

## Enhancing User Experience: A Detailed Examination of Indian Institute of Information Technology (IIITs) Library Websites

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### ABSTRACT

*This paper examines the web content and navigation of library websites associated with the Indian Institute of Information Technology (IIIT) using globally recognized evaluation criteria. With the advent of the World Wide Web (WWW) and Information and Communication Technology (ICT), the landscape of information dissemination and access has undergone a significant transformation. The study specifically targets IIITs library websites, excluding those with limited library-related information. It emphasizes the pivotal role of library websites in offering effective user services and suggests strategies for their enhancement. By extending the web content beyond mere record capture, libraries can better address users' information needs. Furthermore, the paper discusses integrating networked services within the library website environment to provide comprehensive solutions.*

**Keywords:** Website Content-IIIT Library, Library Content Review – IIIT Libraries, IIITs, Library Webpages-IIIT, India

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### 1. Introduction

The significance of library websites and their varied content is pivotal for delivering efficient user services. The emergence of the World Wide Web (WWW) has transformed our daily routines, and Information and Communication Technology (ICT) has redefined how information is processed and disseminated, improving the use of libraries and their resources. In today's rapidly evolving technological landscape, information quickly becomes obsolete, posing a significant challenge for libraries to keep pace. The Indian Institute of Information Technology (IIIT) libraries serve as a central hub for the intellectual pursuits of students and researchers, with a focus on promoting excellence in education and research in the basic sciences. They accommodate a varied audience, including students, scholars, and educators, enabling collaborative learning experiences across scientific disciplines.

In recent times, there's been a notable rise in demand for electronic publishing, particularly for remote access to learning materials in higher education. Scientific and research library patrons seek current information from diverse sources such as full text databases, research articles, papers, and e-databases. The internet's impact, along with web portals and electronic repositories, has notably shaped library web services, solidifying library websites as vital knowledge centres in academia.

ICT enables libraries to offer advanced information services, with academic libraries utilizing the latest technologies for acquiring, storing, disseminating, and organizing information. Library websites are central to providing quality information, serving as primary gateways for virtual users and comprehensive information hubs. They grant access to institutional

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resources and direct links to native interfaces, enhancing the website's usefulness for a wider audience. Therefore, regular analysis of library website content is crucial to ensure the provision of up-to-date information and meet evolving user needs.

### 1.1 Web 2.0

Library websites play a vital role in providing current, accessible information to users by leveraging the vast resources of the World Wide Web (WWW). They serve as platforms for showcasing services and promoting the parent institution. However, merely having a website is insufficient to attract and retain users. Continuous dynamic upgrades are necessary to enhance usability and credibility. Web 2.0 technology, characterized by user-driven interactions and participation, enables two-way communication, improved security, and interoperability. Unlike Web 1.0, where content control resides solely with publishers, Web 2.0 empowers users to engage through actions like liking, tagging, sharing, and commenting. Web 2.0 tools such as wikis, RSS feeds, social networking sites, and blogs enable interactive information storage, creation, and sharing, enhancing user experiences in ways not possible in earlier versions of the web.

### 1.2 Library 2.0

Libraries have transformed from traditional book repositories to vibrant centers of information generation, storage, and sharing, thanks to the advancements of Web 1.0 and Web 2.0 tools. Acknowledging their significance, libraries have embraced the evolution spurred by Web 2.0. Coined by Michael Casey in 2005, "Library 2.0" utilizes "Web 2.0" principles to enrich information sharing through diverse technological tools. It encourages user involvement in producing both physical and digital content, while continuously assessing web services to enhance the information environment.

### 1.3 IIT Library

The Indian Institutes of Information Technology (IIITs) are prestigious science education and research institutions established by the Ministry of Human Resource Development (MHRD), Government of India. Comprising a total of twenty-six centers, IIIT libraries are equipped with state-of-the-art technologies to acquire, process, store, disseminate, and preserve information. They integrate teaching and research, fostering an intellectually vibrant atmosphere. Content analysis, as defined by Bernard Berelson, is a research technique for systematically describing the content of communication. IIIT library websites serve as single access points, combining various services like library catalogues, subscription databases, e-resources, and subject gateways. Analysis of IIIT library websites focuses on essential university and library information, including collection details, e-databases, and services offered.

## 2.0 Statement of the problem

The Indian Institutes of Information Technology (IIITs) are prestigious higher education establishments in India, encompassing 26 centers acknowledged as Institutes of National Importance. Each IIIT features a central library dedicated to fulfilling the informational and scholarly requirements of its community. These libraries host websites displaying a range of electronic resources, such as e-books, e-journals, and online catalogs, while also delivering user centric services. This research assesses the web content and services provided by IIIT library websites to improve user experience.

## 3. Need of the Study

In the age of information explosion, websites are crucial for disseminating access to resources tailored to specific user groups. Evaluating IIIT library websites is vital to ensure they offer updated and authentic information, leveraging the latest technologies and Web 2.0 tools to enhance service delivery

## 4. Methodology

The study surveyed and evaluated 26 IIIT library websites in India using a 65-item checklist. The evaluation occurred in August 2023 and was subsequently verified between September 10th and 25th, 2023. The objective was to analyze the web content of IIIT library websites, identified via Google search and the official website of the Ministry of Human Resource Development, Government of India. Each IIIT library website underwent a thorough examination using a checklist comprising seven broad categories and 65 items, informed by previous research and the authors' expertise in developing academic library websites. Please refer to Table 1 for the list of IIIT library websites included in the study.

Source: <https://www.education.gov.in/iiits>

## 5. Study Objectives

The primary objective is to evaluate the information content of IIIT library websites in India to improve accessibility and usability. The specific objectives include:

- Verifying basic library information on web pages.
- Analyzing and evaluating web content using standard criteria.
- Ranking IIIT library websites based on features and facilities.
- Providing recommendations for website improvement.
- Identifying existing services and resources.
- Investigating website usability for validity, reliability, and usefulness.

## 6. Area and scope of the study

*The scope of this study is limited to examining the libraries of the 26 Indian Institutes of Information Technology (IIITs) in India.*

Sl. No	Name of IIITs	Short Name	Established Year	State
1	Atal Bihari Vajpayee Indian Institute of Information Technology and Management	ABV-IIITMG	1997	Madhya Pradesh
2	Indian Institute of Information Technology, Allahabad	IIITA	1999	Uttar Pradesh
3	Indian Institute of Information Technology, Design and Manufacturing, Jabalpur	IIITDMJ	2005	Madhya Pradesh
4	Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram	IIITDM Kancheepuram	2007	Tamil Nadu
5	Indian Institute of Information Technology, Sri City	IIITSC	2013	Andhra Pradesh
6	Indian Institute of Information Technology, Guwahati	IIITG	2013	Assam
7	Indian Institute of Information Technology, Vadodara	IIITV	2013	Gujarat
8	Indian Institute of Information Technology, Kota	IIIT Kota	2013	Rajasthan
9	Atal Bihari Vajpayee Indian Institute of Information Technology and Management	ABV-IIITMG	1997	Madhya Pradesh
10	Indian Institute of Information Technology, Tiruchirappalli	IIITT	2013	Tamil Nadu
11	Indian Institute of Information Technology, Una	IIITU	2014	Himachal Pradesh
12	Indian Institute of Information Technology, Sonapat	IIIT Sonapat	2014	Haryana
13	Indian Institute of Information Technology, Kalyani	IIIT Kalyani	2014	West Bengal

14	Indian Institute of Information Technology, Lucknow	IIITL	2015	Uttar Pradesh
15	Indian Institute of Information Technology, Dharwad	IIITDWD	2015	Karnataka
16	Indian Institute of Information Technology, Design and Manufacturing, Kurnool	IIITDM Kurnool	2015	Andhra Pradesh
17	Indian Institute of Information Technology, Kottayam	IIIT Kottayam	2015	Kerala
18	Indian Institute of Information Technology, Manipur	IIITM	2015	Manipur
19	Indian Institute of Information Technology, Nagpur	IIITN	2016	Maharashtra
20	Indian Institute of Information Technology, Pune	IIITP	2016	Maharashtra
21	Indian Institute of Information Technology, Ranchi	IIIT Ranchi	2016	Jharkhand
22	Indian Institute of Information Technology, Surat	IIIT Surat	2017	Gujarat
23	Indian Institute of Information Technology, Bhopal	IIIT Bhopal	2017	Madhya Pradesh
24	Indian Institute of Information Technology, Bhagalpur	IIIT Bhagalpur	2017	Bihar
25	Indian Institute of Information Technology, Agartala	IIIT Agartala	2018	Tripura
26	Indian Institute of Information Technology, Raichur	IIIT Raichur	2019	Karnataka

## 7. Literature Review

Al-Qallaf and Ridha's (2018) study involved analysing 110 academic library websites across six GCC (Gulf Cooperation Council) countries, utilising an 83-item checklist for evaluation. Also discovered varying levels of feature inclusion, with only three websites containing over 75% of the features. Most sites fell within the 51% to 75% range, while some had significantly fewer features.

Clausen (1999) emphasized the importance of regular website updates for development, suggesting user studies and comparative evaluations as useful tools in this process.

Devi and Verma's (2018) assessment focused on evaluating the web content and design of 19 Indian Institutes of Technology (IIT) library websites, employing a 128-item checklist. It was found that 74% of the IITs maintained dedicated library websites, while the remaining institutions had library webpages integrated into their main websites. Information regarding library collections, services, value-added services, and Web 2.0 tools was limited in many cases.

Ganaee and Rafiq's (2016) investigation focused on Pakistani academic library websites and identified several useful features, including clear navigation, contrasting colour schemes, easily readable text, minimal horizontal scrolling, content primarily in English, availability of staff information, and Online Public Access Catalogues (OPACs). However, the study found

that features such as Web 2.0 technologies, website aid tools, information about library buildings, and general library details were less prevalent among the websites analysed.

Haridasan and Uwesh (2014) noted the effectiveness of graphics and animations in attracting users to explore library websites. They also underscored the promotional potential of Web 2.0 applications, such as RSS feeds, and social networking sites like Facebook and Twitter.

Hasan (2012), the overview highlighted projects concerning the National Agricultural Research System (NARS) institutions, with a specific focus on the development and organisation of a digital knowledge base containing Indian agricultural dissertations. The objectives encompassed creating an accessible online database, establishing a standardized format for electronic theses (e-theses), enhancing human resource skills, and publishing an electronic journal derived from the database.

Kanamadi (2006), the discussion centred on library web portals and the anticipated web-based library services at management institutes in Mumbai City. The study specifically examined the presence of institute websites and the importance and extent of library-related information available on these websites.

Kaushik (2015) examined the library websites of 28 National Institutes of Technology (NITs) using a comprehensive 120-item checklist. It revealed discrepancies in content and information, with notable deficiencies observed in currency, effective search interfaces, utilization of Web 2.0 applications, and adoption of cloud-based services across most cases.

Kumar and Mir's (2017) investigation focused on the library websites of central universities in India's central region. It was noted that although these websites showcased extensive collections of e-books, e-journals, and e-databases, only the library of Indira Gandhi National Tribal University (IGNTU) had a direct link on the parent homepage.

Kumar et al. (2009) conducted an analysis and comparison of the contents and usability of six Indian Institute of Management (IIM) library websites. Their objective was to evaluate the content, available facilities, and aesthetic appeal of these websites. The study concluded that content management is a crucial factor for ensuring quality in library websites, highlighting elements such as language adequacy, clear organization, tailored options for diverse user groups, and the provision of up-to-date, concise information.

OCLC's white paper (2002), the investigation focused on exploring the web-based information habits of college students and their dependence on campus library websites. The findings revealed that college and university students rely extensively on these websites to meet their information needs, placing significant value on access to accurate, up-to-date information from electronic resources.

Pareek and Gupta (2013) evaluated 52 academic library websites in Rajasthan using a comprehensive 133-item checklist. MNIT Jaipur's library website emerged as the top performer, with the University of Rajasthan and IIT Rajasthan following closely behind. Notably, 96% of these institutions included direct links to their library websites on their homepages, indicating a widespread practice of integrating library resources into the main websites of these academic entities.

Savitha (2016) found in her research that library websites of deemed universities commonly provided information about their institutions, libraries, and copyright policies. However, only a small portion of these websites used social networking platforms such as Facebook and Twitter for outreach or engagement.

Thanuskodi (2012) studied the websites of selected institutes of national importance in India. A researcher conceptualised four primary areas of webometric research: web page content analysis, web link structure analysis, web usage analysis, and web technology analysis. Notably, the study revealed that a majority of these institutes did not provide the last update date for their websites.

Verma and Brahma (2017) conducted a webometric analysis of nine library consortium websites. They emphasised the significance of various factors, including the total number of webpages, authority, and internal and external links, when calculating the web impact factor and the global ranking of websites. This underscores the multifaceted nature of webometric analysis in assessing the influence and reach of library consortium websites.

Wilson (2015), in a content analysis of 24 academic library websites in Alabama, utilised a 32-item checklist. They noted that the majority of these websites provided access to various resources, including e-books (100%), e-journals (100%), and digital collections (66.67%). Additionally, common features such as site search (75%) and catalogue searching interfaces (70%) were prevalent. Moreover, social media integration, particularly on platforms like Facebook (62.50%) and Twitter

(41.67%), was observed. However, these websites generally lacked multilingual features, indicating a potential area for accessibility improvement.

## 8. Data Analysis and Discussion

Centuary Wise	No of Institute
20 <sup>th</sup> Century (Between 1901-2000)	3
21 <sup>st</sup> Century (Between 2001-2100)	23
Total	26

Table 1. Establishment of the IIIT in India categorised by century

Table 1 displays the century-wise establishment of the 26 IIITs in India. The data show that the majority of IIITs (23 out of 26, 50%) were founded in the 21st century, while a smaller proportion (3 out of 26, approximately 34.46%) were established in the 20th century. This observation highlights the significant growth of IIITs in the 21st century, indicating a substantial dedication towards providing educational and research resources for students, researchers, and teachers in the sciences. This emphasizes the commitment to fostering an intellectually dynamic research environment and making education and careers in basic sciences more appealing by offering a diverse range of services aimed at integrative learning. There were only three IIITs established before 2000. With the growth of information technology and computer science as fields of study, and the increase in job opportunities in these fields, enthusiasm among students for studying information technology and computer science has risen, and IIITs are gaining importance and are acknowledged as Institutes of national importance. As demand has increased, 23 new IIITs have been established between 2005 and 2019 across India.

Short Name	State	NIRF Ranking 2022
ABV-IIITMG	Madhya Pradesh	78
IIITA	Uttar Pradesh	93
IIITDMJ	Madhya Pradesh	82
IIITDM Kancheepuram	Tamil Nadu	Not Ranked
IIITSC	Andhra Pradesh	Not Ranked
IIITG	Assam	Not Ranked
IIITV	Gujarat	Not Ranked
IIIT Kota	Rajasthan	Not Ranked
ABV-IIITMG	Madhya Pradesh	Not Ranked
IIITT	Tamil Nadu	Not Ranked
IIITU	Himachal Pradesh	Not Ranked
IIIT Sonapat	Haryana	Not Ranked
IIIT Kalyani	West Bengal	Not Ranked
IIITL	Uttar Pradesh	Not Ranked

IIITDWD	Karnataka	81
IIITDM Kurnool	Andhra Pradesh	62
IIIT Kottayam	Kerala	Not Ranked
IIITM	Manipur	Not Ranked
IIITN	Maharashtra	Not Ranked
IIITP	Maharashtra	Not Ranked
IIIT Ranchi	Jharkhand	Not Ranked
IIIT Surat	Gujarat	Not Ranked
IIIT Bhopal	Madhya Pradesh	Not Ranked
IIIT Bhagalpur	Bihar	Not Ranked
Tripura	Tripura	Not Ranked
Karnataka	Karnataka	Not Ranked

Table 2. IIIT NIRF Ranking 2022 in the engineering category up to the top 100

Source: <https://www.nirfindia.org/engg>

Examining Table 2 reveals that among the 26 IIITs from India in the engineering category in NIRF 2022, only 05 IIITs rank within the top 100 Institutes, while the remaining either did not achieve this rank or did not apply for the NIRF ranking. These 05 IIITs indicate varying levels of research excellence and strong IPRs and patents, highlighting significant scores in outreach activities and inclusivity, support for physically challenged students and researchers, and sponsored funded projects among these 26 IIITs, with IIITDM Kurnool leading in this aspect, i.e., 62nd rank. This suggests a robust research culture and productivity among the faculty of these 26 IIITs, highlighting their commendable academic contributions. It is expected that there should be enough students' strength, including doctoral research students, and these students should represent all sections of society, regions, the physically challenged, the cast, including SC/ST, gender diversity, and enough women students and every group of students should be given proper value and equality. These diversifications should also be found equally within the faculty. The ranking also depends on the number of PhD students who graduated from the IIITs, outreach activities, and inclusivity of the IIITs. Ranking and quality also depend on public perceptions of the IIITs among people, students, and parents. To achieve a high ranking, it is essential to define the value of these parameters according to the NIRF.

State Name	No of Institute	Percentage (%)
Madhya Pradesh	4	15.38
Uttar Pradesh	2	7.70
Tamil Nadu	2	7.70
Karnataka	2	7.70
Andhra Pradesh	2	7.70
Assam	1	3.84
Rajasthan	1	3.84

Haryana	1	3.84
Himachal Pradesh	1	3.84
Gujarat	2	7.70
Manipur	1	3.84
Maharashtra	2	7.70
Jharkhand	1	3.84
Bihar	1	3.84
Tripura	1	3.84
Kerala	1	3.84
West Bengal	1	3.84
Total	26	100

Table 3. Classification of IIIT by state-wise

Table 3 illustrates the distribution of IIITs in India. Nearly all Indian states and union territories have established at least one IIIT. Madhya Pradesh leads with the highest number of IIITs, with four institutes, accounting for 15.38%. Tamil Nadu, Uttar Pradesh, Karnataka, Andhra Pradesh, Gujarat, and Maharashtra each have two IIITs, making up 7.70% each. The remaining states have one IIIT each. Some states and union territories do not have any IIITs.

Facets	Yes	No	Percentage of Yes (%)	Percentage of No (%)
Introduction and Background	26	0	100	0
Core Mission and Objectives	18	2	71.42	28.57
Operational Hours	26	0	100	0
Information on Membership Details	26	0	100	0
Regulations and Conduct Policies	23	1	85.70	14.29
Library Sections and Categories	7	5	28.58	71.43
Comprehensive Library Services	26	0	100	0
Navigation and Links to Resources	26	0	100	0

Table 4. General Library Overview

In the data analysis section of Table 4, it was observed that all IIITs have very interesting library webpages, and that all IIIT libraries (100%) had information regarding their background, operational hours, membership details, comprehensive library services, and links to access resources on their websites. Additionally, 18 (71.42%) IIIT library websites stated their core objectives. Furthermore, information on regulations and conduct policies was provided by 23 (85.70%) IIIT library websites. However, only 7 (28.58%) IIIT library websites mentioned different library sections and their categories on their webpages.

Aspect	Yes	No	Percentage of Yes (%)	Percentage of No (%)
Last Website Update	11	15	42.86	57.14
Advertisement Links	7	19	28.57	71.43
Mobile Page Links	0	26	0.00	100.00
Under Construction Notice	4	22	14.28	85.72
Title Page Name in Top Bar	26	0	100.00	0
Error Handling for Broken Links	5	21	19.23	80.77
Homepage Link	26	0	100.00	0
Index of Website Content	0	26	0	100
Secondary Web Pages(>five pages)	23	3	85.71	14.29
Rewritten Heading Example	18	8	71.43	28.57

Table 5. Enhanced Website Authority

Table 5 reveals that, out of 26 IIIT libraries, 11 (42.86%) have updated their websites, and 7 (28.57%) display advertisements. None of the IIIT library websites provides mobile page links or a website index. And 4 IIIT library websites (14.28%) display under-construction notices or broken-link errors. All websites include their name in the top bar of the title page, and a homepage link. 23 IIIT library websites (85.71%) have more than five subpages. None of the IIIT websites has a website index menu, while 18 IIIT library websites (71.43%) provide handling information rewritten on their webpages. It is suggested that, to give more attractive, current and updated information, the webpages of the library need to be updated regularly.

Type	Yes	No	Percentage of Yes (%)	Percentage of No (%)
Printed Books	26	0	100	0
Physical Journals	15	11	57.14	42.86
Digital Journals	23	3	85.71	14.29
Archived Journal Issues	0	26	0.00	100
Licensing Information Overview	26	0	100	0

Access to Online Resources	26	0	100	0
Electronic Books	15	11	57.14	42.86
Bibliographic and Online Database Access	26	0	100	0
Copyright Considerations	26	0	100	0
Open Access Publications Overview	15	11	57.14	42.86
Non-Print Materials	23	3	85.71	14.29
Full-Text Digital Journals	15	11	57.14	42.86

According to Table 6, every IIT library website contains details about printed books, offers links to online resources, provides access to bibliographic and online databases, and includes information on licensing and copyright considerations. Additionally, based on the data from Table 6, 15 of 26 IIT libraries (57.14%) offer a comprehensive range of resources, including print journals, full-text electronic journals, links to access e-books, and open-access journals, and 23 IIT library websites (85.71%) provide electronic journals. Whereas none of the libraries provides information about back volumes of journals on their websites.

Types	Yes	No	Percentage of Yes (%)	Percentage of No (%)
New Releases and Recent Updates	15	11	57.14	42.86
Recent Announcements	11	15	42.86	57.14
Feed for Latest Update	0	26	0.00	100
Social Media Connections	11	15	42.86	57.14

Table 7. Current Awareness service offerings

Analysis of Table 7 reveals that 11 IITs (42.86%) provide the latest information and links to social media on their library websites. Only 15 IIT library websites (57.14%) provide information on new releases, whereas none of the libraries offers an RSS feed on their websites.

Design	Yes	No	Percentage of Yes (%)	Percentage of No (%)
Websites Visual Interface	26	0	100	0
Animation Elements	15	11	57.14	42.86
Navigation Structure	11	15	42.86	57.14
Background and Font Styling	23	3	85.71	14.29
Downloadable Content	15	11	57.14	42.86
Visitor Counter	7	19	28.57	71.43
Image Gallery	7	19	28.57	71.43
Text-Only Accessibility	11	15	42.86	57.14
Web Design Tools	4	22	14.28	85.72

Table 8. Design Master's Website Taxonomy

Table 8 reveals that all 26 IIIT library websites (100%) include a graphics page with a visual interface. Moreover, 23 IIIT library websites (85.71%) utilize background and font coloring styling. Additionally, 15 IIIT library websites (57.14%) incorporate animation elements and offer the option to download content. Navigation structures and text-only accessibility options are available on 11 IIIT library websites (42.86%). Visitor counters and image galleries are present on 7 libraries (28.57%), while only 4 IIIT library websites (15.38%) offer web design tools.

Aspects	Yes	No	Percentage of Yes (%)	Percentage of No (%)
Staff Contact Numbers	23	3	85.71	14.29
Mailing Address	15	11	57.14	42.86
Email Contact Information	23	3	85.71	14.29
Suggestions Box	0	26	0.00	100
Feedback Submission	0	26	0.00	100
User Education and Support	18	8	71.43	28.57
Frequently Asked Questions (FAQs)	17	9	28.57	71.43
Job Openings	7	19	28.57	71.43
Upcoming Events	7	19	28.57	71.43
User Login Portal	7	19	28.57	71.43

Table 9. Contact Information Retrieval

All the websites are very informative and provide the necessary information on their respective pages. Table 9 shows that the contact details of staff members, including phone numbers and email addresses, are provided on 23 websites (85.71%). Moreover, user education and support facilities are available on 18 websites (71.43%). Additionally, 15 websites (57.14%) list mailing addresses for further correspondence. Furthermore, seventeen websites (53.4828.57%) offer a range of additional features, including frequently asked questions (FAQs). Seven websites (28.57%), out of 26 IIIT libraries, offer information on job openings, details of upcoming events, and user login pages. However, none of the websites includes a suggestion box or feedback option.

Aspects	Yes	No	Percentage of Yes (%)	Percentage of No (%)
Search Functionality	23	3	85.71	14.29
External Search Engine Integration	4	22	14.28	85.72
External Link Count (Exceeding 5)	26	0	100	0
Web Online Public Access Catalogue (OPAC)	15	11	57.14	42.86
Alphabetical Title Index	15	11	57.14	42.86
Publisher-Specific Index	15	11	57.14	42.86
Subject-Categorized Index	11	15	42.86	57.14

Table 10. Criteria for Locating Contact Information

Table 10 shows that Search functionality is present on 23 library websites (85.71%), while all 26 websites (100%) include external links. Across the IIIT library websites, 15 sites (57.14%) provide a Web OPAC, an alphabetical title index, and a publisher-specific index. Additionally, 11 websites (42.86%) offer a subject-specific index. Furthermore, only 4 IIIT library websites (14.28%) include links to external search engines.

Rank	Yes	No	Percentage of Yes (%)	Percentage of No (%)
Top Position on Google Search	26	0	100	0
Leading Position on Yahoo Search	26	0	100	0

Table 11. Search Engine Ranking of Contact Information

In Table 11, it is evident that all websites consistently achieve the top ranking (1st) in both Google and Yahoo search engines when users employ the keyword search 'IIITs library of <particular state name>'. This suggests the high popularity and effectiveness of both search engines among students, teachers, researchers, and other users."

## 9. Discussions

Further studies could explore additional criteria for evaluating website quality, such as user interface interactivity, dynamic tools, and information accuracy. A recent study examined various aspects of library websites in Indian IIITs, revealing both positive and negative findings. It highlighted that the development and upkeep of library websites are ongoing processes rather than one-time endeavours. The results underscored that libraries are still striving to integrate the latest web technologies to enhance user-oriented services. Based on these findings, several suggestions for improving library websites emerged:

- Most websites lack comprehensive information about library sections, a gap that should be addressed to enhance the user experience.
- Regular updating of website content should be emphasised to maintain consistency.
- Including links to internal and external advertisements can improve user engagement.
- Given the prevalence of mobile browsing, developing a mobile-friendly version of the website is crucial.
- Providing a website index can facilitate efficient content search.
- Removing error links is essential to streamlining user navigation.
- Libraries should provide information about their back volumes of journals.
- Websites should offer more links to full-text e-journals, e-books, and open-access resources.
- Including links to the latest notifications and social networking sites can enhance user engagement.
- Connecting to RSS feed services can keep users informed about updates and news.
- Transparency about website design and the designer should be ensured.
- Including a suggestion box and feedback option can facilitate user input for continuous improvement.
- Providing links to external search engines such as Google, Yahoo, and Bing can improve search accuracy.
- Providing essential features such as a Web OPAC, an alphabetical title index, and subject-wise lists is essential.
- Including information on FAQs, job vacancies, events, and login pages can enrich the user experience.
- Librarians should establish and maintain criteria to ensure consistent user interaction.

➤ Adoption of more Web 2.0 tools can enhance website functionality and engagement.

By implementing these suggestions, libraries can enhance their online presence and better serve their users' needs.

## 10. Conclusions

However, it could be said that the library webpages of these IITs under study are very informative and comprehensive. The library websites of IITs serve as vital resources for students, researchers, and faculty members in the sciences. The study assessed the content available on these websites and identified several areas for improvement to better meet user needs. It was observed that the websites could be more informative and visually appealing to enhance user experience. Additionally, incorporating various Web 2.0 tools can help attract new users. While most websites provide information about courses, none offer additional materials, such as links to open-access journals. This gap presents an opportunity for improvement, as enriching the website with such resources can increase user engagement and attention. Therefore, developing these aspects judiciously is essential to garner greater interest and utility among users.

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