



## KEEPING CULTURE ALIVE: ROLE OF TECHNOLOGY IN PRESERVING IDENTITY OF THE ORAON TRIBE

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### ABSTRACT:

Tribes, known for their unique indigenous identity, knowledge and practices, exist around the world. India, a sovereign nation, is home to various tribal communities. One of the tribes in top five largest tribal communities in India is the Oraon tribes. Their forms of practices, knowledge, language and identity are not documented enough to sustain. Very few literatures are available as they lack written accounts of their myths and stories, their history and culture are transmitted orally to the next generation. In the contemporary era, technologies can help in preservation and transmission to the masses about the tradition, culture and identity of the Oraon tribe. The loss of identity would mean the lack of indigeneity. Technology has become a significant resource for safeguarding and showcasing their cultural heritage. The objective of this research is to explore the possibilities and opportunities that modern technologies offer that can be utilized for sustaining the life world of the Oraon tribes. Non-participatory observation and semi-structured interviews facilitated understanding of the cultural practices, language and identity, while secondary sources were utilized to examine the technological dimension through the lens of glocalization theory. The analysis revealed that proper coordination between technology and the tribe will cherish the culture, preserve the heritage and sustain the identity. The findings suggest that the technology, as a global force that can be localized by the Oraon community, can support in the digital preservation and transmission of their cultural identity.

### KEYWORDS:

ORAON TRIBE, IDENTITY, TECHNOLOGY, PRESERVATION, GLOCALIZATION.

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### I - Introduction

India is a country of vast and distinctive cultures and traditions. The tribal communities have long been an integral and crucial part of the Indian society. They contribute to its diversity and cultural richness (Ghurye, 1963). Despite this significance, they remain among the most vulnerable sections in multiple dimensions of life (Sundar, 2008). Many tribal groups continue to face economic challenges, their values & way of life and cultural heritage remain remarkably vibrant, shaping their social structure (Roy, 1915).

Recognizing uniqueness, the framers of the Constitution of India acknowledged factors such as geographical isolation, limited infrastructure, traditions and livelihood had shaped their own model of education, cultural practices,

administration and governance (Government of India, 1950). Consequently, these communities were identified as the Scheduled Tribes to ensure focused development and protection (Singh, 1997).

In the era marked by rapid technological advancement, the question of survival and continuity of indigenous culture is increasingly significant (Giddens, 1990). Communities like Oraon tribe's cultural identity are not merely a symbolic construct but a living reality in everyday practices, language, rituals and ecological knowledge (Fernandes, 2006). Traditional festivals such as Karma & Sarhul reflect a deep relation with nature. Use of the Kurukh language and affinity with nature have shaped the collective life of the community (Munda, 2000). These cultural forms have

been sustained through oral traditions, shared experiences and community participation (Elwin, 1964).

The pressure of migration, modernization and globalization have altered the traditional model of cultural transmission (Appadurai, 1996). These processes have already contributed to the weakening of cultural identities and raised concerns about cultural loss and erosion of traditional culture (UNESCO, 2003). Yet, the narrative of erosion does not fully explain the complexities of contemporary realities. Rather than simply watching it vanish, technological developments are opening new avenues for cultural expression and preservation (Castells, 2010). Recent studies suggest that digital tools and platforms are increasingly being used for the documentation and revitalization of their cultural heritage (Dutta, 2019; Biela et al., 2016)

The classical sociological perspective provides insights into this process. Durkheim (1912) emphasized that collective rituals and shared beliefs are essential for maintaining social cohesion and continuity, while Bourdieu (1977) highlighted how cultural knowledge and practices are transmitted across generations through what he conceptualized as cultural capital. In tribal societies, these processes are particularly significant as identity is deeply intertwined with language, ritual and indigenous knowledge system.

Noteworthy in the present context is the way in which modern technology is being engaged with by the community itself. Digital platforms, audio-visual documentation and emerging tools such as metadata-based databases are increasingly being used to record, organize and disseminate the knowledge of culture. More advanced technologies like digital documentation practices, Light Detection and Ranging (LiDAR) for mapping the cultural landscapes and filmmaking are playing an important role in capturing tangible and intangible aspects of tribal life. Extended Reality (XR) includes Virtual Reality (VR) and Augmented Reality (AR), opening new possibilities for the representation of cultural practices, rituals and environments to be preserved and experiences in new & innovative ways. Recent research highlights that immersive technologies such as VR, AR and XR are transforming cultural heritage preservation by enabling interactive, multisensory engagement and digital reconstruction of the cultural environment (Zhang et al., 2014; Jiang et al., 2025). XR-based systems and digital heritage frameworks allow user to experience culture in more embodied and participatory ways, enhancing both preservation and transformation of knowledge (Guo et al., 2024; Anwar et al., 2025).

Traditional songs are being digitized, rituals are being visually preserved, and linguistic elements are being archived for upcoming generations. These developments indicate that technology is not merely an external force but a resource that can be actively appropriated and reshaped by the community to sustain and revitalize their cultural identity (Mendoza et al., 2023)

## II – REVIEW OF LITERATURE

**Robertson, R. (1995)** introduces the concept of glocalization, which provides a theoretical framework for understanding the interaction between global and local processes. He argues that global influences are not simply imposed on local cultures but are adapted and reinterpreted within specific contexts. This concept is particularly relevant for analyzing how indigenous communities utilize modern technologies to preserve and express their cultural identity.

**Xaxa, V. (2008)** argues that tribal identities are dynamic rather than static, continuously shaped by changing socio-economic and political conditions. His work highlights that tribal communities actively negotiate modern influences while attempting to preserve their cultural distinctiveness. This perspective is crucial for understanding how communities like the Oraon adapt to technological changes without losing their core identity.

**Dutta, U. (2019)** examines the role of digital technologies in preserving indigenous knowledge systems. The study emphasizes that digital archives and documentation tools play a significant role in safeguarding oral traditions, languages, and cultural practices. It further suggests that digitization facilitates intergenerational transmission and ensures wider accessibility of cultural knowledge.

**Parrinello, S. and Picchio, F. (2023)** further develop this discussion by examining advanced digital documentation techniques such as photogrammetry and 3D modeling. Their study highlights the importance of accurate digital reconstruction in preserving both tangible and intangible cultural heritage, particularly in vulnerable or inaccessible regions.

**Diaz Mendoza et al. (2023)** discuss the broader role of digital technologies in cultural heritage preservation. Their study emphasizes that tools such as digital databases, multimedia documentation, and information systems enable systematic organization and long-term preservation of cultural knowledge, making it more accessible for future generations.

**Rivero, O. et al. (2024)** specifically investigate the use of LiDAR and augmented reality in documenting cultural heritage sites. Their research demonstrates how LiDAR-based mapping combined with AR visualization enhances the interpretation and accessibility of heritage, particularly in cases where physical preservation is challenging.

**Zhang, J. et al. (2024)** analyze the growing use of immersive technologies such as Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) in cultural heritage. Their findings suggest that these technologies significantly enhance user engagement and provide interactive and immersive experiences, making cultural heritage more accessible and meaningful to wider audiences.

**Jiang, L. et al. (2025)** provide a bibliometric analysis of immersive technologies in cultural heritage preservation,

demonstrating a rapid increase in research and application of XR technologies. The study emphasizes that XR tools enable digital reconstruction and experiential learning, thereby strengthening cultural understanding and preservation.

**Anwar, M. et al. (2025)** examine the role of Extended Reality (XR) and the metaverse in cultural heritage education. Their study highlights how immersive environments facilitate deeper engagement and learning by allowing users to interact with cultural elements in simulated settings, thus bridging the gap between traditional knowledge and modern technology.

**Zizlavaska, N. and Herber, S. (2025)** demonstrate that LiDAR technology significantly improves the detection and documentation of hidden cultural heritage sites beneath forest cover. By integrating airborne laser scanning with 3D modelling and geomorphometric analysis, the study highlights how digital tools enhance accuracy, preservation, and public engagement, offering valuable insights for technologically driven cultural heritage conservation.

### RESEARCH GAP

While the existing body of literature provides valuable insights into the preservation of indigenous knowledge and the growing role of digital technologies, several important gaps remain. Most studies focus broadly on digital documentation, archives, and general applications of technology in cultural preservation, with relatively limited attention to the use of advanced tools such as LiDAR, Extended Reality (XR), and metadata-driven systems within tribal contexts. Furthermore, much of the research is concentrated in global or Western settings, leaving a noticeable lack of region-specific studies in the Indian context, particularly among communities like the Oraon tribe. There is also insufficient emphasis on how these technologies are socially embedded and locally adapted by indigenous communities themselves. In this regard, the perspective of glocalization (Robertson, 1995) remains underutilized in empirical studies of tribal identity and technological engagement. Therefore, this study seeks to bridge these gaps by examining how modern technologies are not only introduced but also localized and appropriated by the Oraon community for the protection and preservation of their cultural identity in the contemporary era.

### III – THEORETICAL FRAMEWORK

The study adopts a sociological framework which includes glocalization, cultural transmission and cultural capital to examine how technology helps in preservation of indigenous identity and culture on the modern world.

The centre of this follows the concept of glocalization by Robertson (1995). Viewing globalization as a force that simply erodes indigenous cultures, glocalization helps us see the picture where global and local processes constantly interact. Communities do not accept external influences without resistance, instead, reinterpreting and reshape

them according to their own cultural needs. In the case of the Oraon tribe, the use of technologies such as LiDAR, Extended Reality (XR), and digital archives reflects this very process. These tools are not just the product of the global world and borrowed from the outside, they are actively adapted and woven into local cultural practices to preserve and express identity in new ways.

Alongside this, the idea of cultural transmission helps explain how culture continues across generations. Classical sociological thought, especially that of Durkheim (1912), reminds us that shared rituals, beliefs, and collective experiences are what hold communities together over time. For tribal societies, where oral traditions and community participation have long been central, culture has traditionally been passed on through everyday interaction and lived experience. However, today these processes are expanding beyond physical spaces. Digital documentation, audio-visual recording, and immersive technologies like XR are creating new ways of sharing and preserving cultural knowledge, making it possible for traditions to reach younger generations in forms that resonate with the present (Parrinello & Picchio, 2023).

The study is further strengthened by Pierre Bourdieu's (1977) concept of cultural capital. From this perspective, culture is not just something people practice, it is also a resource that carries value and meaning. Language, rituals, and indigenous knowledge systems are all forms of symbolic capital that sustain identity over time. In this study, technologies such as metadata-based databases and LiDAR-based documentation are seen as new ways of safeguarding this capital. By converting intangible cultural elements into digital forms, these tools help store, organize, and transmit cultural knowledge in ways that can endure across generations.

Recent developments in digital heritage research further reinforce this understanding. Advanced technologies now allow for the detailed documentation and visualization of cultural landscapes, including those that may be difficult to access or even hidden from view. LiDAR, for example, makes it possible to map and preserve such spaces with remarkable precision (Zizlavaska & Herber, 2025). Similarly, 3D reconstruction and digital documentation make cultural heritage more accessible and engaging, while immersive technologies like XR open up interactive ways of experiencing traditions (Parrinello & Picchio, 2023). These innovations do not replace traditional practices, they rather extend them into new domains.

Conclusively, these perspectives offer a holistic way of understanding the relationship between technology and indigenous identity. Glocalization shows how global tools are reshaped within local contexts, cultural transmission explains how knowledge continues over time, and cultural capital highlights the importance of preserving cultural resources. Seen through this lens, technology is not simply a force of disruption. Instead, it becomes a meaningful and adaptive tool, one that supports the protection, preservation, and ongoing evolution of the cultural identity of the Oraon community in the modern era.

#### IV – RESEARCH METHODOLOGY

The study follows an interpretivist paradigm to examine the role of technology in preserving the indigenous cultural identity. A qualitative research approach is adopted. Focus group discussion, semi-structured interviews and field observation are adopted to understand the cultural heritage. Purposive and snowball sampling are used to identify the respondents. Secondary sources are utilised to create a theoretical framework and to understand the technology that could mediate cultural transmission. Analysis of data is done by reflexive thematic analysis within the lens of sociology.

#### V – DISCUSSION

The Oraons refer themselves as 'Kurukh' in their native language. The Oraon Tribal community in Jashpur, custodians of age-old knowledge, distinct traditions, and sustainable ways of living, is encountering unparalleled difficulties that jeopardize their survival. As these indigenous individuals deal with invasions of their territories, erosion of cultural identity, and social exclusion, it becomes essential to acknowledge the significance of safeguarding and preserving their community (Roy,1915).

The Oraons are the fourth largest tribal group in India, coming after the Bhils, Gonds and Santhals. They inhabit areas in the neighbouring districts of Bihar, Madhya Pradesh, and Orissa, which are part of the proposed Jharkhand state as advocated by tribal representatives. The Oraons have lived in this region for centuries, considering it their ancestral land. Since the latter half of the 19th century, there has been a steady trend of Oraons migrating in search of work in other areas, especially in eastern India. As a result, they are now present in states like West Bengal, Assam, Tripura, and the Andaman and Nicobar Islands (Xaxa, 1999).

Long ago, when Oraon tribes were settled in the Chota Nagpur plateau, these tribesmen found that the area was already inhabited by tribes that were more primitive than themselves, such as the Korwas and the Birhors, who had lived as hunters or nomads. Even tribes like the Mundas, who had started farming, were still employing very rudimentary agricultural methods (Roy, 1915). The Oraons construct their homes using mud walls and roof made from a dry mud plate known as Khapra, along with other materials like wood, bamboo, sticks, and dry hay.

The Oraon community practices a traditional religion called Sarna Dharam. Their primary deity is Dharmes, who is believed to reside in the sun. Additionally, they have several village deities integral to their religious culture, such as ChalaPacho and Gaondeoti.

#### ROLE OF TECHNOLOGY IN PRESERVING-

**i) Digital Documentation:** The Telugus, Tamils, and Kannadigas are notable as they are part of the Dravidian language group. In contrast, the 'Kurukh', the native language of Oraon tribes have largely stayed "underdeveloped" because they lack their script and

literary tradition. The digital documentation of language can help in the preservation, protection and promotion of the language. Establishing digital archives involves the organized collection and preservation of linguistic resources, including written texts, audio recordings, and video materials. Histories can be transcribed as they are mostly present in their folklore only. Archiving digital documents with the help of technology, such as Large Language Models (LLMs) where linguistic and technology experts work together to gather data, create linguistic corpora and develop tools that can process and generate texts in these vulnerable languages, will ensure the preservation of the language (Hadi, M. et al., 2023).

**ii) 3D Laser Scanning:** Homes made by the Oraon tribal community is a model of sustainable architecture. The dwellings are designed to blend with the surroundings and are constructed with the material available in the local area. They offer comfort temperature, weather adaptability, and is the solution for energy efficiency. Tribal houses provide important lessons for contemporary architecture by demonstrating a harmonious living environment, environmentally friendly and resource-efficient. In recent years, 3D scanning has been an active research area gradually expanded in the field of built heritage. This technology is being widely used in the field of preserving heritage (Li, Y. et al., 2025). Using such technology can achieve a high accuracy, non-invasive digital data of a detailed 3D scan of the housing patterns of tribes, their sacred groves, and other artefacts and architectures. These scans will help in rebuilding those for future generations in the same manner as they are not being easily seen in these days.

**iii) LiDAR:** Heritage encompasses the legacy of both tangible artifacts and intangible attributes inherited from past generations, including physical elements such as landscapes and artworks (Sharma, L. 2025). A remote sensing technique, which is Light Detection Ranging (LiDAR), can generate an accurate three-dimensional representation of surface of the Earth by measuring distances using laser light. It provides a detailed baseline of a site's condition, which aids in the identification of damage and deterioration in areas that need attention. This technology will be significantly helpful in redeveloping those damaged sites that require our serious attention and preservation (Sittler, B. 2007).

**iv) Filmmaking:** A form of conveying cultural experiences, feelings and narratives is film. Indigenous filmmaking is vital for advancing the Oraon tribal culture and safeguarding it, a significant platform allowing community to present their distinct heritage to a worldwide audience. Through the reinterpretation of literary pieces and genuine storytelling, indigenous filmmakers revitalize neglected narratives, sparking a fresh enthusiasm for the diverse cultural heritage of their areas. Initiatives aimed at revitalizing regional literature through cinematic adaptations highlight the significance of preserving culture. By transforming literary pieces from Indigenous tribes into films, directors revive overlooked tales and expose a

wider audience to the depth of tribal literature. Such adaptations not only contribute to the conservation of literary traditions but also offer a glimpse into the varied stories and customs of the area. Filmmaking is essential for the community to highlight their distinct traditions and narratives (Saxena, R. 2023).

**v) Extended Reality (XR):** an umbrella term that includes Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). It signifies a developed technology that uses the real world as its basis while augmenting it with digital information. XR has been applied in diverse areas, particularly in the management and conservation of Cultural Heritage, where it has demonstrated significant advantages (Okanovic, V. et al., 2022). Extended Reality (XR) has been applied in various sectors, such as healthcare, education, the automotive industry, medicine, and tourism. A notable application of XR is in the management and preservation of cultural heritage. Specifically, Augmented Reality (AR) plays several important roles in this area, improving viewer experiences, enabling reconstruction and exploration, supporting conservation and preservation efforts, and bringing historical events to life. Extended-reality (XR) technologies, encompassing virtual reality (VR), augmented reality (AR), and mixed reality (MR), have emerged as powerful tools for transforming cultural heritage engagement by enabling immersive, interactive, and emotionally engaging experiences. VR fully immerses users in digitally constructed environments, allowing them to experience cultural settings in a highly realistic and experiential manner (Munoz, A. et al., 2025). The primary technology utilized for these purposes is digitization, which serves as a supplementary method to safeguard cultural heritage assets and enhance traditional conservation practices. When cultural heritage is digitized, it becomes available to a diverse array of beneficiaries, including both researchers and the general populace. In particular, non-scientists show a keen interest in exploring the information provided in digital formats.

**vi) Metadata and Database:** In the documentation of digital languages and cultural heritage preservation, management plays a vital role in it. Metadata is the data about data, provides critical information about like linguistic material, patterns of cultural practices and life world. Efficient management of the database is as essential as the quality and contributors of the database itself. Safeguarding the archived records is a crucial part of this practice. Data leaks and destruction may cause serious harm to the efforts that have been put in, and we will be standing in the same place of vulnerability as before. The modern era has gifted us the metadata management system which focus on defending the attacks and proper management of the databases. Metadata management remains a cornerstone of data governance and decision making, particularly in the face of rapidly expanding and increasingly complex datasets ( Yang, W. et al., 2025)

## VII – CONCLUSION

When viewed together, these theoretical perspectives

provide a comprehensive understanding of the study's findings. Glocalization explains the adaptation of global technologies to local cultural contexts; cultural transmission highlights the continuity of knowledge through both traditional and digital means; and cultural capital emphasizes the value and reproduction of cultural resources.

The integration of LiDAR, XR, digital archives, and audio-visual documentation illustrates that technology functions as an enabling force in cultural preservation. Rather than contributing to cultural erosion, these tools support the active reconstruction and strengthening of indigenous identity. This challenges deterministic views of globalization and instead positions indigenous communities as active agents who creatively engage with technological change.

Technologies do not merely preserve Oraon cultural heritage, rather, they actively reshape how it is experienced, transmitted, and understood across generations. Festivals and ceremonies, as living cultural systems, acquire new forms of continuity through digital mediation and technological engagement. However, this transformation must remain rooted in community participation, ethical responsibility, and cultural sovereignty to ensure that preservation strengthens rather than distorts cultural meaning.

## VII – LIMITATIONS OF THE STUDY

This study has certain limitations that should be acknowledged. As it is based on a qualitative and interpretivist approach, the findings are context-specific and may not be fully generalizable to other indigenous communities. The use of purposive and snowball sampling may also introduce selection bias, as it mainly includes participants already engaged with cultural practices or digital documentation. In addition, access to some sacred elements of the Sarhul festival and child birth ceremonies was restricted due to cultural sensitivities, which limited deeper observation in certain areas.

The application of advanced technologies such as VR, AR, XR, LiDAR, and 3D scanning is largely conceptual in this study, as full-scale technical implementation was not possible during fieldwork. Furthermore, differences in digital access and literacy within the community created a gap in participation, particularly between younger and older generations. Lastly, because digital technologies evolve rapidly, the relevance of some tools and approaches may change over time.

## VIII – FUTURE DIRECTIONS

Future research can expand this study by moving from conceptual exploration to practical implementation of emerging technologies such as VR, AR, XR, LiDAR, and 3D scanning in the documentation of Oraon cultural heritage. Developing community-based digital archives with structured metadata systems would further strengthen the preservation and accessibility of cultural knowledge. Greater emphasis can also be placed on participatory

approaches, where community members themselves are trained and involved in digital storytelling, film-making, and cultural data creation to ensure authenticity and ethical representation.

Comparative studies across different tribal communities may help in understanding how digital technologies shape cultural preservation in diverse socio-cultural settings. Future work may also explore the impact of digital engagement on younger generations' cultural identity and belonging. Additionally, policy-oriented research is needed to integrate indigenous cultural preservation into broader digital heritage frameworks. Overall, future directions should focus on balancing technological innovation with cultural sensitivity and community ownership.

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