Building bonds for sustainable growth: social capital and networking in Indonesian tourism development
Dia Meirina Suri, Rijalul Fikri, Pahmi Amri, Dini Tiara Sasmi

Party change and electoral performance: assessing the impact of intraparty conflict on the Democrat and Hanura parties
Ridho Al-Hamdi, Krisma Triawan, Lenny Kurniasari, Tanto Lalam, Neni Nur Hayati, Ramil Mahmud

Assessing JAKSTRAKAB: government platform for waste management in Simeulue Regency, Indonesia
Sri Wahyu Handayani, Vellyati Hajad, Fadhill Ilhamsyah, Ikhsan Ikhsan, Heriza Heriza

Navigating the complexities: assessing governance mechanisms for inter-regional cooperation
Ardhana Januar Mahardhani

Transforming vision into action: exploring collaborative governance strategies in the development of the Nusantara New Capital City
Rusmiyat Rusmiyat, Andi Fitri Rahmadany

Bridging the gap: mediating role of organizational citizenship behavior in the relationship between job satisfaction, compensation, and work loyalty
Elvia Siska Sarwi, Dasman Lanin, Aldri Frinaldi

Navigating political terrain: a comprehensive review of leadership theories in political science
Ibnu Asqufi Pohan, Muhmad Taikyuddin Ismail, Sharifah Nurisyahidah Syed Anuar

Governing sustainability: land use change impact on the palm oil industry in Riau Province, Indonesia
Nina Yuslai, Sri Maulidiah

Exploring indigenous intellectual property rights and e-governance: a legal analysis of customary aboriginal knowhow in Arunachal Pradesh, India
Partha Sarothi Rakshit, Koyel Roy, Sarbani Bhownik, Saroj Singhania, Aarin Gosh, Syed Rainaul Hosain, Debanjan Saha

Navigating digital tourism governance: a case study of branding strategies in the Mandalika special economic zones
Ilham Zitri, Rifaid Rifaid, Yudhi Lestanata, Cahyadi Kurniawan

The politics of voicelessness: voices of community elders in ethnic and religious minorities in the Philippines
Sheryl R Morales, Roque S Morales, Randy D Sagun

From global trends to local realities: understanding women’s political involvement for Indonesia’s democratic progress
Yusriah Dzinnun, Hasse Jubba, Muh Azhar, Zuly Qodir

Legislative policy to criminalizing human trafficking in anti-trafficking law in Saudi Arabia
Islam Mahrus Ali Naggi

Technological interventions: a pathway to combatting judicial corruption
Amalia Syauket, Dwi Seno Wijanarko, Tyastuti Sri Lestari, Ismaniah Ismaniah

Geographic information systems and big data analytics: optimizing digital adoption to develop tourism in Buton Islands, Indonesia
Herman Lawela, Anwar Sadat, Ansar Suhair, Muhammat Alin Alfinta, L.M. Ahsan Ishaq
Building bonds for sustainable growth: social capital and networking in Indonesian tourism development
Dia Meirina Suri, Rijalul Fikri, Pahmi Amri, Dini Tiara Sasmi

Party change and electoral performance: assessing the impact of intraparty conflict on the Democrat and Hanura parties
Ridho Al-Hamdi, Krisma Trianisa, Lenny Kurniasari, Tanto Laliam, Neni Nur Hayati, Ramli Mahmud

Assessing JAKSTRAKAB: government platform for waste management in Simeulue Regency, Indonesia
Sri Wahyu Handayani, Vellyayati Hajad, Fadhil Ilhamsyah, Ikhsan Ikhsan, Herizal Herizal

Navigating the complexities: assessing governance mechanisms for inter-regional cooperation
Ardhana Januar Mahardhani

Transforming vision into action: exploring collaborative governance strategies in the development of the Nusantara New Capital City
Rusmiyati Rusmiyati, Andi Fitri Rahmadany

Bridging the gap: mediating role of organizational citizenship behavior in the relationship between job satisfaction, compensation, and work loyalty
Elvia Siska Sari, Dasman Lanin, Aldri Frinaldi

Navigating political terrain: a comprehensive review of leadership theories in political science
Ibnu Asqori Pohan, Muhammad Takiyuddin Ismail, Shariffah Nursyahidah Syed Annuar

Governing sustainability; land use change impact on the palm oil industry in Riau Province, Indonesia
Nina Yuslaini, Sri Maulidiah

Exploring Indigenous intellectual property rights and e-governance: a legal analysis of customary aboriginal knowhow in Arunachal Pradesh, India
Partha Sarothi Rakshit, Koyel Roy, Sarbani Bhowmik, Saroj Singhania, Aarin Gosh, Syed Raihanul Hossain, Debanjan Saha

Navigating digital tourism governance: a case study of branding strategies in the Mandalika special economic zones
Ilham Zitri, Rifaid Rifaid, Yudhi Lestanata, Cahyadi Kurniawan

The politics of voicelessness: voices of community elders in ethnic and religious minorities in the Philippines
Sheryl R Morales, Roque S Morales, Randy D Sagun

From global trends to local realities: understanding women’s political involvement for Indonesia’s democratic progress
Yusriah Dzinnun, Hasse Jubba, Muh Azhar, Zuly Qodir

Legislative policy to criminalizing human trafficking in anti-trafficking law in Saudi Arabia
Islam Mahrous Ali Naggi

Technological interventions: a pathway to combating judicial corruption
Amalia Syauket, Dwi Seno Wijanarko, Tyastuti Sri Lestari, Ismaniah Ismaniah

Geographic information systems and big data analytics: optimizing digital adoption to develop tourism in Buton Islands, Indonesia
Herman Lawelai, Anwar Sadat, Ansar Suherman, Muhammat Alim Alfitna, L.M. Ahsan Ishaq
OTORITAS : Jurnal Ilmu Pemerintahan
Published by the Department of Government Studies,
Faculty of Social and Political Sciences, Muhammadiyah University of Makassar

For further information, please visit: https://journal.unismuh.ac.id/otoritas

**ISSN: 2088-3706 (Print) | 2502-9320 (Online) | DOI: 10.26618**

First published in April 2011

Please send all articles, essays, reviews, and documents to:

**Regular Mail:**
Department of Government Studies
Faculty of Social and Political Sciences
5th Floor of Menara Iqra, Muhammadiyah University of Makassar
Jl. Sultan Alauddin No.259 Makassar, 90221
South Sulawesi, Indonesia

**E-Mail:**
otoritas@unismuh.ac.id

OTORITAS : Jurnal Ilmu Pemerintahan is an internationally peer-reviewed open access journal published triannual in April, August and December, aims to publishes significant and cutting-edge research drawn from all areas of politics and governmental studies and promotes scholarly, theoretical, pragmatic, and contemporary research, which makes a clear conceptual and methodological contribution to existing international literature.

OTORITAS : Jurnal Ilmu Pemerintahan indexed by:

OTORITAS : Jurnal Ilmu Pemerintahan have been double blind-reviewed by international peer reviewers. The decision on whether the scientific article is accepted or not in this journal will be the Editorial Board’s right based on peer reviewer’s recommendation.
About the Journal

OTORITAS : Jurnal Ilmu Pemerintahan, with registered number ISSN 2088-3706 (Print), ISSN 2502-9320 (Online), is an internationally peer-reviewed open access journal published triannual in April, August and December by Department of Government Studies, Faculty of Social and Political Sciences, Universitas Muhammadiyah Makassar in collaboration with Muhammadiyah’s College Association of Government Studies (AIPPTM) and Asia Pacific Society for Public Affairs (APSPA).

OTORITAS : Jurnal Ilmu Pemerintahan aims to publishes significant and cutting-edge research drawn from all areas of politics and governmental studies and promotes scholarly, theoretical, pragmatic, and contemporary research, which makes a clear conceptual and methodological contribution to existing international literature.

OTORITAS : Jurnal Ilmu Pemerintahan Starting from 2015 it is available in e-journal version and has been currently indexed by both national and international indexer institutions such as: ESCI Web of Science (International), DOAJ (International), ASEAN Citation Index (International), Dimensions (International), Garba Rujukan Digital (National), Google Scholar (International), Crossref (International), BASE (International), SINTA (National), and Indonesia One Search (National).

OTORITAS : Jurnal Ilmu Pemerintahan Starting from 2016 and for the upcoming years, the process of manuscript submission and other management processes will be conducted online through Otoritas : Jurnal Ilmu Pemerintahan website and for the betterment of the quality and quantity of Otoritas : Jurnal Ilmu Pemerintahan qualified reviewers and editors are recruited. Besides that in the same year we collaborated with Muhammadiyah’s College Association of Government Studies (AIPPTM) on the publication of this journal.

OTORITAS : Jurnal Ilmu Pemerintahan Starting from 2018, we collaborated with Asia Pacific Society for Public Affairs (APSPA) on the publication and has been accredited by National Journal Accreditation (ARJUNA) Managed by Ministry of Research, Technology, and Higher Education of Republic Indonesia.
Focus and Scope

Otoritas: Jurnal Ilmu Pemerintahan (Journal of Political Science and Government) promotes scholarly, theoretical, pragmatic, and contemporary research, making a clear conceptual and methodological contribution to existing international literature. Its specific aim is to enhance the broad scholarly understanding of governance, public administration, public law, religion and politics, comparative politics, and democratic institutions in emerging countries.

Otoritas: Jurnal Ilmu Pemerintahan (Journal of Political Science and Government) is committed to disseminating rigorous, high-quality research and debate with a scientific influence on the international society. To that purpose, the Editorial team follows a meticulous editorial procedure, bringing the most sophisticated research on modern politics and governance to the academic community and policymakers. The journal is online and has open access, and its internal publication procedure enables it to distribute its research findings internationally promptly.
Editorial Board

EDITOR-IN-CHIEF
Andi Luhur Prianto, Scopus ID: 57208214401, Universitas Muhammadiyah Makassar, Indonesia

MANAGING EDITORS
Nur Khaerah, Scopus ID: 57708938300, Universitas Muhammadiyah Makassar, Indonesia

ACCOCIATE EDITORS
Abel Kinyondo, Scopus ID: 55293738000, University of Dar Es Salaam, Tanzania
Abel Polese, Scopus ID: 57201804952, Dublin City University, Ireland
Ilyas Mohammed, Scopus ID: 57221933986, University of Liverpool, United Kingdom
Michael Hatherell, Scopus ID: 56433408300, Deakin University, Australia
Nursaleh Hartaman, Scopus ID: 57395318100, Universitas Muhammadiyah Makassar, Indonesia
Riccardo Pelizzo, Scopus ID: 6507727385, Nazarbayev University, Kazakhstan

INTERNATIONAL EDITORIAL
Adam Tyson, Scopus ID: 35337925000, University of Leeds, United Kingdom
AKM Ahsan Ullah, Scopus ID: 10043791400, Universiti Brunei Darussalam, Brunei Darussalam
Ahmad Harakan, Scopus ID: 57203222670, Universitas Muhammadiyah Makassar, Indonesia
Andreas Ufen, Scopus ID: 24280605600, German Institute of Global and Area Studies, Germany
Farida Tadjine, Scopus ID: 57678049100, University of Kasdi Merbah Ouargla, Algeria
Mergen Dyussenov, Scopus ID: 57190342068, National University of Singapore, Singapore
Mohd Afandi Salleh, Scopus ID: 55582821500, Universiti Sultan Zainal Abidin, Malaysia
Mubashar Hasan, Scopus ID: 45861188500, Oslo University, Norway
Muh Firyal Akbar, Scopus ID: 57210750267, Universitas Muhammadiyah Gorontalo, Indonesia
Ni Putu Tirka Widanti, Scopus ID: 57970637000, Universitas Ngrah Rai, Indonesia
Nuryanti Mustari, Scopus ID: 57395318000, Universitas Muhammadiyah Makassar, Indonesia
Önder KUTLU, Necmettin Erbakan Universitesi, Turkey
Rudi Hardi, Scopus ID: 57395626900, Universitas Muhammadiyah Makassar, Indonesia
Wolfgang Drechsler, Scopus ID: 36840148600, University College London, United Kingdom

EDITORIAL ASSISTANTS
Abdillah Abdillah, Scopus ID: 57697035900, Universitas Muhammadiyah Makassar, Indonesia
Hamrun Hamrun, Scopus ID: 57395116400, Universitas Muhammadiyah Makassar, Indonesia
# Table of Contents

Building bonds for sustainable growth: social capital and networking in Indonesian tourism development

Dia Meirina Suri¹, Rijalul Fikri², Pahmi Amri³, Dini Tiara Sasmi⁴

1 Department of Public Administration, Universitas Islam Riau, Indonesia
2,3 Department of Government Studies, Universitas Islam Riau, Indonesia
4 Department of Political Science, State University of New York, USA

Party change and electoral performance: assessing the impact of intraparty conflict on the Democrat and Hanura parties

Ridho Al-Hamdi¹, Krisma Trianisa², Lenny Kurniasari³, Tanto Lailam⁴, Neni Nur Hayati⁵, Ramli Mahmud⁶

1,2,3 Department of Government Affairs and Administration, Universitas Muhammadiyah Yogyakarta, Indonesia
4 Faculty of Law, Universität zu Köln, Germany
5 Democracy and Electoral Empowerment Partnership (DEEP) Jakarta, Indonesia
6 Department of Pancasila and Civic Education, Gorontalo State University, Indonesia

Assessing JAKSTRAKAB: government platform for waste management in Simeulue Regency, Indonesia

Sri Wahyu Handayani¹, Vellayati Hajad², Fadhil Ilhamsyah¹, Ikhsan³, Herizat⁵

¹,2,4 Department of Public Administration, Universitas Teuku Umar, Indonesia.
5 Department of Political Science and Public Administration, Erciyes University, Turkiye

Navigating the complexities: assessing governance mechanisms for inter-regional cooperation

Ardhana Januar Mahardhani¹

Department of Civics Education, Universitas Muhammadiyah Ponorogo, Indonesia

Transforming vision into action: exploring collaborative governance strategies in the development of the Nusantara New Capital City

Rusmiyati¹,² Andi Fitri Rahmadany²

¹ Faculty of Government Management, Governance Institute of Home Affairs Jakarta, Indonesia
² Faculty of Community Protection, Governance Institute of Home Affairs Jakarta, Indonesia

Transforming vision into action: exploring collaborative governance strategies in the development of the Nusantara New Capital City

Elvia Siskha Sari¹,² Dasman Lanin³, Aldri Frinaldi³

¹,2,3 Department of Public Administration, Universitas Negeri Padang, Indonesia

Navigating political terrain: a comprehensive review of leadership theories in political science

Ibnu Asqori Pohan¹,², Muhamad Takiyuddin Ismail², Sharifah Nursyahidah Syed Annuar³

¹ Department of Political Science, Universitas Brawijaya, Indonesia
²,3 Department of Political Science, National University of Malaysia, Malaysia.
Governing sustainability: land use change impact on the palm oil industry in Riau Province, Indonesia

Nina Yuslaini1, Sri Maulidiah2
1,2 Department of Government Sciences, Universitas Islam Riau, Indonesia

Exploring indigenous intellectual property rights and e-governance: a legal analysis of customary aboriginal knowhow in Arunachal Pradesh, India

Partha Sarothi Rakshit1, Koyel Roy2, Sarbani Bhowmik3, Saroj Singhania4, Aarin Gosh5,
Syed Raihanul Hossain6, Debanjan Saha7
1234567 Amity Law School, Amity University, India

Navigating digital tourism governance: a case study of branding strategies in the Mandalika special economic zones

Ilham Zitri1, Rifaid2, Yudhi Lestanata3, Cahyadi Kurniawan4
1,2,3,4 Department of Government Studies, Universitas Muhammadiyah Mataram, Indonesia

The politics of voicelessness: voices of community elders in ethnic and religious minorities in the Philippines

Sheryl R. Morales1, Roque S. Morales2, Randy D. Sagun3
1 Polytechnic University of the Philippines-Parañaque City Campus
2 Institute of Comparative and Advances Studies, Philippines
3 Research Management Office, Polytechnic University of the Philippines, Manila

From global trends to local realities: understanding women’s political involvement for Indonesia’s democratic progress

Yusriah Dzunnun1, Hasse Jubba2, Muh. Azhar3, Zuly Qodir4
124 Department of Islamic Politics, Universitas Muhammadiyah Yogyakarta, Indonesia
3 Department of Psychology of Islamic Education, Universitas Muhammadiyah Yogyakarta, Indonesia

Legislative policy to criminalizing human trafficking in anti-trafficking law in Saudi Arabia

Islam Mahrous Ali Naggi1
Department of Public law, Princess Nourah bint Abdulrahman University, Saudi Arabia

Technological interventions: a pathway to combatting judicial Corruption

Amalia Syauket1, Dwi Seno Wijanarko2, Tyastuti Sri Lestari3, Ismaniah4
1,2 Faculty of Law, Universitas Bhayangkara Jakarta Raya, Indonesia
3 Faculty of Computer Science, Universitas Bhayangkara Jakarta Rayam, Indonesia
4 Faculty of Engineering, Universitas Bhayangkara Jakarta Raya, Indonesia

Geographic information systems and big data analytics: optimizing digital adoption to develop tourism in Buton Islands, Indonesia

Herman Lawelai1, Anwar Sadat2, Ansar Suherman3, Muhammat Alim Alfinta4, L.M. Ahsan Ishaq5
1,2,4 Department of Government Studies, Universitas Muhammadiyah Buton, Indonesia
3,5 Department of Communication Science, Universitas Muhammadiyah Buton, Indonesia
Article Guidelines

Article Title: Segoe UI, 14pt Bold, alignment centered, single-line spacing and All Caps. Article title should be written briefly and clearly. It shows exactly the issue to be discussed and should not create misinterpretations. Article title is written in capital letters symmetrically and does not contain unusual abbreviations. Express the main idea of a new article and followed by another explanation.

Author Details: Segoe UI, alignment centered, Article title, author's name (without academic degree(s)), and author's affiliate address are written in the center on the first page under the article title. The distance between title and author's name is double-spacing; meanwhile the distance between author's affiliate address and abstract title is single-spacing. Keywords should be written under abstract for each language. It is arranged alphabetically and separated by a semicolon consisted of 3-5 words. For Indonesian article, the title is translated into English at the beginning of English abstract (see the example above).

Corresponding Author should be marked with an asterisk and followed by a comma “*”) as the example above. At the bottom of the left column on the first page/abstract, it is written the Corresponding Author’s mark and his/her email address (see example). Article revisions and final decisions will only be communicated through the Corresponding Author’s email.

If there is more than one author, write the authors’ names separated by a comma (,). If the author's name consists of two words, the first name should not be abbreviated. If the author's name consists of only one word, write his/her actual name in one word. However, the online version (HTML) will be written in two words consisting of the same name (repeatedly) for metadata indexation purpose (Camdali & Tunc, 2006; Fridman, 2008).

Introduction: Introduction consists of (in sequence) general background, state of the art as the basis for the scientific novelty statement of the article, scientific novelty statement, and research problem or hypothesis. In the end, introduction should mention the purpose of article review. Literature review is not allowed in the scientific article format, so it is replaced by the state of the art to prove the novelty of the article.

Research Methods: Method is implemented to solve problems, including analytical method. The method used to solve the research problems is described in this section.

Results and Discussion: This section consists of results and discussion. Every result should be supported by sufficient data. Then, result should be able to answer the research question or hypothesis stated earlier in the introduction.

Conclusion: Conclusion states the answer of the hypothesis and/or research objective or scientific finding. Conclusion is not the repetition of findings and discussion, but it is the summary of findings as expected in the objective or hypothesis. If necessary, conclusion can also be ended with the next idea to be implemented to the study.

Acknowledgment: Acknowledgment are primarily addressed to research funders or donors. Acknowledgment can also be dedicated to people who contribute in the study.

References: All references used in the article should be listed in the References section. References should contain reference literature originating from primary sources (scientific journals at least 80% of the entire references) published in the last 10 (ten) years. Each article contains at least 10 (ten) references. It is better to write the reference system in the article and in the references section using the reference management programs such as Mendeley, EndNote, Zotero, or others.
Publication Ethics

Otoritas : Jurnal Ilmu Pemerintahan, with registered number ISSN 2088-3706 (Print), ISSN 2502-9320 (Online) is a peer-reviewed journal, available in print and online and published two times a year. This statement clarifies ethical behaviour of all parties involved in the act of publishing an article in this journal, including the author, the chief editor, the Editorial Board, the peer-reviewer and the publisher (Department of Government Studies, Faculty of Social and Political Sciences, Universitas Muhammadiyah Makassar in collaboration with Muhammadiyah’s College Association of Government Studies (AIPPTM) and Asia Pacific Society for Public Affairs). This statement is based on COPE’s Best Practice Guidelines for Journal Editors.

ETHICAL GUIDELINE FOR JOURNAL PUBLICATION
The publication of an article in a peer-reviewed Otoritas : Jurnal Ilmu Pemerintahan is an essential building block in the development of a coherent and respected network of knowledge. It is a direct reflection of the quality of the work of the authors and the institutions that support them. Peer-reviewed articles support and embody the scientific method. It is therefore important to agree upon standards of expected ethical behaviour for all parties involved in the act of publishing: the author, the journal editor, the peer reviewer, the publisher and the society. Department of Government Studies, Faculty of Social and Political Sciences, Universitas Muhammadiyah Makassar in collaboration with Muhammadiyah’s College Association of Government Studies (AIPPTM) and Asia Pacific Society for Public Affairs as publisher of Otoritas : Jurnal Ilmu Pemerintahan takes its duties of guardianship over all stages of publishing seriously and we recognize our ethical and other responsibilities. We are committed to ensuring that advertising, reprint or other commercial revenue has no impact or influence on editorial decisions.

PUBLICATION DECISIONS
The editor of the Otoritas : Jurnal Ilmu Pemerintahan is responsible for deciding which of the articles submitted to the journal should be published. The validation of the work in question and its importance to researchers and readers must always drive such decisions. The editors may be guided by the policies of the journal’s editorial board and constrained by such legal requirements as shall then be in force regarding libel, copyright infringement and plagiarism. The editors may confer with other editors or reviewers in making this decision.

FAIR PLAY
An editor at any time evaluate manuscripts for their intellectual content without regard to race, gender, sexual orientation, religious belief, ethnic origin, citizenship, or political philosophy of the authors.

CONFIDENTIALITY
The editor and any editorial staff must not disclose any information about a submitted manuscript to anyone other than the corresponding author, reviewers, potential reviewers, other editorial advisers, and the publisher, as appropriate.
DISCLOSURE AND CONFLICTS OF INTEREST
Unpublished materials disclosed in a submitted manuscript must not be used in an editor’s own research without the express written consent of the author.

DUTIES OF REVIEWERS:

Contribution to Editorial Decisions
Peer review assists the editor in making editorial decisions and through the editorial communications with the author may also assist the author in improving the paper.

Promptness
Any selected referee who feels unqualified to review the research reported in a manuscript or knows that its prompt review will be impossible should notify the editor and excuse himself from the review process.

Confidentiality
Any manuscripts received for review must be treated as confidential documents. They must not be shown to or discussed with others except as authorized by the editor.

Standards of Objectivity
Reviews should be conducted objectively. Personal criticism of the author is inappropriate. Referees should express their views clearly with supporting arguments.

Acknowledgement of Sources
Reviewers should identify relevant published work that has not been cited by the authors. Any statement that an observation, derivation, or argument had been previously reported should be accompanied by the relevant citation. A reviewer should also call to the editor’s attention any substantial similarity or overlap between the manuscript under consideration and any other published paper of which they have personal knowledge.

Disclosure and Conflict of Interest
Privileged information or ideas obtained through peer review must be kept confidential and not used for personal advantage. Reviewers should not consider manuscripts in which they have conflicts of interest resulting from competitive, collaborative, or other relationships or connections with any of the authors, companies, or institutions connected to the papers.

DUTIES OF AUTHORS

Reporting standards
Authors of reports of original research should present an accurate account of the work performed as well as an objective discussion of its significance. Underlying data should be represented accurately in the paper. A paper should contain sufficient detail and references to permit others to replicate the work. Fraudulent or knowingly inaccurate statements constitute unethical behaviour and are unacceptable.

Originality and Plagiarism
The authors should ensure that they have written entirely original works, and if the authors have used the work and/or words of others that this has been appropriately cited or quoted.

Multiple, Redundant or Concurrent Publication
An author should not in general publish manuscripts describing essentially the same research in more than one journal or primary publication. Submitting the same manuscript to more than one journal concurrently constitutes unethical publishing behaviour and is unacceptable.
Acknowledgment of Sources
Proper acknowledgment of the work of others must always be given. Authors should cite publications that have been influential in determining the nature of the reported work.

Authorship of the Paper
Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors. The corresponding author should ensure that all appropriate co-authors and no inappropriate co-authors are included on the paper, and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

Disclosure and Conflicts of Interest
All authors should disclose in their manuscript any financial or other substantive conflict of interest that might be construed to influence the results or interpretation of their manuscript. All sources of financial support for the project should be disclosed.

Fundamental errors in published works
When an author discovers a significant error or inaccuracy in his/her own published work, it is the author’s obligation to promptly notify the journal editor or publisher and cooperate with the editor to retract or correct the paper.
Geographic information systems and big data analytics: optimizing digital adoption to develop tourism in Buton Islands, Indonesia

Herman Lawelai¹, Anwar Sadat², Ansar Suherman³, Muhammat Alim Alfinta⁴, L.M. Ahsan Ishaq⁵

¹,²,⁴ Department of Government Studies, Universitas Muhammadiyah Buton, Indonesia
³,⁵ Department of Communication Science, Universitas Muhammadiyah Buton, Indonesia

Abstract

This research aims to optimize tourism potential in the Buton Islands, Indonesia, using Geographic Information Systems (GIS) and Big Data Analytics. The study addresses the low tourism potential in the region and constraints in tourism development, such as lack of information and data. Qualitative methods include document analysis, literature studies, and focus group discussions. Quantitative methods involve surveying respondents about the use of GIS and Big Data Analytics in tourism development. Data was collected from government documents, online news, and direct observation of tourist sites. The results emphasize the importance of IT and GIS in developing the tourism sector in the Buton Islands, particularly in Baubau City and South Buton Regency. GIS is crucial for identifying and managing tourism potential, while Big Data Analytics helps optimize development by analyzing visitation trends, tourist preferences, and consumer behavior patterns. The integration of these technologies can improve tourist experience and efficiency of tourism-related public services. By integrating GIS, Big Data Analytics, and Information Technology, local government and stakeholders can collaborate to create a superior tourism experience, support local economic growth, and ensure the sustainability of the natural and cultural environment in the Buton Islands.

Keywords: digital tourism, promotion, strategic innovation, big data analytics

*)corresponding author
E-mail: hermanlawelai92@gmail.com

Introduction

Geographic Information Systems (GIS) and big data analytics are essential in optimizing digital adoption for tourism development (Sakas et al., 2022; Tang, 2023). Using geographic information, big data can strategically plan and control land use to develop and allocate resources for tourism areas such as Sichuan Province (Su, 2023). Using web analytics and big data in tourism development can improve customer visibility and experience. In the era of COVID-19, revenue management, marketing strategies, and innovative and sustainable development of the travel experience must be developed (L. Wu et al., 2023).

Using information technology (IT) in government can potentially improve the effectiveness and efficiency of public services (Lawelai et al., 2023; Sarwar et al., 2023), including in the development of the tourism sector (Pencarelli, 2020; Werthner et al., 2015). GIS and big data analytics are recent developments in government information technology that can be applied to tourism development (Tsou, 2015). By integrating GIS and big data analytics in tourism development, the government can utilize data and
information to identify tourism potential that needs to be developed and determine the right development strategy (Miah et al., 2017), and make more precise and strategic decisions in developing tourism in an area.

GIS technology has had a significant impact on tourism development by providing valuable spatial analysis tools in tourist destinations such as Parma, Spain (Ruiz-Pérez et al., 2023). It also controls pedestrian flows and identifies cultural heritage sites near railroad systems, thus facilitating sustainable tourism routes between cities such as Turin and Milan (Rolando & Scandifflio, 2022). GIS also helps assess visitor preferences and helps travelers decide on planning and marketing strategies (Li et al., 2021). GIS also plays an important role in tourism, potential assessment, geological mapping, and supporting integrated management frameworks for natural areas such as Rottnest Island in Western Australia (Supak et al., 2015).

GIS has had a significant impact on tourism development in various regions (Brown & Weber, 2013). Through integrating spatial data such as topography, climate, vegetation, and infrastructure, GIS helps identify potential tourism areas and develop appropriate strategies (Han et al., 2023). In addition, GIS also helps analyze tourism patterns, plan infrastructure development, and estimate environmental impacts (Nunna & Banerjee, 2022). By combining these data, governments can design sustainable and competitive tourism strategies, including environmentally friendly attractions, effective promotion, and responsible destination management. GIS is thus a valuable tool for planning the future of tourism in the Buton Islands.

Meanwhile, big data analytics can process tourism data and provide new insights into tourism trends, visitor behavior, and preferences (Miah et al., 2017). Thus, the government and tourism actors can be more informed (Burbano et al., 2022; Heimtun & Haug, 2022; Zou & Yu, 2022), and strategic decisions in developing tourism in the Buton Islands (Lawelai et al., 2021). In addition, the use of information technology can also increase government transparency and accountability in tourism development. The government can utilize electronic platforms to publish information related to tourism development (Abdul Aziz et al., 2023), such as plans, budgets, and financial reports. Government information technology use is expected to help improve tourism development in the Buton Islands. New findings and results in this study of government information technology can be applied to tourism development in other regions in Indonesia.

The problem behind this research is the low tourism potential in the Buton Islands, which the government has not maximally utilized (Sadat et al., 2023). Tourism actors (Salma et al., In addition, there are still obstacles to developing tourism in the Buton Islands, such as the lack of information related to tourism potential, lack of data and information about visitors, and lack of access to information for tourists who want to visit the Buton Islands. Therefore, this research aims to optimize digital potential using Geographic Information Systems and Big Data Analytics to develop tourism in the Buton Islands. Thus, it is expected to increase tourism potential in the Buton Islands and encourage regional economic growth.

The urgency of this research lies in the importance of developing the tourism sector in the Buton Islands as a regional economic potential that is still not maximally utilized. Information technology, especially GIS and Big Data Analytics, is crucial in optimizing tourism potential in today’s digital era. This can help collect and analyze data and information related to tourism potential, visitors, and access to tourist information. Thus, tourism development in the Buton Islands can be carried out more
effectively and efficiently to increase regional economic growth and the welfare of the local community (Khairul et al., 2022).

This study aims to create an information system to optimize the tourism potential of the Buton Islands using GIS and big data analysis. This system provides accurate, effective, and efficient information for tourism development. The problem-solving approach includes spatial analysis in decision-making to increase digital potential in tourism development. This research is expected to improve the quality and quantity of tourists, strengthen Indonesia's tourism competitiveness, and improve stakeholder decision-making. Using information technology and big data strengthens innovation and improves efficiency and productivity in the tourism industry.

**Research Methods**

This study focuses on the Buton Islands region, including Baubau City and South Buton Regency, an essential economic, social, and cultural region in Southeast Sulawesi, Indonesia. Baubau City is a historical city founded in 2001 with a land and sea area of 295,072 square kilometers and a population of 166,150 people. Established in 2014, South Buton Regency has a land and sea area of 509.92 square kilometers and a population density of 99,580 people, significantly contributing to the region's economic growth. Understanding the potential and dynamism of the region can help develop effective strategies to increase tourism attractiveness, strengthen the local economy, and improve community well-being.

This study uses several steps to achieve the research objective. In the first phase, geographic data collection will include surveys and focus groups (FGDs) to understand the tourism situation in Baubau City and South Buton Regency and develop geography-based information. In addition, this study will also collect tourism data such as the number of tourist visits, tourists' perceptions, and demographic data of tourists. This research method allows tourism destinations and facilities to be identified and mapped (Rosselló et al., 2021). The provision of tourism information requires the participation of stakeholders through FGDs in tourism decision-making (Avci & Özgen, 2022).

Secondly, in the data analysis stage, researchers used Brand24 to identify patterns, trends, and a deep understanding of big data that can be used for decision-making related to tourism development. Brand 24 is an easy-to-use tool for analyzing discussions and mentions of brands and phrases across various media platforms. It provides sentiment analysis, influencer analysis, and automated PDF reports to help users identify influencers, increase brand awareness, and improve marketing strategies. Web analytics and big data are revolutionizing tourism, enabling destinations to attract more visitors and enhance competitiveness (Tang, 2023). These technologies help predict tourist behavior patterns, optimize destination management, improve decision-making processes, attract quality tourists, and increase tourist revenue (License & Han, 2023).

In the last stage, this research visualizes GIS for Tourism in the Buton Islands, which explains the distribution of tourist destinations in the two research locations. This research also visualizes the trend of mentioning "Wisatabuton" on social media. Utilization of information technology to improve the effectiveness and efficiency of public services in tourism development that displays data on trends in the number of tourists in Baubau City and South Buton Regency.
Results and Discussion
A GIS for Tourism in the Buton Islands

Tourism GIS is very important in the world of tourism (Wei, 2012). Especially in Buton Islands, Baubau City, and South Buton Regency. The system uses geospatial technology and geographic data integration to identify and manage tourism potential in the region (Ambecha et al., 2020). The system provides detailed information about tourist destinations, including location, accessibility, facilities, and unique attractions (Hoang et al., 2018), thus allowing travelers to plan their trips more efficiently.

Tourism GIS also serves as a tool for local governments and tourism destination managers, providing valuable data on visitor patterns, visitation rates, and environmental impact (Zhang et al., 2020). This data helps plan visit management strategies, establish destination capacity, and design conservation measures to preserve nature and culture (Hewlett & Brown, 2018).

The Buton Islands Tourism GIS can potentially benefit the tourism industry, visitors, and local communities. GIS enables personalized travel experiences, increasing visitor satisfaction and expanding the range of passengers visiting the islands. Mobile apps and interactive websites can provide comprehensive information on tourist attractions, visitor reviews, photography, and content sharing, thereby enriching the traveler experience and fostering deeper connections with the locations and local communities.

However, the Buton Islands Tourism GIS also has significant implications for local economic development and the preservation of the unique nature and culture of the region. This technology can enhance local economic sustainability, promote sustainable tourism, and improve tourist accessibility. Therefore, there is an urgent need for the study and development of a Buton Islands Tourism GIS. The Buton Islands can enhance the visitor experience, drive local economic growth, and conserve environmental resources by utilizing advanced technological strategies. Emphasizing this study’s importance can inspire stakeholders to invest resources in this technological advancement to accelerate the growth of the tourism business in the Buton Islands.

The city of Baubau, located in Southeast Sulawesi, Indonesia, is a popular tourist destination famous for its historical and religious tourism (Astiana, 2019; Gufran & Nastia, 2022). The Buton Sultanate Fort, a 2,740-meter-long limestone structure, is the largest in the world and was recognized by the Indonesian Record Museum and Guinness Book Record in 2006. Built-in the 16th century by the third Sultan of Buton, La Sangaji, the fort played an important role in the history and defense of the Buton Sultanate for more than four centuries. The Baadia Fort, built by Sultan Muhammad Idrus Kaimuddin I, was a defensive base from pirate attacks.

In addition to its historical value, Baubau City offers a religious experience with the Great Mosque of Wolio, the oldest mosque in Southeast Sulawesi, and the Cuban Mosque, the tomb of the Sultan of Buton XXIX. The Malige Palace, a heritage wooden building, reflects the tradition of Butonese wooden architecture. Museum Keraton Buton, also known as Museum Budaya Wolio, exhibits a collection of relics of the 38th Buton Sultanate.

The traditional ritual of Batu Poaro, part of Buton’s cultural heritage, is a fascinating experience for tourists seeking a spiritual and historical experience. The ritual pays homage to Sheikh Abdul Wahid, a key figure in the Islamization of the Buton Kingdom. The ritual not only honors historical figures but also reflects the local people’s strong beliefs and cultural roots. The ritual is a direct experience of the
symbolism and traditions passed down from generation to generation, offering visitors a unique and exciting experience.

Figure 1. Distribution of historical tourist destinations of Buton Sultanate
Source: data processing using GRASS GIS

Baubau City and South Buton Regency are also paradises for beach lovers and have various natural attractions. Lakeba Beach in Sulaa Village, Baubau City, offers stunning ocean views and activities such as snorkeling, fishing, jogging, and camping. Families often visit this beach on weekends because of its safe waves and playground. Nirwana Beach in Sula Village, Baubau City, offers a soothing sunset view at dusk and is perfect for tourists looking for white sand and blue seawater.

Figure 2. Distribution of beach destinations
Source: data processing using GRASS GIS

Jodoh Beach in Bola Village, South Buton Regency, is a popular spot for selfies and pre-wedding photo shoots, with facilities such as food stalls, gazebos, and toilets. Pantai Bahari, also known as Ratu Empat, in South Buton Regency, offers natural wonders with clean coastlines, coral formations, and clear seawater. This beach was once a filming location for a television station, so it gives a romantic impression. Lakadao Beach in South Buton Regency is a hidden paradise with cliffs, rocks, and stunning photo spots. Activities that can be done on this beach include snorkeling, swimming, fishing, and diving, and there is a large camping area for a comfortable,
relaxing experience. These beaches are perfect for tourists who want to explore the natural charm of the Buton Islands in Southeast Sulawesi, Indonesia.

Buton Islands, especially in Baubau City and South Buton Regency, is a natural tourist destination in Southeast Sulawesi, Indonesia. Kogawuna Waterfall in Lakolaguu Village, Baubau City, is a popular tourist destination, offering a beautiful natural backdrop for photography and opportunities for freshwater fishing. Kanari Waterfall in Kaisabu Baru Village, Baubau City, is a popular tourist attraction because of the 500-meter-long ring road that connects the two sub-districts.

**Figure 3.** Distribution of waterfall destinations

*Source: data processing using GRASS GIS*

Tirta Rimba Waterfall in Baubau City offers tranquility, with its water flowing gently into natural pools, making it an ideal escape from the daily routine. Kaburaburana Waterfall in South Lawela Village, South Buton Regency, offers beautiful natural scenery, cool breeze from protected forests, and clear water, which local people commonly use. Labusa Waterfall in South Buton Regency, with a height of 30 meters and a cave in the middle, blends beautifully with the surrounding green forest and has a small swimming pool at the bottom. Samparona Waterfall in South Buton Regency offers a hill climbing adventure to reach a 45-meter waterfall hidden in the Samparona Protected Forest area. This waterfall adds to the charm of Buton Islands as a stunning natural tourist destination.

Kotamara area in Baubau City, Southeast Sulawesi, offers an unforgettable relaxing experience with the stunning backdrop of Baubau City Bay. Visitors can enjoy the beautiful sunset while hunting for culinary snacks at the stalls along the way. This area also offers sports facilities such as running tracks, soccer fields, basketball courts, children’s playgrounds, and relaxing places.

Kamali Beach in Baubau City offers stunning views of the beach and bustling boats, with a special attraction in the form of a dragon head statue near the Mayor’s Office. Visitors can relax in the park along the coastline and explore souvenir and snack vendors. Wantiro Hill in Baubau City offers an enchanting atmosphere with unspoiled sea panoramas, with Waramusio Beach below. Wantiro is a popular hangout for sunset lovers and sea view enthusiasts. Batu Sori Tourism is a popular destination in Baubau City, famous for its long bridge over the sea and giant ship-shaped rocks. Located in Palabusa Village, Lea-lea District, visitors can enjoy the bridge’s beauty, multipurpose stage, gazebo, and Batu Sori photo spot, which displays spectacular views of the beach from a height.
Baubau City and South Buton Regency, Southeast Sulawesi, are famous natural tourist destinations with attractions such as Lakasa Cave, Lanto Cave, Moko Cave, and Mokobeau Cave. Lakasa Cave, a stunning cave with sharp stalactites and stalagmites, offers visitors a refreshing pool with beneficial minerals and a stunning view of white crystals. Lanto Cave, a popular tourist attraction, requires diving skills and is unsuitable for beginners due to its dim interior and damp floor. Moko Cave, located in South Buton, is a charming destination with a shallow depth of 50 meters and ancient artifacts such as Chinese jars, ceramics, and human skulls. Visitors can observe these artifacts through freediving, but the roughness of the surrounding rocks makes them unsuitable for beginners. Mokobeau Cave, a natural cave 100 meters long and 50 meters wide, is a must-visit for tourists, offering an unforgettable travel experience due to its aesthetic appeal. Travelers can explore the cave for free, with the best time being late afternoon to evening.

Figure 4. Distribution of beachside culinary destinations
Source: data processing using GRASS GIS

GIS tourism in Buton Islands, especially in Baubau City and South Buton Regency, is important in managing and promoting tourist destinations. The system integrates information about geographic locations, addresses, and descriptions of tourist attractions so that visitors can easily access and understand each destination. The system provides interactive maps and detailed information about these attractions,
which can be accessed through a mobile app or website. Users can see the geographic location, routes, and facilities at each tourist spot, and the system can also provide efficient travel route recommendations based on visitor preferences.

Tourism GIS also helps authorities and managers of tourist attractions regulate visitors’ flow, monitor the environment’s carrying capacity, and take necessary conservation measures (Čulibrk et al., 2021). The system can integrate visitor numbers, travel patterns, and environmental impact data for further analysis. The system can also be used to plan targeted promotional campaigns based on the popularity and appeal of each tourist attraction.

This research shows that GIS for Tourism in the Buton Islands is valuable for managing and marketing tourism potential. GIS provides accurate and up-to-date information, enhances the visitor experience, expands the positive impact of tourism on the local economy, and preserves the environment. This study highlights the importance of identifying and promoting each destination’s distinctive wealth in the tourism concept, emphasizing environmental preservation and cultural heritage in line with the principles of sustainable tourism development.

GIS is a major focus of the research, highlighting the importance of technology in managing tourist destinations. The concept of destination management involves the use of information technology to monitor and manage tourist flows, as well as to enhance the tourist experience (Grundner & Neuhofer, 2021; Huerta-Álvarez et al., 2020; J. Wu & Yang, 2023). An in-depth analysis can delve into how GIS can assist in effective and strategic decision-making in destination management—tourism infrastructure such as museums, beaches, and natural caves. In the literature, tourism infrastructure development is important to improve accessibility and visitor convenience (Dalimunthe et al., 2020; Herrera et al., 2018). Analysis may include comparisons between the success of existing infrastructure and international standards or theories relating to tourism infrastructure development.

In addition, it is important to highlight the role of local communities in tourism development. The concept of sustainable tourism development emphasizes the importance of local community involvement and empowerment (Khalid et al., 2019; Wondirad & Ewnetu, 2019). The analysis may include strategies that have been implemented or recommended to ensure that local communities can equally feel the benefits of tourism. Likewise, tourism marketing strategies are an important factor in the success of tourism destinations. The analysis can link the use of GIS to effective digital marketing and tourism promotion efforts and explore the potential for cooperation with private parties or regional/national tourism organizations.

**Utilization of Big Data Analytics in Increasing Tourism in Buton Islands**

Big data analytics has significantly impacted the development of the tourism sector (Ardito et al., 2019), such as in the Buton Islands. By analyzing data from online reservation platforms, social media, and geolocation sensors, stakeholders can gain insights into visiting trends, traveler preferences, and consumer behavior patterns (Buhalis et al., 2019). This information helps travelers understand their accommodation needs, preferences, and preferences so they can tailor their offerings. Big data also helps identify trends in long and short-term visits, enabling them to plan effective marketing strategies and measure the impact of tourism initiatives.

Big data has improved operational efficiency in the tourism sector, enabling stakeholders to make more informed resource allocation decisions (Liu et al., 2023), leading to optimized tourism service arrangements and better travel routes (Pencarelli,
Regular evaluations of initiatives and programs can identify areas that need improvement or adjustment, resulting in significant improvements in operational efficiency.

Integrating big data analytics with tourism destination management systems has revolutionized the development (Cillo et al., 2021), of personalized tour packages for tourists in the Buton Islands. This integration allows for faster response to trends and changes in traveler preferences, so tour packages can be more responsive to changing market needs. In addition, this integration allows for deeper personalization in providing additional services, offering more precise advice, and improving the traveler experience.

In 30 days (24 Jul 2023 - 23 Aug 2023), there have been four mentions of tourism destinations in the Buton Islands, but the fact that all of them come from social media shows that there is potential that has not been fully tapped. In today’s digital age, leveraging Big Data Analytics can be a powerful tool to improve tourism promotion. While reaching 17,414 people is an appreciable achievement, the potential reach can be much greater with a more targeted analytics strategy.

While there have been nearly a thousand interactions with content, whether these interactions result in conversions to physical visits or purchases is worth considering. Ultimately, the tourism campaign aims to encourage tourists to actually visit the location and experience the beauty of Buton firsthand. Therefore, it is important to measure the impact of this interaction on the end goal.

While there are four pieces of content generated by other users, this can be a positive indicator that there is enthusiasm from the community or travelers toward the destination. However, further strategies can be developed to encourage more user-generated content. Although there are 953 likes, it may be necessary to explore how to create more engaging content that attracts more people's attention. This can involve various elements, such as compelling visuals or a compelling story.

The mentions of Buton Islands on social media, particularly Twitter, have significant value potential. These mentions suggest that people who talk about Buton have influence and can be targeted through promotional strategies. Twitter’s potential as a channel for expanding reach and promoting tourism in the Buton Islands can be leveraged with the right content strategy. However, there is still room for improvement and optimization, such as leveraging Big Data Analytics, increasing user engagement,
and optimizing the use of specific social media platforms to boost tourism promotion in Buton Islands.

This research emphasizes the importance of using big data analysis to improve tourism marketing strategies. This aligns with modern marketing strategies that focus on understanding consumer behavior, industry trends, and customer needs (Rosário & Raimundo, 2021; Sheth, 2021). Big data analysis helps in developing more focused and successful initiatives. The study highlights the importance of conversion metrics in travel marketing, which analyzes how well a campaign motivates users to take action.

The study also emphasizes the importance of creating engaging content to increase user engagement and attract more viewers. This is in line with the concept of content-based marketing, which emphasizes providing valuable and relevant information to the intended audience (Ho et al., 2020; Hollebeek & Macky, 2019). Social media, especially Twitter, is very important for promoting travel because social media helps companies interact with consumers, build brands, and expand the reach of promotional content.

The results of this research emphasize the importance of working with users to improve community engagement and content creation strategies. This research suggests the use of big data analytics to improve destination promotion strategies. Through user engagement in content development and user experience, users can create more relevant and engaging content. Other social media and review sites can also provide useful content. Through big data analytics, users can optimize these strategies by providing valuable data on user preferences and trends, improving content quality and effectiveness, and promoting destination awareness. Thus, this approach can make the tourism industry more efficient and effective in promoting destinations.

**Traveler Trends in Buton Islands**

Tourist trends in the tourism industry are evolving due to factors like the COVID-19 pandemic, focusing on health tourism, sustainable tourism, and virtual tourism (Narmadha & Anuradha, 2021). The industry adapts to new trends by focusing on nature-based destinations, ecotourism, and safety measures (Haukeland et al., 2023). Technologies like multi-buying platforms and high-performance computing tools enhance travel agencies’ role in the industry (Collier & North, 2013). Understanding travelers’ behavior and preferences is crucial for a sustainable tourism industry, emphasizing the importance of technology in the industry.

Based on various studies, social media platforms significantly influence travel trends in island destinations, influencing destination choice, visitor behavior, and interest levels, shaping preferences, and inspiring travel plans (Siegel et al., 2023). In addition, through digital marketing strategies and online promotions, social media marketing effectively increases tourist visits to islands such as Pari Island (Adzra Muthi’ah Hafizah et al., 2022). In Indonesia, social media marketing significantly influences tourists’ perceptions, satisfaction, and loyalty towards new island destinations such as Lebak Regency, Indonesia, highlighting its role in introducing and popularizing the destination (Indrajaya, 2022).

From 2018 to 2022, there will be interesting dynamics in the tourism industry in the Buton Islands. The city of Baubau experienced marked fluctuations in the number of tourist arrivals. Between 2018 and 2019, there was a significant decline. However, things changed quickly. In 2020, there was a sharp spike in the number of visitors, which then continued to increase until 2022. On the other hand, South Buton Regency experienced
encouraging growth from 2018 to 2019. However, in 2020, despite the decline, visitor numbers were still above 2018 levels. Then, there was another increase in 2021 and 2022. This dramatic change in visitor numbers can be influenced by various external factors. Tourism promotion, economic conditions, and even the impact of unexpected factors such as the COVID-19 pandemic can all play an important role in the dynamics of the tourism industry.

Baubau City has proven to have great potential that must be utilized further. The rapid surge from 2020 to 2022 shows that the city has an appeal capable of attracting visitors. Strengthen tourism infrastructure and expand promotion to optimize tourism potential. On the other hand, South Buton Regency shows a higher level of stability in the number of tourist arrivals. Despite the fluctuations, visitor numbers have been relatively stable from year to year. This indicates that the district has attractions that can maintain tourist interest.

Visible trends suggest that there is potential to identify key factors influencing fluctuations in traveler numbers. A deep understanding of these factors can provide a solid basis for planning tourism promotion and development strategies in both regions, especially in Baubau City and South Buton Regency. With proper analysis, the government and relevant parties can design more effective strategies to improve the tourism industry in the Buton Islands.

The number of tourists in Baubau City and South Buton Regency fluctuated significantly over the past five years, with a significant decline in 2019, indicating the need to apply information technology to understand and cope with these changes. Sophisticated analytics and data processing systems can help local governments gain insight into factors that affect traveler numbers, such as seasonality, or external factors, such as events or economic conditions.

The competitive advantage of tourism businesses is significantly influenced by dynamic capabilities such as human resources, organizational learning, and digital marketing (Gintciak et al., 2022). The tourism industry, which is a multi-industry complex, offers significant growth and development potential to address economic challenges in the region (Nguyen et al., 2023). Leadership styles significantly influence group dynamics in organizations, including the tourism sector, by providing clear direction that can motivate team performance (Oprescu, 2023). Tourism significantly
impacts individuals, communities, and sustainable development, shaping social identities and influencing various aspects of life (Ntalakos et al., 2023). The evolution and resilience of the tourism industry is influenced by a variety of complex factors, especially in the face of challenges such as the COVID-19 pandemic.

Tourism infrastructure development is essential to improve regional competitiveness and attract tourists (Petrova et al., 2018). Planning strategies, digital marketing, and accessibility are key factors in attracting tourists (Gupta, 2019). Through a focus on infrastructure development such as accommodation, transportation, and entertainment facilities, as well as effective marketing strategies, destinations can improve their competitiveness, attract more visitors, and drive socio-economic development through tourism activities. Through this approach, it will ultimately improve the overall tourism experience.

The results of this study emphasize that tourism economic theory has significant implications for the development of the tourism industry (Danish & Wang, 2018; Zhao, 2021). The theory emphasizes the importance of considering economic variables in influencing visitor numbers and understanding the impact of global and local economic circumstances on visitor demand. Investments in information technology, such as social media platforms and government websites, have significant implications for improving tourism marketing and maximizing the use of information technology to expand target audiences and increase visitor engagement.

In practice, tourism industry professionals should prioritize developing more efficient advertising techniques and improving services for visitors, such as allocating resources for information technology, improving tourism infrastructure, and developing proficiency in digital marketing. Stakeholder collaboration is essential in designing and implementing tourism development initiatives to ensure that the interests of all stakeholders are considered. By considering these implications, tourism practitioners can plan and implement sustainable tourism development strategies, while researchers and academics can gain a deeper understanding of the factors that influence the dynamics of the tourism industry.

**Conclusion**

This research highlights the importance of integrating big data analysis from GIS and IT to improve sustainable tourism development in Buton Islands, particularly in Baubau City and South Buton Regency. The findings of this study show that GIS helps identify and manage tourism potential by providing detailed information about unique locations, accessibility, amenities, and attractions. Big data analytics optimize tourism development by analyzing online platforms, visitor trends, and consumer behavior patterns. IT integration automates public services, providing accurate information about attractions, accommodations, events, and various tourist facilities. The results of this study emphasize the importance of cooperation between local governments and stakeholders in using information technology to develop the tourism sector.

The theoretical implications of this research are significant, as it provides a foundation for developing new concepts in digital-based tourism and provides insights into the interaction between information technology, environmental sustainability, and tourism development. Practical implications can be implemented by local governments and stakeholders in the Buton Islands, enabling effective strategies and policies to manage tourism destinations, improve public services, and promote tourist attractions. However, limitations of this study include the specific context of the Buton Islands and limitations of data and resources. Therefore, future research needs to explore the
impact of information technology on the tourist experience, sustainable management of tourism destinations, and adaptation to environmental and social change.

Acknowledgment

The research team expresses gratitude to the Directorate General of Higher Education, Research and Technology of the Ministry of Education, Culture, Research and Technology of the Republic of Indonesia for financial support provided through the Research and Community Service Program in Fiscal Year 2023. They also thank all individuals and organizations who provided valuable assistance throughout the research process, as their help was crucial for the study's success.

References


Information System (GIS), Analytic Hierarchy Process (AHP) and Principal Component Analysis (PCA). *Sustainability (Switzerland)*, 10(9), 3097. https://doi.org/10.3390/su10093097


