INDIAN INSTITUTES OF TECHNOLOGY'S WEBSITES IN INDIA: A WEBOMETRIC ANALYSIS

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The Web Impact Factor (WIF) is a quantitative indicator based on link frequencies that was developed by Peter Ingwersen in 1998. The present study uses the webometric tools and indicators to analyse the websites of Indian Institutes of Technology in India. The parameters used for this study are, simple WIF, self link WIF, External link WIF, Back links and Broken links. Google Search Engine, Web Link Analyzer, Back Link Watch and Broken Link Checker are used as tools to collect the data from the IIT's websites. The results of the study indicate that all the IIT's, 23 (100%) have .ac.in domain extension; the IIT Mandi has the highest SWIF and SLWIF, i.e. 0.043 (with 178 LWP and 4130 Web pages) and 0.033 Self Link Web Impact Factor (with 137 SLWP and 4130 Web pages) Whereas, 0.014 External Link WIF with 103 External Link web pages and 7190 web pages the IIT Gandhinagar has the highest ELWIF and IIT Mandi is in the top position with 0.072 RWIF. With 0.81% broken links IIT Palakkad has secured the first position.

Keywords: Broken Links, External Link WIF, India, Indian Institutes of Technology, Self Link WIF, Simple Link WIF, Web Impact Factor, Webometric Analysis, Webometrics

INTRODUCTION

Indian Institutes of Technologies (IITs) are the globally acclaimed world class technological institutes to impart education and research in the area of Engineering, Technology and allied sciences. These IITs are conceptualized before the independence of India to create higher technical educational institutes in India to support post-war industrial development. However, the first IIT was established only in Independent India in May 1950 at Kharagapur, West Bengal. Currently there are twenty-three IITs established across India.

Institutional websites serve as a significant tool to disseminate institutes' overall information communications to the common public in general and to the current and prospective students in particular. Institutional

websites are also used to promote the academic and research developments to the world and promote its visibility in academic arena. Due to the technological advancements, websites have become interactive in nature and for academic promotions websites plays a vital role as digital ambassador for the institutes and bridge the gap between the academic research and common public. Hence, it is very essential to analyse the websites.

The current study adopts the concept of Webometrics to evaluate the websites of the IITs in India. The term 'Webometrics' was first used by Almind and Ingwersen (1997) and they defined it as "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 the study". In simple terms Webometrics is the study of the quantitative aspects of web contents from one or more websites using metrics study. The periodic evaluation of websites using the Webmetrics technology help the institutes to keep the websites updated and avoid broken and obsolete links.

WEB IMPACT FACTOR

The Web Impact Factor (WIF) is a quantitative indicator based on link frequencies that was developed by Peter Ingwersen in 1998. It is used to evaluate the impact of a website or other web pages. There are four kinds of Web Impact Factors, according to him: simple, self-link, external-link and revised WIFs. SWIF is calculated by dividing the total number of external and internal links by the total number of web pages published in the web site that are indexed by the search engine (not all web pages available in the web site). For each website, the External Link WIF is calculated by dividing the number of external links web pages by the total number of web pages. For each website, the Self-Link WIF is calculated by dividing the number of self-linking web pages by the total number of web pages and the Revised WIF is calculated by dividing the number of Inlinking web pages by the total number of web pages.

INDIAN INSTITUTES OF TECHNOLOGY IN INDIA: A PROFILE

Indian Institutes of Technology (IITs) wereestablished immediately after the Independence to cope up with the global industrial revolution. Currently, there are twenty-three IITs established across the country and are declared as Institutes of National Importance, governed by the Institutes of Technology Act 1961 (IIT Act 1961). Each IIT works as an independent institute as an autonomous body.

The very first IIT was established at the Kharagpur, which was inaugurated on 18th August 1951 based on the recommendations by the Sarkar Committee. Following the recommendations of the same committee, the Government of India further established four more IITs at Mumbai (1958), Chennai (1959), Kanpur (1959) and Delhi (1961) to avoid regional imbalance. In 1994 6th IIT was established in Guwahati and in 2001 the University of Roorkee was converted into IIT. In the 11th five-year plan eight more IITs were established at Bhubaneswar, Gandhinagar, Hyderabad, Indore, Jodhpur, Mandi, Patna and Ropar (2008-2009). In the year 2012, Institute

of Technology, Banaras Hindu University was renamed IIT-BHU, Varanasi. In the year 2015-16 six more IITs were established at Bhilai, Dharwad, Goa, Jammu, Palakkad and Tirupati along with conversion of Indian School of Mines, Dhanabad into IIT(ISM) Dhanbad. As per the IIT act, these individual IITs are connected through IIT Council. However, IIT council works under the President of India, being ex officio visitor to all the IITs and has residual powers. Each IIT has a Board of Governors, where Chairman and Directors of each IIT is appointed by the President of India (IIT Council Portal (2021)).

IITs are treated as India's premier technical institutes, hence IITs receive higher grants in comparison with other engineering and technical institutes. IITs impart technical education at various levels like bachelor's degrees, master's degrees, dual degrees and doctoral & post-doctoral research degrees. Some of the IITs also offer master's degree and Post Graduate Diploma degrees in various other subject areas like Science, Business Administration, Arts, Design, and Law etc. Hence, the present study, webometric analysis of IITs in India is conducted.

REVIEW OF RELATED STUDIES

The literature reveals that there are ample studies conducted on the webometric analysis of the universities, engineering colleges, medical colleges and other national importance libraries. But very few studies have been conducted on Indian Institutes of Technology and National Institutes of Technology. Hence, the articles pertaining on both IITs and NITs were reviewed in this section.

Madhusudhan and Prakash (2013) explored several specifications of linking evaluation of 16 IIT websites. The tools employed for the grading and distinguishing of IIT's (Indian Institute of Technology) were WISER(Wanger Institute for Sustainable Energy Research), WIF (in link) and world Rank. The study alluded that there was alliance of proximity between 2 grading methods which is known by WISER grading and WIF (in link) exhibiting, reciprocity i.e. +0.0558824 WIF (in –link) grade exhibited greatly, adjacent distinction to the world rank. In the WIF (in-link) along with world rank, IIT Bombay was placed 1st and IIT Madras was in the 2nd place. Sujithai and Jeyshankar (2013) considered the web pages of Indian Institutes of Technology's websites for their analysis. The websites considered for the study were retrieved by commercial search engine and examined by histogram, scatter plot as well as the line of best fit for its constancy and further by regression analysis, by making use of SPSS 17.0 package. It was discovered that external link Webpages furnish more information compared to other link pages.Chakravarty and Wasan (2015) considered top 10 library websites of HEI's (Higher Education Institutions) of India, for which WIF was calculated and revised the same and in addition to this associated both the formulas in relation to spearman's rank correlation. The outcome was WIF and R-WIF (Revised -Web Impact Factor) was constituted and coordinated, illustrating scant, distinction between the two ranking methods. The evaluation was done using both formulas which revealed that the grading of library websites of half of the HEI's of India is similar.

Seshaiah and Rekha (2016) considered 277 engineering colleges of A.P. (Andhra Pradesh) to explore the number of web pages and link pages and calculate their self link WIF, External link WIF, simple link WIF and upgraded WIF. The tools used for the study were Google Search Engine, Back link watch and webmaster world. The outcome of the evaluation is that very less, effect of web was found in engineering colleges of Andhra Pradesh. The back link pages were found to be stunted. Brahma and Verma (2019)considered the ranking given by National Institutional Ranking Framework (NIRF), to investigate the libraries' websites of top ranked Law Institutes of India. The outcomes of the study reveals that the first position (63, 18.86%) was secured by Indian Institute of Technology Kharagpur with regards to the Domain Authority, and for page Authority (35, 16.58%). Jamia Millia Islamia, Delhi occupies the first place with the highest Internal WIF of 345.36 IWIF, IIT Kharagpur leads with the highest EWIF of 50.68, while the SWIF of Jamia Millia Islamia, Delhi lead with the highest SWIF of 346.13.

Jaiswal and Arya (2020) investigated the web presence of repositories of IIT's as an element belonging to WWW. The authors made use of Google to gather raw information namely number of web pages, in links, self-links as well as external links and so on. Boolean operators were also used to form query syntaxes for retrieving data. SocSciBot web crawler was employed to create network map of all the websites. Websites of repositories are tested through command line textual queries like link, link domain, site etc. Bulla and Hadagali (2020) considered 30 state university websites in Karnataka to conduct webometric analysis. To gather information pertaining to the university websites, Google search engine, Search Engine Optimization tools (SEO), tools and Back link watch were employed. With regards to webometric analylsis SWIF, RWIF, have been studied and ranked the websites according to WIF for 30 state universities' websites in Karnataka. The results indicate that the influence of the state universities on the web was limited; some of the state universities' websites in Karnataka recede in the provision of simple self -link as well as external link WIF in spite of having greater count of web pages the link possessed by those is literally limited in quantity. Kadam and Bhusawar (2021) conducted a webometric analysis of top 25 institutions based on NIRF. The indicators used in the study were WISER index, Alexa traffic rank, search engine optimization, website protection rank, number of social media followers, and external backlinks. The outcome of the results was that the predominant position was occupied by IIT, Indore on WIF (8.678343949), while IIT, Roorkee secured first position on search engine optimization. In Alexa traffic Anna University, Chennai, ranked first with loading time of 0.693 seconds. The review of literature reveals that there are less studies conducted on the Web Impact Factor or Indian Institutes of Technology in India. Further the study used Google Search Engine and SEO tools to obtain the required webometric data

for evaluating website link performance due to its high accuracy, coverage, and popularity. From the present study timely update is covered and ranked the IITs based on Web Impact Factor.

SCOPE AND LIMITATIONS OF THE STUDY

The present webometric study investigates the websites of India's 23 IIT's (Indian Institutes of Technology). But it is observed from the study that some of the well established IIT's (old by age) were not supported to SEO (Search Engine Optimization) tools in almost all aspects of the study.SEO supported top 5 IIT's were considered for analysis and the research focuses on five key areas, namely Web-link structure analysis is the study of a website's overall links, as well as other types of links such as "external links", "self-links, In-Links and Broken Links." The study also aims to rank IIT (Indian Institute of Technology's) websites academically by measuring their Web Impact Factor (WIF).

OBJECTIVES OF THE STUDY

1. To identify and analyse the websites of IIT's in India based on the webometric tools and indicators.

2. To find out the number web pages, link pages, self-link pages, external link pages, in link pages and broken links of the IIT's websites under evaluation;

3. To evaluate the simple Web Impact Factor (WIF), Self-link Web Impact Factor (WIF), External Link Web Impact Factor (WIF) and Revised Web Impact Factor of IIT's websites and rank them as per the WIF.

4. To calculate the broken links of IIT websites in India.

METHODOLOGY OF THE STUDY

The study calculates the Web Impact Factor (WIF), which is considered for the evaluation. The research used Google Search Engine and SEO tools to obtain the required webometric data for evaluating website link performance due to its high accuracy, coverage, and popularity. Using the count of various links and web pages on the IIT's websites, the Simple Web Impact Factor, Self Link Web Impact Factor, External Link Web Impact Factor, Revised Web Impact Factor and Broken Links were calculated.
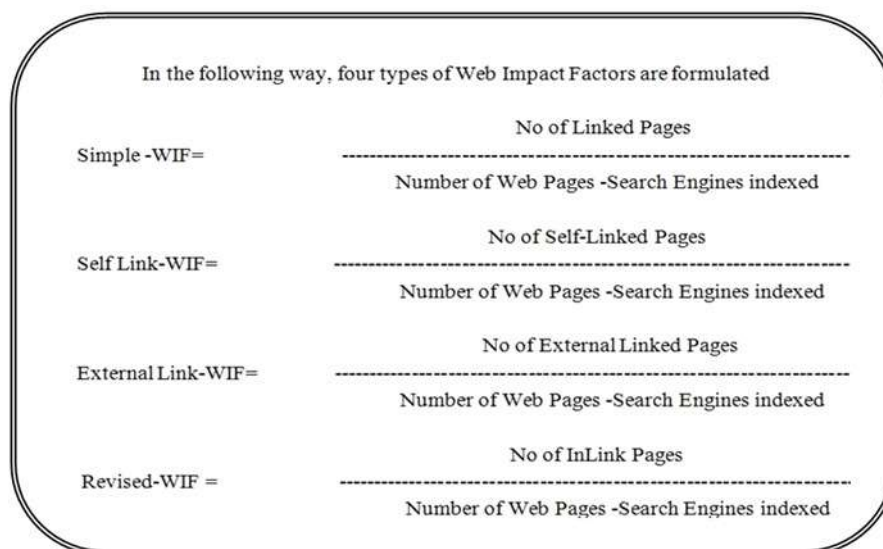
TOOLS USED FOR THE STUDY

To collect the data for each of the IIT (Indian Institute of Technology's) websites, the following tools were used:

- Google: For this study, the Google search engine was used to collect statistics on the number of web pages. For example- site: http://www.iitk.ac.in/ (site:sitename).

- Website Link Analyzer: https://smallseotools.com/website-link-analyzer-tool/collects simple links, self-links, and external links of each library website under investigation.

- Back-link watch: In-links were obtained from the http:/www.backlinkwatch.com/ for this study.

Broken-Link Checker: https://www.deadlinkchecker.com/website-dead-link-checker.asp/ was used to gather broken-links for the study.

CALCULATION OF WEB IMPACT FACTOR (WIF)

In the following way, four types of Web Impact Factors are formulated

$$\text{Simple -WIF} = \frac{\text{No of Linked Pages}}{\text{Number of Web Pages -Search Engines indexed}}$$

$$\text{Self Link-WIF} = \frac{\text{No of Self-Linked Pages}}{\text{Number of Web Pages -Search Engines indexed}}$$

$$\text{External Link-WIF} = \frac{\text{No of External Linked Pages}}{\text{Number of Web Pages -Search Engines indexed}}$$

$$\text{Revised-WIF} = \frac{\text{No of InLink Pages}}{\text{Number of Web Pages -Search Engines indexed}}$$

DATA ANALYSIS AND INTERPRETATION

The data was gathered using Google's search engine because of its wide coverage and convenient use of tools like https://smallseotools.com/website-link-analyzer-tool/. Microsoft Excel was used for data analysis.

Domain wise distribution of IIT's in India

The website name and the domain name extension are the two primary components of a domain name. The Table 1 shows the domain-by-domain distribution of Indian Institutes of Technology websites. All the 23 IITs use only one domain extension, i.e. .ac.in.

Table 1: Domain wise distribution of IIT's in India

Domain Name	No. of Indian Institute of Technologies (IIT's)	Percentage(%)
.ac.in	23	100

Simple Web Impact Factor of top 5 IIT's in India

According to the Simple WIF, the rank distribution of websites of IIT's in India is shown in the Table 2. In terms of Simple Web Impact Factor (SWIF), IIT Mandi placed in first position (0.043 SWIF). With 0.030 SWIF, IIT Gandhinagar placed second rank, whereas, IIT Roper placed third rank with 0.013 SWIF and IIT Kanpur placed fourth rank with 0.006 SWIF. Though the IIT Palakkad has good number of web pages (35300), it ranked fifth (0.003 SWIF) because, the number of link pages were less than the number of web pages.

Table 2: Simple Web Impact Factor of top 5 IIT's in India

NAME OF IIT	WEBSITE	NWP (A)	LWP (B)	SWIF (B/A)	RANK
IIT Mandi (HIMACHAL PRADESH)	http://www.iitmandi.ac.in/	4130	178	0.043	1
IIT Gandhinagar (GUJARAT)	https://www.iitgn.ac.in/	7190	220	0.030	2
IIT Roper (PUNJAB)	http://www.iitrpr.ac.in/	9550	133	0.013	3
IIT Kanpur (UTTAR PRADESH)	http://www.iitk.ac.in/	101000	678	0.006	4
IIT Palakkad (KERALA)	https://iitpkd.ac.in/	35300	122	0.003	5
NWP- No. of Web Pages, LWP- Linked Web pages, SWIF- Simple Web Impact Factor					

Self Link Web Impact Factor of top 5 IIT's in India

According to the Self Link WIF, the rank distribution of websites of IIT's of India is shown in Table 3. In terms of Self Link Web Impact Factor (SLWIF),IIT Mandi placed in first rank (0.033 SLWIF). With 0.016 SLWIF, IIT Gandhinagar placed second rank whereas,IIT Roper placed third rank with 0.010 SLWIF and IIT Kanpur placed fourth rank with 0.005 SLWIF.Though have good number of web pages (35300), IIT Palakkad ranked fifth (0.002 SLWIF) because the number of self-link pages were less than the number of web pages.

Table 3: Self Link Web Impact Factors of top 5 IIT's in India

NAME OF IIT	WEBSITE	NWP (A)	SLWP (C)	SLWIF (C/A)	RANK
IIT Mandi (HIMACHAL PRADESH)	http://www.iitmandi.ac.in/	4130	137	0.033	1
IIT Gandhinagar (GUJARAT)	https://www.iitgn.ac.in/	7190	117	0.016	2
IIT Roper (PUNJAB)	http://www.iitrpr.ac.in/	9550	103	0.010	3
IIT Kanpur (UTTAR PRADESH)	http://www.iitk.ac.in/	101000	568	0.005	4
IIT Palakkad (KERALA)	https://iitpkd.ac.in/	35300	90	0.002	5
NWP-No of Web Pages, SLWP- Self Linked Web pages, SLWIF- Self Link Web Impact Factor					

External Link Web Impact Factor of top 5 IIT's in India

According to the External Link WIF, the rank distribution of websites of IIT's in India is shown in the Table 4. In terms of External Link Web Impact Factor (ELWIF), IIT Gandhinagar placed in first rank (0.014 ELWIF). With 0.009 ELWIF, IIT Mandi placed second rank whereas; IIT Roper placed third rank with 0.003 ELWIF and IIT Kanpur placed fourth rank with 0.001 ELWIF. Though have good number of web pages (35300), IIT Palakkad ranked fifth (0.0009 ELWIF) because the number of external link pages was less than the number of web pages.

Table 4: External Link Web Impact Factor of top 5 IIT's in India

NAME OF IIT	WEBSITE	NWP (A)	ELWP (D)	ELWIF (D/A)	RANK
IIT Gandhinagar (GUJARAT)	https://www.iitgn.ac.in/	7190	103	0.014	1
IIT Mandi (HIMACHAL PRADESH)	http://www.iitmandi.ac.in/	4130	41	0.009	2
IIT Roper (PUNJAB)	http://www.iitrpr.ac.in/	9550	30	0.003	3
IIT Kanpur (UTTAR PRADESH)	http://www.iitk.ac.in/	101000	110	0.001	4
IIT Palakkad (KERALA)	https://iitpkd.ac.in/	35300	32	0.0009	5
NWP-No of Web Pages, ELWP-External Linked Web pages, ELWIF- External Link Web Impact Factor					

Table 5: Revised Web Impact Factor of top 5 IIT's in India

NAME OF IIT	WEBSITE	NWP (A)	ILWP (E)	RWIF (E/A)	RANK
IIT Mandi (HIMACHAL PRADESH)	http://www.iitmandi.ac.in/	4130	301	0.072	1
IIT Roper (PUNJAB)	http://www.iitrpr.ac.in/	9550	343	0.035	2
IIT Gandhinagar (GUJARAT)	https://www.iitgn.ac.in/	7190	221	0.030	3
IIT Kanpur (UTTAR PRADESH)	http://www.iitk.ac.in/	101000	1000	0.009	4
IIT Palakkad (KERALA)	https://iitpkd.ac.in/	35300	174	0.004	5
NWP- No of Web Pages, ILWP- In link Web Pages, RWIF- Revised Web Impact Factor					

Revised Web Impact Factor of top 5 IIT's in India

According to the Revised WIF, the rank distribution of websites of IIT's of India is shown in Table 5. In terms of Revised Web Impact Factor (RWIF), IIT Mandi placed in first rank (0.072 RWIF). With 0.035 RWIF, IIT Roper placed second rank whereas; IIT Gandhinagar placed third rank with 0.030 RWIF and IIT Kanpur placed fourth rank with 0.009 RWIF. Though IIT Palakkad has good number of web pages (35300) it ranked fifth (0.004 RWIF) because, the number of in link pages were less than the number of web pages.

Broken Links of top 5 IIT's in India

The Broken Links (BL) of websites of IIT's of India has been calculated, and the results are shown in the Table 6. The IIT Palakkad is placed in the first rank with 0.81% Broken Links (BL), followed by IIT Gandhinagar placed second rank with 15.00% broken links (BL). IIT Kanpur is placed in the third rank with 15.78% broken links (BL), whereas, IIT Roper placed fourth rank with 24.06% Broken Links (BL). The IIT Mandi is ranked fifth, with the highest Broken Links (BL) of 29.21%.

Table 6: Broken Links of top 5 IIT's in India

NAME OF IIT	WEBSITE	LWP	BL	%	RANK
IIT Palakkad (KERALA)	https://iitpkd.ac.in/	122	1	0.81	1
IIT Gandhinagar (GUJARAT)	https://www.iitgn.ac.in/	220	33	15.00	2
IIT Kanpur (UTTAR PRADESH)	http://www.iitk.ac.in/	678	107	15.78	3
IIT Roper (PUNJAB)	http://www.iitrpr.ac.in/	133	32	24.06	4
IIT Mandi (HIMACHAL PRADESH)	http://www.iitmandi.ac.in/	178	52	29.21	5
BL- Broken Links, **LWP-** Linked Web pages, **%-** Percentage					

SUGGESTIONS

The following suggestions have been made based on the results of the study.

1. The IIT Kanpur and the IIT Palakkad have good number of Self Link Web Pages (568) (90) even though they occupied the 4th and 5th rank respectively since the number of web pages (101000 and 35300) were higher than the number of self link web pages. Hence, it is recommended to the authorities of IIT Kanpur and IIT Palakkad to improve the self link web pages as per their number of web pages.

2. It is evident from the study that though IIT Palakkad has good number of web pages (35300) than the top three ranked IIT's, it

occupied 5th position since the numbers of external link pages were lesser than the number of web pages. Hence, it is recommended to the authorities of IIT Palakkad to improve the number of external link pages.

3. The IIT Kanpur and the IIT Palakkad have good number of In link web pages (1000) (174) even though they occupied the 4th and 5th rank respectively since the number of web pages (101000 and 35300) were higher than the number of In link web pages. Hence, it is recommended to the authorities of IIT Kanpur and IIT Palakkad to improve the In link web pages as per their number of web pages.

4. IIT Mandi has good number of linked web pages (178) though it occupied the 5th rank since the numbers of broken links (52) were higher comparatively the number of linked web pages. Hence, it is recommended to the authorities of IIT Mandi to reduce the broken link pages as per its number of link web pages.

5. It is observed from the study that some of the well established IIT's (old by age) were not supported to SEO (Search Engine Optimization) tools in almost all aspects of the study. Hence it is recommended to the authorities of IIT's (Apart from above top 5 IIT's) that to update website as per the requirement of SEO(Search Engine Optimization) tools which helps to identify the WIF of IIT websites timely.

CONCLUSION

Considering the enormous variety of choices accessible, evaluating websites is a difficult but necessary activity. The WIF, as described above, is a valuable tool for website evaluation, but it must be utilised carefully. The number of webpages or other forms of information published on a website, the substance, and differences between disciplines are all factors to consider. The status of a website's coverage in search engine databases, as well as the occurrence of a domain name change, is both critical. The WIFs are never accurate and are always approximate. The WIF of a site is unstable since some webmasters delete old inlinks to many websites every day, while others link to new ones. The WIF would still be an inferior quality indicator since link impact is more of a measure of scientific utility than that of scientific quality. There appears to be no substitute to competent specialists examining the website resources for evaluating scientific excellence. All WIF research should be standardized to account for characteristics like field or discipline, nation, language, and connection practices, among others.

The results of the study indicate that out of 23 IIT's, 23 (100%) have .ac.in domain extension; the IIT Mandi has the highest SWIF and SLWIF, i.e. 0.043 (with 178 LWP and 4130 Web pages) and 0.033 Self Link Web Impact Factor (with 137 SLWP and 4130 Web pages) Whereas, 0.014 External Link WIF with 103 External Link web pages and 7190 web pages the IIT Gandhinagar has highest ELWIF and IIT Mandi is in the top position with 0.072 RWIF. With 0.81% broken links IIT Palakkad secured the first position. Webometric studies, on the other hand, helps in the improvement of website performance. Such research is beneficial and necessary in order to update, add, edit, and re-design websites on a

regular basis. With the use of the rankings given by this study, people may identify the WIF of websites.

REFERENCES

1. Almind, T. C., &Ingwersen, P. (1997). Informetric analyses on the world wide web: methodological approaches to 'webometrics'. *Journal of Documentation.* 37 (4), 106-113

2. Brahma, K., & Verma, M.K. (2019). Evaluation of Libraries' Websites of selected Law Institutes of India: A Webometric Analysis. *Asian Libraries and Librarians*, 169(2), 378-387.

3. Bulla, S.D., & Hadagali, G.S. (2020). Evaluation of Websites of state universities in Karnataka: A Webometric study. *Indian Journal of Information, Library and Society*, 33 (3-4), 235-248.

4. Chakravarty, R., &Wasan, S. (2015). Webometric Analysis of Library Websites of Higher Educational Institutes (HEIs) of India: A study through Google Search Engine. *DESIDOC Journal of Library & Information Technology*, 35 (5), 325-329.

5. IIT Council Portal (2021). Council of IITs. Retrieved from https://www.iitsystem.ac.in/

6. Jaiswal, B., & Arya, R. (2020). Web presence of Repositories of Indian Institutes of Technology: A Webometric study. *Journal of Library and Information Sciences*, 8 (1), 83-99.

7. Kadam, S D &Bhusawar, S C (2021) websites of Top-Ranked Indian Higher Education Institutions: A Webometric Analysis. *Library Philosophy and Practice (e-journal)*, 1-26.

8. Madhusudhan, M., & Prakash, S. (2013). Websites of Indian Institutes of Technology: A Webometric Study. *International Journal of Library and Information Studies*, *3*(4), 93–107.

9. Seshaiah, O., & Rekha, R.V. (2016). Websites of Engineering Colleges in Andhra Pradesh: A Webometric Study. *International Journal of Information Dissemination and Technology*, 6 (4), 293-297.

10. Sujithai, M., &Jeyshankar, R. (2013). Web page analysis of Indian Institute of Technologies (IITs) Websites: A Webometric study. *International Journal of Digital Library Services*, 3 (1), 55-65.

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Appendix

List of Indian Institutes of Technology in India

Sl. No.	Name of the Institution	Place	State	Year of Establishment
1	Indian Institute of Technology (BHU)	Varanasi	Uttar Pradesh	1919
2	Indian Institute of Technology	Dhanbad	Jharkhand	1926
3	Indian Institute of Technology	Kharagpur	West Bengal	1951
4	Indian Institute of Technology	Mumbai	Maharashtra	1958
5	Indian Institute of Technology	Chennai	Tamil Nadu	1959
6	Indian Institute of Technology	Kanpur	Uttar Pradesh	1959
7	Indian Institute of Technology	New Delhi	Delhi	1963
8	Indian Institute of Technology	Guwahati	Assam	1994
9	Indian Institute of Technology	Roorkee	Uttarakhand	2001
10	Indian Institute of Technology	Roper	Punjab	2008
11	Indian Institute of Technology	Gandhinagar	Gujarat	2008
12	Indian Institute of Technology	Bhubaneswar	Odisha	2008
13	Indian Institute of Technology	Jodhpur	Rajasthan	2008
14	Indian Institute of Technology	Patna	Bihar	2008
15	Indian Institute of Technology	Hyderabad	Telangana	2008
16	Indian Institute of Technology	Indore	Madhya Pradesh	2009
17	Indian Institute of Technology	Mandi	Himachal Pradesh	2009
18	Indian Institute of Technology	Palakkad	Kerala	2015
19	Indian Institute of Technology	Tirupati	Andhra Pradesh	2015
20	Indian Institute of Technology	Bhilai	Chhattisgarh	2016
21	Indian Institute of Technology	Ponda	Goa	2016
22	Indian Institute of Technology	Jammu	Jammu and Kashmir	2016
23	Indian Institute of Technology	Dharwad	Karnataka	2016

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