

Preservation and Revitalisation of Indian Languages through Digital Archiving: A Systematic Review of Bharatvani

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ABSTRACT

Languages play a crucial role in shaping cultural identity, transmitting knowledge, and fostering social cohesion, however many languages around the world face extinction due to various factors such as globalisation and urbanisation. India is not an exception when it comes to language obsolescence. The present paper brings attention to the status of Indian languages and critically analyses India's largest language platform Bharatvani, as an important tool for preserving and reviving Indian languages and mother tongues. This systemic review examines Bharatvani's technological infrastructure, user interface, educational resources, and user testimonials. It utilises a qualitative research methodology and analyses secondary data from academic sources and user testimonials to provide insights into Bharatvani's efficacy and limitations. The study's findings, based on a feedback from 261 reviewers, reveal key insights into the app's functionality and user experience. Additionally, the findings also highlight obstacles in digital archiving, addressing both social and technological challenges such as accessibility issues, browsing difficulties for indigenous communities, and limited community awareness and engagement. The study thus concludes that Bharatvani is an effective tool for linguistic preservation with potential scalability. Recommendations for policy and practice include enhancing community engagement and ensuring technological accessibility and digital equity to optimize the platform's effectiveness.

Keywords: Digital archiving; Documentation; Bharatvani; Multimedia tools; Language preservation

1. INTRODUCTION

When it comes to language and culture, few nations of the world are as diverse as India. India's linguistic landscape is incredibly rich and diverse, shaped by centuries of interactions between different linguistic communities. This rich tapestry of languages has led to both collaboration and conflict, with challenges like linguistic identity disputes and the need for protective policies. The preservation of linguistic diversity is crucial amid rising concerns about language obsolescence. The study conducted by United Nations Educational Scientific and Cultural Organisation (UNESCO) in 2009 underscores the critical status of the Indian languages that are endangered or at risk of disappearing. In UNESCO's constantly evolving Atlas of the World's Languages in Danger (online), India leads the world with 197 entries¹. The concerning aspect is that these endangered languages include scheduled, non-scheduled, and even official languages of some states. Although there has been commendable progress in documenting and safeguarding Indian languages, there remains a pressing need to delve deeper into the root causes of linguistic endangerment and to design effective solutions. As Suzanne Romaine aptly suggests, "We should think about languages in the same way as we do other

natural resources that need careful planning: they are vital parts of complex ecologies that must be supported if global biodiversity is to be sustained"². Suzanne's statement underscores the need for comprehensive strategies to preserve and promote linguistic diversity. This issue must be dealt with at national as well as social level, where both the government and the communities must participate in the preservation of linguistic diversity. The central concern of this study is thus to contribute to the language preservation debate by examining factors and outcomes of declining linguistic diversity. Additionally, it critically reviews the Bharatvani project, which is dedicated to preserving Indian languages and mother tongues, analysing its technological infrastructure, user interface, educational resources, and user feedback.

2. THE STATUS OF INDIAN LANGUAGES

India's linguistic landscape mirrors its cultural diversity, with each region -from Jammu & Kashmir to Kanyakumari-showcasing distinct traditions, languages, and mother tongues, reflecting the nation's vibrant heritage. India's linguistic diversity is immense, with over 1950 languages or dialects spoken as mother tongues. According to the 2011 census data, there are 22 scheduled languages, and 99 non-scheduled languages³. However, figures from various sources may differ, largely due to

varying definitions of ‘language’ and ‘dialect’. In recent decades, a growing body of literature, scholarly articles, and media reports has forewarned of the alarming decline in the number of languages⁴⁻⁶. Some linguists think that as many as 40 to 50 % of India’s languages may face a potential risk of extinction within the next 100 years⁷⁻⁸. David Crystal suggests that, on average, one language in the world may disappear every two weeks over the next century⁹. In view of widespread language endangerment crisis, Krauss surveyed the global situation and estimated that approximately 10 % of languages have a likelihood of persisting into the distant future, while up to 50 % are already on a path toward becoming obsolete¹⁰. The remainders face the threat of becoming moribund by the century’s end. If these speculations prove accurate, only a scant few among the remaining languages will secure a stable future.

In Atlas of the World’s Languages in Danger (UNESCO), India leads the list of countries with 197 endangered languages classified as ‘extinct’, ‘unsafe’, ‘definitely endangered’, ‘severely endangered’ and ‘critically endangered’ (Table 1). Surprisingly, two languages included in the Eighth Schedule that receive Government protection Manipuri and Bodo are endangered in terms of being ‘unsafe’. Even though the endangered languages are found throughout the Indian subcontinent, a significant concentration exists in the North-East region and the tribal belts of Orissa, Jharkhand, West Bengal, Himachal Pradesh, Uttarakhand, and Jammu and Kashmir. The Table 1 below provides a detailed overview of the distribution of endangered languages in India based on the number of speakers. Blackburn and Opgenort emphasise in their study on languages in India and the Himalayan region that due to sparse data on vitality and speaker populations of smaller languages, classifying endangered languages should be regarded as tentative¹¹. Furthermore, a few languages classified as vulnerable might be described as “stable but potentially endangered”¹². Blackburn’s and Opgenort’s predictions give cause for concern as even the stable and healthy languages with a comparatively large

number of speakers like Bodo, Khasi, Tamang and Ho are at the risk of becoming endangered. Noted linguistic and cultural activist, Ganesh N. Devy also expresses his concern over language attrition and affirms that Indian languages are losing linguistic prowess: “India may have lost 220 languages since 1961. There were 1,100 languages since 1961, based on the Census number of 1,652 mother tongues. Another 150 languages could vanish in the next 50 years”¹³. Devy initiated a groundbreaking study of tribal communities and headed the research of Indian languages through the People’s Linguistic Survey of India in 2010. This report highlighted India’s remarkable linguistic diversity, with approximately 780 languages spoken and written using 86 different scripts. However, this linguistic richness is at risk, as the report notes that India has lost approximately 250 languages over the past six decades. This scenario emphasises the urgency to conserve and revitalise India’s linguistic heritage.

However, it is important to note that language loss is by no means inevitable or natural. A number of factors contribute to language loss and obsolescence¹⁴. Factors such as the legacy of colonisation, urbanisation, displacement, pressure from dominant languages, lack of institutional as well as community support, and disenfranchising policies related to indigenous languages and mother tongues are at the heart of language decline.

When languages fade away, the rich tapestry of diverse cultures, traditions, unique knowledge, perspectives, and expressions are also lost¹⁵⁻¹⁶. Language serves as a crucial vessel for preserving a community’s history, culture, and identity, as it embodies cultural wisdom and political significance¹⁷. When a language dies, it’s not just vocabulary or speech forms that disappear, it also signifies the disappearance of a unique worldview. Study findings by Fishman; Nettle & Romaine and Dalby¹⁸⁻²⁰ affirm that when a language fades away, a distinctive way of looking at the world also disappears. Indeed, beyond being a crucial aspect of cultural and individual identity, language is an invaluable source of information about human cognition for the global community.

Table 1. Endangered languages of india according to the number of speakers

Degree of vitality	Data not available	Zero to 5,000 speakers	5,000 to 10,000 speakers	10,000 to 20,000 speakers	20,000 To 50,000 speakers	50,000 to 100,000 speakers	Above 100,000 speakers	Total
Extinct	5	-	-	-	-	-	-	5
Critically Endangered	9	25	1	3	2	1	-	41
Severely Endangered	-	6	-	-	-	-	-	6
Definitely Endangered	4	18	8	6	6	4	15	61
Unsafe/ Vulnerable	3	4	5	3	22	12	35	84
Total	20	55	14	12	30	17	51	197

(Source: Constructed from data in Atlas of the world’s languages in danger (2010), UNESCO)

3. RECENT TRENDS AND FRAMEWORKS IN LANGUAGE PRESERVATION

Given the rapid disappearance of languages worldwide, it's imperative to recognise that each vanishing language signifies a profound loss of invaluable knowledge about human cognition and culture. Indeed, language preservation is a critical aspect of cultural heritage conservation, ensuring that diverse linguistic traditions are maintained and passed down to future generations. Peter K. Austin affirms that more than ever before, presently, there is a surge in concerted and cooperative initiatives aimed at reversing the trend of language loss²¹. These initiatives encompass a range of approaches including documentation, translation, digital technologies, community-centered immersion programs, and language nests.

In today's advanced tech era, data is crucial. AI and IT transform data usage, enabling communities to document and share languages, fostering learning and revitalisation efforts profoundly²²⁻²³. Indeed, technology can help endangered languages continued existence, offering many applications to extend the traditional methods of language preservation²⁴. Digital archiving, for instance, has emerged as a potent tool in promoting endangered languages. It offers a robust platform for languages, potentially motivating individuals to use minor languages more frequently.

3.1 Digital Archiving

Digital archiving employs digital tools to store, manage, and disseminate information, preserving digital content for future use. Initiatives like digital libraries, oral history repositories, and language documentation projects, ensure the preservation and continuity of languages for future generations. A.L. Berez²⁵ and Meighan²⁶ have underscored the impact of digital transformation on archival theory and practice, emphasising the shift from traditional paper-based archives to digital repositories. Babinski²⁷ et al. identifies these cutting-edge archives as tools that support the digitisation and meticulous documentation of historical texts, fostering intentional learning and promoting cultural understanding. These Digital Archival Collections (DACS) are licensed, digital corpora, typically consisting of text, image and audio-visual content²⁸.

These digital archives include collecting and documenting audio-visual materials, transcriptions, translations, linguistic annotation, thereby preserving linguistic and cultural heritage for future generations²⁹⁻³⁰. Candace K. Galla highlights the acknowledged benefits of digital archives, particularly their pivotal role in facilitating access to and preserving indigenous knowledge and languages³¹. The platforms like The Endangered Languages Archive (2002), Living Tongues (2005), CoEDL (2014), SIDHELA (2016), and Bharatvani (2016) amongst others have a proven track record in the documentation of linguistic heritage. These platforms provide a centralised and accessible repository for some of the indigenous and endangered languages, making it easier for linguists, researchers, and communities to access and share resources. By providing a space for

dialogue and collaboration among stakeholders, digital platforms become catalysts for teaching and revitalising endangered and indigenous languages³².

4. LITERATURE REVIEW OF BHARATVANI

Recognising the critical importance of preserving linguistic diversity and addressing the decline in regional languages in India, the government has launched various initiatives to protect these languages. Among them, Bharatvani stands as an interactive, user-friendly multimedia tool offering easy access to numerous Indian languages. This multilingual web content is designed for easy access to applications and materials; ensuring information is preserved for future access, rediscovery, and presentation at any time³³. This digital archive is an initiative of the Ministry of Education, (India) to create a comprehensive online portal for multilingual education. It was launched by the Indian Government in 2016 on International Mother Language Day, 21st February by Government. It aims to provide various language resources, including audio-video recordings, dictionaries, glossaries, grammar books and language learning materials in multiple Indian languages. Irina Bokova, the former Director-General of UNESCO, commended this initiative, "I commend #India for the launch of the #Bharatvani portal to support the richness of linguistic diversity"³⁴.

This multilingual app, executed by The Central Institute of Indian Languages (CIIL), Mysuru, Karnataka, offers open knowledge under fair usage clauses of The Copyright Amendment Act, 2012 for educational purposes. It serves as a valuable resource, providing people worldwide with access to numerous monolingual and multilingual dictionaries, as well as other language resources in 118 Indian languages. The portal is designed to be comprehensive, engaging, and continuously updated with moderation ensuring quality and relevance. The Project is guided by a National Advisory Committee and a Technology Advisory Committee, besides Language Editorial Committees in each of the languages. Customised to meet the needs of a diverse range of language speakers, this interactive platform provides engaging lessons, vocabulary exercises, grammar resources, and pronunciation guides. This digital repository fosters intergenerational and intercultural communication, and promotes its use and relevance across different domains, including education, administration, research, cultural preservation, and language revitalisation.

5. RESEARCH METHODOLOGY

The study employs a systematic literature review approach to analyse qualitative data from Bharatvani user testimonials to provide a detailed overview of the app's perception and usage. It synthesises these findings, identifying gaps, and highlighting areas for further exploration. The review aims to offer valuable insights and guide future qualitative research, ultimately enhancing understanding and informing the app's development based on identified needs and opportunities.

5.1 Significance of Bharatavani

Bharatvani, recognised as the world's largest language corpus, has been instrumental in promoting the preservation and revitalisation of Indian languages. By prominently featuring scheduled, non-scheduled, and tribal languages and mother tongues, in the digital sphere, Bharatvani encourages the younger generation to actively use their languages in blogging, social media, education, and learning activities. This Multilingual Knowledge Portal (www.bharatavani.in and Bharatavani Android App) has accomplished the task of hosting more than 5500 resources in around 118 Indian languages including 22 officially recognised languages and 96 other Indian languages and mother tongues³⁵. The exact number of languages included in Bharatvani may vary over time as it is constantly incorporating materials, but it is intended to cover a wide range of books and materials in approximately 121 Indian languages. This app is currently supported by approximately 200+ multilingual dictionaries; however plans are underway to expand this number to 250 in the upcoming years³⁶. Bharatvani aims to lead a 'Digital Revolution' ('Digital Kranti') in alignment with the Government's ongoing Digital India mission. Through this portal and its mobile app, people from across the world can access knowledge on over 100 languages from a single platform. The portal's provision of multilingual content has a long lasting impact, which can be measured by increased language use in education, improved community engagement, and growth in digital content creation.

6. ANALYSIS AND SUMMARY OF TESTIMONIALS OF BHARATVANI USERS

The study has analysed the testimonials from Bharatavani users using a dataset collected on July 10, 2024, at 4:45 PM (IST)³⁷. The analysis of testimonials reveals key insights into the app's functionality and user experience. The review, which includes feedback from 722 users, provides valuable perspectives on the app's functionality and user experience. Of the 722 reviewers who provided feedback, only 261 customers rated the Bharatavani app on a one-to-five star scale for its content and accessibility (See Fig. 1). A key aspect of the review is the average user rating of 3.8 out of 5, derived from over 50,000 downloads. This suggests a positive reception, with strengths in content relevance and areas for improvement in browsing speed and offline accessibility. However, the absence of metrics on user accessibility and resource access neither on the app nor the website poses a notable limitation in fully assessing its usability. The analysis of Bharatavani highlights positive keywords such as 'richness of linguistic resources,' 'good content,' and 'easy navigation.' These terms underscore user satisfaction with the app's content relevance. The significant percentage of 5-star ratings (29.89 %) reflects widespread acclaim for these features, affirming Bharatavani's effectiveness in meeting user expectations and enhancing linguistic contents. Despite positive feedback, challenges emerge with Bharatavani. About 17.62 % of users rate it 4 stars due to 'slow browsing' and restrictions on 'content downloads',

impacting offline access in low-connectivity areas. Another 16.86 % rate it 3 stars, pointing to 'cumbersome features' and 'slow performance'. Enhancing performance, resolving download restrictions, and improving browsing speed are essential for boosting user satisfaction and app usability. Additionally, 15.71 % of customers give the app a 2-star rating, citing usability concerns like 'slow functioning' and difficulties with the 'dictionary search function'. A significant 19.92 % of users rate the app 1 star, expressing frustration with exclusive 'online access', an 'inefficient user interface', and excessive multimedia content that hampers usability on slower devices. Enhancing usability, introducing offline capabilities, and refining how content, especially photographs and tables, are presented are crucial steps toward improving user satisfaction and overall app performance.

The bar graph in Fig. 1 highlights reviewers' positive feedback on Bharatavani's rich content (29.89 %). However, concerns over download restrictions (17.62 %) and dissatisfaction with online-only access and cumbersome features (19.92 %) are notable. Suggestions for improvement include enhancing performance (16.86 %) and usability (15.71 %), indicating areas where the app could be refined to meet user expectations more effectively.

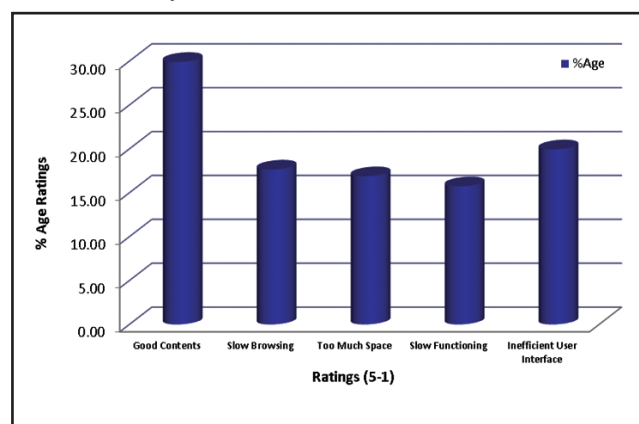


Figure 1. Illustration of reviewers' testimonials.

To effectively address these challenges, Bharatavani should prioritise enhancing offline functionality, optimising browsing speeds, and refining user interfaces for efficient access to its linguistic resources. Improving user feedback mechanisms and transparency in performance metrics would support ongoing enhancements that meet user expectations. Overall, while Bharatavani receives positive feedback for its comprehensive content and interface; there is considerable opportunity to enhance accessibility, performance, and user-centric design. These improvements are crucial for better catering to its diverse user base across different connectivity and device scenarios.

7. COMPARATIVE ANALYSIS OF GLOBAL AND REGIONAL DIGITAL ARCHIVING INITIATIVES FOR LANGUAGE PRESERVATION

Bharatvani, India's initiative for language diversity and digital archiving, contrasts and aligns with several regional and global digital archiving initiatives such as ELAR, Living tongues, DAILP, Missing scripts, CoEDL, SiDHELA, and the Endangered languages

Project in distinct ways, each offering unique features and best practices. While initiatives like, Endangered Languages Archive, Endangered Languages Project, and CoEDL focus on global endangered languages, offering extensive repositories of audiovisual and textual documentation, emphasising rigorous linguistic and anthropological research, Bharatvani uniquely prioritises India's vast linguistic diversity. In a similar vein, Living Tongues provides a free, mobile-friendly platform supporting over 400 under-represented languages worldwide, including many endangered languages of India. With 209,000+ dictionary entries and 963 citizen-linguists globally, it uses digital tools and community engagement for revitalising endangered languages for future generations.

Similarly, The Missing Scripts program endeavors to safeguard the diversity of global languages by preserving indigenous scripts and ensuring their digital presence, employing interdisciplinary approaches such as computational linguistics and historical linguistics. It aims to unlock cultural and historical insights through script decipherment, fostering global collaboration among researchers and scholars. DAILP, which stands for Digital Archive of Indigenous Language Persistence, is a global initiative created to support indigenous communities worldwide in preserving their languages and cultural heritage.

On a regional scale, SiDHELA, Sikkim-Darjeeling Himalayas Endangered Language Archive (SiDHELA) serves as a repository for primary linguistic data of five languages from Sikkim and North Bengal. In contrast to global initiatives, Digital Himalayas centers specifically on the Himalayan region, documenting languages, cultures, and traditions across Nepal, Bhutan, and the Indian Himalayan states. It utilises multimedia approaches to capture oral histories, folklore, and linguistic data, supporting local communities in preserving their cultural heritage and linguistic identities.

Overall, while Bharatvani focuses on India's linguistic diversity and digital accessibility, initiatives like ELAR, CoEDL, Missing Scripts, and the Endangered Languages Project contribute valuable best practices in documentation, preservation, community engagement, and interdisciplinary research on a global scale. Bharatvani distinguishes itself through its focus on India's rich linguistic tapestry, aiming to document and preserve not just mainstream languages and dialects, but also lesser-known tribal and regional languages spoken throughout the country. Unlike many initiatives that specialise in indigenous languages of specific regions, Bharatvani fosters inclusive digital literacy and cultural preservation tailored to India's diverse linguistic and cultural heritage.

8. IMPEDIMENTS TO DIGITAL ARCHIVING

Despite its value in preserving and accessing information, digital archiving poses several challenges:

8.1 Digital Obsolescence

Formats and storage technologies can become obsolete, making it difficult to access older digital materials.

Constant upgrading of formats is required to ensure continued accessibility.

8.2 Data Integrity

Ensuring that archived digital materials remain unchanged and uncorrupted over time is crucial. This requires robust data verification and validation mechanisms.

8.3 Scale and Volume

The sheer volume of digital data being generated can overwhelm archiving systems. Managing and processing large volumes of data is a significant challenge in digital archiving.

8.4 Metadata and Indexing

Accurate categorisation, description, and indexing of digital materials are crucial for efficient retrieval and utilisation.

8.5 Access and Usability

Providing easy access to archived materials while ensuring security is a delicate balance. Cushing & Osti³⁸ affirms that addressing challenges in usability, accessibility, and ethics is crucial for maximising the potential of digital archives in language preservation.

8.6 Adaptability

Creating adaptable digital preservation strategies is vital for ensuring the enduring relevance of archived materials. Burke & Zavalina³⁹ highlight the challenges and complexities of organising and retrieving archived data, emphasising the need for effective organisational strategies.

8.7 Privacy and Ethical Considerations

Digital archives may contain sensitive cultural or personal information. Ethical guidelines must be established to ensure privacy, accuracy, and informed consent for archival use as well as to safeguard against misappropriation or misrepresentation of sacred or sensitive materials.

8.8 Low Community Engagement

Low community engagement poses obstacles to digital archiving and documentation process, hindering transmission of intergenerational knowledge.

8.9 Digital Divide

Limited access to technology and internet obstructs efforts to digitally document, archive, and transmit endangered languages, hindering accessibility for remote communities. Digital archiving is vital for preserving endangered languages, but the digital divide hinders these efforts.

Indeed, the success of digital archives hinges on community awareness, outreach to remote areas, community

engagement, and ethical treatment of languages, knowledge and cultural materials.

9. STRATEGIES TO OVERCOME SOCIAL AND TECHNOLOGICAL BARRIERS TO DIGITAL ARCHIVING

9.1 Community Engagement

Organise workshops on the cultural significance of archiving, collaborate with local leaders for support, and implement accessible technology. Build connections through regular, diverse communication channels like social media, newspapers, and meetings.

9.2 Capacity Building

Provide training and resources to community members and archivists on digital preservation techniques, including digitisation, metadata creation, and long-term storage strategies.

9.3 Accessibility and Inclusivity

Ensure that digital archives are accessible to diverse audiences, including those with varying levels of technological proficiency and disabilities. Offering training can enhance digital equity for individuals with limited knowledge of technology.

9.4 Collaboration and Partnerships

Forge collaborations with local organisations, libraries, museums, educational institutions, and technological companies to leverage expertise, resources, and funding for digital archiving projects.

9.5 Data Security and Preservation

Implement robust data security measures to protect archived materials from loss, corruption, or unauthorised access. Develop strategies for long-term digital preservation to ensure the integrity of archived content over time.

9.6 Public Awareness and Advocacy:

Promote awareness through diverse channels to enhance participation and support for archival initiatives. Raise public awareness about the value of digital archiving through outreach campaigns, exhibitions, and educational programs.

9.7 Continuous Evaluation and Improvement

Regularly evaluate the effectiveness of digital archiving practices and technologies, incorporating feedback from users and stakeholders to refine processes and enhance accessibility.

By employing these strategies, awareness about platforms like The Endangered Languages Archive, Living Tongues, Bharatvani, SiDHELA and many others like that can be effectively spread among communities, encouraging them not only to actively participate in language preservation efforts but also to make the most of the resources available.

10. CONCLUSION

The study highlights that preserving India's linguistic heritage is crucial for maintaining the country's cultural, social, and educational well-being. Analysis of user testimonials reveals the factors that motivate engagement with the Bharatvani app, as well as the social and technical barriers that hinder access. Although the app receives favorable feedback for its content and interface, significant improvements are needed in accessibility, performance, and user-centric design. Although technology provides immense potential for the protection of language and culture, it is important to emphasise that community engagement remains essential for the preservation and revitalisation of languages. Governments, NGOs, and communities can collaborate to address the challenges of language preservation. This effort requires active involvement from various stakeholders, including community elders, educators, policymakers, and cultural leaders to effectively support linguistic initiatives. Such efforts should not be limited to the academic realm of a few individuals; instead, it should involve collaborative efforts that enhance the importance of indigenous languages, motivating younger generations to embrace and safeguard it.

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