

Web GIS of Tourism: Voyage and Forecast

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Abstract

Web GIS is a kind of distributed information system, which consists of a client and a server, where the server is the GIS server and the client is a web application, desktop application, or mobile application. With the rapid development of technology, increasingly mature GIS technology has been applied in various fields, one of which is tourism. By using a web GIS, reviews related to a tourism object, and tourist locations in a particular area can be easily presented on a website. By utilizing this geographic information system, the potential of tourist attractions and public facilities can be mapped to the maximum, so that tourists can find a place more efficiently and not take long. This study aims to find out the further study the tourism GIS web research over the last 3 years. This study uses the Systematic Literature Review (SLR) method where the search for the required papers comes from an electronic database obtained using the Vos Viewer and Publish or Perish software.

Keywords: Web GIS, SLR, GIS, Tourism.

I. INTRODUCTION

Geographic Information System (GIS) is a framework for saving, manipulating, analysis, organize, and showing the geographical data[1]. GIS is used to be more efficient and cost-effective for processing, managing and storing information[2]. Web GIS is a kind of distributed information system, which consists of a client and a server, where the server is the GIS server and the client is a web application, desktop application, or mobile application[1]. Web GIS is a combination consisting of computer programs, databases, graphic design mapping, and digital maps[3].

With the rapid development of technology, GIS technology is increasingly mature, which has been applied in various fields, one of which is tourism[4]. By using web GIS, reviews related to a tourism object, and tourist locations in certain areas can be easily presented on a website[5]. Web GIS can facilitate timely management of tourism information and promote modern tourism management[6]. Web GIS can be accessed using the internet[7]. By utilizing this geographic information system, the potential of tourist attractions and public facilities can be mapped to the maximum, so that tourists can find a place more efficiently and not take long.[8].

With the increase in the tourism sector, web GIS is present as a medium to facilitate the development of the sector. The number of studies on web GIS shows that the study is very interesting and important to study. However, the limitations of previous research, in fact not all that can be done or applied. Therefore, the author wants to dig deeper into web GIS both in the course of his research and future opportunities. Therefore, this research was conducted using the Systematic Literature Review method.

II. METHOD

The research method that will be used in this study uses the method proposed by Moher D et al.[9] namely Systematic Literature Review (SLR) where the search for the required papers comes from an electronic database obtained using the Vos Viewer and Publish or Perish software. An overview of the methodology used can be seen in Figure 1.

A. Identification

At this stage, identification of the papers that have been obtained is carried out whether there are duplications. If there are duplications, the journal will be deleted. From this stage, none of the papers that have been obtained are duplicate.

B. Screening

At this stage, checks are made on the suitability of the content with the title of the paper, whether it is related to the topic being discussed or not. At this stage, the number of available papers is still entirely based on predetermined keywords, titles, and content.

C. Eligibility

At this stage, a check is carried out on the feasibility of the existing paper so as to produce a paper that is more supportive of the research conducted by selecting the latest paper for the last 3 years.

D. Included

At this stage, a check is carried out on the feasibility of the existing paper so as to produce the most supportive paper from the research conducted.



Figure 1 Research Methode

III. RESULT AND DISCUSSION

Searching for journal data that matches the searched keywords, namely Web Geographic Information System Tourism, produces about 2000 journals, then the top 30 journals are taken based on the Publish or Perish ranking which can be seen in table 1.

TABLE I. RESEARCH JOURNAL

NO	RESEARCHER	TITLE	JOURNAL	COUNTRY
1	[10]	Using remote sensing and geographic Informaton System to assess the status of the nesting habitat of hawksbill turtles (<i>Eretmochels imbricata</i>): At Big Giftun Island, Red Sea, Egypt	The Egyptian Journal of Remote Sensing and Space Sciences	Egypt
2	[11]	Geographic Information System for Booking Beauty Salon and Barber Shop with an Android-Based ECRM Approach	Scientific Journal of Informatics	Indonesia
3	[12]	Web Based Distribution of Zakat, Infaq, and Shodaqoh (Case Study of Surakarta City Region)	International Journal of Computer and Informaation System	Indonesia
4	[13]	Combating Overtourism: The Use of Web-GIS in Visualizing Tourist Distribution and Travel Patterns	Journal of Tourism Sustainability	Indonesia
5	[14]	The Implementation of Web +-GIS in Developing Tourism Object in Langkat Regency with Location Based Service Method	International Journal of Information System & Technology	Indonesia
6	[15]	Design of Geographic Information System Based on Android for Culinary Tourism in Pedan District, Indonesia	International Journal of Global Operations Research	Indonesia
7	[16]	Development of emobility mobile app based on geographic informatioan Systems: Integrating Pulic Transportation, Regional GDP, Regional Government Budget Revenues and Expenditures (APBD) in Indonesia	International Journal of Ebusiness and eGovernment Studies	Indonesia
8	[17]	Analysis of Development of Culinary Tourism Management Model in Case Study East Luwu District Based on SIG	International Journal of Tourism & Hospitality in Asia Pasific	Indonesia
9	[18]	Comprehensive survey for Designing and Implementing Web-Based Tourist Resorts and Places Management Systems	Academic Journal of Nawroz University (AJNU)	Iraq
10	[19]	GIS Base Supporting Muay Thai in Creative Tourism on Andaman Coast Thailand	Academy of Strategic Management Journal	Thailand
11	[20]	Information System, Geography, Information Management Sistem and Tourism Planning: A Geographical Perspective From Malaysia	PalArch's Journal of Vertebrate Palaeontology	Malaysia
12	[21]	Developing Web-Based and Mobile-Based GIS for Places of Worship Information to Support Halal Tourism: A Case sStudi in Bukittinggi, Indonesia	International Journal of Geo-Information	Indonesia
13	[22]	Alternative tourism in the biosphere reserve of vizcaino (REBIVI), Mexico: Facing the impacts of Climate Change	WIT Transactions on Ecology and the Environment	Mexico

NO	RESEARCHER	TITLE	JOURNAL	COUNTRY
14	[23]	The use a Geographic Information System to Increase Outdoor Tourism	European Journal of Applied Business Management	Portugal
15	[24]	Development of GIS for Buildings in the Customary village of Minagkabau Koto Gadang, West Sumatra, Indonesia	International Journal of Geo-Informaton	Indonesia
16	[25]	An Approach integrating geographic information system and building information modelling to assess the building health of commercial buildings	journal of Cleaner Production	China
17	[26]	Tourist Geographic Information System in Baturaden	Journal of Informatics, Information System, Software Engineering and Applications	Indonesia
18	[27]	Tourism Planning in Sundarbans Througs Geographic Information System	Tourism and Hospitality International Journal	India
19	[28]	Futur Holiday Climate Index (HCI) Performance of Urban and Beach Destinations in the Mediterranean	Atmosphere	Mediterrania
20	[29]	Geo-Crowdsourcing Contributions for Cultural Mapping	Journal of Information Science Theory and Practice	Portugis
21	[30]	Medan City Tourism Geographical Information System Using Dijkstra Algorithm Method	Indonesian Journal of Computer Science	Indoensia
22	[31]	A Multimedia Web GIS Portal for Promotion of Tourism in Kenya	Journal of Geographic Information System	Kenya
23	[32]	A Sightseeing Planning Support System with Gamification	Journal of Geographic Information System	Jepang
24	[33]	Conception and Implementation of Geographical Database for Cultural Heritage Management - Case of Historical Jeddah KSA	Journal of Geographic Information System	Arab Saudi
25	[34]	Mapping Application for Greater Bandung Area Using Web Technology	Journal of Engg. Research	Indoensia
26	[35]	Mergin'Mode: Mixed Reality and Geoinformatics for Monument Demonstration	Applied Science	
27	[36]	Implementation of Geographic Information System Base On Google Maps API to Determine Bidikmisi Scholarship Recipient Distribution in Central Sulawesi Indonesia	Journal of Humanities and Social Sciences Studies (JHSSS)	Indoensia
28	[37]	The role of geographic information system and global positioning system in dementia care and research: a scoping review	International Journal of Health Geographics	
29	[38]	Public participation geographic information system (PPGIS) as a method for active travel data acquisition	Journal of Transport Geography	
30	[39]	Sightseeing Navigation System from Normal Times to Disaster Outbreak Times within Urban Tourist Areas in Japan	Applied Sciences	

(source: data processed 2022)

TABLE II. RESEARCH RESULT AND SUGGESTION

NO	RESEARCHER	MEHODE	RESEARCH RESULT	FUTURE RESEARCH
1	[10]		Detect changes that cause turtle populations to decrease by applying remote sensing and web GIS	<ol style="list-style-type: none"> 1. Create a advance monitoring program 2. Development and planning of turtle nesting zones or environments 3. Provide signs and warnings to tourists and fishermen regarding turtle nesting locations 4. Every element of the coastal environment community must understand the environmental impact of tourism in the area
2	[11]	SDLC, Waterfall	An application for order salon and barbershop	
3	[12]		An Web GIS application for mapping the distribution of mustahik and muzzaki in the city of Solo	Limitation this Research: <ol style="list-style-type: none"> 1. Result the research consider only two colors; Even if red and blue have been shown to be the most important in influencing behavior, other research shows that other colors are relevant for consumer decision making. Thus, investigating the effect of all colors will greatly increase the number of variables

NO	RESEARCHER	MEHODE	RESEARCH RESULT	FUTURE RESEARCH
				and possibly affect the interpretation of the data. 2. the experimental task consisted of assessing the attractiveness of the product, but the subject did not actually buy any product. Previous studies have largely shown how tasks and use of resources both alone and significantly affect the decision-making process 3. undifferentiated level of financial education, statistical ability, and risk aversion of different subjects. Therefore, different samples of participants should be analyzed to study the effect of other variables and to generalize the results. The learning effects associated with experimental procedures in the subject can also influence the subject's attention and state the attractiveness of financial products.
4	[13]	YWDM	Produce a map of the distribution of tourists and tourist attractions	
5	[14]		Development a web GIS for tourists in Langkat kabupaten	
6	[15]	Waterfall	mobile-based application for culinary mapping in Pedan sub-district	
7	[16]	Rapid Application Development (RAD)	Create a GIS mobile web application to view the results of the APBD based on locations such as airports, terminals, stations, ports.	
8	[17]		GIS for culinary tourism in East Luwu Regency	
9	[18]	RAD (untuk pengembangan TMS)	Create a Tourism Management System with content derived from previous studies	
10	[19]	Mix Methode	Guidelines in building GIS for muay thai creative tourism	
11	[20]		Moderating influence of institutional factors on geographic associations, application of geographic information systems, information management systems, and Malaysian tourism planning	1. Identify appropriate tourism management. 2. Using different sources from the current research for the achievement of the data in the study.
12	[21]	Waterfall	Produce web and mobile apps to find the nearest mosque and its routes and various halal tourist attractions and facilities	Development a GIS for halal food and tourist destinations in Bukittinggi
13	[22]		Analyzing Climate Scenarios using GIS	
14	[23]		Outdoor tourism GIS web in North portugal	The importance of GIS for sustainable tourism development in various regions
15	[24]		GIS for buildings such as MSMEs, offices, mosques, schools, and health centers. Users are divided into ordinary users who can only search for buildings based on certain criteria, view locations, find information, and survey routes. Meanwhile, village officials are allowed to record residents, buildings and houses, as well as search residents' homes.	Examines the effect of GIS for buildings being developed on MSME activities (embroidery and silver crafts), tourism, and village government services.
16	[25]	AHP, GIS, BIM	Evaluate the health of commercial buildings using AHP, GIS, and BIM (building information modeling)	Using digital tools such as big data in conducting assessments
17	[26]	Agile development mhetods	GIS Web Application for tourism mapping in Baturaden	
18	[27]		Development of tourism GIS in Sundarbans by classifying tourism products and providing tourist routes for tourists	
19	[28]	Eksperimen Coordinated Regional Downscalig	Tourism mapping by showing weather forecast	

NO	RESEARCHER	MEHODE	RESEARCH RESULT	FUTURE RESEARCH
		Experiment (CORDEX)		
20	[29]	crowdsourcing	Cultural mapping methodology in creative tourism	Conducted a more detailed study of the use of crowdsourced web for cultural mapping by visitors in urban and rural areas.
21	[30]	Waterfall	Medan City Tourism GIS using OSM (Open Street Map)	
22	[31]		GIS for media marketing and tourism promotion in Kenya	
23	[32]		Combining Gamification with Web GIS for sightseeing planning	Improve the system that has been built, improve the design of web pages, apply gamification to various other urban areas
24	[33]		Using GIS to identify historical sites in the city of Al-Balad	
25	[34]	Waterfall	GIS-based spatial data for mapping the boundaries of villages in Greater Bandung (Bandung City, Cimahi City, Bandung Regency, West Bandung Regency, and Sumedang Regency)	Improve mapping by adding to the existing potential of each region
26	[35]		generate and develop MIX Reality (MR) and an open source platform that relies on location-based data and services by leveraging geospatial functions	
27	[36]	Mix Methode, prototipe	GIS based on Google API to map the distribution of bidikmisi scholarship recipients by region and economic geography	Use precise coordinates to determine the exact location of the student or student
28	[37]	Arksey dan O, Malley's Framework	Thematic mapping and GPS for the field of dementia	Further research on resource allocation and policy planning is needed in all countries
29	[38]	survey	Results of testing public participation GIS (PPGIS) on the Social Fitness Network (SFN) on Strava users	Increase PPGIS sample size by adding QRCode scan feature
30	[39]		Develop a navigation system that supports user activities during normal and disaster times by integrating Augmented Reality (AR) with Web GIS and pictograms	Increase the significance of using the system to get more data

The summary of the limitations of the study which is then used as a suggestion for the next researcher is as follows:

1. Create a follow-up monitoring program for each program created
2. Identify appropriate tourism management.
3. Using different sources from the current research for the achievement of the data in the research.
4. Building GIS for halal food and tourist destinations
5. To examine the effect of GIS for buildings being developed on MSME activities (embroidery and silver crafts), tourism, and village government services.
6. Using digital tools such as big data in conducting assessments.
7. Conduct a more detailed study on the use of crowdsourced web for cultural mapping by visitors in urban and rural areas.
8. Using precise coordinates to determine the exact location of students or students.
9. Increase PPGIS sample size by adding qrcode scan feature

Furthermore, this study will show how network visualization and density visualization with the keyword “Web Geographic Information System Tourism” can be seen in Figures 2 and 3.

Figure 2 shows that there is only 1 cluster, with the keyword “System” being quoted the most 6 times. Other keywords that are closely related to Web Geographic Information System Tourism and have received many reviews are: information, disaster, user, and disaster support facility.

Figure 3 shows that the keyword “Web Geographic Information System Tourism” is the most reviewed system, followed by information and users, as well as disaster support facilities. It can also be seen that there are still many topics related to the Web Geographic Information System Tourism that can be explored and are still in warm conditions for research, including: navigation systems, pictograms, disaster outbreak time, functions, and others. We can also see that this study is still warm and wide open for further study

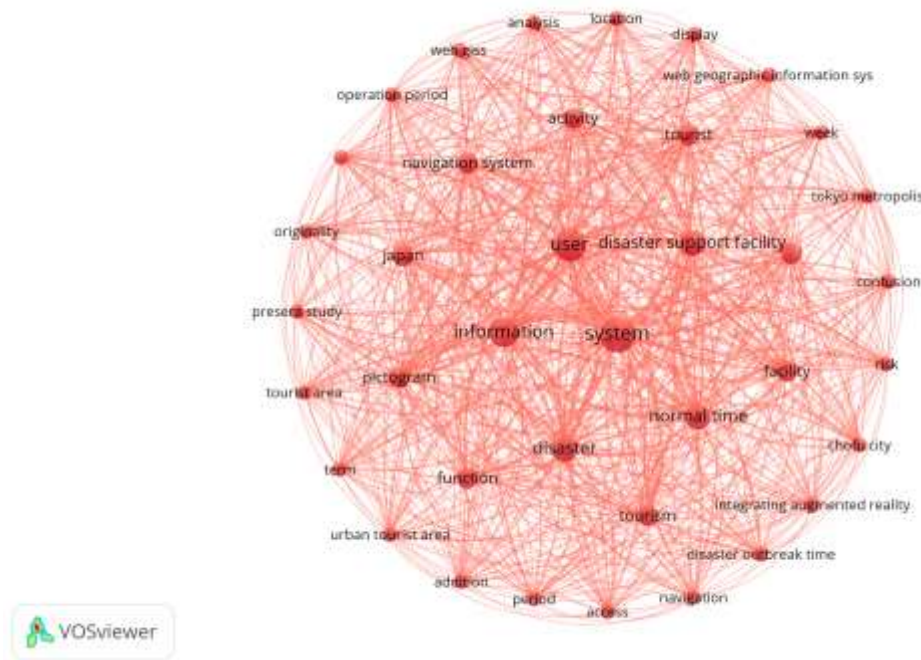


Figure 2 Network Visualization

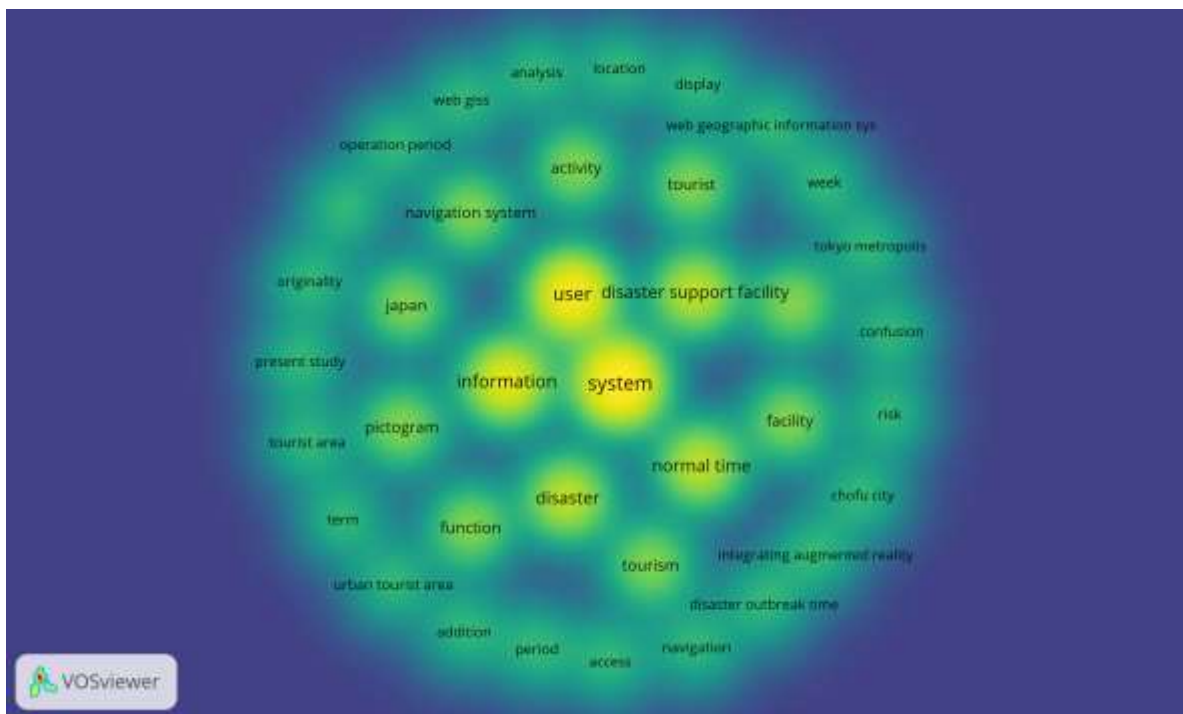


Figure 3 Density Visualization

IV. CONCLUSION

Web Geographic Information System is not a new term in the IT world, but its development into various aspects of life is certainly always interesting to study, such as in the field of tourism. This study found many things that became input for future researchers who are interested in getting involved in the field of tourism and web-based technology development. Research in the last three years has given many views that it turns out that web GIS is very useful when applied, for example the development of a GIS web to detect turtle populations in Egypt which,

if followed up further, will certainly have a positive impact on the turtle ecosystem which will ultimately increase tourist attraction while maintaining the turtle's living environment. Or other examples such as the development of a GIS web to find mosques in Bukittinggi to support a better religious life, which then the researcher suggested to make a GIS to map halal destinations and culinary in the area. The Density Visualization shows that the variables related to web GIS that are still very hot to study are navigation systems, pictograms, disaster outbreak time, functions, and others. Therefore, from this explanation, we can also conclude that web GIS is a tool to analyze the needs of people in various regions and even parts of the world, in which it is hoped that the suggestions outlined by the author can be carried out by researchers in the future.

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