A Webometric Analysis of Libraries of Central Universities of Sanskrit in India

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ABSTRACT

The rise in global internet users has led to a web-centric approach to information, with the World Wide Web (WWW) serving as a primary source of information for academic and research activities. Webometrics, a scientific discipline, studies the quantitative analysis of web content and resource utilization using specific approaches. It aims to measure the World Wide Web using content analysis to understand the influence of web pages, links, and parameters. Key components of webometrics analysis include web page content analysis, web link structure analysis, web usage analysis, and web technology analysis, including search engine performance.

Present study examining the webometrics of central universities of Sanskrit in India and their libraries, focusing on three universities established under the Central Sanskrit Universities Act, 2020, was conducted. The study found that two universities use.ac.in URLs, while only Central Sanskrit University uses.nic.in. Search engine performance evaluation revealed that search expressions with gaps had more hits than without gaps. Central Sanskrit University had the highest domain authority and page authority, while SLBSNSU and NSUT had similar scores. Universities with more link pages have a greater impact factor. Future challenges in webometrics research include quantitative methods like sampling web pages and links, domain authority measuring tools, and qualitative methods like web link interpretation and classification.

Keywords: *Central University, Sanskrit, Link, Websites, Domain, Web Impact Factor*

1. INTRODUCTION

To maintain their place among the world's leading institutions, Indian higher education institutions must improve the creative coordination of international universities through a regular interchange of experiences and information. The websites of these institutes can give a platform for easy and effective communication among them. Figure 1 clearly indicates that there has been a consistent and large increase in Internet users worldwide over the previous decade, indicating that people are getting more and more web centric in order to find information on the internet. Improving a web policy broadens the dialogue between institutions and universities, which in turn contributes significantly to the production of fresh ways and means of communication in the scientific community by facilitating a greater realisation of the potential of innovation and new discoveries. As a result, this article sheds some insight on the use of a critical communication medium and may pave the way for more successful academic use of the internet. "The World Wide Web (WWW) 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"(Babu, Jeyshankar, and Rao, 2010).

Web resources are now recognised as the most important components of all aspects of life since they give much needed value-added services most precisely and thoroughly in the shortest amount of time by being the prospective demand of the hour. In terms of the World Wide Web, web pages are the essential entities of information, holding very prospective and instructive linkages from general aspects pointing to specific aspects, much like citations. The quantitative analysis of websites is carried out in the same way that it is done in traditional databases.Because of the spectacular expansion of web literature and web pages, the methodology for assessing impacts is developing at a quicker rate, with new theories and new metrics of complex network analysis emerging. Webometric analysis scientifically demonstrates the impact and influence of web sites and web contents. The term „webometric" is defined as, "the webometric study is based on quantitative measurement – indirectly

includes the qualitative aspect also of structure, use ofinformation resources and technologies on

WWW drawing on bibliometric and informetric approach"

(Goswami, 2007).

Webometrics, according to Bjornborn and Ingwersen (2004), is "the quantitative study of the construction anduse of information resources, structures, and technologies on the Web using bibliometric and informetric approaches." Almind and Ingwersen (1997) coined the term Tern webometrics. A second definition of webometrics has also been proposed: "the study of web traffic."

Webometrics is the study of all networking activity using quantitative methodologies and measures. The

method of word counts, page counts, page linkages, domain analysis, and other critical criteria are

apparently taken into account when evaluating the depth of the World Wide Web of a specific patch or a

specified field of knowledge, subject, or even institutions. WebPages are information entities that contain

hyperlinks that act as citations. When applying informatics approaches to the internet, the search engine

plays a crucial role. For example, if the search engine is weak and influenced by commercial interests,

then searching for the perfect algorithm; matching the perfect user's perfectly well stated information
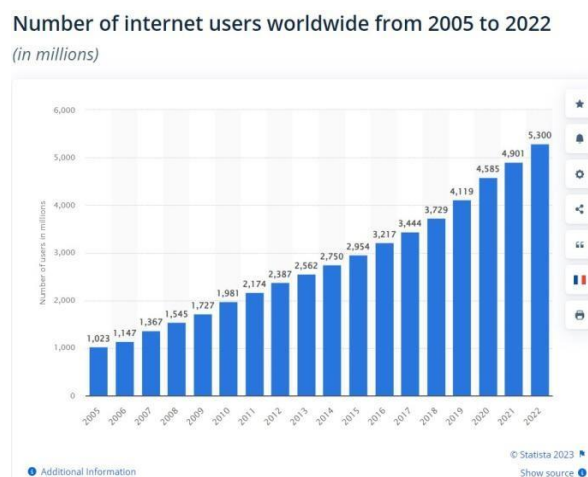
demand (Fugl, 2001).

Fig. 1: Internet Users in the World from 2005 to 2022
(*Sourcehttps://www.statista.com/statistics/273018/number-of-internet-users-worldwide/*)

WEBOMETRIC-THE CONCEPT

Webometrics is a distinct scientific discipline that studies the quantitative analysis of web content and the rate of utilisation of web resources using particular approaches. In other words, webometrics seeks to measure the World Wide Web in a very thorough manner using content analysis, so that the influence of

desired web pages, links, and associated parameters is very well known. Almind and Ingwersen first

invented the term "webometrics" in 1997.Webometrics is an amalgamation of two English words, "web" and "metric." "Webometrics (also known as cybermetrics) attempts to measure the World Wide Web in order to gain knowledge about the number and types of hyperlinks, structure of the World Wide Web, and based content using primarily quantitative methods for social science research goals using techniques that are not specific to one field of study" (Thelwall, 2008). Webometric studies are frequently cited by Social Science scholars. Because of the prolific growth of web literature over the previous decade, there has been a huge increase in webometric studies. The key components of Webometrics analysis are:

- Web page content analysis. (A type of subject analysis based on the content of the website is web page content analysis.)
- Web link structure analysis (e.g. hyperlink, self-link and external link).
- Web usage analysis (e.g., exploiting log files for users searching and browsing behavior).
- Web technology analysis (including search engine performance).

2. SCOPE AND LIMITATION OF THE STUDY

Presently there are 18 Sanskrit universities in India. Current study's scope is limited to webometric examination of websites of central universities of Sanskrit in India and their libraries. Out of 18 Sanskrit universities, currently three (3) are central universities of Sanskrit in the country, as published on the UGC website (https://www.ugc.gov.in/centraluniversity.aspx?type=1), located in various parts of the

country and established under Central Sanskrit Universities Act, 2020 by parliament.Table1contains a list of Central Universities of Sanskrit with URL of their websites.

Table 1: List of Central Universities of Sanskrit with location and Websites Address as on18/10/2023

S.N.	Name of University	Location	Websites
1.	Central Sanskrit University	New Delhi	https://www.sanskrit.nic.in/
2.	Shri Lal Bahadur Shastri National Sanskrit University	New Delhi	https://www.slbsrsv.ac.in/
3.	National Sanskrit University	Tirupati	https://nsktu.ac.in/

3. REVIEW OF LITERATURE

Ingwersen's (1998) examines the case study and found reliability and feasibility of calculating online Impact Factors (Web-IF) for various online sites. Results show high confidence in estimating national and industry Web-IFs, but caution is advised for institutional Web-IFs. Lawarence and Giles (1998) discovered that the coverage and freshness of major search engines are limited, with no one indexing more than one-third of the "indexable Web." The examination of engine overlap implies that the indexable Web has a bottom bound of 320 million pages. Björneborn and Ingwersen (2001 describes Webometrics, a research field since the mid-1990s, investigates the Web's properties using modern informetric methodologies. This article explores recent search engine coverage, performance, challenges in measuring Web Impact Factors, and new directions for knowledge discovery and issue monitoring, based on bibliometric methodologies. Jeyshankar and Babu (2009) examine and explore through a webometric study the websites of 45 universities in Tamil Nadu comprising 27 state and 18 private universities. Karadia and Sahoo (2021) analysed Odisha universities" websites or web portals by applying the webometric indicators to check their existence and performance

in the virtual globe and rank them according to data available on the basis of WIF and R-WIF. Patel et al (2021) in their study aims to examine the website analysis of the top 15 Indian universities ranked in the NIRF (National Institutes Ranking Framework). Varadharajalu and Dhanavandan (2017) explore the Web Impact Factors (WIFs) for the websites of Kerala State Universities. Walia and Gupta (2012) examined the linking on websites of national libraries and found their web impact factor and amount of information present on these websites in the form of rich files.

Kapde and Barphe (2022)analysed 16 homepages of Sanskrit University in India, indicating the enormous impact of the Internet on human activities and education. Kaurand Verma (2021) analyze citation activity in Sanskrit and allied subjects at Uttarakhand Sanskrit University, Haridwar, using bibliometrics and in-house data collected using MS-Excel, SPSS, and Power BI. The study aims to provide qualitative interpretation of published materials.Ramkumar (2020) studied research productivity of guides in two Sanskrit Universities, analyzing 1016 doctoral theses from 2002-2016. Popular topics included Sahitya, Shikshashastra, and Vyakarana. Single-campus universities had higher productivity, while multi-topic guides were more productive. Many studies of website evaluation have focused on Educational Institutions, but no comprehensive study has been found on webometric analysis of Libraries of Sanskrit universities in India and this study is limited to Central Universities of Sanskrit in India.

4. OBJECTIVES OF THE STUDY

The present study is undertaken to have an in-depth study of webometric study of websites of Central Universities of Sanskritin India with following objectives to:

- To analyze URL of websites/ webpages under study.
- To analyze the different types links of websites of Sanskrit Universities and

webpages of their libraries.

- Evaluate the search engine performance for Webometric studies.

- Find out the Domain Authority, Page Authority of websites under study.

- To calculate the web impact factor (WIF) of website under study and rank them as per WIF.

5. METHODOLOGY USED

The current study focuses on webometric analysis of websites of central universities of Sanskrit in India by computing web impact factor of various websites and evaluating search engine performance through webometric study. The primary data is obtained from the websites of selected institutes using survey and observation methods (as shown in table-3).Google, Yahoo Search, All the Web are the search engines and different online free SEO optimisation tool were used to analyse links, search engine performance, and domain authority of Sanskrit Universities website.

Calculation of Web Impact Factor (WIF):
The web impact factor (WIF) can be calculated by using the Showing formula given

by Ingwersen (1998) where:

A = total links to a website (all *in links* and *self-links* pages)

B = *in links* to the website (subset of A)

C = *self-links* within the same website

D = *external links* within the same website

E = total number of web pages present in the website at a time

Calculation for Simple Web Impact Factor(SWIF)

A = total links to a website (all in links and self-links pages)

E = total number of web pages present in the website at a time

SWIF= A/E

Calculation for In-link Web Impact Factor(ILWIF)

B = In-links or Back-link to the website

E = total number of web pages present in the website at a time

ILWIF = B/E

Calculation for Self-link Impact Factor(SLWIF)

C = Self-links within the same website

E = total number of web pages present in the website at a time

Self-link WIF = C/E

Calculation for External-link Impact Factor(ELWIF)

D = external-links within the same website

E = total number of web pages present in the website at a time

Self-link WIF = D/E

6. DATA ANALYSIS AND DISCUSSION

6.1 Analysis of Websites URL

A universal resource locator (URL), often known as a web address, is a specified character string that serves as a resource reference. The transfer protocol is specified in the first portion of the URL, followed by the directory and file names in the second section. The domain name was taken into account when examining the URL of the website. Table 2A shows the URL analysis of websites, and after analysis it was determined that two university websites use.ac.in as domain name in their URLs, whilst one (CSU) website uses.nic as domain name in their URLs. Further all the Sanskrit university websites are using .in (stand for country India) as country code in their URLs. Table 2B shows that there is no separate website of library in any of the Sanskrit University. Library data of all the three universities reflects on the subdomain and

webpages. Links of the library webpages of all three universities is mentioned in table

2B.

Table 2A: Analysis of URLs of Websites

Name of University	Uniform Resource Locator (URL)	URLs	Country Code in URLs
CSU	https://www.sanskrit.nic.in/	.nic	.in
SLBSNSU	https://www.slbsrsv.ac.in/	.ac	.in
NSUT	https://nsktu.ac.in/	.ac	.in

Table 2B: Analysis of URLs of Libraries Website/Subdomain/Webpages

Name of University	Uniform Resource Locator (URL)	Website/ Subdomain/ Webpage
CSU	https://www.sanskrit.nic.in/section_library.php	Subdomain/Webpage
SLBSNSU	https://www.slbsrsv.ac.in/library/about-library-0	Subdomain/Webpage
NSUT	https://nsktu.ac.in/index.php/about-library/	Subdomain/Webpage

6.2 Search Engine Performance of Sanskrit Universities Websites

The search engine performance is one of the important criteria in webometric research for

evaluating the reliability of the search engines. Table 4A & B shows the differences in

performance of search result by using same search expression withafter command and

without command. The Search expressions used for this Study are given below:

1) Search expression with command

Site: www.sanskirt.nic.in/

2) Search expression without command

www.sanskrit.nic.in/

Table 4A & B depicts that search expression without command are having a greater number of

results in comparison to search expression with command. Through logically, search

expressions with command are corrects. The command site: URL means the number of all the

pages inside the URL. There is huge variation in data given by the same search engine for the

same search expression.

Table 4A: Search Engine Performance of Sanskrit Universities Websites
(With link command, Site**: URL** and without link command)

Search Expression (With command)	Google	Yahoo	Bing	Search Expression (Without command)	Google	Yahoo	Bing
CSU	3,060	1,310	1,310	CSU	31,70,00,000	1,48,000	1,48,000
SLBSNSU	3,360	2,200	2,180	SLBSNSU	17,500	17,00,000	15,20,000
NSUT	6,700	2,180	2,170	NSUT	10,700	15,20,000	17,00,000

(Data collection Date &Time: 18.10.2023 between 03:05pm to 4.00 pm)

Table 4B: Search Engine Performance of subdomain of Library of Sanskrit Universities
(With link command,site**:URL**)

Search Expression (With command)	No of results (Google)	No of results (Yahoo)	No of results (Bing)	
CSU	10	0	0	*(Data*
SLBSNSU	974	0	0	
NSUT	1130	1	1	

collection Date &Time: 18.10.2023 between 8:00pm to 8.20 pm)

6.3 Domain Authority and Page Authority of Websites of Sanskrit Universities

The effectiveness and efficiency of a certain website/ domain is measured through domain

authority using a 0 to 100 logarithmic scale and the pattern follows for the measurement of

page authority. In simple terms, the highest score obtained for page authority and domain

authority respectively determines higher ranks.

Here we have used an *"SEO review tool"* free online SEO tools for collecting the data of

Domain Authority and Page Authority of Websites of Sanskrit Universities that are

depicted in table 5.

Table 5 A: Domain Authority and Page Authority of Websites of Sanskrit Universities

Sl. No.	Name of University	Domain Authority	Page Authority
1	CSU	44	65
2	SLBSNSU	37	80
3	NSUT	36	60

Table 5 B: Domain Authority and Page Authority of Websites of Library of Sanskrit Universities

Sl. No.	Name of University	Domain Authority	Page Authority of Library
1	CSU	44	0
2	SLBSNSU	37	12
3	NSUT	36	12

Table-5A shows the Domain Authority and Page Authority of Sanskrit Universities websites, in which Domain Authority ofCSU is in the highest position with 44among theall websites, followed by SLBSNSU with 37 andNSUT has the lowest Domain Authority i.e.,36

In Page Authority, SLBSNSU with 80 is the highest, followed by CSUwith 65. Among the all websites, NSUT has the Lowest Page Authority i.e.,60.

Table-5B shows the Domain Authority and Page Authority of Libraries of webpages of Sanskrit Universities websites, in which Domain Authority results are similar as mentioned in table 5A whereas, in Page Authority of library webpages, SLBSNSUand NSUT has same score i.e. 12 and CSUhas scored zero.

6.4 Link analysis of Websites

**Table 6 A: Total Links (TL): Internal link (IL), External link (EL) and
Back link (BL) of websites of Sanskrit Universities**

University	TL	IL	EL	BL
CSU	486	411	53	220330
SLBSNSU	34	32	2	175807

| NSUT | 840 | 787 | 53 | 165543 |

Table 6 B: Total Links (TL): Internal link (IL), External link (EL)
and Back link (BL)of library subdomain of Sanskrit Universities

University	TL	IL	EL	BL
CSU	128	5	17	1
SLBSNSU	105	92	10	1
NSUT	186	171	14	5

6.5 WebImpact Factor of Websites of Central Universities of Sanskrit

It is observed from table 7A,NSUT has maximum number of webpages followed by SLBSU. It could be noted that NSUT has majority of linked pages followed by CSU. Ingwersen proposed an innovative measurement for calculating the online areas of the web, including websites. Web impact factors determines the average online impact of a website by dividing the number of link pages by total number of webpages. CSU has secured first position (0.15) followed byNSUT (0.12) in Simple WIF. In case of In-linked WIF again CSU secured first position with 0.13 score and NSUT remains in second position with 0.11 score. In Self-Link WIF CSU remains in top with 72 points and SLBSNSU stands at second position with score of 53.32, NSUT stand at least position with score of 24.70 points. In case of External-link WIF again CSU scored 0.01 and stood at first place.

Table 7A: WIF's of Sanskrit Universities Websites

University	SWIF	ILWIF	SLWIF	ELWIF
CSU	0.15	0.13	72.00	0.01
SLBSNSU	0.01	0.00	53.32	0.00
NSUT	0.12	0.11	24.70	0.00

From the table 7B it is observed that the university subdomain of library CSU library

stood at rank 1 in all the WIF"s followed by NSUT library and library subdomain of

SLBSNSU remained last in all the cases of WIF"s

Table 7B: WIF's of Library sub-domain of Sanskrit Universities Websites

University	SWIF	ILWIF	SLWIF	ELWIF
CSU	12.8	0.5	0.10	1.7
SLBSNSU	0.10	0.09	0.00	0.01
NSUT	0.16	0.15	0.00	0.01

Table 7C: Rank of Universities websites as per WIF's

University	SWIF	ILWIF	SLWIF	ELWIF	Overall WIF Rank
CSU	1	1	1	1	1
SLBSNSU	3	3	2	3	3
NSUT	2	2	3	2	2

Table 7D: Rank of Library sub-domain of Sanskrit Universities Websites as per WIF's

University	SWIF	ILWIF	SLWIF	ELWIF	Overall WIF Rank
CSU	1	1	1	1	1
SLBSNSU	3	3	3	3	3
NSUT	2	2	2	2	2

FINDINGS

The major findings of the study are:

- The two universities are using *.ac .in* URL and only one website (Central Sanskrit

  University) used *.nic.in* URL. The country code TLD (ccTLD) *.in* is used by all of

  the all the universities (i.e. 100%) websites.

- In search engine performance evaluation, it was found that search expression with gap having a greater number of hits in all universities websites comparison to search expression without gap in both site command and link command sites and huge variations in data was found. Although, conceptually search expression without gap is more logical. Different search engines show different search results, google search is shown higher in all the cases.

- The Central Sanskrit University have highest (44) domain authority among the websites while SLBSNSU have (80) page authority among the all. As far as concern with page authority of libraries SLBSNSU and NSUT have similar score (12).

- In overall ranking of websites, CSU has the highest WIF‟s and ranked 1st, while NSUT and SLBSNSU ranked second and third respectively.

7. CONCLUSION & RECOMMENDATIONS

Search engine search facilities are continually changing, which is a major impediment to webometrics research, for example, Yahoo, Altavista, and other web-link search enginesno longer function as a search analysis tool. Indeed, the Webometrics study field suffers from a scarcity of relevant and robust measuring instruments. Future Webometrics problems include quantitative methods such as sampling web pages and web links, domain and page authority measuring tools, and qualitative methods such as web link interpretation and classification. In general, online link analysis of university websites is reliable, but in practise, web connections are unequal to citations in scholarly publications, because university website content mentions related other sites.This study reflects a direct relationship with the related links. The universities having a greater number of link pages obviously encompass more impact factor. The study observed that university owing to possess more web sites hence, comprises maximum web impact factor among central universities of Sanskrit.

Following suggestions are recommended to improve the university and library websites:

a) Each university and their website(s) may have requirements that are vital and distinct.
b) Each institution should have its own library website, and the library website or webpage

should be clear and well-planned in relation to the target audience. Students (current,

prospective, and graduates), researchers, professors, and all other staff members are among the

target audience.

c) It is critical to receive feedback from the user community. This takes advantage of users'

impulsive tendencies. It is also critical to ensure that individuals are being heard.

d) It is also proposed that Sanskrit universities acquire expertise in order to navigate this

technological deluge of titanic dimensions. As a result, change must be available and simple

to implement.

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