Content Analysis of NIRF Ranked (2023) Engineering Institutions Library Websites of India: An Evaluative Study

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Abstract

The purpose of this paper is to examine India's top-ranked engineering institutions' library web pages. The study has adopted the content analysis method using early studies checklists. The main objective of this study is how the libraries provide quality services to support the institute's teaching, learning and research activities. At the same time how the libraries lead to achieving the institution's vision and mission. The research has used the checklist to collect the data, and it is categorized into "basic information about the library, resources and services, contents in the library web page and adopted technologies". This study aims to find out the influencing factors of technical institutions' library web pages. The content quality was measured using a simple percentage tool. The results found that the quality of library services and resources varies from one institute to another.

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1. Introduction

The library is considered as an essential requirement for higher education's academic and research process (Chaudhari, 2017). Because the library is an essential factor to achieve all educational needs. In this connection, information Communication and Technology play an important role in all aspects. The advancement of ICT is forced to adopt the technological transformation in the library for quality information services to their end customers. The internet-enabled libraries provide users with updated information (Manjunatha, 2016) using web technologies. In terms of web technology in the library, the library website is a major promoting tool for library services. The library website helps to promote the resources, services, library activities and information about the Library (Wani, 2021). The library interface plays as a single-window search for all available resources and services (Vijayakumar, Kannappanavar & Mestri, 2009). So library plays a major role in achieve the institute's vision and mission. Because in recent

days, every institutional ranking agency has been giving certain weightage to library performance. The measuring parameters are about library resources, services, human resources and using advancements in the information science field. The library websites contain content based on the institute's values. So attempts have been made to review the top ten NIRF-ranked engineering colleges' library website content.

Table - 1: Top ten Institutions

Top 10 Institutes	NIRF		Established Year	Library webpage/website
	Score	Rank		
Indian Institute of Technology Madras (IITM)	89.79	1	1959	https://www.iitm.ac.in/academics/academic-facilities/central-library
Indian Institute of Technology Delhi (IITD)	87.09	2	1961	https://library.iitd.ac.in/
Indian Institute of Technology Bombay (IITB)	80.74	3	1958	https://www.library.iitb.ac.in/
Indian Institute of Technology Kanpur (IITK)	80.65	4	1959	https://pkklib.iitk.ac.in/
Indian Institute of Technology Kharagpur (IITKH)	75.64	5	1951	https://library.iitkgp.ac.in/
Indian Institute of Technology Roorkee (IITR)	73.76	6	joined IITs in 2001	https://mgcl.iitr.ac.in/
Indian Institute of Technology Guwahati (IITG)	70.32	7	1994	https://www.iitg.ac.in/lib/
Indian Institute of Technology Hyderabad (ITH)	70.28	8	2008	https://library.iith.ac.in/
National Institute of Technology Tiruchirappalli (NITT)	69.71	9	1964	https://www.nitt.edu/home/students/facilitiesnservices/library/
National Institute of Technology Karnataka, Surathkal (NITK)	67.04	10	2002	https://library.nitk.ac.in/joomla/

Note: The selected institutes were ranked based on the NIRF score. The table indicates the names, abbreviations, establishment year and library URL of the selected institutions.

2. Literature Review

Library websites act as an information gateway to library resources and services. Hence Library websites should be more informative in terms of quality content. Content analysis is a method for summarizing any form of content by counting various aspects of the content. The content analysis enables a more objective evaluation than comparing content based on the impressions of

a listener. "Any technique for making inferences by systematically and objectively identifying special characteristics of messages" (Holsti, 1968). In this regard, librarians should consult with web designers, content developers, and library policymakers to create, design, and develop a website and its content (Wilson, 2015). In recent years, librarians have been eager to adopt new technologies for quality library services to the user community (Jurkowski, 2005). For ease of approach and reachability, the library websites should provide or enable the user guide and troubleshooting instructions in the library website (Wickramanayake, 2012). Maximum the academic library websites provide links to subscribe to electronic journals and databases. In terms of usage, the electronic journal is the most prominent electronic resource in academic and research institutions. Because the user is more specific into teaching-learning and research. Especially for quality research productivity happens based on citing or referring the early cites only. However, it is very easy to use and user-friendly. Users can retrieve the source with any human intervention. However, electronic databases require special training and orientation for optimal use. Tella & Oladapo, 2016 suggested that if library websites carry the user manuals for e-databases, it will be grateful for users to work independently. Apart from the e-resources, the websites provide their vision, and mission statement, library operations and its administration, collections, services etc. However, does this information raise awareness of the library? Based on this information the library usage increased? Every year library spends a certain amount on library resources. In all, libraries are transforming from manual to automation, tradition to technology. For, this transformation, information communication technology plays a major role in every action. Especially, libraries are more concerned about their user satisfaction. User satisfaction is measured based on the quality of library services. In this connection, library services are mostly dependent on web-based technologies (Jank, 2013). In all the library websites are "owned maintained, and offering content related to the objectives, policies, initiatives and its procedures".

3. Objectives of the Study

The purpose of this study was to examine the content of library websites of top technology institutions through content analysis. The main objectives of this study are given below.

- To examine the library webpage content top-ranked technical institutions.
- To examine the type of content provided by the selected library webpages.
- To examine the library facilities and its services related content on library webpages.
- To be aware about the rightness, easy of access, exposure and user-friendliness.
- To observe the rank of library websites of selected technical institutions in India.

4. Methodology

Based on the early studies, the checklist was prepared and used for data collection. In this present study, secondary data was collected from India's top ten 2023 NIRF ranked engineering institutes. Surveyed institutions library websites were thoroughly verified during the month of August 2023 and the content was verified based on available (1) and not available (0)". "The score was given for 'available' as 1 and for 'Not available as 0". The gathered information was organized and tabulated with the usage of statistical strategies. Analysis and interpretation of the data accumulated through a checklist turned into accompanied for the examine.

5. Scope and Limitation

Scope of the study is to examine the content coverage of technical institutions' library webpages. It is limited to top NIRF ranked technical institutions in India in the year 2023. The selected institution links and ranking scores are listed in the Table 1.

6. Data Analysis and Interpretations

Table - 2: General information about the library

GI	Name of the Institute										
	IIT M	IIT D	IIT B	IIT K	IIT KH	IIT R	IIT G	IIT H	NIT T	NIT S	%
Introduction	1	1	1	1	1	1	1	0	1	1	90
Mission/ Vision	0	1	0	1	0	1	0	0	1	1	50
Library Hours	1	1	1	1	1	1	1	1	1	1	100
Library Rules	1	1	1	1	1	1	1	1	1	1	100
Membership's	1	1	1	1	1	1	1	1	1	1	100
Library Staff	1	1	1	1	1	1	1	1	1	1	100
Library Statistics	1	1	1	1	1	1	1	1	1	1	100
New Arrivals	1	1	1	1	1	1	1	1	1	1	100
Library Floor Map	1	1	0	1	0	1	1	0	0	1	60
FAQ's	1	1	1	1	1	1	1	1	1	1	100
Suggestion/Feedback	1	1	1	1	1	1	1	1	0	1	90
User Manual	1	1	1	1	1	1	1	1	1	1	100
Contact Us	1	1	1	1	1	1	1	1	1	1	100
Quick links	1	1	1	1	1	1	1	1	1	1	100
Ask a Librarian	1	1	1	1	1	1	1	1	1	1	100
Library Committee	1	1	0	1	0	0	1	1	1	1	70
Budget Statement	0	0	0	1	0	0	0	0	0	0	10
Total score	**15**	**16**	**13**	**17**	**13**	**15**	**15**	**13**	**14**	**16**	

Library General Information

Based on the checklist, initially, the study examined whether the library web pages provide general information about the library or not. The study identified nearly seventeen variables in the general information category. Almost all studied institutions library webpages provided the essential features i.e. library hours, library rules, library membership, library staff details, statistical information about the library and its resources, new additions in library, Frequently asked questions, user manual about library and its resources, contact persons details, quick links to related websites or sources and so on. Apart from these, the important features are introduction about the library and its vision and mission. In this connection, the study found that IIT Hyderabad library page the introduction or about the library content is missing. At the same time, Mission and vision statements are missing in IIT Madras, IIT Bombay, IIT Khargpur, IIT

Guwhati and IIT Hyderabad. The library floor plans will guide the users to locate the library resources and its services easily. Details are not provided by IIT Bombay, IIT Kharkpur, IIT Hyderabad and NIT Trichy Library webpages. Compare to all variables in this section, the suggestions and feedback system is playing major role in libraries for better performance. Which information is missing in NIT Trichy Library web page. Among the top-ranked institutions, IIT Kanpur only shared their library budget details to public. The study found that, IIT Kanpur library only provided the all general information in their webpage followed by IIT Delhi, NIT Surathkal, IIT Madras, IIT Roorkee, IIT Guwhati and least mentioned general information by IIT Bombay, IIT Kharagpur and IIT Hyderabad.

Table - 3: Library resources

| Library resources | Name of the Institute | | | | | | | | | | |
	IIT M	IIT D	IIT B	IIT K	IIT KH	IIT R	IIT G	IIT H	NIT T	NIT S	%
Books	1	1	1	1	1	1	1	1	1	1	100
Print Periodicals	1	1	1	1	1	1	1	1	1	1	100
Thesis/Dissertations	1	1	1	1	1	1	1	1	1	1	100
Non-Book Materials	1	1	1	1	1	1	1	1	1	1	100
Conference Proceedings	1	1	1	1	1	1	1	1	1	1	100
Back volumes	1	1	1	1	1	1	1	1	1	1	100
Special Collections	0	0	0	0	0	0	0	0	0	0	0
Standards/Patents	1	1	0	1	1	1	1	0	1	1	80
Previous Question Paper	1	0	0	1	1	1	1	0	0	0	50
Electronic Resources											
E- Journals	1	1	1	1	1	1	1	1	1	1	100
E-Books	1	1	1	1	1	1	1	1	1	1	100
E-Databases	1	1	1	1	1	1	1	1	1	1	100
E-Dissertations and Thesis	1	1	1	1	1	1	1	1	1	1	100
Total	**12**	**11**	**10**	**12**	**12**	**12**	**12**	**10**	**11**	**11**	

Information about the library resources

Library resources and their collections are the backbones of any library. Especially in academic libraries, the library is measured based on its collections. Because the library plays important role in supporting teaching, learning and research. In recent years, the library webpages are the blueprint of its collection and it is user friendly for the community. The resources are categorized into two types as print and electronic resources. The study examined the categorized resources information made available on the library webpage are not. According to the checklist, the study identified 13 types of resources as mentioned in the above table. It is observed that the institutions are provided with their collections of details i.e. books, print periodical,

thesis/dissertation, non-book materials, conference proceedings and back volumes. In terms of electronic resources, every institute subscribes all types of electronic resources which is displayed in their website too.

However, the study found that except IIT Bombay and IIT Hyderabad, rest all provide their standards and patents collections information in their web portal. Previous year question papers details were not mentioned in the IIT Delhi, IIT Bombay, IIT Hyderabad, NIT Trichy and NIT Suratkal. The study found that none of the institutes provide their special collection details. The special collections means for visually impaired users. It is observed that except IIT Delhi, IIT Bombay, IIT Hyderabad, NIT Trichy and NIT Suratkal, rest of the institution were provided with the information.

Table - 4: Library Services

Library Services	Name of the Institute										
	IIT M	IIT D	IIT B	IIT K	IIT KH	IIT R	IIT G	IIT H	NI TT	NI TK	%
WEB OPAC	1	1	1	1	1	1	1	1	1	1	100
Reference Services	1	1	1	1	1	1	1	1	1	1	100
Reprographic Services	1	1	1	1	1	1	1	0	1	1	90
Book Bank for Under Privilege	1	1	1	0	0	1	1	0	0	1	60
for Physically Challenged	0	0	1	0	0	1	0	0	0	0	20
Television and multimedia	1	0	0	0	0	0	0	0	1	0	20
E-Mail services	1	1	1	1	1	1	1	1	1	1	100
Mobile App	0	1	0	0	0	0	0	0	0	0	10
Remote Access	1	1	1	1	1	1	1	1	1	1	100
Current Awareness Service	1	1	1	1	1	1	1	0	0	1	80
Institutional Digital Repository	1	1	1	1	1	1	1	0	1	1	90
Digital Library	1	1	1	1	1	1	1	1	1	1	100
Inter library loan services	1	1	1	1	1	1	1	0	1	1	90
Delnet/Document delivery services	1	1	1	0	1	1	1	0	1	1	80
Information Literacy Programme	1	1	1	1	1	1	1	1	1	1	100
Link to other websites	1	1	1	1	1	1	1	1	1	1	100
Faculty Publications Display	0	1	1	1	1	0	0	0	0	1	50
Plagiarism checking	1	1	1	1	1	1	1	1	1	1	100
Research Assistance and Visibility	1	1	1	1	1	1	1	1	1	1	100
Implementation of RFID Technology	1	0	0	0	1	1	1	0	1	1	60

Information about the Library Services

In academic institutions the libraries are playing as a service provider to their users. The available library resources and its facilities are serving users in unique way. Maximum services mentioned in this checklist are followed by every academic library. But whether the information about the services are properly informed to their end user or not. However, to increase library usage the "libraries should provide their detailed information about their library services". Because, without knowing about the services, the library authorities cannot expect from their users to use their library services effectively. In this connection the study examined the top-ranked institute library websites and whether they provided their detailed service-related information. The study has identified twenty essentials service offered by the selected institutions. Based on the analysis nearly 45% of institutes websites have provided their important services i.e. "WEB OPAC, Reference Services, E-Mail services, Remote Access, Digital Library, Information Literacy Programme, Link to other websites, Plagiarism checking, Research Assistance and Visibility". The study found that NIT Trichy has not mentioned CAS information in their library website, followed by IIT Kanpur library website has also not mentioned Document delivery services. Among all, many of library services related information are missing in IIT Hyderabad library webpage. We hope many of the centrally funded universities might be implemented RFID Technology in their library day-to-day operations. But, only six institutes provided RFID-related information on their webpage except IIT Delhi, IIT Bombay, IIT Kanpur and IIT Hyderabad. At the same time the book bank system is the most important service in government colleges in which details is missing in IIT Kanpur, IIT Kharagpur, IIT Hyderabad and NIT Trichy. Television and multimedia section related information are carried only in IIT Madras and NIT Trichy. The special service for physically challenged students IIT Bombay and IIT Roorkee webpages only provide the data. There is only one IIT providing mobile application based library services to their user. The study found that the top ranked institutions all comes under the national importance category. At the same time the institutes are technically advanced too. Those institutes are not providing the mobile application related information to their website, because they do not have mobile based applications or they are not displayed in their website. However, the study recommends that, institutes should develop and provide the mobile app-based service related information in their webpages. At the same time many of the libraries missed to display faculty research publication related information. It should be displayed as intellectual resource of the institute.

Table - 5: Library Sections

Library Sections	Name of the Institute										
	IIT M	IIT D	IIT B	IIT K	IIT KH	IIT R	IIT G	IIT H	NIT T T	NIT T K	Total (10) %
Circulation section	1	1	1	1	1	1	1	1	1	1	100
Periodicals section	1	1	1	1	1	1	1	1	1	1	100
Stock Area	1	1	1	1	1	1	1	1	1	1	100
Reference Section	1	1	1	1	1	1	1	1	1	1	100
Back volumes section	1	1	1	1	1	1	1	1	1	1	100
Digital library	1	1	1	1	1	1	1	1	1	1	100

Acquisition section	1	1	1	1	1	1	1	1	1	1	100
Pamphlet Section	0	0	1	0	0	0	0	0	0	0	10
Research Support Services and Outreach Programs Section	0	1	0	0	0	0	0	0	0	0	10
Total Score (9)	7	8	8	7	7	7	7	7	7	7	

Table 5 indicates that all colleges' libraries had a circulation section, Periodicals section, reference section, back volumes, digital Library, and the acquisition provides. It is observed that very few libraries are providing some important services like Pamphlet Section and Research Support Services and Outreach Programs Section 1 (10%) (Panneerselvam, 2015).

Table - 6: Features of Library Websites

Features of library websites	Name of the Institute										
	IIT M	IIT D	IIT B	IIT K	IIT KH	IIT R	IIT G	IIT H	NIT T	NIT K	Total (10) %
Last Update	1	1	1	1	1	1	1	1	1	1	100
Member in social networking sites	1	1	1	1	1	1	1	0	1	1	90
Registration/login	1	1	1	1	1	1	1	1	0	1	90
Direct link	1	1	1	1	1	1	1	1	1	1	100
Downloads forms	1	1	1	1	1	1	1	1	1	1	100
Keyword search	0	1	1	1	1	1	1	1	0	1	80
Total Score (6)	5	6	6	6	6	6	6	5	4	6	

Table 6 describes that most of the college 10 (100%) websites provide Last updates, Download forms & direct links to the library website. It is also understood that 9 (90%) libraries have membership in social networking platforms. Nearly 8 (80%) of the libraries stated that keyword search updates on the library websites.

Table - 7: Domain and Display recognition

Domain and Display recognition	Name of the Institute									
	IIT M	IIT D	IIT B	IIT K	IIT KH	IIT R	IIT G	IIT H	NIT T	NIT K
Domain name	ac.in	ac.in	ac.in	ac.in	ac.in	ac.in	ac.in	ac.in	.edu	ac.in
Video and Audio	A	A	A	A	A	A	A	NA	A	A
Background colour	A	A	B	B	C	A	B	C	A	A

A=Best B=Good C=Average

Table 7 indicates that most of the websites have (ac. in) as a web domain. The remaining websites have (.edu) as a web domain. Most of the website's background colour appearance is

good, and few library websites measured as average. Video and audio facilities are providing many college libraries. (Manjunatha, 2016).
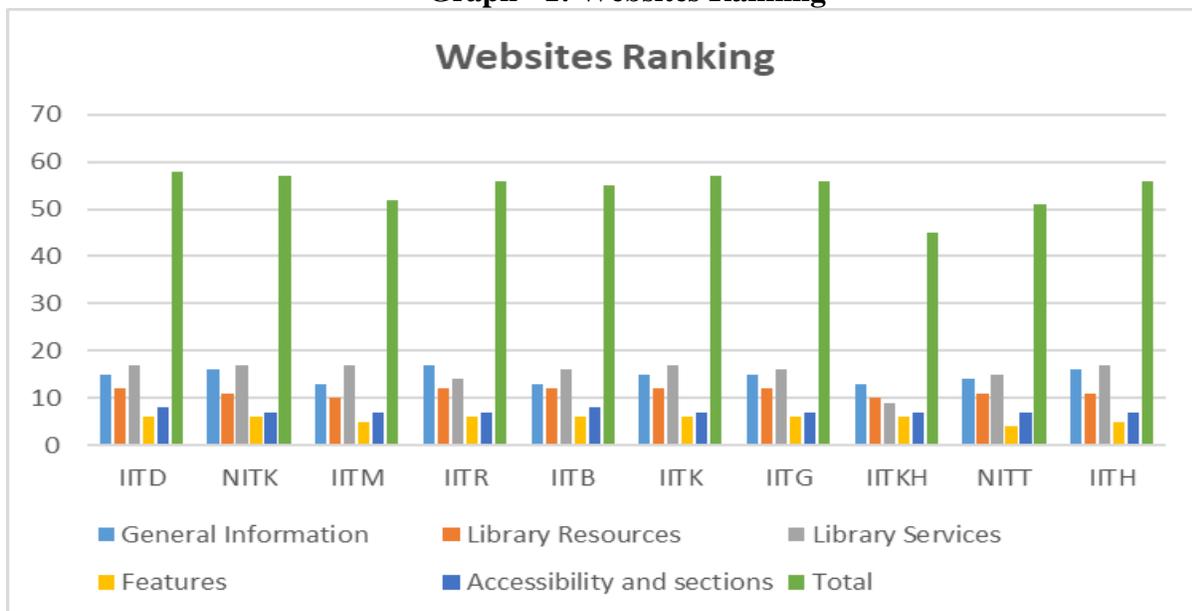
Graph - 1: Websites Ranking

Table - 8: Web page analysis

Particulars	Name of the Institute									
	IIT D	NIT K	IIT M	IIT R	IIT B	IIT K	IIT G	IIT KH	NIT T	IIT H
General Information (Max. Score 17)	15	16	13	17	13	15	15	13	14	16
Library Resources (Max. Score 14)	12	11	10	12	12	12	12	10	11	11
Library Services (Max.Score 20)	17	17	17	14	16	17	16	9	15	17
Features (Max.Score 06)	6	6	5	6	6	6	6	6	4	5
Accessibility and sections (Max. Score 09)	8	7	7	7	8	7	7	7	7	7
Total (Max. Score 66)	58	57	52	56	55	57	56	45	51	56
Rank	1	2	5	3	4	2	3	7	6	3

Category wise Analysis

Table 8 and Table 7 shows the category wise comparison of library webpage analysis. It is observed that the Indian Institute of Technology Delhi scored highest, i.e. (58) out of (66),

followed by the National Institute of Technology Surathkal (57) and Indian Institute of Technology Roorkee& Indian Institute of Technology Madras 3rd position with score (56) whereas the placed the Indian Institute of Technology Hyderabad (45) the final position amongst selected colleges below the study (Wani, 2021). The purpose of the category-wise analysis is to examine the availability of library web content. The study observed that more than 60% of libraries' web pages carry library resources and service-related information in the library webpages followed by general information about the library. However, the study found that the features of library web pages in the leasts core. The "spearman's rank order" was performed to measure the level of correlation between the NIRF rank and Score. The study observed that there is a positive correlation between rank and score with 0.983, p= 0.18, "which is significant at 95 per cent level of significance". Overall, maximum libraries scored a good percentage in all the parameters except IIT Hyderabad.

6. Discussion

The top ten NIRF ranked institutes are centrally funded and come under the institute of national importance. These institutes have separate library web pages that users can directly access. Mostly all the institute library web pages contain basic information, i.e. library rules, library membership, and staff details. In terms of services, libraries are briefly explained about library automation and its advanced RFID technology. All surveyed institutes were effectively participating in Indian Research Information Network System (IRINS) and provided the link to the institutional digital repository. At the same time, the web pages contain details about the Current Awareness Service, Selective Dissemination of Information and Inter-Library Loan channels and their procedures. However, the study found that the Indian Institute of Technology Roorkee library web page provides maximum information except for the library committee and library budget. At the same time, none of the institutes provides their budget statements on the library webpage. However, the study found that IIT Bombay and IIT Roorkee only mentioned the physically challenged section and mobile application facility available with IIT Delhi only. Rest institutes have not mentioned this service in their website. The surveyed institutes have not mentioned the visually challenged students' related resources called Braille Collections, and very few of them mentioned the television and multimedia section on their library page. According to this study Indian Institute of Technology, Delhi secured the first position in the ranking list, followed by NIT Trichy secured the second position and IIT Madras was in the third position.

7. Conclusion

The main purpose of this study is how the library webpages play a major role in reaching the academic and research goals of the institute. Especially the national importance institutes like IITs, NITs and IIITs are examples of many technical institutions in our country. At the same time, the ranking agencies equally give importance to library resources and services. In this connection, the study observed that the library web pages are varied from one another in many aspects. Every library website provides maximum information. At the same time, if the libraries provide the library budget statement on web pages, they would be grateful for other technical institutions to maintain the same kind of quality resources and services. The study highly recommends that the users feedback will make one to improve the library performance in a better manner.

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