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VARIOUS APPROACHES OF ENHANCING CULTURAL HERITAGE PRESENTATION IN AIRPORTS OF THE GULF REGION

Manal Mahmoud Abdellatif^{1*}

¹College of Humanities and Social Sciences, UAEU, manalmahmoud@uaeu.ac.ae <https://orcid.org/0000-0002-4052-3450>

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Corresponding Author: Manal Mahmoud Abdellatif
(manalmahmoud@uaeu.ac.ae)

ABSTRACT

Airports in the Gulf region have evolved from mere transport hubs into cultural gateways and symbols of national identity. As passenger volumes and global connectivity increase, embedding cultural heritage within airport design has become both a policy goal and a design priority. This study investigates how Gulf airports present cultural heritage and develops an evidence-based framework that balances authenticity, visitor experience, and operational sustainability. Using a mixed-methods approach, combining document analysis, interviews, surveys, and field observations, the research examines six key strategies: immersive and interactive media, curated exhibitions, architectural placemaking, narrative wayfinding, intangible-heritage programming, and retail-based storytelling. Findings show that effective heritage integration depends on multi-level governance between cultural authorities and airport operators under shared evaluation models. A KPI-based assessment framework is proposed to measure visitor engagement, inclusivity, and brand perception. Overall, the study demonstrates how smart technologies and design interventions can transform Gulf airports into meaningful cultural interfaces, advancing both heritage management and passenger experience research.

KEYWORDS: Cultural Heritage, Gulf Region, Airports, Museology, Immersive Media, Tourism Experience, National Identity, Smart Technologies, Policy Framework.

1. INTRODUCTION

Airport cultural heritage presentation has become a significant point of connection between museology, tourism and architectural place making. To the people in the Gulf region, airports are not just a place to switch planes, but are also symbolic accesses through which people get their first and final impressions of who they are as a nation. Here, cultural presentation will involve the inclusion of physical and non-physical aspects to the day to day lives of the passengers. These aspects may be vernacular architectural motifs and interactive exhibitions. These attempts belong to a bigger pattern in the airport design sector globally; as places that previously were referred to as non-places are being transformed into significant cultural landscapes (1).

This topic is important as the theoretical frameworks that explain the role played by experience and identity in the public spaces underscore its importance. Experience Economy by Pine and Gilmore assumes that the experiences could be designed as the memorable moments which could go beyond the functional value and, as such, lends credence to the idea of airports as sources of cultural narratives (2). The sense of place framework also discusses how the incorporation of the local heritage into buildings makes people feel more identified with the location they live and work in (3) This sense of place is highly applicable to cultural diplomacy and tourism development in the Gulf airports where most of the international travelers merely transit the country without necessarily visiting the country.

The progress of academia in recent years portrays the growing pace of this field. Another important tendency is the rapid adoption of immersive technologies, such as virtual reality (VR), augmented reality (AR), and mixed reality (MR), which are being actively delivered into the heritage interpretation process to enhance its accessibility and engagement (4). The other trend is employing identity-based design features in gulf airports, which include Islamic geometric designs, desert scenery and sea-related cultural features. These factors have been reported to cause passengers to feel closer to the place as well as enhance their cultural experiences (1). The third trend is the emergence of smart airports that transmit stories associated with cultures via interactive media and narrative. This is compatible with design principles of experience and operational efficiency (5). These innovations demonstrate how technology, culture and design are uniting to transform the process of airports acting as cultural entry points.

The structure of this paper is such that it is able to give a full analysis of these dynamics. Section I provides the theoretical and contextual background, i.e. interpretive frames, place making theories and cultural-tourism nexus in the Gulf. Section II divides the key methods of heritage presentation at airports such as immersion in the media, curated exhibitions, place making, and inclusive interpretation, outlining their strengths and limitations. Section III addresses the governance mechanisms, procurement models and evaluation frameworks with special attention to how the performance indicators can be used to measure effectiveness. Section IV gives comparative case studies of other chosen Gulf airports, which give indications of success and constraints. Section V provides policy and practice implications, providing a roadmap and toolkit that can be used in the future. Lastly, the Conclusion will summarize results and suggest a KPI framework and areas of future study.

This study assumes the position of airports as important cultural cross-roads and not as infrastructures thus adding richness to the debate about the evolving status of heritage within globalized transit spaces. It demonstrates how Gulf airports might serve a broader role than simply logistics; they may also be utilized to do cultural diplomacy, act as expressions of identity, and immersive storytelling.

1.1. Research Gap and Aim:

Despite global interest in airport experience design, limited research explores how cultural heritage can be systematically embedded in airport environments through technology, policy, and governance. This study therefore aims to:

1. identify approaches to cultural heritage presentation;
2. assess how immersive computing tools contribute to engagement; and
3. Propose an evaluation and governance model supporting authentic, accessible, and sustainable heritage integration.

2. THEORETICAL AND CONTEXTUAL FOUNDATIONS

2.1. Airports as a Cultural Interface in the Gulf

Gulf airports have transformed into mere transit centers to symbolic spaces that give a sense of national identity and a soft power. The airport scape has been defined by research as a combination of the spatial, semiotic, and service aspects that affect destination image; managed architecture, interiors, art, and signage enhance a more powerful sense of place (6). This is in line with the Gulf strategies

which use tourism diversification and mega-events to create international reputations (7). Airports are therefore cultural interfaces in which infrastructure and symbols produce the meaning that goes way beyond the journey (8).

2.2. From Museology to Mobility

Previously, the focus of heritage interpretation was concentrated in museums but modern museology introduces accessibility, diversity and community participation (9). Application of such principles to airports decentralizes interpretation of cultures. The example of the public art program in Doha demonstrates this change to make terminals contact zones where people could learn about culture and make informal interpretations (10; 11).

2.3. Sense of Place and Nation Branding

It has been found that even in standardized transport environments, environmental cues such as materials, patterns, and spatial narratives can produce place attachment (6). Airport branding also correlates the service provision with cultural significance, which determines loyalty and choice (12). Traditional patterns and imagery in gulf airports are combined with high technology and culture is incorporated in the passenger experience.

2.4. Digital and Immersive Interpretation

New trends in heritage display include XR (AR, VR, MR), sensor-driven displays, and interactive narrative. It has been found that there is a transition towards technology as an end in itself to user-based design and accessibility (12; 13). XR in an airport can change dwell time into an experience of active cultural interaction with immersive narratives and ambient media (2).

2.5. Smart-Airport Infrastructures as Cultural Enablers

The smart-airport systems offer the strong avenues of cultural narration. Artificial intelligence-based interfaces, mobile services, and digital kiosks improve satisfaction as long as they are user-friendly (14; 15). Localized stories, language inclinations, and sustained curation can all be provided by content-management platforms (Kilic et al., 2021). The example of gulf terminals and especially the Terminal A of Zayed International exemplifies how architecture, operations, and digital media can meet to manifest the cultural identity and at the same time maximize effectiveness (16).

2.6. Fermented Cultural Programs of Gulf Airports

Policymaking objectives are turned into reality through commissioned art, rotating exhibitions and performances. In the Hamad international airport, a partnership with Qatar Museums creates a museum-without-walls that will interact with travelers in various velocities without interfering with traffic (18). The cultural anchors are also what link the passengers to broader heritage sites strengthening soft power and tourism strategies (7; 19).

2.7. Drivers of Policies and Local Situation

Cultural integration in the Gulf airports is a result of tourism diversification. The promotion of heritage attractions, such as Diriyah, Al-Ula, and pearl-diving routes, is conducted in terms of multi-destination itineraries and simplified visas (19). There is thus a repositioning of airports as cultural doorways to demand and improvement of waiting experiences (16).

2.8. Equity, Inclusivity and Intangible Heritage

The guidelines provided by ICOM focus on multilingual, inclusive, and ethical manifestations (9). Participatory AR may be craft-based, oral, and dialect-based and suffuses these components into mobile and ambient layers (13). Micro- narratives, audio samples and overlays provide a slight cultural immersion without being tokenistic since it inserts the heritage into everyday currents.

2.9. More Than Aesthetics: Evaluation and Evidence

Cultural projects should show results other than aesthetics. Evaluation normally deals with:

Visitor experience and learning: KPIs follow engagement, understanding, and accessibility (20).

Brand influence: Airport decisions and perceptions are influenced culturally (21; 7).

Operational congruency: Accessible and properly integrated smart systems have the potential to increase satisfaction (14; 15).

These areas provide a theory of change between heritage exhibition with quantifiable visitor, brand, and operational results.

2.10. Risk, Constraint and Design Ethics

Some of the critical risks are tokenism (vener cultural imagery), over-digitization (technology dominating stories), and logistics (crowds, acoustic, security). With the contexts of multi-ethnic Gulf, curators have to juggle pluralism and coherent

storytelling. The combination of digital layers with the tactile (slow) media, participatory governance, and design coordination with operations is placed in the category of mitigation strategies (2; 14; 22).

2.11. *Synthesis*

The gulf airports are the hybrid cultural systems at the point of intersection of museology, experience design, and smart systems. Heritage is viable and worthwhile through public art schemes, tactical branding and assessment systems. The subsequent sections are guided by three propositions:

1. Interpretive integration: The cultural material in everyday life adds value to place attachment (6; 21).
2. Tech-narrative alignment: XR and digital platforms should be more focused on storytelling and accessibility to increase engagement (12; 2; 14).
3. Evidence-based governance: The KPIs on operations, engagement, and brand help to maintain cultural initiatives in the long term (20; 21).

3. APPROACHES AND DESIGN INTERVENTIONS

3.1. *Overview and Design Logic*

Presentation of cultural-heritage in Gulf airports needs to have strategies that are effective in high-throughput settings with security concerns as well as to a wide audience. As a result of the literature on museology and experience-design, six parallel methods could be used to create memorable cultural experiences (Table 1): (1) immersive and interactive media, (2) curated exhibitions, (3) architectural place making, (4) narrative way finding, (5) intangible-heritage programming, and (6) the retail/F&B storytelling. They may be done using stationary anchors along passenger pathways and mobile punctuations that make it exciting (12; 2; 9).

3.2. *Immersive & Interactive Media*

XR technologies include AR, VR, and MR, which are experienced as interpretive technologies and less of a novelty. They have a personal approach to stories, bridge the gap between the tangible and intangible heritage, and transform the dwell time into the cultural experience (12; 13). Contactless triggers and multilingual interfaces can be used in airports to create short and modular micro-experiences. In the HIA of Doha, there are guided art tours and digital installations which incorporate storytelling in the terminal, whereas in DXB, content-

driven artworks are displayed on large screens (10; 23). The importance of focusing on narrative is an effective way to mitigate over-digitization, and making it accessible (14; 15)

3.3. *Curated Exhibitions*

Exhibitions give material cultural points of contact at various travel rates walk-by, stop, or guided. Rotations maintain the attention, whereas permanent pieces create what is recognized as identity. The validation of conservation and interpretive quality is guaranteed by co-curation between airports and cultural institutions. These are the museum-without-walls at Doha and the civic-themed rotating shows in Dubai (10; 24). Retail and security flows have to be coordinated, and the example of Abu Dhabi Terminal A master-planning (16) demonstrates that it is essential.

3.4. *Architectural Place Making and Material Culture*

Adoption of conventional materials and motifs in the buildings can turn airports into non-places into places that have a culture. In the case of Gulf hubs, this tends to be based on a maritime and desert tradition, oasis scenery, and local artisanship. Some of the interventions may be mashrabiya inspired screens, tactile programs in the family areas, acoustic heritage rooms, and landscape micro-narratives. The Terminal A at Abu Dhabi shows that the sense of design harmony can combine identity, functionality and narrative (16).

3.5. *Narrative Way Finding & Interpretive Signage*

Way finding provides low resistance entry points to add cultural narratives. It is possible to provide direct cultural hints by naming gates or spaces according to maritime or craft traditions, including multilingual QR essays, and in-iconic local semiotics (25; 26). Accessibility is guaranteed through WCAG-compliant designs that have tactile and audio layers. It has been shown that graphics that are embedded in culture, and tested together with users, increase their legibility as well as local identity (27).

3.6. *Intangible-Heritage Programming*

Oral traditions, crafts, performances Living heritage can be shown as short and participatory activations that are appropriate to transient audiences. UNESCO advocates the inclusion of intangible heritage in everyday spaces to help include and identify (28). The common formats are short craft demonstrations, soundscapes, and story

vignettes available through QR or NFC. Exploitative practices are avoided by community co-creation and fair remuneration. The programs enhance community-based interpretation that is authentic (29).

3.7. Retail & F&B Storytelling

Natural storytelling places can be made in retail and food space because they do not need extra floor space. There are provenance labels, scannable packaging, maker pop-ups or graphic storytelling embedded in menus and receipts as ways to tell narratives. Abu Dhabi Terminal A is a perfect example of how the sightlines and adjacencies of a retail setting can be choreographed to serve both purposes, emphasizing cultural themes and helping to meet commercial objectives (16; 30).

3.8. Inclusivity and Accessibility As A Design

Successful cultural programming should be accommodative at the very beginning. These principles are language parity, easy-read, captioned audio, tactile navigation, and the complaint with WCAG 2.1/2.2. Accessibility is a fundamental value maintained through governance-level commitments and cross-functional ownership between the functions of an airport and its brand, on one hand, and cultural partners, on the other hand (27; 31).

3.9. Evaluation-Ready Design

Interventions must have evaluation mechanisms incorporated at the start to facilitate ongoing improvement and accountability.

1. Engagement: footfall, dwell time, scans and tour uptake.
2. b.Knowledge: rapid intercepts and feedback of sentiment.
3. c.Fairness: language scope, accessibility audits, language diversity.
4. d.Operations: queue, maintenance and downtime effects.

Connecting cultural KPIs to smart-airport performance data creates a solid investment decision of the long term (14; 15).

3.10. Gulf Mini-Cases

Doha (HIA): Integrates visual arts installations and tours, with cultural interaction throughout the terminal. The program is presented as a central passenger experience, but not a peripheral attraction (10).

Dubai (DXB): Inclusive storytelling through rotating civic displays and wide-scale ambient media demonstrates scaling to a high-throughput

environment (24; 23).

Abu Dhabi (Zayed International - Terminal A): It combines culture touch points with the architectural identity and commercial planning, establishing a unified passenger experience and high brand positioning (16).

3.11. A Practical Alignment Matrix.

Goal Approach Design Ideas - Evidence hooks.

- b. Place attachment - Architectural place making + narrative way finding - local materials, named gates, graphic heritage - pre/post experience image scores; route-choice recall (25; 6).
- c. Learning/curiosity - Curated exhibitions + XR micro-stories - overlay labels; on-ramp kiosks; short AR vignettes - scan-through, completion, intercept knowledge test (12; 13; 2).
- d. Equity/inclusion - ICH programming + available content - co-creation with communities; captioned audio; easy-read - language coverage; accessibility spot-checks; practitioner diversity (28; 27).
- e. Reputation/soft power - distributed anchors and high-visibility ambient media - partnership with national culture institutions and signature artists - social/press coverage; brand monitoring (32; 23).

3.12. Synthesis: Creating a Toolkit to a Delivery

Successful presentation of airport heritage in the Gulf is never a one-off show but a framework: permanent anchors and rotating punctuations; analog craft and digital overlays; narrative way finding and encompassing ICH programming; and assessment built into design. The above cases show that cultural storytelling can thrive without hindering throughput when a combination of curation, operations, and commercial planning is done. Section 3 adapts this toolkit to governance, procurement and KPI structures, where roles, budgets and refresh times are detailed to support quality and authenticity in the long run.

4. GOVERNANCE, DELIVERY, AND EVALUATION FRAMEWORK

3.1. Principles of Purpose And Design.

- Airport cultural-heritage governance should strike a balance between cultural integrity and local legitimacy and operational goals and branding. An effective framework:
- Brings together collective responsibility between the cultural officials and the airports.
- Integrates accessibility and inclusivity and

ethics in decision-making.

- Embarks on assessment during the delivery process and not as an appendix.
- Meets the requirements of aviation safety and customer-experience standards, and cultural-sector standards (9; 14; 27).

4.2. Institutional Models

Model A: Operator-Directed with MoU - CX or Brand division in the airport will be in the lead, and the curatorial work will be conducted with MoU with cultural organizations. It is fast and applicable to digital activations (14; 15).

Model B: Cultural Authority-Directed - Cultural organizations direct curatorial activity and the logistics are handled by the airport, which is most appropriate with permanent or conservation quality exhibitions (9).

Model C: Joint Program Office (JPO)/PPP A common steering committee and PMO oversee long term portfolios with built in funding, performance based procurement and lifecycle maintenance (33; 34). (Table 2)

Suggestion: In the case of Gulf hubs, which revolve around soft power, JPO (Model C), consisting of a Senior Responsible Owner and service-level agreements between all functions provide the optimal compromise between curatorial latitude and rhythmic operation.

4.3. Governance Anatomy

Organization A Sponsor (airport C-suite or culture CEO) defines policy; a Steering Committee is the cohesion of operations, retail, security, heritage leadership, legal and communications. A PMO is in charge of delivery; a Curatorial Council checks on authenticity and equity; an Accessibility Lead makes sure that it follows WCAG (27).

Key Policies:

- Editorial: story coverage, prose, sensitive material.
- Collections: security standards and conservation standards.
- Digital & Privacy: low analytics, opt-in consent, retention.
- Accessibility: captioning, audio description, tactile substitutes (27; 31).

4.4. Commercial Assessments and Valuations.

The budgets are usually funded through operations budgets, capital budgets and sponsorship or CSR. Media infrastructure design, construction, and maintenance can be procured by the PPP, which includes performance clauses based on uptime and

passenger satisfaction (34). Cultural activations can be financed by retail and F&B partners in accordance with brand guidelines.

4.5. Procurement & Delivery Cycle

A cycle that is repeatable provides quality and consistency:

- Strategic Brief: goals, targets, limitations, KPIs.
- Idea: theme axes, media, accessibility.
- Design Development: way finding and retail integration.
- Testing: queuing simulation, piloting tests, accessibility tests.
- Introduction: maintenance and governance plan handover.
- Reflect: looping and analytics.

In the case of XR and digital material, it should deploy modular vignettes (90 sec), language fallbacks, and analytics on day one. Do not confuse evaluation with airport CX programs to minimize survey fatigue (35; 36).

4.6. Risk Management

- Operational: light/noise spill, congestion, maintenance downtime - risk scan, thresholds, and HSE checks minimize this.
- Ethical: tokenism, extractive practices - alleviated through Curatorial Council review, fair remuneration.
- Reputational: mismatch with national stories, obsolescence - solved by editorial diaries and crisis management.

4.7. Evaluation Framework

Cultural display is associated with quantifiable outcomes in a theory-of-change approach:

- Activities: research, design, XR, training.
- Outputs: language coverage, uptime, anchors, rotations.
- Results: involvement, equity, brand perception, operational fit.
- Effects: boosted destination image, re-selection and cultural involvement.
- KPI Domains: (Table 3)
- Visitor Experience: dwell time, scans, intercepts, sentiment (35).
- Equity and Accessibility: the coverage of the language, captioning, tactile paths, and usage rates (27).
- Brand & Soft Power: associative networks, media coverage, brand tracker alignment (32).
- Functionalities: queue impact, uptime, safety audit.

- Economic & Policy: valuation of cultural capital benefits (37; 38).

4.8. Data & Ethics

The privacy of data collection should be taken into account: on-sided data processing, aggregation, low retention, and voluntary consent. User generated content needs to be properly credited and IP-licensed. UNESCO ICH guidelines point at the need to incorporate community outcomes, but not only passenger measures (28).

4.9. Cadence and Continuous Improvement.

Digital content is to be renewed after every 3-6 months; and physical exhibition after every 6-12 months; and anchor review after every 2-3 years. Transparency is supported by quarterly KPI dashboards and annual cultural value reports. Iteration is facilitated by A/B testing of labels and audio and post-rotation reviews.

4.10. Gulf Regional Considerations

In gulf airports, the transfer shares and short dwell times are high, and micro-experiences at the key decision points are needed. The language base should be composed of Arabic and English, with transit-specific languages. The materials should be resistant to the weather, and programming should be associated with the seasons of the city and its national holidays to incorporate the local identity into the traveling experience (39).

4.11. Regional Case Studies & Comparative Analysis

- Rationale and Method

This section examines how Gulf airports operationalize cultural-heritage initiatives, addressing: (i) which approach bundles (from Section 2) are applied and why; (ii) which governance and delivery choices (from Section 3) sustain them; and (iii) what outcomes – engagement, inclusion, reputation, and operational fit – emerge. The analysis focuses on five cases: Doha (HIA), Dubai (DXB), Abu Dhabi (Zayed International, Terminal A), Bahrain International (BAH), and Saudi Arabia (Jeddah's Western Hajj Terminal and Riyadh's KKIA mural). These sites reflect varied scales, maturity levels, and curatorial models (10; 24; 16; 40; 41 ; 42).

- Doha – Hamad International Airport (HIA)

HIA's partnership with Qatar Museums creates a –museum-without-walls of permanent and temporary artworks across landside and airside zones. This distributed curation integrates art into everyday movement through walk-by anchors, pause points, and guided tours (18).

a. Approach: architectural place making + ambient media + signage.

b.Governance: Authority-hybrid (Model B/C) ensures conservation standards and smooth integration with operations.

c.Results: strong sense of place, global visibility, reproducible programming cycles.

d.Limitations: crowd management, conservation under heavy traffic, and multilingual accessibility.

- Dubai – DXB

DXB uses rotating, thematic exhibitions to convey civic values such as inclusion (e.g., artists of determination), positioned strategically at high-traffic circulation areas. Large-format ambient media supports dynamic storytelling (23; 24).

a.Approach: rotating exhibitions + ambient media + XR.

Governance: Operator-led (Model A), enabling fast refresh cycles.

Results: broad outreach, inclusive messaging, strong narrative visibility.

Limitations: limited interpretive depth and accessibility consistency.

- Abu Dhabi – Zayed International Airport (Terminal A)

Terminal A integrates commercial, architectural, and cultural elements into a unified design strategy. Cultural touch points are embedded within sightlines, retail zones, and circulation routes (16; 43).

a.Approach: place making + narrative semiotics + art zones.

b.Governance: Hybrid operator-partner model (A → C), aligning with long-term development.

c.Results: Cohesive identity, improved user experience, clears brand positioning.

d.Limitations: maintaining curatorial rhythm post-launch and embedding systematic evaluation.

- Bahrain International Airport (BAH)

BAH emphasizes national heritage through permanent galleries and rotating exhibitions curated by the Bahrain Authority for Culture & Antiquities (40).

a.Approach: gallery spaces + rotating exhibitions + interpretive signage.

b.Governance: Authority-led (Model B).

c.Results: strong community connection, policy alignment, and stable infrastructure.

d.Limitations: managing conservation amid heavy traffic and expanding multilingual access for global passengers.

- Saudi Arabia – Jeddah & Riyadh

Jeddah (Western Hajj Terminal): The Islamic Arts Biennale transformed the terminal into a cultural

campus showcasing Islamic art and attracting global audiences (44).

Riyadh (KKIA): A large concourse mural integrates Sadu, Taif rose, and Hasawi bisht motifs, exemplifying monumental architectural place making (41; 45).

a. Approach: event-scale programming (Jeddah) and permanent place making (Riyadh).

b. Governance: consortium-led (Jeddah) and authority-operator collaboration (Riyadh).

c. Results: wide media visibility, symbolic national branding.

d. Limitations: legacy integration and sustained accessibility.

- Cross-Case Synthesis

a. Approach Bundles by Strategic Goal

- Sense of Place: Permanent architectural anchors at HIA, Riyadh mural, and Terminal A create clear cultural identity and memorability.
- High Engagement in Short Time: DXB's rotating exhibitions and ambient media drive visibility and civic messaging despite brief dwell times.
- Deeper Knowledge Acquisition: Distributed galleries at HIA and BAH enable layered engagement supported by XR micro-vignettes.
- Event Diplomacy: Jeddah's Biennale demonstrates how cultural campuses transform airport precincts into soft power platforms.

b. Governance & Delivery Patterns

- Model B (Authority-led): Strong curatorial integrity and policy alignment (BAH, HIA).
- Model A (Operator-led): High agility and activation speed (DXB).
- Model C (Hybrid/JPO): Suitable for large-scale, multi-year strategies (Terminal A, Biennale).

c. Evaluation & Evidence Gaps

All airports lack robust public reporting on engagement, inclusion, or operational KPIs. While HIA and DXB highlight narratives, formal metrics are seldom disclosed. Abu Dhabi's ASQ ratings imply a connection between culture and experience, but evidence remains limited

(43; 16). This presents opportunities for future research and policy standardization.

d. Risks and Mitigation

- Tokenism & Over-Digitization: Emphasizing spectacle over context. → Address through editorial policies, community co-creation, accessible narratives.
- Operational Friction: Congestion or light/noise interference. → Pre-testing, risk

scans, and maintenance SLAs.

- Equity & Inclusion Gaps: Language parity and accessible formats. → WCAG-aligned processes and audits.

5. POLICY & PRACTICE IMPLICATIONS (ROADMAP, KPIS, AND TOOLKITS)

5.1. Purpose and Orientation

This section distills theoretical and design insights into a policy-practice guide for Gulf airports. It provides: (i) a phased plan to embed cultural heritage in terminals, (ii) a KPI framework aligned with customer-experience and safety protocols, and (iii) toolkits for procurement, governance, accessibility, and evaluation. The framework integrates cultural integrity, accessibility, and operational feasibility (9; 14; 37; 38).

5.2. Strategic Policy Anchors

Four anchors guide policy design:

Cultural integrity: Ethical standards with community involvement for intangible heritage (28).

Accessibility: Universal design and WCAG compliance as core editorial practice (27).

Operational fit: Early coordination with operations, retail, and security (14). Soft power: Link cultural assets to branding and tourism (32)

5.3. Roadmap (36 Months)

Phase I – Foundation (0–6 months):

Adopt an Accessibility Charter; set up a Steering Committee and SRO; sign a cultural MoU. Pilot narrative way finding and ambient media; establish baseline engagement and accessibility metrics (35).

Phase II – Scale-up (6–18 months):

Commission signature anchors and rotating programs; deploys XR micro-vignettes; procure digital assets with uptime SLAs; create an ICH panel; set engagement and inclusion targets (12; 13).

Phase III – Institutionalization (18–36 months):

Shift to a Joint Program Office (33). Publish annual Cultural Impact Reports and extend programming to airport precincts to connect terminals with city heritage districts.

5.4. KPI Framework

KPIs must be measurable and actionable across four domains:

- Experience: dwell time, scans, XR completion, recall. Target: +15% dwell; ≥60% XR completion; ASQ lift ≥0.5 (35).
- Equity & Accessibility: multilingual coverage, captioning, tactile alternatives; 90% audit pass

rate; remediation <30 days (31).

- Brand & Soft Power: positive cultural recall $\geq 70\%$; growing media mentions (32).
- Operational: no added queuing; $\geq 99\%$ uptime.
- Economic Value: measure heritage capital for business cases (37).

5.5. Toolkits For Delivery

- Governance: Editorial templates, curatorial council ToR, accessibility checklists.
- Procurement: RFP clauses for accessibility and uptime, outcome-based payments, lifecycle plans.
- Design: ≤ 90 sec XR specs, ambient media rules, narrative way finding (25).
- Accessibility: language roadmaps, inclusive testing, community acknowledgments.
- Evaluation: dashboards, sampling protocols, A/B testing cycles.
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5.6. Risk & Ethics

Key risks—tokenism, over-digitization, congestion, and privacy concerns—should be mitigated through narrative-first design, community oversight, risk scans, and privacy-by-design analytics. Fair remuneration and transparent crediting for practitioners are essential (28).

5.7. Implementation Scenarios

High-throughput hub: rotating exhibits, ambient media, narrative way finding; operator-led governance; KPI focus on reach and operational fit.

Gateway city: permanent anchors, distributed galleries, campus programs; hybrid governance; focus on learning and brand.

Emerging terminal: place making, a few signature anchors, language baselines; authority-led; focus on identity and inclusion.

5.8. Synthesis & Next Steps

Embedding heritage in airports strengthens experience, equity, branding, and operational value. Success requires shared governance, accessibility-centered editorial practice, and integrated evaluation. The 36-month plan balances early wins with institutional maturity. Future research should link cultural interventions to passenger experience data and expand heritage capital valuation in aviation contexts.

6. CONCLUSION

This paper argues that airports in the gulf region should be deliberate cultural interfaces, and not the

incidental place of mobility. Through combining theoretical underpinnings and design typologies, governance models, and comparative examples, we were able to establish that key heritage presentation emerges when three conditions are intersected that is, narrative coherence based upon community and curatorial integrity, experience design based upon inclusivity, accessibility, and temporal engagement, and operational alignment based upon airport safety, security, and commercial values. The system obtained is not a standalone show but an adaptive collection of portfolios, permanent anchors of identity, rotating outreach interventions, and digital or XR micro-narratives, regulated by stated editorial principles and a collaborative program model that binds cultural authorities and airport operators.

The proposed evaluation paradigm connects the cultural intent to measurable outcomes in visitor learning, equity, brand reputation, and compatibility in operations and operations, which offers a practical method of evidence-based budgeting and renewal operations. Regional case studies show that they are built at a variety of levels, including decentralized public art and narrative way finding and campus-wide cultural programming, as well as demonstrate some issues of tokenism, novelty fatigue, and disparities in access. These risks can only be mitigated by continued involvement by communities of practices, deploying privacy-preserving analytics, and integrating routine accessibility audits within content processes at the very beginning.

Future studies could explore cause, effect relationships between specific cultural touchpoints and measurable passenger-experience indicators, using comparative data analytics across airports and passenger segments. In addition, longitudinal KPI assessments can track how heritage-led interventions influence engagement, inclusivity, and brand perception over time. Further work might also extend cultural and heritage capital models to quantify the non-market value of heritage integration in aviation contexts. By placing cultural heritage at the heart of Gulf airports' service design, soft power is enhanced, place attachment deepens, and transit time becomes an opportunity for learning and cultural diplomacy. With increasing governance maturity and consistent evaluation, these airports can evolve into strong cultural portals, readable, inclusive, and genuinely reflective of their regional identity.

Table 1: Approaches To Cultural Heritage Presentation In Gulf Airports: Comparative Framework Of Strategies, Technologies, And Visitor Outcomes.

Approach	Description	Example Airport	Key Technologies / Features	Impact on Visitors
Immersive & Interactive Media	Use of AR/VR/MR to interpret local heritage	Doha (HIA)	AR kiosks, digital art tours	Converts waiting time into participatory cultural engagement
Curated Exhibitions	Permanent or rotating displays curated with museums	Dubai (DXB)	Thematic galleries, rotating exhibits	Strengthens identity & cultural continuity
Architectural Placemaking	Embedding vernacular materials and motifs in design	Abu Dhabi (Zayed Terminal A)	Islamic geometry, local stone & wood finishes	Builds sense of place and brand value
Narrative Way-Finding	Culturally themed signage and QR-linked stories	Bahrain (BAH)	Smart signage, audio guides	Improves accessibility and cultural learning
Intangible Heritage Programming	Crafts and performances representing living heritage	Riyadh (KKIA)	Live demonstrations, soundscapes	Fosters authentic human connection
Retail & F&B Storytelling	Embedding narratives in commercial areas	Abu Dhabi (Terminal A)	Provenance labels, graphic menus	Connects culture and commerce in daily interaction

This table summarizes how major Gulf airports integrate tangible and intangible cultural heritage into the passenger experience through diverse design and interpretive strategies. It highlights best practices that can inform a future **KPI framework for evaluating cultural engagement effectiveness** in transport hubs.

Table 2: Comparative Governance Models For Airport Heritage Programs In The Gulf: Institutional Roles, Strengths, And Challenges

Model	Description	Lead Institution	Strengths	Challenges
A. Operator-Led	Managed by airport CX/Brand division	Airport authority	Fast activation, high flexibility	Risk of superficial content
B. Authority-Led	Directed by national cultural organization	Ministry of Culture / Museums Dept.	High authenticity, policy alignment	Bureaucratic delays
C. Joint Program Office (JPO)	Shared governance via PPP model	Airport + Cultural Partners	Balanced control & funding stability	Needs continuous oversight

This table compares governance arrangements through which Gulf airports deliver heritage interpretation programs. It highlights institutional leadership structures, relative strengths, and implementation challenges that affect sustainability and policy alignment.

Table 3: KPI Framework For Evaluating Cultural Heritage Initiatives In Gulf Airports: Performance Domains, Indicators, And Benchmarks.

Domain	Key Indicators	Measurement Methods	Target/Benchmark
Visitor Experience	Dwell time, scan rates, engagement scores	Smart-sensor data, intercept surveys	+15 % avg. increase in engagement
Accessibility	Multilingual coverage, captioned content, tactile aids	Accessibility audits (WCAG 2.1)	≥ 90 % audit pass rate
Brand & Soft Power	Positive media mentions, sentiment scores	Brand tracking, press analytics	≥ 70 % positive brand recall
Operational Fit	Uptime, maintenance efficiency for digital installations	Technical logs and CX reports	≥ 99 % system uptime

This table outlines a structured framework of Key Performance Indicators (KPIs) designed to evaluate the effectiveness and sustainability of cultural-heritage programs within Gulf airport environments. It links qualitative visitor experience metrics with operational and brand performance measures to support evidence-based decision-making.

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