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Phone: +62281-635624 Fax: +62281- 636653
E-mail: volksgeist@uinsaizu.ac.id
Website: http://ejournal.uinsaizu.ac.id/index.php/volksgeist

Artificial Intelligence Policy in Promoting Indonesian Tourism

Author
Abdul Kadir Jaelani[1*], Resti Dian Luthviati[1], Ahmad Siboy[2], Sholahuddin Al-Fatih[3], Muhammad Jihadul Hayat[4]

[1] Faculty of Law, niversitas Sebelas Maret, Surakarta, Indonesia.
[2] Faculty of Law, Universitas Islam Malang, Indonesia.
[3] Faculty of Law, Universitas Muhammadiyah Malang, Indonesia.
[4] Faculty of Sharia and Law, Universitas Islam Negeri Sunan Kalijaga, Indonesia.

Coresponding Author:
[*]Abdul Kadir Jaelani, *Email: jaelaniabdulkadir@staff.uns.ac.id*

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Artificial intelligence changes how tourist destinations operate, provides better service to visitors, and provides long-term benefits for local communities and the environment. However, it is essential to question whether governments can effectively resolve data privacy and cybersecurity challenges when deploying these technologies. This study aims to analyze issues related to the role of artificial intelligence policy in promoting Indonesia's digital tourism. This research employs a normative legal approach, drawing from both statutory and historical sources. This research concludes that Indonesia promotes artificial intelligence in tourism by investing in AI technology research and development, collaborating between the government and the private sector to implement AI solutions, and establishing a supportive regulatory framework to ensure the ethical use of AI in tourism. The impact of digitalization policies on digital tourism includes increasing accessibility and convenience for tourists through online ordering systems and digital payment methods, developing smart destinations with Internet of Things technology and data-based insights, and enhancing tourist experiences through augmented reality applications and virtual reality.

Keywords: *Artificial intelligence; digital; tourism; wonderful.*

INTRODUCTION

In recent years, new technologies such as Artificial Intelligence, the Internet of Things, Robotics, Cyber Security, 3D printers, and Blockchain have contributed to accelerating the industry's development towards digital transformation trends such as Fintech, e-commerce, smart cities, innovative healthcare, smart manufacturing, and intelligent tourism. Driven by advances in artificial intelligence (AI) and related technologies, the application of intelligent automation in travel and tourism is expected to increase.[1] Smart tourism depends on collecting massive amounts

[1] Iis Tussyadiah, "A Review of Research into Automation in Tourism: Launching the Annals of Tourism Research Curated Collection on Artificial Intelligence and Robotics in Tourism," *Annals of Tourism Research* 81, no. December 2018 (2020): 2, https://doi.org/10.1016/j.annals.2020.102883.

of data and intelligently storing, processing, combining, analyzing, and using big data to inform business innovation, operations, and services with artificial intelligence and big data techniques.[2]

Artificial intelligence (AI) was first proposed by John McCullach in 1955 as "the science and engineering of making smart machines." It refers to the wisdom expressed by machines created by humans. Usually, artificial intelligence refers to human intelligence technology realized by ordinary computer programs. Artificial intelligence has functions including cognitive engagement (speech/pattern recognition function), cognitive process automation (Robotic et al.), and cognitive insight (estimates, recommendations).[3] Russell and Norvig mention that there are six capabilities that a machine needs to perform human behavior (to act humanely). These six abilities represent subdisciplines of artificial intelligence: natural language processing (to communicate), knowledge representation (to store information), automatic reasoning (to use stored information), drawing inferences, machine learning (to extrapolate patterns), computer vision (to understand objects), and robotics (to manipulate objects and move them). Russell and Norvig favor an agent-rational approach to defining AI systems (i.e., rationally acting systems) because it is more suitable for scientific development than basing it on human performance.[4]

Tourism is one of the development sectors currently being promoted by the government. The purpose of tourism development in Indonesia is seen in the Presidential Instruction of the Republic of Indonesia Number 9 of 1969, especially Chapter II Article 3, which states, "Tourism development business in Indonesia is a development of the "tourism industry" and is part of business development and development as well as community welfare and country. Minister of Tourism Arief Yahya said Indonesia's tourism development will rely on digital technology to accelerate its growth and deal with contemporary concept tourist destinations. The use of digital technology is considered most appropriate in the current millennial era. Digitization is "the process of changing from an analog to a digital format in economic activities." This process creates digitized data "without any different-in-kind changes to the process itself," which can be used for business purposes. Therefore, digital technologies are used to change a business model and provide new revenue and value-producing opportunities.[5]

There are two ways to change the world radically: regulation or technology. Digitization policy in tourism refers to a set of actions and strategies implemented by governments, tourism organizations, or other stakeholders to adopt and utilize digital technologies to enhance and optimize the tourist experience and increase the efficiency and competitiveness of the tourism sector. Digitalization policies in tourism aim to increase the attractiveness of destinations, provide

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[2] Mouna Knani, Said Echchakoui, and Riadh Ladhari, "Artificial Intelligence in Tourism and Hospitality: Bibliometric Analysis and Research Agenda," *International Journal of Hospitality Management* 107 (2022): 103317, https://doi.org/https://doi.org/10.1016/j.ijhm.2022.103317.

[3] Sanmugam Annamalah et al., "The Role of Open Innovation and a Normalizing Mechanism of Social Capital in the Tourism Industry," *Journal of Open Innovation: Technology, Market, and Complexity* 9, no. 2 (2023): 100056, https://doi.org/https://doi.org/10.1016/j.joitmc.2023.100056.but consideration should be given to regional open innovation concept. Although tourism development may be carried out in a fashion that enhances innovation, but it also requires a certain degree of external country partner (open innovation

[4] Yogesh K Dwivedi et al., "Metaverse beyond the Hype: Multidisciplinary Perspectives on Emerging Challenges, Opportunities, and Agenda for Research, Practice and Policy," *International Journal of Information Management* 66 (2022): 102542, https://doi.org/https://doi.org/10.1016/j.ijinfomgt.2022.102542.

[5] Xue Zhao et al., "How Digitalization Promotes the Sustainable Integration of Culture and Tourism for Economic Recovery," *Economic Analysis and Policy* 77 (2023): 988–1000, https://doi.org/10.1016/j.eap.2023.01.005.

a better experience for tourists, improve information accessibility, improve operational efficiency, and encourage economic growth in the sector.[6]

In early 2020, the world was facing the COVID-19 pandemic, which had a significant impact on almost all aspects of human life and spread globally to no fewer than 218 countries that had been exposed, including Indonesia. Tourism is one of the sectors most affected by the COVID-19 Pandemic. This pandemic forced the country to carry out social restrictions and prohibit tourist visits between regions and from abroad.[7] Throughout semester 1, 2020, the number of foreign tourist visits to Indonesia decreased by 59.7% from the original 7.7 million people to 3.1 million people (YoY). On the other hand, national transportation activities have decreased, either through planes, trains, or ships. Total national departures in semester 1 of 2020 only accommodated 136 million passengers, whereas in the same period the previous year, they reached 256 million passengers (YoY). The visible impact is that workers in the tourism sector experience a decrease in income, especially those related to accommodation and food and beverage providers; wholesale and retail trade; motorcycle and car repair; and warehousing and transportation.[8]

The COVID-19 pandemic has changed the paradigm of sustainable tourism development, where the marketing focus of Group Travel has shifted to Free Independent Travelers (FIT). Travel industry players must move their resources quickly through digital (internet-based) marketing by developing modified processes and products. With digital technology, tourism destinations can reach a global audience quickly and easily. Websites, social media platforms, and online advertising campaigns allow destinations to be promoted worldwide, reaching potential travelers worldwide.

Promotional activities that utilize internet technology are often referred to as E-Tourism, which is a way to promote tourism by providing convenience in accessing information that can be accessed anytime and anywhere.[9] E-Tourism uses technology to deliver information and communication to increase visitor interest by providing services to consumers through easily accessible media. Data from the Ministry of Tourism and Creative Economy, the rate of development of foreign tourists for the last five years, namely; 2018: 15.8 Million, 2019: 16.1 Million, 2020: 4.1 Million, 2021: 1.6 Million, 2022: 2.3 Million. Based on these data, the visitor difference from 2019 to 2020 is significant. This has an impact on state revenue in the tourism sector. The government has taken extraordinary steps quickly and significantly to deal with the spread of COVID-19 and the impact of social, economic, and financial system threats through *Perpu No. 1 of 2020*, stipulated by Law No. 2 of 2020. This policy was carried out with the aim that the steps and orchestration of policies by the central government and regional governments are always unified, harmonious, and synergistic in handling the pandemic and supporting the National Economic Recovery Program.[10]

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6 Ina Heliany, "Wonderful Digital Tourism Indonesia Dan Peran Revolusi Industri Dalam Menghadapi Era Ekonomi Digital 5.0," *Destinesia : Jurnal Hospitaliti Dan Pariwisata* 1, no. 1 (2019): 21–35, https://doi.org/10.31334/jd.v1i1.551.

7 Susana Borrás and Jakob Edler, "The Roles of the State in the Governance of Socio-Technical Systems' Transformation," *Research Policy* 49, no. 5 (2020), https://doi.org/10.1016/j.respol.2020.103971.

8 Sumalee Ngeoywijit et al., "Open Innovations for Tourism Logistics Design: A Case Study of a Smart Bus Route Design for the Medical Tourist in the City of Greater Mekong Subregion," *Journal of Open Innovation: Technology, Market, and Complexity* 8, no. 4 (2022): 173, https://doi.org/https://doi.org/10.3390/joitmc8040173.

9 S Bhahri, "E-Tourism Dalam Pengenalan Sektor Pariwisata Berbasis Android Di Kota Makassar," *E-Jurnal JUSITI (Jurnal Sistem Informasi Dan Teknologi Informasi)* 10, no. 1 (April 2021): 94–106, https://doi.org/10.36774/jusiti.v10i1.824.

10 Direktorat Jenderal Perimbangan Keuangan, "Annual Report 2020" (Jakarta, 2020).

Digitization policies are essential to promoting tourism through artificial intelligence (AI) and increasing digital tourism. In recent years, countries worldwide have prioritized tourism as a key economic sector to help their overall economic development. "Sustainable Tourism" is now the top priority for all countries to develop tourism. The Asia-Pacific Economic Cooperation (APEC) meeting this year (2018), under the leadership of the host economy, Papua New Guinea, pays more attention to "smart tourism." One of the key points is that the use of digital technology for digital connections will help to develop inclusive tourism and promote the connection of people in the Asia-Pacific region to promote sustainable tourism. In this regard, every country has formulated and actively promoted specific strategies.[11] The rapid development of information and communication technology (ICT), such as cloud computing, mobile devices, extensive data mining, and social media, caused computing, storage, and communication relevant software and hardware to become popular promotion processes needed to be able to increase the interest and attractiveness of domestic and foreign tourists.[12]

"Disembodied AI" systems for on-site experiences include digital assistants tied to location-based services that send push notifications and automated real-time translations to facilitate tourist-resident interactions and interpretations of attractions. Digital assistants can guide tourists through post-trip experiences, helping with experience sharing (e.g., writing reviews, collating photographs, and planning for future trips). Supported by distributed ledger technologies such as blockchain, distributed artificial intelligence allows for more efficient analysis of a large volume of text data and the training of chatbots to enhance the customer experience. Alongside consumer-facing applications, hotels and other venues are implementing AI systems and the Internet of Things to develop intelligent, connected buildings, especially for energy optimization and facility management (i.e., preventative maintenance and fault detection).[13]

The intelligent experience component focuses specifically on technology-mediated tourism experiences and enhances them through personalization, context awareness, and real-time monitoring. Identify information aggregation, ubiquitous connectedness, and real-time synchronization as crucial drivers of the innovative travel experience. Anticipate user needs based on various factors and make recommendations concerning context-specific consumption activities such as places of interest, dining, and recreation. With extensive tourism data collection, AI can study tourist behavior to predict habits and interests, provide recommendations for airlines, hotels, and restaurants, and promote social groups. With process automation, robotics can integrate a travel application or inquiry process into automation to provide a one-stop-shop process robotics and chatbots can help tourists with daily travel information questions and helpdesk questions online.[14]

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[11] Jacques Bulchand-Gidumal, "Post-COVID-19 Recovery of Island Tourism Using a Smart Tourism Destination Framework," *Journal of Destination Marketing & Management* 23 (March 2022): 100689, https://doi.org/10.1016/j.jdmm.2022.100689.

[12] H.M.K.K.M.B. Herath and Mamta Mittal, "Adoption of Artificial Intelligence in Smart Cities: A Comprehensive Review," *International Journal of Information Management Data Insights* 2, no. 1 (2022): 100076, https://doi.org/https://doi.org/10.1016/j.jjimei.2022.100076.

[13] Tussyadiah, "A Review of Research into Automation in Tourism: Launching the Annals of Tourism Research Curated Collection on Artificial Intelligence and Robotics in Tourism."

[14] Yi Ning Katherine Chen and Chia Ho Ryan Wen, "Impacts of Attitudes Toward Government and Corporations on Public Trust in Artificial Intelligence," *Communication Studies* 72, no. 1 (2021): 115–31, https://doi.org/10.1080/10510974.2020.1807380.

Tourism companies face challenges and changes in the market environment through digitization. The main factors influencing potential changes in identified customer needs (digital services, digital marketing, data mining, and online travel communities) form a conceptual model for presenting recommendations for action. A personalized approach to customers on digital communication channels is essential for future service provision.[15] To meet changing needs, bilateral communication between customers and companies must be guaranteed throughout the customer journey, especially in structurally weak areas.[16]

Tourism suppliers have started using intelligent machines in their operations. After introducing an android robot named Spencer to guide passengers at Amsterdam's Schiphol Airport in 2015, KLM Royal Dutch Airlines' new robot, Care-E, an intelligent self-driving trolley, was tested and launched in 2018 to help passengers transport their luggage to the gate. The first robot hotel, Henn na Hotel, opened at Huis Ten Bosch, a theme park in Japan, in 2015. It has since expanded its operations to locations elsewhere. The hotel property employs dinosaur receptionists, robotic porters, changing room robots, and in-room personal assistants, to name a few. While fully robotic hotels like this may still be rare today, hotels around the world have implemented intelligent automation for several customer-related operations, such as autonomous check-in, virtual personal assistants, and robotic room deliveries. With advances in robotic technology comes a huge potential for various aspects of tourism services to be automated.[17]

Intelligent automation can be applied at the pre-trip stage to provide travelers with travel inspiration and assist them in information-seeking booking and pre-arrival experiences. With predictive analytics and adaptive modeling, service providers can predict likely customer responses and purchase tendencies, leading to predictive customer ratings. Artificial intelligence allows for a faster purchase (or order) rate. Applications such as natural language generation, including text-to-speech combined with automatic translation, elevate digital content to a global audience. These systems are then linked to user interfaces that foster ongoing dialogue, facilitate online purchases, and guide the pre-arrival experience, such as personal travel assistants (e.g., Mezi American Express), chatbots, messaging applications with chat services, and certain virtual host providers (e.g., Edwardian Hotel's Edward). At this stage, applications are dominated by 'analytical AI' (cognitive intelligence) tools that collect and process large amounts of customer data. Some of these interfaces can guide travelers throughout their journey, including a post-trip stage for sharing, reminiscing, and following up on their travel experiences.[18]

AI technology and data-driven insights can change how tourist destinations operate, provide better service to visitors, and provide long-term benefits for local communities and the environment.

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15 Reza Octavia Kusumaningtyas et al., "Reduction of Digitalization Policy in Indonesian MSMEs and Implications for Sharia Economic Development," *JURIS (Jurnal Ilmiah Syariah)* 21, no. 2 (December 30, 2022): 157–71, https://doi.org/10.31958/JURIS.V21I2.6855.

16 Christopher Reichstein and Ralf-Christian Härting, "Potentials of Changing Customer Needs in a Digital World – a Conceptual Model and Recommendations for Action in Tourism," *Procedia Computer Science* 126 (2018): 1484–94, https://doi.org/https://doi.org/10.1016/j.procs.2018.08.120.

17 Zheng Xiang, Jason Stienmetz, and Daniel R Fesenmaier, "Smart Tourism Design: Launching the Annals of Tourism Research Curated Collection on Designing Tourism Places," *Annals of Tourism Research* 86 (2021): 103154, https://doi.org/https://doi.org/10.1016/j.annals.2021.103154.

18 Luis-Alberto Casado-Aranda, Juan Sánchez-Fernández, and Ana-Belén Bastidas-Manzano, "Tourism Research after the COVID-19 Outbreak: Insights for More Sustainable, Local and Smart Cities," *Sustainable Cities and Society* 73 (2021): 103126, https://doi.org/https://doi.org/10.1016/j.scs.2021.103126.

However, it is essential to consider and address data privacy and cybersecurity challenges when implementing these technologies wisely. Customer agility enables tourism organizations to draw on digital technologies to interact with customers to source ideas, test services, and attract new customers.[19]

To increase data security, facial recognition systems and predictive analytics have become increasingly popular and practical tools. Combining these two technologies provides new and innovative ways to identify, prevent, and mitigate data breach threats. From everyday gestures like unlocking a smartphone or passing through an airport to more infrequent processes like opening a bank account or taking an online test, facial recognition is increasingly present in the field.[20] Facial recognition is a technology that enables a computer system to recognize and verify a person's identity based on facial features. This technology is based on geometric analysis and unique characteristics of an individual's face, such as the distance between the eyes, the shape of the nose, or the shape of the lips. Facial expression recognition methods based on deep learning and artificial intelligence (AI) techniques have been developed with edge modules to ensure efficiency and real-time processing.[21] Predictive analytics involves using algorithms and mathematical models to analyze historical data and identify patterns or trends that can be used to make predictions about future events. Early risk detection and controls are critical to avoiding unforeseen accidents or incidents across safety-critical industries, especially in digitalization.[22]

The facial recognition technology, security systems can quickly and accurately identify unknown individuals logged into specific accounts. Along with the evolution of today's Artificial Intelligence (AI) technologies, the last few years have witnessed the rapid emergence of data-driven approaches enabling continuous improvement of process safety management. The system can identify suspicious anomalous behavior, which moves in an unusual pattern and can be a potential indicator of cybercrime activity. If suspicious activity enters the application, the system can quickly provide warnings and response actions. The combination of facial recognition and predictive analytics allows security systems to move from passive to proactive responses. Early identification of potential threats and suspicious behavior can assist in preventing adverse events and provide an opportunity to take rapid response actions. Overall, with the implementation of enhanced safety and security measures through facial recognition and predictive analytics, it is expected to increase the overall level of security for using e-Tourism applications and provide a sense of security for everyone.[23]

In the era of development, the world faces severe challenges, and environmental degradation is one of them. However, the world has tried to introduce several initiatives to fight for environmental

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19 Elias Hadjielias et al., "Digitalization, Agility, and Customer Value in Tourism," *Technological Forecasting and Social Change* 175 (2022): 121334, https://doi.org/https://doi.org/10.1016/j.techfore.2021.121334.

20 Marta Beltrán and Miguel Calvo, "A Privacy Threat Model for Identity Verification Based on Facial Recognition," *Computers & Security* 132 (2023): 103324, https://doi.org/https://doi.org/10.1016/j.cose.2023.103324.

21 Muhammad Sajjad et al., "A Comprehensive Survey on Deep Facial Expression Recognition: Challenges, Applications, and Future Guidelines," *Alexandria Engineering Journal* 68 (2023): 817–40, https://doi.org/https://doi.org/10.1016/j.aej.2023.01.017.

22 Jiang Chenyu et al., "Coupling of Adjoint-Based Markov/CCMT Predictive Analytics with Data Assimilation for Real-Time Risk Scenario Forecasting of Industrial Digital Process Control Systems," *Process Safety and Environmental Protection* 171 (2023): 951–74, https://doi.org/https://doi.org/10.1016/j.psep.2023.01.077.an adjoint-based Markov/Cell-to-Cell Mapping Technique (Markov/CCMT

23 Pedro Flores-Crespo, Maria Bermudez-Edo, and Jose Luis Garrido, "Smart Tourism in Villages: Challenges and the Alpujarra Case Study," *Procedia Computer Science* 204 (2022): 663–70, https://doi.org/https://doi.org/10.1016/j.procs.2022.08.080.

sustainability, such as the Sustainable Development Goals.[24] The leading role of the proposed goals is to balance development and environmental anxiety.[25] Therefore, to address these issues, artificial intelligence and technological advancements play a vital role in the natural resource economy in the digital age. Policy analysts are always looking for solutions and have devised several viable remedies to this problem. Consequently, information and communication technology (ICT) plays a significant role in sustainability in the digital era. However, under the theme of natural resource sustainability, the effectiveness of ICT has a significant impact on sustainability.[26]

Hailiang, in his research, explained that renewable energy, green finance, and technical innovation are positively related to the tourism industry. The moderate role of renewable energy and green finance led to a significant increase in tourism activities. The results of his study also show that several important policy implications can help China meet the standards required for sustainable tourism.[27] The Chinese government can pay more attention to senior tourism and virtual tourism services, support SMEs that deal with the tourism industry, and provide packages that stimulate elderly people to use tourism services.[28]

Sustainable tourism refers to eco-friendly tourism services that encourage visiting natural areas and combating the environmental impact of visitors.[29] argue that green tourism is in line with sustainable development goals and helps countries protect natural resources and reduce environmental pollution. Greening the tourism industry maybe even more important in the post-COVID era. The tourism industry is in a deep recession with the spread of the corona disease and the imposition of restrictions imposed by the state. Several studies reveal that COVID-19 is detrimental to the mental health of tourists and their decision to use tour plans due to fear of pandemic infection.[30] dan Aguiar-Quintana also noted that the recovery of the tourism industry will accelerate in the post-COVID era. In 2020, the Organization for Economic Co-operation and Development (OECD) reported that 2020 under COVID-19 restrictions, the global tourism industry fell by more than 80%. the World Tourism Organization (UNWTO) (2022) states that the global tourism industry reached over 65% pre-COVID-19 levels in 2022 and is expected to increase soon.

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[24] Daniel Balsalobre-Lorente et al., "Tourism, Urbanization and Natural Resources Rents Matter for Environmental Sustainability: The Leading Role of AI and ICT on Sustainable Development Goals in the Digital Era," *Resources Policy* 82 (May 2023): 103445, https://doi.org/10.1016/J.RESOURPOL.2023.103445; Hamzah Hamzah et al., "Sustainable Development of Mangrove Ecosystem Policy in South Sulawesi from the Perspectives of Siyāsah and Fiqh Al-Bi'ah," *JURIS (Jurnal Ilmiah Syariah) 22* 22, no. 2 (2023): 367–80, https://doi.org/10.31958/juris.v22i2.10559.

[25] Kartika Winkar Setya, Abdul Aziz Nasihuddin, and Izawati Wook, "Fulfilling Communal Rights through the Implementation of the Second Principle of Pancasila towards the Regulation on Agrarian Reform," *Volksgeist: Jurnal Ilmu Hukum Dan Konstitusi* 6, no. 1 (June 2023): 89–102, https://doi.org/10.24090/volksgeist.v6i1.7867.

[26] Onur Karaman, Adi Alhudhaif, and Kemal Polat, "Development of Smart Camera Systems Based on Artificial Intelligence Network for Social Distance Detection to Fight against COVID-19," *Applied Soft Computing* 110 (2021): 107610, https://doi.org/https://doi.org/10.1016/j.asoc.2021.107610.

[27] Zeng Hailiang, Ka Yin Chau, and Muhammad Waqas, "Does Green Finance and Renewable Energy Promote Tourism for Sustainable Development: Empirical Evidence from China," *Renewable Energy* 207 (May 2023): 660–71, https://doi.org/10.1016/j.renene.2023.03.032.

[28] Da Xu et al., "Population Aging and Eco-Tourism Efficiency: Ways to Promote Green Recovery," *Economic Analysis and Policy* 79 (September 2023): 1–9, https://doi.org/10.1016/j.eap.2023.05.021.

[29] Shigui Ma, Yong He, and Ran Gu, "Joint Service, Pricing and Advertising Strategies with Tourists' Green Tourism Experience in a Tourism Supply Chain," *Journal of Retailing and Consumer Services* 61 (July 2021): 102563, https://doi.org/10.1016/j.jretconser.2021.102563.

[30] Bulchand-Gidumal, "Post-COVID-19 Recovery of Island Tourism Using a Smart Tourism Destination Framework."

However, many experts highlight the opportunities for developing green tourism during the post-COVID tourism industry recovery.[31]

The post-COVID-19 economic recovery strategy can be carried out by all parties by encouraging the development of tourist innovation and digitalization in tourism development and optimization.[32] Based on data from Badan Pusat Statistik Indonesia, the recovery of domestic tourism in 2022 in the Official Statistical Gazette No. 33/05/Th. XXVI in January 2021 the number of tourist trips is not stable enough, the lowest is in June-August with a total of 34.57 million trips and the highest is in November-December with a total of 73.49 million trips. Whereas in 2022 there was a significant increase in tourist trips in February-March of 80.23 million trips, but a decrease again in December, namely 65.96 million trips. Furthermore, the development of the number of foreign tourist visits from 2019–2023 showed that the number of visits in March 2023 reached 809.96 thousand, which is an increase of 15.49% compared to February 2023. The increase in tourism in Indonesia is closely related to the conversion of tourism promotion on social media which needs to be done as an adaptive step amid tourism promotion on social media, the hope is that it will become an innovation in tourism promotion and the creative economy, namely with a storytelling technique approach in promotional content.[33] Optimizing internet networks, developing the digital economy and digital tourism can be new strategies in the national tourism sector, it is hoped that this optimization will accelerate the national economic recovery and restore the tourism sector as the largest foreign exchange earner for Indonesia regularly.[34]

Based on several research, no existing specific study addressing this issue. Nevertheless, many individuals have conducted research related to halal tourism. For instance, Vitor Rodrigues found that the 4.0 paradigm is being embraced from three main perspectives: the visitor-technology interaction and its influence on decision-making, the digital competencies in tourism students, and the technology penetration in different sub-sectors of the supply chain.[35] Other research from Rian Saputra found that the practice of electronic justice in Indonesia still uses procedural law guidelines, which are conventional procedural law and internal judicial regulations. In contrast, the development of electronic justice that utilizes technological advances is insufficient to use conventional procedural law in its implementation.[36] This research was later refuted by Heru

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[31] Teresa Aguiar-Quintana, Concepción Román, and Philipp M.M. Gubisch, "The Post-COVID-19 Tourism Recovery Led by Crisis-Resistant Tourists: Surf Tourism Preferences in the Canary Islands," *Tourism Management Perspectives* 44 (October 2022): 101041, https://doi.org/10.1016/j.tmp.2022.101041.

[32] Edy Sutrisno, "Post-Pandemic Economic Recovery Strategy Through The Umkm And Tourism Sector," *Jurnal Lembaga Ketahanan Nasional Republik Indonesia* 9, no. 1 (2021): 184, https://doi.org/10.55960/jlri.v9i1.385.

[33] Diana Maramis and Vekky Supit, "PROMOSI PARIWISATA DI TENGAH DINAMIKA ISU GLOBAL: DAMPAK PANDEMIK VIRUS CORONA TERHADAP KONVERSI KAMPANYE PROMOSI PARIWISATA KOTA MANADO DI MEDIA SOSIAL," *Jurnal Program Studi Dan Bisnis Gidigal* 1, no. 2 (2021): 42–56, https://doi.org/10.30813/digismantech.v1i2.3244; Fajar Sukma and Zulheldi, "Government Policies in Economic Empowerment of Muslim Communities in the Digital Economy Era," *El-Mashlahah* 11, no. 2 (December 23, 2021): 146–63, https://doi.org/10.23971/ELMA.V11I2.3108.

[34] Ajeng Maharani and Faula Mahalika, "New Normal Tourism As a Support of National Economic Resistance in the Pandemic Period," *Jurnal Kajian LEMHANNAS* RI 8, no. 2 (2020): 44, https://doi.org/10.55960/jlri.v8i2.308.

[35] Vitor Rodrigues, Zélia Breda, and Carlos Rodrigues, "The Implications of Industry 4.0 for the Tourism Sector: A Systematic Literature Review," *Heliyon* 10, no. 11 (2024): e31590, https://doi.org/https://doi.org/10.1016/j.heliyon.2024.e31590.

[36] Rian Saputra, M Zaid, and Silaas Oghenemaro, "The Court Online Content Moderation : A Constitutional Framework," *Journal of Human Rights, Culture and Legal System* 2, no. 3 (2022): 139–48, https://doi.org/https://doi.org/10.53955/jhcls.v2i3.54.

Setiawan who found that the technology in the Constitutional Court's judicial review process can most effectively promote openness and clarity in the decision-making procedure.[37] The different at the Supreme Court was expressed by Nur Putri Hidayah, found that the decisions were not based on the structure of decisions determined by the Supreme Court.[38] Uswatun Hasanah's research also found that the adoption of social capital as the foundation of tourism legislation enhances the role of tourism MSMEs in economic development.[39]

This research explores the important role of digitalization policies in promoting Wonderful Digital Tourism as a strategic step to promote economic recovery. Green tourism regulations play a vital role in promoting sustainable development and ensuring that tourism contributes positively to local communities and the environment. By adhering to these regulations, the tourism industry can become a driving force for economic growth, cultural preservation, and environmental protection. Governments, tourism stakeholders, and travelers alike must work collaboratively to embrace and implement green tourism practices, safeguarding our planet's natural and cultural heritage for generations to come. Through collective efforts, we can create a world where tourism thrives sustainably, bringing prosperity and joy to both visitors and host communities.

RESEARCH METHODS

The type of research used in this article is normative legal research. This is more emphasized in the study of literature which consists of research on legal principles, legal systematics, legal synchronization, legal history, and comparative law. The laws used in this research include Law Number 10 of 2009 concerning Tourism and Regulation of the Minister of Tourism and Creative Economy of the Republic of Indonesia Number 3 of 2021 concerning Technical Guidelines for the Use of Non-Physical Special Allocation Funds for Tourism Services, Law Number 19 of 2009 2016 concerning Information and Electronic Transactions to find digitization policies in promoting artificial intelligence in tourism in Indonesia.[40] This study uses secondary data by examining legal materials obtained from a literature review of primary legal materials, secondary legal materials, and tertiary materials.[41] The research tools for the data are books related to the theory and concept of the object of research, related articles, literary scientific writings, and so on through literary studies. The data were analyzed using qualitative analysis and presented in descriptive form.[42] Qualitative analysis was carried out through categorization based on research problems and data collection.

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[37] Heru Setiawan et al., "Digitalization of Legal Transformation on Judicial Review in the Constitutional Court," *Journal of Human Rights, Culture and Legal System* 4, no. 2 (2024): 263–98, https://doi.org/https://doi.org/10.53955/jhcls.v4i2.263.

[38] Nur Putri et al., "Artificial Intelligence and Quality of Composition Verdicts in Indonesia : Lessons from New Zealand," *Journal of Human Rights, Culture and Legal System* 4, no. 1 (2024): 101–20, https://doi.org/https://doi.org/10.53955/jhcls.v4i1.175.

[39] Uswatun Hasanah and Bakhouya Driss, "The Policy on Tourism MSMEs in Indonesia and Algeria : Sustainability and Challenges," *Journal of Human Rights, Culture and Legal System* 3, no. 3 (2023): 383–411, https://doi.org/https://doi.org/10.53955/jhcls.v3i3.131.

[40] elvira, "The Challenges of Decentralization Fiscal Regulations: Experience from the Philippines," *Bestuur* 11, no. 2 (2023): 235–52, https://doi.org/https://doi.org/10.20961/bestuur.v11i2.75247.

[41] Mohammad Thoha et al., "Can Indonesia ' s Decentralized Education Technology Governance Policy : Evidence from Muslim Countries," *Bestuur* 11, no. 2 (2023): 217–34, https://doi.org/https://dx.doi.org/10.20961/bestuur.v11i2.78320.

[42] Tommy Leonard, Elvira Fitriyani, and Rakotoarisoa Maminirina, "The Influence of Green Tax Regulations on New Renewable," *Bestuur* 11, no. 2 (2023): 384–405, https://doi.org/https://dx.doi.org/10.20961/bestuur.v11i2.82506.

Qualitative analysis is defined as a normative qualitative assessment to assess data collected from secondary data and whether or not the implementation is by existing theories and rules so that it can measure the level of effectiveness of its implementation.[43]

ANALYSIS AND DISCUSSION

Role of Artificial Intelligence Policy in Promoting Indonesia's Digital Wonderful Tourism

Science and information technology are progressing rapidly with an easier way to find data and information in various aspects of life.[44] The occurrence of COVID-19 pandemic has also contributed to accelerating technological developments, such as artificial intelligence (AI).[45] AI is a sub-field of computer or machine science that can mimic human intelligence.[46] Research and development is an integral force that drives the progress of AI, every year a variety of academics, industry, government, experts, and the public community contribute to AI research and development. Based on the Artificial Intelligence Index Report 2023 by the Stanford Institute for Human-Centered Artificial Intelligence (HAI) in terms of research and development of artificial intelligence in each country, it can be mapped based on the quantity and quality of publication of journal articles, conference papers, and repositories, trends in significant machine learning systems, AI conferences, and open source AI software.[47] Keyword searches, such as, "artificial intelligence", "AI", and "research" on the Web of Science confirmed at least 507 related articles in 2020.[48] In addition, an analysis of international press reports, especially articles covering AI in research and development using the Proquest ABI or INFORM database identified 1,287 articles related to AI from various scientific perspectives.[49]

In Europe, financial support and uptake by the public and private sectors are expected to be at least €20 billion by the end of 2020. In the United States $1.2 billion in dedicated funding for AI-based research and training programs.[50] Based on the HAI 2023 report, the total number of AI publications has doubled, from 200,000 in 2010 to nearly 500,000 in 2021, AI publications are

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43 Mabarroh Azizah, "Does the Government ' s Regulations in Land Ownership Empower the Protection of Human Rights ?," *Journal of Human Rights, Culture and Legal System* 4, no. 2 (2024): 391–421, https://doi.org/https://doi.org/10.53955/jhcls.v4i2.222.

44 Jack Clark and Ray Perrault, "Artificial Intelligence Index Report Introduction to the AI Index Report 2023," *Human-Centered Artificial Intelligence*, 2023.

45 Tri Wahyudi, "Studi Kasus Pengembangan Dan Penggunaan Artificial Intelligence (AI) Sebagai Penunjang Kegiatan Masyarakat Indonesia," *Indonesian Journal on Software Engineering* 9, no. 1 (2023): 28–32, https://doi.org/10.31294/ijse.v9i1.15631.

46 Tao Yun, "Review of Science and Technology Innovation Policies in Major Innovative-Oriented Countries in Response to the COVID-19 Pandemic," *Biosafety and Health* 5, no. 1 (2023): 12, https://doi.org/10.1016/j.bsheal.2022.12.001.

47 Jack Clark and Ray Perrault, "Artificial Intelligence Index Report 2022," *Human-Centered AI Institute, Stanford University*, 2022.

48 Ke Zhang and Ayse Begum Aslan, "AI Technologies for Education: Recent Research & Future Directions," *Computers and Education: Artificial Intelligence* 2 (2021): 2, https://doi.org/10.1016/j.caeai.2021.100025.this article reports a comprehensive review of selected empirical studies on artificial intelligence in education (AIEd

49 Prince Chacko Johnson et al., "Digital Innovation and the Effects of Artificial Intelligence on Firms' Research and Development – Automation or Augmentation, Exploration or Exploitation?," *Technological Forecasting and Social Change* 179, no. March (2022): 1, https://doi.org/10.1016/j.techfore.2022.121636.

50 Ali A. Guenduez and Tobias Mettler, "Strategically Constructed Narratives on Artificial Intelligence: What Stories Are Told in Governmental Artificial Intelligence Policies?," *Government Information Quarterly* 40, no. 1 (2023): 9–10, https://doi.org/10.1016/j.giq.2022.101719.

affiliated with the fields of education, government, industry, and other sectors. According to the HAI 2023 survey, two countries that have advanced in AI research and development are the United States of America and China. The United States of America leads in terms of AI conferences and repository citations, as well as most of the world's major languages and multimodal models by 54% in 2022 produced by Americans. Whereas, China leads in the number of AI journals, conferences, and repository publications.[51] Meanwhile, in Indonesia the implementation of AI utilization is still relatively low due to a lack of human resource skills that are not competent to operate AI and a lack of investment in AI development and infrastructure.[52]

The implementation of AI is related to every entity, whether government, private, or creative community, which is the subject of driving Indonesia to become a country that can compete with developed countries and has the readiness to implement AI.[53] The growing use of AI in the public or private sector requires at least four roles for the government.[54] The first role is that of the government as a regulator, which must make policies that are fair to all parties and ensure the compatibility of AI with the social values of its citizens.[55] The second role, the government can minimize obstacles to the implementation of AI, such as providing legal protection for intellectual property and personal data privacy.[56] The third role is the government as a leader, which must be actively involved in the research and development of AI-based applications, maintaining cyber defense, urbanization, disaster management, and expanding collaboration with researchers, laboratories, startups, and corporations.[57] The fourth role, the government as a user of AI technology, the government must be able to initiate and campaign for the adoption of AI in various sectors.[58]

The success of developing AI in a country must be balanced with a good government response. However, according to the 2022 Government AI Readiness Index survey by Oxford Insight, the government has not taken optimal action in responding to the rate of change in AI. Most state governments are not designed to act quickly and adaptively, so this survey was conducted to qualify the government's readiness to implement AI with 39 indicators in 10 dimensions and form three main pillars, that are (1) The Government Pillar, fulfills the qualification that the government must have a strategic vision about steps to develop and manage AI and be supported by community policies and ethics. (2) The Technology Sector Pillar, the government will depend on other sectors

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51 Clark and Perrault, "Artificial Intelligence Index Report Introduction to the AI Index Report 2023."

52 Kirana Rukmayuninda Ririh et al., "Studi Komparasi Dan Analisis Swot Pada Implementasi Kecerdasan Buatan (Artificial Intelligence) Di Indonesia," *Jurnal Teknik Industri* 15, no. 2 (2020): 122–33, https://doi.org/10.14710/jati.15.2.122-133.universitas, dan pemerintahan. Studi ini menggunakan Strenght-Weakness-Opportunity-Threat (SWOT

53 Reza Yogaswara, "Artificial Intelligence Sebagai Penggerak Industri 4.0 Dan Tantangannya Bagi Sektor Pemerintah Dan Swasta," *Masyarakat Telematika Dan Informasi : Jurnal Penelitian Teknologi Informasi Dan Komunikasi* 10, no. 1 (2019): 72, https://doi.org/10.17933/mti.v10i1.144.

54 Guenduez and Mettler, "Strategically Constructed Narratives on Artificial Intelligence: What Stories Are Told in Governmental Artificial Intelligence Policies?"

55 Yanqing Duan, John S. Edwards, and Yogesh K. Dwivedi, "Artificial Intelligence for Decision Making in the Era of Big Data – Evolution, Challenges and Research Agenda," *International Journal of Information Management* 48, no. January (2019): 63–71, https://doi.org/10.1016/j.ijinfomgt.2019.01.021.

56 Hidemichi Fujii and Shunsuke Managi, "Trends and Priority Shifts in Artificial Intelligence Technology Invention: A Global Patent Analysis," *Economic Analysis and Policy* 58, no. 2018 (2018): 60–69, https://doi.org/10.1016/j.eap.2017.12.006.

57 Chen and Wen, "Impacts of Attitudes Toward Government and Corporations on Public Trust in Artificial Intelligence."

58 Borrás and Edler, "The Roles of the State in the Governance of Socio-Technical Systems' Transformation."

that can supply AI technology and a good business environment. (3) The Data and Infrastructure, the government needs a lot of high-quality data to avoid data bias and errors.[59]

Table 1. *Detailed Scores Government AI Readiness 2022 (Oxford Insights)*

Global Position	Country	Total Score	Government Pillar	Technology Sector Pillar	Data and Infrastructure Pillar
1	United State of America	85,72	86,21	81,67	89,28
2	Singapore	84,12	89,68	68,50	94,17
17	China	70,84	78,75	59,84	73,91
29	Malaysia	67,82	77,70	50,26	74,16
43	Indonesia	60,89	73,85	41,51	67,32

Table 2. *Detailed Scores Government AI Readiness 2021 (Oxford Insights)*

Global Position	Country	Total Score	Government Pillar	Technology Sector Pillar	Data and Infrastructure Pillar
1	United State of America	88,16	88,46	83,31	92,71
2	Singapore	82,46	94,88	66,69	85,80
15	China	74,42	83,79	61,33	78,15
36	Malaysia	62,46	68,37	52,67	66,34
47	Indonesia	58,14	73,05	40,96	60,40

In Table 1. the survey was conducted in 181 countries and Indonesia was ranked 43rd with a total score of 60.89 points, up three ranks from originally being ranked 47th with a total score of 58.14 points in Table 2. It can be seen from the Government Pillar score that Indonesia's increase is not very significant, that is only 0.80 points which in the realm of the first pillar policy is the basis for implementing AI, including the government's vision and mission as a regulator that can create regulations with due regard to ethics in society. When compared to the United States of America, the scores of the three pillars are already above 80 points, so they are ranked first in terms of the government's readiness to implement AI. Followed by Singapore with a Government Pillar score of 84.12 points. When compared to the Malaysia Government Pillar, it is only about 3.85 points adrift, but the Data and Infrastructure Pillar is quite a lot, that is 6.84 points. Thus, it can be concluded that from the three pillars, Indonesia has experienced an increase in its score on each pillar, this has the potential for the Indonesian government to increase its readiness to implement AI in various sectors.

Artificial intelligence (AI) possesses the capability to significantly transform the tourism sector; nevertheless, its use gives rise to ethical considerations. This research study examines the imperative nature of establishing a legislative framework to effectively oversee the ethical utilization of artificial intelligence (AI) within the tourist industry.[60] The utilization of AI technology, including data analytics and personalization, may give rise to apprehensions pertaining to issues such as data

[59] Emma Hankins and Wendy Trott, "Government Artificial Intellegence Index 2022," 2022.

[60] El Mehdi Ouafiq et al., "AI-Based Modeling and Data-Driven Evaluation for Smart Farming-Oriented Big Data Architecture Using IoT with Energy Harvesting Capabilities," *Sustainable Energy Technologies and Assessments* 52 (2022): 102093, https://doi.org/https://doi.org/10.1016/j.seta.2022.102093.

privacy, bias, transparency, and security. In the absence of adequate legislation, these concerns have the potential to undermine the trust and privacy of tourists. A comprehensive regulatory framework should include the following components: a. Data Privacy: It is imperative to guarantee that AI applications uphold the principles of user privacy and adhere to the legislation governing data protection. b. The promotion of transparency should involve the enforcement of explicit disclosure requirements about the involvement of artificial intelligence (AI) and its consequential effects on visitor experiences. c. Bias Mitigation: Enact strategies to proactively prevent and effectively resolve biases inherent in artificial intelligence systems. d. Establishing Accountability: It is imperative to implement procedures that ensure organizations and developers are held accountable for the consequences of artificial intelligence (AI) applications.[61]

Developing an ethical regulatory framework for artificial intelligence (AI) in the tourism industry presents numerous advantages; first, trust establishment is the establishment of explicit guidelines fosters trust among tourists over the implementation of AI applications and their ethical utilization. Second, consumer protection is regulations serve to protect visitors by mitigating the harm that may arise from unethical actions related to artificial intelligence. Third, industry reputation is the implementation of ethical AI techniques has the potential to bolster the reputation of businesses and the tourist industry at large.[62] Innovation and development are facilitated by a framework that promotes appropriate practices and safeguards. The establishment of an ethical regulatory framework for artificial intelligence necessitates the collective efforts of governmental bodies, corporate entities, technological specialists, and consumer advocacy organizations. The implementation of a multistakeholder approach guarantees the establishment of regulations that are thorough and balanced.[63]

In light of the worldwide reach of the tourist sector, it is imperative to undertake endeavors aimed at establishing uniform principles for artificial intelligence (AI) ethics across nations. This approach is essential to mitigate any confusion and foster a cohesive and harmonized strategy.[64] The development and implementation of ethical AI policies necessitate addressing difficulties such as striking a balance between innovation and regulation, as well as adjusting frameworks to accommodate the rapid evolution of AI technologies. The incorporation of artificial intelligence (AI) within the tourism industry has the potential to yield significant and far-reaching advantages. However, it is imperative that ethical considerations are thoroughly examined and effectively resolved by means of a comprehensive regulatory framework.[65] By implementing measures to safeguard data privacy, promote transparency, mitigate prejudice, enforce accountability, and

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61 Tariq Ahamed Ahanger, Abdullah Aljumah, and Mohammed Atiquzzaman, "State-of-the-Art Survey of Artificial Intelligent Techniques for IoT Security," *Computer Networks* 206 (2022): 108771, https://doi.org/https://doi.org/10.1016/j.comnet.2022.108771.

62 Paul Upham, Benjamin Sovacool, and Chukwuka Monyei, "Digital Bricolage: Infrastructuring Lower Carbon Digital Space via Nordic Datacentre Development," *Political Geography* 96 (2022): 102617, https://doi.org/https://doi.org/10.1016/j.polgeo.2022.102617.

63 Dwivedi et al., "Metaverse beyond the Hype: Multidisciplinary Perspectives on Emerging Challenges, Opportunities, and Agenda for Research, Practice and Policy."

64 Nancy M P Bocken and Samuel W Short, "Unsustainable Business Models – Recognising and Resolving Institutionalised Social and Environmental Harm," *Journal of Cleaner Production* 312 (2021): 127828, https://doi.org/https://doi.org/10.1016/j.jclepro.2021.127828.

65 Changwook Kim and Jinwon Kim, "Spatial Spillovers of Sport Industry Clusters and Community Resilience: Bridging a Spatial Lens to Building a Smart Tourism City," *Information Processing & Management* 60, no. 3 (2023): 103266, https://doi.org/https://doi.org/10.1016/j.ipm.2023.103266.

enhance security, the tourism sector may effectively leverage the complete capabilities of artificial intelligence (AI) while maintaining ethical standards, cultivating trust, and providing outstanding experiences to tourists.[66] The incorporation of Artificial Intelligence (AI) within the tourist sector presents significant opportunities for improving passenger experiences, optimizing operational processes, and enhancing destination management. Nevertheless, the growing utilization of artificial intelligence necessitates the establishment of a comprehensive legal framework to guarantee its ethical and responsible deployment. This study explores the significance of developing a framework, analyzing its essential elements and the advantages it offers to both the tourism industry and tourists.[67]

The attention of the Indonesian government after the COVID-19 pandemic focuses on recovering the national economy, apart from the government, education, and health sectors, the government is also trying to restore national economic stability, one of which is by implementing technology in the tourism sector. Technology such as AI is used as a means of developing potential and promoting tourism destinations in Indonesia.[68] The role of the government as a regulator in creating a regulatory framework that supports and ensures the use of ethical values in the implementation of AI in the tourism sector is very important. Based on the Regulation of the Minister of Tourism and Creative Economy of the Republic of Indonesia Number 3 of 2021 concerning Technical Guidelines for the Use of Non-Physical Special Allocation Funds for Tourism Services in the framework for managing the business of developing tourist attractions and competitive tourism destinations must be based on principles and ethics. AI penetration as a means of promoting the tourism sector must understand and apply the ethics of social media as stipulated in Articles 27 to 30 of Law Number 19 of 2016 concerning Information and Electronic Transactions, including content appropriateness, prohibition of spreading hoaxes, and taking other people's data without permission.[69] Privacy violations as a result of AI cause inconvenience to users' privacy, a digitalization policy is needed to promote artificial intelligence and increase digital tourism.[70]

Impact of Artificial Intelligence Policy on Promoting Digital Tourism

Before the digital age, many travelers had to rely on traditional travel agents to plan their trips. However, with the advent of online booking and digital payment methods, many tourists are now able to plan their trips, thus saving more on the fees previously paid to travel agents. With the internet, all information is easy for us to get and transactions can be done online through mobile applications that are integrated, for example, ordering hotels can be done mobile without

66 Evanthie Michalena and Valérie Angeon, "Local Challenges in the Promotion of Renewable Energy Sources: The Case of Crete," *Energy Policy* 37, no. 5 (2009): 2018–26, https://doi.org/https://doi.org/10.1016/j.enpol.2009.01.047.

67 A M Oprescu et al., "Towards a Data Collection Methodology for Responsible Artificial Intelligence in Health: A Prospective and Qualitative Study in Pregnancy," *Information Fusion* 83–84 (2022): 53–78, https://doi.org/https://doi.org/10.1016/j.inffus.2022.03.011.

68 Febryola Indra et al., "ETIKA PROFESI PARIWISATA: PENGGUNAAN MEDIA SOSIAL SEBAGAI SARANA PROMOSI DESTINASI PARIWISATA," *Jurnal Inovasi Penelitian* 4, no. 2 (2023): 351–56, https://doi.org/10.47492/jip.v4i2.2681.

69 Zamroni Abdussamad and Mohamad Hidayat Muhtar, "Etika Penggunaan Media Sosial Dalam Promosi Destinasi Wisata Di Desa Patoameme," *Akuntansi Dan Humaniora: Jurnal Pengabdian Masyarakat* 1, no. 2 (2022): 132–39, https://doi.org/10.38142/ahjpm.v1i2.339.

70 Amani Alabed, Ana Javornik, and Diana Gregory-Smith, "AI Anthropomorphism and Its Effect on Users' Self-Congruence and Self–AI Integration: A Theoretical Framework and Research Agenda," *Technological Forecasting and Social Change* 182, no. May (2022): 12, https://doi.org/10.1016/j.techfore.2022.121786.

intermediary hotel staff from the check-in process to the check-out process. With a system that is integrated and updated in real-time, be it in the form of content, images, videos, and prices, it will make it easier to promote tourism digitally. On the one hand, it will spoil customers or tourists to find the places they want without the need to go to a travel agent. And from a business perspective, it will reduce operational costs, be faster and more professional, and the information that can be conveyed will be immediately known to the whole world.[71]

The online booking system has shortened the time and effort for booking accommodation, transportation tickets and tour packages. Travelers can easily book plane, train, or bus tickets and access various lodging options from anywhere, as long as they are connected to the internet. Tourism digitization has provided a platform that provides comprehensive information about tourist destinations, including reviews from previous visitors, images, videos, and location maps. That way, travelers can make better decisions and plan their trips more efficiently.

Digital payment methods, such as credit cards, digital wallets, and online bank transfers, have eliminated the need to carry large amounts of cash with you when traveling. This provides additional comfort and safety for tourists. Online booking platforms often offer special promos and discounts for tourists. This allows travelers to get the best deals on accommodation, transportation, and tourist attractions, so they can save more on their travel costs. A mature digitization policy can help create a tourism ecosystem that is competitive in the digital era. Improved internet connectivity and reliable digital infrastructure can improve accessibility for tourists and help manage destinations efficiently. The introduction of digital payment systems and application-based travel planning platforms can increase convenience and security for tourists when making transactions and planning trips.[72]

Although the advantages are apparent, there are several obstacles that need to be addressed. These obstacles encompass connectivity limitations, impediments to digital literacy, and potential security risks associated with online transactions. The importance of guaranteeing data security and effectively addressing these difficulties cannot be overstated in order to facilitate the widespread deployment of this technology. In order to maintain competitiveness, businesses operating within the tourism industry must embrace and adapt to emerging technologies. The implementation of online booking systems that prioritize user-friendliness and the acceptance of diverse digital payment methods can effectively appeal to technologically proficient tourists and optimize operational processes.[73]

The ongoing advancement of technology has led to the potential integration of artificial intelligence and blockchain, which has promise for augmenting online booking systems and digital payment methods. These technological breakthroughs have the potential to enhance efficiency, security, and personalization in various interactions. The integration of online booking systems and digital payment methods has become essential in order to improve accessibility and convenience for travelers. The adoption of these technologies not only streamlines the processes of booking

[71] Aristea Kontogianni, Efthimios Alepis, and Constantinos Patsakis, "Promoting Smart Tourism Personalised Services via a Combination of Deep Learning Techniques," *Expert Systems with Applications* 187 (2022): 115964, https://doi.org/https://doi.org/10.1016/j.eswa.2021.115964.

[72] Yunifa Miftachul Arif et al., "Decentralized Recommender System for Ambient Intelligence of Tourism Destinations Serious Game Using Known and Unknown Rating Approach," *Heliyon* 9, no. 3 (2023): e14267, https://doi.org/https://doi.org/10.1016/j.heliyon.2023.e14267.

[73] Yaqi Gong and Ashley Schroeder, "A Systematic Literature Review of Data Privacy and Security Research on Smart Tourism," *Tourism Management Perspectives* 44 (2022): 101019, https://doi.org/https://doi.org/10.1016/j.tmp.2022.101019.

and payment, but also presents novel prospects for tailored and smooth travel experiences. The integration of digital innovations will be of paramount importance in creating the future of travel, as the tourist industry undergoes ongoing evolution.[74]

The existence of the Internet, companies involved in the tourism industry distribute tourism information to potential tourists via the Internet, and can even offer tourism products online, so E-Tourism is becoming something that is growing rapidly. E-tourism is the application of the use of Information Communication Technology (ICT) and e-commerce in the tourism industry. E-tourism utilizes several features of information technology, such as tourism information databases, user databases, electronic payments, using computer networks as a means of delivery and service transactions, as part of e-commerce E-tourism provides convenience in terms of efficiency and effectiveness for consumers in choosing tourist destinations. The process of disseminating information through the Internet to help promote regional tourism can be done easily and quickly. However, there are many websites containing tourism information that use different data formats, so they are not integrated and not interoperable. It is this data non-uniformity and interoperability that is the problem and challenge in the development of E-Tourism.[75]

Semantic Web technology can be used to solve this problem because this technology can facilitate the integration of tourism information that is spread and has different data formats from various tourism information systems owned by hotels, travel agents, airlines, and other parties involved in the tourism industry. The Semantic Web is a development (extension) of the current web. The goal is that information on the web can be defined not only to be understood by users (syntactic level to human users) but also to be understood by applications (machine understandable) at the semantic level, thus enabling interoperability and integration between systems and applications.[76]

The Internet of Things (IoT) refers to a system consisting of a network of interconnected devices, sensors, and objects that are designed to collect and transfer data. Within the field of tourism, Internet of Things (IoT) devices possess the capability to effectively monitor crowd density, follow the movements of tourists, and furnish up-to-the-minute information pertaining to attractions, hotels, and transit options. Internet of Things (IoT) equipped sensors and devices has the ability to collect data in real-time, hence offering precise and current information pertaining to many facets of a location. This includes data on weather conditions, traffic patterns, visitor movement, and the efficient utilization of resources. The data that has been gathered is subjected to analysis through the utilization of data analytics technologies, which in turn provides valuable insights pertaining to the behavior, preferences, and trends exhibited by tourists. These insights empower destination managers to make well-informed decisions, optimize their operations, and curate customized experiences for their visitors.[77]

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[74] Knani, Echchakoui, and Ladhari, "Artificial Intelligence in Tourism and Hospitality: Bibliometric Analysis and Research Agenda."

[75] Sarah Eichelberger et al., "Entrepreneurial Ecosystems in Smart Cities for Tourism Development: From Stakeholder Perceptions to Regional Tourism Policy Implications," *Journal of Hospitality and Tourism Management* 45 (2020): 319–29, https://doi.org/https://doi.org/10.1016/j.jhtm.2020.06.011.people, and institutional logic, the entrepreneurial ecosystem (EES

[76] Shahid Hussain et al., "Sustainability of Smart Rural Mobility and Tourism: A Key Performance Indicators-Based Approach," *Technology in Society* 74 (2023): 102287, https://doi.org/https://doi.org/10.1016/j.techsoc.2023.102287.

[77] Kamila Borseková, Anna Vaňová, and Katarína Vitálišová, "Smart Specialization for Smart Spatial Development: Innovative Strategies for Building Competitive Advantages in Tourism in Slovakia," *Socio-Economic Planning Sciences* 58 (2017): 39–50, https://doi.org/https://doi.org/10.1016/j.seps.2016.10.004.

The utilization of data-driven insights facilitates the development of customized experiences for tourists through the process of tailoring recommendations, proposing itineraries, and providing pertinent promotions that are derived from their individual preferences and previous actions. The integration of Internet of Things (IoT) technology and data analytics plays a significant role in promoting sustainable practices within the tourism industry. This is achieved through the efficient allocation of resources, waste reduction, and the mitigation of environmental consequences associated with tourism operations. These technologies facilitate the conservation of cultural and natural resources in many destinations. The utilization of Internet of Things (IoT) technology for the purpose of data collecting and analysis enables prompt and immediate reaction to many issues, including but not limited to overcrowding, traffic congestion, and crises. Destination managers possess the ability to promptly adjust and execute strategies in order to guarantee the safety and contentment of visitors.[78]

The implementation of Internet of Things (IoT) and data-driven analytics in destination management presents various problems, including apprehensions regarding data privacy, the necessity for robust technical infrastructure, and the requirement for proficient employees capable of effectively managing and analyzing the amassed data. The ongoing advancement of technology has led to the increasing potential of utilizing the Internet of Things (IoT) and data-driven insights in the field of destination management. The incorporation of artificial intelligence and machine learning has the potential to facilitate more advanced analysis and predictive modeling.[79]

The tourist sector has undergone a significant transformation as a result of technological advancements, particularly through the incorporation of the Internet of Things (IoT) and data-driven analytics. This has led to the emergence of intelligent destination management practices. This study examines the impact of Internet of Things (IoT) and data analytics on the management of destinations, resulting in improved guest experiences, sustainable practices, and increased overall tourism management. The tourist sector is undergoing a transformation as a result of the integration of intelligent destination management facilitated by the Internet of Things (IoT) and data-driven insights. These technologies enable destination administrators to make well-informed decisions, improve the utilization of resources, and provide individualized experiences to guests. As various destinations adopt these technological advancements, the future of tourism management holds the potential for improved sustainability, operational effectiveness, and overall tourist contentment.[80]

AI is the main pillar in building Wonderful Digital Tourism because of its ability to process and analyze large amounts of data quickly. In tourism, AI can be used to present travel recommendations tailored to tourist preferences, provide interactive tour guides, and organize personalized and unforgettable tourism experiences. In addition, AI-based chatbots can provide 24/7 customer service to answer travelers' questions and concerns quickly and efficiently. In promoting Wonderful Digital Tourism, digitization policies must also support sustainable tourism practices. The use of

[78] Zabih-Allah Torabi et al., "On the Post-Pandemic Travel Boom: How Capacity Building and Smart Tourism Technologies in Rural Areas Can Help - Evidence from Iran," *Technological Forecasting and Social Change* 193 (2023): 122633, https://doi.org/https://doi.org/10.1016/j.techfore.2023.122633.

[79] R T Mohammed et al., "A Decision Modeling Approach for Smart E-Tourism Data Management Applications Based on Spherical Fuzzy Rough Environment," *Applied Soft Computing* 143 (2023): 110297, https://doi.org/https://doi.org/10.1016/j.asoc.2023.110297.

[80] João Romão and Bart Neuts, "Territorial Capital, Smart Tourism Specialization and Sustainable Regional Development: Experiences from Europe," *Habitat International* 68 (2017): 64–74, https://doi.org/https://doi.org/10.1016/j.habitatint.2017.04.006.innovation capabilities and specialization patterns (smart specialization

AI technology and digitization can help manage visitors and minimize negative impacts on the environment. The analytical data collected by AI can help identify tourism areas that are prone to over-tourism and assist in their sustainable management. Tourism digitization has also helped reduce the use of paper, such as physical tickets or brochures, by switching to e-tickets and other digital information. This contributes to a more environmentally friendly approach in the tourism industry. The use of Internet of Things technology and data-driven insights can change the way tourist destinations operate, provide better service to visitors and provide long-term benefits for local communities and the environment. AI algorithms analyze vast amounts of data, including user preferences, travel history, and online behavior, to offer personalized travel recommendations. Through AI-powered platforms and chatbots, travelers can receive tailored suggestions for destinations, accommodations, activities, and even dining options that align with their interests and preferences. This enhances the overall travel experience by reducing the time and effort required for trip planning.[81]

Impact of Digital Tourism on Developing Destination Tourism

Augmented Reality (AR) and Virtual Reality (VR) can enhance the tourist experience by providing more interactive, immersive, and immersive experiences. Through Wonderful Digital Tourism, tourists can take advantage of advanced technology to enrich their experiences. The utilization of augmented reality (AR) and virtual reality (VR) can take tourists on an immersive journey without having to leave their homes. AI can also help create more efficient trips by planning optimal routes and schedules based on travelers' preferences and availability. Augmented Reality (AR) is a fusion of the real and virtual worlds in which physical and virtual objects complement and interact with each other.[82] In AR, users still interact with the real world, but through devices that project virtual objects into their view. Digital devices are used to overlay additional sensory information (sounds, objects, avatars, graphics, labels, etc.) in the real world, this provides contextual information that enhances appearance, usability, and enjoyment, and provides enhanced interactive experiences.

Given the characteristics of tourists who are generally not familiar with the destinations they visit, AR applications allow people to get customized and real-time information about interesting objects placed in their surroundings. Recognizing the considerable potential of AR applications in terms of enhancing the travel experience, the researchers primarily investigated computational algorithms to engineer AR designs and identified factors influencing AR adoption by paying attention to perceived quality, technology readiness, and technology adoption models. Better-designed AR apps that incorporate travel behavior increase their usefulness as a type of travel information resource.

Virtual Reality (VR) is a computer-generated simulation of a situation that incorporates a user, who perceives it through one or more of the senses (currently mostly sight, hearing, and

[81] Jesús Collado-Agudo, Ángel Herrero-Crespo, and Héctor San Martín-Gutiérrez, "The Adoption of a Smart Destination Model by Tourism Companies: An Ecosystem Approach," *Journal of Destination Marketing & Management* 28 (2023): 100783, https://doi.org/https://doi.org/10.1016/j.jdmm.2023.100783.

[82] Sangwon Park and Brigitte Stangl, "Augmented Reality Experiences and Sensation Seeking," *Tourism Management* 77 (April 2020): 104023, https://doi.org/10.1016/J.TOURMAN.2019.104023.

touch), and interacts with it in a way that appears to be real.[83] VR experiences can be delivered via a variety of hardware devices, such as head-mounted displays (HMD), cubic immersive spaces (CAVE), large screens (power walls), mobile devices (smartphones, tablets), or desktop and laptop computers, which are sometimes equipped with other devices either for simulation or tracking. VR/AR is an effective tool for marketing tourism destinations. VR can provide a sensory experience, accessing objects or places through different views facilitated by computerized simulations. VR can give potential tourists a sense of the existence of a particular place, resulting in a genuine and dynamic visual expression of a destination that people can explore and explore. Research conducted by Li-Pin (Lynn) is trying to connect VR with sustainable tourism destination marketing to promote heritage-based Slow Tourism activities in suitable destinations. In his research, he included VR from a 700-year-old Chinese painting of a heritage tourist city in the model. The results of this study state that VR can work effectively to promote sustainable tourism practices.[84] Immersive technologies such as virtual reality (VR) and augmented reality (AR) have enabled tourism managers to increase tourist satisfaction by providing them with unforgettable experiences. Immersive virtual environments have changed the way tourism operators excite their customers before, during, and after the travel experience. VR and AR environments can be used to promote destinations or sites, to add reality to the destination, or ultimately to immerse consumers in new and truly challenging tourism experiences.[85]

In the current era characterized by advancements in digital technology, the utilization of augmented reality (AR) and virtual reality (VR) presents novel opportunities for the tourist industry. These technologies serve to connect and integrate the physical and digital domains, thereby enhancing the overall travel experience. This study investigates the impact of these technologies on the manner in which travelers engage with and gain knowledge about destinations, attractions, and cultural heritage places.[86] The utilization of Augmented Reality (AR) and Virtual Reality (VR) applications facilitates travelers in engaging in immersive explorations of various destinations. Augmented reality (AR) is a technology that superimposes digital information onto the physical world, thereby boosting the observer's view of their surrounding surroundings. Virtual Reality (VR) technology facilitates the creation of fully immersive experiences, enabling travellers to virtually transport themselves to various locations and time periods.[87] Tourists have the opportunity to participate in interactive educational encounters facilitated by augmented reality (AR) and virtual reality (VR) technologies. These technologies can be utilized by historical sites and museums to

[83] Michel Wedel, Enrique Bigné, and Jie Zhang, "Virtual and Augmented Reality: Advancing Research in Consumer Marketing," *International Journal of Research in Marketing* 37, no. 3 (September 2020): 443–65, https://doi.org/10.1016/J.IJRESMAR.2020.04.004.

[84] Li-Pin (Lynn) Lin, Shu-Chun (Lucy) Huang, and Yao-Chun Ho, "Could Virtual Reality Effectively Market Slow Travel in a Heritage Destination?," *Tourism Management* 78 (June 2020): 104027, https://doi.org/10.1016/j.tourman.2019.104027.

[85] Sandra Maria Correia Loureiro, João Guerreiro, and Faizan Ali, "20 Years of Research on Virtual Reality and Augmented Reality in Tourism Context: A Text-Mining Approach," *Tourism Management* 77 (April 2020): 104028, https://doi.org/10.1016/j.tourman.2019.104028.

[86] Nirma Sadamali Jayawardena et al., "'The Persuasion Effects of Virtual Reality (VR) and Augmented Reality (AR) Video Advertisements: A Conceptual Review,'" *Journal of Business Research* 160 (2023): 113739, https://doi.org/https://doi.org/10.1016/j.jbusres.2023.113739.

[87] Namho Chung, Heejeong Han, and Youhee Joun, "Tourists' Intention to Visit a Destination: The Role of Augmented Reality (AR) Application for a Heritage Site," *Computers in Human Behavior* 50 (2015): 588–99, https://doi.org/https://doi.org/10.1016/j.chb.2015.02.068.based on tourists' active usage. Three aspects have been found to be factors encouraging tourists to actively utilize AR. The first aspect is technology readiness (TR

offer instructive, entertaining, and contextually rich content, hence augmenting the educational significance of the visit.[88]

The utilization of augmented reality (AR) and virtual reality (VR) apps presents the opportunity for exceedingly individualized encounters. Tourists have the ability to develop personalized itineraries, wherein they are provided with suggestions that align with their own interests and preferences. Virtual tour guides have the ability to accommodate individual tastes by providing customized and dynamic content.[89] The utilization of augmented reality (AR) and virtual reality (VR) technologies plays a significant role in the preservation of culture through the digital archiving of historical places, artifacts, and cultural practices. Tourists have the opportunity to engage in virtual experiences of heritage places that may otherwise be inaccessible due to preservation initiatives or geographical constraints.[90] Augmented reality (AR) and virtual reality (VR) technologies have the potential to overcome language barriers by providing instantaneous translation, thereby facilitating tourists' comprehension and engagement with foreign language signage, menus, and instructions.[91]

Although there are significant potential advantages, it is crucial to acknowledge and tackle certain obstacles, including the financial implications of implementation, the level of accessibility, and the degree of technological proficiency required. Furthermore, it is imperative to generate content of superior quality that is in harmony with the narrative and historical context of the place in order to offer genuine and authentic experiences.[92] The ongoing advancements in augmented reality (AR) and virtual reality (VR) technologies present limitless opportunities for enriching tourist experiences. The advancement of wearable technology, enhanced internet connectivity, and the incorporation of artificial intelligence will continue to facilitate the progress of increasingly immersive and user-centric apps.[93] The use of Augmented Reality (AR) and Virtual Reality (VR) applications possesses the potential to fundamentally transform the manner in which travelers engage with and perceive various destinations. The utilization of interactive learning and individualized itineraries, along with the ability to overcome language hurdles and preserve cultural heritage, presents considerable promise for reshaping the tourism industry.[94] As stakeholders within the tourism sector increasingly adopt these advances, tourists can anticipate a greater abundance of

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88 Le Yi Koh et al., "Willingness to Participate in Virtual Reality Technologies: Public Adoption and Policy Perspectives for Marine Conservation," *Journal of Environmental Management* 334 (2023): 117480, https://doi.org/https://doi.org/10.1016/j.jenvman.2023.117480.

89 Spyridon Nektarios Bolierakis et al., "Training on LSA Lifeboat Operation Using Mixed Reality," *Virtual Reality & Intelligent Hardware* 5, no. 3 (2023): 201–12, https://doi.org/https://doi.org/10.1016/j.vrih.2023.02.005.

90 Andreea Fortuna Schiopu et al., "Constrained and Virtually Traveling? Exploring the Effect of Travel Constraints on Intention to Use Virtual Reality in Tourism," *Technology in Society* 71 (2022): 102091, https://doi.org/https://doi.org/10.1016/j.techsoc.2022.102091.

91 Hong Qin, Daniel Alan Peak, and Victor Prybutok, "A Virtual Market in Your Pocket: How Does Mobile Augmented Reality (MAR) Influence Consumer Decision Making?," *Journal of Retailing and Consumer Services* 58 (2021): 102337, https://doi.org/https://doi.org/10.1016/j.jretconser.2020.102337.

92 Runhong Hu et al., "Applying Augmented Reality (AR) Technologies in Theatrical Performances in Theme Parks: A Transcendent Experience Perspective," *Tourism Management Perspectives* 40 (2021): 100889, https://doi.org/https://doi.org/10.1016/j.tmp.2021.100889.

93 Michalis Tsepapadakis and Damianos Gavalas, "Are You Talking to Me? An Audio Augmented Reality Conversational Guide for Cultural Heritage," *Pervasive and Mobile Computing* 92 (2023): 101797, https://doi.org/https://doi.org/10.1016/j.pmcj.2023.101797.

94 Hady Pranoto et al., "Augmented Reality Navigation Application to Promote Tourism to Local State Attraction 'Lawang Sewu,'" *Procedia Computer Science* 216 (2023): 757–64, https://doi.org/https://doi.org/10.1016/j.procs.2022.12.193.

immersive and enduring experiences that effectively bridge the divide between the tangible and virtual realms.

CONCLUSION

The analysis and discussion conclude, first, the digitalization policy in Indonesia can foster artificial intelligence in tourism by investing in AI technology research and development, collaborating with the government and private sector to implement AI solutions, and establishing a supportive regulatory framework to guarantee the ethical application of AI in tourism. Second, the impact of digitalization policies on digital tourism includes increasing accessibility and convenience for tourists through online ordering systems and digital payment methods, developing smart destinations with Internet of Things (IoT) technology and data-based insights, and enhancing tourist experiences through augmented reality applications and virtual reality. To accelerate the recovery of the tourism sector after the global crisis, digitalization policies, supported by wonderful digital tourism, play a crucial role. Third, the application of artificial intelligence and digitization in the tourism industry not only enhances the tourist experience but also strengthens the competitiveness of tourist destinations. By paying attention to sustainability and data security, the implementation of Wonderful Digital Tourism can drive economic growth, provide long-term benefits for the tourism industry, and encourage sustainable development for society and the environment. Therefore, an innovative government and stakeholders must adopt a progressive digitalization policy to seize the opportunities offered by excellent digital tourism.

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