

Transforming Cultural Heritage into Sustainable Educational Tourism: The Case of Wahanarata Museum Yogyakarta

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Abstract.

Wahanarata Museum Yogyakarta is a cultural heritage destination that preserves the royal carriage collections of the Yogyakarta Sultanate while simultaneously adapting to the contemporary tourism landscape through digital innovation and educational tourism development. This study aims to analyse the sustainability aspects of Wahanarata Museum from the perspectives of cultural preservation, social sustainability, and tourism development. The research employed a descriptive qualitative approach using data triangulation techniques through observation, interviews, and documentation to obtain a comprehensive understanding of the museum's management and visitor experience. The findings reveal that the museum has implemented several sustainability-oriented strategies, including the revitalisation of museum facilities, the integration of digital technologies such as augmented reality and interactive educational media, and the involvement of Abdi Dalem as custodians of traditional values and cultural interpretation. These efforts demonstrate the museum's attempt to balance heritage conservation with modern tourism demands. However, several challenges remain, particularly regarding limited bilingual interpretative information, insufficient digital promotion, and the need for more engaging educational communication strategies. From a socio-cultural perspective, the museum functions not only as a repository of historical artefacts but also as a living cultural space that maintains the continuity of Javanese traditions, collective memory, and local identity. The study concludes that the sustainability of cultural tourism destinations is not solely dependent on technological innovation or physical conservation, but also on the continuity of social values, community participation, and meaningful visitor experiences. Therefore, Wahanarata Museum has significant potential to become a model of sustainable cultural and educational tourism management that integrates heritage preservation, social sustainability, and digital transformation within the broader context of contemporary tourism development.

Keywords: Sustainable tourism, cultural heritage, educational tourism, museum sustainability and social sustainability.

I. INTRODUCTION

Sustainable tourism has emerged as a contemporary paradigm in destination management that emphasises a balance between economic growth, environmental preservation, and socio-cultural sustainability [1]. This concept has become increasingly important as the rapid development of the tourism industry frequently generates environmental pressures and contributes to the degradation of local culture when not managed responsibly [2]. According to the United Nations World Tourism Organization (UNWTO), sustainable tourism refers to tourism that fully considers its current and future economic, social, and environmental impacts in order to address the needs of visitors, the tourism industry, the environment, and host communities.

From the perspective of social sciences, tourism is not merely regarded as an economic activity, but also as a space for social interaction, the construction of cultural identity, and a medium for public education. Cultural tourism plays a significant role in creating authentic experiences that strengthen the relationship between communities, history, and local cultural heritage [3, 4]. Consequently, museums, as part of cultural tourism destinations, hold a strategic role in maintaining the sustainability of social and cultural identity within society [5-7].

Wahanarata Museum Yogyakarta is one of the cultural museums possessing significant historical value due to its collection of royal carriages belonging to the Yogyakarta Sultanate. The museum was previously known as the Yogyakarta Palace Carriage Museum before undergoing revitalisation and rebranding in 2023. This transformation was undertaken as a form of adaptation to the advancement of

digital technology and the changing preferences of contemporary tourists, who increasingly seek interactive and educational tourism experiences [8, 9].

The development of Wahanarata Museum reflects a shift in the museum paradigm, from being merely a repository of historical artefacts to becoming a communicative and participatory centre for cultural education. The incorporation of technologies such as augmented reality (AR), interactive multimedia, and educational games has become a strategic approach to enhancing visitor experiences whilst simultaneously expanding the museum's social function [6]. Innovation within sustainable tourism destinations is an essential factor in improving competitiveness whilst maintaining cultural relevance amidst global change [10].

Nevertheless, the transformation of the museum also faces several challenges. Limited public interest in museums, less effective digital promotion, and inadequate cultural interpretation systems remain obstacles to improving the quality of visitor experiences. Furthermore, museum management must also consider social sustainability through the involvement of cultural communities and local society. The success of sustainable tourism depends upon a destination's ability to minimise negative impacts whilst maximising socio-cultural benefits for local communities [11-13].

Based on these conditions, this study aims to analyse the sustainability aspects of Wahanarata Museum Yogyakarta from the perspectives of tourism and social sciences. This research is important in understanding how cultural museums may transform into adaptive educational tourism destinations that respond to technological developments without losing their traditional values and cultural identity.

II. LITERATURE REVIEW

Sustainable Tourism

Sustainable tourism has evolved into a strategic framework that seeks to balance economic development, socio-cultural preservation, and environmental protection within tourism destinations. The concept emerged as a response to the adverse impacts of mass tourism, including environmental degradation, commodification of culture, and unequal socio-economic benefits for local communities [2, 11, 14]. From a socio-cultural perspective, sustainable tourism is not merely concerned with visitor satisfaction and destination competitiveness, but also with maintaining cultural continuity and social cohesion. Sustainable tourism should ensure the long-term viability of destinations without compromising the cultural and environmental resources upon which tourism depends [12, 15]. This perspective aligns with the argument proposed by Streimikienė [12] who identified three interconnected pillars of sustainable tourism development, namely economic sustainability, environmental sustainability, and socio-cultural sustainability. These dimensions must operate synergistically in order to achieve long-term destination resilience.

Recent studies have further expanded the concept by incorporating innovation and digital transformation as critical components of sustainability. Santos et al [10] argued that sustainable tourism in the contemporary era requires adaptive innovation capable of responding to changing tourist behaviour, technological advancement, and global socio-economic transformation. Similarly, Loureiro et al. [2] conceptualised sustainable tourism as a dynamic process rather than a static condition, requiring continuous adaptation to societal and technological change.

In the context of cultural tourism, sustainability also encompasses the preservation of intangible heritage, local identity, and traditional social systems. Han [11, 16] highlighted that sustainable tourism should minimise negative impacts whilst maximising social benefits for local communities through participatory and culturally sensitive management approaches. Therefore, sustainable tourism management within heritage destinations such as museums requires a holistic approach that integrates conservation, education, innovation, and community participation.

Museum as Cultural and Educational Tourism

Museums constitute an essential component of cultural tourism because they function as spaces for historical preservation, interpretation, and public education. In tourism studies, museums are recognised not only as repositories of artefacts but also as institutions capable of producing meaningful cultural experiences for visitors. Richards [4] stated that cultural tourism involves experiential engagement with heritage, identity,

and local narratives, thereby positioning museums as important mediators between history and contemporary society.

Historical tourism specifically refers to tourism activities motivated by an interest in experiencing and understanding the past through historical places, objects, and narratives [17]. Historical tourism facilitates interaction between tourists and collective memory through material culture and heritage interpretation. This notion was later reinforced by Sabrina et.al. [18], who explained that the authenticity of heritage narratives plays a significant role in shaping visitor experiences within historical destinations.

Within educational tourism discourse, museums possess strong pedagogical value because they provide experiential learning opportunities beyond formal classroom settings. Zhang [19] defined educational tourism as tourism in which learning constitutes the primary or secondary motivation for travel. Likewise, [18] explained that educational tourism contributes to local development through knowledge dissemination, cultural interaction, and social engagement.

Contemporary museum management increasingly integrates digital technology in order to enhance visitor participation and educational effectiveness. Interactive technologies such as augmented reality (AR), virtual reality (VR), and multimedia interpretation systems have transformed museums into immersive learning environments. According to Meng et al. [20], technological integration within heritage tourism can strengthen public engagement whilst simultaneously supporting sustainable heritage preservation.

In the context of Museum Wahanarata Yogyakarta, the integration of digital technology represents an attempt to modernise heritage interpretation whilst preserving the authenticity of Javanese royal culture. This transformation illustrates how museums may function simultaneously as cultural preservation institutions, tourism attractions, and educational platforms.

Socio-Cultural Sustainability in Heritage Tourism

Socio-cultural sustainability refers to the capacity of tourism development to preserve social values, cultural identity, and community cohesion over time. Within heritage tourism, socio-cultural sustainability becomes particularly important because tourism activities directly interact with local traditions, customs, and collective memory.

According to Pritandari [8], the management of cultural heritage within the Yogyakarta Palace environment relies heavily upon the involvement of Abdi Dalem, who serve not only as custodians of royal artefacts but also as cultural intermediaries responsible for transmitting traditional values to visitors. This reflects the concept of “living heritage”, whereby cultural practices continue to function within contemporary society rather than existing solely as historical remnants.

Furthermore, socio-cultural sustainability within museum tourism also requires inclusive public participation and equitable access to cultural knowledge. Widyastuti [9] argued that interpretative facilities such as multilingual information boards, ergonomic signage, and accessible educational narratives are essential components in improving visitor understanding and cultural appreciation. Without effective interpretation systems, museums risk becoming passive exhibition spaces rather than active centres of cultural communication.

Consequently, sustainable museum management requires a balance between heritage conservation and contemporary visitor expectations. This balance becomes increasingly significant in the digital era, where audiences demand interactive, accessible, and meaningful tourism experiences without compromising cultural authenticity.

III. METHODS

This study employed a qualitative descriptive approach in order to examine the sustainability aspects of Museum Wahanarata Yogyakarta comprehensively. A qualitative approach was selected because it enables researchers to explore social phenomena, cultural meanings, and institutional practices in their natural settings without manipulating existing variables. According to Turale [21], qualitative descriptive research aims to provide systematic and factual descriptions of social realities through the interpretation of participants’ experiences and perspectives.

The research adopted a case study orientation because Museum Wahanarata represents a contemporary example of cultural heritage revitalisation within the broader framework of sustainable tourism development. Yin [22] explained that case study research is particularly appropriate when investigating contemporary phenomena situated within real-life contexts, especially where boundaries between phenomenon and context are not clearly evident.

Data collection was conducted using triangulation techniques in order to enhance data validity and reliability. Denzin [23] categorised triangulation into source triangulation, methodological triangulation, investigator triangulation, and theoretical triangulation. In this study, source and methodological triangulation were applied through the integration of:

Observation

Direct observation was conducted within Museum Wahanarata to examine physical facilities, visitor behaviour, interpretative systems, technological integration, and cultural interactions occurring within the museum environment.

Semi-structured interviews

Interviews were undertaken with museum managers, visitors, cultural practitioners, and Abdi Dalem in order to obtain in-depth insights regarding museum management, sustainability challenges, educational functions, and cultural preservation practices.

Documentation analysis

Supporting documents such as photographs, museum archives, promotional materials, and policy documents were analysed to strengthen contextual understanding and corroborate findings obtained from observation and interviews.

The data were analysed using thematic analysis techniques following the framework proposed by Braun and Clarke [24], involving data reduction, coding, theme categorisation, interpretation, and conclusion drawing. This analytical framework enabled the researcher to identify recurring patterns related to sustainability dimensions, cultural preservation, technological adaptation, and socio-cultural participation within Museum Wahanarata. To ensure research trustworthiness, the study adopted credibility, transferability, dependability, and confirmability criteria as proposed by Lincoln and Guba [25]. Credibility was achieved through prolonged engagement and triangulation, whilst dependability was strengthened through systematic documentation of the analytical process

IV. RESULT AND DISCUSSION

Transformation of Museum Wahanarata

Museum Wahanarata has undergone a significant revitalisation process since its reopening in 2023. This transformation reflects the museum's efforts to adapt to technological advancement and the changing behaviour of contemporary tourists. The implementation of augmented reality (AR), interactive multimedia, and educational games has become a major innovation in enhancing visitors' tourism experiences.

These developments indicate that the museum is no longer positioned merely as a repository for historical artefacts, but also as a dynamic centre of cultural experience. Technological innovation within sustainable tourism can improve the quality of tourism experiences whilst simultaneously broadening public access to cultural education [10].

Cultural Sustainability Aspects

The cultural sustainability of Museum Wahanarata is demonstrated through the preservation of the royal carriage collections of the Yogyakarta Palace, many of which continue to be utilised in traditional royal ceremonies. This condition illustrates that the museum does not merely preserve historical objects, but also maintains a living culture.

The presence of Abdi Dalem as custodians of tradition also constitutes an important element in preserving the cultural authenticity of the museum. They function as cultural narrators who explain the historical background and symbolic meanings of the museum collections to visitors.

From a social science perspective, the museum serves as a medium for cultural reproduction and the formation of collective social identity. The museum becomes a space of interaction between older and younger generations within the process of transmitting cultural values.

Challenges in Museum Management

Despite undergoing revitalisation, Museum Wahanarata continues to face several challenges. One of the principal issues concerns the limitations of its educational information system. Many collections are not yet supported by adequate interpretative information, either in Bahasa Indonesia or in English.

In addition, the museum's digital promotion strategies remain insufficiently optimised, resulting in limited public outreach and visibility. In the digital era, public communication strategies based on social media engagement and digital marketing have become essential factors in increasing tourist visitation.

The limitations of interpretative facilities have also reduced the effectiveness of visitors' educational experiences. Consequently, visitors tend to rely heavily upon tour guides in order to understand the historical narratives associated with the museum collections.

Museum as a Social and Educational Space

Museum Wahanarata possesses considerable potential as a centre for culturally based educational tourism. The existence of interactive attractions and conservation laboratories may function as effective cultural learning facilities for students and tourists alike.

From a social science perspective, the museum should not be viewed solely as a physical space for storing artefacts, but also as a social space that fosters historical awareness and cultural identity within society. Therefore, strengthening the museum's educational function should be pursued through collaboration with educational institutions, cultural communities, and creative industries

Sustainable Cultural Transformation within Museum Wahanarata

The revitalisation of Museum Wahanarata reflects a broader transformation occurring within heritage tourism institutions in response to changing socio-cultural and technological environments. From a sustainable tourism perspective, the museum demonstrates an effort to balance heritage conservation with experiential innovation. The integration of augmented reality, interactive exhibitions, and digital storytelling indicates an institutional shift from passive preservation towards participatory cultural engagement.

However, sustainability within cultural tourism cannot be understood solely through technological modernisation. The findings reveal that the authenticity of Museum Wahanarata remains strongly rooted in its socio-cultural ecosystem, particularly through the continued involvement of Abdi Dalem as living custodians of royal traditions. Their presence reinforces the museum's role as a living heritage institution rather than merely a static exhibition space. This aligns with the argument proposed by Richards [4], who emphasised that contemporary cultural tourism increasingly values authentic social interaction and experiential meaning-making.

From a socio-cultural sustainability perspective, the museum also performs an important educational function by facilitating intergenerational transmission of cultural knowledge. The preservation of royal carriages, ceremonial narratives, and traditional symbolism contributes to the maintenance of Javanese cultural identity amidst rapid globalisation and digital homogenisation. In this regard, Museum Wahanarata functions not only as a tourism attraction but also as a cultural resilience mechanism that safeguards intangible heritage values.

Nevertheless, the research identified several structural limitations that may hinder long-term sustainability. The absence of comprehensive bilingual interpretation systems limits accessibility for international visitors and reduces the educational effectiveness of the museum experience. Similarly, insufficient digital marketing strategies weaken the museum's ability to reach younger audiences who predominantly consume tourism information through online platforms and social media ecosystems.

The findings further indicate that sustainable museum management requires stronger collaboration between cultural institutions, educational organisations, local communities, and government stakeholders. Such collaborative governance is essential for ensuring that heritage preservation remains socially inclusive, economically viable, and culturally relevant. Without active community participation and adaptive

communication strategies, heritage tourism destinations risk losing relevance in increasingly competitive tourism markets.

Consequently, Museum Wahanarata illustrates that sustainability within cultural tourism is multidimensional in nature. Sustainable heritage management must integrate cultural authenticity, technological adaptation, educational accessibility, and social participation simultaneously. This holistic approach is crucial in ensuring that cultural heritage institutions remain meaningful not only as historical repositories but also as dynamic public spaces capable of fostering cultural awareness, social cohesion, and sustainable tourism development

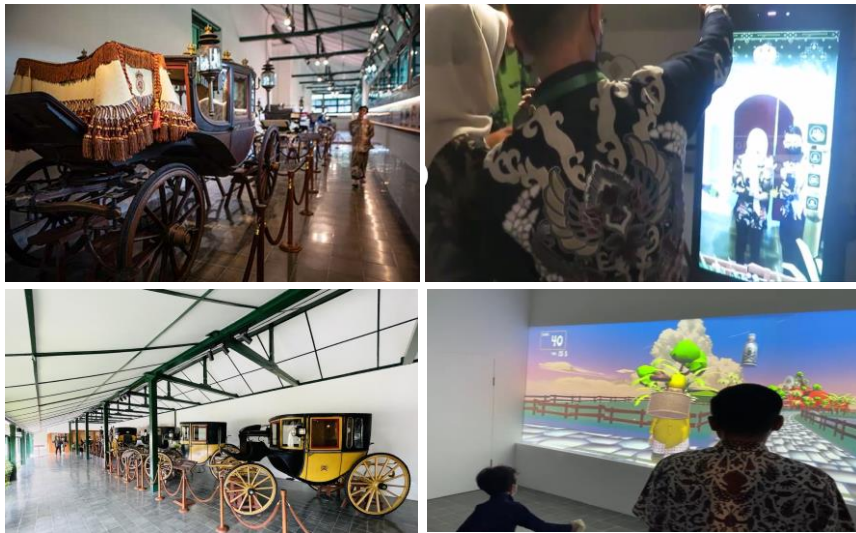


Fig. 1. The of Collection of Wahanarata Museum Kraton Yogyakarta

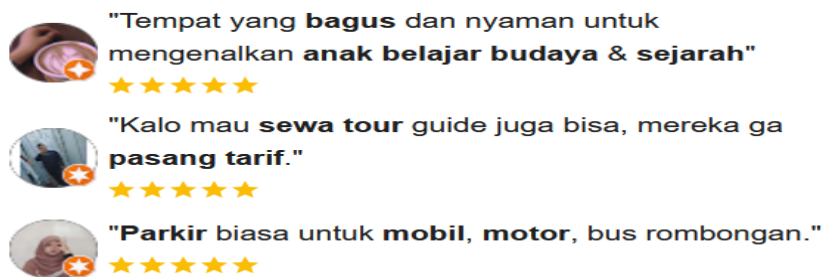


Fig. 2. Testimonials of Museum's "Satisfaction" from Visitor in Google Review

V. CONCLUSION

The Museum Wahanarata Yogyakarta demonstrates how cultural heritage institutions can adapt to contemporary tourism development whilst preserving traditional values and cultural authenticity. The museum's revitalisation through interactive technologies and educational innovation reflects an important transition from a conventional exhibition space into a dynamic centre of cultural learning and sustainable tourism.

The study reveals that the sustainability of Museum Wahanarata is not solely determined by technological advancement, but also by the preservation of living culture through the continued involvement of Abdi Dalem as custodians of cultural heritage. This highlights the importance of socio-cultural sustainability in maintaining historical continuity, cultural identity, and community participation.

However, several challenges remain, particularly regarding interpretative facilities, bilingual information systems, and digital communication strategies. Strengthening these aspects is essential to enhance visitor engagement and educational effectiveness.

Overall, Museum Wahanarata possesses strong potential to become a model of sustainable cultural

tourism in Indonesia by integrating heritage conservation, educational tourism, technological adaptation, and socio-cultural participation within a holistic and inclusive management approach.

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Finally, the authors hope that this study may contribute to the advancement of sustainable tourism studies, cultural heritage preservation, and social science research, particularly in relation to museum-based educational tourism in Indonesia.

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