and Nalanda University have their presence on Instagram with 1,904 and 1,595 followers respectively.

8. Conclusion and Suggestions

This study gives a basic idea and information regarding the websites of 7 Central Universities of Eastern India. The study aimed to check the web presence of the universities; identify the domains of the websites; rank the websites on the basis of rich files, domain authority, and page authority. The study also evaluates the Google PageRank of the websites, content languages, and at last social media presence and engagement of the universities. From the above findings, it is concluded that all universities have a web presence but their performance is not par. only Nalanda University is using ".edu.in" Top-level Domain, while the rest all are using

".ac.in". The study observed that websites have neither good nor bad value of Domain & Page Authority; if it may increase that will increase their search rank on search engines like Google. Only Visva Bharti uses multi-language option on its website including regional and foreign languages. All universities should try to incorporate this feature on their websites to maximize visitors and website visit count. Google PageRank also needs to be improved on all universities' websites. Almost all universities under study have their presence on social media via different platforms. But Nalanda University and the Central University of Odisha are not available on YouTube till date. The study recommends that both universities should make their presence on this platform too, so that they can share their academic activities through this video streaming channel. Webmasters and Policymakers may take advantage from this study and design the websites more informative and attractive so that people visit the websites frequently.

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