International Journal of Advance Studies and Growth Evaluation

Assessing Library Websites in Central Universities of North East India: Usability, Accessibility, and Content Perspectives

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Abstract
The effectiveness of library websites plays a crucial role in enhancing academic access, resource discovery, and user engagement in higher education institutions. This study evaluates the library websites of selected central universities in North East India, focusing on three key dimensions: usability, accessibility, and content. Using a structured evaluation framework, the study assesses the extent to which these websites meet the informational and navigational needs of their users, adhere to web accessibility standards, and provide relevant and up-to-date content. The findings reveal significant variations in the quality and consistency of library websites across the region, with notable gaps in accessibility compliance and user-centered design. The study highlights best practices and offers strategic recommendations for improving the digital infrastructure of academic libraries. By aligning website development with institutional goals and user expectations, the research aims to contribute to the enhancement of digital library services and promote equitable access to academic resources in the region.

Introduction

In the contemporary academic landscape, the library website has evolved into a critical digital interface that connects users to a wide array of scholarly resources, services, and tools. With the ongoing digitization of educational services and the increasing reliance on remote access to information, university libraries are expected to maintain highly functional, user-friendly, and accessible websites that can effectively support teaching, learning, and research activities. This is particularly vital in developing regions, where physical access to resources may be limited, and the digital portal becomes the primary means of academic engagement.

Central universities in North East India occupy a unique position in the Indian higher education system. These institutions cater to a diverse student population, often spread across geographically remote and infrastructurally underdeveloped areas. In this context, library websites serve not just as information hubs, but also as critical instruments for bridging the digital divide and ensuring equitable access to academic knowledge. Given their significance, it becomes imperative to evaluate how well these websites are designed and maintained, and whether they truly meet the expectations of their intended users. This study is driven by the recognition that an effective library website must balance several important factors—usability, accessibility, and content quality. Usability refers to the ease with which users can navigate and interact with the website, locate resources, and perform desired tasks without unnecessary effort or confusion. Accessibility, on the other hand, ensures that users with diverse physical, cognitive, and technological limitations can access the site's content equally. This is aligned with global standards such as the Web Content Accessibility Guidelines (WCAG), which promote inclusive web design. Content, as the third dimension of this study, encompasses the accuracy, relevance, comprehensiveness, and timeliness of the information presented on the website-ranging from e-resources and library services to policies, staff information, and contact details.

Despite the growing importance of digital library services, there has been relatively limited research focused on evaluating the library websites of central universities in the North East region of India. Most previous studies have

concentrated on more prominent urban institutions or have examined academic websites in general, rather than library-specific platforms. This creates a gap in understanding the unique challenges and opportunities faced by libraries in this region,

Review of Literature

Gupta, Saumya and Walia, Paramjeet K (2022) in their study reveals that library related information such as general library information, about collection, links to e-resources, library services; currency and authority of websites are presented on the university library websites but not to the full extent. The study suggested that libraries need to incorporate more information on their websites to promote the use of library resources and services. Libraries need to have a dedicated website and provide all the valuable and relevant information related to the library on their websites. The study depicts that most of the library websites under study are at the development stage. A lot more information could be incorporated to enhance the utilization of these websites. Library general information is the primary and most important information that should be available on all the websites.

Brahma, Krishna & Verma, Manoj & Sinha, Manoj (2019) in their paper studied the domain and page authority of library websites, top followed links to the site, spam score, internal followed links and external followed links, total links, total linking domains and followed linking domains, and the web impact factor (internal, external and simple) of top seven universities of North-East India ranked by National Institutional Ranking Framework selected (NIRF) in 2018. The author developed a checklist to assess the usability of the selected library websites and it visualized the different contents available to the users.

Verma, Manoj & Brahma, Krishna (2017) in their study highlighted the different library websites of north east central universities libraries and analyzed their content available on their webpage. The study also determines the library services and the existing facilities availability through their respective library websites. The authors studied seven central universities of the north east region with a proper checklist designed for library websites based on the evaluation of previous study by different authors.

Laskar, Priyanka & Chakraborty, Susmita (2021) in their study reveals the role of library websites in preservation and conservation of resources provided through web based access to digital information. The study focus on the features of the libraries websites of three leading central universities (Tezpur University, North-East Hill University and Mizoram University) of North east India and with a descriptive analysis of knowledge management practices used in these three central libraries. The study also highlights on the libraries websites of these three universities which were used for knowledge discovery tools to provide quality information services. The data collected from the study are collected with a duration from 22nd June 2021- 25th June 2021.

Mehta, Jaydeep & Trivedi, Mayank (2015) in their paper provides a preview of the contents and design of central university library websites of India. The study is confined to selected 45 central universities in India. The central university libraries have a web occurrence and various levels of services; there is huge scope for improving the websites. The study reveals that if a central university library website is more eye-catching and useful, it can easily capture the notice of library users. The data collected is prepared through a checklist for the study with different criteria like collection, links, services, application of web 2.0 tools and web 2.0 services.

Objectives of the Study

- To analyze the contents of the central universities of north east India.
- To find out the services and facilities provided for the users on their websites.
- To identify the use of social media in the library websites.
- To calculate the Web impact factor of Central Universities in North East India.

Methodology

The study examined the library websites of central universities in Northeast India, which comprise a total of 11 institutions. However, the scope of the study is limited to nine central universities, excluding the Central Agricultural University in Iroisemba, Imphal, and the National Sports University in Koutruk, both located in Manipur, as their academic disciplines differ from those of the other central universities. There are 56 central universities in India where 11 universities are from different states of north east region. The study will be based on the descriptive and analytical survey method where data will be collected through a secondary method from library websites from the selected universities.

Table 1: List of Central Universities in North East India

Name of the Institute	Abbreviations of Institute	Establishment Year	URL(Institute	Library URL
North Eastern Hill University	NEHU	1973	https://www.nehu.ac.in/	https://www.nehu.ac.in/library/
Assam University	AU	1994	http://www.aus.ac.in/	https://ausopac.ltsinformatics.com/
Manipur University	MU	1983(State) 2005(Central)	https://www.manipuruniv.ac.in/	http://mulibrary.manipuruniv.ac.in/
Mizoram University	MZU	2001	https://mzu.edu.in/	https://lib.mzu.edu.in/
Tezpur University	TU	1994	http://www.tezu.ernet.in/	https://www.tezu.ernet.in/Library/
Nagaland University	NU	1994	https://nagalanduniversity.ac.in/English/	https://library.nagalanduniversity.ac.in/
Ragiv Gandhi University	RGU	1984	https://rgu.ac.in/	https://rgu.ac.in/library/
Sikkim University	SU	2007	https://cus.ac.in/index.php/en/	https://library.cus.ac.in/
Tripura Univerity	TRU	2007	https://tripurauniv.ac.in/site/index.php/en/our-university-en/about-tu-en#	https://tripurauniv.ac.in/site/index.php/en/central-library-en

Table 1 shows the various names of the central universities in north east depicting the different library websites along with their establishment year, the abbreviations of the institute and the Uniform resource locators (URL) of the selected library websites. Further, the study found out that the entire library has separate library websites.

Table 2: General Information

General Information	NEHU	AU	MU	MZU	TU	NU	RGU	SU	TRU	Total %
Introduction/About us	✓	✓	✓	✓	✓	✓	✓	✓	✓	9(100)
Mission/Vision	✗	✗	✗	✗	✓	✗	✗	✓	✓	3(33)
Library Hours	✗	✓	✓	✓	✓	✗	✓	✗	✓	6(66)
Library Rules	✓	✓	✓	✓	✓	✓	✓	✓	✓	9(100)
Services	✗	✓	✓	✓	✓	✓	✗	✓	✓	7((77)
Collections	✗	✗	✓	✓	✓	✗	✓	✓	✓	6(66)
Membership	✓	✓	✓	✓	✓	✓	✓	✗	✓	8(88)
Library Sections	✓	✓	✗	✓	✓	✗	✓	✗	✗	5(55)
Visitors Statistics	✗	✗	✓	✓	✓	✗	✗	✗	✗	3(33)
Library Staff	✗	✓	✗	✓	✓	✗	✗	✓	✓	5(55)
Differently abled section	✗	✓	✓	✓	✓	✓	✗	✓	✗	6(66)
Total Score	04	08	08	10	11	05	06	07	08	

Table 2 The Table shows that all of the libraries have introductory information and only a few libraries show their mission and vision with only 3(33%). 6(66%) of the libraries show the library hours in their websites while all of the libraries under study reveal the library rules in their websites. Most of the library i.e., 7(77%) describes the details of the library services in their websites. Regarding the collections of the library, only 6(66%) of the library shows their collections. The membership is shown by 8(88%) of the library, while 5(55%) of the library understudy reveals the different sections of the library. Only 2(22%) of the library highlighted the statistics of the library websites. i.e., the number of counts of the online visitors of the library website. 5(55%) of the library reveals the name and designation of the library staff in their website. And 6(66%) of the library have the facility of differently abled provision in their library, which is a very important factor in the library.

Table 3: Features of Library Website

Features	NEHU	AU	MU	MZU	TU	NU	RGU	SU	TRU	Total %
Last Update	✗	✗	✗	✗	✗	✗	✗	✗	✗	Nil
Research Support	✗	✓	✓	✗	✓	✗	✗	✗	✗	3(33)
Registration/Login	✗	✗	✓	✓	✗	✗	✗	✗	✗	2(22)
Useful Link	✓	✗	✓	✓	✓	✗	✗	✗	✗	4(44)
Download Forms	✓	✓	✓	✓	✓	✓	✓	✗	✗	7(77)
Social Media	✗	✓	✗	✓	✗	✓	✓	✓	✗	5(55)
Feedback	✗	✗	✓	✗	✗	✗	✗	✗	✓	2(22)
Keyword Search	✓	✓	✓	✗	✗	✗	✗	✗	✗	3(33)
Google Maps	✗	✓	✗	✓	✓	✗	✗	✗	✓	4(44)
Total Score	3	5	5	5	4	2	2	1	2	

Table 3: The Table 3 analysis of the study shows that none of the library websites/webpage have found to get updated regularly or at regular intervals. Only 2(22%) have given the option for Research support on their website and only 2(22%) of the library requires login or registration. Only 4(44%) have given useful links on their website. Most of the library 7(77%) of the library have provided download forms of the users. While social media have a great influence in today's world, only 5(55%) of the library have provided social media to its users and only a few libraries successfully implemented the feedback with only 2(22%) and only 3(33%) have given keyword options in their website/webpage. Since location is an important factor 4(44%) of the library have incorporated Google Maps in their website/webpage.

Table 4: Library Resources and Services

Resources and Services	NEHU	AU	MU	MZU	TU	NU	RGU	SU	TRU	Total %
OPAC/Web OPAC	✓	✗	✓	✓	✓	✓	✗	✓	✓	7(77)
e-journals	✓	✓	✓	✓	✓	✓	✓	✓	✓	9(100)
Database	✓	✓	✗	✓	✓	✗	✓	✓	✓	7(77)
Links to Other website	✓	✗	✗	✓	✓	✓	✗	✓	✗	5(55)
FAQ's	✓	✓	✓	✓	✓	✓	✗	✗	✓	7(77)
Location Guide	✓	✓	✓	✗	✗	✗	✗	✗	✗	3(33)
Photo Gallery	✗	✓	✗	✓	✗	✗	✗	✓	✗	3(33)
Ask a Librarian	✗	✓	✗	✓	✓	✓	✗	✓	✗	5(55)
E-Consortium	✓	✓	✓	✓	✓	✓	✓	✓	✓	9(100)

Remote Access	✓	✓	✓	✓	✓	✓	✓	✓	✓	9(100)
Institutional Repository	✓	✗	✓	✓	✓	✓	✗	✓	✓	7(77)
Plagiarism Software	✓	✓	✓	✓	✓	✓	✓	✓	✓	9(100)
Total Score	10	9	8	11	10	9	6	10	8	

Table 4: Table 4 describes the various library resources and services and the services provided through their websites. Most of the library i.e., 7(77%) of the library have given the option of OPAC/Web OPAC and all of the libraries have provided e-journals with 100%. Out of 9 libraries 7 (77%) have revealed the database in their website. 5(55%) have provided links to other websites and almost all 7(77%) have provided Frequently Asked Questions option for easy troubleshooting for the users with 5(55%) providing the Ask the Librarian. Only 3(33%) have given their photo gallery and location guide on their website. The entire library under study has the features of e-consortium and remote access to the users and almost all i.e., 7 (77%) have institutional repositories for their access to their own publications. And the most important factor in providing plagiarism software is being carried out by the entire library under study.

Table 5: Application of Social Networking Platforms

S. No.	Name of Inset	SNS	Platform	Integration	Content Shared	Frequency of Updates	Engagement Level	Remarks
1.	NEHU	No	-	no	-	-	-	No SNS used by library
2.	AU	Yes	Facebook	yes	Events, Notices, tutorials	Weekly	Moderate (1k+ followers)	Regularly updated
3.	MU	No	-	No	-	-	-	No SNS used by library
4.	MZU	Yes	Facebook, Instagram	Yes	Anouncements, e-resources, Events	Weekly	Moderate	Active on Facebook and Instagram
5.	TU	Yes	Facebook	Yes	News, Library Services	Monthly	Low	Basic content only
6.	NU	No	-	No	-	-	-	SNS not identified
7.	RGU	Yes	Facebook	Yes	Events, Digital resources	Bi-Weekly	Moderate	Well integrated SNS
8.	SU	No	-	No	-	-	-	No social media integration found
9.	TRU	Yes	YouTube	Yes	Lectures, Tutorials	Occasionally	Low	Not embedded on library website

The above table provides an overview of how central university libraries in the north east are utilizing social networking sites to enhance communication and outreach.
Out of the 9 universities only 5 (56%) have an identifiable presence on at least one social networking platform. The remaining 4 libraries (44%) do not appear to use SNS, indicating room for improvement in digital engagement. The most commonly used platform is Facebook which is adopted by 4 out of the 5 active universities. 2 libraries use You Tube for sharing video content like lectures or tutorials. Only 4 libraries have visible integrated SNS like or widgets directly on their websites, enhancing user access. The contents shared in their SNS are mainly library notices and announcements, academic events and activities, access to digital resources and recorded sessions and tutorials.

Web Impact Factor Analysis
The Web Impact Factor (WIF) is a crucial metric in evaluating a library website as it quantitatively measures the website's visibility, influence, and presence on the internet. Calculating the WIF helps determine how often a library website is referenced or linked by external sources, reflecting its authority and credibility in the digital environment. A higher WIF indicates that the website's content is widely accessed, trusted, and valued by other institutions, researchers, and users, thereby enhancing the library's reputation and outreach. The WIF is typically calculated by dividing the number of external inbound links by the total number of web pages on the site.

This ratio provides insight into how well the website content is being utilized or acknowledged externally. For academic and research libraries, such as those belonging to central universities, WIF serves as a useful benchmarking tool for comparing the digital impact of different library websites. It also highlights areas for improvement, such as content quality, search engine optimization, and digital marketing strategies.

In the evaluation of library websites, tools such as Moz's Link Explorer are utilized to assess domain authority and link metrics, which are closely related to the concept of Web Impact Factor (WIF). Moz's Domain Authority (DA) is a widely recognized metric that predicts how well a website will rank on search engine result pages based on its link profile, including the number and quality of inbound links. By using Moz's Link Explorer, researchers can retrieve detailed data on external links, linking domains, and DA scores, which serve as proxies for measuring the visibility, credibility, and overall web influence of a library's website.

For accessing the data for the below table Moz was used. Domain authority is a quality score on a 100-point scale developed by Moz that predicts how well a website will rank on search engines. It predicts a root domain's ranking potential in search engines based on an algorithm of link metrics. Page Authority is a score developed by Moz on a 100-point scale that predicts the page ranking potential in search engines based on the algorithm of link metrics. Due to tool limitations, only the first 300 linking domains were analyzed. Academic links were filtered manually.

Table 6: Web Impact Factor of Central University Libraries in North East India

Name of the Library	Total No of Web pages	Total No of inlinks	Total No of Acad Links	SWIF	ISI-like WIF
NEHU	54	532.8k	98	9806.67	1.8148
AU	273	2.6m	77	9523.80	0.2820
MU	81600	94	38	0.0011	0.00046
MZU	1050	69	1	0.0657	0.00095
TU	927	396.1k	55	427.29	0.0593
NU	85	181	58	2.1294	0.6823
RGU	7	52.3k	41	7500	5.8571
SU	290	1.2k	7	4.1379	0.0241
TRU	1	163.3k	15	163300	15

Table 6 exhibits the Web Impact Factor of central universities in the north east where web impact factor was calculated using two parameters namely Simple Web Impact Factor-SWIF and ISI-like WIF used for calculating the academic links. Web impact factor is an important parameter to measure the popularity of a website. A popular website is a website which is viewed and used by many. WIF is directly related with the reputation of the website and if the WIF is high, it means the reputation is also high.

Distribution of Data by SWIF has been calculated by the following formula:

$$\text{SWIF} = \frac{\text{(Total no of inlinks)}}{\text{(Total no of webpages)}}$$

ISI-like WIF: A variation of the Web Impact Factor similar to the ISI Web of Knowledge metrics, used to measure the academic impact or influence of a website. It may account for the academic links differently or adjust for the nature of the content.

Distribution of Data by ISI-Like WIF has been calculated by the following formula:

$$\text{ISI- Like WIF} = \frac{\text{(Total no of acad links)}}{\text{(Total no of webpages)}}$$

The above Table shows that NEHU has a relatively high SWIF of 1.8148, suggesting it has significant external attention per page, especially with its high academic links (98).AU and TRU have high ISI-like WIF values of 9523.80 and 163300 respectively, but TRU only has one page, making it stand out, though this is an anomaly.MU has an extremely low SWIF and ISI-like WIF, despite having many web pages, indicating that while the website has many pages, it isn't receiving much external attention or academic recognition. RGU has a remarkably high SWIF (5.8571), indicating that its website, despite having only 7 pages, has a large number of inlinks, likely signaling high external visibility. The study helps in evaluating how well these library websites are performing in terms of their digital presence, the academic attention they receive, and their overall impact on the web. Websites with higher WIF values (like NEHU, RGU, and SU) tend to be better linked externally and may serve as more prominent online resources.

Findings and Conclusion

1. The present study is confined to 9 central university libraries. All the 9 library websites are functional at the time of data collection and during online evaluation.
2. The study found that all the selected library websites have their own library website with suitable and structural parameters.
3. All the library websites under study have introductory information while only 33% show their vision and mission.
4. Most of the library 77% describes the details of the library services in their website and the collection of the library is shown by 66% of the library in their website.
5. Another important factor is showing the number of counts of the online visitors of the library website, and only 22% of the library website under study reveals their users statistics.
6. Provision to the differently abled students plays an important role. 66% of the library under study has facilities of differently abled provision in their library which is shown in their library website.
7. From the study, it has been observed that none of the library website/webpage updated their website on a regular or at a regular interval, which leaves a room for improvement for immediate action.
8. 22% of the library has given research support for the users and 44% have given useful links on their website.
9. With regard to the social networking sites, its implementation of social media is not yet satisfactory. 55% of the library provided social media presence in their website.
10. Most of the library i.e., 77% has given the option of OPAC/Web OPAC and all the library websites under study have provided e-journals which is a significant factor for easy access to scholarly communication.
11. The entire library under study has the features of e-consortium and remote access to the users and 77% have institutional repositories for their access to their own publications.
12. Out of the 9 libraries only 56% have identifiable presence on at least one social networking platform. The remaining do not appear to use social networking site indicating a room for improvement in digital engagement.\
13. The content shared in their social networking site are mainly library notices, announcements, academic events and activities.

Conclusions

With the advancement of the World Wide Web (WWW) and its sophisticated application, the world has become a much smaller place. There has been a significant change in our information and communication technology. WWW is now an inseparable feature in almost every aspect of our life. The library website under study finds that most of the library have static pages with poor layout and no update on its information.

The evaluation of the library websites under study and the subsequent analysis of the findings concluded that there is an urgent need for improvement to make the library more dynamic and interactive by following the web 2.0 or 3.0 technologies. There should also be provisions for instant messaging, RSS feeds, digital reference services, and others etc so that users can have the opportunity for direct conversation and communication with the system. In addition, the academic library websites should frequently update their

web page with new announcements, information sources and services and check the compatibility with different browsers and media before uploading.

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