Preservation of Indian Languages Through Digital Tools and Resources: With Reference to Bharatvani Platform

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Abstract

Languages are essential for establishing social cohesiveness, transferring information, and defining cultural identity. Despite this, urbanization and globalization are threatening to wipe out a number of languages worldwide. When it comes to linguistic obsolescence, India is hardly an exception. This study discusses the state of Indian languages and examines Bharatvani, the largest language platform in the country, as an essential tool for preserving and restoring Indian mother tongues and languages. This systematic evaluation examines Bharatvani's technical infrastructure, user interface, instructional materials, and user reviews. Utilizing a qualitative research approach, secondary data from scholarly sources and user reviews are examined in order to shed light on Bharatvani's strengths and weaknesses. The study's conclusions, which are based on input from 261 reviewers, provide important new information on the usability and functionality of the app. The results also point to social and technical barriers to digital archiving, including low community knowledge and involvement, browsing problems for indigenous populations, and accessibility concerns. Accordingly, the research comes to the conclusion that Bharatvani is a useful instrument for preserving language that may be expanded. Policy and practice recommendations include ensuring technical accessibility and digital fairness, enhancing community involvement, and maximizing the platform's efficacy.

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

INTRODUCTION

One of the most linguistically and culturally diverse nations in the world is India. India's extremely rich and varied linguistic environment is the result of centuries of contact between various linguistic groups. Due to issues like linguistic identity conflicts and the need for protective legislation, this diverse linguistic tapestry has resulted in both cooperation and conflict. Maintaining linguistic diversity is essential as concerns about language obsolescence grow[1]. The 2009 report by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) emphasizes how important it is for Indian languages that are endangered or in danger of becoming extinct. India tops the globe with 197 entries in UNESCO's continuously changing Atlas of the globe's Languages in Danger (online). It is troubling that these endangered languages include the official languages of certain governments as well as scheduled and non-scheduled languages [2]. There is still an urgent need to investigate the underlying reasons of linguistic endangerment and develop practical remedies, despite the admirable advancements

made in the documentation and protection of Indian languages. According to Suzanne Romaine's admirable statement [3], "We should think about languages in the same way that we do other natural resources that need to be carefully planned: they are vital parts of complex ecologies that must be supported if global biodiversity is to be sustained." Suzanne's comment emphasizes the necessity of comprehensive strategies to preserve and promote linguistic diversity. In order to preserve linguistic variety, this problem has to be addressed on both a national and social level, including both the government and the communities. Therefore, the primary objective of this study is to investigate the causes and consequences of decreasing linguistic diversity in order to contribute to the debate regarding the preservation of languages. It also critically evaluates the user interface, instructional materials, technical infrastructure, and user feedback of the Bharatvani project, which aims to preserve Indian languages and mother tongues [4].

LITTERATURE REVIEW

Recognizing the significance of preserving linguistic diversity and addressing the loss of these languages, the Indian government has initiated a number of programs to protect regional languages. Bharatvani stands out among them because it is a multimedia application that is interactive and easy to use, and it gives easy access to a wide range of Indian languages [5]. Applications and resources are easily accessible via this multilingual online content, which guarantees that data is saved for later access, rediscovery, and display at any time [6]. In an effort to provide a comprehensive online gateway for multilingual education, the Indian Ministry of Education launched this digital repository. The Indian government made it official on International Mother Language Day, February 21, 2016. It aims to provide a variety of language resources in many Indian languages, including grammar books, dictionaries, glossaries, audio-video recordings, and language learning tools. Former UNESCO Director-General Irina Bokova praised this effort, saying, "I commend #India for the launch of the #Bharatvani portal to support the richness of linguistic diversity" [7]. The Central Institute of Indian Languages (CIIL), located in Mysuru, Karnataka, developed this multilingual software, which provides open information for educational purposes in accordance with the fair use provisions of the Copyright Amendment Act of 2012. It is a useful tool that gives individuals all around the globe access to a large number of monolingual and multilingual dictionaries and other language materials in 118 Indian languages [8]. The portal is intended to be thorough, interesting, and updated often while maintaining quality and applicability via moderation. In addition to Language Editorial Committees in each of the languages, the Project is overseen by a National Advisory Committee and a Technology Advisory Committee. This interactive website caters to the needs of a wide range of language speakers by providing engaging courses, vocabulary exercises, grammar tools, and pronunciation guidelines [9]. In addition to promoting its usage and significance across several domains, such as education, administration, research, cultural preservation, and language revitalization, this digital archive encourages intergenerational and intercultural communication [10].

THE STATUS OF INDIAN LANGUAGES

With unique customs, dialects, and mother tongues found in every corner of the country—from Jammu & Kashmir to Kanyakumari—India's linguistic landscape reflects its cultural variety. With more than 1950 languages or dialects used as mother tongues, India has a vast linguistic variety [11]. According to data from the 2011 census, there are 22 scheduled languages and 99 non-scheduled languages.

However, numbers from different sources may vary, mostly because "language" and "dialect" are defined differently.   A growing corpus of literature, academic publications, and media reports [12] have warned of the alarming decrease in the number of languages [14, 15]. Some linguists say that in the next century, between 40 and 50 percent of India's languages could disappear. David Crystal claims that one language could disappear from the world every two weeks on average over the next century [13]. Krauss conducted a worldwide study on the issue of language endangerment and found that up to 50% of languages are already on their way to becoming obsolete and 10% have a chance of surviving into the future. The remaining species might be extinct by the end of the century. If these theories are correct, only a small number of the languages that are still spoken will have a long history [14]. India tops the list of nations with 197 endangered languages listed as "extinct," "unsafe," "definitely endangered," "severely endangered," and "critically endangered" in the UNESCO Atlas of the World's Languages in Danger (Table 1).   Remarkably, Manipuri and Bodo, two languages that are protected by the government and are included in the Eighth Schedule, are threatened because they are deemed "unsafe" [15].   The North-East region and the tribal belts of Orissa, Jharkhand, West Bengal, Himachal Pradesh, Uttarakhand, and Jammu and Kashmir contain a notable concentration of endangered languages, despite their widespread distribution throughout the Indian subcontinent [16]. Table 1 provides a comprehensive breakdown of the distribution of endangered languages in India by speaker count. In their research on languages in India and the Himalayan area, Blackburn and Opgenort emphasize that the classification of endangered languages should be seen as preliminary owing to the paucity of information on the vitality and speaker numbers of smaller languages [17].   Additionally, several languages that are categorized as vulnerable may be characterized as "stable but potentially endangered."   Even stable and healthy languages with relatively high numbers of speakers, such as Bodo, Khasi, Tamang, and Ho, are in risk of becoming endangered, which makes Blackburn's and Opgenort's projections concerning [18].   Ganesh N., a well-known linguist and cultural activist, Devy also acknowledges that Indian languages are becoming less linguistically proficient, stating that "India may have lost 220 languages since 1961." Based on the 1,652 mother tongues reported in the Census, there have been 1,100 languages since 1961. Another 150 languages may go extinct in the next fifty years [19]. Devy started a groundbreaking study of tribal tribes and led the People's Linguistic Survey of India, which studied Indian languages in 2010. With over 780 languages spoken and written using 86 distinct scripts, India has a tremendous linguistic variety, as this survey noted.   According to the research, India has lost almost 250 languages in the last 60 years, putting its linguistic diversity at jeopardy.   The need to preserve and revitalize India's linguistic legacy is highlighted by this circumstance [21].

 It's crucial to remember that language loss is neither inevitable nor normal.   Numerous factors contribute to the loss and obsolescence of languages. Language loss is caused by a number of factors, including the effects of colonization, urbanization, relocation, pressure from dominant languages, a lack of institutional and community support, and policies that disenfranchise indigenous languages and mother tongues [22].

 When languages are lost, the rich fabric of many civilizations, customs, distinctive information, points of view, and expressions are also lost. Because language includes political importance and cultural knowledge, it is an essential tool for maintaining a community's history, culture, and identity [23].   A language's demise represents the loss of a distinct worldview in addition to vocabulary and speech patterns.   Dalby, Fishman, Nettle & Romaine, and others found that when a language is lost, so does a unique perspective on the world. In fact, language serves as a vital source of knowledge about human

cognition for the worldwide community in addition to being an essential component of cultural and personal identity [24].

Table 1. Indian languages that are endangered based on speaker numbers

Vitality Level	0–5k	5k–10k	10k–20k	20k–50k	50k–100k	>100k
Total Extinct	5	–	–	–	–	–
In Perilous Condition	9	25	1	3	2	1
Extremely Threatened	6	–	–	–	–	–
Without a Doubt, In Peril	61	18	8	6	4	15
Threatening or at Risk	34	35	84	32	12	3
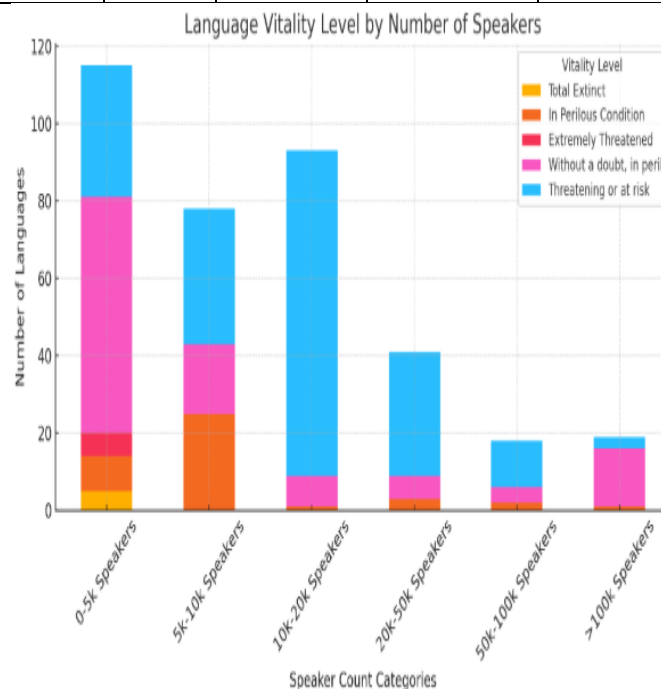
(Source: Constructed from data in Atlas of the world's languages in danger (2010), UNESCO)

RECENT TRENDS AND FRAMEWORKS IN LANGUAGE PRESERVATION

It's critical to acknowledge that, given the speed at which languages are disappearing globally, each one represents a significant loss of priceless insights into human culture and thought. To ensure that various linguistic traditions are preserved and transmitted to future generations, language preservation is in fact a crucial component of cultural heritage conservation. Peter K. claims that Austin, there are now more coordinated and collaborative efforts than ever before to reverse the trend toward language loss. Digital technology, community-based immersion programs, documentation, translation, and language nesting are just a few of the strategies employed in these endeavors [25]. Data is essential in the high-tech age we live in today. AI and IT revolutionize data utilization by allowing communities to record and exchange languages, greatly promoting learning and revitalization initiatives. It is true that technology can help endangered languages survive by providing a wide range of applications that complement traditional methods of language preservation. Digital archiving, for instance, has developed into a potent instrument for supporting endangered languages. It provides a solid platform for languages, which may encourage individuals to speak minor languages more frequently [26].

A. Digital Archiving

Digital archiving preserves digital material for later use by using digital technologies to store, organize, and distribute information. Programs like digital libraries, oral history archives, and language documentation initiatives guarantee the continuation of languages for future generations. A.L. has emphasized the impact of digital transformation on archival theory and practice. Berez and Meighan, who have emphasized the shift from traditional archives that are based on paper to digital repositories. These cutting-edge archives, according to Babinski et al., are resources that help in the careful recording and digitization of historical writings, which in turn encourages deliberate learning and raises cultural awareness. These licensed digital corpora, known as Digital Archival Collections (DACS), usually include text, images, and audio-visual materials [27].

These digital archives preserve linguistic and cultural history for future generations by gathering and recording audio-visual resources, transcriptions, translations, and linguistic annotation. The recognized advantages of digital archives are emphasized by Candace K. Galla31, particularly their crucial role in facilitating access to indigenous languages and knowledge and preserving them. The Endangered Languages Archive (2002), Living Tongues (2005), CoEDL (2014), SIDHELA (2016), and Bharatvani (2016) are among the platforms that have demonstrated success in documenting linguistic history. These platforms, which provide a centralized and simple-to-access repository for some indigenous and endangered languages, make it easier for linguists, academics, and communities to access and exchange information. By providing a platform for stakeholders to communicate and collaborate, digital platforms accelerate the teaching of endangered and indigenous languages as well as their revitalization [28].

RESEARCH METHODOLOGY

In order to offer a thorough picture of how the app is perceived and used, the research analyzes qualitative data from user feedback using a systematic literature review technique. It provides a synopsis of these findings, highlighting any inconsistencies and areas in need of additional investigation. In order to improve knowledge and influence the development of the app based on recognized requirements and possibilities, the review seeks to provide insightful information and direct future qualitative research [29].

A. Significance of Bharatavani

Bharatvani, which is acknowledged as the largest language corpus in the world, has been extremely beneficial to the revival and preservation of Indian languages. In the digital realm, Bharatvani promotes the younger generation to actively employ their mother tongues and scheduled, non-scheduled, and tribal languages in blogging, social media, education, and learning activities. Over 5500 materials in approximately 118 Indian languages, including 22 officially recognized languages and 96 additional Indian languages and mother tongues, have been successfully hosted with the assistance of the Bharatavani Android App and the Multilingual Knowledge Portal (www.bharatavani.in) [30]. The precise number of Indian languages that Bharatvani covers may change over time as new resources are added, but the goal is to include a wide range of books and materials in approximately 121 languages. This app currently supports more than 200 multilingual dictionaries, but efforts are underway to bring that number up to 250 in the coming years. Bharatvani intends to lead a "Digital Revolution" (also known as "Digital Kranti") in accordance with the government's current Digital India agenda. Using this website and its mobile app, people from all over the world can access information in more than 100 languages from a single platform. The portal's long-term effects on providing multilingual content can

be seen in the rise in digital content production, community participation, and language use in education [31].

ANALYSIS AND SUMMARY OF TESTIMONIALS OF BHARATVANI USERS

Testimonials from Bharatavani consumers were analyzed by the research utilizing data gathered on July 10, 2024, at 4:45 PM (IST).   The analysis of user reviews [32] reveals important information about the app's operation and user experience. The review contains 722 user comments that provide insightful perspectives on the software's usability and operation. Out of 722 reviewers, only 261 gave the Bharatavani app a rating between one and five stars for content and accessibility (see figure). 1).   A significant part of the evaluation is the average user rating of 3.8 out of 5, which comes from more than 50,000 downloads. This indicates a favorable response, with opportunities for improvement in terms of browsing speed and offline accessibility and strengths in terms of content relevancy.   However, the lack of data on user accessibility and resource access on either the website or the app is a significant obstacle to properly evaluating the app's usability [33]. Positive keywords like "richness of linguistic resources," "good content," and "easy navigation" are highlighted in the Bharatavani study.   These phrases highlight how satisfied users are with the app's pertinent material.   The noteworthy proportion of 5-star reviews (29.89%) indicates that these capabilities are widely praised, confirming Bharatavani's ability to satisfy user needs and improve linguistic content.   Bharatavani presents difficulties despite encouraging remarks. Around 17.62 percent of users give it a rating of four stars because it has limitations on "content downloads" and "slow browsing," both of which affect offline access in areas with poor internet. Another 16.86% give it a 3-star rating, citing "slow performance" and "cumbersome features." Improving browsing speed, fixing download limitations, and optimizing performance are crucial for increasing user happiness and program usefulness [34].   Furthermore, 15.71 percent of users rate the app with two stars, pointing to usability issues including "slow functioning" and "dictionary search function" issues.   19.92 percent of users give the app one star because they find it difficult to use on slower devices due to its excessive multimedia content, exclusive "online access," and "inefficient user interface." Increasing user satisfaction and app performance require enhancing usability, adding offline functionality, and optimizing the presentation of content, particularly images and tables. Reviewers' favorable comments on Bharatavani's rich material are highlighted in the bar graph in Figure 1 (29.89%).   Dissatisfaction with online-only access and clumsy features (19.92%) and download limits (17.62%) are noteworthy, nevertheless.   Enhancing performance (16.86%) and usability (15.71%) are two areas that have been suggested for improvement, highlighting areas where the program should be improved to better satisfy user expectations [35].
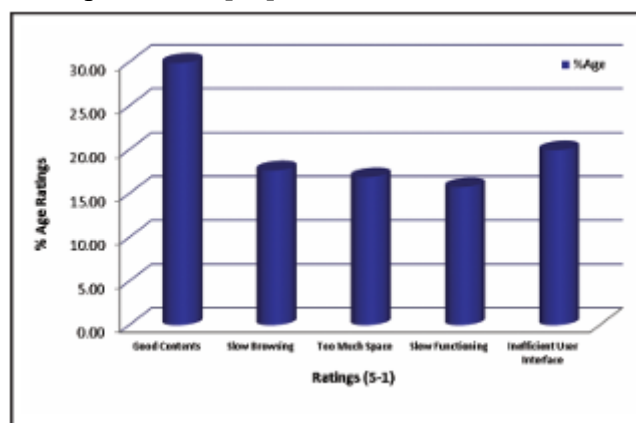
Figure 1. Illustration of reviwers' testimonials.

For effective access to Bharatavani's linguistic resources, Bharatavani ought to prioritize improving user interfaces, speeding up browsing, and improving offline capability in order to successfully resolve these issues. Continuous improvements that satisfy user expectations would be supported by strengthening user feedback systems and increasing performance indicators' openness. Overall, Bharatavani is praised for its extensive content and user interface, but performance, accessibility, and user-centered design always require improvement. To better serve its varied user base across various network and device settings, these enhancements are essential [36].

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

While each offers special features and best practices, Bharatvani, India's initiative for language diversity and digital archiving, contrasts and aligns in different ways with a number of regional and international digital archiving initiatives, including ELAR, Living tongues, DAILP, Missing scripts, CoEDL, SiDHELA, and the Endangered languages Project. In contrast to programs like the Endangered Languages Archive, Endangered Languages Project, and CoEDL, which concentrate on endangered languages throughout the world and provide substantial collections of textual and audiovisual documentation while highlighting rigorous linguistic and anthropological research, Bharatvani places a special emphasis on India's enormous linguistic diversity. In a similar vein, Living Tongues provides a platform that is free and compatible with mobile devices and supports more than 400 languages that are underrepresented all over the world, including a number of endangered Indian languages. With over 209,000 dictionary entries and 963 citizen-linguists worldwide, it uses digital resources and community interaction to revive endangered languages for future generations [37]. Similar to this, The Missing Scripts initiative safeguards the variety of languages spoken worldwide by preserving native scripts and guaranteeing their digital existence using multidisciplinary methods like computational linguistics and historical linguistics. By deciphering scripts, it seeks to provide cultural and historical insights and promote international cooperation among academics and researchers. An international program called the Digital Archive of Indigenous Language Persistence, or DAILP, aims to help indigenous people all over the world preserve their languages and cultural heritage. The Sikkim-Darjeeling Himalayas Endangered Language Archive (SiDHELA) is a regional repository for primary linguistic information on five Sikkim and North Bengali languages. Digital Himalayas focuses only on the Himalayan area, recording languages, cultures, and customs across Nepal, Bhutan, and the Indian Himalayan states, in contrast to worldwide programs. By using multimedia techniques to record oral histories, folklore, and linguistic data, it helps local communities preserve their cultural heritage and linguistic identities. Overall, programs like ELAR, CoEDL, Missing Scripts, and the Endangered Languages Project offer significant best practices in documentation, preservation, community engagement, and interdisciplinary research on a global scale, even though Bharatvani concentrates on India's linguistic diversity and digital accessibility. By focusing on India's diverse linguistic heritage and working to preserve and record not only the country's widely spoken languages and dialects but also the less well-known tribal and regional languages, Bharatvani stands out from the competition. Bharatvani promotes inclusive digital literacy and cultural preservation that is suited to India's various linguistic and cultural history, in contrast to many programs that focus on the indigenous languages of certain areas [38].

IMPEDIMENTS TO DIGITAL ARCHIVING

- **Digital Obsolescence:** Accessing older digital documents may be challenging due to the obsolescence of formats and storage technology. For accessibility to continue, formats need to be updated frequently.

- **Data Integrity:** It is essential to make sure that digital documents that have been preserved stay unaltered and uncorrupted throughout time. Strong data validation and verification procedures are needed for this.

- **Scale and Volume:** Archiving systems may get overwhelmed by the enormous amount of digital data being produced. One of the biggest challenges in digital archiving is handling and analyzing massive amounts of data.

- **Metadata and Indexing:** Digital assets must be accurately categorized, described, and indexed for effective retrieval and use.

- **Access and Usability:** It is necessary to strike a careful balance between ensuring security and making it simple to access preserved content. Cushing & Osti assert that resolving issues related to usability, accessibility, and ethics is necessary in order to maximize the potential of digital archives for language preservation.

- **Adaptability:** For historical content to remain relevant throughout time, flexible digital preservation techniques must be developed. While highlighting the difficulties and complexity of organizing and retrieving archival material, Burke and Zavalina call for effective organizational strategies.

- **Privacy and Ethical Considerations:** Private or sensitive cultural data may be found in digital archives. Establishing ethical standards is necessary to protect against the theft or misrepresentation of sensitive or holy artifacts, as well as to guarantee privacy, accuracy, and informed permission for archive usage.

- **Low Community Engagement:** Low community involvement makes it difficult to transmit knowledge between generations and creates barriers to the digital preservation and documenting process.

- **Digital Divide:** Inadequate internet and technology access makes it difficult to digitally record, preserve, and disseminate endangered languages, making them inaccessible to isolated groups. Digital preservation of endangered languages is difficult due to the digital divide. In fact, community awareness, outreach to distant locations, community involvement, and the ethical use of languages, knowledge, and cultural resources are all critical to the success of digital archives.

STRATEGIES TO OVERCOME SOCIAL AND TECHNOLOGICAL BARRIERS TO DIGITAL ARCHIVING

- **Community Engagement:** Put accessible technology into place, interact with local leaders to provide support, and provide seminars on the cultural relevance of archiving. Create relationships by using a variety of regular contact channels, such as meetings, newspapers, and social media.

- **Capacity Building:** Instruction and resources on digital preservation techniques, such as digitization, metadata generation, and long-term storage plans, should be made available to archivists and other members of the community.

- **Accessibility and Inclusivity:** Ensure that digital archives are accessible to a wide range of users, including those with disabilities and varying levels of technical skill. Providing training may improve digital equality for those who don't know much about technology.

- **Collaboration and Partnerships:** Establish partnerships with regional organizations, libraries, museums, academic institutions, and IT firms to pool resources, financing, and expertise for digital archiving initiatives.

- **Data Security and Preservation:** Implement stringent data security measures to protect archived records from unauthorized access, loss, and corruption. Create long-term digital preservation plans to guarantee the consistency of stored material throughout time.

- **Public Awareness and Advocacy:** Spread the word on a variety of platforms to get more people involved in and supporting archive projects. Through educational initiatives, exhibits, and outreach activities, raise public awareness of the significance of digital archiving.

- **Continuous Evaluation and Improvement:** Assess the efficiency of digital archiving procedures and tools on a regular basis, taking stakeholder and user input into account to improve accessibility and streamline procedures. By using these tactics, communities can be effectively informed about resources such as SiDHELA, Bharatvani, Living Tongues, The Endangered Languages Archive, and many others, which will motivate them to take advantage of the resources offered and actively participate in language preservation initiatives.

CONCLUSION

The research emphasizes how important it is to preserve India's linguistic legacy in order to sustain its social, cultural, and educational well-being. Analyzing user reviews reveals the factors that encourage use of the Bharatavani app as well as the technological and social barriers that prevent access. Despite positive reviews for the app's UI and content, accessibility, performance, and user-centric design all need major improvements. Despite the enormous potential that technology offers to preserve language and culture, it is crucial to emphasize that community involvement is still necessary for language preservation and revitalization. Communities, NGOs, and governments may work together to overcome the difficulties associated with language preservation. This endeavor necessitates the active participation of a number of stakeholders, including educators, community elders, legislators, and cultural leaders, in order to effectively promote language efforts. These initiatives should not be limited to the scholarly realm of a select few; rather, they should include collaborative endeavors that draw attention to the significance of indigenous languages and motivate future generations to value and preserve them.

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