JITK (JURNAL ILMU PENGETAHUAN DAN TEKNOLOGI KOMPUTER)

VOL. 10. NO. 2 NOVEMBER 2024
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v10i2.5381

ARCHITECTURE OF SMART TOURISM APPLICATION: A DEVELOPING COUNTRIES' PERSPECTIVE A CASE STUDY IN INDONESIA

Ruci Meiyanti[1*]; Yuwan Jumaryadi[2]; Riri Fajriah[3]; Bagus Priambodo[4]

Department of Information Systems[1,2,3]
Department of Informatics Engineering[4]
Universitas Mercu Buana[1,2,3,4]
https://mercubuana.ac.id[1,2,3,4]
ruci.meiyanti@mercubuana.ac.id[1*], yuwan.jumaryadi@mercubuana.ac.id[2], riri.fajriah@mercubuana.ac.id[3], bagus.priambodo@mercubuana.ac.id[4]

(*) Corresponding Author
(Responsible for the Quality of Paper Content)

Abstract— *Beautiful, comfortable, safe, and affordable tourist attractions are every tourist's dream. Meanwhile, tourism in developing countries, the authenticity and uniqueness of nature and culture are the main attractions for tourists. The lack of accurate information that can accommodate tourist locations, local culture, unique tourism, transportation, and accommodation of a tourist attraction for developing countries is an obstacle to the success of tourist visits. The role of technology and society can help the concept of smart tourism governance for developing countries. Therefore, a framework model is needed that can explore the advantages of tourism in developing countries. The success of Smart Tourism cannot be separated from the development of the application architecture that is used as the basis for developing the Smart Tourism system application. So, the purpose of this study is to create an informative, accurate, safe, and easy smart tourism application architecture. This study uses a qualitative method, namely with literature studies and in-depth interviews were also conducted with tourism and informatics experts. The Mc Farlan Matrix used in the Ward and Peppard method and the TOGAF framework are used in the formation of smart tourism applications. The results of this study are The results of this study are in the form of an application architecture that focuses on stakeholder interests in the form of Smart Tourism Service Application Architecture for various Stakeholders which is an integration of smart tourism organization, smart destination, smart service, smart decision, smart share, smart experience, smart recommendation.*

Keywords: *application architecture, community, innovation, smart tourism, stakeholder centric.*

Intisari—*Objek wisata yang indah, nyaman, aman, dan terjangkau merupakan dambaan setiap wisatawan. Sementara itu, pariwisata di negara berkembang, keaslian dan keunikan alam serta budaya menjadi daya tarik utama bagi pengunjung wisata. Minimnya informasi yang akurat yang dapat mengakomodir lokasi wisata, budaya setempat, keunikan wisata, transportasi, dan akomodasi suatu objek wisata bagi negara berkembang menjadi kendala keberhasilan kunjungan wisatawan. Peran teknologi dan komunitas masyarakat dapat membantu konsep tata kelola pariwisata cerdas bagi negara berkembang. Oleh karena itu, diperlukan suatu model kerangka kerja yang dapat mengeksplorasi keunggulan pariwisata di negara berkembang. Keberhasilan smart Tourism tidak lepas dari pengembangan arsitektur aplikasi yang dijadikan dasar dalam pengembangan aplikasi sistem Smart Tourism. Jadi, tujuan dari penelitian ini adalah untuk menciptakan arsitektur aplikasi pariwisata cerdas yang informatif, akurat, aman, dan mudah. Penelitian ini menggunakan metode kualitatif yakni dengan studi literatur dan wawancara mendalam juga dilakukan terhadap pakar pariwisata dan informatika. Matriks Mc Farlan yang digunakan dalam metode Ward dan Peppard serta kerangka TOGAF digunakan dalam pembentukan aplikasi pariwisata cerdas. Hasil penelitian ini berupa arsitektur aplikasi yang berfokus pada kepentingan stakeholder berupa Arsitektur Aplikasi Layanan Pariwisata Cerdas untuk berbagai Stakeholder yang merupakan integrasi smart tourism*

organization, smart destination, smart service, smart decision, smart share, smart experience, smart recommendation. experience.

***Kata Kunci**: arsitektur aplikasi, komunitas, inovasi, pariwisata cerdas, berpusat pada pemangku kepentingan.*

INTRODUCTION

In various developing countries that have very potential and valuable natural conditions for tourist destinations, they often have obstacles in terms of infrastructure and tourism services, as well as aspects of security and comfort for tourists. This will certainly have an impact on the psychology of tourists and prospective tourists who will come to the tourist destination. A bad image of a tourist attraction will certainly have an impact on the interest and trust of tourists and have an impact on the local economy and the image of the region and country [1]. The natural beauty that should be a gift to improve the welfare of the people and boost the image of a country has become a boomerang for most developing countries including Indonesia. Therefore, a reliable, safe, accurate, and easy arrangement and information is needed for all parties in supporting local tourism in each region [2] starting from the historical and cultural profile of the tourist destination, accommodation, transportation routes, culinary, health, and various other information related to the tourist attraction and its surroundings, carrying capacity, stakeholder management and community involvement [3]. In addition, there are quite a few tourists who have physical obstacles to be able to explore a tourist destination, this can have an impact on the lack of interest of family tourists to the tourist attraction. This is very possible by using the information and communication technology that exists today [4]. Meanwhile, the use of ICT is an absolute must in the tourism sector, both through virtual tourism and reality tourism, integrating generative artificial intelligence with natural language processing and the Internet of Things into an intelligent platform that supports tourism decision [5]. Likewise, through the development of ICT, it is very possible for tourists, including people with disabilities and the elderly, to be able to experience the tourism experience. For tourists who are digital nomads, tourism locations need to be facilitated with their work, financial, travel, and social life needs [6].

The most common tourism challenges in developing countries are the availability of transportation, traffic congestion, high pollution, poor maintenance of tourism facilities, cultural and lifestyle differences, limited road access, and collaboration in tourism governance. The challenges after the corona virus pandemic also make tourism development linked to economic growth [7]. In addition, tourism challenges related to ICT infrastructure such as ICT unpreparedness, ICT literacy in the community, application developer capabilities and data processing quality, and minimal regulation and funding [8][9].

The development of smart tourism (ST) in developing countries emphasizes more on how to utilize technology and empower human resources in creating ST applications. This is supported by research from Tribe & Paddison that human resource, technology, and financing components are important components in ST development [10]. Meanwhile, according to Singh et al. comfort, security, and peace of mind in traveling are very much needed by utilizing technological developments in mobile applications, mobile devices, and IoT [11]. Therefore, as a developing country, it is necessary to emphasize ICT interaction and intervention in supporting the sustainability of ST [12].

Indonesia as a developing country faces many things that must be improved in the tourism sector such as digital literacy, multiculturalism, inadequate infrastructure, poor management, crisis management, tourism competitiveness, data protection, and integrated tourism governance between the government and the private sector [13]. The integration of tourism governance is a challenge for the Indonesian government. Meanwhile, there is no specific method for regulating tourism governance [14]. Therefore, qualified experts from both the government and the private sector are needed to discuss tourism governance.

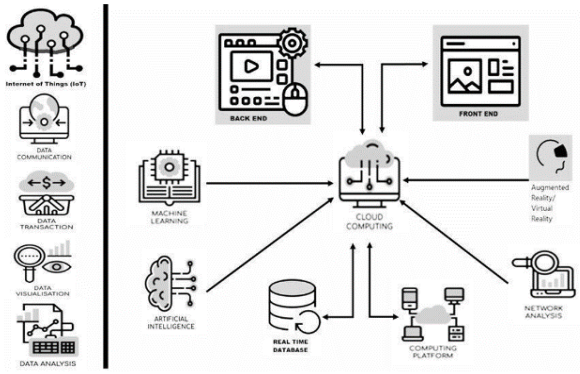
It can be concluded that the constraints or limitations of tourism in developing countries can be viewed from various aspects including technology, human resources both in quality and quantity,tourism management, availability of public facilities and facilities in tourist places, safety and convenience of travelling, financing and investment [15]. To strengthen information about the obstacles that exist in developing countries, the researchers took a case study of the problem of smart tourism in Indonesia. Surveys and in-depth interviews were conducted with tourism experts at the government, business, academic levels, while the community was also involved to find out their contribution and role to tourism activities in Indonesia. Based on tourism problems information obtained from various

Accredited Rank 2 (Sinta 2) based on the Decree of the Dirjen Penguatan RisBang Kemenristekdikti No.225/E/KPT/2022, December 07, 2022. Published by LPPM Universitas Nusa Mandiri

VOL. 10. NO. 2 NOVEMBER 2024
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v10i2.5381

articles on smart tourism in developing countries and the results of interviews with experts in the field of tourism, an application architecture is made that can accommodate the strength of tourism in developing countries in strategic applications in smart tourism. Matrix of Mc Farlan and artifacts from TOGAF framework based on application architecture principles are used in making this application architecture.

As stated by Ham, et al. that the role of ICT is key in the development of competitive smart tourism [16]. The technology in smart tourism that has been used today includes data retrieval via IoT sensors, data communication, data transactions, data visualization, and data analysis. Data is stored in cloud computing in a real-time database that can be accessed at any time by various computing platforms. Various data processing technology trends that use the concept of self-learning are used to process tourism data such as machine learning, artificial intelligence, augmented reality, network analysis, and so on [17][18][19]. This allows for more real-time information updates so that all information presented in the application is the most up-to-date and accurate. In addition, the security aspect of transactions and the provision of virtual reality impressions for virtual tourism are becoming increasingly possible and very close to the original conditions. Furthermore, a dynamic front-end application was developed [20] that is easy and accommodates cultural and language differences. Meanwhile, the back end is carried out as a supporting application for front-end activities so that all user interactions with the system can be studied for further development to make it more perfect. This can be seen in Figure 1.



Source: (Research Results, 2024)

Figure 1. General design of the current role of ICT in smart tourism

It can be concluded that Indonesia as a developing country, faces many things that must be improved in achieving tourism success such as digital literacy, multiculturalism, inadequate infrastructure, poor management, crisis management, tourism competitiveness, data protection, and integrated tourism governance between government and private sector [21]. Meanwhile, there are many things that must be considered in tourism governance such as the responsibilities carried out by stakeholders [22]. Therefore, tourism in Indonesia with all its characteristics requires professional and innovative governance. So, the research problem is how to develop a smart tourism management framework model that can accommodate the needs of various stakeholders so that a tourism destination can compete through all the facilities, infrastructure and services it has.

Based on the results of the internal analysis of the condition of IS/IT tourism and external analysis of IS/IT trends, a research gap was obtained. The IS/IT gap analysis of smart tourism is the limitations that have not been met by the current system compared to the expectations and desires of tourists and other stakeholders so that smart tourism goals are met. The Ward and Peppard's method and Mc Farlan's matrix were used to obtain IS/IT strategies which were further developed into a smart tourism application architecture using the TOGAF framework artifact.

MATERIALS AND METHODS

This study uses a mixed-method with the dominance of research on qualitative methods. At the beginning of the study, the components of smart tourism were collected using a Systematic Literature Review (SLR). This research consists of 3 main phases, namely planning, conducting, and reporting. The SLR process was carried out by collecting articles related to smart tourism from 2015 to 2020 from journals and proceedings and books from seven databases, namely Emerald Insight, Springer, Science Direct, IEEE, ACM, Routledge Taylor & Francis Group, and online journal databases.

Based on the 252 articles collected, 49 articles were selected which were then used in collecting smart tourism components. Next, based on the 49 selected articles, we searched for words that frequently appeared in these articles because they were predicted to be components needed in smart tourism. Next, a more detailed understanding is carried out by skimming the abstract of articles that have words that appear a lot to find out about the role and meaning of these words in smart tourism.

To complement the literature study in developing countries that was previously described,

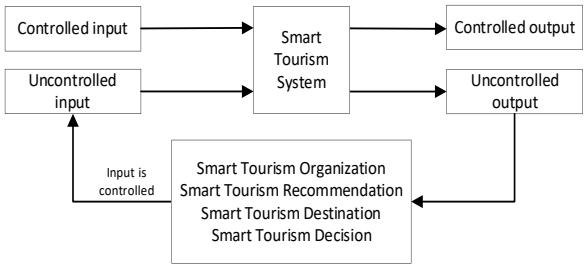
the researcher conducted a case study on smart tourism in Indonesia. Although the application architecture development design produced in this study cannot be generalized to other developing countries because it may be that each country has its own uniqueness, policies, and innovations, the tourism problems faced in other developing countries are not much different. Likewise, the tourism potential of developing countries has in common, namely in the natural panorama, and the unique culture that attracts tourists. This research is a qualitative method by conducting case studies in several tourist areas in Indonesia. In-depth interviews were conducted with 17 resource persons with details of two people from the government level of the Indonesian tourism ministry, six people at the tourism agency level in local government in areas that have leading tourist destinations. Six experts from tourism academics and three people from destination managers and developers of one of the smart tourism applications in Indonesia. The education level of the experts used as resource persons is at the undergraduate level to doctoral level.

RESULTS AND DISCUSSION

Based on the summary of the results of interviews with resource persons, two complementary things were obtained, namely the concept of a smart tourism system and an information system/information technology (IS/IT) strategy.

Smart tourism system concept

The concept of a smart tourism system supported by the use of technological developments is expected to support tourism activities. A system concept consists of Input, Process, and Output (IPO), so the smart tourism system can be described as IPO. Smart tourism systems interact with their environment thereby allowing for uncontrolled input to occur. Due to having uncontrolled inputs, it is possible to produce uncontrolled outputs as shown in Figure 2.



Source: (Research Results, 2024)

Figure 2. IPO Concept on Smart Tourism System

With the existence of a smart tourism system, it is expected that uncontrolled output can be managed so that it becomes feedback as controlled input. Here we can see self-learning which is a special characteristic of an intelligent system, namely an intelligent system that studies the conditions or situations given by its environment so that it can make predictions and suggestions and can be used as a useful reference for decision makers.

The concept of self-learning where the system takes its own initiative by evaluating the learning outcomes from previous data and used as a reference when entering new data is the main characteristic of an intelligent system [23]. This self-learning concept can accommodate uncontrolled output. The concept of self-learning is realized in applications that can manage tourism organizations/ institutions/ managers intelligently (smart tourism organization), applications that can provide recommendations to tourists in various tourist destinations intelligently (smart recommendation), and recommendations to tourist destination managers, governments or decision makers (smart decision) on data provided in real time regarding the condition of tourist destinations and tourist visitors processed by artificial intelligence, this is an increase in reliability that can be provided by using artificial intelligence in the proposed smart tourism.

Before the application of self-learning artificial intelligence, every data or information obtained will be processed manually by the analyst so that it takes a longer time and the possibility of analysis limitations if the variable components considered are very many and complex. Furthermore, there are many more functions that can be developed in smart tourism applications to control uncontrolled output and meet the goals of smart tourism itself. With this smart tourism, the efficiency of human resources, especially for routine and predictable things, can be increased, tourist satisfaction can be measured from the increase in the number of tourists and the length of visits to a tourist attraction. In addition, positive reviews and continued use of smart tourism are also indicators of tourist satisfaction.

Predictions from smart tourism can be measured for their accuracy by comparing them with the real conditions that occur so that the self-learning algorithm of smart tourism will adjust so that the level of accuracy between predictions and reality becomes better. This can be measured from the number of stakeholders who receive advice from smart tourism for planning their travel, both in choosing hotels, transportation, culinary, routes,

Accredited Rank 2 (Sinta 2) based on the Decree of the Dirjen Penguatan RisBang Kemenristekdikti No.225/E/KPT/2022, December 07, 2022. Published by LPPM Universitas Nusa Mandiri

VOL. 10. NO. 2 NOVEMBER 2024
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v10i2.5381

and so on. Increased income/local economy, connected transportation, and measurable time and cost planning are innovations from the proposed smart tourism. With recommendations that are very close to accurate and information that varies according to the needs of each tourist/stakeholder will benefit and maximize tourism potential can be realized. Detailing Deficiencies: The study should include a specific section detailing the current deficiencies in Indonesia's tourism infrastructure and management practices that the new smart tourism architecture aims to improve.

Information system (IS)/Information Technology (IT) strategy.

Based on a general analysis internally and externally involving various organizations with stakeholders related to tourism being studied, a summary of the IS/IT strategy is carried out using the Ward and Peppard's method. It is known, among others, that IS/IT strategies can be used to share information between stakeholders, improve integrity effectiveness that can add value to organizations/institutions, make it easier for organizations to develop various tourism products and services, develop strategy implementations to support tourism management leaders. In addition, it is also said that the success of implementing IS/IT strategies in a tourism organization can be determined by (1) focusing more attention on the external environment such as the tourism market, competitors, pandemics, (2) increasing value with the uniqueness of tourism services and products, (3) mutual benefit sharing among stakeholders related to tourism, (4) understanding the wishes of tourists, (5) innovating business not just technology, (6) increasing sustainable development, (7) utilizing analytical data to obtain more information.

Next, an analysis of the strategic items in the IS/IT strategy is carried out. Each strategy is placed in the appropriate category, namely (1) IS/IT business strategy category, (2) IS/IT management strategy, and (3) IT strategy. Then, it is determined the application that will be developed to fulfil the role of the strategy. The summary of the analysis is in Table 1.

Table 1. IS/IT Strategy And Application Development

Strategy Category	Strategy	Expandable Application	Application Roles and Opportunities
(1) IS/IT business strategy	a. need smart application	Smart tourism	Access to various tourist services at once in one platform makes this application strategic in achieving tourism success
	b. provide the right information	Smart information	Any information about tourism makes this application a support for anyone who wants to travel.
	c. help with tourism marketing	• Smart recommendation • Smart service • Smart destination • Smart experience	Providing recommendations, providing services, and activities and detailed information on a destination make these three applications support operations in tourism activities. Meanwhile, smart experience provides more potential in supporting tourism marketing.
	d. improve Human Resources capabilities	Smart share	This application provides more potential in improving the knowledge, insight, and skills of human resources, as well as tourists
(2) IS/IT management strategy	a. carry out tourism management	• Smart tourism organization • Smart decision	It is a strategy to open up opportunities and innovate so that it
	b. coordinate and collaborate between managers	•	can change the tourism business process
(3) IT Strategy	a. expand the internet network b. improve data security technology keep up with technology trends	• All applications on smart tourism	Supporting superior and competitive tourist destinations

Source: (Research Results, 2024)

The three types of strategies are then depicted in the development of the Mc Farlan Matrix application portfolio in the form of a matrix

concept consisting of strategic quadrants, high potential, as operations, as well as supporters in smart tourism activities as shown in Figure 3.

STRATEGIC	HIGH POTENTIAL
• Smart Tourism Organization • Smart Decision	• Smart Share • Smart Experience
• Smart Destination • Smart Recommendation • Smart Service	• Smart Information
KEY OPERATIONAL	**SUPPORT**

Source: (Research Results, 2024)

Figure 3. Mc Farlan's Application Portfolio of Smart Tourism

Applications in the strategic quadrant are important to be developed in order to obtain business success in the future. For this reason, smart tourism organizations and smart decisions are set to help manage and make decisions based on analytical data provided from tourism big data processing. Applications in the High Potential quadrant are innovative applications that open up opportunities for future profits even though they may not yet be proven, such as smart share and smart experience applications. Applications in the key operational quadrant are applications that support existing business continuity such as smart destinations, smart recommendations, and smart services. Finally, applications in the support quadrant are those that support the effectiveness and efficiency of management even though they do not provide a significant competitive advantage which is smart information applications.

According to the TOGAF framework, The Information System Architecture consists of two parts, namely data architecture and application architecture. Various artifacts can be used to support the creation of application architectures [24]. The following is Table 2 which is an artifact of the application architecture that describes the applications contained in smart tourism and the functions of the application.

Table 2. Application And Application Function Description

No	Application name	Application function description
1.	Smart Tourism	Is the overall application proposed on the smart tourism system
2.	Smart Destination	Is an application that contains information about tourist destinations both in narrative, audio, and visualization of various tourist destinations by utilizing technological trends in the delivery of information.
3.	Smart Recommendation	It is an application that can provide recommendations on the right touristdestinations based on the needs, desires, and behavior of tourists as application users
4.	Smart Experience	An application that presents tourist experiences, both experiences from tourists, as well as experiences from tourist destination managers, communities, and tourism communities. All of these experiences become multi-experiences which can later be used as smart recommendations or smart decisions by application users.
5.	Smart Tourism Organization	It is an application that manages tourism, which can coordinate with various tourism-related institutions/organizations. In addition, this application can be used as monitoring (supervision) and evaluation of tourism activities, managers, and tourist destinations, infrastructure facilities contained in these destinations
6.	Smart Decision	It is an application that is used for decision making by decision makers both from the government and tourism managers
7.	Smart share	An application that is used to share knowledge, insight, knowledge, skills, or expertise related to tourism activities and is owned by stakeholders in thetourism sphere.
8.	Smart service	An application that is used to provide the services for administrative completeness or other tourism activities

Source: (Research Results, 2024)

This smart tourism model is stakeholder centric, so it is necessary to know who the application is intended for. Stakeholders in this application are categorized into six actors, namely tourist, destination manager, accommodation manager, transportation manager, government, and community/public. Each stakeholder can access applications developed in Indonesia's smart tourism according to their needs. Table 3 describes

Accredited Rank 2 (Sinta 2) based on the Decree of the Dirjen Penguatan RisBang Kemenristekdikti No.225/E/KPT/2022, December 07, 2022. Published by LPPM Universitas Nusa Mandiri

VOL. 10. NO. 2 NOVEMBER 2024
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v10i2.5381

the user matrix for various applications that can be used.

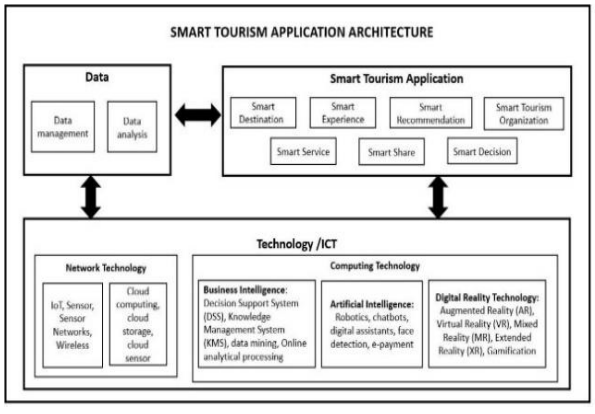
Table 3. Application Matrix Used By Application Users

Application	User					
	Tourist	Destination organizer	Accomodation organizer	Trans-portation organizer	Government	Community / Public
Smart Tourism	*	*	*	*	*	*
Smart Destination	*	*			*	
Smart Recommendation	*					*
Smart Service	*	*	*	*	*	*
Smart Share	*					*
Smart Experience	*	*	*	*		*
Smart Tourism Organization		*	*	*	*	
Smart Decision		*	*	*	*	

Source: (Research Results, 2024)

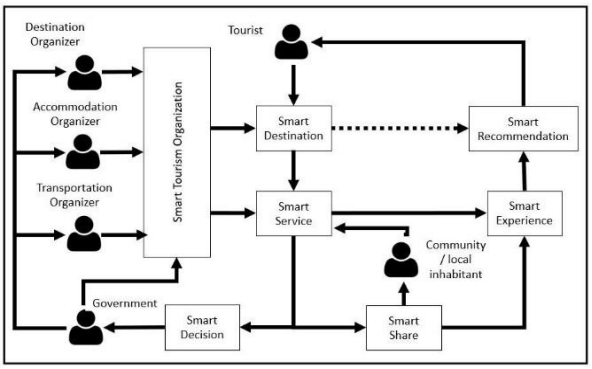
Based on the analysis of IS/IT strategy and application development artifacts, three parts of the application architecture are designed, namely:

(1) The comprehensive architecture is shown in Figure 4. This application architecture is an initial view where this section consists of data, application, and technology layers that support and interact.



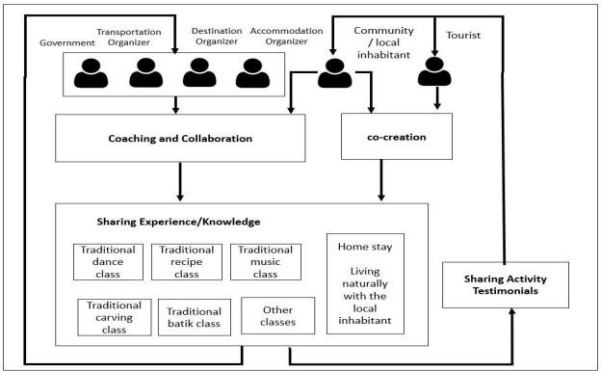
Source: (Research Results, 2024)
Figure 4. Smart tourism application architecture for Indonesia

(2) The application architecture according to stakeholders is shown in Figure 5. In this smart tourism application service architecture, it has been directed according to the users, whether as tourists, as business people, as a community, or as a government that monitors and evaluates activities. tourism in Indonesia. In this section, the application features are developed according to the application's function to its users. Although the application of this smart system looks complex because it is viewed from various stakeholders (stakeholders centric), it can be customized according to the authority and wishes of the user.



Source: (Research Results, 2024)
Figure 5. Smart Tourism Service Application Architecture for various Stakeholders

(3) The smart application architecture for smart share as shown in Figure 6. Indonesia's smart tourism application architecture is more focused on collaboration between stakeholders in cooperation and counseling on community or local inhabitant based on tourism services. Tourists will get satisfaction in the travel experience that is in contact with the life and culture of the local inhabitant or community. What is valuable with this smart share is community empowerment in tourism management activities in each of their destination locations. In addition, the quality of tourism services carried out by the community is always improved by providing guidance or counseling and cooperation by the government and tourism businesses.



Source: (Research Results, 2024)
Figure 6. Smart share application architecture

CONCLUSION

The problems of tourism in various developing countries, especially in Indonesia, are digital literacy, multiculturalism, inadequate infrastructure, poor management, crisis management, tourism competitiveness, data protection, and integrated tourism governance between the government and the private sector, and also no specific method for regulating tourism governance. Therefore, with the help of information and communication technology through this smart tourism application, it can be developed to address these challenges by forming a smart tourism application architecture.

The result of the IS/IT strategy that are realized in the smart tourism application portfolio in Indonesia have resulted in eight applications that support smart tourism, namely smart destinations, smart recommendations, smart services, smart shares, smart experiences, smart tourism organizations, smart decisions, and smart tourism itself which is the initial interface to develop an application for Indonesia's smart tourism system.

Afterwards, the results of the strategy contained in the application portfolio are continued into the formation of a smart tourism application architecture. There are three categories of application architecture made, they are (1) comprehensive architecture, (2) application architecture according to stakeholders, (3) smart share application architecture which is the flagship application in this smart tourism model. This smart share application offers the role of the community, private sector/business, and between government institutions in the form of building synergies through sharing activities to increase competitiveness in leading tourist destinations.

The proposed application architecture is not only intended for tourists but is also useful for other stakeholders such as business actors, government, public/community in carrying out tourism activities and the ability to predict and evaluate tourism activities supported by the use of ICT developments. Integrated data and with the cloud and the use of artificial intelligence make this smart share application one of the characteristics of applications that can be used in developing countries to accommodate the strength of their tourist attractions..

REFERENCE

[1] E. Ismail, - Sumardjo, D. P. Lubis, and R. A. Kinseng, "The Impact of COVID-19 Pandemic on Homestays and Optimism in Kepulauan Seribu on Tourism Future through Smart Tourism," *Mix J. Ilm. Manaj.*, vol. 18, no. 1, pp. 31–43, 2022.

[2] D. A. Fennell, "Technology and the sustainable tourist in the new age of disruption," *J. Sustain. Tour.*, vol. 29, no. 5, pp. 767–773, 2021, doi: 10.1080/09669582.2020.1769639.

[3] A. Mandić and J. Kennell, "Smart governance for heritage tourism destinations: Contextual factors and destination management organization perspectives," *Tour. Manag. Perspect.*, vol. 39, no. October 2020, 2021, doi: 10.1016/j.tmp.2021.100862.

[4] I. Sustacha, J. F. Baños-Pino, and E. Del Valle, "The role of technology in enhancing the tourism experience in smart destinations: A meta-analysis," *J. Destin. Mark. Manag.*, vol. 30, no. May, p.100817, 2023, doi: 10.1016/j.jdmm.2023.100817.

[5] P. Suanpang and P. Pothipassa, "Integrating Generative AI and IoT for Sustainable Smart Tourism Destinations," *Sustainability*, vol. 16, no. 17, p. 7435, 2024, doi: 10.3390/su16177435.

[6] L. Zhou, D. Buhalis, D. X. F. Fan, A. Ladkin, and X. Lian, "Attracting digital nomads: Smart destination strategies, innovation and competitiveness," *J. Destin. Mark. Manag.*, vol. 31, no. August 2023, p. 100850, 2024, doi: 10.1016/j.jdmm.2023.100850.

[7] R. Sharpley, "Tourism and Development Theory: Which Way Now?," *Tour. Plan. Dev.*, vol. 19, no. 1, pp. 1–12, 2022, doi: 10.1080/21568316.2021.2021475.

[8] S. Gössling, "Tourism, technology and ICT: a critical review of affordances and concessions," *J. Sustain. Tour.*, vol. 29, no. 5, pp. 733–750, 2021, doi: 10.1080/09669582.2021.1873353.

[9] X. Wang, F. Zhen, J. Tang, L. Shen, and D. Liu, "Applications, Experiences, and Challenges of Smart Tourism Development in China," *J. Urban Technol.*, vol. 29, no. 4, pp. 101–126, 2022, doi: 10.1080/10630732.2021.1879605.

[10] J. Tribe and B. Paddison, "Critical tourism strategy," *Ann. Tour. Res.*, vol. 98, p. 103511, 2023, doi: 10.1016/j.annals.2022.103511.

[11] A. R. Singh *et al.*, "Electric vehicle charging technologies, infrastructure expansion, grid integration strategies, and their role in promoting sustainable e-mobility," *Alexandria Eng. J.*, vol. 105, no. May, pp. 300–330, 2024, doi: 10.1016/j.aej.2024.06.093.

VOL. 10. NO. 2 NOVEMBER 2024
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v10i2.5381

[12] G. Baldi, A. Megaro, and L. Carrubbo, "Small-Town Citizens' Technology Acceptance of Smart and Sustainable City Development," *Sustain.*, vol. 15, no. 1, p.325, 2023, doi: 10.3390/su15010325.

[13] E. Cerdá-Mansilla, I. Tussyadiah, S. Campo, and N. Rubio, "Smart destinations: A holistic view from researchers and managers to tourists and locals," *Tour. Manag. Perspect.*, vol. 51, p.101223, May 2023, 2024, doi: 10.1016/j.tmp.2024.101223.

[14] Y. Kusumawardhani, H. Hilmiana, S. Widianto, and Y. Azis, "Smart tourism practice in the scope of sustainable tourism in emerging markets: a systematic literature review," *Cogent Soc. Sci.*, vol. 10, no. 1, p., 2024, doi: 10.1080/23311886.2024.2384193.

[15] T. Albayrak, M. Rosario González-Rodríguez, M. Caber, and S. Karasakal, "The Use of Mobile Applications for Travel Booking: Impacts of Application Quality and Brand Trust," *J. Vacat. Mark.*, vol. 29, no. 1, pp. 3–21, 2023, doi: 10.1177/13567667211066544.

[16] J. Ham, C. Koo, and N. Chung, "Configurational patterns of competitive advantage factors for smart tourism: an equifinality perspective," *Curr. Issues Tour.*, vol. 23, no. 9, pp. 1066–1072, 2020, doi: 10.1080/13683500.2019.1566303.

[17] A. Zvaigzne, I. Mietule, I. Kotane, A. Vonoga, and R. Meiste, "Smart tourism: the role and synergies of stakeholders," *Worldw. Hosp. Tour. Themes*, vol. 15, no. 5, pp. 476–485, 2023, doi: 10.1108/WHATT-06-2023-0079.

[18] R. A. Sánchez-Ancajima *et al.*, "Applications of Intelligent Systems in Tourism: Relevant Methods," *J. Internet Serv. Inf. Secur.*, vol. 13, no. 1, pp. 54–63, 2023, doi: 10.58346/JISIS.2023.I1.006.

[19] A. T. Rosário and J. C. Dias, "Exploring the Landscape of Smart Tourism: A Systematic Bibliometric Review of the Literature of the Internet of Things," *Adm. Sci.*, vol. 14, no. 2, p.22, 2024, doi: 10.3390/admsci14020022.

[20] S. Nadkarni and R. Prügl, "Digital transformation: a review, synthesis and opportunities for future research", *Springer International Publishing*, vol. 71, no. 2. pp.233-341, 2021. doi: 10.1007/s11301-020-00185-7.

[21] P. Suanpang, P. Jamjuntr, P. Kaewyong, C. Niamsorn, and K. Jermsittiparsert, "An Intelligent Recommendation for Intelligently Accessible Charging Stations: Electronic Vehicle Charging to Support a Sustainable Smart Tourism City," *Sustain.*, vol. 15, no. 1, p.455, 2023, doi: 10.3390/su15010455.

[22] C. Cardoso, "The contribution of tourism towards a more sustainable and inclusive society: key guiding principles in times of crisis," *Worldw. Hosp. Tour. Themes*, vol. 12, no. 6, pp. 679–689, 2020, doi: 10.1108/WHATT-07-2020-0065.

[23] T. Zhang, Z. A. Shaikh, A. V. Yumashev, and M. Chład, "Applied model of E-learning in the framework of education for sustainable development," *Sustain.*, vol. 12, no. 16, pp. 1–15, 2020, doi: 10.3390/SU12166420.

[24] TOGAF® Version 9.1, "An Open Group Standard," The Open Group. Accessed: Jan. 30, 2024. [Online]. Available: https://pubs.opengroup.org/architecture/togaf91-doc/arch/