Reviving Tribal Languages through Modern-Age Technological Innovations

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Abstract

A tribal language is being eroded and it is a massive cultural crisis of the twenty-first century. With the ongoing marginalization of the indigenous voices in mainstream educational systems coupled with the process of globalization, technology can be used as a possible tool of rejuvenation. It is explored in this paper that the latest technological developments, such as mobile applications, digital storytelling, AI-based linguistic tools, and online archives created by communities can become agents of change in the process of restoring endangered tribal languages. Based on case studies of India and other worldwide indigenous situations, the study highlights the importance of joint projects of linguists, technologists, and tribal groups in supporting the maintenance of their language. This is not only the archiving of the vocabulary or grammar, but the revival of identity, the retrieval of oral traditions, the enabling of the communities to be proud of their language heritage. The human factor plays a critical role, with its elders turning into digital storytellers, children becoming interactive learners, and the native speakers becoming creators and controllers of their linguistic fates. Although issues like access inequalities and cultural sensitivity to digital access continue to pose challenges, the research posits that with ethically-directed and community-based uses of technology, the language can be seen as dead instead of dying through proper application of technology. Therefore, this current paper is a call towards a balance between tradition and innovation, with the tribal languages being not only written, but also spoken, sung, coded, and lived in the cyber age.

Keywords: Tribal, languages, revival, digital, indigenous, AI, preservation

1. Introduction

Among the vibrant kaleidoscope of Indian cultural diversity, tribal languages hold a rather important place, as they reveal not only the systems of communication but also the very essence of native identity. The exemplary case of this linguistic abundance is the state of Odisha, which hosts 64 tribes and 13 Particularly Vulnerable Tribal Groups (PVTGs). According to the *UNESCO Atlas of the World's Languages in Danger, a significant* number of tribal languages in Odisha are critically endangered. The reasons are multifold and include urban migration, intergenerational differences, formal education in dominant languages, and a lack of digital representation. The concept of linguistic imperialism whereby the institutionally favoured languages over the local ones have marginalised the native speech communities, and this has led to the slow decline of the oral cultures (Phillipson, 1992). In Odisha, Odia and English used in education and administration isolate the younger generations even more, as they are not being brought up within their tribe. The blistering technological progress leaves society at a distinct historical point: the very forces of modernity, which once served as a threat to the expression of the indigenous ones, might become a means of revival.

The present paper will look into the ways the technological advances of the modern age, including mobile applications, AI-based language tools, and digital storytelling, are being exploited and how they could be leveraged more to revive the dying tribal languages, especially in Odisha (Jones & Ogilvie, 2013; Zuckermann, 2020). With the community voices and ethical frameworks in mind, these tools have the potential to redefine the current loss into resilience (Smith, 2012). Revitalization then, should not be viewed as the maintenance of vocabulary or grammar but as the reinstatement of cultural independence and intergenerational identification (Hinton, 2011; McCarty, 2013). The loss of language does not necessarily possess the same immediacy as a loss of biodiversity or destroy a heritage site; however, no single language presents the same worldview, expressed in metaphors, myths, systems of knowledge, and ecological wisdom (Evans, 2010, p. 29). This translates to loss of knowledge about medicinal plants, agricultural cycles, spiritual activities and oral histories that are encoded in local languages in Odisha tribal groups (Maffi, 2005; Skutnabb-Kangas, 2015). The consequences are of cultural, ecological, and epistemological implications.

Alongside such fears, there is a new trend in which digital tools are taking sides in the fight for language survival (Jones & Ogilvie, 2013; Zuckermann, 2020). As the cases of First Nations in Canada and the Aboriginal people in Australia show, technology, especially when integrated into community-based projects, can

revitalise the interest in youth and bring cultural pride back (Grenoble & Whaley, 2006; McCarty, 2013). In India, some attempts, like that of Anvita Abbi to document the Great Andamanese in multimedia, manifest the urgency and possibility of preserving the documentation of the endangered language in the multimedia form (Abbi, 2013; Moseley, 2010).

First steps have already been made in Odisha, and the initial progress is encouraging (Panda & Mohanty, 2021). Increasingly, projects use smartphones to capture oral tales, make use of apps to educate tribal languages (where possible) and use AI to maintain phonetic integrity (Jones & Ogilvie, 2013; Zuckermann, 2020). Organisations like the Kalinga Institute of Social Sciences (KISS) have also embarked on digital archiving of tribal songs and folklore, making elders digital storytellers (UNESCO, 2019). This development is indicative of the change of what has been called surrogation by Joseph Roach, which involves remembrance and performance in place of what has been lost, which enables culture to continue to exist in new forms (Roach, 1996).

Outside the technical issues, this project is emotional, cultural and highly human. The notion of affect presented by Brian Massumi highlights the fact that technology is not neutral because it is emotional and intense (Massumi, 2002). When a tribal child reads a bedtime story using his or her first language through a mobile phone, it is more than just the lexical acquisition; it is more like a cultural affiliation and belonging (McCarty, 2013). Equally, youngsters who play the games that aim at educating them about their language, based on tribal beliefs, do not just code words; they are claiming identity (Hinton, 2011). The cooperative involvement of communities, scholars and technologists is a clear transition of the top-down documentation into participatory cultural representation (Smith, 2012). Linda Tuhiwai Smith notes that decolonisation of research must be a process that gives indigenous people the chance to define priorities and take initiatives (Smith, 2012). This principle presents itself in Odisha in both the form of research and code, photography and online storage (Pillai & Annamalai, 2020).

However, major problems still exist. Digital divide is still keen in rural areas where there is unreliable power and internet access (van Dijk, 2020). Furthermore, it is possible that there is the threat of cultural appropriation or the simplification of the complex narratives into superficial digital materials (Nakamura, 2018). A well-thought-out, participative governance is critical in ensuring that the projects are not lost in the abstractions of the communities to which they relate (Smith, 2012; Zuckermann, 2020). The inclination of cultural urgency and digital potential is a promising one despite these obstacles. Odisha uses the technology to protect the

tribal languages, maintaining its past, but building the future as well. Speaking, singing, and coding in tribal languages are a silent revolution, a rebellion against the system, and a fight against it, word by word.

2. Review of Literature

In recent years, the study of the revitalisation of indigenous languages has grown significantly in international scholarship, shedding light on the deep-seated interconnections of language, identity, and culture (Grenoble & Whaley, 2006; Hinton, Huss, & Roche, 2018). Other researchers like David Crystal (Crystal, 2000) argue that the death of language is the equivalent of the death of a world-view because every language has its own distinctive knowledge system, oral literature and ecological explanations. It is in this view that the loss of any language poses an epistemological gap - a break in the diversity of the human mind and mutual cultural heritage (Maffi, 2005). When a tribal language in Odisha started dying, it was not simply a loss of vocabulary, but the loss of centuries of knowledge of the ancestors in agriculture, religious beliefs, rituals and social structure (Skutnabb-Kangas, 2015).

The landmark seminal essay by Michael Krauss, *The World's Languages in Crisis* (Krauss, 1992), was an early warning call to the global linguists, and it claimed that more than ninety per cent of the world's languages would have gone extinct or moribund in a century without proactive action. His forecasts are still highly topical to Odisha in the twenty-first century, where language loss is still a serious issue because of intense urbanisation, the state language policy, and the lack of education and media coverage of tribal languages (UNESCO, 2010; Moseley, 2010). Even though the government acknowledges Scheduled Tribes, there is a large number of tribal languages in the region that are still under-documented and under-resourced (Abbi, 2013).

In India, the first work of Anvita Abbi on the Great Andamanese languages illustrates the need to conserve indigenous languages using direct fieldwork, phonological recording, and interacting with the community (Abbi, 2013). The study by Abbi is not only a list of the vocabulary and syntax, but it also demonstrates that there is a strong interconnection between linguistic structures and tribal cosmologies (Evans, 2010). This method is specifically relevant to the tribal languages of Odisha, which, like those of the Andamanese, are mainly oral and encode distinctive cosmological and geographical orientations (Aikhenvald, 2017).

Online interventions are effective in various projects. Applications in language learning, online dictionaries and games based on a story have become popular with

First Nations populations in Canada, and Aboriginal populations in Australia (Jones & Ogilvie, 2013; Zuckermann, 2020). They have been notable successes with younger users, who include those who are disassociated with their mother tongues because of the forced assimilation or language neglect (Grenoble & Whaley, 2006, p. 39). Indeed, as an example, the project of the *Living Archive of Aboriginal Languages* in Australia has compiled and digitised thousands of oral texts and stories, made available to users, both scholarly and community (Kral, 2018). The model enhances intergenerational knowledge transfer via familiar digital media, which provides a scalable model in Odisha, where smartphone usage is up-and-down the line, even in tribal belts (van Dijk, 2020).

The bridging of the gap between traditional orality and modern preservation has started with institutional work by the Kalinga Institute of Social Sciences and the Scheduled Castes and Scheduled Tribes Research and Training Institute (SCSTRTI) (Panda & Mohanty, 2021; SCSTRTI, 2019). Through these studies, it has been found that most tribal languages in Odisha, such as Kui, Soura, and Bonda, are mainly oral and do not have any written script (Abbi, 2013; Moseley, 2010). Although traditional documents are thrown into question, the digital world is opening up with audio-visual files, podcasts, video collections, and voice recognition via AI (Jones & Ogilvie, 2013; Zuckermann, 2020) (Tripathy and Kuanr). Not only do such tools retain the structure of language, but they also record rhythm, tone and emotional colouring that is a part of oral stories (Finnegan, 2012).

One of the most important aspects of the recent academic discussion implies the affective and embodied nature of language (Ahmed, 2004). According to the Affect theory as expressed by Brian Massumi, affect is not representational but rather represents an intensity, sensation and transmission of a feeling among bodies and generations (Massumi, 2002). In this context, the concept of language is more than a conveyor of abstract concepts but a storehouse of lived feeling (Thrift, 2008). Rebirth of a tribal language can therefore be considered an act of emotional repossession and re-establishment of the feeling of selfhood, belonging, and dignity as a community, and this process is ever-practising (McCarty, 2013).

The performative memory, as proposed by Joseph Roach, also explains why language is embodied amongst indigenous communities. According to Roach, memory is usually performed in the form of rituals, narratives, and oral performance as opposed to written records, which remain in place (Roach, 1996). Such a point of view is particularly relevant in the tribal situation in Odisha, where folklore, dance, and myth are the key pillars of linguistic expression (Schechner, 2013). An example would be Saura murals (ikons), which are, however, not just graphic objects; they

are also accompanied by song and stories, and it is a synesthetic experience of language that is not limited by grammatical structure (Elwin, 1951; Skoda, 2015).

All these theoretical models are a challenge to the limited view of language preservation as the simple act of stocking up dictionaries or grammar textbooks (Hinton, 2011). They support the holistic approach, which views language as a dynamic living practice that occurs within the cultural life (Grenoble & Whaley, 2006). This appeals to the decolonising processes put forward by Linda Tuhiwai Smith, who encourages indigenous people to be at the forefront in reviving their languages, identities, and histories (Smith, 2012). The work by Smith is keeping scholars in mind that research should be expanded to include not only documentation but also empowerment, justice, and self-determination (Kovach, 2009).

Overall, it is clear that the renewal of native languages would not be achieved only by implementing technological devices; instead, it needs to be culturally based, emotionally appealing, and community-oriented, as the body of literature suggests (Zuckermann, 2020; Hinton et al., 2018). The tribal languages of Odisha, with their rich oral culture and cultural specificities, will gain significantly through a system that combines the traditional knowledge systems with the digital innovation (Abbi, 2013; UNESCO, 2019). The intersection of world case studies, Indian literature, and affective theory offers a solid base on which the future of the Odisha language could be re-conceived not as a given heritage but as an act of creation (Massumi, 2002; Roach, 1996).

3. Methodology

The research undertaken was using a strict mixed methodology, and a qualitative paradigm was utilised to create a detailed analysis of the topic at hand. The data were collected with the help of ethnographic observation, participant observation and searching of online literature. Most importantly, the paper directly worked with the indigenous groups of Odisha, in this case, the Soura, Santhal, and Bonda groups. Fieldwork involved trips to Koraput, Rayagada and Mayurbhanj. Semi-structured interviews were conducted with tribal educators, oral historians, linguists and developers of digital-media in the local language field. The research study was largely based on the use of flexible interviews, which allowed the flow of the conversation to be maintained, with a supplement of watching the community storytelling activities. Also, the analysis of the available digital material, including the web Adivasi Bhasa, the KISS (DU) digital library devoted to oral narratives and initial mobile applications aimed at learning tribal languages, was carried out. Analogous technology projects in India and other parts of the world were also

compared with the aim of determining the level of scalability and applicability in Odisha. The most important ethical issues were related to informed consent, anonymity of the participants, and the involvement of community voices during the research process. The main goal was to evaluate the efficacy of digital resources to aid language preservation and examine their effect on emotional health, social interaction, and cultural persistence.

4. Discussion

4.1 Oral Traditions and Without Forgetting

Odisha has a large share of tribal languages that are more oral in nature (Abbi, 2013; Moseley, 2010). Although the lack of a written codification is viewed as a weakness by some, digital modalities, especially audio and video recordings, may also be of great help in preserving such traditions (Finnegan, 2012; Jones & Ogilvie, 2013). As an example, aged members of the Bonda and Santhal society are actively using smartphones to store narratives, melodies and prayers, thus closing the gap in their generations, and documenting the spoken heritage in digital modes (Roach, 1996, p. 33; Kral, 2018). Hearing a myth of a grandmother on YouTube or listening to songs about a wedding on the podcast makes a family stronger (McCarty, 2013). The affective experience, according to the effect theory, is an emphasis of this modality as opposed to factual transmission of affective experience (Massumi, 2002, p. 25)

4.2 When Communities Lead the Way

When the community is in the middle of project participation, the results are significantly enhanced. The gamified language-learning application developed by youth in tribal groups co-created in Mayurbhanj included culturally-relevant riddles and songs, thus creating cultural pride and improving digital literacy. Furthermore, when native speakers create written material instead of being the objects of recordings, power does not lie with the researchers but with the aboriginal people, which saves authenticity and provides them with self-representation (Smith 2012).

4.3 The Fits of AI and Machine Learning

Artificial intelligence presents new opportunities. OCR and Text-to-Speech (TTS) can be used to develop tribal orthographies and proper models of pronunciation. Other projects like the Google one titled AI to Cultural heritage may be adapted to the Odia language, which is facing extinction, particularly complex linguistic tasks. Nevertheless, ethical issues, including privacy, cultural appropriation, and artificial intelligence bias, should be brought up; their information needs to be included in AI training sets only with the permission of the community (Benjamin 2019).

4.4 Schools and Policies

The 2020 National Education Policy is a promotion of the use of the mother tongue at the level. The multilingual education plan in Odisha aims at including tribal languages, although the execution is still not uniform. Electronic resources may supplement classroom learning- e.g. audio lessons on tablets or numeracy exercises with tribal songs. Effective integration cannot just be achieved through hardware, but it takes pedagogical reform, teacher development, and long-term community confidence.

4.5 The Roadblocks

Thought notwithstanding, a number of challenges exist: lack of trusted broadband connectivity, low level of technology among the older generation, cost issues, and adoption of new technologies. More so, digital platforms that are designed poorly are potential trivializers or falsifiers of complex oral traditions. Recording the language alone does not mean that it is alive; everyday use in the fields of education, family, and work is crucial, or the digital ones can be stored in archives (Fishman 1991).

5. Findings

Recalling the Tribal Tongues to Life

The restoration of the indigenous language is not confined to the preservation of the lexicons, but is a reclaim of the cultural identity of Odisha and its continuity. It is the digital storytelling that makes these linguistic habitats alive and keeps them going.

The Technology the Right Way

The overall strategic use of technology would help in reducing the generational gaps, as older people would be able to pass their knowledge and also as children become digital storytellers.

Working Together is a Must

Successful initiatives are most likely to be initiated through collaborative efforts, and at the very beginning of the process, the stakeholders in the community are involved; the by and for strategy is more authentic and has more traction.

School Integration Can Help

The integration of tribal languages into the curricular programs through the use of interactive applications can create a feeling of pride and inclusivity among students; this would necessitate a concerted action among the stakeholders to put the content into a proper perspective.

The Internet Problem

Poor and slow broadband connectivity in most tribal villages is also a setback to the implementation of the digital content, as potential gains are not achieved without a reliable connection.

AI – Friend or Foe?

Artificial intelligence is potentially useful in the study of linguistics, but it should be applied responsibly, without violating the rights and cultures of the affected communities.

6. Conclusion

Odisha, with its fantastic tribal variety, is at a language crossroads. It is not wishful thinking that its tribal languages will survive, but rather a shared and deliberate effort. The linguistic status burden in a state with 64 tribes and 13 Particularly Vulnerable Tribal Groups (PVTGs) is not limited to policy systems and institutions within the educational sector, but extends to community-based efforts and technological development. The intersection of ancestral memory and digital possibility brings a special chance to Odisha to influence the future when tribal languages are flourishing.

The digital era provides threats and tools. On the one hand, mainstream technologies promote the dominance of international languages like English and Hindi, hence pushing aside tribal languages. Conversely, these technologies, when used carefully and sensitively in the context of ethics and culture, can become potent tools of renaissance. As Crystal stresses, language death is a symptom of a larger cultural process of disenfranchisement; however, when languages are reanimated through digital means (i.e., voice recordings, storytelling apps, or AI-assisted learning tools), communities can gain control over their language and cultural narrative. Working together, community-based and ethically sound interventions have the potential to transform the erasure discourse into the discourse of renaissance, which we have already seen is shifting in Odisha (Crystal, 2000). Projects like digital storytelling organised by institutions such as KISS (DU) and SCSTRTI have provided elders with a voice that was once restricted to local communities (Tripathy & Kuanr, 2025). These projects do not merely record; they effect change, enabling tribal elders as mentors with the help of YouTube videos, podcasts, and mobile applications, creating a participatory ecosystem of cultural transmission.

The notion of affect, as suggested by Massumi, reminds us that language is not a container of cognitive meaning only but also of emotion and extreme significance.

This is especially correct in tribal Odisha, where languages are endowed with ritual, song, and oral performance. When a tribal child reads a bedtime story in their native language through a smartphone, they do not just hear words; they feel the past, being part of a group, and feeling pride (Massumi, 2002). Similarly, the idea of performative memory described by Roach confirms that language revival is a process of rediscovering an embodied tradition where language and identity are performed simultaneously (Roach, 1996).

The process of revitalising tribal languages with the help of technology involves recording sounds, protecting stories, healing history, and restoring intergenerational continuity. The aim is much more than digitalising languages; it aims at breathing them back to life so they can be spoken, sung, and lived. Krauss (Krauss,1992) advises that once a language is lost, it is usually impossible to revive it unless serious attempts are taken. Odisha should, therefore, follow a tailored, participatory, and futuristic route. Ethical aspects must be recognised in such efforts. Smith suggests that the preservation of language should be based on a decolonial approach, whereby the needs of the community, cultural ownership, and epistemic justice are central (Smith, 2012). Vernacular speakers need to collaboratively design how their languages are maintained, taught, and exchanged. Such transformation among stakeholders is necessary to revive languages sustainably and respectfully. The final representatives of dying languages will not only be the first teachers of their digital times but will also carry poetic justice and humanistic potential. This situation demands respect for the past and acceptance of the future; it sees tribal languages not only surviving but thriving.

Therefore, Odisha will spearhead such a transformative agenda with its abundant linguistic and cultural capital. The work can be monumental, but the prospect is great: a world where diversity is not just accepted but valued, not just stored but practised.

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