

Digital-Based Sustainable Tourism Security through Pentahelix Collaboration in Samalona Island, Makassar, Indonesia

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Abstract

Samalona Island is a tourist destination in Makassar City, South Sulawesi Province, Indonesia. This study aims to identify the potential and challenges in developing digital innovation-based tourism on Samalona Island. The potential of Samalona Island includes a sense of security and the beauty of its underwater nature. This island is a favorite place for foreign and domestic tourists because tourists feel safe when visiting the island. The involvement of all actors, such as stakeholders, industry, media, academics, and local communities, supports the development of Samalona Island. The novelty in this study is the lack of articles discussing Samalona Island based on the pentahelix model. This study found that Samalona Island's development applies the ecotourism principle that focuses on the environment. The role of the media in marketing the potential of Samalona Island attracts domestic and foreign tourists to the island.

Keywords: *Samalona Island; digital innovation; stakeholders; industry; media; community.*

Introduction

The development of the tourism industry is greatly influenced by communication and information technology that facilitates mobility in tourism practices. Advances in technology and information make it easier for tourists to access tourism information through various online platforms available. In addition, technology can make tourism trips more effective with multiple changes offered in the tourism industry business model (Briandana, Doktoralina, & Sukmajati, 2018). Digital innovation has become a current and future trend because applying digital innovation tools has become one of the new needs and requirements in creating tourism products (Thomas, 2024). Thus, the tourism sector becomes more inclusive to be accessed by all groups globally and enables more tourists to enjoy quality travel.

Tourism is one of the mainstays of economic growth, and its benefits can be felt directly by those involved. Properly developed tourism practices can benefit a region's progress in various development sectors. The increase in the number of tourists is due to the increase in money circulation, which represents the manifestation of efforts to increase community development, from natural resources to infrastructure. Therefore, many countries compete to develop their tourism sectors (Priyanto et al., 2020). Indonesia is one of the countries that focuses on developing maritime tourism, especially on small islands.

One of the strategies for developing sustainable tourism is through digital marketing because it is related to investment (Zvaigzne et al., 2023). This condition illustrates that the tourism sector contributes to progress, so its development is not only a practice that continues to grow in global trends but also a necessity that the country must meet to maximize the potential benefits of the tourism sector. This study aims to identify the potential and challenges in developing digital innovation-based tourism on small islands. The novelty in this study is the need for more research that focuses on digital innovation that local governments have carried out in supporting tourism on small islands. To develop a Penta helix model, this study focuses on

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the opportunities and challenges in improving the security of sustainable tourism based on digital innovation on tourist islands in Makassar City.

Method

The method used in this study is qualitative, which includes unstructured interviews, Focus Group Discussions, and library research. FGD involved 25 people: stakeholders, students, and lecturers interested in tourism. Interviews involved 42 people: stakeholders, tourism business actors on the island, foreign and domestic tourists, and fishermen. Researchers conducted this research from March 2023 to July 2024. This research is located on Samalona Island in Makassar City, South Sulawesi Province, Indonesia. To create a Penta helix model, the study involved the Makassar City Tourism Office, the South Sulawesi Provincial Marine and Fisheries Office, local communities, entrepreneurs, domestic and foreign tourists, and researchers interested in sustainable tourism development. This study took Malaysia as a comparative country because Malaysia has a high level of tourist arrivals in ASEAN (Community Relations Division, 2022).

Literature Review

Penta helix is a socio-economic development model that encourages mutually beneficial cooperation through synergy between government, academics, communities, businesses, and mass media to realize tourism development. The Penta helix model focuses on activities that arouse feelings and involve individuals or groups in an activity. This model is essential because the development of social innovation will not succeed without influencing the community to solve problems that exist in the community (Yasir, Firzal, Sulistyani, & Yesicha, 2021). The development of the local tourism industry will be successful if there is synergy between the community, local communities, government, and industry. The development of Penta helix is based on collaboration between five main actors, namely government, academics, society, the business world, and mass media, to develop local tourism potential.

Universities, governments, and stakeholders also have essential roles in formulating and implementing sustainable tourism development by utilizing existing tourism resources. Coordinated communication between stakeholders is vital in disseminating knowledge and public awareness regarding sustainable tourism development based on local communities (Yasir et al., 2021). Universities, governments, and stakeholders have a significant role in developing existing tourism resources to create sustainable tourism.

The Penta Helix elements were originally Triple Helix, consisting of academics, the business sector, and government. Then, one element was added, namely civil society, so that it became a Quadruple Helix to accommodate the perspective of society. Media and culture-based societies have also become integral to innovation in the 21st century. In addition, the community element opens up opportunities for configuration to form an interdisciplinary network accompanied by innovation (Pradhipta, Pusparani, & Nofiyanti, 2021). As one of the most essential elements in providing input and responses, the community becomes one of the elements of consideration in the tourism development process. Initially a triple helix model and only involving government, academics, and the business sector, it developed into a Penta helix model to improve the quality of the economy resulting from discussions between the three actors and produce more functional economic considerations and objectives.

Discussion and Analyses

The potential of Digital Innovation-Based Tourism Sector on Samalona Island

The progress of the tourism sector cannot be developed from several aspects that influence the growth and market demand for tourism facilities, including increasing living standards of the global community, population growth, the process of globalization and the emergence of various multinational companies, the growth of the technology and information industry, increasing the language skills of the community, to the emergence of professional associations and so on which are the main drivers in the progress of the tourism

sector (Briandana et al., 2018). Therefore, the progress of the tourism sector through the implementation of digitalization during the decade 2016 to 2025 is estimated to bring profits to the industry of \$305 billion (Weinelt & Moavenzadeh, 2017). Population growth coupled with demand for tourism access and facilities has made this sector continue to grow and become increasingly popular. To support this development, there needs to be an emphasis on developing digital-based innovative tourism to develop sustainably and guarantee tourist safety.

Digital innovation significantly impacts the tourism industry, especially on information, data, and knowledge (Cuomo et al., 2021). The spread of information technology in the tourism sector also increases the economic and social impact in developed and developing countries (Minghetti & Buhalis, 2010). Then, promoting sustainable tourism development must also pay attention to the ecological safety of tourist locations (Lin et al., 2023). In addition to ecological security, paying attention to tourist security is also essential. Tourist security can be compromised if police security is poor, terrorism risk communication is lacking, and counter-terrorism strategy integration is limited (Lin et al., 2023). The head of the Makassar city tourism office said cooperation between various elements is necessary to ensure sustainable tourism security. Tourism security is a driver for foreign tourists visiting Samalona Island and other tourist islands (FGD, Makassar, March 29th, 2023). Foreign tourists are interested in coming to Samalona Island because of their confidence in its safety.

Two countries are massive in developing their tourism sectors, namely Indonesia and Malaysia. Indonesia has great potential in the tourism sector because the growth of its tourism sector can provide a long-term economic contribution of 8% of the total foreign exchange earnings in 2019. This percentage allows the tourism sector in Indonesia to generate up to IDR 240 trillion from domestic and international tourists (Lee & Syah, 2018). The head of the Makassar City tourism office said that the Makassar City tourism office has carried out many strategies and actions in the tourism sector, such as training creative tourism business actors, creating branding such as "The Makassar City of Delicious Food", promoting traditional culinary at various festivals and important events held by the mayor of Makassar and the Makassar city tourism office (FGD, Makassar, March 29th, 2023). This culinary promotion can also be seen online on the Instagram of the Makassar city tourism office. Various culinary promotions can be developed on Instagram by highlighting the tourism image of the city of Makassar.

Indonesia has abundant tourism potential, especially in the maritime sector, because it is an archipelagic country with a large and diverse area. The total length of the coast in Indonesia, which reaches more than 81,000 km, is a maritime potential that can be developed optimally in the tourism sector. The maritime potential owned by Indonesia is not limited to offering natural beauty but also the preservation and sustainability of marine ecosystems (Briandana et al., 2018). Indonesia is blessed with natural wealth and beauty that can encourage the growth of the country's tourism sector by attracting tourists to visit the diversity of natural destinations. The main attraction offered by the maritime tourism sector in Indonesia is the richness of the ecosystem and marine biota promoted through various activities such as enjoying the beauty of the underwater world and nature conservation that represents quality and sustainable tourism. Domestic and foreign tourists who visit Samalona Island say we visited Samalona Island because of the enchanting beauty of the underwater world and because it has a variety of marine biota. Therefore, we are interested in snorkeling and diving around the island area (Samalona Island, Makassar, interview, May 2nd, 2024).

The development of the tourism sector in Indonesia is a manifestation of the government's commitment to developing long-term development by considering strategic sectors. Therefore, tourism development in Indonesia is carried out in stages through a master plan for tourism development starting from development at the national level. Down to the provincial level, it is ending with development at the district/city level (Hasbi et al., 2021). Tourism development in Indonesia prioritizes elements of equality that strategically use a top-down approach. This approach was initiated at the national level and implemented independently by each region in Indonesia according to the region's potential.

The strategy that prioritizes regional potential allows tourism development to be more structured in its implementation and can be developed according to the characteristics of each region so that each region

has its tourist attractions. In addition, this strategy can encourage strengthening collaboration in maximizing the implementation of ecotourism in Indonesia, which can be a major tourist attraction by collaborating with the environment and tourism. The head of the Makassar City Tourism Office said that Makassar has a distinctive culinary tourism characteristic. Therefore, the Makassar City Government issued the "Eat Delicious" program to support traditional cuisine in Makassar. Small islands in Makassar, including Samalona Island, also have culinary advantages, generally from fish (FGD, Makassar, March 29th, 2023). Several tourists from Japan said that Samalona Island has traditional culinary delights such as grilled fish or fried bananas, which are made to order (Samalona Island, Makassar, interview, June 20th, 2024).



Figure 1. Visiting Japanese Tourists

Source: Authors

South Sulawesi is one of the potential areas in Indonesia in the realm of tourism sector development. This situation is evidenced by the increasing trend of foreign tourist visits, which increased by 25.80% from 14,126 visits in 2018 to 17,771 in 2019. Although in 2020, there was a decrease of up to 1,210 visits caused by the Covid-19 pandemic, it did not become an obstacle to developing the tourism sector in South Sulawesi (Hasbi et al., 2021). The head of the marine, coastal, and small islands spatial management and planning division of the South Sulawesi provincial marine and fisheries office said that South Sulawesi is one of the economic centers of Eastern Indonesia, so it would be relevant for the government to encourage the development of tourism and commercialization of tourism MSMEs in this region to increase equality in Indonesia (interview, Makassar, May 5th, 2024).

The main strategy for developing tourism in Makassar City is through efficient cooperation between stakeholders, industry, academics, and the community to ensure the sustainability and long-term success of the tourism sector. The practice is reflected through the development of maritime tourism in Makassar City, which focuses on easy access and availability of facilities, market development, and promotion, increasing community management participation through empowerment, and preparing quality human resources. Therefore, the Makassar City Tourism Office, as a government agency, fully encourages the promotion and participation of the community in various stages of maritime tourism sector development, starting from planning, management, development, monitoring, and evaluation. The Makassar City Government also supports strengthening community participation in tourism development through strengthening control mechanisms and preserving the environment and community economy (Roem, 2023). Collaboration between government, industry, and the community, especially tourism business actors,

is essential in developing sustainable tourism because its development is not only focused on providing destinations but also the availability of various aspects that realize quality tourism in Makassar City. Community involvement in the tourism development process will enable them to play a role in the tourism process that allows the community to gain economic benefits from providing goods and services in the tourist destination area. In other words, the community can become the leading actor in local tourism activities.



Figure 2. The beauty of the white sand of Samalona Island

Source: Authors

Tourism development in Makassar City through collaboration with the private sector is the primary strategy by considering the benefits to be gained. Collaboration with the private sector is a momentum that can improve the quality of tourism and encourage more relevant promotional practices in attracting tourists. A strong market network is needed between tourism industry players in developing maritime tourism. That is why the private sector also has a reasonably large share. One of the prominent examples is the collaboration between the Makassar City government and ASITA or the Association of Indonesian Travel and Tourism Companies. ASITA plays a role in developing the management of maritime tourism objects in Makassar City (Roem, 2023). Collaboration between various actors can maximize tourism development in Makassar City, which can align with sustainable tourism aspects based on ecotourism. The fishermen group on Samalona Island said that every year, the government, especially the South Sulawesi Provincial Marine and Fisheries Service, provides training such as the introduction and use of environmentally friendly fishing gear by inviting fishermen on the islands in Makassar City (Samalona Island, Makassar, interview, April 15th, 2024). This picture shows the government's and local fishermen's collaboration in improving their skills.



Figure 3. Penta helix Model

Source: Authors

The impact of the training has formed an environmental observer group that cares about coral reefs. There is also training for making coral houses on Kodingareng Island, which attracts foreign and domestic tourists to visit the island (Samalona Island, Makassar, interview, April 15th, 2024). The fishermen's success in making artificial fish houses is due to the government's great motivation to educate local communities about the importance of maintaining coral reef ecosystems. This condition also shows the existence of collaboration involving the government and local communities. Then, the role of online media is also huge because tourists visit these tourist islands because of promotions from online media (Samalona Island, Makassar, April 15th, 2024). The ecotourism principle implemented in developing the tourism sector makes Samalona Island increasingly popular among tourists.



Figure 4. Samalona Island from a distance

Source: Authors

Meanwhile, researchers are interested in seeing Malaysia as a neighboring country that has succeeded in bringing in large numbers of tourists to Malaysia. The tourism sector in Malaysia is one of the essential components that support the national economy. The Malaysian government uses the income obtained through the tourism sector for investment and industrial development to achieve a high-status economic target in 2020 (Puah et al., 2018). The following figure is the tourism index in Southeast Asia in 2024.

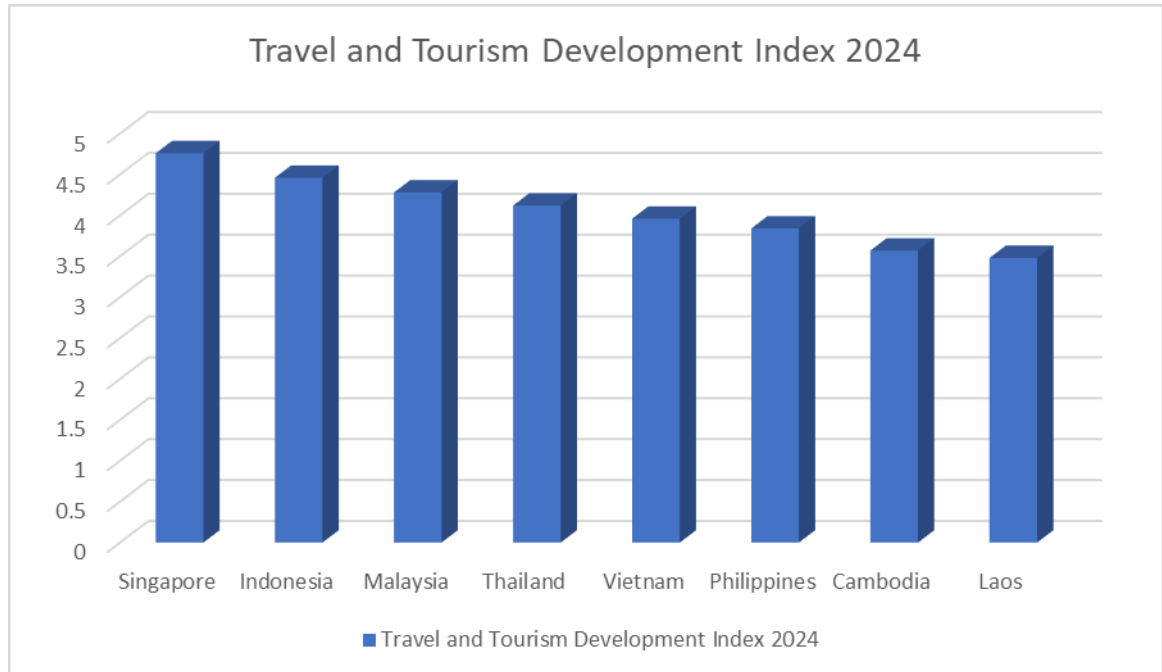


Figure 5. Travel and Tourism Development Index 2024

Source: (Seasia, 2024)

Figure 5 above shows the index of tourist and travel development. Indonesia is ranked 2nd, and Malaysia is ranked third. Unlike Indonesia, which focuses on the maritime tourism sector as its main base at this time, Malaysia focuses on the tropical forest tourism sector. This picture is the primary consideration because the Malaysian government has a vision to provide sustainable ecotourism facilities. Malaysia is known as one of the twelve countries with the most incredible biological diversity in the world. There are at least 15,000 species of flowering plants, 1,500 species of vertebrates, and more than 150,000 species of invertebrates in this country (Malaysia Tourism Promotion Board, 2023). With the diversity of tropical forest ecosystems, it is not surprising that Malaysia has made the tropical rainforest tourism sector its leading tourism sector, which can attract the interest of foreign tourists.

To develop a tourism sector relevant to ecotourism practices, Malaysia has developed a wildlife-based tourism (WBT) model whose primary basis is nature tourism, which provides experiences and activities with wildlife as part of environmental conservation. This model was developed because the nature sector is proliferating and becoming one of the dominant trends in global tourism. In practice, WBT is an activity that harmonizes nature-based tourism, wildlife, human-animal relations, rural tourism, and ecotourism (Charles & Hamid, 2022). Through WBT, Malaysia can develop its tourism by aligning the tourism industry trend with the need to balance nature conservation. Ultimately, WBT becomes a practice that encourages the sustainability of nature tourism in Malaysia because it minimizes the impact on habitat and ecosystem damage.

Sabah is one of the regions in Malaysia that focuses on developing the ecotourism sector. The strategy implemented to realize tourism development in Sabah is through the Malaysian government's launch of the National Ecotourism Plan 2016-2025. This strategy is implemented to protect and preserve nature and Malaysia's cultural heritage. Malaysia believes this strategy can produce maximum synergy between local

communities and the tourism and economic sectors to encourage mutual respect between residents and tourists. The result is an attraction that makes visitors find natural beauty and a positive culture from the local population. This strategy is implemented in the Sabah region because it is famous for its tropical forest potential, which can be utilized as the leading tourism potential (Malaysia Tourism Promotion Board, 2023). The natural landscape in the Sabah region is an attraction for tourists who want to visit and carry out various activities with the various flora and fauna. Through the National Ecotourism Plan, Malaysia can implement a relevant strategy to combine the interaction between natural potential and the role of various actors ranging from the government to the community that can be useful to maximize the development of a sustainable tourism sector that is very beneficial to the national economy.

Malaysia's Kinabatangan region has the Kinabatangan River, the longest river in Sabah and a place for wildlife exploration. The strategy for developing ecotourism in this region is to use floodplains as a coverage area for plants and various animal species that are Malaysia's leading tourism products. This destination is considered an essential part of Malaysia's local community and ecotourism because it has a diverse natural habitat and is the leading site for environmental conservation in Sabah. Utilizing the floodplain area downstream of the Kinabatangan River is a strategy to maintain the sustainability of rare species and biodiversity, including more than 1500 species. Then, to overcome the challenges concerning nature conservation, quality tourism, and sustainable tourism practices, the Malaysian government makes these problems a component that must be guaranteed in the sustainability of Kinabatangan as an ecotourism destination (Chan et al., 2021). This explanation indicates that the Malaysian government has fully committed to making the Kinabatangan region a leading ecotourism destination in Malaysia by maximizing its development, which is relevant to sustainable tourism goals. Thus, the potential of biodiversity in the Kinabatangan region can be utilized appropriately to support Malaysia's tourism sector without worrying about its environmental impact because it has practiced ecotourism relevantly.

Challenges of the Digital Innovation-Based Tourism Sector on Samalona Island

Various challenges will undoubtedly arise when realizing sustainable tourism. Collaboration between stakeholders is needed to face various challenges that can hinder the tourism sector, including roles, synergies, and shared responsibilities to realize sustainable tourism—moreover, considering that sustainable tourism is not just a goal but also a process of monitoring and preventive action to maintain the sustainability of the tourism sector (Roem, 2023). Implementing digital transformation is one requirement for maintaining the tourism sector's sustainability (Gutierrez et al., 2023). If those involved in the tourism sector can unite their goals, achieving sustainable tourism for the country's development will be easier. The head of the management and arrangement of marine, coastal, and small islands space of the South Sulawesi Provincial Marine and Fisheries Service said that collaboration between the government, industry, fishermen, and business actors is essential in supporting sustainable tourism (interview, Makassar, May 5th, 2024).

One of the challenges in sustainable tourism is ecotourism. Ecotourism is a tourism practice that impacts the environment by directly contributing to the maintenance or conservation of the environment to maintain the sustainability of the natural ecosystem. Ecotourism is one of the challenges of tourism because it is related to nature and includes various forms of tourism, both consumptive and non-consumptive. One of the main concerns in ecotourism is the extent to which mass tourism can be categorized as a form of ecotourism. The primary reference is the guarantee that the fulfillment of ecotourism needs for mass tourism can still pay attention to the ecological footprint and dynamics of resource use (Fennell, 2008). The development of ecotourism-based tourism ensures that the impact on the environment can be minimized so that mass tourism does not hinder the process of environmental conservation. On the contrary, tourism is carried out in line with efforts to preserve nature as a form of human connection with nature. The head of the Makassar City Tourism Office said that the programs carried out by the Makassar City Tourism Office always pay attention to nature conservation (FGD, Makassar, March 29th, 2023).

Tourism growth is an aspect that goes hand in hand with environmental sustainability. Both are interdependent because tourism development depends on tourist interest, which can be influenced by

environmental sustainability. In this case, the long-term basis is to protect the environmental ecosystem through support for community health and welfare. A sustainable environment will be represented by nature and rapid biodiversity and has excellent appeal accompanied by strong socio-cultural values so that tourist interest will be more significant to visit. Several tourists from Japan who were interviewed said they were interested in visiting Samalona Island because of its white sand, the beauty of its underwater nature, and its clean environment (Samalona Island, Makassar, interview, June 2nd, 2024). However, based on our monitoring when visiting the island in May 2024, we still found some visitor waste around the island's coastal area even though trash bins had been provided. The large number of visitors to Samalona Island has made some tourists undisciplined in throwing away trash.



Figure 6. Tourists on Samalona Island

Source: Authors

To align tourism development and environmental preservation, ecotourism becomes a challenge that can minimize the impact of tourism on natural resource damage. Ecotourism becomes a challenge for tourists and hosts in ensuring the protection of environmental ecosystem components by reflecting a mindset whose primary orientation is to create added value and provide value for tourist destinations that are relevant to environmental and social issues (Baloch et al., 2023). Ecotourism practices can be a guideline for realizing sustainable tourism sector security so that its economic benefits can increase local communities' welfare. Tourism business actors on Samalona Island said that tourists who come every year to this island have increased income for our business because they shop or rent diving equipment in our shop (Samalona Island, Makassar, interview, May 2nd, 2024).

In developing the ecotourism sector, Indonesia, which focuses on developing maritime tourism, has challenges from consumers and market competition. Therefore, the tourism sector in Indonesia should not be limited to the appeal of natural resources; it must also collaborate with other aspects, including culture and culinary arts (Briandana et al., 2018). The Indonesian government can develop the tourism sector according to current market demand and trends. The tourism sector in Indonesia has diversity ranging from maritime, forest, and mountain to cultural orientation. However, currently, the most relevant main focus is the development of the maritime tourism sector, especially in various coastal areas of Indonesia. The selection of the maritime sector as a leading tourism in Indonesia is in line with efforts to implement ecotourism because tourism practices in Indonesia utilize a lot of marine resources. Marine environmental conservation is also needed to meet sustainability aspects.

Indonesia and Malaysia utilize the tourism sector to increase the economy. Therefore, the tourism sector in both countries must be developed sustainably to ensure success in developing the tourism sector that benefits the national economy. In realizing sustainable tourism development, of course, there are various challenges ranging from nature conservation to exceptional destinations from tourist destinations that can attract tourists and can follow market trends. Therefore, tourism development in both countries must be carried out by referring to ecotourism practices, which collaborate between tourism and sustainability.

One of the main challenges for the Malaysian government regarding its tourism sector is minimizing the environmental impact. The Malaysian government is trying to face this challenge through sustainable nature-based tourism in tropical rainforest areas. This area is believed to attract foreign tourists if managed optimally. Nevertheless, the Malaysian government continues implementing various strategies for developing tropical rainforest tourism (Sumanapala & Wolf, 2023). Therefore, in aligning the development of nature-based tourism with ecotourism practices in Malaysia and Indonesia, there needs to be a policy from the local government to maximize environmental management in line with aspects of sustainable tourism.

The policy framework is essential in supporting sustainable tourism growth because it concerns maximum enforcement practices. In Malaysia, several challenges still need to be resolved to maximize its tourism potential. These challenges include the need to improve visitor attractions, develop natural and cultural tourism, and improve the ecotourism sector, which still needs to be improved. In addition, the Malaysian government also maximizes investment opportunities in the tourism sector and develops human resources to realize quality tourism. Therefore, the Malaysian government is concerned with tourism issues and environmental conservation as policies in developing tourism (Charles & Hamid, 2022). The Malaysian government can maximize efforts to develop the ecotourism-based tourism sector, as can the Indonesian government, which always focuses on its ecotourism policies.

Conclusions

The potential for developing digital innovation-based tourism on Samalona Island is because tourists are confident that there is security while visiting the location. Various strategies have been carried out by the Makassar city government, such as training creative tourism entrepreneurs, creating branding such as "Makassar Kota Makan Enak," and promoting traditional culinary at various festivals. The potential for the culinary sector in Makassar City is huge and unique. Samalona Island also has a wealth of ecosystems and marine biota. This condition makes tourists interested in visiting this island. Meanwhile, Malaysia, focusing on forest tourism, also practices ecotourism to attract tourists. Then, the challenges in developing digital innovation-based tourism on Samalona Island include garbage that is still scattered in several locations on the coast of Samalona.

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