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International Journal of Artificial Intelligence Research

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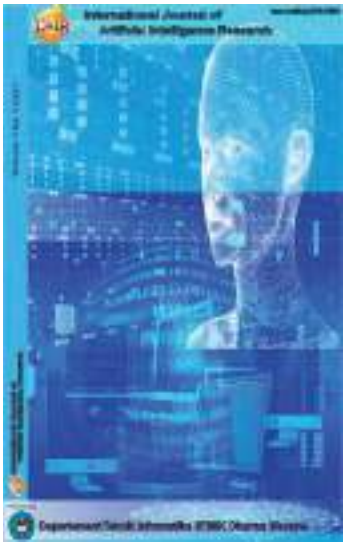

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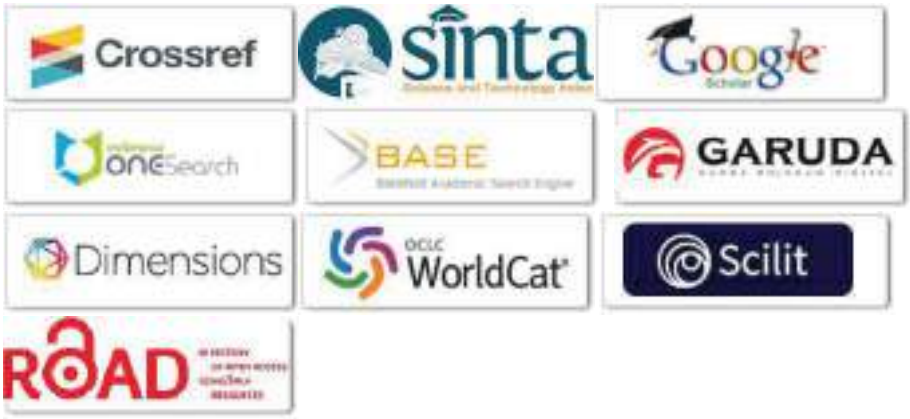

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Editorial Policies

Focus and Scope

The Journal covers the whole spectrum of intelligent informatics, which includes, but is not limited to :

• Artificial Immune Systems, Ant Colonies, and Swarm Intelligence
• Autonomous Agents and Multi-Agent Systems
• Bayesian Networks and Probabilistic Reasoning
• Biologically Inspired Intelligence
• Brain-Computer Interfacing
• Business Intelligence
• Chaos theory and intelligent control systems
• Clustering and Data Analysis
• Complex Systems and Applications
• Computational Intelligence and Soft Computing
• Cognitive systems
• Distributed Intelligent Systems
• Database Management and Information Retrieval
• Evolutionary computation and DNA/cellular/molecular computing
• Expert Systems
• Fault detection, fault analysis and diagnostics
• Fusion of Neural Networks and Fuzzy Systems
• Green and Renewable Energy Systems
• Human Interface, Human-Computer Interaction, Human Information Processing
• Hybrid and Distributed Algorithms
• High Performance Computing
• Information storage, security, integrity, privacy and trust
• Image and Speech Signal Processing
• Knowledge Based Systems, Knowledge Networks
• Knowledge discovery and ontology engineering
• Machine Learning, Reinforcement Learning
• Memetic Computing
• Multimedia and Applications
• Networked Control Systems
• Neural Networks and Applications
• Natural Language Processing
• Optimization and Decision Making
• Pattern Classification, Recognition, speech recognition and synthesis
• Robotic Intelligence
• Rough sets and granular computing
• Robustness Analysis
• Self-Organizing Systems
• Social Intelligence
• Soft computing in P2P, Grid, Cloud and Internet Computing Technologies
• Stochastic systems
• Support Vector Machines
• Ubiquitous, grid and high performance computing
• Virtual Reality in Engineering Applications
• Web and mobile Intelligence, and Big Data

• Digital Marketing
• CRM (Customer Relationship Management)
• Financial Technology
• Digital Distribution Channel
• Digital Consumer Behavior

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Peer Review Process

Peer Review Process

1. Editors first review the submitted manuscript, called **initial review by the editors**. It will be desk evaluated whether the submitted manuscript is **suitable** for the International Journal of Artificial Intelligence Research based on **focus and scope,** similarity score by using Crosscheck-iThenticate, **methodological flaw, readability of the articles,** and adhering to **the submitted paper template**.
2. Furthermore**,** the manuscript will be sent to at **least three anonymous reviewers (Double-Blind Peer-Review)**.
3. The anonymous reviewers' comments are then sent to the corresponding author for necessary actions and responses. Afterward, the editorial team meeting suggested the final decision to the revised manuscript by authors.
4. Finally, the Editor will send the final decision to the corresponding author.
5. The accepted manuscript then continued to the copyediting and layout editing process to prepare the camera-ready paper.

Review Outcomes

Utilizing feedback from the peer review process, the Editor will make a final publication decision. ***The review process will take approximately 4 to 12 weeks***. Decisions categories include:

- **Reject** - Rejected manuscripts will not be published, and authors will not have the opportunity to resubmit a revised version of the manuscript to International Journal of Artificial Intelligence Research.
- **Resubmit for Review**– The submission needs to be re-worked, but with significant changes, it may be accepted. However, It will require a second round of review.
- **Accept with Revisions** - Manuscripts receiving an accept-pending-revisions decision will be published in International Journal of Artificial Intelligence Research under the condition that **Minor** or **Major** modifications are made. Revisions will be reviewed by an editorial team to ensure necessary updates are made prior to publication.
- **Accept** - Accepted manuscripts will be published in the current form, with no further modifications required.

Correspondence

All correspondence concerning manuscripts should be directed to the Editor of International Journal of Artificial Intelligence Research and cc to **info@ijair.id**. The Editor will direct all correspondence to the lead author; the lead author is responsible for sharing communications with other authors. Beyond communication concerning the review, manuscripts accepted for publication may require additional correspondence to complete copyediting and layout editing.

[Update on August 4, 2021]

Publication Frequency

This journal is published two times a year (June, December)

Open Access Policy

The International Journal of Artificial Intelligence Research holds the principle that all research is for the benefit of mankind. Research is a product of investment by society and therefore the results must be returned to all without borders or discrimination, serving society in a universal and transparent manner. That is why the International Journal of Artificial Intelligence Research provides free and open online access to all of its research publications. All articles that are accepted will be available immediately and free to download on the https://ijair.id/index.php/ijair/index page without limits and at no cost.

The International Journal of Artificial Intelligence Research understands that in this world everyone has an equal opportunity to seek, share and create knowledge - we hope the authors join us in this open access concept.

Archiving

This journal utilizes the LOCKSS system to create a distributed archiving system among participating libraries and permits those libraries to create permanent archives of the journal for purposes of preservation and restoration. More...

Publication Ethics and Malpractice Statement

International Journal of Artificial Intelligence Research, called IJAIR, is committed to upholding the highest standards of publication ethics and takes all possible measures against any publication malpractices. The Editorial Board is responsible for, among others, preventing publication malpractice. Unethical behavior is unacceptable, and the IJAIR does not tolerate plagiarism in any form. Authors who submitted articles: affirm that manuscript contents are original. Furthermore, the authors' submission also implies that the manuscript has not been published previously in any language, either wholly or partly, and is not currently submitted for publication elsewhere. Editors, authors, and reviewers, within the International Journal of Artificial Intelligence Research, are to be fully committed to good publication practice and accept the responsibility for fulfilling the following duties and responsibilities, as set by the COPE Code of Conduct for Journal Editors. As part of the Core Practices, COPE has written guidelines on the http://publicationethics.org/resources/guidelines.

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3. The factors that are taken into account in review are relevance, soundness, significance, originality, readability, and language.
4. The possible decisions include acceptance, acceptance with revisions, or rejection.
5. If authors are encouraged to revise and resubmit a submission, there is no guarantee that the revised submission will be accepted.
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8. No research can be included in more than one publication.

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1. Authors must certify that their manuscripts are their original work.
2. Authors must certify that the manuscript has not previously been published elsewhere.
3. Authors must certify that the manuscript is not currently being considered for publication elsewhere.
4. The authors must participate in the peer-review process.
5. Authors are obliged to provide retractions or corrections of mistakes.
6. All Authors mentioned in the paper must have significantly contributed to the research.
7. The authors must state that all data in the paper are real and authentic.
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9. The authors must identify all sources used in the creation of their manuscript.
10. Authors must report any errors they discover in their published paper to the Editors.

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1. Reviewers should keep all information regarding papers confidential and treat them as privileged information.
2. Reviews should be conducted objectively, with no personal criticism of the author.
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4. Reviewers should identify relevant published work that has not been cited by the authors.
5. Reviewers should also call to the Editor in Chief's attention any substantial similarity or overlap between the manuscript under consideration and any other published paper of which they have personal knowledge.
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Section D: Editors' responsibilities

1. Editors have complete responsibility and authority to reject/accept an article.
2. Editors are responsible for the contents and overall quality of the publication.
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14. Editors should not allow any conflicts of interest between staff, authors, reviewers, and board members.

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Papers submitted to IJAIR will be screened for plagiarism using **CrossCheck/iThenticate** plagiarism detection tools. IJAIR will immediately reject papers leading to plagiarism or self-plagiarism.

Before submitting articles to reviewers, those are first checked for similarity/plagiarism tool, by a member of the editorial team. The papers submitted to IJAIR must have a similarity level of less than 15%.

Plagiarism is the exposing of another person's thoughts or words as though they were your own, without permission, credit, or acknowledgment, or because of failing to cite the sources properly. Plagiarism can take diverse forms, from literal copying to paraphrasing the work of another. In order to properly judge whether an author has plagiarized, we emphasize the following possible situations:

- An author can literally copy another author's work- by copying word by word, in whole or in part, without permission, acknowledge or citing the original source. This practice can be identified by comparing the original source and the manuscript/work who is suspected of plagiarism.
- Substantial copying implies for an author to reproduce a substantial part of another author, without permission, acknowledge or citation.
  The substantial term can be understood both in terms of quality as quantity, is often used in the context of Intellectual property. Quality refers to the relative value of the copied text in proportion to the work as a whole.
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Every article accepted by IJAIR use references manajement softwere. eg Mendeley or zotero

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The papers published in the International Journal of Artificial Intelligence Research will be considered to retract in the publication if :

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3. it constitutes plagiarism
4. it reports unethical research

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IJAIR Editorial board recognizes that plagiarism is not acceptable and therefore establishes the following policy stating specific actions (penalties) when plagiarism is identified in an article that is submitted for publication in IJAIR.

Definition:

Plagiarism involves the "use or close imitation of the language and thoughts of another author and the representation of them as one's own original work."

Policy:

Papers must be original, unpublished, and not pending publication elsewhere. Any material taken verbatim from another source needs to be clearly identified as different from the present original text by (1) indentation, (2) use of quotation marks, and (3) identification of the source.

Any text of an amount exceeding fair use standards (herein defined as more than two or three sentences or the equivalent thereof) or any graphic material reproduced from another source requires permission from the copyright holder and, if feasible, the original author(s) and also requires identification of the source; e.g., previous publication.

When plagiarism is identified, the Editor in Chief responsible for the review of this paper and will agree on measures according to the extent of plagiarism detected in the paper in agreement with the following guidelines:

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1. Minor: A short section of another article is plagiarized without any significant data or idea taken from the other paper

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It is understood that all authors are responsible for the content of their submitted paper as they all sign the IJAIR Copyright Transfer Form. If a penalty is imposed for plagiarism, all authors will be subject to the same penalty.

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This policy applies also to material reproduced from another publication by the same author(s). If an author uses text or figures that have previously been published, the corresponding paragraphs or figures should be identified and the previous publication referenced. It is understood that in case of a review paper or a paper of a tutorial nature much of the material was previously published.

The author should identify the source of the previously published material and obtain permission from the original author and the publisher. If an author submits a manuscript to IJAIR with significant overlap with a manuscript submitted to another journal simultaneously, and this overlap is discovered during the review process or after the publications of both papers, the editor of the other journal is notified and the case is treated as a severe plagiarism case. Significant overlap means a use of identical or almost identical figures and identical or slightly modified text for one half or more of the paper. For self-plagiarism of less than one half of the paper but more than one-tenth of the paper, the case shall be treated as intermediate plagiarism. If self-plagiarism is confined to the methods section, the case shall be considered as minor plagiarism.

If an author uses some of his previously published material to clarify the presentation of new results, the previously published material shall be identified and the difference to the present publication shall be mentioned. Permission to republish must be obtained from the copyright holder. In the case of a manuscript that was originally published in conference proceedings and then is submitted for publication in IJAIR either in identical or in expanded form, the authors must identify the name of the conference proceedings and the date of the publication and obtain permission to republish from the copyright holder. The editor may decide not to accept this paper for publication.

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Author Guidelines

[Update on December 27, 2017]

Carefully read the submission guidelines as follows:

A. General Requirements

The minimum standard requirements of International Journal of Artificial Intelligence Research must be

1. Written in **English**.
2. The length of submitted paper is at least **6 pages and no more than 12 pages**. Editors will be evaluated if the papers are needing more pages than 12 pages.
3. Use of a tool such as Zotero, Mendeley, or EndNote for r**eference management and formatting**, and choose **IEEE style**
4. Make sure that your paper is prepared using the **IJAIR paper template and Copyright Transfer Form** when if it accepted**.**

B. Structure of The Manuscript

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Smart Tourism Concepts to be applied for the Lake Toba Tourism Area

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Abstract

One way to improve tourism is to take advantage of information and communication technology advances. Smart Tourism is a tourism development that focuses on the application of Information and Communication Technologies (ICT) in an integrated manner with tourism programs. The purpose of the research is to study the concepts of smart tourism and how to apply them to the tourist area of Lake Toba, North Sumatra. The research method used in this study is a qualitative approach. The study on the concept of Smart Tourism was conducted using a literature review and discussion with several related resource persons. The city/district government in the Lake Toba tourist area of North Sumatra is now innovating to develop every tourism potential, both in terms of infrastructure development to smart branding as one of the smart tourism programs in promoting tourist destinations.

Keywords

Smart Tourism, Tourism Area, Lake Toba

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Arif, A., Sodikin, A., & Hidayat, F. (2011). Terbentuknya danau toba. Retrieved from http://nationalgeographic.co.id/berita/2011/10/terbentuknya-danau-toba

Bachrian F.A., Suryawan I.A. (2021). Implementasi Bandung Smart City Untuk Mewujudkan Smart Tourism Destination. Jurnal Destinasi Pariwisata, 9(2), 458-476.

Battarra, R., Fistola, R., La Rocca, R.A. (2016). City SmartNESS: the Energy Dimension of the Urban System. In: Papa, R., Fistola, R. (eds) Smart Energy in the Smart City. Green Energy and Technology. Springer, Cham. https://doi.org/10.1007/978-3-319-31157-9_1

Buhalis, Dimitrios, and Amaranggana, Aditya. (2013). Smart Tourism Destinations. In: Xiang, Z., Tussyadiah, I. (eds) Information and Communication Technologies in Tourism 2014, Springer Cham, 553–564. DOI: https://doi.org/10.1007/978-3-319-03973-2_40

Farania, A., Hardiana, A., Putri, R.A. (2017). Kesiapan Kota Surakarta dalam Mewujudkan Pariwisata Cerdas (Smart Tourism) Ditinjau dari Aspek Faslitas dan Sistem Pelayanan. Indonesia: Surakarta, 12(1), 36-50.

Fawzia, Estylita Dea. (2018). Promotion Strategy by Malang City Government in Creating Museum Mpu Purwa as Tourism Destination (Study at The Department of Culture and Tourism of Malang City). Thesis Sarjana, of Public Administration Faculty of Administrative Science, University of Brawijaya.

Gamatechno. (2019). Penerapan Smart Tourism Dalam Pengelolaan Pariwisata Daerah. Blog.Gamatechno.com, Retrieved from https://blog.gamatechno.com/penerapan-smart-tourism/

Gcaba, O., & Dlodlo, N. (2016). The internet of things for south african tourism. Paper presented at the ISTAfrica.

Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart Tourism: Foundations and developments. Electronic Markets, 25(3), 179–188.

Gretzel, U., Werthner, H., Koo, C., & Lamfus, C. (2015). Conceptual foundations for understanding smart tourism ecosystems. Computers in Human Behavior, 50, 558-563.

Hanum F., Suganda D., Muljana B., Endyana C., Rachmat H. (2020). Konsep Smart Tourism Sebagai implementasi Digitalisasi di Bidang Pariwisata. TORNARE Journal of Sustainable Tourism Reserch, 3(1).

Harrison, C., Eckman, B., Hamilton, R., Hartswick, P., Kalagnanam, J., Paraszczak, J., et al., (2010). Foundations for Smarter Cities. IBM Journal of Research and Development, 54, 1-16.

Helmita, Sari O.N., Julianti N.T., Dwinata J. (2021). Pengembangan Desa Wisata Berkonsep Smart Tourism Melalui Pemberdayaan Kompetensi Masyarakat Desa Pujorahayu. Jurnal Gentiaras Manajemen dan Akuntasi, 13(1), 37 –49.

Hidayah N. (2018). Bagaimana Destinasi Pariwisata Digital Agar Tetap Kompetitif. Retrieved from https://pemasaranpariwisata.com/2018/03/01/destinasi-zaman-now/

Hidayah N. (2018a). Sekilas Mengenai Smart Destinations. 11/01/2018. Retrieved from https://pemasaranpariwisata.com/2018/01/11/sekilas-mengenai-smart-destinations/

Höjer, M., & Wangel, J., (2015). Smart Sustainable Cities: Definition and Challenges, In L. M. Hilty & B. Aebischer (Eds.), ICT innovations for sustainability, advances in intelligent systems and computing, 333-349. Springer, New York.

Huang, C., & Li, Y. (2011). In the 12th five-year plan, the system research of smarter tourism under the background of smarter cities. Paper presented at the Annual conference of tourism tribune.

Koo, C., Yoo, K.-H., Lee, J.-N., & Zanker, M. (2016). Special section on generative smart tourism systems and management: Man-machine interaction. International Journal of Information Management.

Križaj, Dejan, Miha Bratec, Peter Kopić, and Tadej Rogelja. (2021). A Technology-Based Innovation Adoption and Implementation Analysis of European Smart Tourism Projects: Towards a Smart Actionable Classification Model (SACM). Sustainability, 13(18), 10279. DOI: https://doi.org/10.3390/su131810279

Lamsfus, C., Martín, D., Alzua-Sorzabal, A., & Torres-Manzanera, E. (2014). Smart Tourism Destinations: An Extended Conception of Smart Cities Focusing on Human Mobility. Information and Communication Technologies in Tourism 2015, 363–375. DOI: 10.1007/978-3-319-14343-9_27

Liberato P.M.C, Alén-González E., Liberato D.F.V.A. (2018). Digital Technology in a Smart Tourist Destination: The Case of Porto. Journal of Urban Technology, 25(1), 75-97. DOI: https://doi.org/10.1080/10630732.2017.1413228

Li, Y., Hu, C., Huang, C., & Duan, L. (2016). The concept of smart tourism in the context of tourism information services. Tourism Management.

Lin, Y. (2011). The application of the internet of things in Hainan tourism scenic spot. Paper presented at the 2011 Seventh International Conference on Computational Intelligence and Security.

Lopez de Avila, A. (2015). Smart destination: XXI century tourism. Paper presented at the ENTER 2015 Conference on Information and Communication Technologies in Tourism.

Muawanah A. (2013). Definisi, komponen, dan sistem pariwisata. January 31, 2013. Retrieved from https://annisamuawanah.wordpress.com/2013/01/31/definisi-komponen-dan-sistem-pariwisata/

Park, J. H., Lee, C., Yoo, C., & Nam, Y. (2016). An analysis of the utilization of Facebook by local korean governments for tourism development and the network of smart tourism ecosystem. International Journal of Information Management.

Qualman, Erik. 2012. Socialnomics: How Social Media Transforms the Way We Live and Do Business. 2nd edition. John Wiley & Sons, New Jersey.

Rahman, Yudha. 2015. Perubahan Perilaku Ekonomi Masyarakat Sebagai Dampak Pengembangan Pariwisata Alam Perdesaan: Studi Kasus Pemandu Wisata Air Terjun Nyarai Kecamatan Lubuk Alung, Provinsi Sumatera Barat. Tesis, Perecanaan Wilayah dan Kota, Universitas Diponegoro.

Saida Z., and Farid Y.M. (2019). Identification of attitudes supporting tourism development: a case study of the Derawan Island people, Berau of East Borneo. RJOAS, 2(86). DOI: 10.18551/rjoas.2019-02.04

Santoso A., Setyowati A.I., Vydia V. (2022). Instagram: is it a Social Media Solution to Promote Sustainable Tourism? International Journal of Artificial Intelegence Research, 6(1). DOI: 10.29099/ijair.v6i1.286

Smith, Richard. (2015). Smart Tourism Tools: Linking Technology with The Touristic Resources of City Destinations. NHVT Breda University of Applied Science.

Trinanda M.H. (2020). Tingkat kesiapan penerapan smart tourism dalam meningkatkan potensi sektor pariwisata pesisir di kawasan wisata terintegrasi Teluk Lampung, Studi Kasus Kawasan Strategis Pariwisata Daerah Teluk Pandan, Kabupaten Pesawaran. Tugas akhir program studi perencanaan wilayah dan kota jurusan teknologi infrastruktur dan kewilayahan, Institut Teknologi Sumatera (ITERA) Lampung Selatan.

UNWTO. (2012). Tourism resilience committee stresses need for "Smart Tourism"[EB/OL].www.slideshare.

Wang, D., Li, X., & Li, Y. (2013). China's "smart tourism destination" initiative: A taste of the service dominant logic. Journal of Destination Marketing & Management, 2, 59-61.

Wang, H., Jin, T., & Zhou, B. (2012). Smart Tourism. Tsinghua University Press, Beijing.

Wang, X., Li, X., Zhen, F., & Zhang, J. (2016). How smart is your tourist attraction?: Measuring tourist preferences of smart tourism attractions via a FCEM-AHP and IPA approach. Tourism Management, 54, 309-320.

Werthner, H., Koo, C., Gretzel, U., & Lamfus, C. (2015). Special issue on smart tourism systems: Convergence of information technologies, business models, and experiences. Computers in Human Behavior, 50, 556-557.

Widjaja A.E, dan Tarigan E.R. (2016). Meningkatkan potensi pariwisata danau toba melalui konsep smart tourism: aplikasi dan tantangannya. Seminar Nasional Inovasi dan Teknologi Informasi (SNITI-3) at Samosir, Sumatera Utara, Indonesia.

Yanti, Dewi. (2022). Potensi Kabupaten Simalungun dalam Menerapkan Konsep Smart Tourism melalui Infrastruktur TI [Simalungun's potency in implementing the concept of smart tourism through out the ict infrastructure]. Jurnal Akademi Pariwisata Medan, 10(1), 18-36. DOI: https://doi.org/10.36983/japm.v10i1.177

Yunita, N. W. (2016). Jokowi teken perpres badan otorita pengelola kawasan pariwisata danau toba. Retrieved from http://news.detik.com/berita/3241431/jokowi-teken-perpresbadan-otorita-pengelola-kawasan-pariwisata-danau-toba

Zhui, Xiang, and Tussyadiah, I. eds. (2014). Information and communication technologies in tourism. 2014: Proceedings of the international conference in Dublin, Ireland. Springer science & Business media.

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Smart Tourism Concepts to be applied for the Lake Toba Tourism Area

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ABSTRACT

One way to improve tourism is to take advantage of information and communication technology advances. Smart Tourism is a tourism development that focuses on the application of Information and Communication Technologies (ICT) in an integrated manner with tourism programs. The purpose of the research is to study the concepts of smart tourism and how to apply them to the tourist area of Lake Toba, North Sumatra. The research method used in this study is a qualitative approach. The study on the concept of Smart Tourism was conducted using a literature review and discussion with several related resource persons. The city/district government in the Lake Toba tourist area of North Sumatra is now innovating to develop every tourism potential, both in terms of infrastructure development to smart branding as one of the smart tourism programs in promoting tourist destinations.

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I. Introduction

The world of tourism has now shown a change in market behavior. These changes can be seen in how tourists seek information, plan and implement their trips, engage in activities at destinations, etc. The rapid development of information technology causes this behavior change. Changes in information technology from analog to digital ushered generations in society, from baby boomers to the alpha generation. The phenomenon of the transition of the era makes visitors more demanding and has trends that want convenience and instant ways. The tourism industry has now begun to show its dependence on information and communication technology (ICT) in creating, communicating, and delivering value to its visitors to make it more competitive. [16]

The tourism industry in various countries is trying to increase the selling value and tourist attraction in various ways to be more competitive. One way to improve the tourism industry is to take advantage of advances in information and communication technology (such as the internet of things, cloud computing, big data, and artificial intelligence). This method is known as smart tourism. The Smart Tourism concept is an application of the smart city concept in the tourism sector. The term smart tourism was first mentioned at the United Nations World Tourism Organization (UNWTO) meeting in 2009. In addition, the concept of smart tourism was also put forward by The Organization for Smart Tourism in England in 2011 [22]. In its application, "The smart tourism system includes several elements, namely the Information Exchange Center (IEC), Government, scenic zone, beauty and business [41]". Developed Asian countries such as South Korea, China, and Taiwan implement smart tourism to increase the selling value of their tourism industry[9][36][38]

According to Piu Liu & Yuan Liu [5], smart tourism is closely related to smart cities because the development of the smart tourism concept is based on the existence of the smart city concept first. It relies on infrastructure and strengthens the linkage of each subsystem to the smart city. Therefore, "currently, smart tourism is more widely applied in urban or regional tourist areas that already have complete basic infrastructure, a good transportation system, adequate information technology infrastructure, and a comprehensive service system [39]". There are two main elements in smart tourism in its application: smart tourism destinations and smart tourism tools.

Smart tourism is a platform used to increase the selling value of tourism by integrating Information and Communication Technology (ICT) which impacts the economy and improves tourism services. The application of the smart tourism concept in tourism development is still relatively rare. In the implementation in Indonesia, several regions are reviewing the readiness of their regions to apply the concept of smart tourism, such as Bali, Surakarta, Semarang, and Lake Toba Tourism. The application of smart tourism in several cities has goals such as making it easier for visitors to move (mobility), easier to access information, and easier to get other needs in tourist activities. And realizing a world-class tourism area with a competitive advantage that is not inferior to other areas. [32]

[5] examined the city of Surakarta and stated that Surakarta was somewhat ready to apply the concept of smart tourism. Components of tourism actors who are not ready to make tourist attraction services supported by transportation and tourism supporting facilities cannot run properly. It was knowing the level of readiness of the City of Surakarta to realize smart tourism.[38] show that information and communication technology through the smart tourist concept can be used optimally to help increase the value of tourism in a tourism area. By proposing that the government adopt the Smart Tourism concept as soon as possible better to increase the Lake Toba area's tourism potential. [32] found that the level of readiness for implementing Smart Tourism on coastal tourism objects in Teluk Pandan is somewhat ready.

It may apply smart tourism concepts in the development of Lake Toba Tourism, one of the tourist areas prioritized by the Indonesian government. Thus, this study aims to study the concepts of smart tourism and how to apply them to the tourist area of Lake Toba, North Sumatra. For example, by looking at promotions through websites that have been carried out and created.

II. Methods

The study on the concept of Smart Tourism was conducted using a literature review and discussion with several related resource persons. The concept is a mental picture or perception that summarizes ideas, observations, or feelings similar to meanings that can differ from one another [32]. Literature studies on smart tourism from literature reviews are mostly theoretical or conceptual. Some of them by [4]; [10];[22]; [34]. [36] show that previous smart tourism studies have been carried out in various areas, namely: smart tourism and smart cities, smart tourism destinations, tourism applications on smartphones, smart hotels, smart cards, gamification, smart recommendations for tourists, as well as smart tourism. Guides. [38]. To further complement this study, the researcher also conducted several discussions related to the research with resource persons.

III. Result and Discussion

A. Smart Tourism Destinations

Destinations oriented to providing convenience using ICT as the backbone are called smart destinations. The smart word destinations come from two syllables: "smart" and "destinations." So basically, smart destinations are the implementation of smartness into tourism destinations, and the word smart starts from urban developments that provide various conveniences for visitors or smart cities. So it can postulate the science of smart destinations from smart cities [15].

Smart tourism destinations are defined as innovative tourism destinations built on technological infrastructure that can ensure the sustainability of the development of tourism areas. It can be accessed by anyone and can facilitate the interaction of tourists with the conditions, conditions, or situations of tourism around the tourist area. Thus it can improve the tourist experience and the resident's quality of life [24]. In addition, [4] argue that "smartness" in tourism destinations requires dynamic interconnection between stakeholders through a sophisticated digital platform. It can support the exchange of information related to tourism activities in real-time, with the main goal, namely maximizing tourist satisfaction and resource efficiency. [38]

Smart Tourism Destination is an initiative to improve the tourism experience, improve resource management efficiency and maximize competitiveness, in particular, to increase consumer satisfaction when implementing the sustainability aspects of tourist destinations. “The principles of Smart Tourism Destinations are to improve the tourist travel experience, provide more intelligent

platforms for collecting and distributing information within destinations, facilitate the efficient allocation of tourism resources, and integrate tourism suppliers at the micro and macro levels. It aims to ensure its benefits from this sector are well distributed to local communities. [4].” [32]

[20] add that "Tourism Destinations" are said to be smart when using intensive technology infrastructure. It is provided by smart cities to: “(1) Improve the tourist experience of visitors by personalizing and making them aware of both the tourism services and products available to them at their destination. And (2) By empowering destination management organizations, local agencies, and tourism companies to make decisions and take action based on the data generated within the destination, collected, managed, and processed through the technological infrastructure (Lamsfus, 2014).” So the main goal of smart destinations is "to take advantage of the system to improve the tourist experience and increase the effectiveness of resource management to maximize competitiveness and consumer satisfaction while demonstrating sustainability in the long term [19]” [4].

Smart destinations, in principle, are to improve the visitor experience. “Provide a smart platform (model) to unify and distribute information within destinations, facilitate more efficient allocation of resources, integrate tourism suppliers at macro and micro levels so that the benefits obtained by local communities can be ensured [3]” [15]. The increase in tourists is expected in the form of experience obtained by providing reviews so that tourists who visit can choose the destination to be addressed based on reviews given by previous tourists. [41].

Smart destinations are divided into two categories: SoftSMARTness: collaboration, innovation, and leadership (human resources); and HardSMARTness: technology and infrastructure (the heart of smartness). According to him, he can interpret the soft and hard concepts in smartness that the destination does not only use technology in the environment but must be coupled with human resource expertise and intelligent decision making. Smart Destinations take advantage of The technological environment (e.g., internet of things, sensors, etc.); Response speed at macro and micro levels (e.g., intelligent services, etc.); End-user devices in multiple touch-points (smartphones, etc.); Bringing stakeholders together using dynamic platforms such as neural systems. [15]

“Smart Tourism Destinations focus on the needs of tourists by combining technology, information, and communication (ICT) with casual culture and tourism innovation industry to promote tourism, service quality, improve tourism management, and scale up the industry to a wider level. Three ICT forms are vital to establishing a Smart Tourism Destination, namely Cloud Computing, IoT and End-User Internet Service System [3].” [17] [2] “First, the Cloud Computing Service is designed to provide an easy way to access online data stores. Second, IoT can support Smart's goals in providing information and analysis as well as automation and control. As for automation and control, the system can control the number of visitors in a particular tourism site by using various sensors about the carrying capacity of each site [36].” “The third component is the End-User Internet Service System, which refers to the number of applications at various levels supported by a combination of Cloud Computing and IoT [21].” [32]

Today the travel and tourism industry has at the forefront of technology and has taken advantage of the relationship between technology and tourism. Smart Tourism Destinations have the following characteristics: “(1) An environment that applies the use of technology; (2) Responsive processes at the micro and macro levels; (3) Distributed end-user devices; and (4) Engaging stakeholders who use the platform dynamically as a central system [19].” This Smart Tourism Destination comprises stakeholders from Tourism organizations, Government, residents/Local Communities, Tourists, and Environment [4]. [2]

The characteristics of smart destinations based on stakeholders have the following characteristics (Hidayah, 2018a) “[4]:

1) Tourism organization, with characteristics: Functioning as a smart hub that can coordinate all information and make it easy to access for users to access information in real-time; Digitizing core business processes; Optimizing energy use; Uniting with local communities, visitors, and the government in co-creating tourism experiences; Organizational agility, speed of decision making and responsiveness to customer needs in a just-in-time manner; Precision targeting & personalized service.

2) Government. With characteristics: Open information management; Personal data settings; Building public-private partnerships.

3) Local community; with characteristics: Constantly connected; Creative and empowered; Smart towards technology; Citizen journalism; Actively involved in building smart heritage/e-culture.

4) Visitors, with characteristics: Well-connected and well-informed; Active critics & buzz marketers; Demand personalized service; Engage socially and technologically; Dynamic discussion in social media; Co-create experiences; Contribute to content; Utilize end-users devices in multi touch-point.

5) Environment, with characteristics: Interconnected through the Internet of Things; Presence of cloud computing services; Ecosystem innovation; Sensor network through the environment; The combination of digital information and social context that will add to the geophysical reality; Can be operated against social platforms."

B. Smart Tourism Tools

Entering a new era of Information and Communication Technology has also opened up many new tools for the tourism industry [4]. It can clarify Smart Tourism Tools as having been formed based on concepts derived from the combination of Smart with Tourism and Tools (ICT). In the context of tourism, tourists can use their mobile phones to explore destinations and activities in the tourist destination.[32]

Users are enabled by the technology in Smart Tourism Tools who can navigate their way through urban environments without using pre-existing maps or trend guides. Visitors can use technology through their cellphones to carry out various tourist activities, and they can find information about the tourist destinations they will visit through Smart Tourism Tools. These activities leave a huge amount of digital data known as Big Data (SOCAP International, 2013, cited in Buhalis & Amaranggana, 2013). By managing Big Data, tourism organizations are in a position to extract valuable insights from information that can provide tourists with a new dimension of customer experience. And improve the way destinations interact with customers, "Those who master this form of technology gain an abundant competitive advantage compare to competitors [4]."

Each destination area masters various matters related to this technology and will get a competitive advantage that can increase competitiveness compared to others. The development of mobile computing software and hardware has supported many applications, especially visual tagging of physical objects and Near Field Communication (NFC), which have contributed to and complemented the development of IoT (Borrego-Jaraba et al., 2011 in Trinanda, 2020).

It can conclude that Smart Tourism Tools is a concept that combines various elements. It includes smart, tourism, and tools (ICT) that can use in the form of applications on various smart devices that manage various big data from tourist destinations and aim to provide real-time information. And also make it easier for tourists to carry out tourist activities. [32]

C. Application of Smart Tourism in the Lake Toba Tourism Area

Lake Toba is one of the tourist objects in North Sumatra, Indonesia. This natural lake, formed by the eruption of the ancient Toba volcano about 74,000 years ago, has an area of about 1,130 km2 and is the largest lake in Southeast Asia [1]. Some tourist areas around Lake Toba are famous for their natural beauty, including: Samosir Island, Sibandang Island, Parapat, Tongging, Bakara, Pusuk Buhit, Lumban Silintong Beach Balige, and others. Lake Toba was recently ordained as one of the priority tourism by the government. The Lake Toba Tourism Area Management Authority Agency (BOPKPDT) was formed on June 1, 2016, which specifically has the task of supporting the acceleration and development of tourism in the Lake Toba area [40]

It can apply smart tourism applications to the Lake Toba Tourism Area [38]. It may apply several smart tourism applications may be applied, divided into 5 (five) categories, namely: 1) Provision of tourist information and services, 2) Ticket management, 3) Nature/environment monitoring, 4) Plant/animal monitoring, and 5) Facilities support. [8]; [23]. The explanation of each category is as follows [38]:

1) Tourist information services are: (1) Provide virtual maps (tourism maps) which are full of interactive information on the tourist areas of Lake Toba; (2) Provide suggestions regarding tourist destinations, food, activities/attractions/shows, schedules, wifi hotspots, accommodation, and services, such as vehicle rentals/information on public transportation; (3) Personalization of services, such as schedules, itineraries, and guides that can customize via mobile apps; (4) Special offers and discounts (tickets, hotels, restaurants, boats, etc.) which can access via mobile apps; (5) On-site discovery learning-studying the natural wealth in the surrounding area, culture, customs, and local culture around Lake Toba (6) Story Telling, for example, an explanation of the history, origin, and development of tourism Lake Toba from time to time. Or maybe a folklore legend. (7) Provide interactive media, augmented games, location-based service, and accurate GPS around Lake Toba.

2) Ticket Management: (1) Entrance tickets to tourist attractions with RFID (Radio Frequency Identification) or NFC (Near Field Communication) technology; (2) Processing and analyzing visitor data; (3) Setting the number of tourists in tourist attractions/attractions around Lake Toba (passenger flow management)

3) Natural/environment monitoring around Lake Toba (Intelligent monitoring): (1) Security Monitor around tourist areas (video surveillance, integrated CCTV 24 hours, seven days non-stop); (2) Forecasting weather conditions (rain, heat, etc.); (3) Air condition, temperature, wind direction, humidity, atmosphere, carbon dioxide level, and UV rays, and others; (4) Monitoring the situation and condition of roads/areas, traffic control, and management. Notifications when a road is closed or due to an accident. (5) Monitoring the state of lake water, water level, water quality, water discharge, and flow, etc. (6) Monitoring and early detection of forest fires.

4) Monitoring of plants/animals around Lake Toba: (1) Monitoring of plants, especially those with "step" status. (2) Monitoring of animals, for example, birds (watching birds), fish, wild animals, etc.

5) We are supporting Facilities and others: (1) Monitoring and calculating the availability of car/motorcycle parking spaces; (2) Monitoring and tracking of commercial boats sailing on Lake Toba.

It can use information and communication technology through the concept of smart tourism optimally to help increase the value of tourism in a tourism area. Smart tourism can significantly change the behavior of tourists, the number of visits, and the function and structure of the tourism industry. The main element in its application is using the concept of smart tourism destinations and smart tourism tools, which can be seen in the table below:

Table 1 Main Elements in implementing Smart Tourism Destinations and Smart Tourism Tools

Dimension	Variables to Pay Attention to	Sub Variable
Smart Destination	Basic Infrastructure	1. Transportation Conditions and Quality (Roads, Wharves, Modes of Transportation) 2. Source and Quality of Clean Water Supply 3. Quality of Electric Network Service 4. Waste Treatment System
	Attractions	1. Availability of ICT to support attractions 2. Quality of Service of Tourist Attractions
	tourism support facilities, availability, Quality, Ease of reach and application of technology	1. Availability and Application of Technology in Security Facilities 2. Availability and Application of Technology in Accommodation Facilities 3. Availability and Application of Technology in Restaurant Facilities 4. Availability and Application of Technology in Shopping Facilities 5. Availability and Application of Technology in Health Facilities 6. Availability and Application of Technology in Bathroom/Toilet Facilities 7. Availability and Application of Technology in Parking Facilities 8. Availability of Worship Facilities 9. Availability and Application of Technology in Banking/ATM Facilities. 10. Availability and Application of Technology in Information Facilities and Tourism Services
Smart	Big Data System	1. Current tourism data management system

Tools	ICT	1. Availability of ICT Infrastructure 2. Internet service availability 3. Tourism support application
	Information and Promotion	1. Tourism destination marketing strategy 2. How to disseminate information that has been implemented
	Provision of tourist information and services	1. Virtual Map Availability 2. Availability of travel agent information, advice regarding tourist destinations, and various services that can access through the application

The following is an example of a website promoting the Lake Toba Tourism Area, which is one part of smart tourism.

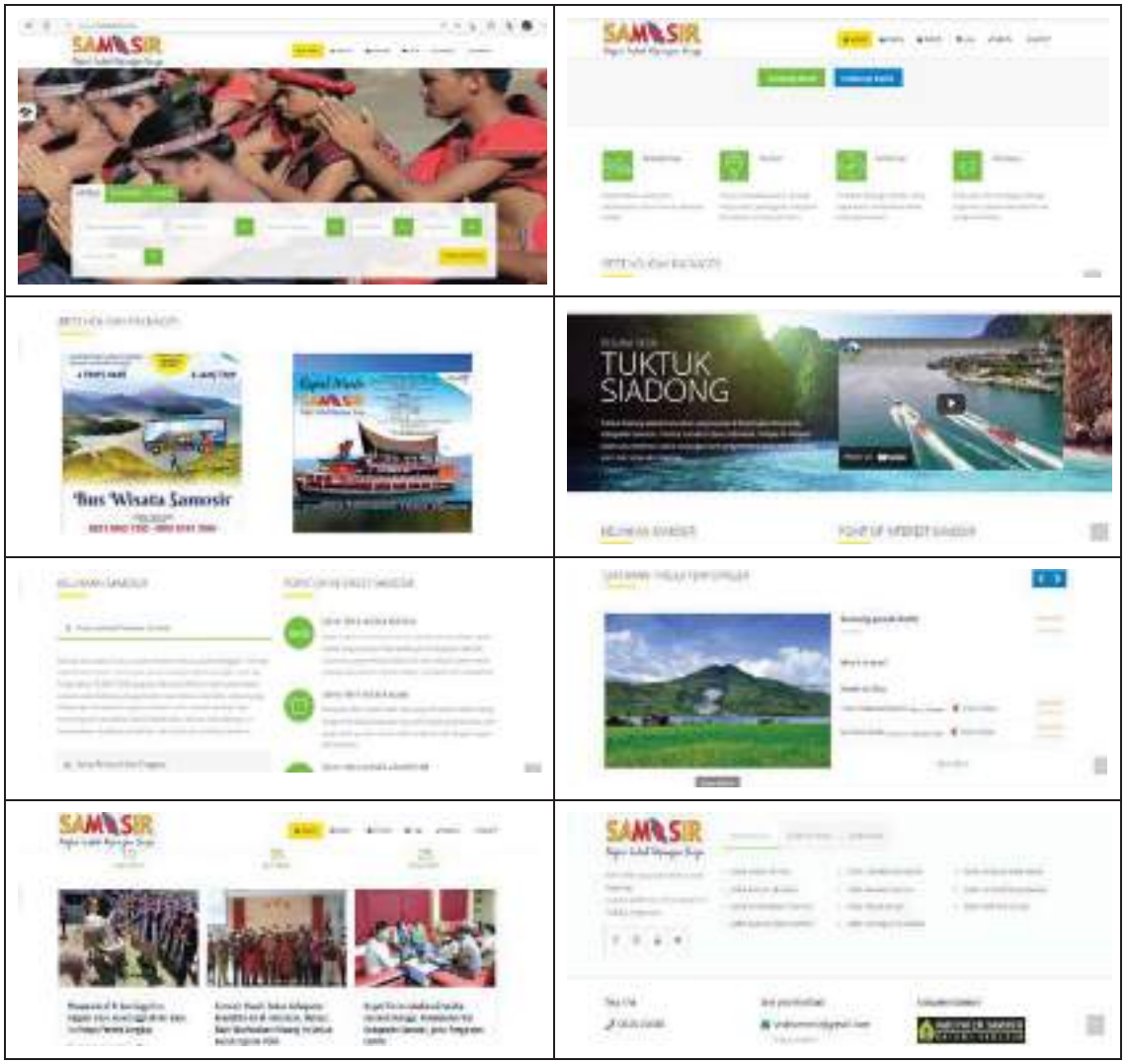

Figure 1 Example Website from https://visitsamosir.com/

IV. Conclusion

Smart Tourism discusses the availability and application of technology, information, and communication (ICT) in infrastructure, attractions, transportation, and supporting facilities. This study was conducted on smart tourism, where the tourism area must prepare various devices. There are two main elements in smart tourism in its application: smart tourism destinations and smart tourism tools. Smart tourism destinations are initiatives to improve the tourism experience, improve resource management efficiency and maximize competitiveness, especially to increase consumer satisfaction when implementing sustainability aspects in tourist destinations. Smart tourism tools are

instruments in the tourism industry for developing tourist destinations by improving service quality and ease of information in tourism activities.

In realizing the smart village movement with the development of smart tourism in the Lake Toba area, an active role is needed from all parties to be able to support Lake Toba as a tourist destination known by national and international tourists. It can optimally use information and communication technology through smart tourism to help increase tourism's value in this region. It can implement smart tourism applications in the Lake Toba tourism area. Several websites that fully inform this tourist area have started to exist and have been prepared, for example, "visitsamosir.com".

References

[1] Arif, A., Sodikin, A., & Hidayat, F. (2011). Terbentuknya danau toba. Retrieved from http://nationalgeographic.co.id/berita/2011/10/terbentuknya-danau-toba

[2] Bachrian F.A., Suryawan I.A. (2021). Implementasi Bandung Smart City Untuk Mewujudkan Smart Tourism Destination. *Jurnal Destinasi Pariwisata*, 9(2), 458-476.

[3] Battarra, R., Fistola, R., La Rocca, R.A. (2016). City SmartNESS: the Energy Dimension of the Urban System. In: Papa, R., Fistola, R. (eds) *Smart Energy in the Smart City*. Green Energy and Technology. Springer, Cham. https://doi.org/10.1007/978-3-319-31157-9_1

[4] Buhalis, Dimitrios, and Amaranggana, Aditya. (2013). Smart Tourism Destinations. In: Xiang, Z., Tussyadiah, I. (eds) *Information and Communication Technologies in Tourism 2014*, Springer Cham, 553–564. DOI: https://doi.org/10.1007/978-3-319-03973-2_40

[5] Farania, A., Hardiana, A., Putri, R.A. (2017). Kesiapan Kota Surakarta dalam Mewujudkan Pariwisata Cerdas (Smart Tourism) Ditinjau dari Aspek Faslitas dan Sistem Pelayanan. *Indonesia: Surakarta*, 12(1), 36-50.

[6] Fawzia, Estylita Dea. (2018). *Promotion Strategy by Malang City Government in Creating Museum Mpu Purwa as Tourism Destination (Study at The Department of Culture and Tourism of Malang City).* Thesis Sarjana, of Public Administration Faculty of Administrative Science, University of Brawijaya.

[7] Gamatechno. (2019). Penerapan Smart Tourism Dalam Pengelolaan Pariwisata Daerah. Blog.Gamatechno.com, Retrieved from https://blog.gamatechno.com/penerapan-smart-tourism/

[8] Gcaba, O., & Dlodlo, N. (2016). The internet of things for south african tourism. Paper presented at the *ISTAfrica*.

[9] Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart Tourism: Foundations and developments. *Electronic Markets*, 25(3), 179–188.

[10] Gretzel, U., Werthner, H., Koo, C., & Lamfus, C. (2015). Conceptual foundations for understanding smart tourism ecosystems. *Computers in Human Behavior*, 50, 558-563.

[11] Hanum F., Suganda D., Muljana B., Endyana C., Rachmat H. (2020). Konsep Smart Tourism Sebagai implementasi Digitalisasi di Bidang Pariwisata. *TORNARE Journal of Sustainable Tourism Reserch*, 3(1).

[12] Harrison, C., Eckman, B., Hamilton, R., Hartswick, P., Kalagnanam, J., Paraszczak, J., et al., (2010). Foundations for Smarter Cities. *IBM Journal of Research and Development*, 54, 1-16.

[13] Helmita, Sari O.N., Julianti N.T., Dwinata J. (2021). Pengembangan Desa Wisata Berkonsep Smart Tourism Melalui Pemberdayaan Kompetensi Masyarakat Desa Pujorahayu. *Jurnal Gentiaras Manajemen dan Akuntasi*, 13(1), 37 –49.

[14] Hidayah N. (2018). Bagaimana Destinasi Pariwisata Digital Agar Tetap Kompetitif. Retrieved from https://pemasaranpariwisata.com/2018/03/01/destinasi-zaman-now/

[15] Hidayah N. (2018a). Sekilas Mengenai Smart Destinations. 11/01/2018. Retrieved from https://pemasaranpariwisata.com/2018/01/11/sekilas-mengenai-smart-destinations/

[16] Höjer, M., & Wangel, J., (2015). Smart Sustainable Cities: Definition and Challenges, In L. M. Hilty & B. Aebischer (Eds.), *ICT innovations for sustainability, advances in intelligent systems and computing,* 333-349. Springer, New York.

[17] Huang, C., & Li, Y. (2011). In the 12th five-year plan, the system research of smarter tourism under the background of smarter cities. Paper presented at the *Annual conference of tourism tribune*.

[18] Koo, C., Yoo, K.-H., Lee, J.-N., & Zanker, M. (2016). Special section on generative smart tourism systems and management: Man-machine interaction. International Journal of Information Management.

[19] Križaj, Dejan, Miha Bratec, Peter Kopić, and Tadej Rogelja. (2021). A Technology-Based Innovation Adoption and Implementation Analysis of European Smart Tourism Projects: Towards a Smart Actionable Classification Model (SACM). *Sustainability*, 13(18), 10279. DOI: https://doi.org/10.3390/su131810279

[20] Lamsfus, C., Martín, D., Alzua-Sorzabal, A., & Torres-Manzanera, E. (2014). Smart Tourism Destinations: An Extended Conception of Smart Cities Focusing on Human Mobility. *Information and Communication Technologies in Tourism 2015,* 363–375. DOI: 10.1007/978-3-319-14343-9_27

[21] Liberato P.M.C, Alén-González E., Liberato D.F.V.A. (2018). Digital Technology in a Smart Tourist Destination: The Case of Porto. *Journal of Urban Technology*, 25(1), 75-97. DOI: https://doi.org/10.1080/10630732.2017.1413228

[22] Li, Y., Hu, C., Huang, C., & Duan, L. (2016). The concept of smart tourism in the context of tourism information services. *Tourism Management.*

[23] Lin, Y. (2011). The application of the internet of things in Hainan tourism scenic spot. Paper presented at *the 2011 Seventh International Conference on Computational Intelligence and Security*.

[24] Lopez de Avila, A. (2015). Smart destination: XXI century tourism. Paper presented at the *ENTER 2015* Conference on Information and Communication Technologies in Tourism.

[25] Muawanah A. (2013). Definisi, komponen, dan sistem pariwisata. January 31, 2013. Retrieved from https://annisamuawanah.wordpress.com/2013/01/31/definisi-komponen-dan-sistem-pariwisata/

[26] Park, J. H., Lee, C., Yoo, C., & Nam, Y. (2016). An analysis of the utilization of Facebook by local korean governments for tourism development and the network of smart tourism ecosystem. *International Journal of Information Management.*

[27] Qualman, Erik. 2012. *Socialnomics: How Social Media Transforms the Way We Live and Do Business*. 2nd edition. John Wiley & Sons, New Jersey.

[28] Rahman, Yudha. 2015. *Perubahan Perilaku Ekonomi Masyarakat Sebagai Dampak Pengembangan Pariwisata Alam Perdesaan: Studi Kasus Pemandu Wisata Air Terjun Nyarai Kecamatan Lubuk Alung, Provinsi Sumatera Barat.* Tesis, Perecanaan Wilayah dan Kota, Universitas Diponegoro.

[29] Saida Z., and Farid Y.M. (2019). Identification of attitudes supporting tourism development: a case study of the Derawan Island people, Berau of East Borneo. *RJOAS*, 2(86). DOI: 10.18551/rjoas.2019-02.04

[30] Santoso A., Setyowati A.I., Vydia V. (2022). Instagram: is it a Social Media Solution to Promote Sustainable Tourism? *International Journal of Artificial Intelegence Research*, 6(1). DOI: 10.29099/ijair.v6i1.286

[31] Smith, Richard. (2015). Smart Tourism Tools: Linking Technology with The Touristic Resources of City Destinations. *NHVT Breda University of Applied Science.*

[32] Trinanda M.H. (2020). *Tingkat kesiapan penerapan smart tourism dalam meningkatkan potensi sektor pariwisata pesisir di kawasan wisata terintegrasi Teluk Lampung, Studi Kasus Kawasan Strategis Pariwisata Daerah Teluk Pandan, Kabupaten Pesawaran.* Tugas akhir program studi perencanaan wilayah dan kota jurusan teknologi infrastruktur dan kewilayahan, Institut Teknologi Sumatera (ITERA) Lampung Selatan.

[33] UNWTO. (2012). Tourism resilience committee stresses need for "Smart Tourism"[EB/OL].www.slideshare.

[34] Wang, D., Li, X., & Li, Y. (2013). China's "smart tourism destination" initiative: A taste of the service dominant logic. *Journal of Destination Marketing & Management*, 2, 59-61.

[35] Wang, H., Jin, T., & Zhou, B. (2012). *Smart Tourism*. Tsinghua University Press, Beijing.

[36] Wang, X., Li, X., Zhen, F., & Zhang, J. (2016). How smart is your tourist attraction?: Measuring tourist preferences of smart tourism attractions via a FCEM-AHP and IPA approach. *Tourism Management,* 54, 309-320.

[37] Werthner, H., Koo, C., Gretzel, U., & Lamfus, C. (2015). Special issue on smart tourism systems: Convergence of information technologies, business models, and experiences. *Computers in Human Behavior,* 50, 556-557.

[38] Widjaja A.E, dan Tarigan E.R. (2016). Meningkatkan potensi pariwisata danau toba melalui konsep smart tourism: aplikasi dan tantangannya. *Seminar Nasional Inovasi dan Teknologi Informasi* (SNITI-3) at Samosir, Sumatera Utara, Indonesia.

[39] Yanti, Dewi. (2022). Potensi Kabupaten Simalungun dalam Menerapkan Konsep Smart Tourism melalui Infrastruktur TI [Simalungun's potency in implementing the concept of smart tourism through out the ict infrastructure]. *Jurnal Akademi Pariwisata Medan*, 10(1), 18-36. DOI: https://doi.org/10.36983/japm.v10i1.177

[40] Yunita, N. W. (2016). Jokowi teken perpres badan otorita pengelola kawasan pariwisata danau toba. Retrieved from http://news.detik.com/berita/3241431/jokowi-teken-perpresbadan-otorita-pengelola-kawasan-pariwisata-danau-toba

[41] Zhui, Xiang, and Tussyadiah, I. eds. (2014). Information and communication technologies in tourism. 2014: *Proceedings of the international conference* in Dublin, Ireland. Springer science & Business media.