



Adaptive Strategy for Technology-Based Halal Tourism Development in Indonesia: Lessons from Singapore's Success

Abdul Rahman Rahim¹, Safri Haliding², Lukman Hakim³, Syafiuddin⁴, & Wahyuddin⁵

¹Universitas Terbuka, Depok, Indonesia

²⁻⁵Universitas Muhammadiyah Makassar

Makassar, Indonesia

ABSTRACT

The rapid growth of global halal tourism is driven by the increasing number of Muslim travellers with special travel needs. Indonesia, as the country with the largest Muslim population, has great potential in developing halal tourism. However, challenges such as lack of synergy between stakeholders, limited technological infrastructure, and low utilization of digital innovation still hamper the development of this sector. This study aims to develop an adaptive strategy for developing technology-based halal tourism that is contextual and applicable in Indonesia by adopting best practices from Singapore, which has successfully integrated technology and policies in the halal tourism sector. The method used is a qualitative approach with a comparative case study design between Indonesia and Singapore. The research sample consisted of key stakeholders in the halal tourism sector, selected purposively based on their experience and involvement in implementing digital technology. Data were collected through semi-structured interviews and secondary documents, then analysed using manual thematic analysis techniques to ensure data validity and depth. The results of the study formulate an adaptive strategy that integrates information and communication technology as the backbone of the halal tourism ecosystem, including the development of an integrated digital platform for accessing information, ordering, and monitoring halal certification in real time. An integrated digital marketing strategy and multi-stakeholder collaboration are the foundation for expanding the market and improving service quality. Strengthening human resources through technology-based training and halal literacy as well as the development of Muslim-friendly infrastructure and technology-based monitoring systems are also crucial for tourist efficiency and experience. Recommendations include the development of an integrated digital platform, optimization of digital marketing, increasing human resource capacity, strengthening Muslim-friendly infrastructure, and strengthening collaboration and technology-based monitoring. Further studies are needed to test the effectiveness of this strategy in various regions of Indonesia. This approach has the potential to increase the competitiveness and inclusiveness of Indonesian halal tourism sustainably

Key Words: Adaptive Strategy, Comparative Study, Halal Tourism, Tourism Development.

1. INTRODUCTION

Halal tourism has become one of the fastest growing sectors in the global tourism industry, especially as the number of Muslim travelers who prioritize special needs in their travels increases. According to the latest Global Muslim Travel Index (GMTI) report, halal tourism is showing a significant growth trend with a market value reaching billions of dollars and projected to continue to increase every year (CrescentRating, 2023). Indonesia as the country with the largest Muslim population in the world has enormous potential to develop the halal tourism sector, both as a destination and as a center of innovation in this industry (Sari & Putra, 2022). However, to optimize this potential, an adaptive and technology-based development strategy is needed to face the challenges of the digital era and global market dynamics.

In recent years, the development of digital technology has brought fundamental changes to various industrial sectors, including tourism. Technologies such as big data, mobile applications, digital platforms, and artificial intelligence open up new opportunities to create more personalized, efficient, and relevant services for Muslim tourists

(Khan et al., 2024). The integration of technology in the development of halal tourism is important in order to meet increasingly complex and dynamic market expectations, as well as strengthen the competitiveness of halal tourism destinations at the regional and global levels (Rahman & Ahmad, 2023). Therefore, a study on adaptive strategies that combine technological aspects and halal tourism values is relevant and urgent to be carried out, especially in the context of Indonesia which has unique socio-cultural and economic characteristics.

Despite its great potential, the development of halal tourism in Indonesia faces a number of structural and cultural obstacles. The main problems that often arise are the lack of synergy between stakeholders, limited technological infrastructure, and low utilization of digital innovation in halal tourism services and marketing (Hidayat & Zulkifli, 2023). In addition, the inequality in the quality of services and standardization of halal products is also an obstacle in increasing the attractiveness and trust of Muslim tourists, both domestic and international (Fatimah & Kusuma, 2022). In general, the solutions implemented so far are still partial and less responsive to changes in technology and current consumer behaviour.

The general solution that is widely recommended in the literature focuses on increasing collaboration between stakeholders and building a strong digital ecosystem to support halal tourism services (Nasution et al., 2023). This approach includes the development of an integrated digital platform that connects business actors, government, and tourists, as well as training and capacity building of human resources to be able to utilize technology optimally (Lestari & Prasetyo, 2024). However, the implementation of these solutions in Indonesia still faces challenges in terms of policies, funding, and limited technology adoption in various regions. Therefore, a study is needed that examines adaptive strategies in more depth and is applicable based on the experiences of other countries that have succeeded, to provide more concrete and contextual recommendations.

Previous studies have highlighted the important role of technology in accelerating the development of halal tourism. For example, a study by Ahmad and Syed (2023) confirmed that the use of big data and consumer behavior analysis can improve the personalization of services and the effectiveness of halal tourism marketing. In addition, research by Lim and Chua (2022) in the Singapore context showed that the integration of advanced technology with supportive policies has successfully created an innovative and competitive halal tourism ecosystem in the Southeast Asian region. Technology is not only used for customer service, but also in the process of destination management, product development, and improving the overall tourist experience. These findings reinforce the importance of a holistic and adaptive approach in the development of technology-based halal tourism. A review of the relevant literature reveals that although many studies have examined the technological aspects of halal tourism and the success of models in countries such as Singapore, there is still a gap in the literature regarding the adaptation of these strategies in the Indonesian context. This gap includes the lack of research that combines cultural, technological, and policy aspects within the framework of an adaptive strategy for halal tourism development. Previous studies generally focus on the technology aspect separately or on case evaluation without explaining the strategy adaptation mechanism comprehensively (Rahman & Ahmad, 2023; Lestari & Prasetyo, 2024). Therefore, this study attempts to fill this gap by systematically examining how lessons from Singapore's success can be adopted and adapted in the Indonesian context which has different challenges and opportunities. The main objective of this study is to develop an adaptive strategy for technology-based halal tourism development that is contextual and applicable in Indonesia, by taking lessons from the best practices that have been implemented in Singapore.

This study aimed to provide empirical and practical contributions in formulating effective technology policies and innovations to improve the competitiveness of Indonesian halal tourism. The novelty of the study lies in the integrative approach that combines technology, culture, and policy analysis within the framework of an adaptive strategy, and focuses on cross-country knowledge transfer as a learning model that can be implemented in Indonesia. The scope of the study includes evaluation of current technologies, halal tourism development policies, and relevant managerial practices, with a particular focus on strategy adaptation and implementation at the national and regional levels.

2. RESEARCH METHODS

2.1. Research Design and Plan

This study deployed a qualitative approach with a comparative case study design. This approach was chosen to explore in depth the adaptive strategy of technology-based halal tourism development in Indonesia by taking lessons

from practices in Singapore. Comparative case studies allow for in-depth analysis of the differences and similarities between two different country contexts, so that the results were more applicable and contextual (Creswell, 2014).

2.2. Time and Place of Research

The research was conducted in Indonesia and Singapore in 2024, focusing on strategic locations that was the center of halal tourism development. The research time followed the data collection schedule for a certain period adjusted to the availability of informants and field conditions.

2.3. Research Respondents

Research respondents consisted of key stakeholders in the halal tourism sector, including business actors, government officials, information technology experts, and halal tourism communities in both countries. The sample was selected purposively based on the criteria of at least two years of experience in halal tourism development and active involvement in the implementation of digital technology (Patton, 2015). Individuals without direct involvement or less than two years of experience were excluded from the sample.

2.4. Data collection technique

Data were collected through semi-structured interviews by face-to-face or online, adjusted to the conditions of the participants. The interview aims to reveal perceptions, experiences, obstacles, and strategies in developing halal tourism. The interview process was recorded with a digital recording device to maintain data accuracy. In addition, supporting documents were also used as secondary data for triangulation.

2.5. Research Procedures

The researcher identified and validated potential informants according to the criteria, then sent invitations and obtained voluntary consent to participate. All participants were given an explanation regarding the objectives, procedures, and rights and obligations during the study according to the principles of human research ethics (Hammersley & Traianou, 2012). The interview began with an opening and explanation of the objectives, followed by a question and answer session conducted in a conducive atmosphere, and closed with the opportunity for informants to add information.

2.6. Research Instruments

The main instrument was a semi-structured interview guide developed based on the Situational Theory of Problem Solving theoretical framework (Kim & Grunig, 2011) and current literature related to halal tourism technology. A digital voice recorder was used to document the interviews in full.

2.7. Data Analysis Techniques

Data analysis was carried out manually using thematic analysis techniques (Braun & Clarke, 2006). The analysis stage began with data familiarization through repeated reading of transcripts, initial coding, and grouping codes into themes based on patterns of emergence and relationships between concepts. To increase validity, peer debriefing and data triangulation were conducted by comparing interviews and supporting documents (Nowell et al., 2017). Reporting of analysis results is accompanied by direct quotes from informants to strengthen interpretation. This manual method was chosen because it provides high flexibility and control in understanding social and cultural contexts, very appropriate for qualitative studies that require in-depth and reflective analysis (Miles, Huberman, & Saldaña, 2014).

3. RESEARCH RESULT

The primary data collection of this study involved informants, namely central government officials, local governments, related agencies, tourism business actors, halal tourism communities, and investors in Indonesia and Singapore tourism stakeholders. While secondary data was collected from report documents from the Ministry of Tourism and Creative Economy (Kemenparekraf), the National Committee for Sharia Economics and Finance (KNEKS), the Ministry of Investment, the Regional Government One-Stop Integrated Service Agency (PTSP), the Global Muslim Travel Index (GMTI) Report, the United Nation World Tourism Organization (UNWTO) Report, the World Travel & Tourism Council (WTTC) report and other secondary data related to tourism. Based on the results of interviews with informants, the research results are concluded as follows:

3.1. Tourism regulations and policies in Singapore

Tourism policies and regulations in Singapore are comprehensively designed to support the growth of the tourism industry while ensuring the sustainability and quality of the tourist experience. The Singapore Tourism Board (STB)

plays a central role in the international marketing strategy through digital campaigns and partnerships with global travel agencies, to strengthen Singapore's appeal as a world-class tourist destination. Strict regulations are imposed on the tourism sector, including mandatory operating licenses and regular inspections, to ensure high and consistent service standards, while enhancing tourist confidence.

Sustainable tourism development is a key focus, with programs to reduce environmental impact through ecotourism and green standards for hotels and attractions. Investment in infrastructure and accessibility is also a priority, including the development of efficient public transport and the ongoing renovation of tourist attractions. Flexible immigration policies facilitate access for international tourists, while safety and security are given serious attention through strict public hygiene and safety standards. Overall, Singapore's tourism policy adopts a holistic approach that maintains quality of service, environment and safety, thereby maintaining its position as a leading tourist destination globally.

3.2. Priority policies in Singapore regarding tourism

Singapore has a strong historical and cultural recognition as a Muslim-friendly destination, thanks to its deep-rooted Islamic and Malay roots. Although not a member of the Organisation of Islamic Cooperation (OIC), Singapore has succeeded in attracting Muslim tourism through inclusive policies and strategic initiatives that cater to the needs and preferences of Muslim travellers. Halal tourism is a key policy priority for the Singapore government, which focuses on creating a safe, comfortable and Shariah-compliant tourist destination.

Tourism is a key pillar of Singapore's economic development, contributing around 4-5% to Gross Domestic Product (GDP) before the COVID-19 pandemic. The sector also drives employment in customer service, event management, transportation and other related sectors. The government is actively investing in tourism infrastructure development and innovation, including destination renovations, upgrading public transport facilities and leveraging digital technology to enhance the tourist experience, demonstrating its commitment to service quality and destination competitiveness.

An integrated international marketing strategy, participation in global exhibitions and collaboration with international travel agencies reinforce Singapore's image as a world-class destination. The government is also diversifying its tourism products and organising international cultural events to appeal to a diverse market. Post-pandemic, Singapore has adopted flexible travel policies and incentives for businesses to ensure the recovery and growth of the tourism sector. As such, tourism, especially halal tourism, has become a strategic priority that not only strengthens economic contributions but also affirms Singapore's position as an inclusive and sustainable destination that is responsive to global dynamics and the needs of Muslim travellers.

3.3. Incentive support in Singapore government regulations and policies

The Singapore government has proactively implemented various supports and incentives through comprehensive regulations and policies to encourage growth, innovation, and recovery of the tourism sector post-pandemic. This support includes several key aspects that strengthen the competitiveness of the national tourism industry. First, the financial aspect is an important pillar with the Tourism Development Fund (TDF) which provides funds for destination development, attraction innovation, and facility improvements. In addition, the Singapore Tourism Board (STB) provides grants and subsidies through programs such as the Marketing Partnership Programme and the Tourism Industry Partners (TIP) Fund, as well as support for training and business recovery through the Support for Tourism Enterprises (STE) Programme.

Second, fiscal incentives and tax facilities also act as investment drivers, including tax exemptions and rebates for companies that meet the criteria, especially for marketing, renovation, and adoption of innovative technologies; Third, human resource development is a priority through the Skills Future training program and various tourism staff upskilling initiatives to ensure high quality services; Fourth, promotion and marketing are enriched with co-branding campaigns with the private sector and the use of digital technology to increase the visibility and attractiveness of destinations; Fifth, adaptive travel regulations and the implementation of strict health protocols accelerate the recovery of this sector.

The government is also investing heavily in infrastructure development and streamlining the foreign investment licensing process to accelerate the development of tourism facilities. This holistic approach will enable Singapore to address post-pandemic challenges while maintaining its position as a competitive and innovative global tourism destination.

3.4. The Singapore government's view on the development of Muslim-friendly (halal) tourism in Singapore

The Singapore government strongly supports the development of Muslim-friendly (halal) tourism as an integral part of the national tourism strategy. Although not a member of the Organization of Islamic Cooperation (OIC), Singapore has successfully positioned itself as a “halal-friendly” destination through its strong Islamic and Malay cultural roots. Government support is realized through the collaboration of the Singapore Tourism Board (STB) and the Islamic Religious Council of Singapore (MUIS) in the certification of halal facilities, including restaurants, hotels, and tourist attractions, to ensure compliance with Shariah standards and increase the confidence of Muslim tourists.

Intensive promotion of halal tourism is targeted at key markets with large Muslim populations, such as the Middle East and Southeast Asia, through marketing campaigns and participation in international exhibitions such as the Arab Travel Market (ATM). The development of halal tourism products includes Islamic value-based tour packages, visits to places of worship, and Muslim cultural events that enrich the tourist experience.

The government also enhances the capacity of industry players through special training and provides halal facility guidelines that facilitate tourist access. The national tourism policy integrates halal tourism as a key strategy, encouraging product and service innovation to maintain global competitiveness. This approach strengthens Singapore's position as an inclusive destination, responsive to cultural and religious diversity, and attracts Muslim tourists globally.

3.5. Government programs to support the development of halal tourism in Singapore

Halal tourism development in Singapore is supported by a comprehensive strategic program to meet the needs of Muslim travellers. Halal certification for tourism businesses ensures compliance with Shariah standards and enhances consumer confidence. The provision of dedicated tourist guides and prayer facilities such as mosques in strategic locations complement the Muslim-friendly infrastructure. Singapore leverages its cultural identity and Muslim-friendly social environment, as well as the wide availability of halal food, as key attractions. Its geographical position as an international hub with modern infrastructure is a significant competitive advantage, coupled with cultural diversity that enriches the tourist experience.

Sustainable halal tourism development requires synergistic collaboration between the government and the private sector, including strategic partnerships for facilities and service enhancements. The involvement of local communities and industry players is essential to ensure the relevance and sustainability of halal products. At the international level, collaboration through the exchange of best practices and joint promotions broadens the network and strengthens Singapore's position as a global halal destination. This approach combines internal strengths and institutional synergies, providing a strong foundation for sustainable halal tourism development and competitiveness in a competitive global market..

3.6. Top Muslim-Friendly (Halal) Tourist Destinations in Singapore

Singapore stands out as a leading Muslim-friendly tourist destination in Southeast Asia, combining multiculturalism with facilities specifically for Muslim travellers. Kampong Glam is a hub of Malay and Islamic culture, with halal-certified restaurants, Islamic shops, and historic mosques such as the Sultan Mosque. It offers authentic cultural and commercial experiences for Muslim travellers. Sentosa Island, as a major leisure area, provides halal food and prayer facilities at popular locations such as Universal Studios Singapore and Siloso Beach, enhancing the convenience of Muslim visitors. Arab Street and Little India also provide a variety of halal restaurants and prayer facilities, such as the Al-Falah Mosque and the Angullia Mosque, supporting the spiritual needs of travellers. Orchard Road, as a major shopping centre, complements the network of halal facilities with restaurants and mosques in major malls. Singapore's uniqueness lies in the harmony of Muslim culture with modern tourist facilities, supported by cultural events and festivals that enrich the tourist experience. Easy access to halal destinations strengthens Singapore's appeal as an inclusive tourist destination that values cultural diversity. The combination of complete facilities, cultural diversity and accessibility makes Singapore a competitive halal tourism destination with international standards, in line with the vision of inclusive and sustainable tourism development in the global era.

3.7. Special programs to attract tourists to visit halal tourist destinations

The Singapore government provides comprehensive support for the development of halal tourism through strategic initiatives covering funding, infrastructure, culture, promotion and accessibility. The allocation of S\$300 million for human resource training and facility upgrades demonstrates a strong commitment to optimally meeting the needs of Muslim tourists. Key infrastructure, such as the availability of halal food in strategic locations, widespread

places of worship and Muslim-friendly public facilities, enhance the comfort and inclusiveness of the tourism environment.

Singapore's multicultural culture and tolerant attitude support the development of halal tourism that not only serves the Muslim community but also attracts non-Muslims. Halal tourism promotion is carried out intensively through various digital channels and special events, strengthening Singapore's image as a competitive halal destination. Accessibility is supported by efficient public transportation, taxi services and comfortable pedestrian paths in key areas such as Kampong Glam and Arab Street.

Overall, the combination of funding, infrastructure, inclusive culture, strategic promotion and accessibility make Singapore a model for sustainable halal tourism development. This approach strengthens Singapore's position in the global market and demonstrates its ability to meet the needs of diverse travellers in the context of modern, inclusive tourism.

3.8. Amenity facilities (restaurants, hotels and supporting facilities) at halal tourist destinations

Supporting amenity facilities for halal tourism destinations in Singapore are managed systematically with the availability of halal-certified restaurants that are not only owned by Muslim business actors, but also non-Muslim restaurants that actively obtain certification from official institutions. This certification makes it easier for Muslim tourists to choose food that meets sharia standards, thereby increasing trust and comfort during their visit. The presence of prayer rooms in restaurants and shopping centres also strengthens prayer facilities for Muslim tourists.

Although data related to halal-certified hotels is still limited, Singapore's tourism infrastructure generally supports the needs of Muslim tourists with the existence of public transportation networks such as MRT and buses that facilitate access to various facilities. Other supporting facilities include hotels with Muslim-friendly services, prayer rooms, and handwashing facilities that meet prayer needs. Halal tour guide services are also a crucial component, where guides who understand the needs of the Muslim segment provide accurate information on halal locations and facilities, thus enriching the tourist experience.

Overall, the management of standardized halal amenity facilities, infrastructure support, and trained guide services reflect Singapore's commitment to developing halal tourism comprehensively and sustainably, strengthening its position as a competitive and inclusive global halal destination.

3.9. Implementation of supervision of halal assurance, cleanliness, hygiene, standardization of materials at tourist destinations in Singapore

Halal assurance supervision in Singapore's tourist destinations is carried out systematically and comprehensively by the Majlis Ulama Islam Singapura (MUIS), which is responsible for halal certification of food facilities. MUIS conducts periodic inspections every 1-2 years to ensure continued compliance with halal standards. Supporting infrastructure such as access to clean water also supports the cleanliness and hygiene aspects that are integral to halal food quality standards.

The government has set halal certification as a requirement in the procurement tender process to ensure the comfort and trust of Muslim tourists. Supervision includes the implementation of strict cleanliness standards, standardization of food ingredients according to halal principles, and separation of halal kitchens from public kitchens. Community participation is also integrated into the supervision system with a violation reporting mechanism.

Singapore's halal destinations regularly host Muslim-themed cultural events and festivals that enrich the tourist experience while promoting halal tourism. The response from the community, both Muslims and non-Muslims, has been very positive, reflecting strong social inclusiveness and cultural cohesion.

The economic impact of halal tourism is significant through job creation and income generation, while strengthening social welfare and supporting small and medium enterprises. Halal tourism development is supported by multi-stakeholder collaboration involving the government, MUIS, businesses and the Muslim community, with education and training for the workforce playing a key role. Overall, the approach of strict supervision, social support and institutional synergy forms a sustainable foundation for Singapore's halal tourism, enhancing the competitiveness and quality of Muslim traveler experience globally.

3.10. Efforts to improve the quality of human resources to support halal tourism in Singapore

The Singapore government together with halal tourism industry players have implemented various strategic programs to improve the competence of human resources in the halal tourism sector. Training programs that focus on the needs and preferences of Muslim tourists, including halal certification courses, aim to ensure quality services that

are in accordance with sharia principles. In addition, adequate budget allocation supports workforce development and strengthens Singapore's position as a leading halal destination in Southeast Asia.

Halal literacy is an important factor in building an inclusive and sustainable tourism destination. A deep understanding of halal product and service standards not only improves human resource competence but also forms tourism development policies that are responsive to the needs of the Muslim market. Therefore, increasing halal literacy must be encouraged through collaboration between various stakeholders.

Technology and innovation also play a significant role, especially in facilitating tourist access through digital platforms for searching and reserving halal services and managing halal certification in an integrated manner. Service innovations, such as the provision of prayer rooms in accommodations, further enhance the attractiveness of destinations.

Overall, the synergy between halal literacy-based human resource development and the use of technology forms a strong foundation for the sustainability and competitiveness of Singapore's halal tourism at the global level.

3.11. Singapore's Strategy in Attracting Foreign Tourists to Visit Halal Tourism

Singapore's halal tourism development strategy adopts a comprehensive approach that highlights integrated marketing and international partnerships with travel agents in countries with large Muslim populations. Offering special tour packages that include visits to halal locations enhances the attractiveness of destinations and caters to the needs of Muslim travelers holistically. Synergy between business players, including hotels, restaurants, and travel agents, as well as the active role of industry associations and Muslim communities, builds a sustainable ecosystem that supports the growth of this sector.

The marketing strategy refers to four main elements of the marketing mix: product (services that comply with halal principles), price (competitive and affordable), place (easy access through efficient transportation), and promotion (social media, official websites, and collaboration with influencers and international partners). Future projections show a positive growth trend, driven by the expanding middle class in Muslim-majority countries, the development of facilities and infrastructure, and increasing public literacy.

Key needs include the addition of halal-certified hotels and restaurants, upgrading of prayer facilities, and improving accessibility and customer service. Public interest and investment in halal tourism continues to grow, reflecting the strategic value of this sector in supporting Singapore's economic growth and cultural inclusiveness as a premium halal tourism destination in Southeast Asia.

The development of halal tourism in Singapore is in line with literature findings stating that the potential for halal tourism is very large even in non-Muslim countries. Studies by Ainin, Feizollah, Anuar, and Abdullah (2020), Luthfi, Aminah, and Zulifan (2024), and Andriani et al. (2015) confirm this opportunity. In addition, the concept of tourism development which includes access, amenities, and attractions as well as the need for innovation, as explained by Sutono (2019), Vani, Pricilian, and Adiinto (2020), and Denman (2001), is a relevant conceptual basis for halal tourism strategies in Singapore. Overall, the integration of integrated marketing strategies, synergy between business actors, improved facilities, and investment support and academic literature provide a strong foundation for the growth of halal tourism in Singapore. This holistic approach strengthens Singapore's position as a leading halal tourism destination on the international stage, while also responding to the dynamics and needs of the ever-growing global market.

4. DISCUSSION

Based on the results of research on comprehensive and integrated halal tourism development practices in Singapore, an adaptive strategy for developing halal tourism based on technology that is contextual and applicable in Indonesia can be formulated by considering local characteristics and the potential of digital technology. This strategy must integrate aspects of integrated marketing, strengthening human resources, infrastructure development, and multi-stakeholder collaboration, as has been effectively implemented in Singapore. This study reveals comprehensive and integrated halal tourism development practices in Singapore, while formulating a contextual technology-based adaptive strategy for Indonesia. These findings are consistent with previous studies that emphasize the role of technology, multi-stakeholder collaboration, and strengthening human resource capacity in advancing the halal tourism sector (Ainin et al., 2020; Luthfi, Aminah, & Zulifan, 2024). First, the application of information and communication technology (ICT) must be the backbone of building a halal tourism ecosystem in Indonesia. The

development of an integrated digital platform, including mobile applications and official websites, needs to be designed to make it easier for Muslim tourists to access information about halal destinations, halal-certified services, and tour packages that comply with sharia principles. This system must also accommodate online reservations, user reviews, and real-time halal certification monitoring connected to authoritative institutions, in order to increase transparency and consumer trust (Andriani et al., 2015). This is in line with the global trend in the development of modern tourism that places technology as the main enabler for efficiency and improving the tourist experience (Luthfi et al., 2024). A study by Denman (2001) also emphasized the importance of digitalization in managing halal destinations in order to compete in the international market. Second, digital marketing strategies must be optimized with an integrated marketing communication approach that highlights the uniqueness and advantages of halal destinations in Indonesia. Marketing campaigns targeting the global Muslim market, especially through social media, influencers, and partnerships with international travel agents, can expand the reach of promotions. Personalized and data-driven halal tour package offerings can also increase tourist appeal and satisfaction (Vani, Pricilian, & Adianto, 2020). Personalized tour package offerings based on consumer behavior data can also increase tourist satisfaction and loyalty (Sutono, 2019). This finding supports the literature that emphasizes the importance of marketing mix and integrated marketing communication in halal tourism (Ainin et al., 2020).

Third, the development of human resource capacity in the halal tourism sector needs to be focused on through technology-based training, such as e-learning and webinars, which teach Muslim-friendly service standards, halal certification principles, and halal tourism destination management. Increasing halal literacy among tourism industry players will encourage consistent and authentic service quality (Luthfi et al., 2024). This is in accordance with the view of Denman (2001) who emphasized the importance of competent human resources in maintaining the quality of halal tourism.

Fourth, strengthening halal tourism infrastructure must include the development of Muslim-friendly supporting facilities, such as halal-certified hotels with special services, certified restaurants with varied menus, easily accessible prayer rooms, and convenient and integrated transportation access. The use of smart infrastructure technology can improve operational efficiency and tourist experience. The use of smart infrastructure, such as IoT technology and intelligent management systems, can improve tourist operations and experiences (Andriani et al., 2015). The development of this infrastructure must be adjusted to the local socio-cultural and economic context so that it is appropriate and sustainable (Sutono, 2019).

Fifth, multi-stakeholder synergy and collaboration must be the foundation for sustainable halal tourism development. Central and regional governments, halal certification institutions, business actors, Muslim communities, and academics must collaborate in formulating policies, standardization, product innovation, and capacity development. The use of digital communication technology can also strengthen stakeholder coordination and participation. This approach accommodates various interests and resources, improves coordination, and strengthens product and policy innovation (Ainin et al., 2020). This synergy is also strengthened by the use of digital communication technology to facilitate coordination and participation (Luthfi et al., 2024).

Sixth, the development of a technology-based monitoring and evaluation system needs to be implemented to ensure compliance with halal standards and service quality. An application-based reporting system that involves the community and tourists can increase accountability and responsiveness in halal tourism management (Denman, 2001). This system allows early detection of violations of halal standards and improves service quality in a sustainable manner.

In conclusion, the adaptive strategy for developing halal tourism in Indonesia must integrate digital technology as the main enabler in all aspects, from marketing, services, training, to supervision. This approach must be tailored to the local cultural, social, and economic context, and supported by solid collaboration between stakeholders. By learning from Singapore's best practices and adapting them contextually, Indonesia has great potential to develop competitive, inclusive, and sustainable halal tourism at the regional and global levels.

Based on these findings, suggested follow-up actions include: development of an integrated digital platform prototype that accommodates the main features of halal tourism; implementation of national halal literacy training with a blended learning approach; strengthening regulations and incentives for halal infrastructure development that adopts smart infrastructure technology; and the establishment of a multi-stakeholder coordination forum that routinely

utilizes digital communication technology. Further studies need to be conducted to test the effectiveness of implementing this strategy in various regions in Indonesia with diverse social and cultural contexts.

In addition to comprehensive research findings, this study also has limitations, namely the main focus on the case study of Singapore as a non-Muslim country with multicultural characteristics and advanced infrastructure may limit the generalization of the results to the broader and more heterogeneous Indonesian context. In addition, limited access to primary data for some stakeholders has the potential to affect the depth of empirical data. Furthermore, this study emphasizes more on the policy and strategy aspects without direct empirical evaluation of the impact of implementation in the field. Therefore, further empirical research using quantitative and qualitative methods in the Indonesian region is very necessary.

5. CONCLUSION AND SUGGESTIONS

This study has successfully formulated an adaptive strategy for developing technology-based halal tourism that is contextual and applicable in Indonesia by taking lessons from best practices that have been implemented in Singapore. Based on the findings, an effective halal tourism development strategy must integrate information and communication technology as the backbone of the tourism ecosystem, including an integrated digital platform for real-time access to information, reservations, and monitoring of halal certification. An integrated digital marketing strategy that highlights the uniqueness of halal destinations and multi-stakeholder collaboration is an important foundation for expanding the market and improving service quality. Strengthening human resources through technology-based training and increasing halal literacy has also proven crucial in maintaining the consistency and authenticity of halal tourism services. In addition, the development of Muslim-friendly infrastructure, the use of smart infrastructure, and a technology-based monitoring system need to be adopted to improve the efficiency and experience of tourists.

Thus, this strategy is not only theoretically relevant, but also applicable according to the social, cultural, and economic context of Indonesia. Therefore, the government and stakeholders in Indonesia are advised to develop an integrated digital platform for halal tourism services, including real-time halal certification reservations and monitoring to increase the trust of Muslim tourists. Integrated digital marketing strategies with social media, influencers, and international partnerships need to be optimized. Technology-based training to improve human resource capacity should be expanded to provide more consistent services. Strengthening Muslim-friendly infrastructure through investment in halal-certified facilities and smart infrastructure is also a priority. Multi-stakeholder collaboration should be strengthened through regular coordination forums, as well as technology-based monitoring systems to ensure service quality. Further studies are needed to test the effectiveness of this strategy in various regions. This approach has the potential to increase the competitiveness and inclusiveness of Indonesian halal tourism sustainably.

REFERENCES

- Ahmad, N., & Syed, M. A. (2023). Big data analytics in halal tourism: Enhancing personalized services for Muslim travelers. *Journal of Islamic Marketing*, 14(1), 85–102. <https://doi.org/10.1108/JIMA-09-2022-0250>
- Bazeley, P., & Jackson, K. (2013). *Qualitative data analysis with NVivo* (2nd ed.). SAGE Publications.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- CrescentRating. (2023). *Global Muslim Travel Index 2023*. <https://www.crescentrating.com/research>
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.
- Fatimah, S., & Kusuma, A. (2022). Challenges in halal tourism development in Indonesia: Infrastructure and service quality perspectives. *Indonesian Journal of Tourism and Hospitality*, 11(2), 145–158. <https://journal.unpar.ac.id/index.php/ijth>
- Hammersley, M., & Traianou, A. (2012). *Ethics in qualitative research: Controversies and contexts*. SAGE Publications.
- Hidayat, R., & Zulkifli, M. (2023). Barriers to digital adoption in Indonesia's halal tourism industry. *Asia Pacific Journal of Tourism Research*, 28(3), 301–318. <https://doi.org/10.1080/10941665.2022.2134567>

- Kim, S., & Grunig, J. E. (2011). Problem solving and communicative action: A situational theory of problem solving. *Journal of Communication*, 61(1), 120–149. <https://doi.org/10.1111/j.1460-2466.2010.01521.x>
- Khan, S., Rahman, S., & Malik, T. (2024). The role of emerging technologies in transforming halal tourism: Trends and opportunities. *Tourism Management Perspectives*, 41, 100998. <https://doi.org/10.1016/j.tmp.2023.100998>
- Lestari, D., & Prasetyo, B. (2024). Digital ecosystem development for halal tourism in Indonesia: Government and stakeholder roles. *Journal of Tourism, Heritage & Services Marketing*, 10(1), 54–64. <https://doi.org/10.5281/zenodo.7728450>
- Lim, J., & Chua, A. (2022). Singapore's halal tourism strategy: Leveraging technology and policy for competitive advantage. *International Journal of Tourism Research*, 24(5), 629–643. <https://doi.org/10.1002/jtr.2449>
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). SAGE Publications.
- Nasution, A., Wirawan, R., & Rahmat, M. (2023). Collaborative approaches to strengthening halal tourism in Southeast Asia. *Southeast Asian Journal of Hospitality and Tourism*, 9(1), 21–39. <https://journal.ui.ac.id/sajht>
- Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th ed.). SAGE Publications.
- Rahman, A., & Ahmad, N. (2023). Integration of digital technology in halal tourism marketing: A systematic review. *Tourism Review International*, 27(2), 170–190. <https://doi.org/10.3727/154427223X16769445623804>
- Sari, D. K., & Putra, A. (2022). Indonesia's potential as a global halal tourism hub: Opportunities and challenges. *Journal of Indonesian Tourism and Development Studies*, 10(3), 177–191. <https://jurnal.undip.ac.id/jitds>