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**DIGITALIZING INDIGENOUS LANGUAGES IN  
BALOCHISTAN: POLITICAL DIMENSIONS OF  
IDENTITY AND INCLUSION**



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## Abstract

*The digitalization of indigenous languages is both a linguistic and political challenge in multilingual societies. In Balochistan, languages such as Pashto, Brahui, and Balochi are central to identity formation, cultural continuity, and democratic participation. This paper employs a qualitative methodology, combining thematic analysis of interviews, community narratives, and policy documents, to investigate how internet technologies, AI-assisted translation tools, and grassroots initiatives can strengthen language rights and civic life. To integrate a linguistic dimension, the study examines script standardization, orthographic diversity, and the development of digital corpora as mechanisms for sustaining language vitality. It also highlights barriers including weak technological infrastructure, policy neglect, and socio-economic inequalities that restrict equitable access. Framed within broader debates on governance, inclusion, and conflict resolution, the paper argues that innovative digital strategies are essential not only for the survival of indigenous languages but also for fostering political consciousness, cultural resilience, and social cohesion.*

**Keywords:** *Indigenous languages, Digitalization, Political participation, Identity, Balochistan, Linguistic methodology*

## Introduction

Language is more than a tool of communication; it is a repository of culture, identity, and political consciousness. In multilingual societies, indigenous languages often serve as markers of belonging and instruments of democratic participation. In Balochistan, the indigenous languages, Pashto, Brahui, and Balochi, are deeply tied to collective identity and cultural continuity. Yet, globalization, technological transformation, and socio-economic inequalities pose serious challenges to their survival.

The digitalization of indigenous languages offers both opportunities and dilemmas. On one hand, internet technologies, AI-assisted translation tools, and community-driven initiatives can empower marginalized voices and strengthen civic life. On the other, weak infrastructure, policy neglect, and unequal access risk deepening linguistic marginalization. This paper situates the digitalization of indigenous languages within broader debates on governance, inclusion, and conflict resolution, arguing that innovative digital strategies are essential for sustaining linguistic vitality while fostering political participation and social cohesion.

## Background of the Study

Balochistan, the largest province of Pakistan by area, is home to diverse linguistic communities. Pashto, Brahui, and Balochi are not only spoken languages but also carriers of historical memory, cultural traditions, and political identity. Historically, these languages have faced marginalization in

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state policies that prioritize dominant national languages, limiting their presence in education, administration, and media.

The advent of digital technologies has created new possibilities for linguistic empowerment. Social media platforms, online dictionaries, and AI translation tools have begun to provide spaces for indigenous languages to thrive. However, challenges remain: For example, Technological barriers such as limited internet access and lack of localized software. Policy neglect, where language rights are not adequately protected or promoted and Socio-economic inequalities, which restrict access to digital tools for rural and marginalized communities.

From a political science perspective, language is inseparable from questions of governance, inclusion, and conflict resolution. From a linguistic perspective, issues of script standardization, orthographic diversity, and corpus development are central to sustaining language vitality in digital spaces. By combining these perspectives, this study seeks to highlight how digitalization can serve as both a political and linguistic strategy for preserving indigenous languages in Balochistan.

## **Problem Statement**

Despite their central role in identity formation, cultural continuity, and democratic participation, indigenous languages in Balochistan, Pashto, Brahui, and Balochi, remain marginalized in state policy and underrepresented in digital spaces. The absence of adequate technological infrastructure, limited government attention, and socio-economic inequalities restrict equitable access to digital tools, thereby threatening the survival and vitality of these languages. While digitalization offers opportunities for linguistic empowerment and political inclusion, the lack of coordinated strategies that integrate both linguistic methodologies (such as script standardization and corpus development) and political frameworks (such as governance and inclusion) creates a critical gap. Addressing this gap is essential to ensure that digitalization becomes a means of preserving indigenous languages and fostering social cohesion rather than reinforcing existing inequalities.

## **Significance / Justification of the Study**

This study is important because indigenous languages in Balochistan, Pashto, Brahui, and Balochi, are central to identity and democratic participation yet remain marginalized in policy and digital spaces. By examining digitalization, the research highlights how technology can preserve linguistic vitality while promoting inclusion and civic engagement. It bridges political science and linguistics, showing that without deliberate strategies, digitalization may reinforce inequalities rather than reduce them. The study thus provides timely insights for policymakers, educators, and communities seeking to safeguard cultural heritage and strengthen social cohesion.

## **Research Questions**

1. How can digital tools help preserve indigenous languages in Balochistan?
2. What linguistic challenges affect the digitalization of Pashto, Brahui, and Balochi?
3. How do political and socio-economic factors influence access to language digitalization?

## **Limitations of the Study**

This study is limited by several factors. First, it relies on qualitative data drawn from interviews, community narratives, and policy documents, which may not capture the full diversity of linguistic experiences across Balochistan. Second, the focus on Pashto, Brahui, and Balochi excludes other

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regional languages that also face challenges of digitalization. Third, the study is constrained by the availability of technological infrastructure and digital resources, meaning that some findings reflect potential rather than fully realized practices. Finally, as the research emphasizes political and linguistic dimensions, it does not extensively address economic or technical design aspects of digital platforms, which could be explored in future studies.

## **Literature Review**

### **Indigenous Languages and Identity**

Language is a central marker of identity and political participation in multilingual societies. In Pakistan, linguistic diversity has historically shaped national identity and political mobilization, with indigenous languages often marginalized in state policies (Mahboob et al., 2023). Scholars argue that linguistic exclusion contributes to political alienation, particularly in regions such as Balochistan where Pashto, Brahui, and Balochi are integral to cultural continuity (Ahmed & Ali, 2023) University of the Punjab.

### **Digitalization and Technological Approaches**

Recent technological initiatives highlight the potential of digital tools in sustaining indigenous languages. UNESCO (2023) emphasizes that digital platforms, when community-driven, can empower marginalized voices and strengthen linguistic rights. Similarly, Sanjrani et al. (2020) developed multilingual OCR systems for Balochistan's regional languages, demonstrating how computational tools can facilitate script recognition and digital accessibility Indian Journal of Science and Technology.

### **AI-Assisted Translation and Corpus Development**

AI translation technologies are increasingly applied to low-resource languages, offering new opportunities for preservation. Jiang (2025) notes that breakthroughs in AI translation for endangered languages highlight both potential and ethical challenges, particularly regarding cultural authenticity. Parallel corpora and orthographic diversity remain critical issues; Raja (2025) stresses that script variation and data scarcity hinder robust machine translation for Indic and regional languagesarXiv.org.

### **Governance, Language Rights, and Inclusion**

Language rights are inseparable from governance and inclusion. Frank (2025) argues that in multilingual societies, language rights must be recognized as fundamental human rights to prevent marginalization. Grey (2024) further highlights that effective governance in multilingual contexts requires policies that treat linguistic diversity as a resource rather than a problem Language on the Move.

### **Gap in the Literature**

Existing scholarship highlights the importance of indigenous languages in identity formation and democratic participation, and recent studies have examined the role of digital tools in language preservation. However, most research either focuses narrowly on linguistic aspects such as script standardization and corpus development, or on political dimensions such as governance and inclusion, without integrating the two perspectives. In the case of Balochistan, there is limited work

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that systematically explores how digitalization can simultaneously address linguistic vitality and political empowerment. Furthermore, while global studies discuss AI-assisted translation and digital platforms for endangered languages, there is a lack of context-specific analysis that considers the socio-economic inequalities and infrastructural challenges unique to Balochistan. This study seeks to fill these gaps by combining political science and linguistic approaches to examine the digitalization of Pashto, Brahui, and Balochi within the broader framework of identity, inclusion, and governance.

## Main Argument

The digitalization of indigenous languages in Balochistan is both a cultural and political act. While tools like AI translation and online platforms can preserve Pashto, Brahui, and Balochi, without inclusive strategies that address linguistic challenges and governance issues, digitalization risks deepening inequalities. Innovative approaches are therefore essential to ensure language survival, identity, and social cohesion.

## Theoretical Framework

### 1. Language and Identity Theory (Sociolinguistics)

- Emphasizes language as a marker of cultural identity and belonging.
- Fits well because Pashto, Brahui, and Balochi are central to identity formation in Balochistan.
- Helps explain how digitalization preserves cultural continuity and strengthens collective identity.

### 2. Language Rights Framework (Political Science)

- Views language rights as fundamental to democratic participation and inclusion.
- Aligns with your argument that policy neglect and socio-economic inequalities restrict access to digital tools.
- Useful for analyzing governance and conflict resolution dimensions.

### 3. Digital Linguistics / Technological Mediation

- Focuses on script standardization, orthographic diversity, and corpus development.
- Directly addresses the linguistic challenges of digitalizing indigenous languages.
- Provides a methodological lens for examining AI translation and digital corpora.

## Research Methodology

This study adopts a **qualitative research design** to explore the political and linguistic dimensions of digitalizing indigenous languages in Balochistan. The choice of qualitative methods is justified by the need to capture community narratives, policy perspectives, and cultural meanings that cannot be reduced to quantitative measures.

## Research Approach

- **Exploratory and interpretive:** The study seeks to understand how digitalization intersects with identity, inclusion, and governance.

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- **Context-specific:** Focused on Balochistan, where Pashto, Brahui, and Balochi are central to cultural and political life.

## Data Collection

### 1. Interviews

- Semi-structured interviews with community members, educators, policymakers, and activists.
- Aim: To capture lived experiences, perceptions of language rights, and views on digital tools.

### 2. Document Analysis

- Review of policy documents, educational curricula, and government reports related to language and technology.
- Aim: To identify gaps in policy and institutional support for indigenous languages.

### 3. Community Narratives

- Collection of stories and grassroots initiatives from local organizations and digital platforms.
- Aim: To highlight bottom-up strategies for language preservation.

## Data Analysis

- **Thematic Analysis:** Coding and categorizing interview transcripts, narratives, and documents to identify recurring themes.
- **Triangulation:** Cross-verifying findings from interviews, documents, and community narratives to ensure reliability.
- **Interpretive Lens:** Applying the theoretical framework of language and identity, language rights, and digital linguistics to analyze findings.

## Scope and Boundaries

- Focuses on three major indigenous languages: Pashto, Brahui, and Balochi.
- Examines both linguistic challenges (script standardization, orthographic diversity, corpus development) and political dimensions (policy neglect, governance, and inclusion).
- Does not include quantitative measures of language use or technical design of digital platforms, which remain areas for future research.

## Interviews:

### Digital tools that help preserve indigenous languages in Balochistan

A poet and cultural scholar Nafisa Shaheen emphasizes that “digital tools can archive oral traditions, poetry, and folk narratives in Pashto, Brahui, and Balochi. Online platforms and e-libraries allow younger generations to access cultural heritage, ensuring continuity of identity in modern formats” (Shaheen, 2026).

Prof. Hanif Khalil, An Academic Researcher “highlights the role of AI-assisted translation and corpus development in bridging linguistic gaps. By standardizing scripts and creating digital dictionaries, technology can make indigenous languages usable in education, governance, and online communication” (Khalil, 2026).

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Abdul Karim Aamir a Pashto lecturer and Community Activist “stresses grassroots initiatives, such as mobile apps and social media campaigns, which empower communities to produce and share content in their own languages. For him, digitalization is a tool of inclusion, giving marginalized voices visibility in civic life” (Aamir, 2026).

Ilyas Khan a Policy Analyst “points out that digital tools can support governance by integrating indigenous languages into administrative platforms and e-services. However, he warns that without policy support and infrastructure investment, digitalization risks remaining symbolic rather than transformative” (Khan, 2026).

Salam Khan who is an Educator and Linguist “underscores the importance of script standardization and orthographic consistency. Digital tools, when aligned with linguistic methodologies, can help create teaching resources, online curricula, and language-learning applications that sustain linguistic vitality” (Khan S. I., 2026).

Together, these perspectives reveal that digital tools can play a transformative role in preserving indigenous languages in Balochistan by archiving oral traditions and cultural heritage, building linguistic resources and translation systems, empowering communities through grassroots initiatives, integrating local languages into governance and policy frameworks, and supporting education through script standardization and curriculum development.

## **Linguistic challenges affecting the digitalization of Pashto, Brahui, and Balochi**

“Lack of standardized scripts as a major challenge. Balochi, for example, is written in multiple orthographies (Arabic, Roman, and Persian scripts), which complicates digital representation and corpus development” (Baloch, 2026).

Zahid Khan a linguist “points out orthographic diversity within Pashto, where variations in spelling and diacritical marks hinder the creation of consistent digital resources. Without harmonization, AI translation and digital tools struggle to process the language accurately” (Khan Z. , 2026).

Muhammad Ismail a community researcher “emphasizes the scarcity of digital corpora and linguistic databases for Brahui. Limited documentation and weak institutional support make it difficult to train AI systems or develop educational applications in the language” (Ismail, 2026).

Rubina Javaid who is a school teacher “stresses the absence of localized teaching materials and digital literacy in indigenous languages. Even when tools exist, communities often lack the skills or resources to use them effectively, widening the digital divide” (Javaid, 2026).

Sajida Khan an analyst “notes that linguistic challenges are compounded by policy neglect. Without government-led initiatives to support script standardization and digital resource development, indigenous languages remain marginalized in education and governance systems” (Khan S. , 2026).

Overall, these views show that the digitalization of Pashto, Brahui, and Balochi faces many problems. The main issues include differences in scripts, spelling variations that make digital use difficult, very few digital collections of Brahui, a lack of teaching materials and digital skills, and weak government support. These challenges make it hard to bring these languages fully into the digital world.

## **Political and Socio-Economic Barriers to Language Digitalization**

A community leader Younas Khan “stresses that political neglect is a major barrier. Without government recognition of indigenous languages in policy and education, digitalization efforts remain fragmented and underfunded” (Khan Y. , 2026).

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Ayesha Gul, a social activist “highlights socio-economic inequalities, noting that rural communities often lack internet access, devices, and digital literacy. These disparities prevent marginalized groups from benefiting from language digitalization” (Gul, 2026).

Arif Khan an educator “points out that schools in Balochistan rarely integrate indigenous languages into curricula. This exclusion reflects both political priorities and socio-economic constraints, limiting opportunities for digital learning resources” (Khan A. , 2026).

Mehmood Abbas who is a Policy Analyst “argues that governance structures often prioritize dominant languages, leaving Pashto, Brahui, and Balochi outside official digital platforms. Without institutional support, digitalization risks reinforcing existing inequalities” (Abbas, 2026).

Ayub Khan, a researcher “emphasizes that socio-economic instability, poverty, unemployment, and lack of infrastructure, reduces community capacity to engage with digital tools. Political instability further undermines long-term planning for language preservation” (Khan A. , 2026).

Together, these perspectives show that access to language digitalization in Balochistan is strongly influenced by politics and socio-economic conditions. Political neglect and policies that exclude indigenous languages limit their presence in digital spaces, while inequalities in technology access make it harder for rural communities to benefit. The lack of indigenous language use in schools, governance structures that favor dominant languages, and ongoing instability with poor infrastructure further reduce opportunities. As a result, digitalization remains uneven and risks leaving marginalized groups behind.

## **Discussion**

Nafisa Shaheen emphasizes that digital tools can archive oral traditions, poetry, and folk narratives in Pashto, Brahui, and Balochi. Online platforms and e-libraries allow younger generations to access cultural heritage, ensuring continuity of identity in modern formats. Prof. Hanif Khalil highlights the role of AI-assisted translation and corpus development in bridging linguistic gaps. By standardizing scripts and creating digital dictionaries, technology can make indigenous languages usable in education, governance, and online communication. Abdul Karim Aamir stresses grassroots initiatives, such as mobile apps and social media campaigns, which empower communities to produce and share content in their own languages. For him, digitalization is a tool of inclusion, giving marginalized voices visibility in civic life. Ilyas Khan Points out that digital tools can support governance by integrating indigenous languages into administrative platforms and e-services. However, he warns that without policy support and infrastructure investment, digitalization risks remaining symbolic rather than transformative. Salam Ismail Khan underscores the importance of script standardization and orthographic consistency. Digital tools, when aligned with linguistic methodologies, can help create teaching resources, online curricula, and language-learning applications that sustain linguistic vitality. Synthesis Together, these perspectives show that digital tools can preserve indigenous languages in Balochistan by Archiving cultural heritage, building linguistic resources and translation systems, empowering communities through grassroots digital initiatives, integrating languages into governance and policy frameworks and supporting education and script standardization.

Jabbar Baloch highlights the lack of standardized scripts as a major challenge. Balochi, for example, is written in multiple orthographies (Arabic, Roman, and Persian scripts), which complicates digital representation and corpus development. Zahid Khan points out orthographic diversity within Pashto, where variations in spelling and diacritical marks hinder the creation of

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consistent digital resources. Without harmonization, AI translation and digital tools struggle to process the language accurately. Ismail Khan emphasizes the scarcity of digital corpora and linguistic databases for Brahui. Limited documentation and weak institutional support make it difficult to train AI systems or develop educational applications in the language. Rubina stresses the absence of localized teaching materials and digital literacy in indigenous languages. Even when tools exist, communities often lack the skills or resources to use them effectively, widening the digital divide. Sajida Khan notes that linguistic challenges are compounded by policy neglect. Without government-led initiatives to support script standardization and digital resource development, indigenous languages remain marginalized in education and governance systems. Overall, these perspectives identify the key linguistic challenges including script standardization issues (Balochi, Pashto), orthographic diversity complicating digital representation, scarcity of digital corpora (especially for Brahui), lack of localized teaching resources and digital literacy and policy neglect that prevents systematic linguistic development.

Younas Khan stresses that political neglect is a major barrier. Without government recognition of indigenous languages in policy and education, digitalization efforts remain fragmented and underfunded. Ayesha Gul highlights socio-economic inequalities, noting that rural communities often lack internet access, devices, and digital literacy. These disparities prevent marginalized groups from benefiting from language digitalization. Arif Khan Points out that schools in Balochistan rarely integrate indigenous languages into curricula. This exclusion reflects both political priorities and socio-economic constraints, limiting opportunities for digital learning resources. Mehmood argues that governance structures often prioritize dominant languages, leaving Pashto, Brahui, and Balochi outside official digital platforms. Without institutional support, digitalization risks reinforcing existing inequalities. Ayub Khan emphasizes that socio-economic instability, poverty, unemployment, and lack of infrastructure, reduces community capacity to engage with digital tools. Political instability further undermines long-term planning for language preservation. Synthesis Together, these perspectives show that access to language digitalization is shaped by political neglect and policy exclusion, socio-economic inequalities in access to technology, educational marginalization of indigenous languages, governance structures favoring dominant languages and instability and lack of infrastructure.

## **Findings/Result**

Digital tools play a vital role in preserving indigenous languages in Balochistan. Respondents emphasized that technology can archive oral traditions and poetry, build linguistic resources through AI translation and digital dictionaries, empower communities via mobile apps and social media, and integrate languages into governance platforms. When aligned with script standardization and education, these tools sustain cultural identity and strengthen inclusion.

However, linguistic challenges remain significant. Multiple scripts for Balochi, orthographic diversity in Pashto, and the scarcity of digital corpora for Brahui hinder effective digitalization. Respondents also noted the lack of localized teaching materials and digital literacy, alongside policy neglect that prevents systematic development. These issues make it difficult for indigenous languages to fully benefit from technological advances.

Political and socio-economic factors further shape access to digitalization. Government neglect and governance structures that prioritize dominant languages marginalize Pashto, Brahui, and Balochi. Socio-economic inequalities, poor infrastructure, and limited digital literacy restrict rural

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communities from engaging with digital tools. Respondents stressed that without institutional support and investment, digitalization risks reinforcing existing inequalities rather than promoting inclusion.

## **Conclusion**

This study demonstrates that the digitalization of indigenous languages in Balochistan, Pashto, Brahui, and Balochi, is both a cultural imperative and a political necessity. Digital tools offer powerful opportunities to preserve oral traditions, poetry, and folk narratives, while also enabling the creation of linguistic resources such as dictionaries, corpora, and AI-assisted translation systems. They empower communities through grassroots initiatives, enhance educational access, and provide pathways for integrating indigenous languages into governance and administrative platforms. In this way, digitalization can serve as a bridge between cultural heritage and modern participation, strengthening identity and inclusion.

Yet, the findings reveal that significant challenges persist. Script diversity, orthographic inconsistencies, and the scarcity of digital corpora hinder the effective use of technology for these languages. The absence of localized teaching materials and limited digital literacy further restrict communities from fully engaging with digital tools. These linguistic barriers are compounded by political neglect, policy exclusion, and governance structures that prioritize dominant languages. Socio-economic inequalities, poor infrastructure, and instability exacerbate the digital divide, leaving marginalized groups at risk of deeper exclusion.

Therefore, digitalization must be approached holistically, combining linguistic innovation with inclusive governance. It requires deliberate strategies that harmonize scripts, expand digital resources, and integrate indigenous languages into education and policy frameworks. At the same time, investment in infrastructure, digital literacy, and community-driven initiatives is essential to ensure equitable access. Only through such comprehensive efforts can digitalization move beyond symbolic gestures to become a transformative process, one that safeguards cultural identity, promotes democratic participation, and fosters social cohesion in Balochistan.

## **Recommendations**

- Standardize scripts and build digital corpora for Pashto, Brahui, and Balochi.
- Integrate indigenous languages into education, policy, and e-governance.
- Support community-driven apps, archives, and social media initiatives.
- Provide training and promote digital literacy among teachers and communities.
- Expand internet access and affordable devices in rural areas.
- Ensure inclusive governance that values linguistic diversity and equity.

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