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# Evaluation of the Louvre Abu Dhabi interactive website: user perceptions, usability, and learning outcomes

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**Introduction:** This study evaluates user perceptions of the Louvre Abu Dhabi (LAD) interactive website, focusing on how digital technologies influence the consumption and interpretation of cultural heritage.

**Methods:** The research employed a mixed-method design with 50 participants. It investigated key parameters including usability, content richness, and learning outcomes, specifically examining how digital interactivity supports heritage engagement. The analytical framework extended the Technology Acceptance Model (TAM) and the Kano model to a Gulf cultural context.

**Results:** Findings revealed consistently high satisfaction across usability and learning dimensions, confirming the site's effectiveness as a cultural mediation tool. Beyond technical performance, participants described the platform as a gateway to immersive and participatory heritage consumption, where digital storytelling and interactivity foster curiosity and sustained cultural interest.

**Discussion:** Thematic analysis identified key development priorities: immersive virtual and augmented reality (VR/AR) integration, deeper narrative context, personalized guided itineraries, and stronger social-media outreach. The results suggest that digital heritage features have evolved from optional enhancements to essential components of cultural participation. The study concludes that sustained innovation in immersive design and AI-driven personalization is vital for museums seeking to expand cultural access and learning through digital media.

## KEYWORDS

digital heritage, museum website evaluation, technology acceptance model, Kano model, user experience, Louvre Abu Dhabi, Gulf region, digital engagement

## 1 Introduction

Digital technologies have fundamentally reshaped how audiences consume and engage with cultural heritage. Online museum platforms are no longer secondary to physical exhibitions but are now integral spaces of interpretation, education, and identity formation. Within the Gulf region, cultural institutions have increasingly adopted advanced digital systems that enable storytelling, interactivity, and personalization—each influencing how users perceive and interact with heritage content (Cameron and Kenderdine, 2020).

The Louvre Abu Dhabi (LAD) represents a major turning point in this transformation. Since its opening in 2017, it has utilized an interactive website to connect local and global audiences through a hybrid presentation of universal art and regional identity. Yet, while global

scholarship on digital cultural heritage (DCH) is extensive, empirical research on Gulf-based platforms remains limited. Most prior studies have focused on Western museums such as the British Museum and Smithsonian Institution, with few addressing how audiences in high-context cultural settings experience digital heritage.

This study addresses two key research needs:

- 1) To evaluate how the LAD interactive website facilitates user engagement, learning, and cultural participation.
- 2) To examine how established theoretical frameworks—the Technology Acceptance Model (TAM) and Kano Model of User Satisfaction—apply within a non-Western cultural environment.

By integrating user-experience evaluation with theoretical reflection, the study contributes to understanding how digital design choices mediate cultural consumption in the context of the Arabian Gulf.

## 2 Literature review

### 2.1 Theoretical background

The Technology Acceptance Model (Davis, 1989) remains foundational for analyzing digital adoption. It posits that perceived usefulness and perceived ease of use drive individuals' willingness to engage with digital technologies. Within the museum context, these dimensions' influence not only navigation and usability but also how visitors perceive the educational and cultural value of online experiences (Falk and Dierking, 2018).

The Kano Model (Kano et al., 1984) complements TAM by classifying design features as *basic*, *performance*, or *delight* attributes. As digital heritage experiences evolve, previously innovative features—such as 360° views or interactive maps—have become baseline expectations. This “expectation inflation” (Wang, 2021) underscores the need for museums to continually innovate in order to sustain user engagement.

### 2.2 Digital cultural heritage in the Gulf context

While Gulf countries have made significant investments in cultural infrastructure, academic literature on digital heritage consumption in this region remains limited. Studies such as Exell (2021) highlight how museums in the Gulf serve broader purposes of cultural diplomacy and national branding, yet few have empirically examined audience interactions with digital platforms. Understanding how local cultural values, power distance, and communication preferences shape online engagement is essential for designing inclusive digital experiences (Al-Muraikhi, 2017).

The Louvre Abu Dhabi offers an ideal case for such examination. Its website functions as a digital museum ecosystem, bridging Western museological traditions with regional expectations for interactivity and narrative richness. Evaluating this platform provides insights into how digital technologies mediate heritage

learning and shape user perceptions within this hybrid cultural setting.

## 3 Methods

### 3.1 Research design and participants

A cross-sectional survey design was employed using Qualtrics between 3 and 17 October 2025. Fifty participants from a Gulf-region university completed a 12-item Likert-scale questionnaire assessing usability, content richness, and heritage-learning impact. The sample was balanced by gender (52% female) and primarily aged 18–25 (52%). Participants' prior experience visiting the physical museum was also recorded.

### 3.2 Data collection instrument

The instrument integrated validated items from prior DCH studies (Smith and Rowe, 2021; Kelly, 2020) and included open-ended questions to capture qualitative insights. The translation-back-translation method (Brislin, 1986) ensured linguistic equivalence between Arabic and English versions. Reliability was high ( $\alpha = 0.94$ ), and thematic consistency was confirmed through inter-coder reliability ( $\kappa = 0.87$ ) (Henseler et al., 2015).

### 3.3 Analytical approach

Data were analyzed using non-parametric tests (Mann–Whitney U, Kruskal–Wallis) due to non-normal distribution. Effect sizes and ceiling effects were computed to assess satisfaction strength. Qualitative data underwent reflexive thematic analysis (Braun and Clarke, 2021) to identify enhancement themes related to digital consumption and learning engagement.

## 4 Results

### 4.1 Quantitative findings

User satisfaction was uniformly high across all dimensions, with mean scores ranging from 4.62 to 4.78 on a 5-point scale. No statistically significant differences were observed by gender, age, or prior visitation, indicating that the LAD website appeals broadly across demographics. These results suggest a universally accessible interface and consistent user appreciation for digital heritage content.

### 4.2 Qualitative insights

Analysis of open-ended responses ( $n = 44$ ) revealed four dominant enhancement priorities:

1. Immersive Technologies (VR/AR/360°)—27%
2. Richer Storytelling and Contextual Narratives—20%
3. AI-driven Guided Itineraries and Personalization—16%

#### 4. Enhanced Social-Media Marketing and Outreach—14%

Participants emphasized a desire for more experiential forms of digital engagement, aligning with global trends in participatory museum practice. Some respondents suggested continuous content updates and improved audiovisual features to maintain long-term interest.

## 5 Discussion

The findings demonstrate that the Louvre Abu Dhabi interactive website achieves exceptionally high usability and learning satisfaction, confirming that digital design can effectively mediate cultural understanding. Importantly, the study shows that users perceive the website not merely as an informational tool but as a dynamic environment for cultural consumption, where interactivity transforms passive observation into active participation.

These results extend the Technology Acceptance Model to a high-context Gulf culture, affirming the universal relevance of *perceived usefulness* and *ease of use* in predicting engagement. Furthermore, consistent with the Kano framework, features once considered innovative now constitute expected standards in digital heritage platforms.

However, the ceiling effects observed suggest an approaching innovation plateau. Without continued development—such as immersive storytelling and personalized experiences—user engagement may stagnate. The findings thus position innovation not as optional but as essential for sustaining digital cultural impact.

### 5.1 Limitations

The study's scope is limited by its small, convenience-based sample and single institutional setting, which constrain generalizability. Data collection over a two-week period also prevents longitudinal assessment of user retention. Future research should employ larger, cross-institutional samples and consider comparative analysis of multiple Gulf-region museum platforms.

## 6 Conclusion

The Louvre Abu Dhabi's interactive website exemplifies how digital media extend museums' reach and transform heritage engagement into a participatory, educational, and emotional experience. High usability and strong learning outcomes confirm that digital technologies can effectively foster cultural literacy and identity connection. Yet to maintain this success, institutions must continuously evolve through VR/AR integration, AI personalization, and multi-language narrative design that reflect cultural diversity and accessibility.

## 7 Implications for digital impacts

This study underscores the expanding digital impact of cultural heritage technologies. Interactive platforms redefine how heritage is consumed—transforming visitors from spectators into co-creators of meaning. For museums and cultural policymakers, this shift demands

sustained digital investment, inclusive design, and evidence-based evaluation of online experiences. The Gulf region, with its rapid technological growth, offers fertile ground for pioneering such transformations and for demonstrating how digital heritage can enhance intercultural understanding and educational outcomes.

## Data availability statement

The datasets generated and analyzed during the current study (survey responses and qualitative insights) are not publicly available due to privacy and confidentiality concerns related to the university participant sample. However, the aggregated and anonymized data summaries used to support the findings are available from the corresponding author upon reasonable request.

## Ethics statement

Ethical approval was not required for the study involving humans in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and the institutional requirements.

## Author contributions

MM: Methodology, Investigation, Writing – review & editing. EM: Methodology, Formal analysis, Writing – review & editing, Writing – original draft. WM: Writing – review & editing, Methodology. RJ: Writing – review & editing, Methodology. AH: Writing – original draft, Data curation, Methodology.

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