



ROLE OF TECHNOLOGY IN EMPOWERING TRIBES

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Abstract

The digital India initiative was launched in 2015 with a vision to transform India into a digitally empowered society and knowledge economy. Digital India strives to bring inclusive growth and bridge the digital divide by leveraging technology solutions that are low cost, developmental, and transformative and designed to empower ordinary Indians. However, digital services are not being uniformly distributed and accessible to all segments of the society. Though it's not a constraint, technology-wise, the geographic area where tribes normally reside, poses problems due to deep forests, hilly areas, and unavailability of cables. The matter may be overcome through wireless (mobile both voice & data) communication, line of sight is usually a problem for this reason. Once these basic issues are redressed, connectivity to the surface world can easily be provided. Some communities, the Scheduled Tribes (STs) in particular-face considerable obstacles in accessing digital services and are either completely or partially excluded. It's essential to involve residents to understand the way the tribes can be educated and use technology and thereby develop an interface that is friendly to them in a sustainable manner. It can help in understanding their requirement and thereby finding an answer acceptable to them rather than imposing it on them. If it is implemented because it is, it'll not be accepted by them. A local person should be identified and he/she should be made coordinator for better coordination with the tribes. Otherwise it'll be taken by them as an intrusion in their area/domain and they will not come forward. This paper throws its light on access to education, challenges faced by tribes in digital era, role of technology to improve the well-being....



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Introduction

Technology is playing a big role when it comes to transforming the lives of people living in tribal areas. Today, they are not only maintaining good communication within the community but also sharing scientific information about their experiential and traditional knowledge of Nature. The tribal communities are deep-rooted in the forests of southern India who are dependent on forest for their livelihood and striving for alternative sources of income to overcome vulnerability. The literacy of tribes is improved, and the tribes embrace the adoption of technology, like access to Direct to Home (DTH) and mobile phones. Technology could be made possible because of Central Government mobile network coverage in the hamlet areas. Digital media had become a significant platform for the Indigenous community to document and protect their cultural identities, one can raise one's voice and 'challenge the hegemonic misrepresentations' (Rodreguez, 2001) locally and globally, easily. Tribes are mostly self-educated by nature and their capability to overcome natural calamity is very high. Efforts are being made around the world to give Indigenous peoples a voice, to empower them to share their wisdom and stories and to ensure First Nations are involved in building our digital futures. The government has taken positive steps since towards digital accessibility. In 2013, the government approved a National Policy on Universal Electronic Accessibility. This policy is aimed at facilitating equal access to electronic and other information and communication technologies, and at creating awareness about issues pertinent to universal design and universal accessibility guidelines (National Policy on Universal Electronic Accessibility, 2013). The marginalization from dominant economic, political and legal systems many Indigenous peoples face mean our world views are routinely overlooked by modern society, but it doesn't have to be this way. Tribal people have unique cultures and ways of relating to others and the environment. Digital media is an easy way to preserve indigenous culture, knowledge, art and literature. In the contemporary era, community generated constricted identities, legitimizing narratives, and building communities both in local

and global contexts (Appadurai, 1990; Gusburg, Abu-Lughod & Larkin 2002) Digital learning frees the learners from the constraints of time and space. Another advantage is that the mobile device and computers have become common household items. With the help of digital media the barriers such as negligence and alienation of the tribals and their issues, geographical isolation, 'communication gaps such as linguistics and literacy barriers' can be overcome.' (Dutta, 2). But history has left a legacy of structural inequality and disadvantage. Coupled with lack of access to technology and skills education opportunities, this means many are being left out of the conversation in the development of future technologies. If we want safe and equitable digital futures, it is imperative Indigenous peoples have a seat at the table in the development of these technologies. In India, low-income clients are not able to afford the technology required to access digital services (Niranjan, 2017). Technology plays a pivotal role in empowering tribal communities, offering opportunities for social, economic, educational, and cultural advancements. Here's how technology contributes to the empowerment of tribes:

Access to Information and Education

- **Online Learning Platforms:** Tribal communities can access online educational resources and digital literacy programs, providing opportunities for both formal and informal education.
- **E-Learning Tools:** With access to the internet, members can learn new skills, engage in online certifications, and enhance their employability.
- **Digital Literacy:** Teaching digital skills helps tribes navigate the modern world and gain independence, increasing their participation in various sectors.

Healthcare Improvement

- **Telemedicine:** Remote tribal areas often lack proper healthcare infrastructure. Telemedicine allows them to consult doctors, access medical advice, and receive diagnoses without traveling long distances.

- **Mobile Health Apps:** Mobile health (m-Health) technologies can provide critical health information, reminders for vaccinations, maternal care, and disease prevention strategies.

Economic Development

- **E-Commerce and Entrepreneurship:** Technology enables artisans and tribal communities to sell their goods through e-commerce platforms, cutting out middlemen and providing direct access to larger markets.
- **Digital Payment Systems:** Mobile banking and digital payments allow communities to engage in the formal economy, improving access to financial services and ensuring secure transactions.
- **Job Creation and Skills Training:** Technology-driven initiatives offer training programs to improve employability in areas like IT, handicrafts, and sustainable agriculture.

Cultural Preservation and Promotion

- **Digital Archiving:** Indigenous languages, traditions, and histories can be preserved digitally, safeguarding cultural knowledge for future generations.
- **Social Media and Content Creation:** Technology enables tribes to share their cultural practices, art, and stories globally through platforms like YouTube, Instagram, and blogs, raising awareness and fostering cross-cultural exchanges.
- **Virtual Reality (VR) and Augmented Reality (AR):** These technologies can recreate traditional experiences, rituals, or environments for education and tourism, making cultural heritage accessible to a global audience.

Governance and Civic Participation

- **Digital Platforms for Advocacy:** Social media and other online tools help tribal communities to organize, advocate for their rights, and spread awareness about issues like land rights, environmental protection, and access to resources.

- **E-Governance Services:** Technology bridges the gap between tribal communities and government services, allowing them to access benefits like subsidies, legal rights, and welfare programs efficiently.

Environmental Management and Sustainability

- **Data Analytics and Satellite Technology:** These tools help in monitoring forest resources, wildlife, and sustainable farming practices, empowering tribes to manage their environment.
- **Renewable Energy Solutions:** Solar power, wind energy, and other renewable technologies provide electricity to remote tribal villages, reducing dependence on non-renewable resources and improving quality of life.

Communication and Networking

- **Mobile Connectivity:** Mobile phones and the internet connect tribal communities to the outside world, enabling communication, emergency assistance, and access to essential services.
- **Community Platforms:** Digital platforms help foster community building, encouraging collaboration among tribal groups and between tribes and external partners for mutual growth.

Challenges faced by the tribes in digital era

Tribal communities face several challenges in the digital era, ranging from access to infrastructure to preserving cultural identity while adapting to modern technologies. Chen and Wellman (2004) found that geographic location is one of the major factors affecting people's access to and use of the internet, with more prosperous regions having higher internet penetration rates than poorer or isolated regions. However, it was not a simple case of 'haves' and 'have-nots' of digital infrastructure and technology, but it was more about systematic differences that produce champions and failures of the digital society (Hargittai et al. 2018; Eubanks 2011; Dewan and Riggins 2005). Here are the key challenges they encounter:

Digital Divide

- **Limited Internet Access:** Many tribal areas, especially those in remote or rural regions, lack reliable internet connectivity. This limits their access to online education, healthcare services, and economic opportunities.
- **Inadequate Infrastructure:** Poor infrastructure such as electricity, mobile networks, and broadband services further exacerbates the digital divide, making it difficult for tribes to leverage technology fully.

Digital Literacy and Skills Gap

- **Lack of Training:** Many tribal members may not have the necessary digital skills to effectively use modern technologies. This includes basic computer literacy, using the internet, or engaging with online platforms.
- **Intergenerational Gap:** Older generations may find it more challenging to adopt digital tools and technologies, creating a gap between younger members who may be more tech-savvy.

Economic Barriers

- **High Cost of Technology:** The cost of digital devices (computers, smartphones, etc.) and internet services is often prohibitive for economically disadvantaged tribal communities. This limits access to essential tools needed to engage in the digital economy.
- **Limited Access to Financial Services:** Tribal communities may not have access to digital payment systems or online banking, which can hinder their participation in e-commerce and other online financial activities.

Cultural Erosion and Identity

- **Cultural Homogenization:** Exposure to dominant digital cultures and global media can dilute tribal traditions, languages, and practices. Younger generations may adopt mainstream values at the expense of their cultural heritage.

- **Language Barriers:** Many online platforms and educational resources are not available in indigenous languages, limiting the ability of tribal communities to engage with these resources in a way that aligns with their cultural identity.
- **Preservation of Indigenous Knowledge:** The digitization of tribal culture and traditions can be complex, as there are concerns about intellectual property rights, misrepresentation, and the commercialization of sacred practices.

Economic Exclusion in the Digital Economy

- **Lack of Market Access:** Even when tribes have traditional skills in crafts, agriculture, or tourism, they often lack the means to participate in the digital economy. Without digital literacy or online marketing skills, they are unable to sell their products online, limiting their income generation potential.
- **Limited Entrepreneurial Support:** Many tribal communities lack access to startup capital, mentorship, or support systems needed to establish online businesses or participate in digital entrepreneurship.

Language and Content Barriers

- **Lack of Multilingual Content:** Most digital content is created in dominant languages, making it difficult for tribal communities to access resources that are relevant or understandable to them.
- **Inadequate Representation of Indigenous Cultures:** Many online platforms fail to cater to the unique knowledge systems, beliefs, and histories of tribal communities, leading to underrepresentation or misrepresentation in the digital space.

Data Privacy and Security

- **Exploitation of Indigenous Knowledge:** As more tribal knowledge is digitized, there is a risk of exploitation, with corporations or individuals

using traditional knowledge for commercial purposes without compensating the communities.

- **Vulnerability to Cyber Threats:** Tribal communities may lack the technical knowledge or resources to protect themselves from online threats like cyber fraud, data breaches, or identity theft.

Environmental Concerns

- **E-Waste in Remote Areas:** The influx of digital devices, if not managed properly, can lead to electronic waste in regions that do not have the infrastructure to recycle or dispose of such materials responsibly.
- **Environmental Impact of Tech Expansion:** Introducing new infrastructure, such as telecommunications towers and power grids, in tribal lands can disrupt ecosystems, damage sacred sites, and interfere with traditional ways of life.

Social Exclusion and Inequality

- **Marginalization in Policy-Making:** Tribal communities are often excluded from decision-making processes related to the introduction of digital technologies and infrastructure. Policies that are not adapted to their needs can deepen social and economic disparities.
- **Social Isolation:** Rapid digital integration without adequate training or understanding can lead to social isolation for those who struggle to keep up, especially elders or those in the most remote areas.

Dependency on External Technologies

- **Loss of Autonomy:** Over-reliance on external technologies (e.g., social media, cloud services) controlled by non-indigenous entities can erode tribal autonomy. Tribes may become dependent on external platforms for communication, education, and commerce, limiting their control over their own digital futures.

- **Vulnerability to Global Trends:** Tribal communities are often vulnerable to global economic fluctuations, tech company policies, or internet regulations that can impact their ability to access and use technology effectively.

Inconsistent Government Support

- **Lack of Tailored Programs:** Governments often overlook the unique needs of tribal communities in digital literacy programs, infrastructure development, and technology funding.
- **Inconsistent Policies:** In some cases, government initiatives for digital development may not be sustained over the long term, leaving tribal communities with incomplete or dysfunctional digital infrastructure.

Addressing the Challenges: To overcome these challenges, efforts need to focus on:

- **Infrastructure Development:** Expanding internet connectivity and ensuring affordable access to digital tools in tribal areas.
- **Digital Literacy Programs:** Tailoring digital education initiatives to meet the unique cultural and linguistic needs of tribal communities, including training in digital skills for various age groups.
- **Culturally Relevant Content:** Creating digital content and platforms that reflect tribal traditions, languages, and knowledge systems.
- **Entrepreneurship and Market Access:** Providing resources and support for tribal entrepreneurs to participate in the digital economy, including access to e-commerce platforms and financial services.
- **Community-Led Technology Initiatives:** Involving tribes in decision-making processes and encouraging community-led projects that use technology to address local needs and aspirations.

The digital era offers significant opportunities for tribal communities, but to fully realize them, it is crucial to address these challenges in a culturally sensitive and inclusive manner.



Challenges to Overcome

While technology has immense potential to empower tribes, challenges such as lack of infrastructure, affordability, digital literacy, and cultural adaptation must be addressed for meaningful impact. When technology is appropriately implemented, it can act as a powerful tool to bridge the developmental gaps faced by tribal communities, ensuring they have equal access to

Role of technology to improve the well-being of tribal communities in India:

Technology has a significant role to play in improving the well-being of tribal communities in India by addressing some of the key challenges they face, such as healthcare, education, connectivity, livelihoods, and governance. Here are several ways technology can contribute:

Healthcare Access

- **Telemedicine:** Remote healthcare services through telemedicine can bring quality healthcare to remote tribal regions where medical infrastructure is lacking. Online consultations, diagnostic tools, and mobile health clinics can significantly reduce the healthcare gap.
- **Mobile Health Apps:** Apps providing health information in local languages can help tribal communities' access essential medical knowledge on hygiene, nutrition, maternal care, and disease prevention.
- **Drone Delivery:** Drones can be used to deliver medicines and vaccines to areas that are difficult to access due to poor road infrastructure.

Education

- **E-learning Platforms:** Digital platforms offering learning content in tribal languages can make education more accessible. Technology can provide virtual classrooms, which help overcome the challenge of inadequate educational infrastructure in remote areas.

- **Mobile-Based Literacy Programs:** Mobile learning solutions can help improve literacy rates in tribal communities by offering interactive content tailored to their cultural context.
- **Digital Libraries and Learning Resources:** Providing access to digital libraries and learning materials ensures that students and adults in tribal areas can expand their knowledge base and educational opportunities.

Digital Connectivity and Inclusion

- **Internet Connectivity:** Expanding internet access through mobile networks or satellite-based connectivity can help bridge the digital divide between tribal regions and urban areas. This connectivity opens up opportunities for education, employment, and access to government services.
- **Information Dissemination:** Technology can serve as a platform to disseminate vital information on government schemes, rights, agriculture, and market prices, helping to empower tribal people.
- **Digital Identity:** Providing digital identity through initiatives like Aadhaar enables better access to social welfare schemes, banking, and public services for tribal populations.

Livelihood and Employment

- **Digital Marketplaces:** Platforms like e-commerce can connect tribal artisans and producers directly to markets, bypassing intermediaries and ensuring fair prices for their products such as handicrafts, forest produce, and agricultural goods.
- **Agri-tech:** Technological solutions in agriculture, such as mobile apps providing weather forecasts, crop management techniques, and market trends, can help tribal farmers improve productivity and income.
- **Skill Development:** Online training programs in local languages can provide skill development opportunities, enabling tribal youth to participate in new employment sectors like digital services, manufacturing, and entrepreneurship.



Preservation of Culture and Language

- **Digital Archiving:** Technology can help preserve tribal cultures by digitally recording oral traditions, languages, rituals, and folklore. This ensures that their heritage is maintained and can be shared with future generations.
- **Cultural Platforms:** Mobile apps and websites dedicated to tribal culture can promote their art, traditions, and languages globally, creating opportunities for cultural exchange and tourism.

Governance and Empowerment

- **E-Governance:** Technology allows the government to efficiently implement and monitor welfare schemes for tribal populations. It also ensures transparency and reduces corruption in the delivery of benefits.
- **Mobile-Based Grievance Redressal:** Mobile platforms can allow tribal communities to raise grievances, report issues related to land rights, or access to government schemes, ensuring quicker resolutions and better accountability.
- **Digital Financial Inclusion:** Mobile banking and digital financial services help tribal populations manage their finances securely, reducing their dependence on informal money lenders.

Environmental and Resource Management

- **GIS and Remote Sensing:** These technologies can help monitor land use, deforestation, and environmental degradation in tribal areas, ensuring sustainable development practices. Such tools can also support tribal communities in managing their natural resources better.
- **Renewable Energy Solutions:** Solar-powered solutions can provide clean energy to off-grid tribal villages, improving their access to electricity for lighting, education, and health facilities.

Conclusion

By leveraging technology, tribal communities in India can experience improvements in their overall well-being. It enables better access to essential services like healthcare and education, promotes economic development, preserves cultural heritage, and enhances governance. For technology to be effective, however, it must be tailored to the specific needs, languages, and cultural context of these communities, ensuring inclusive and sustainable growth. Digital learning frees the learners from the constraints of time and space. Another advantage is that the mobile device and computers have become common household items. With the help of digital media the barriers such as negligence and alienation of the tribes and their issues, geographical isolation, communication gaps such as linguistics and literacy barriers' can be over-hawked.

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