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Geographical Information System for Indonesian Tourist Destinations

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Abstract

Geographical Information Systems have been widely used as a method for effective, efficient and robust decision making in the business world. It has also been used in the selection of precise and accurate tourist destinations. This paper discusses a review of geographical information system for Indonesian tourist destinations. Articles taken from sources in the form of national journals, international journals and conferences proceedings. The author limits the years 2018-2021. Furthermore, the writer will present the taxonomy and summary of the review results. Finally, the authors present research opportunities that have the potential to be studied in the future.

Keywords: *Geographical Information System; Destination; Tourism; Survey; Indonesia.*

1. Introduction

Indonesia is an archipelago with various ethnicities, cultures, and tourism potential that are scattered throughout the region. It is not surprising that there are a variety of tours that can be found in Indonesia, be it nature tourism, cultural tourism, culinary tourism, spiritual tourism and many other tours that are no less interesting. This causes Indonesia to become one of the countries most visited by foreign tourists. By offering many choices of tourist attractions to tourists, making Indonesia a popular destination for foreign tourists. The tourism sector makes a big contribution to Indonesia because it contributes foreign exchange which can increase state income. Tourism activities also have an economic impact on the community because they can improve people's welfare, especially people who are around tourist objects. In addition, the increasing number of tourist objects also opens up many jobs. Therefore, as a popular tourist destination, Indonesia continues to develop various existing tours in a sustainable manner so that they can compete with tourism in other countries. One of the strategic steps in developing tourism in a sustainable manner is through the use of a Geographical Information System. By utilizing Geographical Information System (GIS) technology, it is expected to be able to analyze the spatial aspects of an area so that the existing tourism potentials can be developed into tourist objects and attractions optimally that can attract both domestic and foreign tourists. With the increasing number of tourists objects it also opens up many jobs. Therefore, as a popular tourist destination, Indonesia continues to develop various existing tours in a sustainable manner so that they can compete with tourism in other countries. One of the strategic steps in developing tourism in a sustainable manner is through the use of a Geographical Information System. By utilizing Geographical Information System (GIS) technology, it is expected to be able to analyze the spatial aspects of an area so that the existing tourism potentials can be developed into tourist objects and attractions optimally that can attract both domestic and foreign tourists. With the increasing number of tourists objects it also opens up many jobs. Therefore, as a popular tourist destination, Indonesia continues to develop various existing tours in a sustainable manner so that they can

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compete with tourism in other countries. One of the strategic steps in developing tourism in a sustainable manner is through the use of a Geographical Information System. By utilizing Geographical Information System (GIS) technology, it is expected to be able to analyze the spatial aspects of an area so that the existing tourism potentials can be developed into tourist objects and attractions optimally that can attract both domestic and foreign tourists. Indonesia continues to develop various existing tours in a sustainable manner so that they can compete with tourism in other countries. One of the strategic steps in developing tourism in a sustainable manner is through the use of a Geographical Information System. By utilizing Geographical Information System (GIS) technology, it is expected to be able to analyze the spatial aspects of an area so that the existing tourism potentials can be developed into tourist objects and attractions optimally that can attract both domestic and foreign tourists. Indonesia continues to develop various existing tours in a sustainable manner so that they can compete with tourism in other countries. One of the strategic steps in developing tourism in a sustainable manner is through the use of a Geographical Information System. By utilizing Geographical Information System (GIS) technology, it is expected to be able to analyze the spatial aspects of an area so that the existing tourism potentials can be developed into tourist objects and attractions optimally that can attract both domestic and foreign tourists.

As an archipelagic country with a very large area, a Geographical Information System for Indonesian tourist destinations is needed so that tourists can get information about the distribution of tourist objects. Thus, making it easier for tourists to find the location of the tourist attraction they want to visit. In addition, the existence of precise and accurate information about tourism potential can raise and promote certain tourist objects that are not yet well known so that they can attract local and foreign tourists. Issue regarding the Geographical Information System for tourist destinations in Indonesia, namely the limited use of geographic information systems on tourist destinations. This is influenced by a lack of education on the importance of using geographic information systems to managers of tourist attractions and local government. The simplest example is that there are still many tourist objects that do not have an official website that can be visited by tourists to obtain all information related to tourist objects. Furthermore, a breakthrough is needed that can support tourism activities, for example the use of technology in the form of applications that can be accessed via cellphones so that it is useful for finding the location of tourist objects that tourists want to visit.

In addition, the limitations of the internet network in some areas can be an inhibiting factor in the utilization of the geographic information system for tourist destinations. In fact, many regions in Indonesia, especially in eastern Indonesia, have interesting and unique natural and cultural attractions, but without internet network access, these areas become isolated and their potential tourist attractions are not exposed and are not well known by local tourists. and abroad. Many studies discuss the Geographical Information System for Indonesian Tourism Destinations in various aspects and different application domains. Therefore, this paper presents a review of the Geographical Information System for Indonesia's Tourism Destinations. The rest of this paper is organized as follows: Part 2 discusses the theoretical background of Geographical Information Systems. Section 3 discusses the method of study in this scientific article, including: how to obtain literature and review methods. Section 4 discusses the literature review on the Geographical Information System for Indonesian Tourism Destinations. Section 5 discusses the discussion in a comprehensive manner. Section 6 discusses the conclusion of the paper followed by suggestions.

2. Research Methodology

2.1. Definition of Geographical Information Systems (GIS)

Geographical Information Systems (GIS) are usually specialized information systems that manage data containing spatial information. GIS is also software that can be used for

input, storage, processing, display and output of geographic information and its attributes (Prahasta, 2005: 49). Geographical Information Systems (GIS) are computer-based systems used to store and process geographic information. Geographical information systems are designed to collect, store, and analyze objects and phenomena. These objects and phenomena emphasize that geographic location is an important or key feature of the analysis. Therefore, a geographic information system is a computer system that has four functions for processing geographic reference data, namely: input, output.

2.2. The Purpose of Geographical Information Systems (GIS)

There are several purposes for using geographic information systems (Geographical Information Systems - Examples, Definition and Benefits in It, 2020), among others from;

a) The scope of the individual, can be used to form, enhance, and develop maps related to personal psychology and real life.
b) Education, GIS aims to gain understanding, knowledge and learning about concepts related to population, location, space and other geographic information.
c) Scope of Research, is used to more easily describe the elements that exist on the earth's surface in terms of shapes, colors and symbols.

2.3. Benefits of Geographical Information Systems (GIS)

As for the benefits of geographic information systems (Geographical Information System (GIS) - Definition, Subsystems, Components, How it Works, History, Benefits, Examples, 2020), among others:

a) For Land Use Management

Utilization and use of land are part of geographic research and need to be considered from all aspects. The goal is to determine land zoning based on existing land characteristics. In this case, GIS can assist in the planning of each area, and the results can be used as a reference for building the necessary facilities / infrastructure. The location of proposals / infrastructure in urban areas needs to be considered so that they are effective and do not violate certain standards which can lead to inconsistencies. Meanwhile in rural areas, land use management is more focused on the agricultural sector. By mapping rainfall, climate, soil conditions, altitude and natural conditions will help determine the location of crops, use of fertilizers and methods of cultivation. The construction of irrigation channels can also be carried out evenly, and a map of rice fields.

b) For Inventory of Natural Resources

The inventory of natural resources includes;

1) Benefits in understanding the distribution of various natural resources, such as petroleum, coal, gold, iron, and other mining products.
2) Understand the distribution of land area, such as areas of potential and critical land, forest areas that are still good and damaged forests, agricultural and plantation areas, changes in land use, and land conservation and rehabilitation.

c) For Supervision of Natural Disaster Areas

The ability of GIS for monitoring natural disaster areas for example; monitoring the area of natural disasters, preventing future natural disasters, compiling plans for reconstructing disaster areas, determining erosion hazard levels, predicting flood heights, and predicting drought levels.

d) For Regional and Urban Planning

Following are the benefits of GIS in urban and regional planning;

1) For resource areas, such as residential land, agriculture, plantations, land use, mining and energy applications, analysis of disaster-prone areas.

2) Used for spatial planning, such as regional spatial planning, industrial estate arrangement, markets, residential areas, system layout and defense status.
3) It is suitable for management, water supply network information systems, power grid planning and expansion, and other areas of management or infrastructure.
4) For the tourism sector, such as an analysis of the tourism inventory and tourism potential of an area.
5) For the transportation sector, for example, list public transport networks, implement alternative routes, expand the road network planning system, analyze areas prone to congestion and accidents.
6) For the socio-cultural field, such as understanding the breadth and distribution of the population of an area, understanding the breadth and distribution of agricultural land as well as possible drainage patterns, data collection, and development of regional growth and development centers. Collecting and developing data for residential areas, industrial areas, schools, hospitals, recreational facilities and offices.

2.4. Geographical Information System (GIS) Subsystem

The subsystem in the Geographical Information System (GIS) can be illustrated (according to Mierzejowska, A. and Pomykoł, M., 2019) as depicted in Figure 1 as follows:

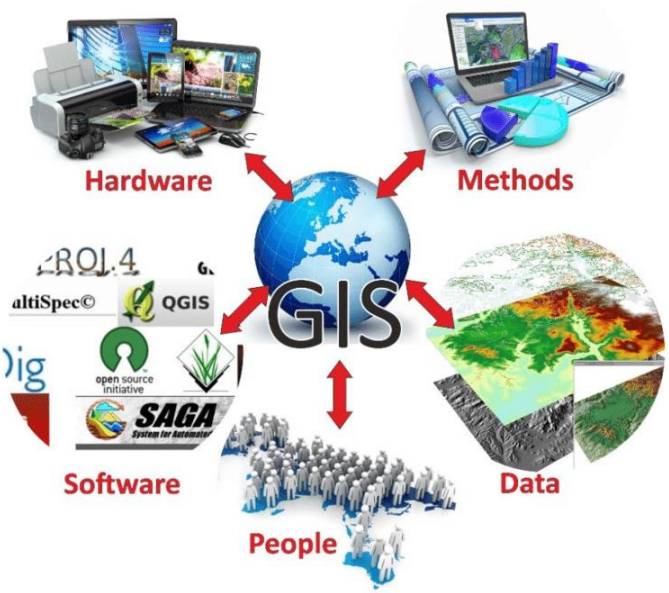

Figure 1. Geographical Information Systems (Mierzejowska, A. and Pomykoł, M., 2019).

A sub system consisting of four capabilities in dealing with geographic data (Geographical Information System (GIS) - Definition, Subsystem, Components, How it Works, History, Benefits, Example, 2020), including;

a) Input data, this subsystem is responsible for collecting and preparing spatial and attribute data from various sources. This subsystem is also responsible for converting or transforming the original data format into a format usable by GIS.
b) Output Data, this subsystem displays or produces all or part of the database output in soft copy and hard copy, among others; tables, charts, maps, etc.
c) Data Management, this subsystem organizes spatial data and attribute data into a database in a way that is easy to retrieve, update and edit.

d) Data Manipulation & Analysis, this subsystem determines the information that can be generated by GIS. In addition, the subsystem also performs data processing and modelling to produce the expected information.

2.5. Geographical Information System (GIS) Components

GIS is a complex system, usually integrated with other computer system environments at the functional and network level (Geographical Information Systems (GIS) - Definition, Subsystems, Components, How It Works, History, Benefits, Example, 2020). The GIS system consists of the following components:

a) Hardware: GIS is run on hardware, in this case a computer system, to perform data storage and processing.
b) Software: GIS is also a modular structured software system, in which the database plays a key role.
c) Geographical data and information: GIS can indirectly collect or store required data and information by importing from other GIS software, or directly collect and store spatial data using a keyboard to digitize from maps and enter attribute data from tables and reports. Data and information required.
d) Management: If a GIS project is well managed and implemented by people with the appropriate skills at all levels, the project will be successful.

2.6. How the Geographical Information System (GIS) Works

GIS can represent the real world (real world) on a computer monitor, and a map can represent the real world on paper. However, compared to paper maps, GIS has greater functionality and flexibility. GIS stores all descriptive information of its elements as attributes in a database, which is then formed by GIS and stored in a table (relational), then GIS links the above elements with their related tables. So that these attributes can be accessed through the location of map elements and vice versa can access the location of map elements through their attributes. Therefore, these elements can be searched and found based on their attributes. GIS connects a set of map elements and their attributes in units called Layers. Rivers, buildings, roads, sea, administrative boundaries, estates, and forests are examples of layers. The collection of these layers will become the GIS database. Therefore, database design is very important in GIS. Database design will find the effectiveness and efficiency of the process of input, management and output of GIS (Geographical Information Systems (GIS) - Definition, Subsystems, Components, How it Works, History, Benefits, Examples, 2020).

2.7. Components and Specifications of Geographical Information Systems (GIS) Applications

a) Geographical Information System Application Components (Geographical Information System (GIS) applications, 2017) include:
   1) Main page, the main page will display a large map containing a place in the form of a marker that can be clicked and displays details of the place, both a description, gallery, map, and route.
   2) The place, dynamic place processing, with google map the location can be positioned by drag and drop. The editor for place descriptions uses TinyMCE to make it easier to write HTML-formatted text. Each place can also be filled with gallery images.
   3) Route Details, displays a detailed route to the place where the start point is your current location.
   4) Login & Password, to be able to process place data, you must log into the geographic information system.
b) Geographic Information System Application Specifications (Geographical Information System (GIS) applications, 2017) include:

1) PHP Version: All PHP version which supports MySQLi
2) DBMS: MySQL (MariaDB)
3) EzSQL Database Library
4) Bootstrap CSS Framework 3
5) HTML 5 & CSS 3

The study method of the Geographical Information System for Indonesian Tourist Destinations is based on literature studies. Namely by collecting related research from various sources, namely articles in journals and conference proceedings, and others. The databases used are sourced from: Google Scholar, Emerald, Elsevier, Science Direct, and Scopus. Figure 2 below presents a method for searching suitable literature from within the country.

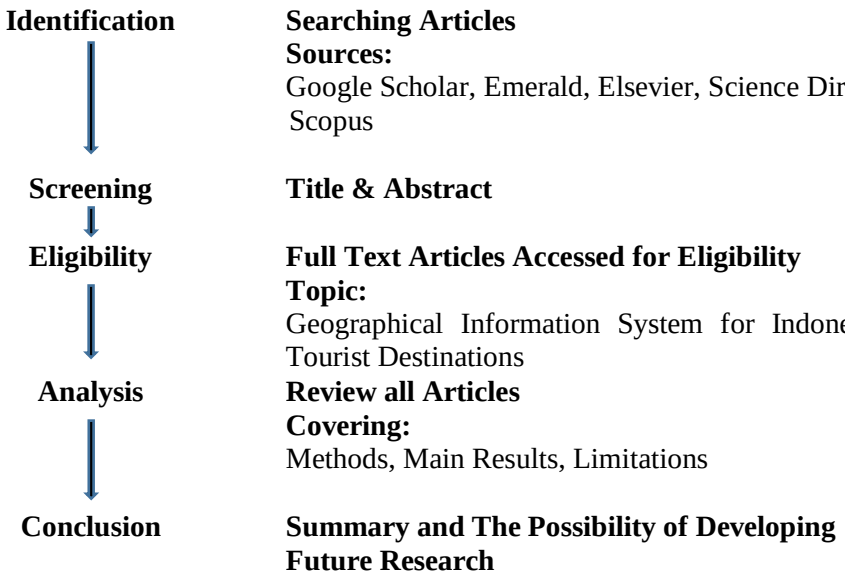

Figure 2. Literature survey method

2.8. Indonesia Tourism Destination Geographic Information System

Many studies have discussed the Geographical Information System of Indonesia's Tourism Destinations from various aspects. Table 1 provides a summary.

Table 1. Geographical Information System for Indonesian Tourist Destinations

Authors and Years	Location	Method	Description	Suggestions
Umagapi & Ambarita, (2018)	Ternate City	Methods of System Analysis and Development using a structured model, and the development using the linear sequential method (Waterfall).	Marine Tourism Geographical Information System at the Tourism Office	a. The development of this website can still be made as attractive as possible and further developed, especially in terms of system views. b. In terms of presentation, it may not be completely perfect, so it's better. Add some more complete information. c. In order for this website to look beautiful, it is advisable to add and copy animations simultaneously so that visitors who visit the website do not get bored immediately.

Authors and Years	Location	Method	Description	Suggestions
Ilyas & Budijanto, (2018)	Batang Regency	This study refers to the 2012 Rogers S Pressman waterfall system development method	Geographical Information System (Sig) of Tourist Destinations	The Batang Regency Tourism Geographical Information System can help the Batang Regency Tourism Office to promote tourism effectively and efficiently to the community. The geographic information system can be used as a guide in finding tourist attractions in Batang Regency. The geographic information system of the Batang Regent Tourism Area can use a catalog, desktop-based, printed media, brochures and booklets to replace the previous information facilities.
Ratungalo, et al., (2018)	Talaud Regency	This stage is done based on the initial stages of the Rapid Application Development (RAD) method [7]	Geographical Information System for Tourism in Talaud Regency based on Android	a. This application will be equipped to display routes by sea. b. This application will add a function to display traffic data on a map in the future. c. Future applications can be equipped with facilities for tourists to book, for tourists to visit used before.
Kartikasari, et al., (2018)	Magetan Regency	Using Literature Studies, Data Collection, System Design, System Implementation, System Testing	Geographical Information System for Tourism Potential of Magetan Regency based on Android	a. The resulting teaching materials are not optimal. b. Hope this app will use more data to add in the future.
Danny, (2018)	Karanganyar Regency	The method used by the author to design the system is the SDLC (System Development Life Cycle) methodology. The form of this system is like a waterfall (Water Fall).	Geographic Information System for Tourism in Karanganyar Regency based on Android	a. The application uses the GPS function, so the system can track the user's location and provide information about the distance from the user to tourist attractions. b. This application does not only use Indonesian but also English, so that users (in this case foreign tourists) can use it. c. Photo studio applications for tourist attractions are more so that they are more attractive. d. There is other content in the system, such as cooking areas and public facilities, so that users can get more travel support information. e. Applications can be developed by adding a cache so that it can display maps offline. 6. Add a search function to make it easier for users to find tourist attractions that do

Authors and Years	Location	Method	Description	Suggestions
				not yet exist.
Marojahan, *et al.*, (2018)	Toba Samosir	Using the SDLC (System Development Life Cycle) method.	Geographical Information System for Web-Based Mapping of Toba Samosir Tourism Potential	A GIS method is needed to analyze the potential of a tourist attraction in Toba Regency
Ariasa & Treman, (2018)	Nusa Penida District, Klungkung Regency	The method used in this research is the method of field observation, interviews, and document recording. The data analysis used is spatial analysis.	Mapping of Potential Tourism Objects with Geographical Information Systems	The next researcher can conduct research in the same location. There are different opinions, but there are variables to measure the progress of a tourist spot.
Nugrahani & Subiyanto, (2018)	Umbul area in Klaten	Withdrawing samples of the economic value of an area based on the Travel Cost Method (TCM) to obtain direct use values and the Contingent Valuation Method (CVM) method is used to obtain the value.	Utilization of Willingness to Pay Value for Making Zones of Economic Value Zones of the Umbul Area in Klaten and Utilities Maps Using Geographical Information Systems Methods	a. Primary data collection should look for time during holidays or weekends, as more visitors and people use the area than usual. b. Retrieving respondent data from more than the specified target to overcome data reduction when data is deleted or rejected. c. We recommend that you select respondents who are married and have an income.
Munthe & Pakpahan, (2018)	Karo District	Data collection methods that will be used as material in this research are observation, interviews, literature study	Geographical Information System for Tourism in Karo Regency Using Web-Based Google Maps	It is hoped that the creation of this Tourism Geographical Information System will display pictures of the Karo Regency tourist map to make it more attractive and accessible to tourists.
Herison & Romdania, (2018)	West Coast District	Using a SWOT analysis	Analysis of Marine Ecotourism Zoning Based on Geographical Information Systems	The Pesisir Barat Regency government needs a comprehensive marine ecotourism planning, and the development of the West Coastal District's human resources also needs to be socialized.
Agus & Ridwan, (2019).	Selayar Islands Regency	The research method used is a qualitative approach	Mapping of Natural Tourism Objects in Selayar Archipelago Regency based on Arcgis Geographical Information System 10.5	Mapping of Natural Tourism Objects in Selayar Islands Regency more details need to be made Based on Arcgis Geographical Information Systems 10.5
Fatkhudin, (2019).	Pekalongan	The method used by the author is the Waterfall	Geographical Information System for Mountain Tourism in	Geographical Information System for Mountain Tourism in Pekalongan needs to be made in more details based on

Authors and Years	Location	Method	Description	Suggestions
		system development method, which consists of 1) analysis 2) design 3) coding 4) system design and design and 5) maintenance.	Pekalongan based on Android	Android
Susanto, (2019)	Maros Regency	Data collection was carried out using a case study approach for completeness of data and information.	Designing Geographical Information System Application for Tourist Attractions in Maros Regency based on Android	It is hoped that with the help of this Android-based application users (especially beginners and tourists) can learn about tourist attractions in the Maros area, so that tourists are interested in visiting, and can also be an inspiration to improve community infrastructure in Maros Regency.
Safitri, (2019)	Bintan Regency	In activities to obtain data in this thesis research, the author uses data collection techniques	Web-Based Geographic Information System (Sig) for Bintan Regency Tourism	It is hoped that it can be used as a solution to promote the existence of a tourist area in Bintan Regency, as well as to function as a guide for tourists visiting the tourist area
Santoso, *et al.*, (2019).	Tangerang City		Guide Tangerang City Tourism Locations with Web-Based Geographical Information Systems.	a. We recommend that the application not only use Indonesian but also English so that foreign tourists can use the suggested website. b. Because the website is based on the internet, the application should be developed again for offline use.
Wahyuni, (2019)	Small Islands in Makassar City	The method used in this research is the method of spatial analysis	Inventory of Island Tourism Potential Based on Geographical Information Systems (GIS)	Some settlement arrangements still need to be rearranged so that residents living on the island can maintain and maintain investments that can add value to the development of the island itself, of which part of the island is already inhabited.
Solle, *et al.*, (2019).	On the island of Timor	The system development method used is the Waterfall method (Waterfall Cycle).	Web-Based Design of Geographical Information System for Tourism Places on the Island of Timor	Due to the limited capacity and time to develop the system, after passing the test or trial phase several things can be suggested, namely: This web-based East Timor Tourism Geographical Information System is designed to help local people find interesting tours and assist the Tourism Bureau to promote the destination excellent test on Timor Island. Features can be added with the help of the administrator from the developer who wants to develop this application.

Authors and Years	Location	Method	Description	Suggestions
Rohadi, *et al.*, (2019).	Mojokerto	The method used in designing this application is Waterfall or waterfall	Development of Geographical Information System for Historical Tourism in Mojokerto as Path Determination	a. To develop this system, it needs more data to be completed. b. Try to use new methods of the system. c. Add other criteria for users to filter the required historical tourist sites.
Yusuf & Kasim, (2019)	on Langala Beach, Gorontalo Province	The method used in this research is survey method, suitability analysis, in-depth interview, and area mapping	Analysis of Marine Tourism Potential Based on Geographical Information Systems	Langala Beach has the potential to be developed into marine tourism. The development of marine tourism requires further research on the management of the Langala tourism area in terms of biology, chemistry, fisheries, socio-economic, and community culture.
Githa & Dharmaadi, (2019)	Bali	The TOPSIS method is used in finding the tourist attraction that best fits the 3 types of criteria, namely budget, time and rating	Geographical Information System for Bali Tourism Object Recommendations Using the TOPSIS Method	The Geographical Information System for Bali Tourism Object Recommendations needs to be developed with other methods
Khasanah, *et al.*, (2020).	Indonesia	The system development method uses the Waterfall method which includes several stages such as: Planning, Analysis, Design, Implementation and System	Web-Based Design of Geographical Information System for Indonesian Cultural Arts	The Design of Geographical Information System for Indonesian Cultural Arts needs to be developed with other applications, e.g. Android
Sutariyani, *et al.*, (2020).	Karangany ar Regency	The data collection technique is done by observation and documentation. As for data analysis using PIECES analysis	Application of Geographical Information System for Tourism in Karanganyar Regency based on Android	a. The data input must be accurate, especially the coordinates of the location. b. For further development, after calculating the distance, you can use the route along the path to the target location (such as arrows) to determine the direction of the location. c. In addition to the information already in the application, you can also develop other information related to the respective centers.
Sofjan, *et al.*, (2020).	Bogor	The method used is interviews, observation, analysis of the existing system, testing	Geographical Information System Design for Web-Based Mapping of Tourism Locations in the City of Bogor	A system is needed to support the selection of a tourist destination location for a tourist, so that it can facilitate the realization of travel location information.
Triwardhani & Zaidiah,	Lebak Regency	This research uses qualitative	Mapping of Tourism Objects in	It is hoped that the people who are going to the Lebak Regency

Authors and Years	Location	Method	Description	Suggestions
(2020).		descriptive analysis and quantitative analysis	Lebak Regency Using GIS	area will get direction regarding the location and information needed. Given the large number of tourist objects in Lebak Regency, you can choose which tourist attraction and the type of tourist attraction that you want to complete according to the budget provided.
Karman & Mulyono, (2020)	In the city of Lubukling gau	The method used in this research is using UML, PHP program, Java and MySQL database as data storage.	Geographical Information System Design for the Location of Tourism Objects in the City of Lubuklinggau based on Android	The introduction of tourist objects in Lubuklinggau City is expected to increase the number of tourists visiting the city.
Mariyanto, *et al.*, (2020).	In Twa Manipo, Enoraen Village, East Amarasi District, Kupang Regency	Using the Object Based Image Segmentation (OBIS) and Normalize Difference Vegetation Index (NDVI) methods.	Spatial Analysis of Land Cover Conditions Between Time in Mangrove Forest Areas Using Geographical Information Systems (Sig)	a. This research can also be used as a material for consideration or comparison between policies taken by local governments or management agencies with policies taken to protect mangrove areas in TWA Manipo, especially Manipo Island itself. b. This research can be used as a reference or reference for similar research in the future.
Nurhindarto, *et al.*, (2020).	Kudus Regency	Method The development applied in this research is the Prototyping method using Unified Modeling Language (UML) modeling.	Application Design of Geographical Information System for Tourism and Culinary Objects in Kudus Regency Based on Android Smartphones	Based on the implementation of the application, there are several suggestions that can be used as improvements or further research so that a better geographic information system application can be built. Applications designed can be developed in terms of appearance or user interface to facilitate accessing and controlling the device while the user is on the move. Street-view view mode needs to be used as a choice of display form to make it easier for users to identify the location not only from a bird-view perspective at the same time to improve accuracy in determining the location. It is necessary to develop a module for updating tourism and culinary information that can be done directly using a smartphone device as a complementary alternative to the existing web-based modules.
Zufriwandi & Elisabet,	In Nias Regency,	The method used in this	Utilization of Geographical	Utilization of other information system platforms in determining

Authors and Years	Location	Method	Description	Suggestions
(2020).	North Sumatra	research is survey method and spatial analysis	Information Systems in Determining Tourist Areas	tourist areas
Rindika, *et al.*, (2020).	City of Pagar Alam, South Sumatra	The TCM (Travel Cost Method) and CVM (Contingent Valuation Method) approach and analysis using the HPM (Hedonic Pricing Method) approach to determine the effect of hedonic value on the number of requests for visits. travel	Geospatial Analysis of Economic Value Development of Pagar Alam City Tourism Area Using Geographical Information System	a. In taking TCM data, CVM and HPM should be done on holidays because the number of visitors or people who sell are more during holidays. b. It is necessary to first study the validity and reliability tests of the CVM and HPM questionnaires to find out how far the validity and c. reliability of the questionnaire to be used. d. In the process of rejecting data, one should be done one by one to get more results e. Accurate f. Be sure to ensure all data, it takes easy to obtain in order to speed up the research process.
Putri, NA, & Waljiyanto, W.	Sendang Village, Wonogiri District, Wonogiri Regency	Analytic Hierarchy Process (AHP) Method	Analysis of Geographical Information Systems (GIS) for Determining Tourist Homestay Locations	Utilization of other information system platforms for determining tourist homestay locations
Sari, *et al.*, (2021).	Banten	The research methodology used in this study includes data collection taken with literature studies, interviews, and observations then analysis, system design, programming, testing, and implementation.	Mapping Application of Waterfall Tourism Locations in Banten Province Based on Geographical Information Systems	From the design of the geographic information system for waterfall tourism that has been made, it is still very possible for better development to be carried out. It is recommended to add features or things that can complement the upcoming geographic information system application for this waterfall tour. The application built still has a relatively simple interface, so there is a need for development in the display design to make it easier for users to use information systems and be able to attract users' interest.

From some of these studies in Table 1 above, it can be concluded that Geographical Information Systems have been widely used in the development of Indonesian tourist destinations. Many studies have developed geographic information systems based on android and web. From various previous studies, the benefits of using GIS are able to provide accurate information and updates in the form of certain tourist locations to tourists. With an Android-based application that can be accessed via cellphone, it is very helpful for tourists in finding tourist attractions that they want to visit. Through the GPS function, the system can track the user's location and provide information about the distance from the

user to tourist attractions. The application also provides information related to travel support facilities, such as places to eat and other facilities.

Geographical information systems can also be used to promote tourist destinations. The use of websites, brochures and booklets with an attractive appearance can provide information related to tourist destinations, so that they are better known by many tourists. In addition, information about fees or rates really helps tourists in choosing the type of tourist attraction that is tailored to the budget provided. With the increasing number of foreign tourists, the website provided should not only use Indonesian but also English in order to make it easier for foreign tourists to access all information related to tourist locations that they want to visit.

3. Results and Discussion

Tourism is an activity that is highly dependent on environmental resources so that it requires a proper planning in its management. Geographical Information System (GIS) technology can be used in the context of developing Indonesian tourist destinations. There are several main features of GIS that are useful for tourism planning, including; ability to manipulate data and spatial attributes, provide necessary added value information, ease in allocating resources, adaptability in providing and changing data from time to time and the ability to identify patterns or relationships based on certain criteria in decision making

GIS technology in tourism activities can be used as a supporting tool in the decision-making process. In addition, GIS can also be used to provide a more holistic approach to solving a problem in which there are qualitative and quantitative data that must be processed. In general, this technology is used to collect information, data and spatial analysis which is then displayed in the form of a more effective graph or map that is easier for the user to understand.

The use of Geographical System technology for Indonesian tourist destinations is very important in developing sustainable tourism. Therefore, there needs to be readiness to develop this technology, such as a complete budget and database. In addition, internet network infrastructure is also needed at tourist destination locations, so that the availability of accurate information can be accessed easily through applications or the web. Thus, these technological breakthroughs can help tourists choose tourist destinations that they want to visit and will have an impact on increasing the number of visitors.

4. Conclusion

Geographical Information System (GIS) is a technology that is very useful in supporting decision making in the tourism sector. This is because the Geographical Information System (GIS) is able to collect information and data and analyze it spatially which then displays it in the form of graphs or maps that are more effective and easier for users to understand. Geographical Information Systems can display information related to tourist locations and the distribution of tourism potential in an area, so that tourists can choose tourist objects to visit. Geographical Information Systems for tourist destinations that are usually developed are based on android and web.

The role of the Geographical Information System is very crucial in the development of tourist destinations in Indonesia. However, the use of Geographical Information Systems is still limited because it was found that not all regions had developed this technology. This is of course very unfortunate, because the tourism potential of each region in Indonesia is very rich and varied. There were several problems found, namely lack of budget, incomplete data base and inadequate supporting infrastructure, such as internet networks. Therefore, further research on Geographical Information Systems needs to be carried out so that its utilization has the maximum impact on the development of tourist destinations in Indonesia.

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