Sustainable Solutions for Ancient Monuments: Integrating Traditional Craftsmanship with Modern Technology By 2047

Malikarjun Y. Sandimani

Lecturer of History, Govt. First Grade College, Golasangi.

ABSTRACT:

Sustainable solutions for ancient monuments by 2047 involve integrating traditional craftsmanship with modern technology to ensure their preservation and cultural continuity, a core component of India's Viksit Bharat Vision 2047. This approach uses non–invasive digital tools like LiDAR and Augmented Reality for documentation and restoration, alongside modern scientific methods. It supports traditional artisanal skills and livelihood opportunities through initiatives like the Pradhan Mantri Vishwakarma Scheme, and incorporates passive cooling techniques and local materials into conservation, creating sustainable development while respecting ancient wisdom. It is thesustainable conservation of ancient monuments by 2047 is a component of the Viksit Bharat Vision 2047 strategy, focusing on preservation, visitor engagement, digital platforms for heritage outreach, and operational efficiency for cultural institutions. Key elements include developing digital repositories, leveraging VR/AR for recreation, promoting sustainable materials, and using technology to analyze materials and support local artisans, ensuring a blend of ancient wisdom and futuristic innovation for India's cultural heritage.

KEYWORDS:

Integrating, Sustainable, Holistic, Heritage, homogenization, Tradition.

● ●

OBJECTIVES OF MICRO FINANCE:

The following are objectives of present research study:

1. To study theintegrating trading craftsmanship with modern technology.

2. To study thesustainable solutions and energy.

3. To study thegovernment initiatives and vision 2047.

RESEARCH METHODOLOGY:

This paper is basically theoretical background. It is based on information obtained from secondary sources data. The secondary source data was collected about the different journals, research papers, books, articles and websites etc.

INTEGRATING TRADING CRAFTSMANSHIP WITH MODERN TECHNOLOGY:

1) Digital Preservation:

Digital preservation for India's Viksit Bharat @ 2047 vision involves creating a National Digital Preservation Programme with a national study report identifying key R&D projects, technical standards, and legal imperatives to ensure the long-term readability and trustworthiness of digital information, despite its ephemeral and non-tangible nature. This national effort focuses on mitigating threats from digital obsolescence and rapidly changing technology to safeguard human heritage in digital form. Use technologies like 3D laser scanning and photogrammetric to create detailed digital records of monuments and artifacts, forming the basis for digital repositories and online accessibility.

2) Non-Invasive Restoration:

Apply modern non-invasive techniques in preservation efforts to maintain the integrity of the ancient structures while integrating technological advancements. "Non-invasive Restoration by 2047" refers to India's goal of achieving net-zero carbon emissions by 2047, a key aspect of itsViksit Bharat (Developed India) Vision, which aims to transform the country through sustainability, innovation, and technology. This initiative includes restoring natural and cultural heritage sites using technology, balancing green growth with climate action, and implementing eco-friendly infrastructure and sustainable landscape management, particularly in the Himalayas.

3) Smart technologies:

Smart technologies by 2047 in India's Viksit Bharat vision include advanced AI, ML, and IoT in smart cities, smart grids, and smart EVs for energy and mobility; development of indigenous chip design, bioproduction, and digital twins in electronics and chemicals; and the use of these technologies across sectors like agriculture, defense, and healthcare to achieve a developed, tech-driven economy by 2047. implement sensors

and IoT devices within Heritage Building Information Modeling (HBIM) (HBIM) systems to enable dynamic monitoring of structural conditions and environmental factors.

SUSTAINABLE SOLUTIONS AND ENERGY:

1) Inspired by Ancient Practices:

Inspired by India's ancient practices, Viksit Bharat @ 2047 is a national vision to transform India into a developed nation by its 100th year of independence in 2047, emphasizing the integration of traditional knowledge, culture, and holistic well–being with modern innovation, technology, and sustainable development to achieve inclusive growth and global leadership. Draw inspiration from ancient Indian sustainable practices, such as the water–cooling mechanisms of baori (stepwells), to inform modern designs and technologies for climate control and energy efficiency.

2) Sustainable Energy Integration:

India aims for sustainable energy integration by 2047, targeting 2,100 GW of total installed capacity by that year to meet the projected 708 GW peak demand. Key strategies include scaling up solar and wind power, significantly increasing nuclear energy and hydro pump storage, developing energy storage, and fostering indigenous technology supply chains for green hydrogen and other sustainable sources to achieve energy independence and net–zero emissions by 2070.

GOVERNMENT INITIATIVES AND VISION 2047:

1) Viksit Bharat 2047:

Viksit Bharat @2047 refers to the Indian government's vision to make India a completely developed nation by 2047, the 100th anniversary of its independence. It focuses on transforming India into a prosperous nation with economic growth, social progress, environmental sustainability, good governance, and cultural heritage preservation. The vision leverages India's demographic dividend, particularly its youth, and emphasizes self–reliance, innovation, and citizen participation in nation–building efforts.The overarching national vision for India's development by 2047, which includes integrating traditional knowledge and heritage with modern technological advancements and innovation.

2) Ministry–Level Collaboration:

Ministry–level collaboration under the Viksit Bharat @2047 vision aims to foster synergy among government departments to achieve developed nation status by 2047 through shared goals and cross–functional initiatives, focusing on sectors like science, innovation, and administrative reforms to achieve administrative clarity, simplicity, and a delivery–oriented approach. Examples include the convergence of the Ministry of Education with NEP 2020, the NITI Ayoga's dialogues with states, and inter–ministerial meetings convened by the

3) Skill Development:

Establish frameworks and initiatives for skill development and training to support the integration of new technologies and traditional crafts in heritage management. Skill development for Viksit Bharat @ 2047 focuses on transforming India into a developed nation by fostering a workforce with future–ready, digital, and industry–aligned skills. Initiatives aim to upgrade trainer capabilities, promote apprenticeships, integrate technology like AI and VR, foster industry–academia linkages, and encourage entrepreneurship, especially among women and in rural areas, to achieve economic growth and social equity.

CONCLUSION:

The art of preservation is a delicate balance between honoring the past and adapting to the present. Protecting architectural heritage is not merely an act of nostalgia. it is an investment in identity, education, and sustainable development. As custodians of history, it is our collective duty to pass on these cultural beacons to future generations intact and revered. Preserving architectural heritage is not merely an act of conservation but a commitment to sustaining cultural identity, history, and collective memory in an ever–changing world. As societies continue to evolve and urban landscapes expand, the significance of protecting heritage structures becomes increasingly urgent. These monuments are silent storytellers of human creativity, resilience, and tradition.

This review explores the evolving relationship between craftsmanship, fashion, and technological progress, offering a nuanced understanding of how innovations have reshaped the fashion industry. Technology integration into fashion has improved production quality and efficiency, enabled precise, scalable manufacturing processes, and fostered global

connectivity. However, this progress comes with challenges. Traditional craftsmanship faces threats such as cultural homogenization, artisanal displacement, and environmental concerns. Yet, technology also presents unique opportunities for growth and development, including digital archiving of cultural heritage, sustainable production practices, and the creation of innovative materials.

References:

1. https://powerline.net.in/2025/04/06/vision-2047-key-factors-shaping-the-future-of-the-indian-power-sector/
2. http://bvicam.in/INDIACom/IJRMS/downloads/pdf/issue5/3.pdf
3. https://darpg.gov.in/sites/default/files/Viksit_Bharat_2047_Governance_Transformed.pdf
4. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2118258
5. https://swadeshishodh.org/viksit-bharat-2047-a-look-at-the-future-of-science-and-technology/
6. https://architecture.celnet.in/sustainable-environment-and-energy-efficient-technologies-for-developed-bharat-2047/
7. https://www.mdpi.com/topics/3ISK1l6649
8. https://www.ijert.org/the-art-of-preservation-protecting-architectural-heritage-in-a-changing-world
9. UNESCO, Building Resilience: Disaster Risk Management for Documentary Heritage and Digital Archives; Training Toolkit, UNESCO,
10. Giuliani, F., Gaglio, F., Martino, M. et al., (2024) "A HBIM Pipeline for the Conservation of Large-scale Architectural Heritage: The City Walls of Pisa," Herit Sci 12, 35

Conflict of interest:

The Authors have no conflict of interest to declare that they are relevant to the content of this article.