# Innovative Approaches to Cultural Preservation: Integrating AR/VR Technology in Kempegowda Museum: A Case of Bengaluru

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**Abstract**

Over a period, there has been a considerable evolution in the preservation and presentation of cultural heritage, with a significant contribution from technological innovations. This research paper explores the creative fusion of virtual reality (VR) and augmented reality (AR) technology at Bengaluru, India's Kempegowda Museum, formerly known as Mayo Hall. Adaptive reuse has allowed the museum, which formerly held items and pictures pertaining to Bengaluru's founder Kempegowda, to incorporate contemporary technologies for an enhanced visitor experience. With the help of holographic and AI-powered interactive displays, traditional displays will be replaced to modernize the museum while maintaining its cultural significance.

**Keywords:** Cultural Heritage, Adaptive Reuse, Augmented Reality, Virtual Reality

## Introduction

In an era marked by rapid technological advancement and evolving visitor expectations, the traditional museum must adapt and innovate. In this regard, the Kempegowda Museum, housed within the Mayo Hall located in Bengaluru, India, serves as a bulwark of historical preservation and is dedicated to celebrating the inheritance of Kempegowda, the city's founder. Kempegowda, a highly esteemed figure in Karnataka history, founded Bengaluru city in the sixteenth century by establishing a fortified township with forts, temples, and water reservoirs, his strategic leadership and planning laid the foundation for Bengaluru's rise to prominence as a major urban hub.

However, to make sure the museum experience remains relevant and resonates with modern audiences, it is imperative to rethink it considering evolving societal paradigms and the pervasiveness of digital technology. Mayo Hall aims to go beyond the confines of conventional museum settings by incorporating cutting-edge technologies into its exhibits and storytelling. This allows visitors immersive and interactive engagements with Bengaluru's rich cultural heritage.

The integration of AR/VR technology with cultural heritage preservation is ushering in a new era in the museum's history. This convergence promises to improve visitor experiences, encourage closer relationships with historical exhibits, and further the preservation of Bengaluru's cultural footprint in the digital era. As we set out on our exploratory voyage, it becomes evident that the incorporation of AR/VR technology signifies more than just a technical advancement; rather, it is a pledge to respect the past,

interact with the present, and influence how cultural heritage interpretation is interpreted in the future. We reveal the complex interactions between tradition and innovation, history and technology, via the lens of the Kempegowda Museum's evolution, setting the stage for a dynamic and engaging museum experience that appeals to audiences locally and internationally.

**Objectives**

- This project's primary goal is to increase visitor engagement using AR and VR technologies to produce immersive and interactive experiences that encourage closer interaction with the cultural artifacts and stories on display at the Kempegowda Museum.
- To ensure Bengaluru's rich cultural history is accessible and conserved for future generations, it is important to protect the heritage with modern digital preservation techniques.
- The aim is to create awareness and raise public knowledge of Kempegowda's contributions to Bengaluru's history and development by utilizing AR/VR technology to facilitate experiential learning opportunities.

**The application of augmented reality technology in museums**

Museums have traditionally safeguarded cultural heritage by preserving the narratives and artifacts that illuminate our common history. Modern tools are being used by museums to increase visitor engagement and provide immersive learning experiences because of technology advancements. Of these, Augmented Reality (AR) has the most potential to change the museum visitation experience. By superimposing digital content over the actual world and fusing virtual and physical aspects, augmented reality (AR) opens new opportunities for engagement and storytelling in museum settings. With the use of augmented reality (AR) technology, museums may enhance their displays, interact with a variety of patrons, and provide interactive educational opportunities. Enhancing artifact exhibits is one common usage of augmented reality in museums. Augmented Reality (AR) brings life to static displays by superimposing digital reconstructions, historical photos, or multimedia information over actual objects. This enables visitors to see artifacts in their original setting or see historical events unfold in front of their eyes.

Additionally, museums can design interactive and customized experiences with AR that are based on the interests of specific visitors. Visitors can receive additional information, audio guides, or interactive activities related to exhibits through wearable technology or other gadgets with augmented reality capabilities, which improves their comprehension and engagement. For example, visitors can digitally tour ancient sites, examine artworks detail by detail, or participate in role-playing simulations that bring historical narratives to life using AR-enabled gadgets. Moreover, AR makes immersive storytelling possible by empowering museums to create dynamic storylines that go beyond the confines of traditional exhibits. Museums can use augmented reality (AR) to develop interactive quests, or augmented dioramas that motivate visitors to actively explore exhibits and find deeper meanings. Museums may accommodate a wide range of learning preferences and encourage closer relationships between visitors and the collections by utilizing augmented reality technology.

In the AR experience in the British Museum's "A Gift for Athena" the interactive AR game play with natural feature recognition breaks new ground in in-gallery mobile experiences. Gift for Athena's AR challenges direct and support players' looking at the real artefacts and their unique aesthetic qualities.

(Gamar, 2015) Anticipating the future, augmented reality in museums presents stimulating opportunities for creativity and cooperation. Museums can investigate novel narrative techniques, collaborative teamwork, and community outreach programs as augmented reality technology advances and becomes more widely available. Museums may continue to encourage curiosity, empathy, and continuous learning in a variety of audiences by embracing augmented reality (AR) as a tool for normalizing knowledge and promoting cross-cultural communication.

**The application of virtual reality technology in museums**

Museums protect cultural heritage by keeping stories and artifacts that illustrate the range and depth of human history. In this age of technological advancement, museums are using Virtual Reality (VR) more and more to transform how visitors engage with the displays and discover the past. Using digital reconstructions, historical simulations, and multimedia information, virtual reality (VR) immerses viewers in virtual surroundings, opening new possibilities for storytelling and experiential learning in museum settings. Virtual reality (VR) technology presents museums with a plethora of potential to improve exhibitions, interact with a variety of audiences, and support immersive educational experiences. Creating virtual displays and immersive installations is one common usage of virtual reality in museums. Museum visitors can examine items and historical contexts in previously unheard-of detail by traveling to far-off places, ancient civilizations, or fantastical worlds using VR headsets or immersive displays.

Virtual reality (VR) also makes it possible for museums to reconstruct lost or inaccessible heritage sites, giving visitors the chance to digitally investigate underwater archaeology, tour ancient ruins, or experience damaged or destroyed cultural icons. Deeper connections with museum collections and historical narratives can be fostered through hands-on learning experiences provided by VR simulations, such as virtual item handling, historical reenactments, and interactive storytelling. Virtual reality technology makes it easier to take an interdisciplinary and collaborative approach to the curation and interpretation of museums. Through partnerships with academics, artists, and tech specialists, museums may create immersive experiences that transcend conventional exhibit formats and captivate a wide range of viewers by fusing science, art, and storytelling. Through online exhibitions, virtual learning programs, and digital outreach projects, VR also helps museums reach a wider audience, normalizing access to cultural heritage and promoting global relationships.

In *Mona Lisa: Beyond the Glass*, the visitor is invited inside the painting, where they can meet Lisa Gherardini in person, best known under the name of "Gioconda". It is a beautiful and poetic experience, which creates a remarkable balance between artistic reinterpretation and scientific information about the painting. (Jusseaux Maëlys, 2020) VR in museums has a bright future ahead of it, full of creative opportunities for cooperation and innovation. With the ongoing advancement and accessibility of VR technology, museums can investigate novel approaches to narrative, audience interaction, and cultural conservation. Museums may enhance visitor experiences, stimulate curiosity, and foster empathy and understanding among varied populations by utilizing virtual reality (VR) as a medium for experiential learning and cross-cultural engagement.

**Design Strategies**
● Reviving Kempegowda Era Through Technology: Bringing the stories of the Kempegowda Era back

to life by utilizing technology. Ancient landscapes are shown through digital reconstructions and augmented reality. Interactive platforms provide historical figures and their legacies with insights. We transcend time via innovation, bringing Kempegowda's reign to life and deepening our knowledge of the past. The advantage of VR technology is that it fills the information gap of traditional display and has rich forms of expression. It also fits into the trend of active presentation and interactive information exchange, paying attention to audience emotions and creating multi-sensory immersive experiences. (Wenru Zhao, 2023)

- Architectural Heritage ensured: Kempegowda's royal legacy is precisely mirrored in the architectural designs, which honor his legacy. Every building honors the cultural significance and majesty of his rule. The essence of Kempegowda's reign is preserved through elaborate embellishments and regal motifs, guaranteeing a timeless link to our regal history.

- Authenticity Assurance in Museum Content Presentation: Authentic content and story representation within the museum are given priority in design concepts. The museum ensures that tales are faithfully portrayed using rigorous research and curation, which increases visitor engagement and promotes a deeper understanding of cultural heritage.

- Evoking Emotions: Visitors are drawn into the world of Nada Prabhu Kempegowda by the fusion of design and content. The museum establishes a strong bond by using storytelling and sensory experiences to arouse a variety of emotions that are consistent with Kempegowda's rich cultural tradition. Use AR/VR to create an interactive narrative in the context of the historical background of artefacts, characters, and their stories, but also of a wider storytelling experience, starting before the visit to a museum and continuing after it ends. (Vassos, 2017)

- Crafting Seamless experience for visitor engagement: Smooth visitor experiences in the museum context are given top priority in design initiatives. From the entry to the exit, interactive features, clear signage, and easy navigation are prioritized. The museum makes sure that visitors are completely engaged in the discovery of Nada Prabhu Kempegowda's universe through careful layout and user-centric design. In the VR virtual environment, visitors are better able to visit a variety of cultural relics, collections, to bring an immersive sensory experience to the audience, and thus improve the quality and efficiency of audience visits. (Liu, 2019)



**Figure 1: Existing conditions of the Kempegowda Museum**

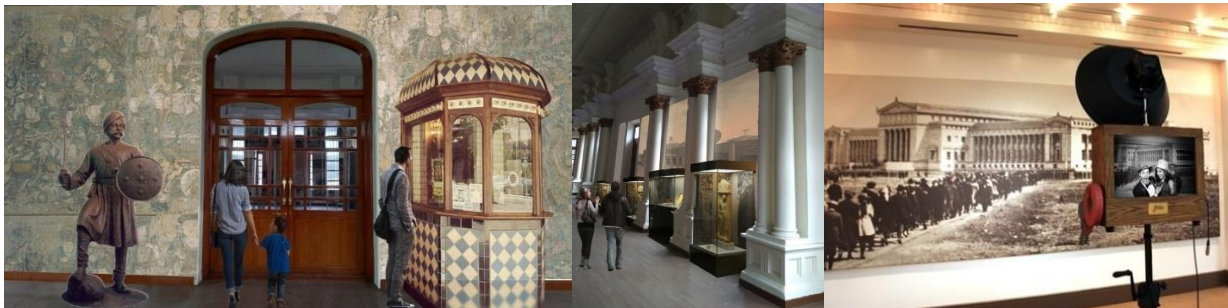**Figure 2: AR / VR proposals in Kempegowda Museum**



**Figure 3: Proposal of sculptures and visuals in the Kempegowda Museum**

**Conclusion**

In conclusion, the Kempegowda Museum's incorporation of augmented reality (AR) and virtual reality (VR) technologies represents a major advancement in the fields of cultural preservation and visitor interaction. Through the creative use of digital media to revitalize traditional museum experiences, the museum makes sure that the rich legacy of Kempegowda, the founder of Bengaluru, continues to be fascinating and available to both current and future generations. The museum celebrates history while promoting greater awareness and respect for Bengaluru's cultural legacy through experiential storytelling, interactive displays, and authentic content presentation.

Furthermore, the way that AR and VR technologies are incorporated into architectural design and physical exhibitions is a testament to a dedication to maintaining authenticity while embracing technological progress. This strategy guarantees a unified and stimulating visitor experience that cuts beyond chronological bounds, enabling guests to participate in a dynamic and captivating exploration of Kempegowda's reign. Setting the standard for the preservation and display of cultural heritage in the digital age, the Kempegowda Museum is a shining example of innovation and cultural stewardship as museums continue to change in response to shifting societal trends and technological advancements.

**References**

1. Gamar. (2015, April). *MW2015: Museum and the Web 2015*. Retrieved from https://mw2015.museumsandtheweb.com/: Samsung Digital Discovery Centre at the British Museum
2. Jusseaux Maëlys, B. P.-Y. (2020). Mona VR - recreating an experience. *Journal on Computing and Cultural Heritage*, 1-7.

3. Liu, B. W. (2019). The Research on Application of Virtual Reality Technology in Museums. *Journal of Physics: Conference Series, Volume 1302, Issue 4*, 1-5.

4. Vassos, F. D. (2017). Museum Experience Design: A Modern Storytelling. *The Design Journal, An International Journal for All Aspects of Design, Taylor & Francis*, 1-10.

5. Wenru Zhao, L. S. (2023). Designing virtual reality based 3D modeling and interaction. *www.cell.com/heliyon*, 1-12.