5 Traditional Knowledge and Cultural Heritage in the Age of AI: Shaping the New Cultural Economy in India

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Abstract

Artificial intelligence is increasingly transforming the preservation, circulation, and economic value of traditional knowledge and cultural heritage in India. In the Indian context, traditional knowledge includes indigenous practices, oral traditions, medicinal systems, local languages, folk arts, and artisanal skills transmitted across generations, while cultural heritage includes both tangible and intangible forms sustained by communities and institutions. AI has begun to influence manuscript preservation, language technologies, digital archives, handicraft visibility, and heritage-based tourism, thereby contributing to the emergence of a new cultural economy. At the same time, this transformation should not be interpreted as uniformly beneficial. The same technologies that expand access can also detach cultural expressions from community control, flatten historical context, and convert living traditions into marketable data. This paper argues that AI can strengthen India's cultural economy only when it is guided by ethical governance, community participation, and culturally sensitive policy frameworks.

Keywords: Traditional Knowledge, Cultural Heritage, AI, Policy Frameworks, Ethical Governance.

Introduction

The expansion of artificial intelligence into cultural sectors has altered the ways in which societies preserve, interpret, and circulate heritage. In India, this development carries special significance because heritage is not limited to monuments or museums; it also exists in songs, rituals, manuscripts, craft practices, oral traditions, medicinal knowledge, and local languages. Official cultural policy in India recognizes this broad spectrum by treating tangible, intangible, and knowledge heritage as interconnected domains rather than isolated categories. This wider understanding is essential because AI does not simply enter archives; it also enters living social worlds where culture is practiced, transmitted, and economically sustained.

The central argument of this paper is that AI is helping shape a new cultural economy in India by turning heritage into something more digitally accessible, economically visible, and globally circulable. However, this process requires critical examination. Technologies that preserve and promote culture can also decontextualize it, commodify it, and redistribute authority away from the communities that sustain it. AI is therefore not merely a technical addition to the cultural sphere; it changes the terms on which culture is classified, discovered, valued, and exchanged. A serious academic analysis must therefore ask not only what AI can do for heritage, but also what AI does to heritage when it restructures access and meaning through data-driven systems.

Conceptual Framework

Traditional knowledge and cultural heritage are closely related but conceptually distinct. UNESCO describes intangible cultural heritage as living practices, expressions, knowledge, and skills recognized by communities as part of their cultural identity and transmitted from generation to generation. WIPO describes traditional knowledge as knowledge, know-how, practices, and skills developed and sustained in a traditional context, while traditional cultural expressions include forms such as music, dance, art, designs, symbols, performances, handicrafts, and narratives. Together, these definitions make clear that heritage is not only a collection of old objects; it is also a living system of memory, skill, and social meaning. This distinction is important because AI operates most easily on codified material, while much of cultural life remains embodied, oral, and context-dependent.

A second conceptual issue concerns continuity and authenticity. Living heritage survives not because it remains unchanged, but because it is continually adapted and recreated within communities. AI systems, by contrast, usually rely on classification, standardization, and reproducibility. This creates a structural tension. What is culturally meaningful may be fluid, local, and variable, while what is computationally useful is often that which can be fixed, labelled, and repeated. For this reason, AI can assist cultural preservation only up to a point; beyond that point, the logic of computation may begin to reshape the very thing it seeks to preserve. A formal study of AI and heritage must therefore address not only preservation of content but preservation of context, plurality, and community interpretation.

India’s Heritage and Traditional Knowledge Landscape

India’s heritage landscape is exceptionally diverse, encompassing manuscripts, classical and regional languages, tribal knowledge systems, folk traditions, ritual practices, handloom, handicrafts, and traditional medicine. This diversity is cultural, linguistic, and economic at the same time. Heritage in India is not merely symbolic; it is also tied to livelihoods, local identity, artisanal production, and regional economies. Government sources on textiles and handicrafts indicate that

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heritage-linked sectors continue to hold significant economic value, including through exports and employment. This means that any discussion of AI and heritage in India must move beyond preservation alone and account for the material conditions under which culture is produced, transmitted, and monetized.

At the same time, India's cultural abundance is marked by deep unevenness. Some traditions are institutionally recognized, documented, and promoted, while others remain local, oral, and vulnerable to disappearance. This matters because AI systems tend to perform best where data already exists. Better-documented languages, archives, and crafts are more likely to benefit from digital preservation than low-resource traditions that remain weakly represented in formal repositories. A major concern, therefore, is the emergence of a digital hierarchy of heritage in which already visible traditions become even more visible, while fragile community knowledge remains excluded from technological support. In such a scenario, AI does not merely reflect cultural inequality; it risks intensifying it.

AI in Heritage Preservation and Documentation

One of the most important areas in which AI can contribute is heritage preservation and documentation. India's National Mission for Manuscripts describes its mandate as identifying, documenting, conserving, and making accessible the manuscript heritage of the country. It also notes that India possesses one of the world's largest manuscript collections. Such scale makes digital tools increasingly necessary for cataloguing, retrieval, restoration, and public access. AI can assist this work through optical character recognition, handwritten text processing, multilingual search, metadata creation, and pattern recognition across large collections. These are not minor technical conveniences; they increasingly shape the infrastructure through which historical knowledge becomes legible to scholars and citizens alike.

Yet documentation should not be confused with safeguarding. A digitized manuscript, archive, or oral record may be easier to store and search, but this does not automatically preserve its social meaning, ritual use, or interpretive depth. AI-based archival systems also alter the nature of authority: where classification once depended primarily on historians, philologists, librarians, and community custodians, algorithmic systems now increasingly influence how heritage is indexed and retrieved. This may improve efficiency, but it also risks privileging technical organization over cultural understanding. A digital archive can appear complete while still being culturally incomplete if it lacks community voices, indigenous frameworks of interpretation, or contextual knowledge about how material is used in living practice.

AI, Indian Languages, and Cultural Access

Language is one of the strongest points of contact between AI and cultural heritage in India. Since many oral traditions, folk narratives, ritual practices, and local knowledge systems are carried through language rather than through formal

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archives, language technologies can play a major role in preservation and access. The BHASHINI initiative presents itself as an AI-powered multilingual platform intended to bridge language, literacy, and digital divides. Its stated mission and impact reflect a national effort to make digital services and communication more accessible across Indian languages. This has direct implications for heritage because cultural participation in India is inseparable from linguistic participation.

However, the significance of language AI extends beyond convenience. Language is not merely a medium of communication; it is a carrier of worldview, memory, rhythm, symbolism, and identity. AI tools for translation, speech recognition, transcription, and text-to-speech can widen access to cultural materials, but they do not automatically preserve the full cultural logic of the languages they process. Translation may transmit information while still losing tone, metaphor, performance context, or communal meaning. For this reason, language AI must be evaluated not only in terms of scale and efficiency but also in terms of representational depth. If it privileges dominant languages and standardized forms, it may reproduce hierarchy while appearing inclusive.

AI, Crafts, and the New Cultural Economy

AI is also beginning to reshape the economic dimension of heritage, especially in the domains of handloom, handicrafts, and traditional creative industries. Digital systems can improve cataloguing, demand forecasting, inventory management, language-based product discovery, and storytelling around provenance. In this sense, AI contributes to a new cultural economy in which heritage becomes more searchable, marketable, and visible to wider audiences. This transition can create opportunities for artisans and small producers by expanding access to consumers, reducing informational barriers, and strengthening digital presence. In policy terms, this suggests that cultural heritage is increasingly becoming part of innovation-driven development rather than remaining confined to conservation discourse.

At the same time, market expansion is not identical with justice. Digital platforms often reward speed, visibility, personalization, and trend responsiveness, and these pressures can gradually alter the aesthetic and cultural character of traditional crafts. Artisans may be encouraged to modify designs for algorithmic visibility or consumer preference rather than for continuity within their own traditions. The danger is not only economic dependency on platforms; it is also the slow transformation of tradition into a market style shaped by digital demand. AI may therefore preserve the appearance of tradition while quietly reshaping its substance. A careful research approach must acknowledge that cultural economies can be modernized in ways that either strengthen or erode the communities from which they draw value.

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Policy, Tourism, and Cultural Trade

Public policy plays a decisive role in determining how AI enters the cultural sphere. India's institutional landscape already includes a framework of ministries, missions, archives, and digital platforms concerned with manuscripts, languages, and intangible heritage. Such institutions provide the infrastructure through which AI can be integrated into preservation, public access, and cultural administration. This matters because technological change in heritage is rarely spontaneous; it is shaped by policy choices about what to digitize, what to fund, what to classify, and whose knowledge receives institutional recognition. Therefore, AI in the cultural domain should be understood as part of governance, not merely as an isolated technical development.

These developments also have implications for tourism and cultural trade. Multilingual interfaces, searchable heritage repositories, and digital discovery systems can make sites, practices, and products more accessible to broader publics. In principle, this can support heritage tourism and cultural commerce by helping people find, understand, and engage with cultural materials across linguistic and regional boundaries. Yet such benefits are uneven unless policy deliberately resists selective visibility. Tourism and market systems often privilege the most recognizable, aesthetically attractive, or commercially successful traditions, leaving less visible communities further behind. A culturally responsible policy must therefore ask whether AI broadens access across the full map of Indian heritage or merely amplifies those forms that were already easier to market.

Ethical and Legal Challenges

The ethical and legal issues surrounding AI in heritage are substantial. UNESCO's framework on the ethics of artificial intelligence emphasizes principles such as fairness, transparency, accountability, human rights, and human oversight. These principles are particularly relevant in cultural contexts because AI systems do not simply store culture; they classify, translate, prioritize, and sometimes generate representations of it. WIPO's work on traditional knowledge and traditional cultural expressions further underscores that conventional intellectual property systems do not fully resolve questions of protection, ownership, and benefit-sharing in relation to community-based knowledge. As a result, the legal framework around heritage in the AI age remains incomplete.

India's Traditional Knowledge Digital Library offers an important example of both the promise and the limits of digital protection. CSIR describes TKDL as a pioneering initiative designed to protect Indian traditional medicinal knowledge and prevent misappropriation through the wrongful grant of patents. This is a significant achievement because it demonstrates how documentation can serve defensive legal purposes. Yet the deeper challenge remains unresolved. Documenting knowledge is

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not the same as ensuring justice for knowledge holders. Once traditional knowledge or cultural expressions enter digital systems, questions arise about consent, interpretation, access, attribution, and commercial use. The hardest issue is therefore not technical storage, but authority: who has the right to digitize, classify, circulate, or reinterpret community knowledge in the first place?

A further challenge concerns authenticity in the age of generative systems. AI can restore damaged images, imitate voices, generate designs inspired by traditional motifs, and recombine styles in ways that blur the line between preservation and fabrication. Such tools may be useful for education or public engagement, but they can also distort cultural meaning if generated outputs begin to circulate as if they were authentic community expressions. In that case, heritage becomes vulnerable not only to appropriation but also to misrepresentation. The problem is not simply that AI can copy tradition; it is that digital copies may acquire authority in spaces where the original community has little control. Ethical governance must therefore protect not only access to culture, but also the integrity of cultural representation.

AI and the Ritual Ecology of Indian Festivals

Indian culture cannot be understood only through archived objects, manuscripts, and institutional repositories; it is also sustained through recurring cycles of collective performance. Festivals such as Diwali, Holi, Durga Puja, Navratri, Onam, Bihu, Pongal, Eid celebrations in local Indian settings, Guruparabs, and Rath Yatra are not isolated events but dense cultural systems that bring together ritual knowledge, food practices, costume traditions, seasonal songs, temple arts, marketplace exchanges, and intergenerational learning. From the perspective of cultural economy, such festivals activate entire networks of local production, including potters who make diyas, weavers who produce ceremonial textiles, florists, folk performers, sweet makers, metal artisans, idol makers, rangoli designers, and ritual specialists. When AI enters this field, it does not simply document a celebration; it begins to mediate the visibility, discoverability, and commercial circulation of the many forms of knowledge embedded within festival life.

AI tools can contribute positively in this area by creating multilingual documentation of songs, oral narratives, chants, and ritual procedures that are otherwise transmitted locally and often remain under-recorded. Image recognition and cataloguing systems can help preserve visual motifs associated with alpana, kolam, pattachitra-based festive iconography, temple decorations, and region-specific craft forms. Recommendation systems on cultural platforms can also connect younger audiences to local histories behind festivals that are increasingly consumed only as spectacle. In India, where one festival frequently carries many regional forms, AI can help reveal plurality rather than flatten it, provided the system is trained to recognize regional context. For example, harvest celebrations in different parts of

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India may share a seasonal logic while expressing very different agricultural histories, songs, cuisines, and ritual symbols. A culturally responsible digital system should therefore present these traditions as related but not interchangeable.

However, the ritual ecology of festivals also makes visible the limits of a purely data-driven approach. Festivals are not only visual events to be classified; they are participatory experiences governed by timing, sacred meaning, bodily practice, and social relations. A machine may identify objects in a procession or translate a hymn into another language, but it may not fully register what participation means for a community that experiences the ritual as devotion, obligation, memory, and belonging. If AI-based platforms overemphasize spectacular and marketable aspects of festivals, there is a risk that cultural representation becomes selective: what is colorful, sellable, and platform-friendly receives attention, while local ritual discipline, oral instruction, and community labour remain invisible. This is especially important in the Indian context because many traditions survive not through formal institutions but through repeated collective enactment. Therefore, any AI model of festival heritage must preserve not only the image of celebration but also the social knowledge through which the celebration acquires meaning.

Community Knowledge, Sacred Geography, and Local Memory in India

A second dimension that deserves greater attention is the relation between Indian culture and sacred geography. Indian civilization has long organized memory through landscapes as much as through texts. Rivers, ghats, pilgrimage circuits, village shrines, monasteries, dargahs, sacred groves, stepwells, mountain paths, and temple towns all function as sites where history, devotion, ecology, and livelihood intersect. Places such as Kashi, Prayagraj, Madurai, Puri, Ajmer, Amritsar, Bodh Gaya, Hampi, and countless less globally visible local centres are not only destinations; they are repositories of layered meanings produced by oral narratives, local legends, seasonal practices, and community custodianship. In such settings, heritage is spatially embedded. It lives in routes, gestures, occupations, and repeated acts of remembrance.

AI can strengthen the preservation of this spatially embedded heritage by assisting in the mapping, annotation, and interpretation of culturally significant locations. Intelligent search systems can help users discover not only major monuments but also lesser-known local heritage sites tied to oral tradition or community practice. Speech-based interfaces in Indian languages can make local archives more usable for elders, pilgrims, students, and regional researchers. Machine-assisted documentation can also help record narratives associated with neighbourhood shrines, artisan quarters, and pilgrimage routes before such knowledge disappears under pressures of migration, urban restructuring, or tourism-driven standardization. In a country as vast as India, where many communities

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preserve memory outside formal written archives, AI-supported place-based documentation can become a valuable method of cultural continuity.

Yet sacred geography also raises difficult questions of authority and interpretation. When a local community explains the significance of a pond, a shrine, a tree, a procession route, or a hill path, that explanation is often inseparable from faith, custom, caste dynamics, local ecology, and historical conflict. AI systems tend to prefer clean metadata, stable categories, and searchable descriptions. But Indian sacred landscapes are often plural, contested, and layered with multiple meanings that do not fit a single authoritative label. A place may be at once archaeological, devotional, ecological, and political. It may be differently understood by priests, pilgrims, women in the locality, artisanal communities, historians, and municipal authorities. Therefore, digital representation should not erase interpretive plurality in the name of technical clarity.

This issue becomes even more significant when sacred geography enters tourism and platform economies. Digital discovery systems may direct visitors toward a set of high-visibility locations while bypassing the communities that maintain them. Markets around pilgrimage and heritage tourism can expand rapidly, but expansion may also increase pressure on fragile local infrastructures and living traditions. In India, where cultural places are often inseparable from local economies of offerings, food, craft, music, and hospitality, technological mediation must be designed carefully. The question is not only how to attract attention to cultural places, but how to ensure that attention translates into respectful engagement and equitable benefit. AI should help represent India's sacred geographies as living cultural worlds rather than as decontextualized points on a digital map.

Indian Aesthetics, Artisanship, and the Future of Cultural Creativity

The discussion of cultural economy in India also needs a stronger engagement with aesthetics. Indian cultural production has historically involved highly developed theories of form, symbolism, rasa, devotion, ornament, rhythm, and embodied skill. Whether one looks at classical music, miniature painting, temple sculpture, Bharatanatyam, Kathak, weaving traditions, bamboo work, Madhubani painting, Channapatna toys, Bidri craft, Kutch embroidery, or tribal visual cultures, one encounters not only products but disciplined systems of making and meaning. These systems are usually learned through apprenticeship, family transmission, community practice, or guru-shishya style pedagogy. Their value lies as much in process as in output. This is precisely why AI-generated simulations of style demand careful scrutiny in the Indian context.

There is no doubt that AI can open new possibilities for cultural visibility. Artisans can use digital tools to catalogue motifs, explain provenance, reach new customers, and preserve design memory across generations. Museums and

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educational platforms can build interactive systems that help learners understand regional forms of ornament, iconography, instrument traditions, or performance vocabularies. AI can support transcription of oral teaching materials, improve search across collections, and assist designers in identifying historical patterns without physically handling fragile objects. These uses may reduce informational barriers and help heritage sectors adapt to changing market conditions, especially when younger practitioners need new digital pathways to sustain inherited professions.

Nevertheless, Indian artisanal and aesthetic traditions are not simply datasets of reusable motifs. A Banarasi weave, a Warli composition, a Kuchipudi performance, or a Dhrupad lineage carries context, discipline, and social history. If generative systems are trained on such materials without consent, attribution, and benefit-sharing, they may produce commercially attractive outputs while bypassing the actual communities and practitioners who sustain the tradition. The result would be a familiar pattern of extraction in digital form: value is captured from culture without responsibility to culture bearers. This concern is particularly serious in India, where many traditional practitioners already work within conditions of economic vulnerability, unequal recognition, and unstable market access. AI may amplify opportunity, but it may also intensify asymmetry if computational creativity is celebrated while living creators remain underpaid.

A culturally grounded policy response should therefore distinguish between assistance and substitution. AI may assist artisans, performers, archivists, and educators by improving access, documentation, and communication. It should not casually substitute for the communities whose authority derives from practice, lineage, labour, and situated knowledge. In fact, one of the most important contributions India can make to global debates on AI and culture is to insist that creativity is relational, not merely generative. Indian traditions repeatedly show that art emerges from pedagogy, devotion, repetition, ethical discipline, and social inheritance. A machine-generated image inspired by a folk style may imitate surface features, but it does not inherit the ritual occasion, the household practice, the local cosmology, or the labour history that made the form meaningful.

For this reason, the future cultural economy of India should not be imagined as a contest between tradition and technology. A more productive vision is one in which digital systems are designed to strengthen community archives, certify provenance, support regional language storytelling, enable fairer access to markets, and document endangered practices without stripping them of context. India's long history of plural artistic traditions makes it especially important to resist one-size-fits-all technological solutions. The aim should be to build AI systems that can accommodate diversity of region, caste experience, language, pedagogy, and aesthetic logic. Only then can technological innovation contribute to a genuinely

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inclusive cultural economy rather than merely converting Indian tradition into a reservoir of decorative content for automated reuse.

Conclusion

Artificial intelligence is becoming a major force in the transformation of traditional knowledge and cultural heritage in India. It offers significant possibilities for manuscript preservation, language access, digital archiving, artisanal visibility, and heritage-linked economic activity. At the same time, these possibilities are inseparable from questions of power, interpretation, and justice. Heritage cannot be reduced to a store of content waiting to be digitized; it is a living social resource shaped by memory, practice, and community authority. Any adequate account of AI in this field must therefore move beyond technological optimism and recognize that preservation without context can become another form of loss.

The future of India's cultural economy will depend less on how advanced its AI systems become and more on how responsibly they are governed. A meaningful model of innovation must ensure that communities remain central to cultural authority, economic benefit, and ethical decision-making. If guided by inclusive policy, legal safeguards, and culturally grounded design, AI can strengthen both preservation and participation. If governed poorly, it may transform living traditions into extractive digital assets. The real challenge, therefore, is not simply to modernize heritage, but to do so without dispossessing the people and practices that give heritage its life.

Disclosure

AI tools were used to improve grammar and enhance sentence flow.

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