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## Webometric Analysis of National Importance Libraries and Archives under the Ministry of Culture, India

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# Webometric Analysis of National Importance Libraries and Archives under the Ministry of Culture, India

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## ***Abstract***

*The study aimed to analyse the websites of national importance libraries and archives, comes in group namely Knowledge Resources Heritage, under Ministry of Culture, India, which includes 16 websites. The websites were analysed based on languages, rich files, social media presence and network diagrams. Tools used to collect required data were Google Search Engine, Alexa Internet Tool and SocScibot4. The study found that English and Hindi languages are predominantly used in the website content. National Archives of India and Gandhi Smriti and Darshan Samiti has the highest number of rich files, about 506 and 488, respectively. Also, the Central Institute of Higher Tibetan Studies has the lowest bounce rate, i.e. 50%, which is the best among the websites. Through the network diagram, it is visible that very few websites are linked to others. National Archives of India connected to 4 other websites is significant in number. Websites need to improve their SEO results for better visibility.*

**Keywords-** *webometrics, knowledge resources heritage, rich files, SocScibot4, network diagram, social media*

## **Introduction**

The World Wide Web is the reason behind the emergence of Webometrics. Initially, users mostly used the Internet for scholarly communications, which increased the range and vanished the geographical boundary in the distribution of research publications by many folds to the world. In 1997, Almind and Ingwersen used informetric methods, including bibliometrics and scientometric

approaches, to analyse the world wide web and used 'Webometrics'. The study of webometrics helps both Computer Science and Information Science. In computer science aspects, it helps in improving the performance of websites on search engines. In contrast, information science allows hyperlinks to create online document collections for computer science, but 'many different Web-related computer science topics use link analysis but do not cite webometrics research'.[1]

Before webometrics, the term 'cybermetrics' was used, and both terms were used interchangeably. Still, there is a difference that webometrics deals with the analysis of web contents, link structures, web usage and web technologies and provides a descriptive study of the web. In contrast, cybermetrics is a statistical study of discussion groups, mailing lists and other computer-mediated communication on the Internet. During the same period, fields like Internetometrics, Netometrics, Cybermetrics and Webometrics emerged but evolved with the same objectives as Bibliometrics.

The web is getting more complex day by day, and it is hard for many websites to appear on top of search engine result pages. To improve the website's visibility, the tools of webometric helps in analysing the web qualitatively and quantitatively. For evaluation of the websites, there are many tools available for web analytics, such as SocScibot, LexiURL, Alexa Internet, Link Explorer, Search Engines query syntax, Pajek and so on.

In the current era of ICT, almost everything is present on Internet, so the website becomes the resemblance of institutions online which gives the insight of services provided by the institutions and what information they hold. A website gives the round the clock accessibility, convenience for the remote user to know the organisation without visiting, and increases the credibility among the users.

## **Literature Review**

**Pal, Kar and Sardar**<sup>[2]</sup> analysed the websites of ICSSR sponsored research institutions in India. They analysed the 29 w and used various tools to find the required data of 29 websites for the study, such as Neil Patel's SEO analyser, Alexa and Google search engine. They drew the link topology of the 29 websites using Pajek. It was found that the Giri Institute of Development Studies has links to other websites most. They also carried out the text analysis of selected websites using the Cyclist tool incorporated in SocScibot.

**Stephen**<sup>[3]</sup> used Alexa Internet to conduct the webometric analysis of 10 Central Universities of the North Eastern Region of India. The researcher has taken seven aspects to evaluate the websites using Alexa, including traffic rank, top keywords, the geographical distribution of users, upstream sites, and so on. The study's finding shows that Sikkim University had the highest Upstream site, about 55%, Nagaland University has 55.9% of search percentage, which is high among the universities. In last, it concluded that there is constant change in search facilities of search engines which hampers the webometric studies.

**Majhi and Das**<sup>[4]</sup> mapped the 25 websites of the High Courts of India using SocScibot4. Also used other tools to analyse the websites and also calculated the web impact factors. Chhattisgarh and Kerala high court has maximum links to other high courts website.

**Dastani, Panahi and Sattari**<sup>[5]</sup> studied the 41 websites of Iranian Universities of Medical Sciences for six months using various webometric instances such as Moz, Google search engine, Google Scholar and others. In 6 months, it was seen that five universities showed the highest increase in their rank through the rise in the content on the homepage, providing scientific resources and rich files. They also suggested the one capable person should be deployed to maintain the website and use SEO principles to increase the visibility of the websites.

**Rekha and Kumar**<sup>[6]</sup> analysed the seven websites of the national library of SAARC nations to measure the websites' visibility, but the national library of Afghanistan had no web presence. To collect rich files of the websites, researchers used Google Search Engine, and it was found that the National Library of Pakistan has the highest number of rich files, about 129.

The WIF and link topology of websites of the Indian Council of Agricultural Research Organisations (ICAR) analysed by **Kumar**<sup>[7]</sup> using Google and SocScibot web crawler to collect data and visualise the links between the ICARs. In the study, the researcher drew the micro-link topology for each type of ICAR, and the outcome shows that 2 ICAR-Deemed Universities did not have web links. In contrast, in the link topology of ICAR-Institutions, IASRI Delhi has the highest number of in-link pages.

**Sarkar, Pal and Kar**<sup>[8]</sup> analysed the 36 tourism sites of India through webometric mapping using SocSciBot and used other tools, Neil Patel's SEO analyser and Alexa, to collect data. The mapping

found that Northeast Indian state tourism websites linked together and Delhi tourism websites linked to 12 other websites.

Saha<sup>[9]</sup> conducted the webometric study to rank Institutional Digital Repositories of India and used various parameters to rank the websites, like visibility, size, rich files, web impact factor, etc. To collect required data researcher used Google Search Engine and Google Scholar. Pdf and HTML file format was the most visible among the rich files of IDRs.

## Scope of the Study

The Ministry of Culture, Government of India, is responsible for the preservation, conservation, and dissemination of India's cultural heritage and archival resources. It is the responsibility of the Ministry to promote the Indian culture and heritage among the people of the nation and worldwide. To cater to this objective, the Ministry has divided the organizations, which promotes India's culture and heritage into three groups: Tangible Cultural Heritage which deals with monuments; Intangible Cultural Heritage, which deals with regional museums; and Knowledge Resources Heritage which deals with archival records.

National Archives of India (NAI) lead 16 knowledge resources heritage, including all major and prominent libraries with archival records (National Library, Delhi Public Library, Central Reference Library, etc.) except two institutions responsible for protecting Buddhism and Tibetan Culture, which provides education to Tibetan Refugee students living in the Himalayan region.

**Table 1. List of Knowledge Resources Heritage of India with URL**

S. No.	Knowledge Resources Heritage	URL
1.	Rampur Raza Library	<a href="http://razalibrary.gov.in/">http://razalibrary.gov.in/</a>
2.	Asiatic Society	<a href="https://www.asiaticsocietykolkata.org/">https://www.asiaticsocietykolkata.org/</a>
3.	National Archives of India (NAI)	<a href="http://nationalarchives.nic.in/">http://nationalarchives.nic.in/</a>
4.	Khuda Baksh Oriental Public Library	<a href="http://kblibrary.bih.nic.in/">http://kblibrary.bih.nic.in/</a>
5.	Thanjavur Maharaja Serfoji's Sarasvati Mahal Library (TMSSML)	<a href="http://www.tmssmlibrary.com/">http://www.tmssmlibrary.com/</a>
6.	Anthropological Survey of India (ANSI)	<a href="https://ansi.gov.in/">https://ansi.gov.in/</a>
7.	Delhi Public Library (DPL)	<a href="https://dpl.gov.in/">https://dpl.gov.in/</a>
8.	National Library	<a href="https://www.nationallibrary.gov.in/">https://www.nationallibrary.gov.in/</a>

9.	Central Reference Library	<a href="http://crlindia.gov.in/">http://crlindia.gov.in/</a>
10	Nehru Memorial Museum and Library (NMML)	<a href="http://nehrumemorial.nic.in/en/">http://nehrumemorial.nic.in/en/</a>
11.	Central Institute of Higher Tibetan Studies (CIHTS)	<a href="https://cihts.ac.in/webpage/index.aspx">https://cihts.ac.in/webpage/index.aspx</a>
12.	Raja Rammohun Roy Library Foundation (RRRLF)	<a href="http://rrrlf.nic.in/">http://rrrlf.nic.in/</a>
13.	Indira Gandhi Rashtriya Manav Sangrahalaya (IGRMS)	<a href="https://igrms.gov.in">https://igrms.gov.in</a>
14.	Gandhi Smriti and Darshan Samiti (GSDS)	<a href="https://www.gandhismriti.gov.in/">https://www.gandhismriti.gov.in/</a>
15.	Maulana Abul Kalam Azad Institute of Asian Studies (MAKAIAS)	<a href="http://makaias.gov.in/">http://makaias.gov.in/</a>
16.	Central Institute of Himalayan Cultural Studies (CIHCS)	<a href="http://www.cihcs.edu.in/">http://www.cihcs.edu.in/</a>

## Objectives of the Study

The objective of the study is to evaluate the website of knowledge resources heritage of India using different webometric tools. Following are the objectives:

1. To find out the languages used by websites.
2. To find the presence of knowledge resources heritage on social media and engagement on social media.
3. To rank the websites on the basis of Rich Files using Google query syntax.
4. To analyse the bounce rate, top keyword, audience geography, top three similar websites by audience overlap and time spent by users on the site daily using Alexa Internet.
5. To map the links of the websites.

## Methodology

The current study is intended to analyse the websites and connection patterns among the websites of knowledge resources heritage of India. Websites of India's knowledge resources heritage were collected and carefully validated for the study from the Ministry of Culture, Government of India's websites. Table 1 lists the web addresses of the websites.

Manual website visits, Google search engine advanced query syntax, Alexa Internet Tool chrome extension was installed in the browser, and a webometric analysis application called

SocScibot4 were utilised to acquire the necessary data for the study. The data required for the study was gathered between August 26, 2021, and September 4, 2021.

## Results and Discussion

### A) Language

India is one of the culturally rich countries in the world and has linguistic diversity. About 22 scheduled languages approved by the constitution of India to use as the official language and approximately 1500 languages, including dialects spoken throughout India. Knowledge Resources Heritage acts as an archival centre of Indian heritage, which acquires multi-lingual text, ancient scripts and many more.

**Table 2. Languages of the Websites**

S. No.	Knowledge Resources Heritage	Languages	
		English	Hindi
1.	Rampur Raza Library	✓	✓
2.	Asiatic Society	✓	✗
3.	NAI	✓	✓
4.	Khuda Baksh Oriental Public Library	✓	✗
5.	TMSSML	✓	✗
6.	ANSI	✓	✓
7.	DPL	✓	✓
8.	National Library	✓	✓
9.	Central Reference Library	✓	✓
10	NMML	✓	✓
11.	CIHTS	✓	✓
12.	RRRLF	✓	✓
13.	IGRMS	✓	✓
14.	GSDS	✓	✓
15.	MAKAIAS	✓	✗
16.	CIHCS	✓	✓

Through table 2, the websites of Asiatic Society, Khuda Baksh Oriental Public Library, Thanjavur Maharaja Serfoji's Sarasvati Mahal Library and Maulana Abul Kalam Azad Institute of Asian Studies is in English only, whereas the rest of the websites are bilingual, i.e., in both English and Hindi. Also, the website of Asiatic Society used Google Translate to translate the content into

different languages of the world. Still, there are many studies shows that Google translate is not compatible with translating the text accurately.

In 16 knowledge resources heritage, most are located in regions with different official languages other than English and Hindi. So, these centres must also maintain a website in regional language to increase the native language speaking people to visit the website. Also, CIHCS and CIHTS websites must be in the Tibetan language too. It will be beneficial for the people in getting the knowledge about their culture in their language.

## B) Social Media Presence

Social media has become a vital tool for communication in the current era, as the majority of people are using social media for their purposes. Organizations, institutions, governments, etc., are using social media to reach out to their audiences throughout the world without any geographical boundaries.

**Table 3. Social Media presence**

S. No.	Knowledge Resources Heritage	Facebook	Instagram	YouTube	Twitter
1.	Rampur Raza Library	-	-	-	-
2.	Asiatic Society	6,217	-	-	-
3.	NAI	14,386	-	230	65
4.	Khuda Baksh Oriental Public Library	1,660	-	-	64
5.	TMSSML	-	-	-	-
6.	ANSI	7913	133	114	1,173
7.	DPL	3,874	155	110	2,098
8.	National Library	1,611	242	351	1,916
9.	Central Reference Library	251	-	-	705
10.	NMML	10,951	-	6.58 K	4,154
11.	CIHTS	4,953	-	12.1 K	126
12.	RRRLF	2,494	-	501	1,517
13.	IGRMS	4,223	-	1.22 K	1,715
14.	GSDS	4,893	-	425	3,767
15.	MAKAIAS	1,389	-	1.29 K	313
16.	CIHCS	781	116	340	45

Social media helps organisations in building relations with audiences. For the social media presence of knowledge resources heritage on Facebook, Instagram, YouTube and Twitter



are considered as these social platforms are highly used. Out of 16 knowledge resources heritage 14 using Facebook and Twitter, while 11 using YouTube and 4 using Instagram.

From Table 3, the National Archives of India and has the highest number of followers on Facebook, i.e. 14,386, while 4,154 Twitter followers of Nehru Memorial Museum and Library are the highest on the list. About 12.1K subscribers of Central Institute of Higher Tibetan Studies' YouTube channel. Anthropological Survey of India, Delhi Public Library, National Library and Central Institute of Himalayan Cultural Studies have a presence on all social media platforms.

### C) Rich Files

Rich files are different file formats of documents. For this study four rich files formats were selected, retrieved and tabulated, viz. .doc, .pdf, .ppt and .ps.

The Google search engine, and is the most popular and largest search engine, was used to collect raw data for the research to analyse the rich files of the selected websites. To extract data from the Web, Google offers some query syntax. The four syntaxes used to acquire the necessary data are shown in Table 4.

**Table 4. Query Syntax for Rich Files**

Types of Files	Syntax
Microsoft Word (.doc)	site: URL filetype:doc
Adobe Acrobat (.pdf)	site: URL filetype:pdf
Microsoft Powerpoint (.ppt)	site: URL filetype:ppt
Adobe PostScript (.ps)	site: URL filetype:ps

.doc= document files, .pdf= portable document format, .ppt= power point presentation, .ps= postscript

**Tables 5. Rich Files of the Websites**

S. No.	Knowledge Resources Heritage	.doc	.pdf	.ppt	.ps	Total	Rank
1.	NAI	03	503	00	00	506	1
2.	GSDS	00	488	00	00	488	2
3.	MAKAIAS	1	485	00	00	486	3
4.	CIHTS	2	476	00	00	478	4
5.	ANSI	91	291	00	00	382	5

6.	RRRLF	38	111	00	00	149	6
7.	IGRMS	01	138	00	00	139	7
8.	Asiatic Society	00	134	00	00	134	8
9.	DPL	01	87	00	00	88	9
10.	Rampur Raza Library	00	62	00	00	62	10
11.	Central Reference Library	00	49	00	00	49	11
12.	Khuda Baksh Oriental Public Library	00	45	00	00	45	12
13.	CIHCS	00	27	00	00	27	13
14.	TMSSML	00	06	00	00	06	14
15.	National Library	00	01	00	00	01	15
16.	NMML	00	00	00	00	00	16

Table 5 showed that most of the rich files in pdf file type. The National Archives of India, with a total number of 506 rich files, placed in the first rank which includes 503 pdf files. The second and third ranks were taken by Gandhi Smriti and Darshan Samiti (488 rich files) and Maulana Abul Kalam Azad Institute of Asian Studies (486 rich files). Nehru Memorial Museum and Library, with 00 rich files, got the last rank in this list.

#### D) Bounce Rate and Time Spent

Bounce rate is a percentage of the Audience who are not allowed to visit more than one page of the site or are not able to visit the site. Whereas ‘time spent’ is an average of visitors’ daily time spent on the particular website in minutes: seconds. Alexa Internet, the product of Amazon, was used to collect the required data for the analysis of the websites.

**Table 6. Bounce Rate and Time Spent**

S. No.	Knowledge Resources Heritage	Bounce Rate	Time Spent (mm:ss)
1.	Rampur Raza Library	--	--
2.	Asiatic Society	--	--
3.	NAI	70.3%	2:07
4.	Khuda Baksh Oriental Public Library	59.9%	6:40
5.	TMSSML	--	--
6.	ANSI	--	0:46
7.	DPL	87.5%	1:02
8.	National Library	54.3%	3:13
9.	Central Reference Library	--	--
10	NMML	--	0:50
11.	CIHTS	50%	1:46
12.	RRRLF	--	1:36

<b>13.</b>	IGRMS	96.8%	0:10
<b>14.</b>	GSDS	69.2%	2:42
<b>15.</b>	MAKAIAS	--	--
<b>16.</b>	CIHCS	--	--

Table 6 shows the bounce rate of the websites and the average time spent by the Audience of the sites over the website. Central Institute of Higher Tibetan Studies (CIHTS) has the lowest bounce rate among the websites, which is about 50% and topped the list, followed by National Library with a bounce rate of 54.3% and Khuda Baksh Oriental Public Library with 59.9% placed second and third in the list respectively.

The average daily time spent by the Audience on the site is also depicted in Table 6. Visitors spend the highest time on Khuda Baksh Oriental Public Library, i.e. 6:40 minutes. The second place was occupied by National Library with 3:13 minutes and followed by Gandhi Smriti and Darshan Samiti and National Archives of India at third and fourth place with 2:42 and 2:07 minutes, respectively.

#### **E) Top Keywords Search for Sites**

Table 7, given below, shows the top keywords used by visitors in a search engine to reach the website. About 57.09% of visitors, highest in number, used the keyword ‘thanjavur mah serfojis sarawswathi mahal library website’ to visit the TMSSML website. To visit the website of Rampur Raza Library, 47.4% of users used ‘rampur raza library’ keyword to search in search engine followed by 46.57% of the audience used the ‘ボークレス bilibili’ keyword to view the website of CIHCS. The Audience used keywords in small case letters to search the website.

**Table 7. Keyword Search**

<b>S. No.</b>	<b>Knowledge Resources Heritage</b>	<b>Top Keyword</b>	<b>% Age</b>
1.	Rampur Raza Library	rampur raza library	47.4%
2.	Asiatic Society	asiatic society	42.4%
3.	NAI	national archives of india	13.08%
4.	Khuda Baksh Oriental Public Library	unicode to krutidev	4.94%
5.	TMSSML	thanjavur mah serfojis sarawswathi mahal library website	57.09%
6.	ANSI	anthropological survey of india	28.77%
7.	DPL	delhi public library	33.09%

8.	National Library	national library	19.83%
9.	Central Reference Library	central reference library	36.76%
10.	NMML	nehru memorial	15.72%
11.	CIHTS	central institute of higher tibetan studies	39.88%
12.	RRRLF	rrrlf	26.82%
13.	IGRMS	indira gandhi rashtriya manav sangrahalaya	25.73%
14.	GSDS	gandhi smriti and darshan samit	12.06%
15.	MAKAIAS	maulana abul kalam azad	45.97%
16.	CIHCS	ボーダレス bilibili	46.57%

## F) Audience Geography

Audience geography is all about the traffic gain by websites from around the world in the last 90 days. From table 8, it is clear that ANSI, DPL, National Library, NMML, RRRIf and IGRMS has 100% Indian audience, followed by Khuda Baksh Oriental Public Library, National Archives of India and Gandhi Smriti and Darshan Samiti has 99.4%, 93.9% and 85.1% of Indian Audience respectively.

**Table 8. Audience Geography**

S. No.	Knowledge Resources Heritage	Indian	Foreign
1.	Rampur Raza Library	--	--
2.	Asiatic Society	--	--
3.	NAI	93.9%	6.1%
4.	Khuda Baksh Oriental Public Library	99.4%	0.6%
5.	TMSSML	--	--
6.	ANSI	100%	00
7.	DPL	100%	00
8.	National Library	100%	00
9.	Central Reference Library	--	--
10.	NMML	100%	00
11.	CIHTS	--	--
12.	RRRLF	100%	--
13.	IGRMS	100%	00
14.	GSDS	85.1%	14.9%
15.	MAKAIAS	--	--
16.	CIHCS	--	--

In the case of a foreign audience, Gandhi Smriti and Darshan Samiti have the highest 14.9% foreign audience placing it in number one. National Archives of India and Khuda Baksh Oriental

Public Library were placed at number two and three with foreign audiences of 6.1% and 0.6%, respectively.

### G) Network Diagram of Knowledge Resources Heritage

A network diagram is a combination of nodes and arrows which show how websites of a similar entity or of others are connected to each other and form a network. SocSciBot4 crawler was used to draw the network diagram of 16 websites. The crawler includes several analytical tools and produces data in a format that can be readily loaded into the standard network analysis software.



Fig. 1. Network Diagram of Knowledge Resources Heritage

Figure 1 shows that the National Archives of India (nationalarchives.nic.in) is linked with four other heritage, which is the best among the others. Whereas Maulana Abul Kalam Azad Institute of Asian Studies (makaias.gov.in) is linked to Nehru Memorial Museum and Library

(nehrumemorial.nic.in) and Central Reference Library (crlindia.gov.in) linked to National Library (nationallibrary.gov.in).

The network diagram shows that very few websites have been linked to others. To increase the reach of the websites, it is necessary for the webmasters of the individual websites to link each other websites. It will also help the users to visit another heritage website from other related websites, and it will benefit them in many ways like reduces time in searching, engages them more, motivate them to visit the parent website of the heritages and so on.

## **Conclusion**

There are plenty of options, and evaluating websites is a complicated but essential process. The effect and presence of a website on the Internet are influenced by factors such as its language. The number of web pages or other forms of information published on a website and the contents and variation between disciplines is critical for the visibility of the websites. Each website should connect to other similar and distinct websites to gain inlinks and visibility.

In the present study, websites have mainly two types of rich files, i.e., pdf and HTML, but few websites don't have any rich files, which hamper their visibility over the Internet. In the case of inlinks, very few websites are linked to other websites. Performance of most of the sites recorded poor through Alexa Internet Tool. The webmaster of the websites must use SEO tools and improve websites visibility, index on Alexa Internet and rank.

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