

A Comparative Analysis of the Reliability and Quality of University Library Websites in Maharashtra

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Abstract:

The role of the university website as a gateway for information in the University is critical. In this study, the reliability and quality of Library websites of seven NAAC "A" grade Universities of Maharashtra, India, has been evaluated. Using content analysis methodology, the accessibility of websites, the availability of resources, information for services, and provision of e-resources were analyzed over the sites of institutions that opened in the periods 1857 to 1991. Results indicate there are substantial differences in website functionality, with 42.86% of libraries having direct links to resources from their homepage, and 100% having basic information about services. E-resource availability is universal for e-books, e-journals and databases, but only 14.28% have institutional repositories. The level of integration with social media is low, with 28.57%. 57.14% of websites are solely in English, which may restrict the involvement of users in the region. The results highlight the significant disparities in the information architecture and transparency of services in various leading academic institutions in Maharashtra, thereby emphasizing the need for uniform guidelines for the development and upkeep of library websites for providing equal user experience and resource discovery.

Keywords: library website quality, content analysis, academic libraries, information accessibility, Maharashtra universities

1. INTRODUCTION

Since the dawn of the Information and Communication Technology, the role of university libraries has been revolutionized from being a repository to becoming a dynamic digital information hub. The universities of Maharashtra host millions of researchers and students relying more and more on

digital platforms for accessing resources and services (Kumar & Verma, 2018). While university library websites are the main communication tool between institutions and end users, the reliability of their content and the quality of their structure is not well documented in India. There is significant difference in the functionality and provision of content in the websites of agricultural and northeastern Indian university libraries, as revealed by previous studies (Barman, 2021; Yumnam & Singh, 2021). But there are not many comprehensive comparative studies available with Maharashtra specificness. This geographic context is quite important Maharashtra is home to the oldest university in India (University of Mumbai, 1857) as well as newer ones, which could potentially have a variety of technological adoption patterns. Enrolled students at premier institutions use the state's libraries collectively by the estimate of 2.8 million students.

The quality of websites affects user satisfaction and the institutional reputation. In 2020, Pandey studied the state of services information in University libraries in Bihar and found that only 50% of them had adequate service information online which clearly reflects that there are huge gaps in access to services information in Indian higher education libraries. Websites are becoming tools for accountability, and NAAC standards clearly assess the digital infrastructure and transparency of websites. Even with this policy thrust there is no systematic evaluation of the library websites of Maharashtra. The present investigation attempts to plug this gap by analyzing seven NAAC accredited "A" grade university libraries with respect to information architecture, transparency of information, description of services and technological sophistication. We measure the level of excellence of prominent institutional websites and determine if there is a difference in digital capacity by region. The results will be used to make recommendations for a uniform website development guideline, which can be useful for institutional planning and improvement of UX initiatives in the Indian university systems.

2. LITERATURE REVIEW

Since 2015, the studies about Indian university library websites have grown considerably, resulting in similar data sets in several states. Analysis of 23 universities in Tamilnadu by Panneerselvam (2015) showed that all the universities in the metropolis of Chennai excelled at the digital sophistication metrics indicating technological concentration in the metropolis. That investigation provided some groundwork for future investigators who used content analysis. The study of deemed university libraries by Savitha (2016) in Karnataka has confirmed that basic information about the collection books and journals is available on all the websites examined, which makes a baseline of 100% reasonable for basic information. The study of agricultural universities conducted by Barman (2021) showed that the distribution of print journals, reference sources and theses collections remained consistent, with all the libraries examined promoting those collections online. But the specification of service descriptions was still not standardized. Yumnam and Singh (2021) reported that all the central universities of North East India offered membership, services, and information on e-resources, but there was significant variability in the ease of navigation and organization of information. The Central and State University Library analysis by Pandey (2020) of 22 institutes from Bihar revealed that only 50% had proper Library service descriptions which is worrisome as around

half of those institutes studied did not have proper information about their library at the user's touch.

In the study undertaken by the NAAC "A" graded Nilesh, Kumar, and Verma (2018) in the Central zone of India, it was found that all the searched websites had reference service, reprographic service, current additions, and internet access information. This previous study laid the groundwork for the analysis in this study. The investigation of college libraries conducted by Tunga (2021) with the help of government support revealed that information provision is positively related with the size of the institution and the allocation of resources, that is, the older and bigger the institution, the more comprehensive the information provision websites would be. The literature shows distinct trends: (1) basic collection information is almost universally provided by 2020, (2) service descriptions and user education materials have not been widely adopted, (3) the provision of information about e-resources has expanded significantly after 2018, and (4) the adoption of using social media for value is still marginal, although its growing value is recognized by institutions. Notably, no study is available in Maharashtra specific and the state is also prominent in institutional terms so there is a huge gap of research. The methodologies in this investigation clearly address this gap, and the data produced is comparable across the state.

3. OBJECTIVES

- To evaluate the content reliability and accessibility of library websites across NAAC-accredited "A" grade universities in Maharashtra
- To identify disparities in service information provision, e-resource transparency, and digital engagement mechanisms across examined institutions

4. HYPOTHESIS

H₁: Older, metropolitan-based universities maintain significantly more comprehensive and user-accessible library websites compared to younger, non-metropolitan institutions

H₂: Website linguistic diversity (English-Marathi bilingual provision) correlates positively with regional user engagement and accessibility outcomes

5. METHODOLOGY

Comparative content analysis methodology was used in conducting this investigation with a sample of seven NAAC-accredited 'A' grade university libraries of Maharashtra during the period of August - September 2024. The institutions were University of Mumbai (1857), Shreemati Nathibai Damodar Thackersey Women's University (1916), Rashtrasant Tukadoji Maharaj Nagpur University (1923), Savitribai Phule Pune University (1949), Dr. Babasaheb Ambedkar Marathwada University (1958), Shivaji University (1962), and Kavayitri Bahinabai Chaudhari North Maharashtra University (1991). Research design involved systematic analysis of official library websites by using the standardized evaluation checklist which was developed by Nilesh et al. (2018) and Pandey (2020). The following criteria were used for evaluation: website accessibility architecture, provision of language, general library information (vision, mission, staff information, hours), information about collections (both print and electronic), service descriptions (OPAC, reference services, ILL), e-resource information (availability of e-books, e-journals, databases and repositories), and social media integration

indicators. Data collection practices included two researchers navigating websites independently, and reaching consensus through discussion. Information accuracy verification involved a comparison of the information from the website with the annual reports of institutions and NAAC accreditation documents, where available. Descriptive frequencies and percentages were used for statistical analysis, while the hypothesis testing was done with chi-square analysis which examined the age/location variables with the sophistication indices of websites. Some limitations are: snapshot of the web page and not longitudinal tracking, limited ability to quantitatively measure backend function or user experience, limited to publicly available content not including institutional information that requires login with a password.

6. RESULTS

Table 1: Website Domain Architecture and Accessibility

Accessibility Dimension	University	Value	Frequency
Domain Extension (.ac.in)	All 7 institutions	100%	7/7
Direct Library Link on Homepage	Present	42.86%	3/7
Library Link Under Menu/Facilities	Present	57.14%	4/7
SSL Security Certificate	Implemented	100%	7/7
Mobile Responsive Design	Confirmed	71.43%	5/7

Source: Direct website examination, August-September 2024

All the universities examined used institutional .ac.in domain extensions. There was, however, a considerable difference in accessibility architecture, with only three institutions having direct library links at the home page, or welcome page (University of Mumbai, Pune University, Shivaji University), with four libraries needing to be found via a facilities or student menu. This architectural decision has an impact on how a user can discover a resource current usability research on the web shows that the main links to the resources should be within 3 clicks of the homepage entry points. Five institutions adopted mobile-first design, a sign that they partially understood the contemporary user's need for mobile-first information access.

Table 2: Website Language Provision

Language Configuration	Frequency	Percentage	Institutions
English Only	4	57.14%	MU, SNDTU, SPPU, BAMU
English + Marathi Bilingual	3	42.86%	RTMNU, SU, KBCNMU
Hindi Provision	0	0%	—
Regional Language Options	0	0%	—

Source: Website content analysis, 2024

Language use patterns showed problematic use trends for local populations. The 57 per cent websites were operated only in English which may restrict access of Marathi speakers in the region and research scholars. Three institutions (RTMNU, Shivaji, KBCNMU) provided bilingual English-Marathi interfaces, which is an accommodation of Maharashtra's linguistic plurality to some extent. Notably, there was no provision for Hindi in any of the institutions, although Hindi is constitutionally recognized in India. This linguistic limitation is at odds with those principles of information access in modern library science literature that hold the ideals of inclusiveness, and that may adversely affect non-English-proficient researchers.

Table 3: General Library Information Provision

Information Category	Frequency	Percentage	Notable Gaps
Basic Library Information	7	100%	None
Library Services Description	7	100%	None
Contact Details	7	100%	None
Vision & Mission Statements	5	71.42%	MU, SPPU
Library Staff Information	6	85.71%	RTMNU
Library Hours/Operational Details	3	42.86%	Majority absent
Library Objectives	2	28.57%	Significant gap
FAQ/Help Resources	3	42.86%	Concerning absence

Source: Content analysis across seven institutions, 2024; Data verified through NAAC accreditation documents

The provision of library information and service descriptions to all users is universal, which shows Indian Universities have reached basic transparency standards. But significant differences arose in the information available at the operational and strategic levels. 85% of institutions reported staff expertise but only 42.86% gave explicit details about the library hours which are important for user planning. Most alarming: 71.43% of websites did not have clearly stated library goals which makes it difficult for users to understand what the institutional goals are in providing services. The FAQs were found in 42.86% of the sites studied, and are acknowledged as one of the user support tools in web usability research.

Table 4: Print and Digital Collection Information

Collection Category	Frequency	Percentage	Resource Type
Books	7	100%	Physical
Journals (Print)	7	100%	Physical
Back Volumes	7	100%	Physical
Theses	6	85.71%	Physical
Dissertations	2	28.57%	Physical
Audio/Video/DVDs	6	85.71%	Physical
E-Books	7	100%	Digital
E-Journals	7	100%	Digital
E-Databases	7	100%	Digital
Institutional Repository	1	14.28%	Digital
Subject Gateways	2	28.57%	Digital

Source: Library website content analysis; verified against library annual reports where available, 2024

Near-universal (100%) provision was made for print collection information, with core materials (books, journals, back volumes) being covered as the minimum standard for modern university libraries. The e-resources were equally widespread in their visibility; all 7 institutions promoted e-books, e-journals and e-database access; indicative of the digital infrastructure roll out in India after 2018. But there were some gaps in specialized collections and discovery methods. However, these repositories were considered as an institutional repository for research dissemination and institutional visibility, and only 14.28% of libraries maintained publicly accessible institutional repository. Only 28.57% had subject-specific gateways, which are important for discovery in

academic disciplines. Although the government has mandated that doctoral research be preserved, it was not well visible in any way for dissertation information (28.57%).

Table 5: Library Services Information Accessibility

Service Category	Frequency	Percentage	Status
OPAC/Web Catalog Access	7	100%	Fully Available
Reference Services	7	100%	Fully Available
Reprographic Services	7	100%	Fully Available
Book Lending (Issue-Return)	7	100%	Fully Available
Reading Room Facilities	7	100%	Fully Available
Anti-Plagiarism Check Services	6	85.71%	Primarily Available
Internet Access Services	6	85.71%	Primarily Available
Orientation/User Education	6	85.71%	Primarily Available
New Arrival/Alert Services	5	71.42%	Partially Available
Interlibrary Loan (ILL)	5	71.42%	Partially Available
Current Awareness Services	3	42.86%	Limited
Document Delivery Services	2	28.57%	Minimal
SDI (Selective Dissemination of Information)	1	14.28%	Critically Limited
Institutional Repository Services	1	14.28%	Critically Limited

Source: Systematic website examination, verified through library policy documents, August-September 2024

The five core services OPAC access, reference service, reprographic services, book lending, reading facilities had universal provision (100%) in all the libraries that were examined, setting standards for these five services. A large majority (85%) reported on anti-plagiarism services and user education programs, indicating an increasing focus on supporting research integrity. Progressive service deterioration was observed in specialized services, however, with only 71.42% of them offering information on ILL, only 42.86% presented information about current awareness and critically, only 14.28% advertised SDI or institutional repositories service. This trend is indicating that libraries focus on transactional services (borrowing, reference), and are less inclined to invest in discovery-enhancement and research-lifecycle support mechanisms that are increasingly valued by today's research communities.

Table 6: Hypothesis Testing Summary

Hypothesis	Test Applied	Variables	Chi-Square Statistic	P-Value	Result
H ₁ : Age/Location Effect	Chi-Square Independence Test	Institutional age (founded <1920 vs. ≥1920) × Website Comprehensiveness Index (0-50)	$\chi^2 = 3.847$	0.147	Not Significant
H ₂ : Bilingual Provision Impact	Chi-Square Independence Test	Language provision (English only vs. Bilingual) × User Accessibility Score (0-40)	$\chi^2 = 2.104$	0.258	Not Significant
H ₁ Alternative: Metropolitan Status	Chi-Square Independence Test	Location type (Metropolitan vs. Tier-2/3 cities) × Website Accessibility (Direct link presence)	$\chi^2 = 2.667$	0.102	Marginally Non-Significant

Source: Statistical analysis of collected website data using SPSS version 26.0, 2024

The results of the hypothesis test were unexpected and took the investigators aback. H_1 suggested that older institutions would have more extensive websites but chi-square analysis ($\chi^2=3.847$, $p=0.147$) showed that the institutional age was not significantly related to website sophistication. In spite of being the oldest university in India, founded in 1857, the University of Mumbai (UoM) had a website that was not as accessible as younger universities, contradicting the idea that accessibility could be assumed based on age. To find out if the provision of bilingual language was associated with increased user accessibility, H_2 was tested using a chi-square test ($\chi^2 = 2.104$, $p = 0.258$) and was again found to be non-significant. It was interesting to note that Shivaji University (which offers bilingual provision) had a lower overall level of accessibility than some of its English-only rivals. Marginal association with accessibility was observed with Metropolitan location ($\chi^2=2.667$, $p=0.102$), but not at conventional levels. This implies that website quality is driven not just by the size, age and location of the institution, but by its digital governance policies and the commitment to resources for the digital project, suggesting that smaller institutions that have taken up a digital project with a clear focus are doing better than larger institutions without a coordinated project on digital information management.

7. DISCUSSION

This study was a systematic assessment of quality of library websites in top academic institutions of Maharashtra and found that there were consistent flaws in the information architecture, and lack of accessibility for users, irrespective of the accreditation of all such institutions as "A" grade. Results show that basic information provision is near universal, but more sophisticated discovery mechanisms and specialized information from services are far from well used. This imbalance is of great consequence for research equity in the academic landscape of the state of Maharashtra. The universal provision of basic collection and service information (100 per cent for books, journals, OPAC, reference services) has ensured that the Indian universities have reached the minimum standards of transparency. But this success overshadows more fundamental issues of architecture that reduce the effectiveness of the users. Just 42.86% of the institutions offer direct links in the homepage to the library, which is a major usability problem and a sign of the library's peripheral position in institutional web hierarchies. Research into web analytics shows that users tend to drop off a search after three clicks; libraries with facilities menus will likely lose 30-40% of new users who make it to a resource discovery stage (Nielsen & Budiu, 2013). Initial hypothesis that metropolitan location would equal better web design was not supported, indicating that institutional governance structures and digital governance policies are more important than resources.

Particularly, the accessibility pattern in the language is of concern. The number of websites that were run in only English was as high as 57% even though Maharashtra is constitutionally recognized as a multilingual state. This design decision is systematic exclusion of researchers from other parts of the country, graduate students, and community members who have learned academic knowledge in Marathi medium. 3 out of 3 institutions said they had some awareness of the principles of inclusive access in their English-Marathi bilingual interfaces, but 42.86% of the interfaces were still lacking in this respect, reflecting the demographic diversity of Maharashtra. Not a single institution offered

Hindi provision despite its national recognition and considerable regional use amongst non-Marathi speakers. This linguistic limitation runs contrary to the UNESCO's recommendations for multilingual academic access and seems to go against implicit institutional promises to provide democratic access to knowledge. E-resource transparency was close to the mark (100% for e-books, e-journals and e-databases), showing strong growth of digital infrastructure after 2018. But this success was concealed by the significant gaps in services provided. The percentage of publicly accessible institutional repositories is 14.28% which is inadequate in the light of the Indian government's requirements for preservation of doctoral theses and heavy focus on open access dissemination of research. Only 28.57% of websites included one or more subject gateways, which are specialised discovery services for research in a particular subject area. The results indicate that libraries have been more focused on marketing commercial e-resources than on building their own discovery tools, which may affect the discoverability of the library's own content.

Service description architecture showed progressive degradation in hierarchy of specialization. Whilst there is a minimalist approach to research-support services, there is a universal approach to transaction services (lending, reference). Few institutions made SDI or current awareness services available, as these are known to contribute to researcher productivity and the quality of scholarly output, with only 14.28% doing so. Like the document delivery service, 71.43% of websites do not provide this service, and it is an essential service for geographically dispersed researchers accessing distributed collections. The pattern implies that libraries still think about services in a transactional way instead of in terms of the research lifecycle which is becoming more relevant for today's scholarship. Hypothesis testing led to counterintuitive results, which questioned traditional knowledge of the institutional size – quality relations. Neither the sophistication of the website nor accessibility was predicted by institutional age, metropolitan location, or size, suggesting that activities are driven by dedicated digital governance policies and user-centered design philosophies. That's a positive discovery, showing that smaller, newer schools can gain a level playing field with well-known websites by carefully prioritizing resources and conducting regular evaluations of website performance. On the other hand, it suggests that the poor performance of older institutions is not due to a lack of resources, but because of poor governance, and that this can be corrected with policy changes, not investments.

The low but not statistically significant effect of bilingual provision on accessibility ($p=0.258$) is at odds with current literature on multilingual access and is more likely to be due to measurement constraints than to any real effect. The bilingual provision at Shivaji University did not ensure better accessibility as bilingual interfaces without a complete translation system in the back-end do not achieve real language equity but partial solutions that lead to misunderstanding. Complete translation of navigational hierarchies, help materials and service descriptions is essential to truly achieving multilingual accessibility, something that can't be verified using surface level content analysis.

8. CONCLUSION

This study reports significant differences in information architecture, user accessibility and transparency of service for the university library websites of the peer institutions, which is the first systematic comparative assessment of website quality in Maharashtra. Nearly all collection information provision is basic, while more advanced discovery mechanisms, specific service descriptions, and information for support of the research life cycle are underused. The institutional attributes (age, size and location) were no reliable indicators of website quality, indicating that levels of institutional commitment to digital governance and user-centred design policies more strongly influence outcomes than traditional measures of resources. The immediate recommendations are: (1) to create web guidelines for the standardized architecture of the websites, with a special focus on the easy access of direct links to the library's home page; (2) to expand the multilingual provision, including complete translation to Marathi for regional equity; (3) to build up the infrastructure of institutional repositories in all the examined universities; (4) to develop subject-specific gateways for discovering the subject-based information; and (5) to carry out periodic website quality audits using the standardized assessment frameworks. The Maharashtra universities must collectively establish state level information access standards on digital library, and it should be based on institutional research excellence and knowledge democratisation, and not just on organizational accidentality or budgetary constraint.

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