

REVIEW ARTICLE

Challenges and Opportunities in Digital Preservation of Intangible Culture Heritage with Special Reference to Manjusha Art of Ang Region

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ABSTRACT

This paper explores the challenges and opportunities of digital preservation in safeguarding intangible cultural heritage, with a special focus on the Manjusha art of the Ang region. It also explores the complex relationship between technological innovation and the preservation, documentation and promotion of cultural heritage. The findings reveal key obstacles in digitization including digital obsolescence, accessibility barriers, copyright complexities, data security risks, and resource limitations. Conversely the study also highlights how digital tools enhance the archival, dissemination and accessibility of cultural artifacts, traditions and languages. The study examines the characteristics of digital preservation methods, analyzing their role in mediating the relationship between modern society and cultural traditions.

KEYWORDS

- Digital Preservation • Intangible Cultural Heritage • Manjusha Art
- Ang Region • Challenges and Opportunities

INTRODUCTION

Digital technologies offer innovative methods for creating virtual repositories they often struggle to capture the authentic essence of memory, history and tradition potentially diluting the axiological significance of heritage. Conversely digital tools such as virtual museums and artifact reconstructions play a

crucial role in conserving cultural knowledge that might otherwise vanish.

Since the 1990s, digital technology encompassing information systems, networked platforms and computational tool has undergone remarkable advancements. While its applications span diverse industrial sectors its transformative potential in cultural heritage

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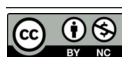
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preservation has become increasingly evident. Notably modern technological innovations have revolutionized the intangible cultural heritage (ICH) domain, marking a new chapter in conservation and revitalization efforts.

Digital platforms facilitate crowd sourcing initiatives encouraging public participation in the identification, documentation and preservation of cultural heritage (Von Schorlemer, 2020). Digital technology plays a pivotal role in the documentation, archiving, processing and dissemination of ICH. Through digitization degraded cultural artifacts can be restored and vanishing traditions can be digitally reconstructed offering novel interpretive frameworks while enhancing accessibility and safeguarding authenticity. As digital tools continue to evolve their contributions extend beyond conventional preservation methods, reshaping how intangible heritage is both protected and promoted. According to Maraieva (2022) envisions technologies serving as tools with information playing a synergistic role that connects humans, society, nature and technology.

Recent progress in information technology, computing and digital storage solutions has enabled more effective ICH preservation. The integration of advanced digitization techniques ensures that endangered cultural expressions are accurately recorded and sustainably maintained. Given these advancements the adoption of digital technology in ICH conservation is no longer optional but an essential pathway forward. Core developments in computer based digitization present unprecedented opportunities ensuring that intangible heritage endures in an increasingly digital world.

In the context of *Manjusha* art, digital initiatives prove instrumental in safeguarding intangible heritage, reducing vulnerability to loss and fostering broader cultural appreciation. The research underscores that the integration of technology and heritage conservation not only addresses immediate preservation challenges but also establishes a sustainable framework for protecting cultural treasures in a rapidly changing world.

Research Framework: Examining Digital Technologies in Cultural Heritage Preservation

This study establishes a comprehensive research paradigm to critically analyze how digital technologies contribute to the safeguarding and dissemination of cultural heritage. The investigation focuses on three interconnected dimensions that collectively address both the transformative potential and inherent challenges of digital preservation approaches.

First, the research examines the capacity of digital technologies to conserve intangible cultural heritage. This includes analyzing how tools like immersive augmented reality experiences, AI-assisted language documentation systems and interactive digital storytelling platforms can effectively capture and transmit living traditions, oral histories and ritual practices to future generations. Particular attention is given to evaluating how these technologies maintain the contextual authenticity and cultural significance of heritage elements during the digitization process.

Second, the study explores the methodological frameworks for digitally documenting and increasing access to cultural artifacts, traditions and endangered languages. This involves assessing various digitization techniques from high resolution 3D scanning and spectral imaging to block chain based provenance tracking while considering their appropriateness for different types of cultural materials. The research also investigates how digital archives and knowledge management systems can be designed to balance widespread accessibility with cultural sensitivity and community ownership rights.

Third, the investigation critically engages with the fundamental challenges inherent in digital preservation efforts. This includes analyzing issues of technological obsolescence the potential dilution of cultural meaning through digital mediation and the ethical considerations surrounding the commodification of digitized heritage. The study pays special attention to tensions between preservation accuracy and interpretive flexibility as well as the practical constraints faced by communities with limited technological infrastructure.

Through this multidimensional framework, the research aims to develop evidence based guidelines for implementing digital preservation strategies that are both technologically robust and culturally respectful. The findings seek to contribute to ongoing scholarly discussions while providing practical insights for heritage professionals, policymakers and indigenous communities engaged in preservation work. The ultimate goal is to advance digital approaches that genuinely serve the needs of cultural bearers while ensuring the longevity of diverse heritage traditions in an increasingly digital world.

Manjusha Art: An Intangible Cultural Heritage of the Ang Region

Manjusha art represents a profound intangible cultural heritage that embodies the living traditions, spiritual beliefs and collective memory of the Ang region (currently Bhagalpur district) in Bihar, India. As an oral and visual tradition passed down through generations this sacred art form encapsulates far more than mere aesthetic expression it serves as a vital vessel for cultural transmission, community identity and ritual practice.

The intangible essence of Manjusha art manifests in multiple dimensions. At its core lies the oral tradition of the *Bihula-Bishahari* legend, a mythological narrative that artisans recite while creating their paintings. This storytelling aspect transforms each artwork into a performative act, where the creative process becomes inseparable from the sacred tales being narrated. The art form's distinctive visual vocabulary triangular human figures, symbolic motifs and sequential compositions functions as a sophisticated mnemonic system that encodes ancestral knowledge and cosmological beliefs.

As intangible heritage, Manjusha art thrives through its deep connection to seasonal festivals and religious observances. The annual Bishahari puja sees these paintings transition from artistic objects to sacred implements used in rituals that invoke divine protection and community wellbeing. This ritual context gives the art form its living, evolving character as each generation of practitioners interprets traditional motifs while maintaining their spiritual essence.



Figure 1: Manjusha painting(using only green red and yellow colour) depicting Sati Bihula carrying the bodies of her husband Lakhendra in a boat made of banana stems and travelling to heaven on the holy river Ganga



Figure 2: View of Dhobi Ghat on the river Ganga, From where Bihula started her journey

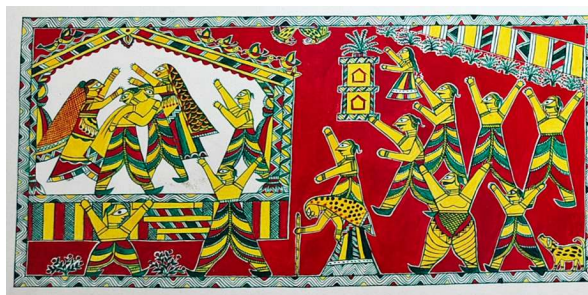


Figure 3: Manjusha painting depicting the marriage ceremony of Bihula and Lakhendra



Figure 4: The people of Ang region worshipping Bishahari

The transmission of Manjusha art occurs through an informal guru-shishya (master-apprentice) tradition, where technical skills, symbolic meanings and ritual protocols are taught through immersive practice rather than formal documentation. This knowledge system

encompasses not just painting techniques but also the preparation of natural pigments, the crafting of bamboo surfaces, and the proper ceremonial use of completed artworks.

Currently this intangible heritage faces critical threats from modernization including the erosion of oral transmission channels, declining ritual significance among younger generations and the commodification of sacred designs. Preservation efforts must therefore focus not merely on conserving physical artworks but safeguarding the complete ecosystem of knowledge, skills and cultural practices that give Manjusha art its profound meaning as living heritage.

The art form's intangible value lies precisely in this holistic integration of artistic skill, oral narrative, ritual function and community identity. A fragile constellation of cultural elements that digital preservation initiatives must approach with both technological sophistication and deep cultural sensitivity.

Despite its cultural richness, Manjusha art faces significant challenges. With only around 50 practicing artisans remaining the tradition is at risk of fading from mass produced imitations. Recognized with a Geographical Indication (GI) tag in 2018, efforts are underway to preserve and revitalize this heritage. Digital technologies like 3D scanning and augmented reality are being explored to document and promote the art while community initiatives aim to empower artisans and sustain their craft.

More than just an artistic expression Manjusha art embodies the spiritual and social identity of the Ang region. Its survival depends on a harmonious blend of traditional preservation and modern innovation ensuring that this cultural treasure continues to inspire future generations.

Digital Approaches to Cultural Heritage Preservation

The application of digital technologies has revolutionized cultural heritage preservation through multiple innovative methodologies:

1. **Digital Documentation of Cultural Artifacts:** Advanced imaging technologies, including high-resolution photography and 3D scanning systems, enable comprehensive digital capture of cultural

objects. These techniques preserve both macroscopic features and microscopic details of artifacts while photogrammetry and structured light scanning generate precise three dimensional digital models. Such documentation facilitates virtual examination and analysis while minimizing physical handling of delicate objects.

2. **Digital Archiving Systems:** Cultural institutions now implement sophisticated digital repositories that systematically organize and preserve diverse heritage materials. These databases incorporate metadata standards and cloud based storage solutions ensuring long term accessibility while maintaining the integrity of historical documents, multimedia recordings and artifact documentation.
3. **Performance and Practice Preservation:** Ethnographic recording techniques employ professional-grade audio-visual equipment to document intangible cultural expressions. High-fidelity audio recordings, 360 degree video capture, and motion capture technologies preserve the nuances of traditional performances, rituals and craft processes with exceptional accuracy.
4. **Linguistic Conservation:** Digital linguistics tools address language endangerment through systematic recording, transcription and analysis. Mobile applications, speech recognition software and interactive databases create comprehensive records of endangered languages including their phonological, syntactic and semantic structures.
5. **Participatory Preservation Models:** Crowdsourcing platforms and community based digital initiatives engage local populations in heritage documentation. These collaborative approaches leverage mobile technologies and social media to collect oral histories, vernacular knowledge and personal heritage narratives from community members.
6. **Geospatial Documentation:** Geographic Information Systems (GIS) and satellite imaging provide robust frameworks for mapping and monitoring heritage sites. These technologies support condition assessment, risk mapping, and

conservation planning through precise spatial data analysis.

7. **Digital Accessibility Solutions:** Virtual museum platforms and online exhibitions employ web based technologies to democratize access to cultural collections. Interactive digital displays, augmented reality applications, and high resolution zoom features enable global audiences to engage with heritage materials while maintaining contextual information and scholarly interpretation.

These digital methodologies collectively enhance preservation outcomes while addressing challenges of physical deterioration, access limitations and knowledge transmission. The integration of these technologies represents a paradigm shift in cultural heritage conservation strategies offering both precision in documentation and breadth in public engagement.

Key Challenges in Digital Cultural Heritage Preservation

The digitization of cultural heritage presents several critical challenges that must be addressed to ensure ethical, sustainable and effective preservation efforts:

1. **Ownership and Legal Protection:** When cultural items are digitized, complex questions arise about who controls these digital versions. Museums and communities must carefully navigate copyright laws to protect creator's rights while still allowing appropriate public access especially for culturally sensitive materials.
2. **Digital Security Risks:** The transition to digital formats introduces new vulnerabilities. Sacred texts, private rituals and other sensitive cultural knowledge require special protection against hacking, unauthorized use and data breaches through robust cyber security measures.
3. **Cultural Sensitivity:** Misinterpretation of cultural heritage can arise if digitization is conducted without community involvement. Collaborative approaches that prioritize local perspectives are crucial to maintaining authenticity and preventing cultural harm.
4. **Resource Constraints:** Many cultural institutions particularly those with limited

funding, struggle with the high costs of digitization including equipment, storage and technical expertise. Long term digital preservation demands sustained financial and human investment posing barriers for smaller organizations.

5. **Ethical Considerations:** Digitization raises concerns about cultural ownership, consent and appropriate usage. Ethical frameworks must guide the digitization process ensuring that communities retain agency over their heritage and that digital representations remain respectful and accurate.
6. **Digital Conservation:** Unlike physical artifacts digital materials face unique threats including format obsolescence, software dependency and data degradation. Proactive strategies such as migration, emulation and redundancy are needed to ensure long term accessibility.
7. **Standards and Interoperability:** The absence of universal digitization and metadata standards complicates data sharing and integration across institutions. Developing consistent protocols is essential for creating interconnected accessible digital heritage repositories.
8. **Global Collaboration and Coordination:** Cultural heritage often transcends national boundaries necessitating international cooperation. Establishing shared best practices, policies and technological infrastructures can enhance cross border preservation efforts while respecting diverse cultural contexts.

Addressing these challenges requires a multidisciplinary approach, integrating legal, technical and ethical strategies to ensure that digital preservation efforts are both sustainable and culturally responsible.

The Transformative Role of Digital Technology in Safeguarding and Transmitting Intangible Cultural Heritage

Digital technology has revolutionized the preservation and transmission of intangible cultural heritage (ICH) through innovative documentation and storage solutions. Advanced capture methodologies including high resolution 2D/3D scanning, photogrammetry, holographic imaging and motion capture systems, enable comprehensive

recording of ephemeral cultural expressions with unprecedented precision. These technological solutions facilitate the creation of detailed digital surrogates that preserve both the tangible and intangible dimensions of cultural practices. Digital dissemination platforms effectively transcend geographical limitations, enabling intercultural dialogue while maintaining the authenticity of transmitted content (Zhang *et al.*, 2022).

The conventional paradigm of museum centered ICH preservation has demonstrated significant limitations in contemporary contexts. Current preservation requirements necessitate transitioning from static archival models to dynamic, cloud based ecosystems incorporating computational analysis distributed storage and interactive playback functionalities. This paradigm shift enables more robust transmission mechanisms aligned with the living nature of intangible heritage.

Digital preservation methodologies offer distinct advantages over traditional approaches particularly for critically endangered cultural expressions. The capacity for rapid documentation and stabilization of vanishing traditions provides crucial temporal buffers for subsequent preservation initiatives, effectively mitigating the rate of cultural erosion. This technological intervention proves particularly valuable for time sensitive preservation scenarios where traditional methods would prove inadequate.

The integration of these digital solutions represents not merely an enhancement of existing practices, but rather a fundamental transformation in our approach to cultural heritage conservation. By leveraging these technological advancements preservationists can address both the immediate challenges of cultural erosion and the long term requirements of sustainable heritage transmission in the digital age.

CONCLUSION

The digital preservation of intangible cultural heritage, as exemplified by the Manjusha art of the Ang region, presents both significant challenges and transformative opportunities. While technological advancements offer innovative solutions for documentation, archiving and dissemination. They must be

carefully balanced with ethical considerations, cultural sensitivities and sustainable practices. For Manjusha art, digital tools can play a pivotal role in safeguarding its intricate motifs, oral narratives and ritual significance. However challenges such as digital obsolescence, authenticity maintenance and equitable community participation must be addressed to ensure meaningful preservation. The opportunities enhanced global visibility, intergenerational transmission and creative revitalization highlight the potential for digital methods to not only conserve but also revitalize this unique heritage.

Moving forward a collaborative approach involving artists, technologists, policymakers and local communities will be essential. By integrating traditional knowledge with cutting edge digital strategies. We can ensure that Manjusha art and intangible cultural heritage at large thrives in the digital age while retaining its cultural essence. Future research should focus on developing culturally adaptive frameworks that bridge technological innovation with heritage sustainability ensuring that preservation efforts remain inclusive, dynamic and true to their origins. This study underscores the need for a balanced, interdisciplinary strategy to harness digital potential while respecting the living spirit of intangible heritage. The lessons drawn from Manjusha art can inform broader efforts to protect and promote the world's diverse cultural traditions in an increasingly digital world

REFERENCES

1. Chaudhury, P.C. Roy. (1962). *Bihar District Gazetteers Bhagalpur*. Patna: The Superintendent Secretariat Press, Bihar, Patna.
2. Government of Bihar. (2020). *Manjusha Art: Geographical Indication Tag Application Report*. Department of Art, Culture & Youth.
3. Maraieva, U. (2022). On the formation of a new information worldview of the future (literature review). *Futurity Philosophy*, 1(1), 18-29.
4. Mishra, S. (2018). *Manjusha Art: The Ancient Storytelling Art of Ang Pradesh*. Bihar Heritage Publishing.
5. Parijeet, Shiv Sankar Singh. (2018). "Anga Janapad ki Lok-ghatha; Bihula Vishahari abang

- Manjusha Paintings." *Himangini*, 79-83.
6. Patel, D., & Joshi, M. (2023). Digital repositories for folk art preservation: The case of eastern Indian traditions. *International Journal of Intangible Heritage*, 18, 45-59.
 7. Sharma, J.C. (2010). *Manjusha Folk Art*. Varanasi: Bharati Prakashan.
 8. Srinivasan, K. (2021). Digital preservation of Indian folk arts: Challenges and solutions. *Journal of Cultural Heritage*, 48, 152-160.
 9. UNESCO. (2003). *Text of the Convention for the Safeguarding of the Intangible Cultural Heritage*, 2003. <https://ich.unesco.org/en/convention>
 10. Von Schorlemer, S. (2020). UNESCO and the Challenge of Preserving the Digital Cultural Heritage. *Santander Art and Culture Law Review*, (2(6)), 33-64.
 11. Zhang, L., et al. (2022). "Digital Solutions for Intangible Cultural Heritage Preservation." *Journal of Cultural Heritage Management*, 15(3), 245-260.