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Smart Tourism Concept in the Heritage and Cultural Tourism Area in Sade Hamlet, Central Lombok

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ABSTRACT

Sade Village, located in Central Lombok, represents a heritage- and culture-based tourism area with significant historical value, particularly in terms of traditional architecture and the local wisdom of the Sasak ethnic community. This settlement serves as an important representation of a traditional residential pattern that has been preserved and passed down through generations. However, with the increasing number of tourists each year, various challenges have begun to emerge, especially those related to cultural heritage preservation, environmental sustainability, and the need for more structured and responsible tourism management. This study aims to formulate a conservation-based smart tourism concept that offers innovative solutions for integrating cultural and environmental preservation with advancements in digital technology. This approach utilizes digital tools such as QR codes, enabling the delivery of interactive and educational information to visitors. The research employs a qualitative method, using observation, documentation, and analysis of existing site conditions as its primary approaches. The findings indicate that the implementation of this concept in Sade Hamlet can be achieved through the development of interactive tourism information systems, data-driven visitor flow management, and the provision of immersive cultural experiences that enhance tourist engagement. Furthermore, this approach encourages active participation from the local community in managing the tourism area. Therefore, conservation-based smart tourism is expected to preserve the

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authenticity of both architecture and local traditions, improve the quality of the tourism experience, and establish an adaptive, sustainable, and contextually relevant model for heritage area management in response to contemporary developments.

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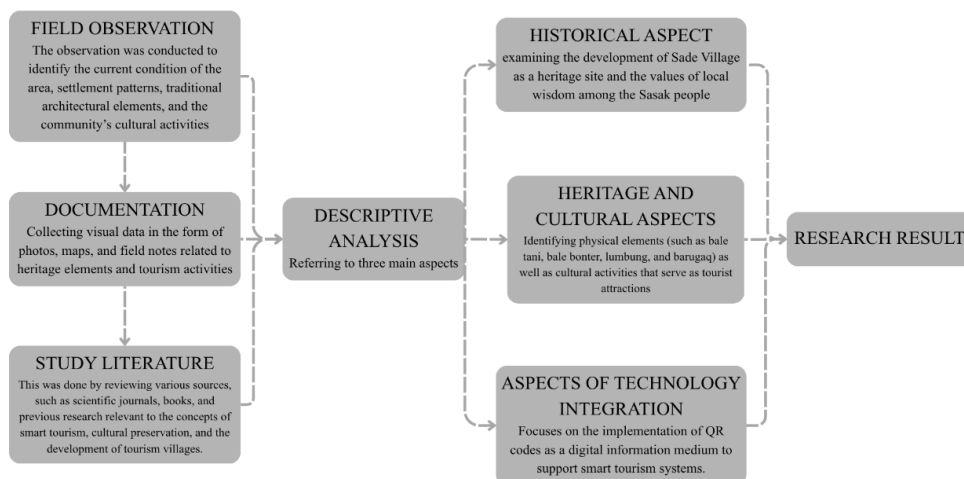
1. INTRODUCTION

Sade Village is a settlement that continues to preserve its local wisdom to this day, making it a strong potential candidate for heritage tourism development. The traditional architecture found in Sade Village—such as *bale tani*, *bale lumbung*, and *bale bonter*—represents vernacular architectural principles that emphasize adaptation to the tropical climate, the use of local materials, and a strong connection to the cultural values of the Sasak community. Architectural elements such as woven bamboo walls, thatched roofs made from alang-alang grass, and earthen floors reinforced with a mixture of clay and buffalo dung not only serve practical purposes but also embody religious and social symbolism that strengthens the community's collective identity. Currently, Sade Tourism Village still relies on conventional manual tour guides to help visitors gain a deeper understanding of Sasak culture and traditions. These guides are generally local residents who possess extensive knowledge of the village's history, customs, and everyday life. (Ansori et al., 2025). However, tour guiding services have certain limitations, particularly in terms of the number of available guides and their time availability. The introduction of conservation-based smart tourism technology, such as the use of QR codes, can serve as both a complementary tool and an innovative solution. The implementation of QR codes has been proven effective in providing accurate and easily accessible information across various tourist destinations, including heritage sites. (Hà et al., 2023). The use of QR codes enables tourists to more easily explore destinations within a particular area and obtain accurate and up-to-date information. This approach is more reliable compared to relying solely on general internet searches, which often provide incomplete or less comprehensive data. (Eka Selfi Nur Jayanti et al., 2023).

For example, Borobudur Temple, as one of UNESCO's World Heritage Sites, has implemented a smart tourism concept by utilizing digital applications and QR codes at several points throughout the site. Through scanning these QR codes, visitors can access information on historical background, the philosophy of the reliefs, and guided tour routes. This implementation aligns with best practices identified in Europe, where smart technologies are employed to enhance the attractiveness and value of heritage destinations. (Pinke-Sziva et al., 2024). In addition, Augmented Reality (AR) technology is utilized to present visual reconstructions of the temple in its past form, allowing visitors to understand its historical context in a more interactive manner. The use of AR/VR also reflects a global trend in revitalizing and enhancing cultural experiences. This implementation helps preserve cultural values while simultaneously providing a rich and in-depth educational experience. (Deri, 2023)

Therefore, the implementation of QR codes in Sade Village will be realized through their installation or placement on information boards located near the village entrance. Tourists, both domestic and international, can scan these QR codes, which will direct them to an integrated website containing comprehensive information about Sade Village. Furthermore, the management of social media accounts is expected to strengthen the image of Sade Village as an attractive tourist destination, allowing it to gain wider recognition as a creative, innovative, and progressive village. (Hery and Widijanto n.d.).

2. RESEARCH METHODOLOGY



Sumber: Penulis 2025

This study employs a qualitative approach using descriptive methods to examine and formulate the concept of conservation-based smart tourism in the heritage and cultural tourism area of Dusun Sade, Central Lombok. A qualitative approach was chosen because it provides a deep understanding of social, cultural, and spatial phenomena within the context of tourism. This aligns with the statement that “qualitative approaches are essential to understand the complexity of tourism experiences and socio-cultural contexts in smart tourism development” (Zheng & Wu, 2023).

Data collection techniques were conducted through field observations, documentation, and literature reviews. Observations were conducted to identify the existing conditions of the area, settlement spatial patterns, traditional architectural elements, and community cultural activities. Documentation involved collecting visual data such as photos, maps, and field notes related to heritage elements and tourism activities. Meanwhile, the literature review involved examining various relevant scientific sources on smart tourism and cultural preservation. Digital innovations in tourism, such as QR codes, are considered capable of enhancing the quality of tourists’ experiences, as stated that “digital technologies enhance tourists’ access to information and enable more personalized and interactive experiences” (Alsharif et al., 2024).

The data obtained was then analyzed descriptively, focusing on three main aspects. First, the historical aspect, which examines the development of Sade Village as a heritage area and the local wisdom values of the Sasak community. Second, the heritage and cultural aspect, which identifies physical elements such as the bale tani, bale bonter, lumbung, and barugaq, as well as cultural activities as tourist attractions. Third, the technological integration aspect, which focuses on the application of QR codes as a digital information medium to support the smart tourism system. This is reinforced by research stating that “the integration of digital tools in heritage tourism can support both the conservation and interpretation of cultural assets” (Sarah et al., 2023).

Furthermore, the analysis results are synthesized to formulate a smart tourism concept that is adaptive to developments in digital technology. The integration of technologies such as QR codes and digital platforms not only enhances the efficiency of tourism management but also strengthens the sustainability of the destination. As noted, “smart tourism technologies contribute to sustainable destination management by improving efficiency, accessibility, and stakeholder engagement” (Zheng & Wu, 2023).

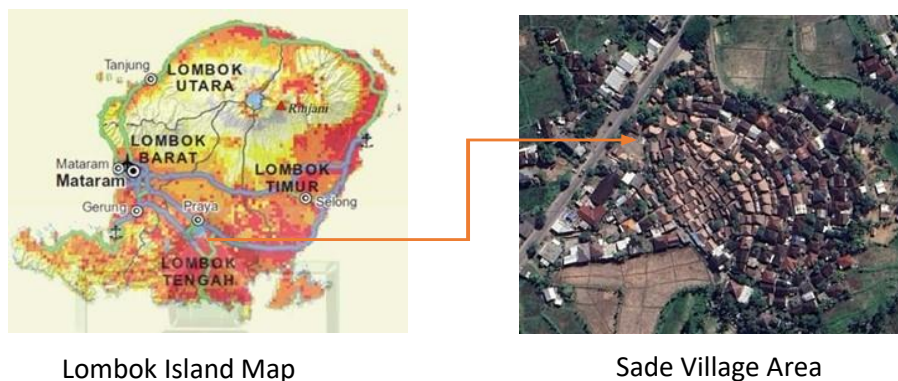
Thus, this research method emphasizes the integration of analysis of existing conditions with the utilization of digital technology to produce a smart tourism concept that is not only innovative but also oriented toward cultural preservation, enhanced tourism experiences, and the sustainable empowerment of local communities.

3. RESULT AND DISCUSSION

Sade Village, as a cultural tourism destination, still faces limitations in managing tourism information, as it relies heavily on local guides who are limited in number and not always available. Meanwhile, the number of visitors continues to increase, including international tourists who require information in foreign languages. The implementation of a smart tourism concept can serve as a strategic solution through the utilization of QR codes and digital technologies. In this study, one of the main components of the proposed smart tourism approach is the use of smart QR codes in Sade Village. QR codes are utilized as a digital information medium that can be accessed directly through smart devices, allowing tourists to gain in-depth knowledge about the village's history, culture, traditional houses, and local crafts.

The implementation of smart tourism through the use of QR codes in Sade Village is expected to address key challenges in providing accurate, timely, and multilingual information for tourists. Beyond being merely a technological innovation, this approach represents a strategic effort in destination management that is adaptive to the advancements of the digital era, while preserving the cultural values that form the core identity of Sade Village. (Eka Selfi Nur Jayanti et al. 2023).

To provide a clearer understanding of the spatial context of this study, a map of Lombok Island is presented below, illustrating the location of Sade Village as one of the strategic cultural tourism destinations in Central Lombok.



Lombok Island Map

Sade Village Area

Gambar 1 Sumber: (1) (Saipul Hadik 2022),(2) Google Earth
Sumber: Penulis 2025

3.1 Historical Aspect of Sade Village

Sade Village has developed as a living heritage village, meaning a heritage settlement that remains actively inhabited, with approximately 150 households to date, and continues to preserve a traditional spatial system that reflects customary values, in which each *bale* serves distinct social, religious, and economic functions. Traditional houses such as *Bale Tani*, *Bale Bonter*, and *Bale Lumbung* are constructed using local materials, including wood, bamboo, alang-alang grass, and clay reinforced with buffalo dung, reflecting the local wisdom of the community in adapting to the tropical climate of Lombok. (Wahyudi 2025).

The cultural history of Sade Village is also inseparable from the religious identity of the Sasak community, which originally adhered to *Islam Wetu Telu*, a belief system that blends

local traditions with Islamic teachings, before later coexisting with the more dominant *Islam Waktu Lima*. These traditions have shaped ritual patterns, customary ceremonies, and social practices that continue to be preserved to this day. (Ansori et al., 2025). In addition, cultural heritage such as the *Peresean* tradition (a traditional combat performance using rattan sticks and buffalo-hide shields), marriage rituals, and *ikat* weaving crafts have been passed down through generations as symbols of Sasak identity. (Ferro et al., 2025).





This condition positions Sade Village not merely as a tourist destination, but also as a living space that functions as a medium for cultural learning, where vernacular architecture, social values, and community traditions can be directly experienced and understood. Therefore, the historical context of Sade Village serves as a fundamental basis for implementing a conservation-based smart tourism concept, ensuring that the use of technology continues to preserve the authenticity of cultural heritage passed down across generations.



3.2 Heritage Aspect

In the heritage study of Sade Village, several key elements represent the culture and identity of the local community. These elements include traditional pathways, the mosque, *barugaq*, *bale tani*, *bale bonter*, and *lumbung*, each of which carries distinct functions, meanings, and philosophical values. Traditional pathways serve as connectors of social life, the mosque functions as a spiritual center, *barugaq* acts as a space for deliberation and communal activities, while traditional houses such as *bale tani*, *bale bonter*, and *lumbung* reflect social structures, livelihoods, and symbols of prosperity. Examining these six elements is essential to understanding how the physical heritage of Sade Village can be interpreted and developed within a QR code-based smart tourism concept, serving both conservation efforts and educational purposes for visitors.




Gambar 3. Kawasan Desa Sade,
Sumber: Penulis 2025





	Heritage Elements	Function	Cultural/Philosophical Values	QR Code Potential
A	 <p>Gambar 2. Barugaq Sumber: Dokumentasi Lapangan 2025</p>	Serves as a communal space for deliberation, community meetings, and the implementation of traditional ceremonies.	The <i>barugaq</i> reflects values of togetherness, mutual cooperation (<i>gotong royong</i>), and the tradition of deliberation as a form of local democracy.	QR codes can provide access to video or photographic documentation of traditional activities such as <i>Peresean</i> , customary meetings, and traditional ceremonies that typically take place in the <i>barugaq</i> .
B	 <p>Gambar 4. Bale Tani, Sumber: Dokumentasi Lapangan 2025</p>	A simple and functional dwelling for farming households.	Reflects the daily life of the community, which is closely connected to nature, as well as the philosophy of simplicity and local wisdom in the selection of natural materials.	QR codes can present information on traditional house construction techniques, the spatial philosophy of the <i>bale tani</i> , and narratives of the daily life of Sasak farming communities.
C	 <p>Gambar 5. Bale Bonter Sumber: Dokumentasi Lapangan 2025</p>	A residence designated for traditional leaders or prominent community figures.	Serves as a symbol of social status and leadership roles within the social structure of Sade Village.	QR codes can contain information on the history of traditional leadership, the role of the <i>bale bonter</i> in maintaining social order, as well as visual documentation of the structure.
D	 <p>Gambar 6. Lumbung Sumber: Dokumentasi Lapangan 2025</p>	A storage structure for rice and agricultural produce, characterized by its distinctive form with supporting pillars.	The <i>lumbung</i> is an iconic element of Sasak architecture that symbolizes prosperity, food sustainability, and the cultural identity of the community.	QR codes can display 3D animations of the <i>lumbung</i> structure, provide explanations of its function as a rice storage facility, and convey its philosophical significance for the sustainability of community life.

	Heritage Elements	Function	Cultural/Philosophical Values	QR Code Potential
E	 <p>Gambar 7. Masjid Nur Syahla Sumber: Dokumentasi Lapangan 2025</p>	Serves as a center for worship, religious activities, and community gatherings.	The mosque reflects the religious identity of the Sasak community, serving as both a spiritual center and a space for strengthening social solidarity.	QR codes can provide information on the history of the mosque, its construction process using local materials, and its role in strengthening religious values within the village.
F	 <p>Gambar 8. Jalan Setapak Desa Sade Sumber: Dokumentasi Lapangan 2025</p>	Functions as the main pathway connecting houses, communal areas, and various spaces of community activities.	The pathway is not merely a means of circulation, but also reflects the organic pattern of traditional settlement and symbolizes the social interconnectedness among community members.	QR codes can be used to display a digital map of the spatial layout of Sade Village, the history of its settlement formation, and narratives on the role of pathways in the social life of the community.

3.3 Cultural Aspect

In addition to its rich heritage of physical elements, Sade Village also preserves cultural heritage that remains well maintained to this day. The Sasak community's culture in this village is reflected in its traditions, arts, and daily life practices that have been passed down through generations. These cultural aspects not only function as a source of identity and pride for the local community but also serve as a tourist attraction that strengthens Sade Village's position as a destination rooted in local wisdom. The discussion of cultural aspects is essential to ensure that traditional values are not merely presented as attractions for tourists, but are also understood, appreciated, and preserved in a sustainable manner.

Cultural Aspect	Description/function	Cultural/Philosophical values	QR Code Potential (Smart Tourism)
 <p>Gambar 9. Menenun Sumber: Dokumentasi Pribadi 2025</p>	The primary activity of women in Sade Village is performed manually using traditional tools.	A symbol of Sasak women's identity, reflecting values of patience, perseverance, and creativity.	Displays photos/documentation of weaving activities, explanations of the philosophy behind the motifs, and promotes songket products as part of the creative economy.

Cultural Aspect	Description/function	Cultural/Philosophical values	QR Code Potential (Smart Tourism)
 <p>Gambar 10. Peresean Sumber: Dokumentasi Pribadi 2025</p>	<p>A traditional combat performance using rattan sticks (<i>penjalin</i>) and cowhide shields, typically held during customary ceremonies or in welcoming guests.</p>	<p>Symbolizes the courage, sportsmanship, and fighting spirit of the Sasak community.</p>	<p>Videos of performances, explanations of the rules, and the philosophy of <i>Peresean</i> as a symbol of masculinity.</p>
 <p>Gambar 11. Gendang Beleq Sumber: Dokumentasi Pribadi 2025</p>	<p>A traditional music performance featuring large drums, played in groups to accompany customary ceremonies, celebrations, or guest receptions.</p>	<p>A symbol of togetherness, joy, and community cohesion.</p>	<p>Videos of <i>Gendang Beleq</i> performances, its historical development, and its social significance.</p>
 <p>Gambar 12. Musik Sasak Sumber: Dokumentasi Pribadi 2025</p>	<p>A Sasak gamelan performance or bamboo-based instruments used in rituals or entertainment.</p>	<p>Maintains harmony and balance between humans, nature, and God.</p>	<p>Recorded videos, along with the philosophy of Sasak music.</p>
 <p>Gambar 13. WC Sumber: Dokumentasi Pribadi 2025</p>	<p>Most houses in Sade Village place toilets or bathrooms outside the main building, separated from the primary dwelling.</p>	<ul style="list-style-type: none"> - Maintains the sanctity and cleanliness of the core residential area (<i>bale</i>). - Symbolizes the boundary between private space (the house) and utility space. - Encourages closeness to nature, as bathing and washing activities are conducted in open spaces. 	

Cultural Aspect	Description/function	Cultural/Philosophical values	QR Code Potential (Smart Tourism)
		Reinforces values of togetherness, as some facilities are shared communally.	

4. DISCUSSION

Sade Village receives both domestic and international tourists on a daily basis. The increase in visitor numbers is not matched by the availability of adequate tour guides. Based on observations, the number of guides in Sade Village remains limited and is not always available, as most of them also have other occupations. This condition results in long queues at the *barugaq*, delays in the flow of visits, and visitor dissatisfaction due to extended waiting times. (Fikri et al., 2025).

Through the implementation of QR code based smart tourism, visitors are no longer fully dependent on the presence of tour guides but can instead utilize QR code technology. The QR codes are operated by scanning the codes provided at the entrance or on information boards. Once scanned, visitors are directed to a digital platform that contains a variety of relevant information. (Hendi Prasetyo, 2022).

The content displayed includes:

1. A digital map of Sade Village, which helps tourists navigate the area without the risk of getting lost.
2. Information on traditional architecture, such as *Bale Tani*, *Bale Lumbung*, and *Bale Bonter*, including their social functions, philosophical meanings, spatial layouts, and construction materials (wood, bamboo, clay, and thatch).
3. Photos and videos of traditional house interiors, providing a realistic depiction of the daily life of the Sasak community.
4. Documentation of cultural traditions, including weaving, *Peresean*, customary rituals, and traditional music.
5. Information on local products, such as *ikat* weaving and handicrafts, which can be purchased directly through digital payment systems.

With this facility, tourists can conduct a self-guided tour that is more efficient, personalized, and interactive. Tour guides still play an important role; however, their function is more focused on providing in-depth explanations to specific groups or to visitors who require direct interaction. (Trihandoyo et al., 2024).



Gambar 14. Kawasan Desa Sade
Sumber: Penulis 2025

4.1 QR Code Usage Flow

The findings indicate that the QR code usage flow in Sade Village is relatively simple and systematic, as follows:

1. Arrival Tourists arrive at the entrance of Sade Village and receive a brief explanation about the QR code.
2. Registration and Scanning Tourists complete a registration process and then scan the QR code using their smartphones from the admission ticket or information boards. (Minata et al., 2023).
3. Digital Information Access Tourists are directed to a website or application containing maps, historical information, photos, videos, as well as detailed information about buildings and traditions.
4. Self-Guided Exploration Tourists move along designated routes independently; at key points, additional QR codes are provided for more detailed information.
5. Cultural Interaction Tourists can register for cultural activities (such as weaving, learning traditional music, or watching *Peresean*) through QR codes.
6. Local Product Shopping Tourists can view detailed product information, prices, and make digital payments.
7. Completion of Visit and Satisfaction Survey Tourists scan a QR code at the exit to complete a satisfaction survey, receive a digital visit certificate, and share their experiences on social media.

4.2 Impact of QR Code Implementation

Social Impact

1. Reduces full dependence on tour guides.
2. Involves the local community in the creation of digital content, enabling intergenerational knowledge transfer.
3. Encourages the community to become more digitally literate.

Economic Impact

1. Facilitates the promotion of handicrafts and Sasak *ikat* weaving products.
2. Provides opportunities for modern transactions through digital payment systems.
3. Increases community income as tourists can more easily access information and are more likely to purchase local products.

Cultural and Conservation Impact

1. Digital documentation through QR codes helps preserve Sasak cultural values and architectural heritage.
2. Information about traditional houses (*Bale Tani*, *Bale Lumbung*, *Bale Bonter*) is recorded in digital form, ensuring that it is not lost even if physical changes occur.
3. Increases tourists' awareness of the importance of preserving cultural traditions.

This study is in line with several theories and previous studies. According to (Gretzel et al., 2015), Interactive technologies such as digital maps and visual media can enhance tourist interest and strengthen positive attitudes toward destinations. (Melladia et al., 2024) Indicates that the use of QR codes in agrotourism is effective in expanding access to tourism information. (Darmayanti, 2023) Emphasizes that QR codes can strengthen the branding of tourism villages, while (Nadee et al., 2024) Emphasizes the importance of smart tourism that is not only technology-oriented but also focuses on cultural preservation and community participation. The implementation of QR code-based smart tourism in Sade Village not only provides digital information but also opens new opportunities for cultural preservation and tourism destination management. The success of this system largely depends on the

involvement of the local community. The residents of Sade Village play a crucial role in the development of digital content, such as photographic documentation, videos of cultural activities, and oral narratives passed down through generations. Community participation not only ensures the authenticity of the information but also guarantees the continuous updating of content in the future.

In addition to content aspects, the availability of digital infrastructure is a key requirement to support the implementation of this technology. Stable internet access, public Wi-Fi points, and clearly displayed QR code information boards will facilitate tourists in accessing information. Without adequate infrastructure, the potential of QR codes as a digital information medium cannot be fully utilized as intended. (Akbar & Wibowo, 2023).

System maintenance is also an important issue. QR codes installed in open spaces are at risk of damage due to weather conditions or vandalism. Therefore, routine maintenance strategies are required, including both physical upkeep and digital content updates. In addition, data security aspects, particularly in digital transactions, must be carefully considered to ensure that tourists feel safe and comfortable. (Handojo & Lim, 2017)

Furthermore, QR codes can be integrated with educational tourism programs. Desa Sade has the potential to develop digital learning modules accessible to students through QR code scanning. Information related to the village's history, the philosophy of traditional houses, and Sasak cultural traditions can serve as interactive learning resources. This supports Desa Sade not only as a cultural tourism destination but also as an open learning space. (Melladia et al., 2024).

Evaluation and tourist feedback also play an important role in improving the quality of the system. QR code usage data, such as which points are most frequently scanned, can serve as a basis for evaluating and enhancing the presentation of information. Satisfaction surveys integrated with QR codes can directly reveal visitors' needs, enabling managers to quickly adapt to tourists' expectations. (Yanis et al., 2023).

Thus, the implementation of QR codes in Desa Sade not only serves as a solution to the limited availability of tour guides, but also functions as an instrument to strengthen cultural identity, enhance digital literacy among the local community, and promote the sustainability of community-based tourism.

5 CONCLUSION

This study shows that the implementation of smart tourism through QR code technology in Desa Sade has a significant impact on improving the quality of the tourist experience. Through this digital facility, visitors can independently access information related to history, traditional house architecture, cultural traditions, and local crafts in an interactive and real-time manner. As a result, tourism visits are not only recreational but also educational and informative, leading to a more meaningful and memorable experience.

Furthermore, the implementation of QR codes also contributes to more efficient tourism management. Tourists no longer have to rely entirely on the limited availability of tour guides, thereby reducing long queues at Barugaq. This aligns with previous studies which indicate that interactive technology can accelerate access to information while simultaneously increasing tourist satisfaction. (Melladia et al., 2024).

From a cultural and conservation perspective, QR code technology plays an important role in documenting and preserving the local wisdom of the Sasak community. Information about Bale Tani, Bale Lumbung, and Bale Bonter, for instance, can be accessed digitally, ensuring that knowledge regarding the form, function, and philosophy of traditional houses is maintained even if physical changes occur in the field. (Hendi Prasetyo, 2022). Thus, this

system not only introduces Sasak culture to tourists but also serves as a medium for intergenerational knowledge transfer within the local community.

Overall, this study highlights that the integration of digital technology in community-based tourism not only enhances the efficiency and quality of the visitor experience but also strengthens local cultural identity, expands economic opportunities, and supports the preservation of traditional practices. With these achievements, Desa Sade has the potential to become a national model for the development of smart tourism villages that are modern, interactive, and sustainable without losing their cultural roots.

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