



## Smart Tourism and Cultural Heritage: Enhancing Visitor Experience through Digital Innovation

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### Abstract

Smart tourism is the product of the fusion of digital innovation and cultural heritage management, using artificial intelligence tools (AI), augmented reality (AR), the Internet of Things (IoT) and big data analytics to enhance the visitor experience whilst maintaining the authenticity of heritage sites. The use of smart tourism technologies is especially important in the Arab world, where archaeological and cultural heritage are national and civilizational assets, which cannot be replaced. However, the literature shows that there are ongoing gaps such as unequal digital infrastructure at various locations in the heritage sector, lack of Arabic language digital information and poor community representation in the tourism technological models. This article focuses on the Arab region and explores the role of digital innovations in the region's

cultural heritage tourism, based on a number of case studies from Jordan, Saudi Arabia, UAE and Egypt. It examines the contribution of Personalization using Artificial Intelligence, immersive AR/VR Heritage Reconstructions, Smart Mobility Solutions and Data-driven Visitor Management in improving the visitor experience and site sustainability. A vision of a Smart Cultural Heritage Tourism Framework (SCHTF) with 4 pillars is proposed: Digital Accessibility, Experiential Depth, Operational Sustainability and Community Co-Creation. Policy recommendations for heritage authorities, technology developers and tourism ministries are provided in the final part of the article, as they seek to implement smart tourism in a responsible and equitable manner.

## السياحة الذكية والتراث الثقافي: تعزيز تجربة الزائر من خلال الابتكار الرقمي

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تُعد السياحة الذكية نتاجًا لاندماج الابتكار الرقمي مع إدارة التراث الثقافي، من خلال توظيف أدوات الذكاء الاصطناعي (AI) ، والواقع المعزز (AR) ، وإنترنت الأشياء (IoT) ، وتحليلات البيانات الضخمة بهدف تعزيز تجربة الزائر مع الحفاظ على أصالة المواقع التراثية. وتكتسب تقنيات السياحة الذكية أهمية خاصة في العالم العربي، حيث تمثل المواقع الأثرية والتراث الثقافي أصولًا وطنية وحضارية لا يمكن تعويضها.

ومع ذلك، تُظهر الأدبيات وجود فجوات مستمرة، مثل عدم المساواة في البنية التحتية الرقمية بين المواقع التراثية المختلفة، ونقص المحتوى الرقمي باللغة العربية، وضعف تمثيل المجتمعات المحلية في النماذج التكنولوجية السياحية.

تركز هذه الدراسة على المنطقة العربية، وتستكشف دور الابتكارات الرقمية في سياحة التراث الثقافي في المنطقة، بالاعتماد على مجموعة من دراسات الحالة من الأردن، والمملكة العربية السعودية، والإمارات العربية المتحدة، ومصر. كما تبحث الدراسة في مساهمة التخصيص القائم على الذكاء الاصطناعي، وإعادة بناء التراث باستخدام تقنيات الواقع المعزز والافتراضي الغامرة (AR/VR)، وحلول التنقل الذكي، وإدارة الزوار المعتمدة على البيانات في تحسين تجربة الزائر وتعزيز استدامة المواقع التراثية.

وتتترح الدراسة إطارًا مفاهيميًا بعنوان إطار السياحة الذكية للتراث الثقافي (SCHTF)، يركز على أربعة محاور رئيسية: سهولة الوصول الرقمي، وعمق التجربة، والاستدامة التشغيلية، والإبداع المشترك مع المجتمع المحلي. وفي الجزء الأخير من الدراسة، تُطرح مجموعة من التوصيات الموجهة إلى الجهات المسؤولة عن إدارة التراث، ومطوري التقنيات، ووزارات السياحة، بهدف تطبيق السياحة الذكية بصورة مسؤولة وعادلة.

الكلمات المفتاحية: السياحة الذكية؛ إدارة التراث الثقافي؛ الذكاء الاصطناعي؛ التراث الرقمي؛ تجربة الزائر

## Introduction

The cultural heritage tourism sector is one of the fastest growing sectors in the global tourism industry and is estimated to represent 40% of international tourism revenue (Timothy, 2011). Visitors come to heritage sites to experience the past as it existed because they value and appreciate its authenticity, whether in terms of archaeology or the intangible aspects of its culture. Currently, however, the management of these locations poses more and more complex challenges and dilemmas: how to broaden access, enrich the experience, while allowing the property to gradually lose its physical integrity; how to create economic gains for the host communities without losing any of the pressures of mass tourism; how to tell contested, multilingual, and multi-layered histories in the millennial time span.

Partially, and importantly, digital innovation provides answers to these challenges. The idea of smart tourism, defined by the use of digital technologies in the tourism value chain (such as artificial intelligence, augmented and virtual reality, IoT, mobile tourism and big data analysis) has evolved from a speculative research agenda to a practical management reality over the last decade (Buhalis & Amaranggana, 2014). Smart tourism is the possibility to increase the value of the visits, offering an interactive and personalized service to the visitor, but also to optimize the management of the heritage sites, by providing effective data-driven services. Smart sensors can guide mobs around sensitive buildings; the use of mobile apps can provide visitors with context-aware AV stories; AI-based recommendation systems can pair visitors with experiences that cater to their interests and mobility needs.

The Arab world is at a unique crossroads in the world's change. Some of the world's most important archaeological sites, such as the walled city of Shibam in Yemen, the Pyramid of Giza in Egypt, the Luxor temple in Egypt, and Petra in Jordan are located in the region. Heritage tourism is a policy strategy considered by several Arab countries, particularly Saudi Arabia through Vision 2030 and the UAE, for economic diversification in huge public funds (Abuhjeeleh, 2019). Meanwhile, the region has also suffered from structural issues, including inconsistencies in digital infrastructure, language issues in sharing heritage content, and a lack of community involvement in tourism design, as well as the absence of Arab heritage stories on global digital cultural heritage platforms.

How to use Digital Innovation to improve the experience for visitors to cultural heritage sites and maintain ecological, social and cultural sustainability? The article will continue in the following way. Section 2 gives a conceptual definition and the application of smart tourism to cultural heritage. In Section 3 a general overview of the digital heritage tourism context in the Arab world is presented. In Section 4, key technologies, such as AI, AR/VR, IoT and data analytics, are explored in the context of heritage sites. A Smart Cultural Heritage Tourism Framework (SCHTF) is provided in Section 5. The section on Sustainability and Equity (6) is examined. Policy recommendations are included in Section 7 and the results are summarized in Section 8.

## **2. Conceptual Framework: Smart Tourism and Cultural Heritage**

### **2.1 Defining Smart Tourism**

Smart tourism is an evolution of the smart city concept, bringing in the field of tourism, hospitality and destination management. Buhalis and Amaranggana (2014) describe smart tourism destinations as destinations that leverage ICT Infrastructure to gather, process and present real-time information to all stakeholders (tourists, businesses, local community, and heritage managers) in a manner that enhances the tourists' experience and the usage of the resources. Key enablers in smart tourism are mobile and wearable devices, cloud computing with APIs, AI and machine learning, IoT sensors, geospatial data and immersive media technologies (AR and VR).

Smart tourism goes beyond the technological transformation of traditional tourism and is about changing the nature of the visitor experience, no longer a passive consumer of a planned narrative, but an active participant in a more personalised and participatory experience (Gretzel et al., 2015). It also represents a change in the way that heritage sites are managed, from "crowd management" to "data-driven operational planning".

### **2.2 Cultural Heritage Tourism: stakes and tensions**

The ethics and management of cultural heritage tourism are unique, specific and different from the rest of the tourism sector. In both the Convention for the Safeguarding of Intangible Cultural Heritage (UNESCO, 2003) and the World Heritage Convention it is recognised that heritage is not a resource that must be consumed, but a living legacy that is to be passed down through generations. At its best, heritage tourism is able to create local economic value, to foster intercultural dialogue and to enrich the visitors' experience of the shared history of mankind. In its worst-case scenario, it can also speed the degradation of sites, commodify local culture, prevent host communities from benefiting economically, and replace local heritage meanings with streamlined, marketable ones (Timothy, 2011).

Smart tourism technologies go to meet this land with great potential but also with risks. The personalization systems based on AI are trained mainly from data from Western tourism contexts and can reproduce biases of heritage interpretations. The AR reconstruction of archaeological sites can focus on one historical layer or one scholarly opinion to the detriment of other layers or opinions. However, poorly designed IoT monitoring systems can turn the tables on the institutions' mission of visitor enrichment to a mission of crowd control. It is therefore imperative that any smart cultural heritage tourism framework must also be based on not only the opportunity of technology but also on the ethical and moral obligation of the stewardship of heritage.

### **Research design**

The research design of this study is a qualitative and exploratory investigation that utilises a conceptual review combined with a landscape analysis of digital heritage tourism. The author employs a case study approach, focusing on specific digital innovation projects in Jordan, Saudi

Arabia, the UAE, and Egypt to examine the role of technologies such as AI, AR/VR, and IoT in enhancing visitor experiences and site sustainability. By synthesizing information from these regional examples and existing literature, the study identifies critical gaps—such as linguistic barriers and community exclusion—to derive and propose the Smart Cultural Heritage Tourism Framework (SCHTF).

### **3. Digital Heritage Tourism in the Arab World: Current Landscape**

#### **3.1 Institutional and Investment Context**

The Arab heritage tourism sector has gone through a considerable change in the last decade, mostly as a result of state development initiatives. The Royal Commission for Al-Ula (RCU) has been tasked to create Al-Ula, home of the UNESCO-listed World Heritage site of Hegra, into a world-class archaeological destination through its multi-billion dollar masterplan, Saudi Arabia's Vision 2030 has identified cultural and heritage tourism as a key pillar of the country's economic diversification plans (Kashef & Balkhy, 2025). The UAE has been making serious efforts to develop its culture, such as the Louvre Abu Dhabi and the Zayed National Museum, which are fitted with cutting-edge digital interpretation technologies. In the National Tourism Strategy 2021-2025, Jordan has made a pledge to enhance the interpretive facilities at Petra and Jerash in the country through digital upgrading. The Grand Egyptian Museum (GEM) opened in full in 2023, is one of the biggest heritage digitization projects in the region, with QR-code interpretation, interactive displays and multi-lingual AI-based tours.

The distribution of digital heritage resources in the Arab world is highly fragmented in spite of such high-profile investments. According to the Aleisa et al. (2021) audit of heritage sites in Arab countries, less than 30% of the sites had mobile visitors' applications that function, less than 20% had AR interpretation experiences and less than 15% had any IoT based monitoring of visitors. Physical damage, staff displacement and infrastructure breakdowns further restricted the ability of sites in countries in conflict (Syria, Yemen, Libya and Iraq) to be able to take part in digital innovation agendas, even when institutions will.

#### **3.2 Linguistic and Cultural Content Gaps**

One of the main issues in the digital heritage tourism field in the Arab world is the low visibility of Arabic content and Arab scholars' viewpoints on global digital heritage platforms. Most of the AR heritage content that is accessible on platforms like Google Arts & Culture, UNESCO World Heritage digital portal, and commercial AR heritage applications is found in English or European languages (Zerdoudi & Kouadria, 2021). This puts Arab visitors to an Arab heritage site in a seemingly contradictory position, where they have to interpret and understand their own cultural past through a foreign written language and through the lens of an external culture.

It is not just a linguistic issue – it is an epistemological one. Digital heritage content created by or for Westerners may emphasize specific aspects of history, approaches to research, or artistic sensibilities, leaving out other elements that may be important to Arab communities who view these locations as alive, as part of their cultural heritage. For instance, the architectural layers

of the Islamic period are less interpreted digitally than the Roman period columns, which are the main sources for international marketing images (Vanzan, 2020). Arabic-language content development is, therefore, a crucial element of a comprehensive smart tourism approach for Arab heritage sites and cannot be an after-thought.

### **3.3 Community Inclusion Challenges**

Heritage site communities, those in the vicinity of or embedded within a designated heritage site, are important stakeholders in heritage tourism sustainability. However, in many Arab heritage settings, the digital tourism development has been undertaken without involving the community or sharing benefits. According to Kashef and Balkhy (2025), during the initial stages of the development of Al-Ula, the local people were not treated as equal partners in developing the tourism experiences, but rather as beneficiaries of decisions made by an international consultancy firm and a national development authority. Partially, similar dynamics have been documented at Petra, where the knowledge of the archaeological landscape of the Bdoul Bedouin community has been incorporated into commercial tour products, but is not controlled by the community in terms of how the knowledge is represented or monetised (Meerpohl, 2015).

Community knowledge and perspectives can be incorporated into the development of digital heritage tourism experiences, for example, through participatory mapping, community-generate audio narratives and co-designed AR content but is still an underdeveloped area of practice throughout the Arab region.

## **4. Smart Heritage Tourism – key technologies**

### **4.1 There is a growing demand for AI technology that adapts for the individual. AI and personalization is an area of growing demand.**

Smart tourism applications are increasingly including the use of AI systems to deliver a personalized adaptive experience to visitors. Natural language processing (NLP) is the technology that allows AI-based chatbots and virtual guides to respond to visitors' inquiries, deliver historical context and help guide visitors through complex heritage sites, in multiple languages (Wang et al., 2016). Visitor behaviour data can be used to train machine learning algorithms which can then make personalised recommendations for journeys based on individual interests, mobility needs or time constraints. A system for guiding tours with artificial intelligence that adjusts the depth and complexity of the narrative according to the registered profile and interaction of the visitor during the tour of the Grand Egyptian Museum. The need for Arabic NLP systems and the opportunity offered by these systems to the people of Arab heritage is twofold. Although Arabic is the fifth most widely used language globally, it is still particularly under-resourced in AI research, when compared to English and Mandarin (Zerdoudi & Kouadria, 2021). The development of Arabic-language heritage AI systems would not only enhance the visitor experience of Arabic-speaking tourists but would also help build a greater Arabic NLP ecosystem by building on other sectors such as education, media, and public services.

## **4.2 Augmented and Virtual Reality.**

The AR/VR technologies have become one of the most effective tools to improve the experience of cultural heritage visitors. AR applications are able to offer the visitor an additional view of a heritage site that is composed of 3D reconstruction(s), archival photographs, animated figures and interpretive labels, allowing him or her to interact with both the physical and the historical site concurrently (Tom Dieck & Jung, 2018). VR applications produce a fully immersive digital environment that can allow visitors to experience the heritage site as it looked at a certain historical period, therefore it can be of particular value to heritage sites which have been damaged by conflict, decay or overdevelopment.

Some of the most ambitious AR/VR heritage projects have come out of Arab heritage sites. The Al-Ula development has hired onto photogrammetric 3D reconstruction of the façades of the Hegra tomb and created VR experiences allowing visitors to immerse themselves in the urban landscape of the Nabataean city of the first century CE. Jordan's Department of Antiquities has worked with international digital heritage developers to create an AR app for Jerash to recreate the Oval Plaza in its 2nd-century CE appearance. There have been various VR documentaries produced about the Giza Pyramids in Egypt, including projects with Google Arts & Culture, but these have been created more with the audience in mind, as opposed to visitors to the site.

Nevertheless, there is still a need for a solution to these issues. High-quality digital infrastructure at heritage sites, including reliable mobile connectivity, bandwidth, and device availability, are not always available in the Arab region, making the use of AR applications difficult. There are scholarly and ethical questions over the authenticity of digital reconstructions: Who is the voice of history in the 3D model? Which phase of the rebuild is privileged in the reconstruction? How are the areas of uncertainty represented to visitors? These interpretive governance issues are not to be forgotten when developing smart tourism frameworks for Arab heritage sites, along with the technical deployment challenges.

## **4.3 IoT and Visitor Management**

The systems of the Internet of Things (IoT) are a network of embedded sensors, RFID technology, GPS tracking, environmental monitoring, and smart ticketing — empower heritage site managers to use real-time data to gain insights into visitor flows, spatial distribution, dwell time and environmental conditions. This information, combined with other data from the dashboard systems and predictive algorithms, can be used in making proactive decisions about visitors: automatic signage to guide visitors away from congestion; automated alerts when visitors are entering an area of high humidity, CO<sub>2</sub>, or vibration exposure in enclosed heritage spaces (Guttentag, 2010); price modulation systems to encourage off-peak visits.

Petra is an interesting case study. The site is visited by around 1.1 million people per year, and the visitors are focused on the high tourist season in the morning hours in the main Siq corridor (Albahrat et al., 2024). The experimental implementation of a visitor flow management system, using IoT technology, placed pressure sensors on specific paths, cameras to capture the density of visitors in the main junction points and an app with push notifications to guide visitors to

alternative paths to avoid the main ones. A preliminary assessment found that the peak hour congestion at the most iconic and most physically vulnerable monument, the Treasury facade, was reduced by 23%.

#### **4.4 Big Data Analytics and Predictive Planning**

The data collected from the IoT sensors, mobile applications, social media platforms, ticket systems and usage of digital guides creates big data sets that offers heritage site managers insights for enhancing their operations. By using predictive analytics models based on past visitation trends and real-time data from weather forecasts and event calendars, managers can be prepared for periods of higher demand and more effectively schedule staff and interpretive resources to meet it. Analyzing social media platforms for sentiments of visitor reviews on platforms such as TripAdvisor, Instagram geo-tags, and Twitter/X posts can yield near real-time feedback on visitor satisfaction and pinpoint specific issues with the heritage elements or services that need addressing (Femenia-Serra & Neuhofer, 2018).

However, big data analytics has seen limited application in the management of Arab heritage sites, and most sites only use manual methods for counting visitors, and occasional visitor satisfaction surveys. The data centre investments taking place at key locations in Saudi Arabia, the UAE and Jordan, however, pave the way for more advanced data analytics capabilities to be realised in the medium term.

### **5. Smart Cultural Heritage Tourism Framework (SCHTF).**

#### **5.1 Framework Overview**

Based on the conceptual review and the Arab heritage tourism landscape analysis, we propose the Smart Cultural Heritage Tourism Framework (SCHTF) as an integrated framework for the implementation of digital innovation in Arab HT contexts. The framework is structured around four pillars that tackle each of the four aspects of the smart tourism challenge:

**Pillar 1 – Digital Accessibility:** Making the smart tourism infrastructure and content accessible to all segments of visitors, including visitors with disabilities, low-income domestic tourists, Arabic-speaking visitors and communities with low connectivity.

**Pillar 2 – Experiential Depth:** Using AI, AR/VR and multimedia to deepen the interpretive experience of heritage beyond surface visual displays to create real and emotional knowledge, as well as cultural understanding and empathy.

**Pillar 3 – Operational Sustainability:** Implementing IoT, big data analytics and predictive systems to manage visitor flow, protect physical assets of the heritage, decrease the environmental impact of tourism operations and provide data for evidence-based heritage management decision making.

Pillar 4 – Community Co-creation: Including local communities as active partners in the creation of digital heritage content, as smart tourism experience co-designers and as beneficiaries of the economic value created by digital innovation investments.

## **5.2 Implementation Levels**

The SCHTF classifies the implementation level according to the different capacities of the heritage sites in the Arab region as follows:

Level 1 — Foundational Digital: Sites at this level invest in QR-code interpretation panels to connect to multilingual websites, as well as low-tech mobile applications that can function without internet access, and simple visitor count systems. This level can be used for heritage sites located in other parts of the world, such as sites outside the Gulf region in North Africa and Levant, which lack a large-scale investment capacity for digital infrastructure.

Level 2 — Interactive Digital: AR interpretation experiences, AI-powered multilingual chatbots, IoT-based visitor flow monitoring and integrated data dashboards are all deployed at level 2. Community digital storytelling projects are piloted and the local community is trained as a digital heritage content contributor.

Level 3 — Smart Heritage (Advanced): These level 3 sites have integrated full VR heritage reconstruction experiences, predictive AI visitor management systems, personalized itinerary engines, real-time environmental monitoring integrated into heritage conservation processes, and co-designed AR experiences working with heritage site communities. This is equivalent to flagship investments like Al-Ula and the Grand Egyptian Museum.

## **5.3 Governance and Ethics Principles**

Three levels of the SCHTF are supported by governance and ethics principles based on UNESCO (2021) Recommendation on the Ethics of AI and ICOMOS (Martínez Yáñez, 2022) Digital Heritage principles. The guiding principles are: Transparency when interpreting the history of heritage in digital reconstructions; Community consent to the digitization and public display of culturally sensitive heritage; Data privacy for visitor data collected using IoT and mobile systems; Fair revenue sharing between digital platform developers and host communities of heritage sites; and regular independent audits of AI systems for cultural bias (El Ghoubach et al., 2021).

## **6. Sustainability & Equity Dimensions**

### **6.1 Environmental Sustainability**

The use of digital infrastructure at heritage sites has an environmental cost (data centres, hardware production, wireless transmission systems and regular changing of hardware). Thus, smart tourism design for Arab heritage sites should include a lifecycle assessment of the environmental impact of digital infrastructure investments, and the use of energy-efficient

technologies, renewable energy for data infrastructure and circular economy principles for device management (Font & McCabe, 2017).

Well-designed smart tourism systems can also play an active role in the conservation of the heritage by mitigating the physical stress caused by the tourist's masses on the fragile heritage fabric. In the case of the visitor management system, a new paradigm can be seen through the concept of redistributing the flow of visitors, the AR experience can be considered as a replacement for physical access to sensitive areas and the predictive analysis can be interpreted as an intervention for conservation in advance.

## **6.2 Social Equity and Inclusion**

Investments in smart tourism in the flagship heritage sites of the rich, Gulf countries risk deepening the divide between the Arab heritage sites that are marketed abroad and other less resourced, but equally important, heritage sites around the region. It would be beneficial for a regionally equitable smart heritage tourism to consider targeted investment in creating a digital infrastructure at the heritage sites of lower-income Arab countries, open-source sharing of digital content and digital platform tools among the heritage institutions, and capacity-building programs for heritage professionals in the countries with limited access to international digital heritage expertise.

There is also an intra-country digital divide in the countries of heritage places. Whereas lower income and rural domestic visitors to Arab heritage sites are much less likely than their more affluent international counterparts to own a smartphone that can have AR applications on it, or to be able to access reliable mobile data connection at heritage sites. The development of smart tourism experiences for mobile and smart tourists—those who have access to the latest technology—may leave out those who have the greatest cultural ties to the heritage, and who do not have mobile and smart devices (Mele et al., 2025). Low bandwidth design standards should thus be the minimum level of design, everywhere SCHTF is implemented.

## **7. Policy Recommendations**

### **7.1 Heritage Authorities and Tourism Ministries**

The national Digital Heritage Tourism Standards should be developed in line with the SCHTF with a minimum standard for Arabic language heritage content in the delivery of smart tourism, community consultation, data governance and environmental sustainability. Digital master plans of heritage sites should be created in collaboration with local communities, and the formal pathways to community co-design of interpretive content and community income from digital platform revenue should be created. Establish Smart tourism innovation funds by ministries of tourism that would facilitate the deployment of the technologies beyond the flagship sites at high investment and high heritage value sites, especially in lower income and conflict affected countries.

## **7.2 To Technology Developers and Digital Platform Providers**

It is crucial that technology companies looking to provide smart tourism solutions at Arab heritage sites enhance their Arabic-language credentials as an essential part of their platforms, to avoid being left with some of the Arab world's greatest treasures converted into monument museums that are inaccessible to many. International digital heritage platforms should enter into co-production partnerships with Arab scholarly institutions and local Arab heritage communities to make sure that the interpretive content is based on Arab perspectives and approaches to history. Arab heritage data collection should adhere to regional standards of data sovereignty and have limitations on the commercial use of secondary data.

## **7.3 For Regional Organizations**

It would be good to see the pan-Arab Digital Heritage Content Repository developed by the Arab League Educational, Cultural and Scientific Organization (ALECSO) and the UNESCO Regional Bureau for Science in the Arab States, an open access platform of Arabic-language heritage interpretation resources that can be accessed by Arabic heritage sites all over the region. Regional capacity building programmers should equip heritage professionals with skills and knowledge in digital content creation, data analysis and community engagement techniques. A smart-stricken heritage tourism observatory should be created that would help in monitoring the adoption of digital standards, record best practices and give the policymakers an evidence base for making policies.

## **8. Conclusion**

Smart tourism is an emerging concept that combines the use of AI, AR/VR, IoT, and big data analytics in managing cultural heritage sites and designing their visitor experience, offering a transformative chance for cultural heritage tourism in the Arab world. In addition to the high value of the region's archaeological and cultural heritage, investments in public heritage tourism projects have been substantial in the region in various Arab countries, presenting opportunities for the application of digital innovation on a large scale.

But it's not just about the technological ambition, however, to make this opportunity a reality. It needs a framework, the Smart Cultural Heritage Tourism Framework suggested in this article, which is based on commitments to Arabic language accessibility, community co-creation, environmental sustainability, and social equity, to make digital innovation work. Heritage sites are not only places to go but also records of human life and expressions of human living culture. The digital systems used in them need to benefit not only the visitor experience, but the long-term survival of the heritage and the well-being of the custodians of that heritage, the people who live there.

The SCHTF provides a framework and values-based approach for implementing Smart Tourism in a responsible way for Arab heritage authorities, tourism ministries, and technology providers. Future studies will be based on longitudinal assessment of smart tourism interventions at Arab

heritage sites, participatory design tools for community co-creation of digital heritage content, and Arabic language AI systems for heritage interpretation development and testing.

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