

FROM TEMPLES TO TOKENS: PROTECTING INDIA'S SACRED GEOMETRY AND RELIGIOUS SYMBOLS IN THE NFT ERA

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ABSTRACT

Sacred geometric designs in India's architecture and religious diagrams like yantras and mandalas, showing advanced math principles, are now being threatened by their digitalization and market exploitation using NFTs. In this study, the researchers look into how blockchain technology uses ancient mathematical symbols as collectible assets, often without respecting how these symbols are regarded by their communities. It becomes evident from the research that copyright, patent, and trade secrets are not suitable to defend common indigenous heritage. However, efforts like India's Traditional Knowledge Digital Library ["TKDL"] have stopped biopiracy in medicinal knowledge, and yet the digital colonization of architecture and visual heritage continues to occur. The paper proposes a detailed plan that includes reforms, blockchain-based self-governance, and advanced systems that watch for any illegal use. It stresses the importance of complying with ancient traditions and sharing income with people in the area, so they continue to preserve their traditions as well. The study takes part in the new debate about safeguarding indigenous knowledge in Web3 and introduces a dharmic perspective on protecting digital heritage.

Keywords: *Traditional Knowledge, Religious Symbols, NFTs, Blockchain, digital heritage.*

I. INTRODUCTION

The intricate geometric patterns of old Indian temple walls actually represent mathematical concepts of order seen in the universe. Ancient practitioners used these geometric patterns as bridges between the physical and spiritual realms, encoding profound mathematical principles into sacred architecture. The complex mathematical knowledge exhibited in these sacred geometrical patterns is advanced and occurred before many western discoveries. As an example, the Shulba Sutras (800-500 BCE) have geometric precepts such as Pythagorean triples, approximations of square roots, and methods of squaring circles which were applied to the construction of altars. The accuracy of these mathematical principles demonstrates that ancient Indian builders combined spiritual beliefs with a high level of mathematical knowledge, making buildings that were ritually important and mathematically accurate. This integration can also be seen in the Brihadeeswarar

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Temple at Thanjavur, constructed during the 11th century, where the use of the golden ratio ($\phi = 1.618$) is reflected in the proportions of the architecture and shows how mathematical rules were understood to be crucial to the creation of spaces capable of balancing the energies of the earth and the universe.¹ Ancient practitioners encoded the profound mathematical principles into sacred architecture, creating what Maharishi Mayan describes in the Vastu Shastra as the geometric foundation underlying all creation in the universe.²

In today's world, the long-standing wisdom is encountering challenges from digital media. When Non-Fungible Tokens ["**NFTs**"] became popular, which are unique cryptographic tokens existing on a blockchain that cannot be replicated and serve as a digital certificate of ownership for an asset, be it digital or physical³ they made it possible to digitize cultural heritage, but they also allowed anyone to adopt well-known sacred symbols, ignoring their very important origins. These solemn spiritual diagrams are now offered as "*Sacred Geometry Crypto*" and "*Mandala Tokens*" on digital marketplaces, severing their traditional significance and discounting them as collectible items.

Digital progress raises uncertainty about India's highly valued mathematical customs in the fast-changing Web 3.0 world. It represents the next iteration of the internet, characterized by decentralization, blockchain technologies, and a user-centric digital environment.⁴ It becomes more complicated since these forms come from living traditions, not from work by single known writers. Older ideas about intellectual property have trouble with how sacred geometry is produced and shared by many generations.

The article analyses how India's sacred geometric practices have met the NFT development, looking at what this meeting means for both risks and opportunities. We study how monastery and *yantra* structures from old times can make use of new technology but still maintain their meanings. According to our analysis, a dharmic perspective can help keep India's sacred geometry protected in digital times, respects traditional beliefs, supports the community, and uses technology as a tool to save cultural sites rather than misusing them.

¹ Kim Plofker, *Mathematics in India in the Mathematics of Egypt, Mesopotamia, China, India, and Islam: A Sourcebook*, VICTOR J. KATZ ED., PRINCETON UNIVERSITY PRESS (2007).

² Kaarwan Team, *Exploring the Fractal Architecture and Sacred Geometry of Hindu Temples*, KAARWAN BLOG (Oct. 18, 2024), <https://www.kaarwan.com/blog/architecture/exploring-fractal-architecture-sacred-geometry-of-hindu-temples?id=1001>.

³ *Non-fungible tokens (NFT)*, ETHEREUM, <https://ethereum.org/en/nft/>.

⁴ *Introduction to Web3*, ETHEREUM, <https://ethereum.org/web3/>.

The goal is not only to safeguard ancient knowledge by turning it into digital works, but also to preserve how sacred geometric traditions unite us with the powerful mathematics that underlies all things. It means changing the usual view on intellectual property to one that respects the active nature of traditional knowledge [“TK”] and the duties of those who take care of it.

II. THE LIVING LEGACY OF INDIA’S SACRED GEOMETRY

A. Historical Evolution of Sacred Mathematical Principles

India’s sacred geometry represents one of humanity’s most advanced integrations of mathematics, spirituality, and architectural design. For over two thousand years, sacred geometry in Indian temple design was guided by texts that created mathematical rules for making structures that balance both earthly and cosmic forces.⁵

The mathematical principles governing Indian sacred architecture demonstrate remarkable continuity from the Indus Valley Civilization through classical Sanskrit texts to medieval temple construction. This chronology reveals an unbroken tradition of geometric codification.

1) Proto-Historic Foundations (3300-1300 BCE)

The precision of Harappan town planning was achieved by laying out straight aligned grids, ensuring the town blocks had a rectangular shape. The town’s drainage system and brick ratio (4:2:1) rules at Mohenjo-Daro demonstrate that the designers knew proportional geometry.⁶

2) Vedic Systematization (1500-500 BCE)

The geometric concepts embedded in Harappan planning evolved into the more sophisticated spatial theories found in Vedic literature. The Atharva Veda’s spatial concepts (circa 1200-800 BCE) evolved into specialized *Śulba Sūtras*- geometric manuals for altar construction. *Baudhāyana’s Śulba Sūtra* (8th-7th century BCE) contains:

- i. Pythagorean triples predating Greek mathematics
- ii. Circle squaring approximations ($\pi \approx 3.088$)

⁵ A. K. Singh, V. M. Das, & Y. K. Garg, *Investigating architectural patterns of Indian traditional Hindu temples through visual analysis framework*, 11 CURRENT ENGINEERING AND ARCHITECTURE 25 (2022).

⁶ Balasaidulu Kanneboina & Dr. Jogendra Singh, *Urban Planning and Architecture of Indus Cities: Exploring the Layout and Infrastructure of Harappan Settlements*, (2022), 2 INT’L J. ADVAN. RES. SCI. COMM. & TECH. 830, available at <https://ijarsct.co.in/Paper12466.pdf>.

iii. Square root 2 approximations $(1 + 1/3 + 1/12)^7$

Mathematical work in this era was centred on ritual altar construction, where experts believed that Math's precision helped unite Earth and the cosmos.

3) *Classical Codification (300 BCE-500 CE)*

The experts of the classical age culminated the mix of mathematics and spirituality by perfectly structuring the *Vastu Śāstra*. The *Manasara* (1st millennium CE) lists more than 10,000 verses that deal with every aspect of architectural rules using 70 chapters. The manual established uniform ways for building both Dravidian and Nagara temples, so their construction could be guided for many centuries in the subcontinent.⁸

4) *Medieval Applications (500-1500 CE)*

Old rules that have been handed down are demonstrated in the sacred geometry of the Kumbh Mela (recorded from the 14th century onward):

- i. Camps arranged using mandalas according to the compass points;
- ii. Yantric patterns used in small shrines;
- iii. Ritual areas that proportionally relate to each other.⁹

B. Mathematical Perfection in Architectural Expression

In India, the key messages of philosophy were most beautifully displayed in temple construction, using perfect mathematical elements for spiritual reasons. These architectural canons, codified in texts known as the *Vāstu Śāstras*, utilized geometric ground plans like the *Vāstu Puruṣa Maṇḍala* to create a model of the cosmos on earth.¹⁰ With these examples, we see that sacred geometry uses more than beauty to build spaces that represent the natural order of the universe.

1) *Golden Ratio and Cosmic Proportion*

Analysis of archaeological findings shows that the major temples in India follow sophisticated mathematical patterns that are found everywhere. The temple's layout in Thanjavur shows how Indian architecture connected with other disciplines, since golden ratio proportions (φ equals

⁷ *Supra*, note 1.

⁸ Radhakanta Seth, *Manasara: An Ancient Text on Architecture*, SAMACHAR (March 06, 2021), <https://www.samacharjustclick.com/manasara-an-ancient-text-on-architecture/> (last visited June 6, 2025).

⁹ *Sacred Geometry of Kumbh: Investigating the Ancient Principles of Sacred Geometry Embedded in the Layout and Design of the Kumbh Mela Grounds*, KUMBHMELA ENCYCLOPEDIA, <https://www.kumbhmela.co.in/encyclopedia/the-sacred-geometry-of-kumbh-investigating-the-ancient-principles-of-sacred-geometry-embedded-in-the-layout-and-design-of-the-kumbh-mela-grounds/>.

¹⁰ George Michell, *The Hindu Temple: An Introduction to Its Meaning and Forms*, UNIVERSITY OF CHICAGO PRESS (1988).

1.618) are found throughout. The style of the temple, with its many features and layout, makes use of phi ratios to give harmony to the building and suggest elements from the cosmos.¹¹

Similarly, the Konark Sun temple, where the 24 stone wheels function as precise sundials, with each spoke calculated to cast shadows at specific times, merging artistic beauty with astronomical accuracy, with very precise diameters and patterns for their spokes, show cases in controlling time and other forms of geometry.¹²

2) *Fractal Patterns and Recursive Design*

Temples in Khajuraho demonstrate India's advanced sense for geometry by using the Vastu-purusha-mandala grid.¹³ Space is arranged using the Golden Mean, where architecture from temples looks alike when repeated in smaller or larger forms, which now scientists call fractal geometry. Because the patterns have a repeating structure, the building looks in harmony no matter how far one looks.¹⁴ What we find in the design of these buildings is knowledge that has implications above and beyond decorative elements. Mathematics is used to design the mandapa so that it echoes, and the positions of the sanctums are chosen according to careful calculations of sunrise and sunset times.¹⁵ These principles explain that sacred geometry helps merge the real world and the world of spiritual belief.¹⁶

C. Yantras: Sacred Geometry as Spiritual Technology

Temple architecture represents the geometry of sacred architecture in a grand way, whereas yantras represent it in its purest and most accurate form. These intricate diagrams are designed for both meditation and for describing the cosmos, fitting extensive mathematical relationships into simple and clear pictures.¹⁷

¹¹C. Velmurugan & Kalaivanan Raja, *Existence of the Golden Ratio in Tanjavur Brihadeeswarar Temple*, 4 OPEN J. MATH. SCI. 485 (2020).

¹² Shivani Chougula, *Konark Sun Temple – A Chariot of the Sun God in Stone*, KAARWAN, <https://www.kaarwan.com/blog/architecture/konark-sun-temple-a-chariot-of-the-sun-god-in-stone?id=1462>.

¹³ Mayank Chaturvedi, *Square and Circle of Hindu Architecture*, WORDPRESS <https://chaturvedimayank.wordpress.com/2023/03/20/square-and-circle-of-hindu-temple-architecture/#:~:text=Khajuraho%20temples%20use%20the%20,its%20rises%20towards%20the%20sky>.

¹⁴ *Exploring Fractal Geometry: Nature's Hidden Patterns*, KNOWLEDGEUM ACADEMY (July 25, 2024), <https://knowledgeumacademy.in/blogs/exploring-fractal-geometry-natures-hidden-patterns#:~:text=Fractal%20Geometry%20and%20Examples,in%20video%20games%20and%20movies>.

¹⁵ R.P.B. Singh, *Cosmic Order and Sacred Geometry in the Hindu Temple of Khajuraho*, (M.K.D.S.S. PERERA (ED.), BUILT ENVIRONMENT, SACRED GEOMETRY AND DEIFORM FELLOWSHIP), GODAGE INT'L PUBLISHERS (2009).

¹⁶ A.T. MANN, SACRED ARCHITECTURE (Element Books 1993).

¹⁷ M. KHANNA, YANTRA: THE TANTRIC SYMBOL OF COSMIC UNITY (Thames & Hudson 2003).

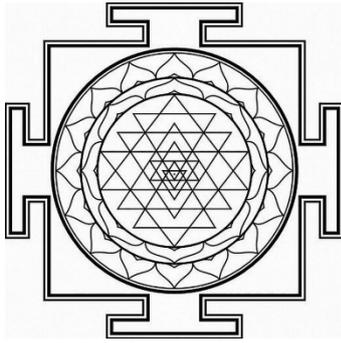


Figure 1 Sri Yantra

1) *Mathematical Foundation of Yantra Construction*¹⁸

The word “yantra” combines the Sanskrit roots “yam” (to control or restrain) and “tra” (instrument), defining these geometric forms as instruments for focusing and controlling mental attention.¹⁹

Mathematical perfection is applied during yantra formation through careful geometrical rules, so that each line, angle and intersection turns into symbolic meaning. The Sri Yantra is the most complex yantra, made up of nine interlocking triangles, with four turning upward towards Shiva and five turning downward towards Shakti. The 43 triangles formed by these nine create a unique mandala with advanced math. Very few people can fully understand the mathematical details of how the mandala is formed.²⁰

2) *Living Traditions in Contemporary Practice*

Contemporary yantra creation demonstrates how ancient mathematical principles remain vibrant and adaptive. Traditional practitioners maintain the essential geometric relationships while employing modern tools to achieve the precision these sacred forms demand.²¹ This adaptation illustrates how living traditions evolve their methods while preserving their essential characteristics such as the quality that makes them particularly vulnerable to digital appropriation that strips away both context and continuity.

3) *Cryptographic Dimension of Sacred Patterns*

Different yantra contains different patterns that act as sacred formulas for metaphysical beliefs. The Kali Yantra includes geometry shaped like a pentagon which reflects the five main elements,²² while the Ganesha Yantra is made from triangles that symbolize the deity’s abilities to get rid of obstacles and help us start something new.²³ When making a yantra, following a specific pattern,

¹⁸ *Sbri Yantra: the King of all Yantras*, KAARIGAR (2022), <https://kaarigarhandicrafts.com/blogs/kaarigar/sri-yantra-the-king-of-all-yantras>.

¹⁹ T. Dutta & M. Ghosh, *Sonic Geometry in Temple Architecture*, 11 VEDA-VAANEE 45, 45–62 (2023), <https://vedasamskrutisamiti.org.in/wp-content/uploads/2024/07/Paper-4-Issue-2-Vol1-Jul-23-vEda-vaaNee.pdf>.

²⁰ S. Hosseinabadi, *Residual Meaning in Architectural Geometry: Tracing Spiritual and Religious Origins in Contemporary European Architectural Geometry*, UNSW SYDNEY (2016).

²¹ *Unveiling the Secrets of Copper Yantra Making Machine: A Comprehensive Guide*, ASIAN STAR, 2025, <https://www.asianstarcnc.com/cnc-copper/unveiling-the-secrets-of-copper-yantra-making-machine-a-comprehensive-guide>.

²² *The Kali Yantra*, TOWARD STILLNESS, <http://towardstillness.com/resources/articles/the-kali-yantra/>.

²³ Kathleen Karlsen, *Ganesha Yantra*, VOCAL MEDICINE - KATHLEEN KARLSEN, <https://kathleenkarlsen.com/ganesha-yantra/>.

using certain mathematical ratios and shaping the ends in a set way creates what practitioners think are active forms.

D. The Challenge of Protecting Living Mathematical Traditions

Living traditions in yantra creation exist now among traditional practitioners who know the way to build, measure and charge them. Many current yantra creators rely on advanced technology to maintain the high level of detail demanded in their works, illustrating how ancient methods keep changing but keep their main traits.²⁴

1) Living Traditions vs. Static IP Frameworks

Since sacred geometric traditions are flexible and constantly developing, it's hard for intellectual property laws made for fixed authors and rights. The protection of evolving sacred geometric traditions under current intellectual property (IP) laws is challenging because these traditions are communal, dynamic, and intergenerational, unlike the fixed individual ownership model IP systems assume. Indian copyright law offers protection for authors for life plus 60 years, a model tailored for individual creators rather than community custodians.²⁵ Differential rule generation, which develops through generations in various parts of the world, resulting in diverse versions rather than a single original creation,²⁶ explains why there are difficulties determining ownership under present IP systems. Hence, rigid IP frameworks fail to accommodate the fluid nature of sacred geometric traditions, emphasizing the need for sui generis protections that recognize communal rights and continuous cultural development.²⁷

2) Limitations of Conventional IP Frameworks

Traditional intellectual property law struggles to accommodate “*intergenerational innovation*”, a group exercise in which members of various generations come together to provide knowledge and experiences in order to generate a new solution. This is a dynamic interplay of the new ways of thinking and digital dexterity of the younger generations, coupled with the rich experience-based wisdom of the older generations. This is in the case of traditional knowledge where cultural practices, including the sacred geometry, are passed on by elders to young people. Such

²⁴ Swami Ayyappa Giri, *Yantra: Harnessing the Power of Mystical Geometry*, YOGINI ASHRAM (2016), <https://www.yoginiashram.com/yantra-harnessing-the-power-of-mystical-geometry/>.

²⁵ The Copyright Act, 1957, No. 14 of 1957, § 22 (India) (*Hereinafter* referred to as “Copyright Act 1957”).

²⁶ S.R. Munzer & K. Raustiala, *The Uneasy Case for Intellectual Property Rights in Traditional Knowledge*, 27 CARDOZO ARTS & ENT. L.J. 37 (2009).

²⁷ *Genetic Resources, Traditional Knowledge and Traditional Cultural Expressions*, WIPO, <https://www.wipo.int/tk/en/>; Madhavi Sunder, *IP*³, 59 STAN. L. REV. 257 (2006).

transmission is not only a form of cultural preservation, but also a way to creatively adapt to the world, with young practitioners potentially using new technology or bilingual methods of making the ancient knowledge accessible and meaningful, so that traditions could be kept alive and continue to be developed.²⁸ in which traditional wisdom is shared and built upon by many generations. The law prioritizes individual makers and sets set strict time limits which makes it hard to appreciate knowledge that changes and grows within a community. Specifically, under the Indian Copyright Act, 1957, copyright protection for literary, dramatic, musical, and artistic works lasts for the lifetime of the author plus 60 years from the beginning of the calendar year following the author's death.²⁹ This finite duration reflects the balance between incentivizing creation and eventually contributing works to the public domain.

Similar restrictions in patent systems call for creation that is novel and not obvious,³⁰ making it hard for discoveries from spiritual and cultural learning to gain protection. Section 2(1)(j) defines “invention” as a new product or process involving an inventive step that is not obvious to a person skilled in the art and capable of industrial application.³¹ This requirement can make it difficult for spiritual or cultural knowledge which is often transmitted collectively over generations and lacking novelty in a conventional sense, to qualify for patent protection.³²

Therefore, while copyright and patent laws in India provide protection to individual creators and inventors under specific conditions and for fixed durations, these frameworks are poorly suited to safeguarding traditional, evolving communal knowledge rooted in spiritual and cultural learning.³³

3) *Gaps in Current Protection Mechanism*

While India's TKDL serves its purpose by protecting medicinal knowledge, once bio-piracy could have cloned them, but it does not cover as much architectural and geometrical knowledge. Most of the information in the database comes from texts about Indian medicine and not the mathematical and design principles of its geometric traditions.³⁴

²⁸ I. Nurhas *et al.* *Barriers and wellbeing-oriented enablers of intergenerational innovation in the digital age*, 22 UNIV ACCESS INF SOC 591–607 (2023).

²⁹ Copyright Act 1957, § 22.

³⁰ The Indian Patents Act, 1970, No. 39 of 1970, § 2(1)(l) (India) (Hereinafter referred to as “Patents Act 1970”).

³¹ Patents Act 1970, § 2(1)(j).

³² *The Protection of Traditional Knowledge: Draft Gap Analysis: Revision*, WIPO/GRTKF/IC/13/5(B) REV., Annex I, at 9.

³³ *Intervention of the Delegation of New Zealand during the eleventh session of the Committee*, ADOPTED REPORT OF THE ELEVENTH SESSION, WIPO/GRTKF/IC/11/15, ¶ 309.

³⁴ *Traditional Knowledge Digital Library*, PRESS INFORMATION BUREAU (Sept. 01, 2022), <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/sep/doc20229199001.pdf>.

Similar problems are found when analysing indigenous knowledge systems around the world. The Māori people in New Zealand have seen their trademark patterns (*ta moko*) used by others online, whereas Aboriginal dot painting techniques have been exploited commercially without the community's authorization.³⁵ These examples from other countries clearly show why sui generis mechanisms are needed for indigenous and TK. They illustrate the clear limitations of conventional intellectual property (IP) regimes in protecting indigenous and traditional knowledge (TK), which is communal, evolving, and intergenerational.³⁶ Conventional IP laws prioritize individual, time-limited rights and novelty, making them poorly suited for TK. In contrast, sui generis mechanisms are tailored legal frameworks that recognize collective ownership, protect bio-cultural heritage in situ, incorporate customary laws, and require free prior informed consent for use.³⁷ These systems prevent unauthorized appropriation and ensure equitable benefit-sharing while respecting the spiritual, cultural, and ecological contexts of TK.

For instance, the Potato Park in Peru exemplifies a sui generis system integrating intellectual, material, and spatial indigenous knowledge under community control, differing fundamentally from Western IP focused on individual commercial rights.³⁸ The World Intellectual Property Organization (WIPO) emphasizes that sui generis systems provide legal certainty, lower transaction costs, and promote sustainable development benefits tailored to indigenous contexts.³⁹ These examples thus justify India's need to adopt sui generis protection mechanisms that are culturally sensitive, participatory, and equitable to safeguard its rich bio-cultural heritage.

4) *The Imperative for New Frameworks*

The fact that ancient principles are intertwined with modern practice complicates the issue of preserving them even more, as it turns into an attempt to save the heritage of living heritage. As a result, static documentation practices are now being challenged, and there is a need for defences that maintain traditional frameworks while guarding against unauthorized access or misuse.

³⁵ R. Bocquillon & J. van Loon, *Symbolic Misery and Digital Media: How NFTs Reproduce Culture Industries*, 11 NECSUS EUR. J. MEDIA STUD. 24 (2022).

³⁶ *The Protection of Traditional Knowledge: Revised Objectives and Principles*, WIPO/GRTKF/IC/17/5, art. 4.

³⁷ *Elements of a Sui Generis System for the Protection of Traditional Knowledge*, WIPO/GRTKF/IC/4/8 (Sept. 30, 2002), https://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_4/wipo_grtkf_ic_4_8.pdf.

³⁸ *Sui Generis Systems for the Protection of Traditional Knowledge: Information for the Secretariat of the Convention on Biological Diversity* (2005), IIED, <https://www.iied.org/sites/default/files/pdfs/migrate/G02378.pdf>.

³⁹ *Development of Elements of Sui Generis Systems for the Protection of Traditional Knowledge*, U.N. DOC. UNEP/CBD/WG8J/5/6, 2, CONVENTION ON BIOLOGICAL DIVERSITY (Sept. 20, 2007), <https://www.cbd.int/doc/meetings/tk/wg8j-05/official/wg8j-05-06-en.pdf>.

The challenge extends beyond legal protection to encompass the preservation of mathematical wisdom that has guided Indian civilization for millennia. As these traditions meet new and rising digital problems, it is not just culturally important, but crucial to protect the integrity of knowledge systems that Indians depend on in everyday life.⁴⁰

III. THE NFT EXPLOSION – OPPORTUNITIES & THREAT

The value and perception of cultural artifacts in digital spaces have changed greatly because of NFTs. India's ancient designs now have great opportunities to be promoted around the globe and kept safe, but they also face the risk of being used incorrectly and commercialized. As the NFT market quickly expanded and reached a peak trading amount of \$25 billion in 2021, it allowed for culture to be authentically shown but also made it easier for exploitation of traditional cultures.⁴¹ At present, digital transformation is happening when India's cultural traditions encounter more globalization pressures. For centuries, spiritual minds have used sacred geometric shapes, but now their high meaning can just as easily be tossed aside to make them look good on digital platforms. This tension should be explored by handling the menace of cultural theft and the positive effects of innovative projects put together by broad groups of people.⁴²

Globalization has amplified the exposure of India's sacred geometric symbols on digital platforms, creating a tension between their deep spiritual meaning and their reduction to mere aesthetic or commercial assets.⁴³ The commodification of these symbols as NFTs or digital collectibles often separates them from their cultural and ritual contexts, leading to cultural appropriation and harm to source communities. However, globalization also offers opportunities for wider dissemination and collaborative innovation to empower and preserve these traditions.⁴⁴ Balancing these dynamics requires ethical vigilance, legal frameworks recognizing communal custodianship, and digital practices that respect the sacredness of India's heritage rather than exploiting it for superficial appeal. This balance is crucial for safeguarding India's sacred geometry in an interconnected world.

⁴⁰ Septika Laily Anti & Ifan Awanda, *Preserving Traditional Knowledge in the Digital Era: Challenges and Strategies*, 76 SOCIOSPHERE: INTERDISCIPLINARY JOURNAL OF SOCIAL SCIENCES AND HUMANITIES, 76-82 (2025).

⁴¹ Elizabeth Howcroft, *NFT Sales Hit \$25 Billion in 2021, Growth Shows Signs of Slowing*, REUTERS (Jan. 10, 2022), <https://www.reuters.com/markets/europe/nft-sales-hit-25-billion-2021-growth-shows-signs-slowng-2022-01-10/>.

⁴² Nisa Taptiani et al., *The Impact of Globalization on Local Culture*, 45 INT'L J. PROGRESSIVE SCI & TECH., (2024).

⁴³ Divinah Andrew, *The Impact of Globalization on the Traditional Religious Practices and Cultural Values: A Case Study of Kenya*, 4 INT'L J. CULTURE & RELIGION STUD., 6 (2023).

⁴⁴ *Id.*

A. Digital Colonization of Sacred Forms⁴⁵

Indian sacred geometry has been widely used in the modern NFT space, and this is now generally considered a form of digital colonialism against traditional religious practices.⁴⁶ Examining popular NFT platforms, it is clear that symbols with great cultural meaning are often taken out of their ceremonial setting and turned into digital assets. The “*Sacred Geometry Crypto*” collection, launched on OpenSea in August 2021,⁴⁷ faces significant challenges amid the 2024 NFT market crisis, with 98% of NFTs remaining unprofitable and OpenSea’s trading volume decreasing by 76.32%.⁴⁸

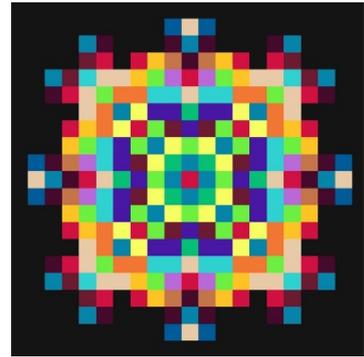


Figure 2 Mandala Token from OpenSea

Digital technology has profoundly influenced mandala art creation, enabling artists to design and distribute mandalas through computer applications and online platforms. Such developments empower designers to create unique looks, adjust to customers’ needs and market their works internationally.⁴⁹ However, there are some problems, like giving up the calming and actual process of doing traditional art and the doubts about if something is genuinely authentic after being copied. In spite of these issues, digital tools have mainly helped mandala art move forward and grow.⁵⁰

The most egregious example of such digital appropriation manifests in the “*Mandala Tokens*” collection on OpenSea. Launched in March 2021 on the Ethereum blockchain, this collection comprises 1,347 digital mandala artworks listed under the Art category. As of mid-2024, the collection’s floor price stands at 1.03 ETH, with a total trading volume of 18.84 ETH across 161 unique owners (representing 12% of total token holders).⁵¹ Despite the collection’s commercial success, these mandalas are presented as aesthetic objects devoid of their traditional Buddhist or

⁴⁵ Mandala Tokens, OPENSEA (2021), <https://opensea.io/collection/mandala-tokens>.

⁴⁶ *The Ethical Implications of NFTs: Ownership, Sustainability, and Digital Rights*, MEDIUM (March 24, 2023); Cyber Cosmos, *The Ethical Implications of NFTs: Ownership, Sustainability, and Digital Rights*, MEDIUM (Dec. 2024).

⁴⁷ *Sacred Geometry Crypto*, OPENSEA (Aug. 2025), <https://opensea.io/collection/sacred-geometry-crypto/offers?tab=items>.

⁴⁸ *Analysis: 98% of NFTs Launched in 2024 Unprofitable, Only 2% Yield Gains*, BINANCE SQUARE, (Nov. 2024), <https://www.binance.com/en/square/post/163695520256841>.

⁴⁹ Neha Gupta, *Mandala Art and the Importance of Impermanence: A Spiritual Lesson in Letting Go*, NEHA CREATIONS (Jun. 07, 2025), <https://www.nehascreations.com/blogs/news/mandala-art-and-the-importance-of-impermanence-a-spiritual-lesson-in-letting-go?srltid=AfmBOoR1HPCGmTD53xMnkToc5dQeZUuiKdYE54JpnK1Cr8Nu4TtrGF>.

⁵⁰ *Mandalas in the Digital Age: Impact of Digital Technology on Mandala Art*, SUMMER ART, <https://summerart.in/mandalas-in-the-digital-age-impact-of-digital-technology-on-mandala-art/>.

⁵¹ *Supra*, note 45.

Hindu spiritual significance, and lack attribution or consent from source communities. This case exemplifies the commodification of sacred geometry in the NFT space, where complex cosmological symbols are reduced to visual trends stripped of ritual context.⁵²

These projects often remove the ceremonial and religious features of sacred symbols, hoping to turn them into objects meant to decorate. According to studies, the NFT scene in India faces the same injustices as standard art markets, as creators do not earn much while those selling or distributing their work gain the biggest benefits.⁵³

People involved in higher education are deeply worried about the way it is now being commodified. Religious organizations worry about the way sacred symbols are no longer valued, while artists who have dedicated their lives to traditional crafts now compete with artificial versions of their culture's art.⁵⁴ Culture is important here since using sacred symbols only for show means they lose their transforming properties, leading young people to misunderstand their religious past.

B. Emergent Preservation Models

In response to digital appropriation threats, innovative ways to preserve and transmit culture openly are emerging. Community efforts support tradition the most, as local artisan groups combine forces with technologists to create real digital databases for sacred geometric forms. The Indian Railway Catering and Tourism Corporation ["**IRCTC**"] has set a significant precedent by issuing NFT-based pilgrimage tickets to Ayodhya, turning them into permanent digital souvenirs of the Shree Ramotsav. Powered by NFT trace, this initiative marks official recognition of blockchain's role in religious experiences, bridging technology and spirituality. Traditionally wary of digital tools, the religious domain saw rapid tech adoption during the COVID-19 pandemic, paving the way for such innovations.⁵⁵ As designer Kirti Vardhan Rathore noted, it's "*a great move towards increasing awareness of NFTs,*" reflecting how government and religious bodies can collaborate to preserve spiritual significance in the digital era.⁵⁶

⁵² Shideh Arjmandi, *Globalizing the Metaverse: Embracing Persian Culture*, POLITECNICO DI MILANO (2023).

⁵³ Kamyani Sharma, *In India, the world of NFTs suffers from the same inequalities as the world of traditional art*, SCROLL (April 09, 2022), <https://scroll.in/magazine/1020893/in-india-the-world-of-nfts-suffers-from-the-same-inequalities-as-the-world-of-traditional-art>.

⁵⁴ *Id.*

⁵⁵ Ezra Icy, *NFT train ticket options: Winning over tech enthusiasts in India*, COINGAPE (March 15, 2024), <https://coingape.com/trending/nft-train-ticket-options-winning-over-tech-enthusiasts-in-india/>.

⁵⁶ Pradipta Mukherjee, *Indian pilgrims get NFT collectible option*, COINGEEK (March 11, 2024) <https://coingeeek.com/indian-pilgrims-get-nft-collectible-option/>.

Using NFT technology for religious tourism, as shown by the Indian Railway Catering and Tourism Corporation, demonstrates recognition of blockchain's value in saving culture by issuing tickets to Ayodhya using NFTs.⁵⁷ The TKDL has done important work in saving indigenous knowledge, though it cannot currently respond to the problems that happen in the NFT world. Because it was built for filing patents, TKDL does not have the necessary technology to track NFTs being used around the world in real time. The framework used now is not much help with tracking changes to symbols in the online world which shows a need for updated systems.⁵⁸

Co-operative projects are starting to develop with leading Indian cultural institutions joining forces with globally recognized blockchain firms dedicated to following ethical rules. They aim to give legal artists genuine chances to display their work, all while making it difficult for others to steal it digitally. There is increasing focus on cultural smart contracts, as they put community consent processes into the blockchain at the time of initiation.

These collaborations aim to empower legitimate artists by providing secure digital platforms that deter unauthorized copying. A key focus is on cultural smart contracts, which embed community consent mechanisms into the blockchain from the outset, ensuring that any use of cultural heritage receives approval from rightful custodians.⁵⁹ This approach aligns with government strategies such as NITI Aayog's "*Blockchain: The India Strategy*" and IndiaChain initiative, which highlights blockchain's potential to improve transparency and trust in governance and business processes, including cultural sectors.⁶⁰ Additionally, the Ministry of Electronics and Information Technology's (MeitY) the National Blockchain Framework promote blockchain adoption with a focus on protecting intellectual property and community interests.⁶¹ These efforts collectively represent a promising model for integrating traditional cultural custodianship with cutting-edge technology to enhance ethical stewardship of India's rich heritage.

Blockchain alliances the leading Indian cultural organizations are engaging with Web3 global companies that commit to upholding the principles of ethical NFT. In 2024, Pilot programmes have been announced to match museums like Indira Gandhi National Centre for the Arts with Polygon-based start-up to mint artworks powered by cultural smart contracts. At the time of their

⁵⁷ *Id.*

⁵⁸ *Supra* note 35.

⁵⁹ A. Kumar, *Blockchain: The India Strategy – Towards Enabling Ease of Business, Ease of Living, and Ease of Governance*, ICRIER (2020).

⁶⁰ *Id.*

⁶¹ *National Blockchain Framework*, MEITY, <https://blockchain.meity.gov.in/>.

creation, these contracts bake community-vetted metadata such as origin stories, ritual context, revenue-sharing and revocation clauses, directly on-chain. Since the licence and consent process is written into the token itself, any resale will automatically redirect royalties back to the wallets of the communities that were given the rights to the token and mark any attempts to offer the work without the explicit authorisation of the original custodians. According to Indian legal commentators, such designs not only meet the requirements of the Copyright (assignment must specify royalty terms), but provide artists with real-time provenance tracking currently provided by no existing databases, such as TKDL.⁶²

The primary challenge within these emerging models lies in balancing accessibility and protection. It is concluded from the research on Hindu temple architecture that detailed recording of such work could aid its appreciation worldwide, as well as hinder unethical uses.⁶³ These suggested new models that general geometric concepts can be used in schools, but particular layouts for use in trade must first be sanctioned by the whole community.

C. The Authentication Crisis

Digital marketplaces bring remarkable problems in confirming the true ownership and history of sacred items which scholars have called an “*authentication crisis*” for religion. Right now, being able to prove ownership of digital assets is easy for blockchain technology, though validating cultural authority is quite tough. Deciding who is qualified to digitize sacred India symbols is still unclear, as India’s many religions and regions all interpret these symbols differently.⁶⁴

Contemporary authentication systems are made worse by technical issues. Although NFT platforms prove that a token is related to a specified asset, they don’t know if the artist was really qualified to tokenize it. The absence of boundaries has let unattached individuals gain from spiritual geometry by creating their own collections.⁶⁵ This problem becomes more severe since many religious symbols belong to everyone, not one person, so standard copyright laws do not help.

⁶² *Blockchain: The India Strategy, Part I*, NITI AAYOG (2020).

⁶³ Mayank Chaturvedi, *Fractal Geometry and Hindu Temple Architecture*, WORDPRESS (Sept. 7, 2022), <https://chaturvedimayank.wordpress.com/2022/09/07/fractal-geometry-and-hindu-temple-architecture/>.

⁶⁴ Sudipta Shee, *Digital preservation of cultural heritage in India: A digital age*, 7 INT. J. HUMANIT. EDUC. RES. 260-265 (2025).

⁶⁵ *Supra* note 53.

Authentication disputes have appeared in Indian courts, but the law has yet to provide many examples. Key cases dealing with digital evidence issues such as *Shafi Mohammad v. The State of Himachal Pradesh*⁶⁶ and *Anvar P.V. v. P.K. Basheer*⁶⁷ emphasize strict compliance with Section 65B of the Indian Evidence Act, 1872, for admissibility of electronic records. Trademark disputes also raise authentication concerns, with courts clarifying jurisdiction and arbitrability in online infringement cases, e.g., *HK Media Limited v. Brainlink International Inc.*⁶⁸ However, there are many problems in judgeship over who officially represents cultural heritage in various NFT collections.⁶⁹ And religious institutions cannot control blockchains, since they reject external laws.⁷⁰ Presently, these disputes are framed within existing IP and electronic evidence laws, stressing procedural rigor and statutory compliance. Ongoing judicial and legislative developments are needed to effectively address authentication issues in India's evolving digital cultural heritage landscape.

Legal experts, technologists and culture experts are now working together to create new standards for identifying culture online. One of the frameworks being considered involves testing authenticity within local communities, forming multi-identity boards for authentication and tracking ownership with blockchain-based systems that take into account the item's cultural background. These standards recognize that authentic cultural preservation requires not just technological innovation but fundamental restructuring of how digital platforms acknowledge and respect TK systems.⁷¹

Such issues with authentication also apply to larger matters about digital control and preserving cultural identity. Since sacred geometry now reaches the global digital economy, local communities must work out how to maintain their spiritual authority even when they come across technologies that bypass traditional leaders. This conflict highlights that we must have technologies that do not limit communities and improve their ability to respect and enjoy their culture.⁷²

⁶⁶ Shafi Mohammad v. State of H.P., (2018) 2 SCC 801.

⁶⁷ Anvar P.V v. P.K.Basheer & Ors, 2014 (10) SCC 473.

⁶⁸ HT Media Limited v. Brainlink International, 2021 SCC OnLine Del 5398.

⁶⁹ Primavera De Filippi, Morshed Mannan, & Wessel Reijers, *The legality of blockchain technology*, 41 POLICY AND SOCIETY 358-372 (2022).

⁷⁰ A. Wagner & Marie-Sophie de Clippele, *Safeguarding Cultural Heritage in the Digital Era – A Critical Challenge*, 36 INT. J. SEMIOTIC LAW 1915-1923 (2023).

⁷¹ Xinda Liu et al., *Blockchain in Digital Cultural Heritage Resources: Technological Integration, Consensus Mechanisms, and Future Directions*, 13 NPJ HERITAGE SCIENCE (2025).

⁷² Nevine Nasser, *Sacred Geometry: The Spiritual Meaning of Islamic Architectural Technologies*, ACSF (May 28, 2024), <https://acsforum.org/sacred-geometry-the-spiritual-meaning-of-islamic-architectural-technologies/>.

IV. LEGAL & TECHNOLOGICAL SAFEGUARDS

The protection of India's sacred geometry requires a comprehensive framework that addresses both immediate digital threats and long-term preservation needs. Current legal instruments, designed for conventional intellectual property, prove inadequate when confronted with the unique challenges posed by sacred symbols in digital marketplaces. This section outlines a three-pronged approach: reforming existing legal frameworks, implementing blockchain-driven community governance, and deploying Artificial Intelligence ["AI"]-powered monitoring systems to create a robust protective ecosystem.

A. Reforming IPR Frameworks

Despite the ancient and community-driven nature of this knowledge, current intellectual property regimes especially the *Copyright Act, 1957* lack provisions for protecting such traditional expressions. These symbols and yantras, often transmitted orally or through practice,⁷³ fall outside the formal categories of authorship, originality, or fixation required by law.⁷⁴ This creates a legal vacuum where sacred expressions are exploited as commercial NFTs without consent or benefit to their originators. Thus, there is an urgent need to develop *sui generis* frameworks tailored to TK and traditional cultural expressions ["TCE"] alongside reforms in existing IP statutes.

1) *Sui Generis Framework*

India's TKDL, though pioneering in preventing biopiracy in Ayurveda and Unani medicine, does not yet extend its database or legal impact to visual and symbolic expressions like yantras.⁷⁵ The database contains over 34 million pages on some 2,260,000 traditional medicines under TK but lacks the systematic documentation of sacred geometric forms that now populate NFT marketplaces.⁷⁶

The *Sri Yantra*, for instance, is not merely a graphic pattern but a spiritually consecrated diagram symbolizing cosmic order in Shakta traditions under the Tantric Hinduism.⁷⁷ Its digital replication

⁷³ GUDRUN BÜHNEMANN, *MANDALAS AND YANTRAS IN THE HINDU TRADITIONS* (2003).

⁷⁴ Copyright Act 1957, § 13.

⁷⁵ *Traditional Knowledge Digital Library Unit (TKDL)*, CSIR, <https://www.csir.res.in/documents/tkdl>.

⁷⁶ Samir K. Brahmachari, *Traditional Knowledge Digital Library (TKDL) – An Effective and Novel Tool for Protection of India's Traditional Knowledge Against Bio-Piracy*, PRESS INFORMATION BUREAU (2011), https://www.tkdl.res.in/tkdl/PressCoverage/PIB_120811.pdf.

⁷⁷ Gérard P. Huet, *Sri Yantra*, RESEARCH GATE (Jun. 2, 2025), https://www.researchgate.net/profile/Gerard-Huet/publication/277295011_Sri_Yantra/links/55af62d008aed9b7dcddbc42/Sri-Yantra.pdf.

and commercial use via NFTs on platforms like OpenSea, one of the largest NFT marketplaces,⁷⁸ without cultural context or community consent, pose a unique challenge. Such usage, though not strictly illegal under current copyright law, can amount to cultural misappropriation and moral injury to source communities. Expanding TKDL's ambit to include sacred geometry like *Sri Yantras*, cultural motifs, and indigenous architecture that carry deep spiritual and cultural value, would allow state-led documentation and preventive protection. Protecting such TCEs would preserve community identity, prevent misuse, and ensure artisans benefit culturally and economically. A digital archive, like TKDL, could serve as both a shield and a platform for respectful recognition.

Internationally, institutions like the World Intellectual Property Organization [**WIPO**] have acknowledged this gap. WIPO's Intergovernmental Committee on Intellectual Property and Genetic Resources, TK and Folklore [**IGC**]⁷⁹ continues to push for *sui generis* legal protection of TK, TCE and genetic resources [**GRs**]⁸⁰ which could, for instance, grant perpetual communal rights and require mandatory disclosure and consent for commercial use.⁸¹ Further, reforms to the Indian Copyright Act could draw from *Peru's Law No. 27811*, which protects indigenous knowledge through a register and mandates benefit sharing with source communities.⁸² Such examples demonstrate the viability of codifying protections for sacred designs in India through a dedicated legal pathway.

B. Blockchain-Driven Solutions

While legal reform provides the foundation, blockchain technology offers innovative mechanisms for community-controlled heritage protection. Rather than simply digitizing sacred symbols, blockchain can embed cultural governance directly into digital assets through smart contracts and decentralized autonomous organizations [**DAOs**].

1) *Smart Contracts as Cultural Guardians*

The decentralization enabled by blockchain technology offers new avenues for protecting sacred symbols in the digital age. An NFT is a unique cryptographic asset which can encode metadata

⁷⁸ OPENSEA, <https://opensea.io/>.

⁷⁹ *Intergovernmental Committee (IGC)*, WIPO, <https://www.wipo.int/en/web/igc>.

⁸⁰ *Elements of a Sui Generis System for the Protection of Traditional Knowledge*, WIPO/GRTKF/IC/3/8, (March 29, 2002), https://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_3/wipo_grtkf_ic_3_8.pdf.

⁸¹ *Traditional Knowledge, Genetic Resources and Traditional Cultural Expressions/Folklore*, WIPO, https://www.wipo.int/ip-development/en/agenda/flexibilities/resources/tk_gr_tce_f.html.

⁸² *Law No. 27811: Introducing a Protection Regime for the Collective Knowledge of Indigenous Peoples derived from Biological Resources, Peru*, WIPO (Aug. 10, 2002), <https://www.wipo.int/wipolex/en/legislation/details/3420>.

that attributes cultural ownership, embeds usage conditions, and even automates royalties through *smart contracts*.⁸³ For example, a community organization or temple trust could mint an NFT of a sacred symbol with embedded cultural metadata and licensing rules. Unauthorized reproduction would not only violate blockchain records but could also trigger legal takedowns via smart contract logic. This model of community-controlled NFTs shifts power back to originators by allowing digital governance over heritage.

2) *Community-Controlled DAOs*

Furthermore, the concept of DAO enables distributed governance by communities themselves. As discussed earlier, religious bodies often lack effective control over blockchain spaces, a DAO could collectively decide how a sacred symbol is to be used, commercialized, or restricted, ensuring that spiritual and cultural values remain central in the decision-making process.

A powerful example of blockchain-driven cultural protection is Canada's *400 Drums* project, where NFTs are used not to sell sacred ceremonial drums, but to digitally represent them and provide access to Indigenous marketplaces and educational tools. Created in consultation with Elders, the initiative allows artisans like master drum-maker David Fierro to uphold ceremonial protocols while earning income through digital access, tutorials, and cultural utility. The project reflects Indigenous economic principles of reciprocity and limited harvesting, demonstrating how blockchain can align with traditional values while enabling decentralized cultural governance.⁸⁴

3) *Implementation Challenges*

Despite the promise of AI, blockchain, and digital registries for protecting sacred geometry, significant challenges persist in the Indian context. India's regulatory environment lacks clarity. The *Information Technology Act, 2000*⁸⁵ and rules under the *Intermediary Guidelines 2021*⁸⁶ do not yet offer a legal definition or protection mechanism for smart contracts in cultural use. Moreover, digital literacy and access to technological resources remain uneven, especially in rural and marginalized communities, creating gaps in both awareness and the ability to participate in or

⁸³ Rakesh Sharma, *Non-Fungible Token (NFT): What It Means and How It Works*, INVESTOPEDIA, <https://www.investopedia.com/non-fungible-tokens-nft-5115211>.

⁸⁴ Kate Wilson, *How NFTs Are Transforming Indigenous Economics*, VANCOUVER TECH JOURNAL (Aug. 18, 2022), <https://vantechjournal.com/p/how-nfts-are-transforming-indigenous>.

⁸⁵ Information Technology Act, 2000, No. 21 of 2000 (India).

⁸⁶ Information Technology (*Intermediary Guidelines and Digital Media Ethics Code*) Rules, 2021, GAZETTE OF INDIA, pt. II, sec. 3(i), G.S.R. 139(E) (Feb. 25, 2021) (India), amended by G.S.R. 240(E) (Apr. 6, 2023).

benefit from these protective systems.⁸⁷ This digital divide risks leaving traditional custodians of sacred symbols underrepresented in governance and enforcement processes, potentially undermining the inclusivity and effectiveness of these technological solutions.

C. AI-Powered Monitoring Systems

The scale and speed of digital appropriation demand automated monitoring systems capable of detecting unauthorized use across global platforms.

1) *Advanced Pattern Recognition*

AI can assist in detecting and preventing the unauthorized use of religious practices and rituals used in sacred geometry in digital spaces.⁸⁸ Image recognition algorithms, trained on datasets of yantras, mandalas, and temple motifs, can identify reproductions across NFT marketplaces, social media, and design platforms. This proactive monitoring could complement legal enforcement by issuing alerts or initiating automated takedown requests. Platforms like Google Vision API and open-source tools like TinEye already offer rudimentary pattern recognition capabilities. However, these need to be customized for culturally specific symbols like the *Sri Chakra* or *Navagraha yantras*, which require contextual and symbolic interpretation beyond mere geometry.

2) *Proactive Enforcement Mechanisms*

The integration of machine learning tools into intellectual property enforcement is not new. For instance, YouTube's Content ID system uses AI to detect copyrighted audio/visual content. A similar framework for visual sacred designs could be implemented in Indian NFT marketplaces, such as *WazirX NFT* or *Jupiter Meta*, to auto-flag culturally sensitive works.⁸⁹ However, the use of AI in this domain must address concerns of data sovereignty, especially when sacred symbols are digitized and stored in foreign-owned servers. Privacy laws, such as the upcoming *Digital Personal Data Protection Act, 2023*,⁹⁰ must be interpreted to ensure that cultural communities retain control over their digital heritage.

⁸⁷ Dr. Suruchi Kumari & Maitri Singh, *Safeguarding Rural India Through Critical Digital Literacy Endline Assessment Report*, DIGITAL EMPOWERMENT FOUNDATION (2024), https://www.defindia.org/wp-content/uploads/2024/12/Aspen-Endline-Report_14-Oct-2024-2-1.pdf.

⁸⁸ Khader I. Alkhouri, *The Role of Artificial Intelligence in the Study of the Psychology of Religion* 2024, 15(3) RELIGIONS 290, (2024).

⁸⁹ *Best NFT Marketplace In India: Why WazirX Is The Best*, WAZIRX (May 24, 2022), <https://wazirx.com/blog/best-nft-marketplace-in-india/>.

⁹⁰ The Digital Personal Data Protection Act, 2023, No. 22 of 2023 (India).

Ultimately, integrating AI with blockchain can create a robust system where every use of a sacred symbol is traceable, verifiable, and enforceable hence bridging the gap between traditional spiritual significance and contemporary digital law.

3) *Challenges*

The implementation of blockchain and AI-driven systems also faces challenges related to ownership disputes over pan-community symbols and the accuracy of cultural data. Many sacred symbols, motifs, and geometric patterns are shared digitally across multiple communities and regions,⁹¹ making it difficult to establish clear ownership or authority for digital registration and enforcement.⁹² Additionally, training AI systems to accurately identify and respect culturally specific meanings requires high-quality, community-validated datasets of resources that are often limited or fragmented.⁹³ Without careful curation and ongoing community involvement, there is a risk of misrepresentation or exclusion,⁹⁴ which could further complicate efforts to protect India's sacred geometric heritage. Furthermore, the lack of comprehensive, culturally nuanced datasets poses a significant obstacle for AI systems,⁹⁵ increasing the risk that automated monitoring may misinterpret or overlook important context, leading to further disputes or unintentional disrespect.

D. Creating a Unified Protective Ecosystem

The convergence of legal reform, blockchain governance, and AI monitoring creates unprecedented opportunities for cultural protection. However, these tools must work in harmony rather than isolation to achieve meaningful impact.

1) *Technical Integration Requirements*

The integration of legal reform, blockchain governance, and AI monitoring offers a transformative opportunity to protect cultural heritage, but these tools must operate cohesively for real impact. A unified protective ecosystem requires interoperable databases that connect the expanded TKDL with blockchain registries, API frameworks for real-time data exchange between monitoring and

⁹¹ Daduvai Akshita, *The Intersection Of Innovation And Regulation: Legal Challenges Of Ai And Blockchain Technologies*, 18 THE LAWWAY WITH LAWYERS JOURNAL (2024).

⁹² Aranya Nath & Gautami Chakravarty, *Interpreting Digital Ownership & Intellectual Property Protection for Ai-Generated Content and Blockchain enabled Digital Assets In Cyberspace*, 5 E-JAIRIPA 73-94 (2024).

⁹³ *Responsible AI: #AIForAll – Approach Document for India: Part 2 – Operationalizing Principles for Responsible AI*, NITI AAYOG (2021), <https://www.niti.gov.in/sites/default/files/2021-08/Part2-Responsible-AI-12082021.pdf>.

⁹⁴ *Regulating AI in India: Challenges, Initiatives, and Path to Future Success*, K SINGHANIA & CO. (2025) <https://singhanialaw.com/regulating-ai-in-india-challenges-initiatives-and-path-to-future-success/>.

⁹⁵ H. Akin UNVER, *Artificial intelligence (AI) and Human Rights: Using AI as a Weapon of Repression and its Impact on Human Rights*, Policy Department, European Parliament (2024), [https://www.europarl.europa.eu/RegData/etudes/IDAN/2024/754450/EXPO_IDA\(2024\)754450_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2024/754450/EXPO_IDA(2024)754450_EN.pdf).

legal systems, cultural authentication protocols to verify community authority, and automated compliance tools that help digital platforms enforce cultural usage guidelines.

To ensure meaningful protection, India's Ministry of Electronics and Information Technology ["MeitY"] could pilot a scheme integrating blockchain for safeguarding sacred symbols, drawing from UNESCO's *Digital Heritage recommendations*.⁹⁶ India should seek bilateral agreements with major NFT marketplace jurisdictions such as the United States, United Kingdom, Hong Kong, Cayman Islands, and Canada,⁹⁷ to ensure that protective measures are recognized and enforced globally, preventing digital platforms from bypassing Indian regulations simply by relocating.⁹⁸ Ultimately, coordinated action across legal, technological, and cultural domains is essential. While challenges persist, the convergence of these mechanisms provides a real path forward for preserving India's sacred geometric heritage and fostering respectful digital innovation.

As India transitions into the Web3 and AI era, safeguarding sacred geometry requires more than conventional IP protection. A hybrid approach such as reforming IPR laws, enabling community-based blockchain governance, and deploying AI-powered cultural and legal enforcement offers a promising path. In this system, AI scans digital platforms for unauthorized use, cross-checks findings against blockchain records, and, if violations are confirmed, issues takedown notices, notifies cultural authorities, and escalates to legal proceedings if necessary. This integrated method ensures swift detection, transparent verification, and robust legal action. However, any solution must prioritize cultural consent, ethical frameworks, and the spiritual integrity of the symbols involved.

V. ETHICAL DIMENSIONS & COMMUNITY RIGHTS

While legal and technological frameworks are essential for protecting sacred geometry, they have inherent limitations when it comes to addressing the deeper spiritual and cultural harm caused by unauthorized digital use. Legal enforcement and blockchain verification may prevent unauthorized sales or reproductions, but they cannot restore the loss of sanctity or heal the sense of alienation

⁹⁶ Charter on the Preservation of the Digital Heritage, UNESDOC DIGITAL LIBRARY, <https://unesdoc.unesco.org/ark:/48223/pf0000229034>.

⁹⁷ *Types of NFT Marketplaces and How to Legally Structure Them*, LEGAL NODES (Aug. 25, 2025) <https://legalnodes.com/article/nft-marketplaces-legal-structuring>.

⁹⁸ Septika Laily Anti & Ifan Awanda, *Preserving Traditional Knowledge in The Digital Era: Challenges and Strategies*, 1 SOCIOSPHERE: INTERDISCIPLINARY JOURNAL OF SOCIAL SCIENCES AND HUMANITIES 76-82 (2025).

that communities feel when their sacred symbols are commodified without consent.⁹⁹ The reduction of living, spiritually-charged symbols to mere digital assets risks eroding their meaning and undermining the cultural continuity that sustains these traditions.¹⁰⁰ The following section explores the moral and cultural dimensions that must guide any such frameworks.

A. The Consecration Paradox

In Indian spiritual traditions, symbols like the *Sri Yantra*, *Lingam*, and *Navagraha Mandalas* are much more than decorative designs; they are considered ‘consecrated’ forms, infused with divine energy through rituals.¹⁰¹ These symbols are often lovingly placed in homes and temples, not just for their beauty, but to bring purification, protection, and positive energy into the space. They carry spiritual meaning passed down through generations, connecting people to their faith, culture, and inner peace. This spiritual sanctification raises profound ethical challenges when these symbols are commodified as digital collectibles, especially through NFTs.¹⁰² While intellectual property frameworks focus on ownership and control, the deeper concern lies in the *sanctity* and *context* of these symbols.

For instance, many *Agama Shastras* and temple traditions prohibit the casual replication or display of consecrated symbols outside prescribed rituals.¹⁰³ Yet, marketplaces like OpenSea and Rarible have seen NFTs of the *Sri Yantra* being sold with no cultural context or community consent, often stylized or altered.¹⁰⁴ Religious authorities and temple trusts, such as the Kanchi Kamakoti Peetham, have expressed strong disapproval of such practices, viewing them as profane or spiritually harmful.

Furthermore, with the mandala art, consecration becomes an important issue because while making uses dedicated prayers, sacred resources and customary actions, the finished piece is typically destroyed to prove how nothing permanently lasts. Once these holy maps are converted

⁹⁹ Dr. Aditi Patel, *Decontextualizing The Divine: Ethical Concerns In The Commodification Of Dhokera Deities*, 5 SHODHKOSH: JOURNAL OF VISUAL AND PERFORMING ARTS 1652 – 1654 (2014).; P. Oruç & Uma Suthersanen, *Intellectual property and cultural heritage issues for museums of archaeological materials*, EDWARD ELGAR PUBLISHING 392-412, (2022).

¹⁰⁰ A. Pandey & P. K. Gupta, *Commodification and Religion: A Sociological Study of Budheshwar Temple in Lucknow*, 2 OPEN ACCESS J. ECON. RES. 1 – 5 (2025).

¹⁰¹ *What is Yantra: Properties, Significance and Importance*, RUDRA CENTRE (Aug. 06, 2025), <https://www.rudraksharatna.com/articles/yantra?srsid=AfmBOoqSbimY8IdttvLqtDdYZWl2o8CKIGON3yMoLJj8JbtZFaqQ2R5k>.

¹⁰² *Ethical Dilemmas in NFTs Ownership, Environmental Impact, and Cultural Concerns*, BINUS UNIVERSITY (Oct. 24, 2024), <https://sis.binus.ac.id/2024/10/24/ethical-dilemmas-in-nfts-ownership-environmental-impact-and-cultural-concerns/>.

¹⁰³ Dr. Uday Dokras, *Agama Shastra and Its Role in Temple Construction*, SCRIBD, <https://www.scribd.com/document/758505205/Agama-Shastra-and-its-Role-in-Temple-Construction>.

¹⁰⁴ RARIBLE, <https://rarible.com/explore/search/sri%20yantras/collections>.

and offered as NFTs for permanent ownership, they disregard main beliefs of Buddhism and Hinduism regarding attachment and the temporary nature of things.¹⁰⁵

The core ethical dilemma is that digital platforms operate under secular laws that do not account for ritual authority or cultural custodianship. Digital platforms are mostly governed by secular laws that prioritise private property, business rights and Intellectual Property rights, ignoring the cultural guardianship and ritual authority that communities have over holy symbols.¹⁰⁶ As a result, there is an ethical gap that although copyright and intellectual property laws safeguard digital assets as property, they ignore the customs, ancestry, and communal duties that define custodianship in many indigenous and religious communities.¹⁰⁷ Therefore, even if formal legal requirements are met, the authority of ritual custodians is often ignored when sacred heritage is moved to digital domains or made into NFTs, posing a risk of spiritual harm and cultural alienation. This disconnects leaves source communities with limited recourse. As these practices clash with sacred codes, they violate not only cultural sensitivities but also the moral rights embedded under *Article 6bis of the Berne Convention*¹⁰⁸ and *Section 57 of the Indian Copyright Act*,¹⁰⁹ which allow creators (and arguably, communities) to object to distortion or derogatory treatment of their works.

In the landmark case *Amar Nath Sehgal v. Union of India*,¹¹⁰ the Delhi High Court recognized and expanded the scope of moral rights under *Section 57 of the Copyright Act, 1957*,¹¹¹ emphasizing that an author's connection to their work is more than economic, it is spiritual and cultural. Sehgal is a renowned sculptor who challenged the arbitrary removal and storage of his bronze mural from Vigyan Bhawan by the Government of India. The court held that this treatment of his work amounted to mutilation and destruction, violating his right of integrity, a fundamental component of moral rights.

Justice Pradeep Nandra, in the aforementioned decision, eloquently noted in paragraphs 24, 38 and 39, that moral rights safeguard not just the individual author's dignity but also India's cultural heritage, as artists are cultural contributors. Importantly, the court interpreted moral rights in a broad and purposive manner, holding that even destruction and amendment of a work could

¹⁰⁵ *Supra* note 49.

¹⁰⁶ Fiona Macmillan, *Intellectual Property and Cultural Heritage: Towards Interdisciplinarity*, 331 OXFORD UNIV. PRESS (2021).

¹⁰⁷ Sarah Lee, *Cultural Heritage Laws in Digital Era*, NUMBER ANALYTICS, <https://www.numberanalytics.com/blog/cultural-heritage-laws-digital-era>.

¹⁰⁸ Berne Convention for the Protection of Literary and Artistic Works, art. 6bis, Sept. 09, 1886, 828 U.N.T.S. 221.

¹⁰⁹ Copyright Act 1957, § 57.

¹¹⁰ *Amar Nath Sehgal v. Union of India*, 117(2005) DLT717, 2005(30) PTC253(DEL).

¹¹¹ Copyright Act 1957, § 57.

constitute a breach under Section 57 in paragraphs. 35 and 56 of the judgement. The court further underscored in paragraph 61, that these rights are independent of copyright ownership, thus surviving even after assignment.

This case strongly supports the proposition that sacred and consecrated symbols, when altered, decontextualized, or commercialized through NFTs, may violate the cultural integrity of the work and its custodians. Extending this jurisprudence to community-held works like sacred geometry. Hence, we can argue for the legal recognition of moral and cultural rights even in the absence of individual authorship, thereby protecting India's intangible heritage in the digital age. Any framework for digital representation must go beyond legality to integrate religious ethics, customary law, and spiritual sovereignty.

B. Profit Sharing Frameworks

When sacred cultural expressions are commercialized, it becomes essential to ensure that source communities share in the economic benefits. This is not just a matter of fairness but a requirement under international legal frameworks like the *Nagoya Protocol*, which affirm community rights to Access and Benefit-sharing Agreements for issues in Intellectual Property¹¹² and the *UN Declaration on the Rights of Indigenous Peoples* [“**UNDRIP**”] reaffirm the use of their TK and cultural heritage.¹¹³ A similar structure can be envisioned for digital sacred symbols: proceeds from NFT sales or licensing could be channelled into cultural trusts, heritage preservation funds, or community development projects.

Digital smart contracts offer further possibilities. Inspired by projects like *400 Drums in Canada*, NFTs can be programmed to redirect a portion of resale royalties automatically to a community-managed wallet. This ensures long-term, passive income for the source community without sacrificing spiritual ownership of the symbol. However, implementation remains complex. Determining the legitimate representative body, be it a temple trust, a cultural guild, or a tribal panchayat is often fraught. There is also the danger of elite capture, where benefits may not reach the grassroots. Hence, any profit-sharing model must be underpinned by transparent governance structures, free prior informed consent [“**FPIC**”], and community-led oversight.

¹¹² *A Guide to Intellectual Property Issues in Access and Benefit-sharing Agreements*, WIPO (2018) https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1052.pdf.

¹¹³ United Nations Declaration on the Rights of Indigenous Peoples, G.A. RES. 61/295, U.N. DOC. A/RES/61/295, PART ONE, CHAP. II, SECT. A (Sept. 13, 2007).

To bridge this gap, community involvement must be operationalized within digital governance frameworks. For example, a blockchain-based voting system could be implemented, where recognized representatives from source communities have the authority to approve or reject proposed uses of specific sacred symbols before they are minted as NFTs or used in digital art. Advisory panels composed of tradition bearers and cultural scholars could be integrated into NFT marketplace protocols, ensuring that any digital transaction involving sacred geometry is subject to a transparent process of community consultation and consent. Such mechanisms would move beyond mere compliance, embedding ethical stewardship and community agency into the heart of digital cultural protection.

C. Balancing Innovation & Sanctity

While the dangers of cultural appropriation are real, innovation must not be stifled. The challenge lies in distinguishing respectful engagement from exploitative commodification. Sacred geometry, by its very nature, inspires universal awe and creative exploration but there is a thin line between appreciation and abuse.

To achieve this balance, educational interventions are vital. Artists, designers, and tech developers engaging with sacred symbols should be equipped with cultural literacy tools and ethical engagement guidelines, possibly through museum partnerships, online courses, or platform-mandated tutorials. For example, platforms like OpenSea could incorporate a “*Cultural Use Protocol*” checkbox for listings that involve sacred content.

The most significant example of community-controlled sacred digitization comes from Australia’s “*Walking Between Worlds*” project, which represents “*the world’s first genuine Indigenous Generative Collection*” with a mission to “*energise global Indigenous communities to amplify First Nations powerful, guiding voices through NFTs*”.¹¹⁴ This ground-breaking initiative demonstrates how indigenous communities can maintain control over their cultural expression while leveraging blockchain technology for economic empowerment.

This came after several Aboriginal artists have pursued legal action after their sacred dot painting techniques and motifs were misappropriated and sold as NFTs on platforms like OpenSea without consent. In response, the *Arts Law Centre of Australia* and *Indigenous Art Code* have called for stronger legal protections and ethical protocols for Indigenous cultural expressions in digital

¹¹⁴ WALKING BETWEEN WORLDS), <https://www.walkingbetweenworlds.net/>.

marketplaces.¹¹⁵ *Walking Between Worlds* actively works to help communities “*capitalize on the NFT market, leading to greater financial inclusion and self-determination for Indigenous artists*” These efforts underscore the global relevance of India’s challenge, and offer valuable lessons for community-led governance of sacred art in Web3 spaces.

Furthermore, community-approved repositories could serve as reference points for what is acceptable. The TKDL in India could be expanded to include visual TCEs, not just medicinal formulations, with cultural access protocols embedded. Cross-cultural collaboration can also yield powerful outcomes. Indigenous blockchain initiatives, such as the Kaitiaki NFT governance model (*Māori*) and the 400 Drums platform, show how protocols and permissions can be encoded into the very architecture of digital platforms. These examples can inspire similar models for India’s sacred geometry where usage rights, attribution, and revenue flows are all governed by community consent and cultural logic.

Ultimately, a Dharmic digital framework rooted in *satya* (truth), *ahimsa* (non-harm), and *seva* (service) can help guide ethical use in sacred digital heritage. These core principles, drawn from Indian philosophical traditions, emphasize transparency, honesty, compassion, and collective service as guiding values for digital stewardship of culture. *Satya* ensures that heritage is represented authentically and with integrity; *ahimsa* calls for systems and digital policies that actively prevent harm, misappropriation, or disrespect to communities and their traditions; and *seva* centres the wellbeing and empowerment of cultural custodians through inclusive digital access and respectful preservation.¹¹⁶ Embedding these values into technology and policy promotes not only lawful but deeply ethical preservation and sharing of sacred heritage. Indian government initiatives such as the Digital India Programme and National Digital Library, supported by the Ministry of Electronics and Information Technology [“**MeitY**”], explicitly incorporate these values by promoting transparency, ethical access, and equitable participation in safeguarding heritage.

VI. CONCLUSION

The new framework describes a single, three-tiered structure that will help secure and underpin India’s ancient and unique arts as they move onto the internet. The lawmaking process will start with the new Sacred and Traditional Arts (Digital Protection) Act, which increases TKDL, gives

¹¹⁵ INDIGENOUS ART CODE, <https://www.indigenousartcode.org/>.

¹¹⁶ Jagabandhu Sahoo, *Dharma and Digital Democracy: An Indian Perspective on Participatory Governance*, 5 INT. RES. J. HUMANITIES. INTERDISCIP. STUD. 113 – 118 (2024).

communities the benefits of moral and economic rights, mandates the verification of online art sales, and creates a separate tribunal to solve issues easily. Dharmic-Chain Initiative is used to back the legal structure by adding traditional guidelines right to digital assets that use Dharma-Contracts. Under the authority of a community DAO and supervision by an AI trained by the TKDL, the system tries to ensure that everything is done in a fair manner. The framework is rounded off by effective outreach efforts, like require special classes on “Cultural Impact” online and “Heritage Innovation Labs” that help artisans and technology specialists cooperate respectfully and earn together.

A. Critical Analysis

Even though the system was created to account for many situations, it has major inherent problems. The legal process gets harder because it is tricky to identify what constitutes a community and authentic religion in India and because the speed of law reform lags behind technological progress, and it can be tough to put laws into effect on unidentified online networks. The technology has its own set of contradictions as it could leave behind those it is meant to include, nor would it stop the rise of new elites. Moreover, writing down spiritual ideas as smart contracts may cause them to be made overly simple. Essentially, the challenge of the initiative is to manage a sharp difference between the pure, non-profit styles of traditional practices and the heavily market-driven focus of today’s digital world. By handling sales of spiritual items, the framework turns them into commerce, which might lead to a gap between people who want to stay spiritually pure and those who depend on income, as the digital market’s strong influences can easily wipe out traditional culture.

B. Suggestions

A phased roadmap is proposed to construe these recommendations into actionable results. *Phase 1* should focus on extending the TKDL to systematically document sacred geometric forms, mandalas, yantras, and architectural motifs, supported by appropriate metadata and cultural context. *Phase 2* involves developing DAO models and smart contract standards that implant community consent and benefit-sharing protocols into blockchain structure, enabling culturally respectful governance of sacred symbols in NFT markets. *Phase 3* should implement AI-powered monitoring systems, trained on culturally specific datasets, to detect unauthorized use of sacred geometry across digital platforms and initiate automated responses. Finally, *Phase 4* must prioritize education and awareness to the indigenous people and the development of cross-cultural guidelines, fostering cultural literacy among digital creators, NFT platforms, and global audiences

to promote informed appreciation rather than commodification, and also access and benefit sharing of profits. This holistic approach offers a sustainable pathway to honour tradition while engaging meaningfully with technological innovation.