

Accessibility and Design Analysis of Library Websites/Webpages of National Institute of Technology (NITs) in India

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Abstract

The purpose of this study is to analyze and examine the design and content information presented in library website/webpages of institutes of NITs across India. Website content organization and effectiveness can be measured utilizing content analysis techniques specifically under a prepared checklist to evaluate the website design and content of the library websites/webpages. In this study the library website/webpages design, functionality, usability and productivity of NITs libraries websites/webpages have been determined under the checklist parameter which includes evaluative indicators of design and content of website/webpages. A Comparative Checklist was created to recognize and analyze different points related to content and design of website/webpages. Study findings and observations indicate that there is variation in design and content presentation in most NITs library websites/webpages. Only one-fourth of NITs have separate websites with secure web URL addresses for their libraries. More than half of the libraries use text, images, and graphics in webpage design using only the English language. This study also reveals that most NITs libraries fail to provide additional aids, tools, and features like language selection options, font resize, site map, and search bar in their library websites. Utilizing the findings and observations of this study, NIT website quality, usability, and accessibility can be improved and increased.

Keywords: Content analysis, library website, NIT, web content analysis, webometrics, website accessibility, website design, website usability

INTRODUCTION

Rapid advancements of internet and web-based technologies have increased the challenge for libraries and information centers, especially due to the information-seeking pattern and quick information requirement of modern tech-savvy users. Due to the extensive uses of modern web-based technologies for communication and information retrieval, users, such as academicians and researchers demand high-quality information with authenticity. So the libraries are changing their pattern of library

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Received Date: January 31, 2026

Accepted Date: February 07, 2026

Published Date: February 28, 2026

Citation: Sandeep S. Pradhan, Sanjay S. Bhutamwar. Accessibility and Design Analysis of Library Websites/Webpages of National Institute of Technology (NITs) in India: A Comparative Study. Journal of Advancements in Library Sciences. 2026; 13(1): 76–84p.

collection and dissemination of information to fulfill the information needs of such users and provide their resources and services using modern technologies in libraries. Nowadays library websites are highly reliable modes of information dissemination and information access to global users [1]. From a website, millions of users can search, access, and retrieve information according to their needs at a time. Using modern internet and ICT-based technologies, academic, and research institutions design and develop separate websites and webpages for their libraries, providing resources, service facilities and communicating with users using the website as a medium. Well-designed, efficient, and interactive websites engage

users more and help them to get reliable information easily, also helping increase usability due to content variation and proper content management. It consists of information of library, about facilities, collection, services, policies, and rules and regulations, and is useful only if the information is accurate, reliable, and up-to-date [2]. Most information users prefer online information-retrieval methods before visiting physically, and in such cases, it is a big challenge to manage content when technologies are changing rapidly [3]. In the changing scenario of user information needs and quick evaluation and acceptance of modern technologies, there is a challenge for academic and research institutions to handle users and technologies in balance. Hence website content design, management, and making it available to users in updated forms with authenticity on a regular basis is a critical part for developers and administrators of the website [4]. However, to fulfill the users' information needs, the library website must constantly update its information so that users have access to the latest information at all times. For this, it is very important that the library website is analyzed periodically with usability and content analyzing tools and techniques, which helps to improve the website design, website content management, and to increase website usability. So the analysis and evaluation of website design and content of library website is essential to ensure the accuracy of information, content authenticity, accessibility for users, effectiveness of website design, and the overall quality of the website.

REVIEW OF LITERATURE

Madhu and Kannappanavar [5] explored thoroughly the content of pharmacy institutes having NIRF ranking under accessibility, availability, general information, collection, and facilities of library where they observed that there was no similarity in content presentation of websites and most of websites need to update their content on regular basis. Yumnam and Singh [6] conducted a study of nine library website content studies of central universities of North East India and found that all nine Central Universities have general and basic information of library, services, and e-resources, rich collection of books, periodicals, e-books, e-journals, reference sources, newspapers, theses, and dissertations. In this study only one library showed objectives. Verma and Pathak [7] analyzed the content and design of 29 ICSSR institutes' websites. They found that most institutes provide details of responsibility. Website design uses graphics and only one language, English, for content presentation. Only four websites provide information updating dates. Rahman and Batcha [8] evaluated the content of 10 selected library websites in the University of Delhi. They analyzed that no one library website/webpage includes features, such as feedback, keyword search, news clippings, question papers, social networking tools, and regular updates of website content. They suggested that all websites need to update at regular intervals. Devi and Verma [9] analyzed the content features and design features of twenty-seven NIT library websites. The study discovered that above 50% of NITs provide basic information of library, staff, and library hours, books, journals, e-books, e-journals and OPAC. Most of the websites have text-only versions with copyright statements and follow the parent website webpage format throughout the website. Verma and Shukla [10] conducted a usability analysis of library websites of nineteen IIM institutes. The study shows that all IIMs have their own separate library website. Here, only few of them have multilingual facilities. Further study reveals that more than half of the IIM library websites include various general usability features on web 2.0, searching, content writing etc. in their websites.

Objectives

The main objectives of the study are as follows:

- To examine the design trends of library websites and webpages of NITs
- To find out accessibility, currency, and user-friendliness of NIT library websites/webpages
- To know about the compatibility and navigation features of NIT library websites/webpages
- To analyze the availability of web support and web 2.0 tools in NIT library websites/webpages

Scope

The present study has covered the accessibility and design trend analysis of NIT libraries' websites and webpages (Appendix- A). Hence, this analysis becomes limited to NIT Libraries' websites/webpages. On the basis of some design and accessibility analysis checklist parameters, NIT

library websites and web pages were analyzed and observed for data collection and finding results. Here, only 31 NIT library websites and web pages in India were used for the study.

Methodology

For conducting the accessibility and design analysis of NIT libraries' websites and webpages, data collection has been done using observation and survey methods. For this study, a structured checklist was prepared for data collection, and the data was collected from respective library websites and webpages of NITs.

Data Analysis and Interpretation

Classification of URL Domain Type

Table 1 shows the classification of website domain uses in the website by the NIT institutions in India. It is observed that all 31 NIT institute websites have .ac.in domain extension for their websites, which is a second-level domain specially used for academic institutions in India.

NIT Website/Webpage Availability

The virtual existence of any national institute helps to serve its services and facilities to users; also it helps to promote research and development activities globally. Here, Table 2 gives the details of website/webpage availability of NIT institute libraries. The availability of website/webpages was measured under four criteria. From the study, it is observed that most NIT institutions, i.e., 18 (58.06%), have separate webpages for their library. Near about 7 (22.58%) NITs have separate websites for libraries. Five (16.12%) NIT institutions have a dedicated webpage in their institute website for the library, while only one (3.22%) NIT institute, NIT Silchar, uses KOHA ILMS for the library website.

Accessibility of NIT Library Websites/Webpage

For any educational institution, the quick and easy access of its website/webpage helps in increasing usability of web content and services. For any library, having a separate web URL address plays a key role in access for users and providing information services effectively. Table 3 gives the details about NIT library website/webpages accessibility. From the study, it is found that out of 31 NITs only 4 (12.90%) NIT institute libraries have a direct access link on their parent institute website home page. Most NITs, i.e., 27 (87.09%), provide library webpage access links under facilities, resources, academics, campus infrastructure, quick menu etc.

Table 1. Classification of URL domain type.

S.N.	Criteria	URL Domain extension type	Frequency (%)
1	Domain Extension	.ac.in	31 (100%)

Table 2. Library website/webpage availability.

S.N.	Criteria	Frequency	Percentage
1	Have separate website	07	22.58%
2	Have a separate webpage	18	58.06%
3	Have dedicated webpage in its institute website	05	16.12%
4	Use ILMS as Website	01	3.22%

Table 3. Library website/webpage accessibility.

S.N.	Criteria	Frequency	Percentage
1	Direct Link on Parent Institutes Website Home Page	04	12.90%
2	Library link under Facilities, Resources, Academics, campus infrastructure, Quick Menu etc. with Library or Central Library	27	87.09%

Library Website Layout

Various types of website layouts are used to design and display website content. Table 4 shows observations on layouts used to design NIT website/webpages. It is observed that out of 31 NIT institutions, 10 (32.25%) institutions use full-screen layout and 10 (32.25%) institutions use fixed-width content area layout while the rest of 11 (35.48%) institutes use fixed-width website layout for their website.

Content Design Description of Website

The design and development of websites/webpages is done using effective use of text, images, graphics, and animation. Hence effective and attractive content presentation helps in user engagement, which directly affects the usability of websites/webpages. Here, Table 5 shows the analysis of content design description. It is observed that 13 (41.93%) NIT institution library websites/webpages use only text for their library website page design while the remaining 18 (58.06%) of NIT institutions use creative images, graphics, and animations along with text for their library website and webpage design and development.

Website Content Language

The language used on a website is highly important because it represents institutional or organizational information related to academic research and its development in specific regions and worldwide. Table 6 shows observations about the use of languages to represent information on NIT institutions' websites. It is observed that 19 (61.30%) NITs provide their information in English. While 10 (32.25%) NITs use both English and Hindi language on their websites, only 2 (6.45%) NITs offer a multilingual option on their websites.

Website Compatibility and Access Features

Table 7 describes the compatibility and access features of NIT library websites. From the study, it is observed that 29 (93.54%) NIT library websites have a secure website/webpage URL, 100% of websites load in quick time (within 5 seconds) and avoid web push notifications, ads, and pop-ups in their websites, while all NIT library websites fail to provide information about browser compatibility and screen resolution for best views in their respective website.

Library Website Header Design Features

During the design and development of a website, the webpage starts with the website where primary information like the website name with tagline, logo etc. is placed in the header, due to which the website is known to users. Table 8 mentions observations about website headers like the presence of a logo, and linking of the logo with library or parent website/webpages. It is observed that all 31 (100%) NIT libraries have a parent institute logo on the library website/webpage header, where 24 (77.41%) of NITs have a header institute logo linking to the parent institute website home page and only 4 (12.90%) NIT websites show the header library logo linking to the library website/webpage. It is also found that no NIT website has a separate library logo on the library website/webpage header.

Table 4. Library website layout.

S.N.	Criteria	Frequency
1	Full Screen Layout	10 (32.25%)
2	Fixed Width Layout	11(35.48%)
3	Full width Header with Fixed Width Content Area Layout	10 (32.25%)

Table 5. Content design description of website.

S.N.	Criteria	Frequency	Percentage
1	Use of Text only	13	41.93%
2	Use of Text and Images/Graphics/Animations	18	58.06%

Table 6. Library website/webpage language.

S.N.	Criteria	Frequency
1	Only one language (English)	19 (61.30%)
2	Two languages (English & Hindi)	10 (32.25%)
3	More than two languages	02 (6.45%)

Table 7. Website compatibility and access features.

S.N.	Criteria	Frequency
1	Website Load in Quick time (within 5 second)	31 (100%)
2	Secure Website URL	29 (93.54%)
3	Best View Resolution Suggested	0 (0%)
4	Suggest Browser Compatibility Information	0 (0%)
5	Web Push Notification, Ads & pop-ups Avoided	31 (0%)

Table 8. Library website header design features.

S.N.	Criteria	Frequency (%)
1	Only Parent Institute Logo on Library Website/webpage Header	31(100%)
2	Separate Library Logo on Library Website/webpage Header	0 (0%)
3	Header Institute logo links to Parent institute Website Home Page	24 (77.41%)
4	Header Library logo links to Library Website/webpage	4 (12.90%)

Availability of Navigation Tools

Navigations in a website play an important role in navigating users over the site. Clear proper navigation helps to increase accessibility and search volume of the website. It also helps in guiding and directing users to different pages over the website within a quick time. Table 9 shows findings on the availability of navigation. From the study, it is found that 17 (54.83%) NIT library websites/webpages have only the parent institute top navigation menu, and also have a separate side menu in library website/webpages. It is also found that 13 (41.93%) NIT library websites/webpages have a separate library top navigation menu in library website/webpages.

Library Name Position Description

Table 10 indicates the observation about NIT libraries' name position in websites/webpages. From the study, it is observed that 10 (32.25%) of NITs have the library name in the library website/webpage header, while 18 (58.06%) of NIT library websites/webpages show the library name below the page header with a specific name or as library or central library etc. Three (9.67%) NITs do not specify any library name on the website header or below the header.

Availability of Header and Footer

The header and footer are major parts of website design because they consist of the most valuable and identification information of any website. Table 11 gives observations related to the presence of headers and footers in NIT library websites/webpages. From the study, it is found that 20 (64.51%) library websites/webpages of NITs have a parent institute header in the library webpage, while 11 (35.48%) NITs have a separate header for their library website/webpages. It is also observed that 20 (64.51%) library websites/webpages have a parent institute footer in the library website/webpage and 11 (35.48%) have a separate library footer for the library website/webpage.

Availability of Support Tools

Integration of support features like a search bar, site map, visitor counter, social media share options, and a home page with marquee text or images in a website helps the website to increase productivity. Table 12 gives detailed observations on website support features provided by NIT library websites/webpages. It is observed that 14 (45.16%) NITs have marquee text/images/gallery on their website/webpage home page. A search bar option is available on 10 (32.25%) library websites. It is also found that 7 (22.58%) NIT library websites have a visitor counter, similarly 6 (19.35%) NITs with separate social media share icons and links for the library. It has also been observed that only 3 (9.67%) library websites provide a site map in the parent website.

Website Aids and Tools

Table 13 highlights the availability of web aids and tools like language selection, font resize options, screen readers, theme color toggle switch tools, live user help/support tools, and Google location maps/virtual maps of the library available on NIT websites/webpages. From the study, it is observed that a language selection option is available on 14 (45.16%) NIT websites, while 10 (32.25%) websites include a website font resizer feature. Only 3 (9.67%) websites have a screen reader and theme color toggle switch tool in their website/webpages. Facilities like live help/support menus and google location maps/virtual tour maps of libraries were found on only one (3.22%) NIT library website/webpage.

Table 9. Navigation design features.

S.N.	Criteria	Frequency (%)
1	Only Parent Institute Top Navigation menu in Library webpage/webpage	17(54.83%)
2	Parent Institute Top Navigation Menu with Library Menu in Library Website/WebPages	0 (0%)
3	Separate Library Top Navigation Menu in Library website/WebPages	13(41.93%)
4	Separate Side menu in Library website /WebPages	17(54.83%)

Table 10. Library name position description.

S.N.	Criteria	Frequency (%)
1	Library Name in Library website/webpage Header	10 (32.25%)
2	Library Name at Bellow the Page Header with Specific Name or as library or Central Library etc.	18 (58.06%)
3	Only parent Institute Name in Header (No Library Name)	03 (9.67%)

Table 11. Availability of header and footer.

S.N.	Criteria	Frequency (%)
1	Parent Institute Header in library webpage	20 (64.51%)
2	Separate Header in Library website/webpage	11 (35.48%)
3	Parent Institute Footer in library website/webpage	20 (64.51%)
4	Separate Library Footer in library website/webpage	11 (35.48%)

Table 12. Availability of support tools.

S. N.	Criteria	Frequency
1	Search bar	10 (32.25%)
2	Visitor counter	07 (22.58%)
3	Website site map (Parent Website)	03 (9.67%)
4	Library home page with marquee Text/Images/Gallery	14 (45.16%)
5	Separate library social media share icon & links	06 (19.35%)

Table 13. Website aids and tools.

S.N.	Criteria	Frequency (%)
1	Website Theme Color Toggle Switch Tool	03 (9.67%)
2	Online Screen Reader	03 (9.67%)
3	Website Language Selection Tool	14 (45.16%)
4	Website Font Resizer	10 (32.25%)
5	Google Location Map	01 (3.22%)
6	Live Help/Support Menu Facility	01 (3.22%)

Key Findings of Study

- All NIT libraries have variations in their website design and content presentation.
- All institutes have the.ac.in domain extension for their websites.
- About 18 (58.06%) of NIT institutes provide a separate webpage for the library while only 7 (22.58%) NITs design a separate library website.
- About 61.30% of websites use only one language, English, for website content.
- Almost 27 (87.09%) NITs provide library website/webpage links under menus, such as campus infrastructure, facilities, academics, and resources quick menus.
- Most of NIT library (93.54%) websites/webpages have a secure website/webpage URL.
- Nearly half of NIT libraries have website support features, such as social media share links, library home pages with marquee text/images/galleries and use of text and images/graphics/animations for website design and development.
- Only 13 (41.93%) libraries have their separate library top navigation menu in library websites/webpages.
- Only 10 (32.25%) library websites include the library name in their website/webpage header.
- More than half, 20 (64.51%), of NIT library websites/webpages have the parent institute header as the library website/webpage header, while only 11 (35.48%) NIT library websites have a separate header for their library website.

CONCLUSION

The easy retrieval and sharing of information has become possible due to internet and web technologies. With the help of modern web technologies, most information can be accessed anytime from anywhere, and the ability to search for online data has become incredibly fast and efficient. Web-based services like websites allow users to connect and collaborate with resources and services significantly. Accessing and sharing knowledge is quicker than ever because of the virtual existence of information in the form of websites/webpages. For the last two decades, research, and educational institutions have been moving toward providing online web-based services to their global users through websites; hence it is essential and mandatory for institutions to provide up-to-date information within time with accuracy. In such a scenario, the analysis of content of library websites of NITs helps in pointing out usability and productivity. From the study, it is observed that all library websites/webpages use similar domain extensions, but their website and webpage designs and developments differ from each other. Hence, the overall functionality and usability of the websites are affected due to variations in content presentation in webpages and websites. Almost all websites do not provide updated dates for content, meaning the information provided by the websites is not up-to-date or updated regularly, which has a great impact on library website access and usability. So there is a need to update and monitor library websites/webpages frequently with the user requirement.

Acknowledgements

None

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APPENDIX-1 (LIST OF INDIAN INSTITUTES OF TECHNOLOGY WITH LIBRARY WEBSITE/WEBPAGE URL & URL STATUS)

List of Indian institutes of technology with library website/webpage URL & URL status

S.N.	Name of NITs Institutes	Library Website/Webpage URL	Type of URL
1	NIT, Warangal	https://nitw.ac.in/library	Webpage
2	NIT, Bhopal	http://www.manit.ac.in/central-library	Webpage
3	NIT, Nagpur	https://vnit.ac.in/library-and-information-center/	Webpage
4	NIT, Durgapur	https://nitdgp.ac.in/p/library-5	Webpage
5	NIT, Jamshedpur	https://www.nitjsr.ac.in/facilities/Central_Library	Webpage
6	NIT, Karnataka	https://library.nitk.ac.in/joomla/	Website
7	NIT, Srinagar	https://nitsri.ac.in/Department/Deptindex.aspx?page=a&ItemID=io&nDeptID=ck	Webpage
8	NIT, Allahabad	https://mnnit.ac.in/index.php/lib-home	Webpage
9	NIT, Surat	https://www.svnit.ac.in/web/library/library.php	Webpage
10	NIT, Calicut	https://library.nitc.ac.in/	Website
11	NIT, Rourkela	https://library.nitrkl.ac.in/	Website
12	NIT, Jaipur	https://library.mnit.ac.in/	Website
13	NIT, Kurukshetra	https://nitkkr.ac.in/?page_id=250	Webpage
14	NIT, Tiruchirappalli	https://www.nitt.edu/home/students/facilitiesnservices/library/	Webpage
15	NIT, Silchar	http://library.nits.ac.in/	Website
16	NIT, Hamirpur	https://nith.ac.in/library/elibrary.php	Webpage
17	NIT, Jalandhar	http://lib.nitj.ac.in/	Website
18	NIT, Patna	https://www.nitp.ac.in/Facilities/Library	Webpage
19	NIT, Raipur	http://www.nitr.ac.in/dept-cl.php	Webpage
20	NIT, Agartala	https://www.nita.ac.in/userpanel/DisplayPage.aspx?page=kk&ItemID=cs	Webpage
21	NIT, Arunachal Pradesh	https://www.nitap.ac.in/section/home?section=7f6e1080c4	Webpage
22	NIT, Delhi	https://nitdelhi.ac.in/central-library/	Webpage
23	NIT, Goa	https://www.nitgoa.ac.in/academics/library.html	Webpage
24	NIT, Manipur	https://www.nitmanipur.ac.in/Deptindex.aspx?page=a&ItemID=mk&nDeptID=co	Webpage
25	NIT, Meghalaya	https://www.nitm.ac.in/department/central-library-4	Webpage
26	NIT, Mizoram	https://www.nitmz.ac.in/DisplayPage.aspx?page=ck&ItemID=cq	Webpage
27	NIT, Nagaland	https://www.nitnagaland.ac.in/index.php/facilities/library	Webpage
28	NIT, Puducherry	https://www.nitpy.ac.in/library	Webpage
29	NIT, Sikkim	https://kic.nitsikkim.ac.in/	Website
30	NIT, Uttarakhand	https://www.nituk.ac.in/library	Webpage
31	NIT, Andhra Pradesh	https://www.nitap.ac.in/section/home?section=7f6e1080c4	Webpage