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Library Website as an Indicator of Academic Excellence: A Web Analysis of the Leading IITs in India

Abstract

This study aims to understand the services and web-based library resources of Indian Institutes of Technology (IIT) libraries. Each library included in the study has a specific webpage and provides standard library information. The content characteristics of the websites of the top five Indian Institutes of Technology (IIT) libraries, according to the NIRF ranking 2023, are assessed in this study. We create a systematic checklist to achieve the study's goals, utilizing the availability of literature. The study focuses primarily on the webpages of the selected IIT libraries, examining aspects such as webpage framework, style, layout, library services, and content. It explores how the IIT Library system employs rankings, services, print and electronic resources, and library technology solutions to support its users. The observational approach is utilized as the primary research method for this study. The study indicates that IITs have satisfactory web-based tools and services. Search and advanced search tools are implemented in almost all libraries, allowing users to browse available resources. Furthermore, every library website features hyperlinks to institutional repositories and open-access content. Based on the overall assessment, the IIT Delhi library website obtains the highest rating (77%), while the IIT Madras library website scores the lowest (60%) among the selected IIT libraries. The study suggests that these libraries should transition to the next level of high-tech services, such as dynamic websites, social media networks, and mobile applications, to meet the needs of young and emerging minds.

Keywords: IIT Libraries, Library Websites, Library webpages, NIRF 2023, Web analysis, IITs in India, IIT ranking 2023

1. INTRODUCTION

The library is regarded as a center for learning at academic institutions, where users acquire data from many sources under their needs. Libraries are transforming their resources and services in response to emerging technology, environmental changes, and user demand. The role of library websites in disseminating and delivering library and information services is improving in the present era. It has never been more prominent than it is now. The libraries of prominent Indian academic institutions, including the Indian Institute of Technologies (IIT), are crucial to the engineering education process. It serves as a resource point for information for college students taking classes outside the classroom. Since users no longer visit libraries, library websites are essential in the current situation for information delivery. The library website now serves as a reference librarian for users to find collections and get help with services. The library's website serves as its public face, showcasing its resources and how it provides information to users. As a result, the library website is more informational. It helps the larger audience's needs, thanks to high-quality online content and linkages to all resources. Therefore, periodic inspection of the online content of library websites is required to give consumers updated information.

2. IITs in India

The IITs, or Indian Institutes of Technology, are governmental technical institutions financed by the Indian government. The Government of India's Ministry of Education holds ownership of them. Act of 1961 governing institutes of technology, which established them as Institutes of National Importance and set the foundation for their governance as the nation's top technological institutions, controls them. The network of institutes referred to as the Indian Institute of Technology (IIT) is among the few institutions of higher learning in independent India to receive global recognition for excellence in functioning. Many learned Indians know

these prestigious institutions, and today's young students aim to attend one for their studies. The Indian Ministry of Education now oversees 23 IITs operational in various states.

3. National Institutional Ranking Framework

On September 29, 2015, the Honourable Minister of Human Resource Development introduced the National Institutional Ranking Framework (NIRF), which had been authorized by the Ministry of Human Resource and Development (now the Ministry of Education). This framework describes a strategy for classifying institutions all around the nation. The technique uses the general suggestions and comprehensive knowledge of the Core Committee, established by MHRD, to determine the essential criteria for rating different universities and institutions. The primary categories of the requirements are "Teaching, Acquiring knowledge and Skills," "Research and Professional Activities," "Graduation Performance," "Outreach and Respect for diversity," and "Perception" (https://www.nirfindia.org/About/).

3. Literature Review

Gaurav et al. (2022) examined the websites for the IIT library regarding content and design performance. For its distant readers who were looking for information, they recommended making the library websites' accessible features better.

Kumar and Yadav (2020) analyzed for efficacy in NIRF rankings and university library systems. Together with ILA, they recommended that libraries boost user interaction by utilizing library portals for a more significant user effect.

Sahoo and Panda (2019) examined the different types of library technology utilized by the IIT Bombay and IIT Delhi Library Systems. They discovered that IIT libraries use the most

recent technological advancements to provide their patrons with innovative library services.

Sahoo (2019) used common assessment standards to assess the web contents and browsing capabilities of the Indian Institute of Technology (IIT) library portals. He discovered that none of the 18 IIT library websites met all the requirements established for the research, with 3 (16.7%) scoring only about 50 among the 100 checklist elements.

Singh (2018) investigated the usage of Web 2.0 tools in Indian Institutes of Technology (IITs) and Indian Institutes of Management (IIMs), including awareness of their existence and their prevalence. Additionally, it was shown that respondents were familiar with and used such programs in their academic and research projects.

Verma and Shukla (2018) studies were conducted on fourteen Indian Institute of Management (IIMs) Library website usability. They advised that university libraries in India keep their websites' standard layout and structure for periodic evaluation.

Talati and Bhatt (2016) discuss the web-based library products and services offered through the library websites of IITs and NITs and provide new recommendations on fulfilling today's generation of young technocrats. To please the young technocrats, they advised that such libraries upgrade to the next level of hi-tech offerings, such as dynamic websites, social networking, and mobile applications.

Lithitkar and Manohar (2014), Emphasizing the influence of Web 2.0 on libraries and information activities of IIT Libraries in India, have explored how Web 2.0-based services have increased opportunities and created new methods of interacting and working.

Singh and Samyal (2014) evaluated the libraries of IITs to determine their steps to represent these resources and services to their patrons. They suggested setting up a dedicated

Information Technology Cell within every IIT library to maintain the website's content with information on its holdings, architecture, layout, facilities, resources, and hyperlinks.

Ratha, Joshi, and Naidu (2014) stated that according to various crucial viewpoints, such as customer support services, the number of links on home pages and entire websites, the quantity and placement of graphics, inactive connections, and web pages, there are noticeable disparities, etc.

4. Objectives

- Assess the library's general information and technical features supported by the library websites.

- To know library services and e-resources availability among India's top five selected IITs.

- To analyze the availability of LIB 2.0 on the webpage and other features like their Currency, Accuracy, and organizational structures.

- To evaluate library websites by various criteria to rank them accordingly.

5. Scope and Methodology of the Study

This study aims to examine the web pages for the library at the Indian Institute of Technology (IIT). In India, there are 23 IITs, from which the top five IITs, based on the NIRF 2023, the National Institutional Ranking Framework, are selected for the study. All the chosen IIT libraries have separate websites or web pages. The IIT libraries covered in this study are the Indian Institute of Technology Madras, Delhi, Bombay, Kanpur, and Roorkee. The IIT Library system comprises rankings, services, print and electronic resources, and library technology

solutions utilized to assist its clients as the research's basis. The study primarily focuses on NIRF 2023 top five ranked IITs in India, including the framework of webpages, style, layout, library services, and contents of the webpages of IIT libraries, primarily observational. (see *Table 1*).

Table 1 *Library websites of selected IITs*

NIRF Rank 2023	Name of IITs	Estd.	State	Library Name	URL of the Library
1	IIT Madras	1959	Tamil Nadu	Central Library	https://cenlib.iitm.ac.in/
2	IIT Delhi	1961	Delhi	Central Library	https://library.iitd.ac.in/
3	IIT Bombay	1958	Maharashtra	Central Library	https://www.library.iitb.ac.in/
4	IIT Kanpur	1959	Uttar Pradesh	PK Kelkar Library	https://pkklib.iitk.ac.in/
5	IIT Roorkee	1847	Uttarakhand	Mahatma Gandhi Central Library	https://mgcl.iitr.ac.in/

The IIT libraries' websites were used to gather the primary data, which was then entered into an MS Excel spreadsheet using a different perspective to produce the tables and graphs that show the study's findings. The secondary data is gathered from various sources, including relevant papers, books, journal articles, the internet, etc. Two variables indicate a checklist's unavailability or availability for every category: Yes = 1 and No = 0. At the end of the data analysis, the sum of the obtained scores of each library's websites is divided by the sum of the total scores, multiplied by 100, to find the overall score of each library website. In conclusion, the overall score can be evaluated by finding the average scores of all variables to rank the IITs according to their library facilities.

6. Data Analysis

6.1 Library information and general features supported by the library websites

6.1.1 Library information available on webpages: According to the contents on each library's website, some preliminary and necessary information has been listed (*Table 2).* We discovered from the investigation that IIT Delhi and IIT Roorkee scored the highest % in the availability of information on their websites by 93%. In contrast, IIT Madras scores the lowest, with 66% of information availability.

Table 2: Information available on the IIT websites

Library Information	IITM	IITD	IITB	IITK	IITR
Introduction	1	1	1	1	1
Mission/Vision	0	1	0	1	1
Opening hours	1	1	1	1	1
Library rules	0	1	1	1	1
Membership	1	1	1	1	1
Library fees and other charges	1	1	1	0	1
Collections	1	1	1	1	1
Infrastructure/Building	1	1	1	1	1
Teams/Staff	0	1	1	1	1
Collection Development Policy	0	1	0	1	1
Notice/Notification	1	0	1	1	1
Contact	1	1	1	1	1
Publishers	1	1	1	1	1
Scholar's Profile	1	1	1	0	0
Librarian's contact	1	1	1	1	1
Total Score (15)	**11**	**14**	**13**	**13**	**14**

*6.1.2 General features of libraries***:** Table 3 shows the general features of the IITs libraries. A general feature of the library is one of the aspects of the IIT library websites, like staff directories, news and. events, information about the contents available in the library, library rules, and so on. From the information available on their library websites, we found that IIT

Roorkee provides the highest information available on the website, with an 83.3% score. While IIT Delhi scores 77.7%, library websites of IIT Bombay and Kanpur score the same amount of information with 66.6%. IIT Delhi scores the least, with 61.1% regarding general features information.

Table 3: General features of libraries

General Features	IITM	IITD	IITB	IITK	IITR
Content Information	1	1	1	1	1
Opening hours	1	1	1	1	1
Staff Directory	0	1	1	1	1
Library rules	0	1	1	1	1
News and events update	0	1	1	1	1
Mission of library	0	1	0	0	1
Annual report	0	0	1	1	0
FAQs	0	1	1	1	1
Floor Map	1	1	1	1	1
Newsletter	0	0	0	0	0
History	1	0	0	1	1
Library committee	1	1	0	0	0
Photo Gallery	1	1	0	0	1
Help Facility	1	1	1	1	1
E-mail	1	1	1	1	1
Fax no.	1	0	0	0	1
Phone no.	1	1	1	1	1
Library Address	1	1	1	0	1
Total points (18)	**11**	**14**	**12**	**12**	**15**

6.2 Library services and Resources among India's top five selected IITs

6.2.1 Library services: Table 4 shows the library services offered by the IITs. A total of 35 library services have been acknowledged to check whether the libraries of selected IITs provide

all the facilities. It was found that IIT Bombay scored the highest with 71%, IIT Delhi and Kanpur scored the same, i.e., 68%, IIT Roorkee with 65%, and IIT Madras with the lowest score, offers only 57%.

Table 4*: Library services offered by the IITs*

Library Services offered	IITM	IITD	IITB	IITK	IITR
Interlibrary loan	1	1	1	1	1
Online instruction	1	1	1	1	1
Citation style guides tools	0	0	1	1	1
Information literacy	1	1	1	1	1
Plagiarism tools	1	1	1	1	1
Web search guide	1	1	1	1	1
New arrival list	0	1	1	1	1
Newspaper clipping	0	1	0	1	0
Photocopying	1	1	1	1	1
ASK a Librarian via email	1	1	1	1	1
ASK a librarian via chat	0	0	0	0	0
Library services for faculty	1	1	1	1	1
Differently-abled section	0	0	1	0	0
E-resources	1	1	1	1	1
Links for e-journals	1	1	1	1	1
Bibliographic database	1	1	1	1	1
Subject Guide	1	1	0	0	0
Web-based OPAC	1	1	1	1	1
Web-based Union Catalog	0	0	0	1	0
Special collection	1	1	0	1	1
Electronic Thesis and Dissertation	1	1	1	1	1
Links to open Access resource	1	1	1	1	1
Link to other web reference sites	0	1	1	1	1
Links to eBooks	1	1	1	1	1
Links to an institutional repository	1	1	1	1	1
Links to back volume	0	0	1	0	0

Links to search engine	0	0	1	0	1
Links for library consortia	0	0	0	0	0
Book review and other web resources	0	0	0	0	0
Privacy Statement	0	0	0	0	0
Links to subject specialist	0	0	0	0	0
Remote access facility	1	1	1	1	1
Information for disabled users	0	0	1	0	0
Job Opportunity	0	0	0	0	0
Other services	1	1	1	1	1
Total points (35)	**20**	**24**	**25**	**24**	**23**

6.2.2 E-resources subscribed by the IIT libraries: Table 5 shows the e-resources subscribed by the IIT libraries in India. Some renowned e-resources have been subscribed to every library, primarily focusing on Science and Technology. Acknowledging that there are 20 e-resources have been shortlisted for the study. It is observed that IIT Delhi scores the highest among all, as it has subscriptions for over 90% of the listed e-resources. IIT Roorkee has 80% of subscriptions. IIT Bombay with 70%, and IIT Madras with 65%, consecutively. At the same time, IIT Kanpur has the most diminutive scorer in this criterion, with 55%.

Table 5: Subscribed e-resources by the IIT libraries

E-Resources	IITM	IITD	IITB	IITK	IITR
ACM Digital Library	0	1	0	0	1
ASME Journals	0	1	0	1	0
Business Source Ultimate (EBSCO)	1	1	0	1	1
Cambridge University Press	1	1	0	0	1
CMIE Economic Outlook	1	1	0	1	0
CMIE Industry Outlook	1	1	1	0	0
CMIE States of India	1	0	1	1	0
CRISIL Database	1	0	1	0	1
Emerald Premium Collection	0	1	1	0	1
JSTOR	1	1	1	1	1

MathSciNet	1	1	1	1	1
OnePertro	1	1	1	0	1
ProQuest	0	1	1	1	1
RSC Database	0	1	0	0	1
Sage	0	1	1	0	1
SciFinder Scholar	1	1	1	1	1
SCOPUS	1	1	1	1	1
SPIE Digital Library	0	1	1	0	1
Springer Materials	1	1	1	1	1
Web of Science	1	1	1	1	1
Total points (20)	**13**	**18**	**14**	**11**	**16**

6.3 Availability of LIB 2.0 in the webpage and other features like their Currency, Accuracy, and organizational structures

6.3.1 **Availability of library 2.0 features:** Table 6 shows the availability of Library 2.0 features on the websites of the selected IITs in India. The present study found that the IIT libraries of the selected IITs provide LIB 2.0 features in their web pages at a very unsatisfactory level, and more adaptations of LIB 2.0 tools are needed. Any of the libraries adopt some of the features. IIT Bombay and IIT Delhi still score satisfactorily, 66% and 60%, respectively. At the same time, IIT Kanpur scores the least, with 20%.

Table 6: Available library 2.0 features on the website

Library 2.0 tools	IITM	IITD	IITB	IITK	IITR
RSS Feeds	1	1	1	1	1
Library Blogs	1	0	1	0	1
Wikis	1	1	1	0	0
Social media sites	1	1	1	1	1
YouTube	0	1	1	0	0
Twitter	0	1	1	0	1
Facebook	0	1	1	0	1

LinkedIn	0	1	0	0	1
Social Bookmarking and tagging	0	1	1	1	1
File sharing	0	0	0	0	0
Instant Messaging	1	1	1	0	0
Virtual tour	0	0	0	0	0
Video sharing	0	0	0	0	0
Collaborative authoring	0	0	0	0	0
Podcasts	0	0	1	0	0
Total points (15)	**05**	**09**	**10**	**03**	**07**

6.3.2 **Currency, Accuracy, and Relevance**: Table 7 shows the Currency, Accuracy, and Relevance to define whether the libraries' web pages are updated daily, if their hyperlinks are appropriate, copyright status, etc. The study found that IIT Kanpur scores the best, with 100% accuracy. IIT Madras and Delhi stand at 83%, IIT Bombay at 66%, and IIT Roorkee with the lowest score of 50%.

Table 7: *Currency, Accuracy, and relevance of IIT library websites.*

Currency, Accuracy, and Relevance	IITM	IITD	IITB	IITK	IITR
All hyperlinks retrieved	1	1	1	1	0
The hyperlink is appropriate	1	1	1	1	1
Copyright status(Given/ Not given)	1	1	0	1	1
Update about date available on home page	0	0	0	1	0
Official logo available of the organization	1	1	1	1	1
No Spelling or grammatical errors on webpage	1	1	1	1	1
Total points (06)	**05**	**05**	**04**	**06**	**03**

Table 8 shows the overall scores obtained by the library websites of selected IITs. In the present study, while combining all the scores of the selected IIT libraries, it is found that IIT Delhi scored the best among all in terms of overall performance and secured 1st rank among the five

IIT libraries. Followed by IIT Bombay (2nd), Roorkee (3rd), and Kanpur (4th). In comparison, IIT Madras stands in the last position (5th) with 43% of the overall score.

Table 8: Overall scores obtained by the library websites of selected IITs

Criteria's	IITM	IITD	IITB	IITK	IITR
Library information (out of 15)	11	14	13	13	14
General features (out of 18)	11	14	12	12	15
Library services (out of 35)	20	24	25	24	23
E-Resources (out of 20)	13	18	14	11	16
LIB 2.0 (out of 15)	05	09	10	03	04
Currency, Accuracy, and Relevance (out of 06)	05	05	04	06	03
Total score (out of 113)	65	84	78	69	75
Average	57.5%	74.3%	69%	61%	66.3%
New Library Ranking	**05**	**01**	**02**	**04**	**03**

7. FINDINGS

- The results show that all IIT libraries have provided essential website information, such as About the Library, Postal Address, Contact Details, Email ID, and Library Hours. However, some libraries have not mentioned borrowing rights or library rules.

- Almost all IIT libraries have websites where you can get general information about the library, and the organization of the web pages is decent.

- Except for IIT Bombay, all four IIT libraries offer copyright information.

- Most of the libraries at a few Indian IITs do not use Library 2.0 technology. IIT Bombay and IIT Delhi communicate with their users on the most popular networking sites. These libraries promote their resources and offerings through the services of blogs, Twitter, Facebook, YouTube, and LinkedIn.

- By developing OPAC/Web-OPAC, the libraries have done an excellent job of producing online bibliographical descriptions of library holdings. Through OPAC, all libraries offer On-Campus and Off-Campus accessibility to their holdings. For their users to search what is accessible in the library, almost all libraries employ search and advanced search tools. Links to institutional repositories and open-access resources are available on every library website.

- All libraries offer access to online journals, other databases, and a wide variety of e-resources regarding web-based information resources. In terms of providing full access to online educational resources, it has been discovered that IIT Delhi leads with 90%, closely by IIT Roorkee with 80%.

- IIT Delhi took the top spot overall with a score of 77%, whereas IIT Bombay came in second with a total score of 71%, followed by IIT Roorkee and Kanpur with 69% and 63%, respectively. IIT Madras, in contrast, had the lowest ranking (60%).

8. CONCLUSION

In the academic context, libraries are essential because they provide users access to all library-related material via their websites. The study examined how Web-based IIT Libraries offer information services and resources. The current research picked the top five IITs in India, according to NIRF ranking 2023, out of 23 independent library websites, and conducted a content analysis among these websites under several categories. The IIT Madras Library website received the lowest ranking (60%), while the IIT Delhi Library website placed the highest in order (77%) based on the total evaluation. It has been discovered that these libraries are doing relatively well by giving their users access to digital materials and services. In certain circumstances, libraries lack the required infrastructure to access informational resources.

Thus, it is necessary to improve library technologies, particularly LIB 2.0 features and informational resources.

Data availability statements:

The datasets generated during the current study are available on the official library websites of [IIT Madras, IIT Delhi, IIT Bombay, IIT Kanpur, and IIT Roorkee]. Respectively the links of the webpages are [https://cenlib.iitm.ac.in; https://library.iitd.ac.in; https://www.library.iitb.ac.in; https://pkklib.iitk.ac.in; https://www.iitr.ac.in]

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