International Journal of Public Administration and Management Research (IJPAMR), Vol. 8, No. 3, Nov.-Dec., 2022. Available online at http://journals.rcmss.com/index.php/ijpamr. ISSN:2350-2231(E) 2346-7215 (P). Covered in Scopedatabase- https://sdbindex.com/Sourceid/00000429, google scholar, etc.
Rabia Adawiyah, I. Rawati, Rasmiati Rasyid, 2022, 8(3):48-65

Development of Tourism Objects and Micro Small and Medium Enterprises (MSMEs) Based on Geographic Information System (GIS) in Tanggetada District

Rabia Adawiyah, I. Rawati, Rasmiati Rasyid
Sembilanbelas November University of Kolaka, Indonesia

Abstract
Tourism is a sector that is being seriously worked on by every region in Indonesia to boost the national economy. In addition to increasing regional income, it can also increase the economic growth of the people who are around these tourist objects, especially Micro, Small and Medium Enterprises (MSMEs). Tanggetada District is one of the areas that has started to pioneer the development of the tourism sector, as seen from several tourist sites that have started to improve by adding various attractive attributes to serve as photo spots and can be posted on social media. However, the lack of widespread information dissemination has made this tourist attraction in Tanggetada District only known to a limited number of people. The utilization of social media and Google, which are considered information search media, seems to be underused. It can be seen that when typing in the keyword Tanggetada tourist attraction, only a few tourist attraction areas are visible. Therefore, we need a geographic information system that utilizes the Google Maps API as a feature that can detect the location points of tourist attractions and MSMEs that are closest to tourism. With this system, it is hoped that it can increase visitors to each tourist attraction in Tanggetada District and in line with the increase in visitors it can also help improve the economy of the surrounding community. This geographic information system was designed using the Rapid Application Development (RAD) method which has features in the form of information on the location of tourist objects and MSMEs around Tanggetada District.
Keywords: *Geographic Information System, object tourism, MSMEs*

Introduction

Tourism is a medium sector that is seriously worked on by each region in Indonesia to push the economy nationally generally and in particular their respective areas. Indonesia has the potential for big tourism because Indonesia is a vast archipelagic country, whose territory stretches from Sumatra to Papua. Tourism is one of the social, economic, political, cultural and technological phenomena so the situation becomes great attention from experts and planning development. Tourism is everything something related to tourism is also a business object as well as a tourist attraction as well as related businesses in this field (Choridotul Bahiyah, Wahyu Hidayat R, 2018)

The land area in Indonesia according to data from the Central Bureau of Statistics (BPS, 2017) is 1,913,578.68 Km ^{2} has riches culture and arts society and beautiful nature is a special attraction. The territory of Indonesia that is passed by the equator being Indonesia has a climate that gave rise to its stunning variety of flora and fauna for tourists to visit Indonesia. circumstances geography of Indonesia in the form of forest rain tropics, mountains the coast and also the ocean are the basic assets that have the potential to be made area famous tour. Indonesia is a famous country with the object the tour good that object tour natural nor object tour culture. development tourism in an area will bring many benefits to society, namely economically, socially and culturally. Village development Tourism is one of the three quick-win programs launched by the Ministry of Tourism and Creative Economy.

Subdistrict tanggetada has tourism potential and is considered quite interesting and unique compared to the surrounding tourist villages which are both beach tourism. The beauty of this regional tourist location has been well managed, as evidenced by the many interesting photo spots to post on social media. Object Tourism in the district These include Janda Lestari Beach, DJ Waterparpark, and other tourist objects developed by the village and not yet exposed. The promotion process of this tourist attraction is considered to be lacking compared to the tourist

objects around it. To find tourist destinations, information seekers must use specific keywords, for example, beach tourism, or directly state the name of the location. One of the search media that is often used in searching for tourist attractions is Google. In addition, also social media Facebook and Instagram. Social media and Google applications are still lacking, there are even tourist objects where social media management is not found related to tourist objects in Tanggetada District. This causes this tourist attraction to be known only by the relevant government and the community around the village. Lack of utilization of information technology in the management of this tourist attraction, causing the dissemination of confusing information from visitors. Therefore, it is necessary to develop the use of GIS-based technology as a means of promoting tourism objects in the district deadline. Exists GIS utilization is also expected to increase economy communities that have local Micro, Small and Medium Enterprises (MSMEs). due to the number of visitors in this area will increase many.

A geographic Information System (GIS) is a combination of three main elements namely system, information, and geography. Thus, a geographic information system is a kind of software, hardware, people, procedures, databases, and communication network facilities that are used to facilitate the processes of entering, storing, manipulating, displaying, and outputting data/information. The function of the Google Maps API is to provide several features for manipulating maps and adding content through various types of services it has, as well as allowing users to build enterprise applications on their website, this application can also detect points of the location where tourism and MSMEs closest to their location. The Google Maps API is a service provided by Google to users to utilize Google Maps in developing applications. (Rohendi & Setiawan, 2017)

The geographic information system concept

A geographic information system, or in English better known as Geographic Information System is a computer-based system that is used to process and store geographically referenced data or information (Adil, 2017). Here are some definitions of GIS according to experts:

1. According to Aronoff (1989), GIS is one computer-based system that can handle referenced data geography, namely data entry, data management (storage and retrieval), manipulation and analysis of home data as well as output as the final result (output). The final result (output) can be used reference in taking decisions on related issues with geography.
2. According to Burrough (1986), GIS is a useful tool for collection, stockpiling, and retrieval returns the desired data and displays spatial data that originates from the real world.
3. According to Marble et al. (1983), GIS is a system of spatial data handling.
4. According to Berry (1988), GIS is a system of information internal references, as well as spatial data automation.
5. According to Calkin and Tomlinson (1984), GIS is a system of computerization of important data.
6. Gistut (1994), GIS is a system that can support taking decisions spatial and capable integrate the description of a location with characteristics and phenomena found at that location. Complete GIS covers the required methodology and technology, namely spatial data, devices hard device software and structure organization.
7. Chrisman (1997), GIS is a system consisting of devices hard device software, data, people (brainware), organizations, and institutions used to collect, store, analyze, and disseminate information about surface areas earth.

In general, the meaning of GIS is the components that comprise the device hard, device software, geographic data, and sources of power working man together effectively to enter, store, correct, update, manage, manipulate, integrate, analyze, and display data in a geographically based information. (Adil, 2017). According to John E. Harmon and Steven J. Anderson (2003) in detail the GIS can operate with components as follows:

a. User: the person running the system, includes people who operate, develop, and even obtain system benefits. Category people who become various parts of GIS, for example, operators, analysts, programmers, database administrators, and even stakeholders.
b. Application: procedures used to process data into information. For example, summation, classification, rotation, correction geometric, query, overlay, buffer, join table, and so on.
c. Data: the data used in GIS can be in the form of graphical data and attribute data. Position/coordinates/graphics/space/spatial data: is data that is a representation phenomenon surface earth/space that has common references (coordinates) maps, photos aerial, satellite imagery, and so on or the results of the interpretation of these data. Attribute data/non-spatial: data that represent aspects descriptive of the phenomenon it is modelling. For example, census data residents, notes surveys, and statistical data other.
d. Software: device GIS software is an application program that has the ability management, storage, processing, analysis and display spatial data (for example ArcView, Idrisi, ARC/INFO, ILWIS, MapInfo, and others).
e. Hardware: devices hardware required to run the system from device computers, Central Processing Units (CPUs), printers, scanners, digitizers, plotters, and devices supporters other.

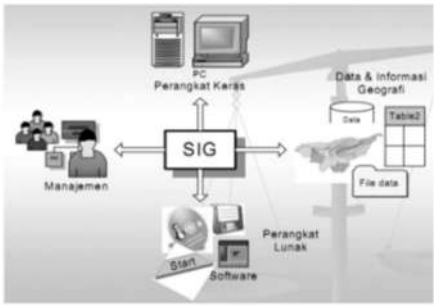


Figure 1. GIS Components (Adil, 2017)

Besides the fifth component above, there is one actual component no lost important, namely the method. A good GIS is when supported by method planning design good and proper system with business rules organizations that use the GIS.

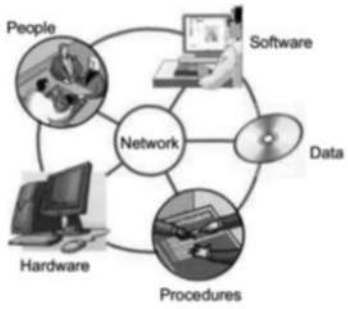


Figure 2. GIS Organization (Adil, 2017)

Here's an example of system information geographic implemented on the mapping mining.

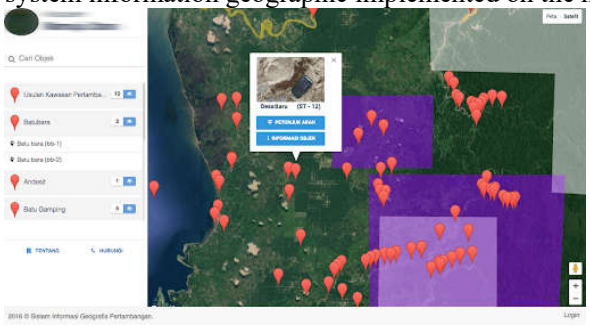


Figure 3. GIS Example (Adil, 2017)

Tourism Object Concept

The development of tourist rural areas is the impact of a change in interest in tourists to the area destination tour. growing travel trends and motivation tour interest especially wanted return tour to nature, interaction with local communities, as well interested to learn local culture and uniqueness thus encouraging development tour countryside. Tourist Rural is a model of tourism new, often well known with tourism interest special interest tourism. Object tour countryside is one village that has means or supporting object activity tourism and owns potency big in the sector tourism, so it is feasible to be made and developed into object tour new.

Chafid Fandeli (200 2) in more detail comprehensively describes a village tour as a rural area that offers a whole reflective atmosphere and authenticity village, both in terms of life social culture, custom customs, daily activities, architecture buildings, and spatial structures of the village, as well potential that can be developed as power pull tourism, for example, attractions, food and drink, souvenirs, lodging, and needs tour other (Fandeli, 2002)

Village tourism is one form of integration among attractions, accommodations, and facilities support presented in a structured life unified society with the rules and traditions that apply. Something village tour has power typical pull (can be unique physique environment natural rural areas, as well life social culture its people) which are packaged naturally and attractively so that the power pull countryside can move to visit traveller to the village (Ministry Culture and Tourism: Village Tourism is a related area by region or various wisdom local. Herman Harry (2016) defines a village tour as an area from an environment the countryside that has tourist attractions based on local wisdom such as customs, culture, as well riches nature has uniqueness and authenticity in the form of a characteristic atmosphere rural. The managed rural area as a village tour usually has more than one or a combination of several forces pull tours.

The Concept of Micro, Small and Medium Enterprises (MSME)

Micro, small and medium Enterprises (MSMEs) have different definitions in each literature according to several agencies or institutions even constitution number 20 of 2008 concerning MSMEs as follows:

a. Micro Enterprises are businesses Economy Productive owned by individuals and/ or individual business entities that meet the requirements criteria effort Micro as stipulated in the law.
b. Small business is a business Economy Productive stand-alone carried out by individuals or a business entity that is not a company or no branch company owned, controlled or Becomes part good direct or no straight from business medium or effort big fulfilling criteria effort small as stipulated in the law this.
c. Medium enterprises are businesses economy productive stand-alone carried out by individuals or a business entity that is not a company or no branch company owned, controlled or Becomes part good direct or no straight from business medium or effort big by the amount of wealth clean or sum annually as stipulated in the law this.

Characteristics of MSMEs

According to (Sarfiah, Atmaja, & Verawati, 2019) 4 reasons explain the characteristics of MSMEs in Indonesia:

a. MSMEs do not require large capital as the company is big so formation effort this not as difficult effort big.
b. Required manpower does not demand a certain formal education.
c. Most are located in rural areas and do not need infrastructure as the company is big.
d. Proven MSMEs have strong resistance when Indonesia was hit crisis economy.

System Development Model

Rapid Application Development (RAD) or rapid application development, proposed by Kendall is an object-oriented approach to system development which includes development methods as well as software. Kendall sees RAD as a system development methodology that seeks to address changing user requirements and recommends RAD for developing web-based applications (Lengkong, Sengkey, & Sugiarso, 2019) The RAD stages are the steps that must be carried out in the RAD method (Kendall & Kendall, 2011) are as follows:

1) *Requirements Planning*: In phase, users and analyzers meet to identify application goals or systems as well as to identify conditions and information resulting from these purposes. Orientation in phase this is finish problems company. Though technology information and systems can direct part of the proposed system, the focus will always remain on the efforts to achieve company goals.

2) *RAD Design Workshop*: This phase is the phase to design and improve that can be depicted as workshops. Analyzer and programmers can work to construct and demonstrate visual representations of designs and patterns work to users. Workshops design can be done over several days depending on the size of the application to be developed. During workshops on RAD design, users respond to existing prototypes and analyzers repair designed modules based on user response. If one of the developers is the developer or experienced user, Kendall rate that effort as creative because it can push development up to the level accelerated.

3) *Implementation*: In phase implementation, analyzer work intensely with users During workshops and designing aspects of business and non-technical companies. Quick after aspects, this approved and systems built and filtered, those systems new or part of the system tested and then introduced to the organization.

Community Empowerment

The process of improving people's welfare can be applied in various approaches. One of them is community empowerment. The community empowerment approach is not entirely new, but as a development strategy, it has not been discussed for too long. The term empowerment in the context of society is the ability of the individual concerned Empowerment is a process and goal (Suharto, 2017). The meaning of empowerment as a goal, namely empowerment, while the process includes indicators of successful empowerment.

Comprehensive community empowerment is the empowerment that has characteristics: 1). locally based; 2) oriented to increase the welfare of the community; 3) partnership based; 4). Holistically; and 5) sustainable (Asian Development Bank; in Vitayala, 2020)". Empowerment in another context is referred to as community development.

Research Methods

Research Sites

The research location for taking data samples is located in the District of Tanggetada. Specifically, area object tourism and community MSMEs.

Data Collection Technique

Data collection techniques are carried out using 3 ways, namely:

a. Literature review

Literature study activities are carried out by studying the literature that supports research. The literature studied is related to GIS, objects tourism and MSMEs obtained from various sources including scientific journals, research reports and books.

b. Interview and Observation

Interviews and observations were carried out by conducting a question and answer directly to parties who have the capacity and information needed in conducting this research. Interviews will be carried out by competent parties on management object tourism and MSMEs. As well as observations made by looking directly at the conditions at the research site.

c. Focus Discussion Group (FGD)

d. Documentation

Results and Development System

The research results are based on the development model The system used is the RAD (Rapid Application Development) model, consisting of:

1. Requirements Planning
2. RAD Design Workshop
3. Implementation

Requirements Planning

The requirements planning stage is carried out by gathering all needs related to the software design that will be carried out. The data collection process was carried out using interviews, observation and literature studies related to the research to be carried out. The interview process was carried out with Tanggetada sub-district staff where the result was to ascertain the areas of tourism potential in Tanggetada Sub-district, as well as the location of MSMEs that were not directly visible. Observations were made by visiting MSMEs and related tourist attractions and documenting photos, taking coordinates of locations and monitoring the area for data that needs to be stored in the information system being built.

RAD Design

The main goal of global system design is to provide an overview of the system to be built and to understand the flow of information and processes in the system. System design that will be carried out in building GIS to improve the welfare Public in the field of MSMEs and Tourism consists of process design, and base design data.

Context Diagram

A context diagram is a global picture of the system, how data is used and transformed for processes or which describes the flow of data into and out of the system.

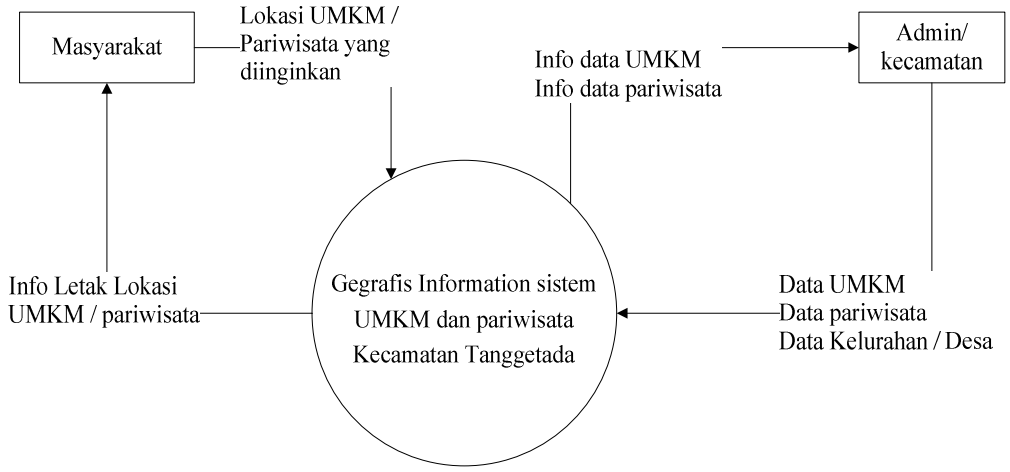


Figure 4. Context Diagram

In Figure 4, the context diagram above shows that two external entities have access rights to the system, namely the community and the sub-district admin. MSME and Tourism data are input by the sub-district admin, and then the community inputs them by choosing the location of the desired UMKM/tourism and the system will display the results of the position and location mentioned.

Data Flow Diagrams level 1

Data flow diagram level 1 process 1 is a diagram that is used to describe the stages of the data process in the context diagram. Figure 4 shows the process that runs starting from the sub-district admin entering MSME data, tourism data and location data for each MSME and tourist attraction. The system then processes the data, saves it into a database table and then produces an output in the form of information on tourist attractions and MSME around that location. People can look for MSME or tourist district Tanggetada in the system by selecting the desired location and the system will provide output form information location or position of the desired MSME/Tourism

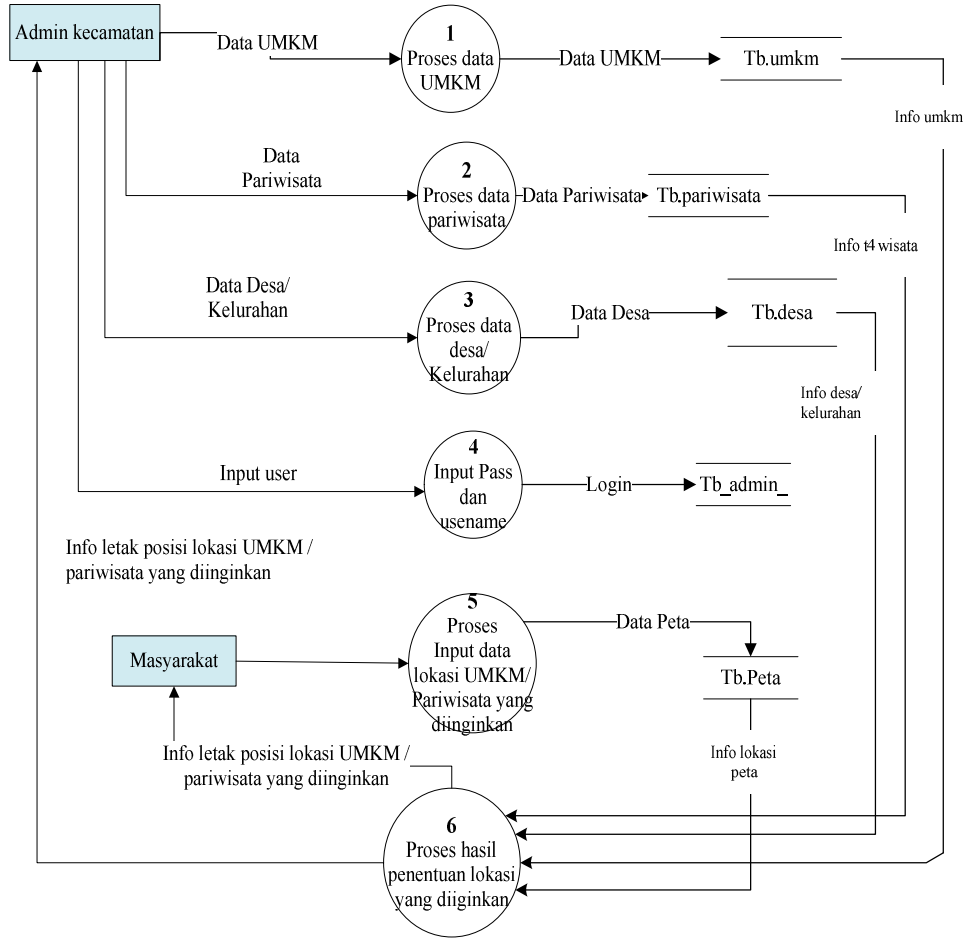


Figure 5. Data Flow Diagram Level 1

Design Flow chart

This flowchart design aims to describe the flow of the program created. This is done to facilitate the creation of the system and as an illustration of how the application works.

1. Main Menu Flowchart

Figure 6 shows the main menu flowchart that can be accessed by the community and admin, where there are several choices, namely the home menu which displays all tourism galleries and MSMEs that have been entered into the system. The tour menu displays the search for tours that will be carried out and details of several tourist location points on the map, as well as the MSMEs menu and the choice of travel and MSMEs menus.

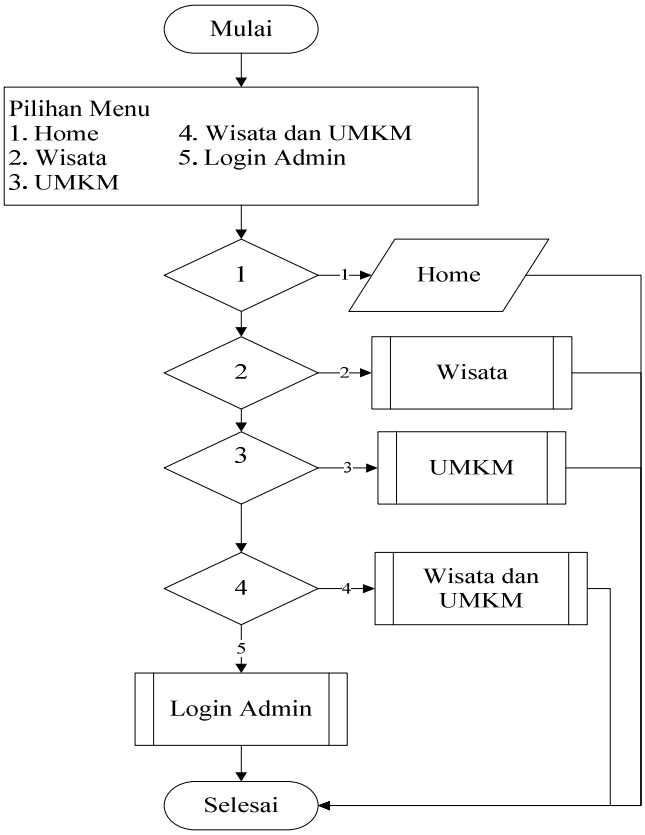


Figure 6. Main menu flowchart

2. Home menu flowchart

Figure 7 shows the flow of the home menu selection, where the user can click on one of the display images in the gallery. In detail, there are 2 options, namely the option to view a photo slide show and the choice of location details for the selected photo.

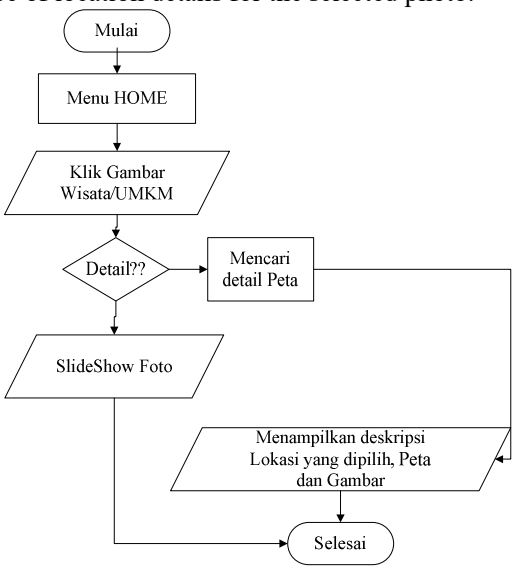


Figure 7. Flowchart of Home menu options

3. Flowchart of the MSME/Tourism search menu

Figure 8 shows the program flow on the tourism menu, where users can search for tourist locations by first selecting a village, and then determining the tourist location they want to choose. The application will display detailed information regarding the location on the map, descriptions of tourist attractions and several images related to these tourist locations. The tourism menu flowchart in Figure 8 is the same as the MSME menu flowchart.

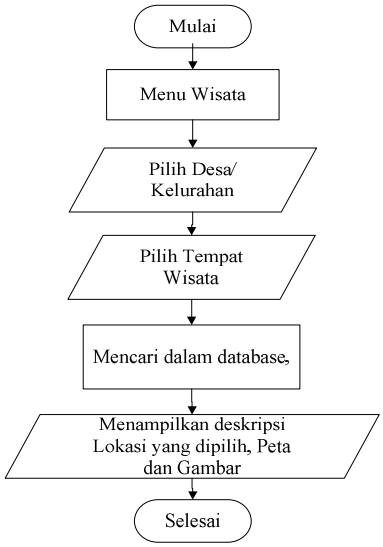


Figure 8. Search menu flowchart tour

4. Admin menu flowchart

Figure 9 shows the menu contained in the admin, where the admin first enters the username and password that was entered into the previous database. The menu options for this admin consist of village or sub-district data input forms in the Tanggetada sub-district, then a menu to receive input in the form of tourism and MSME data in the Tanggetada area. Another menu is user management where the admin can change the user's name and password to log in to the application, as well as the logout option to exit from the admin menu.

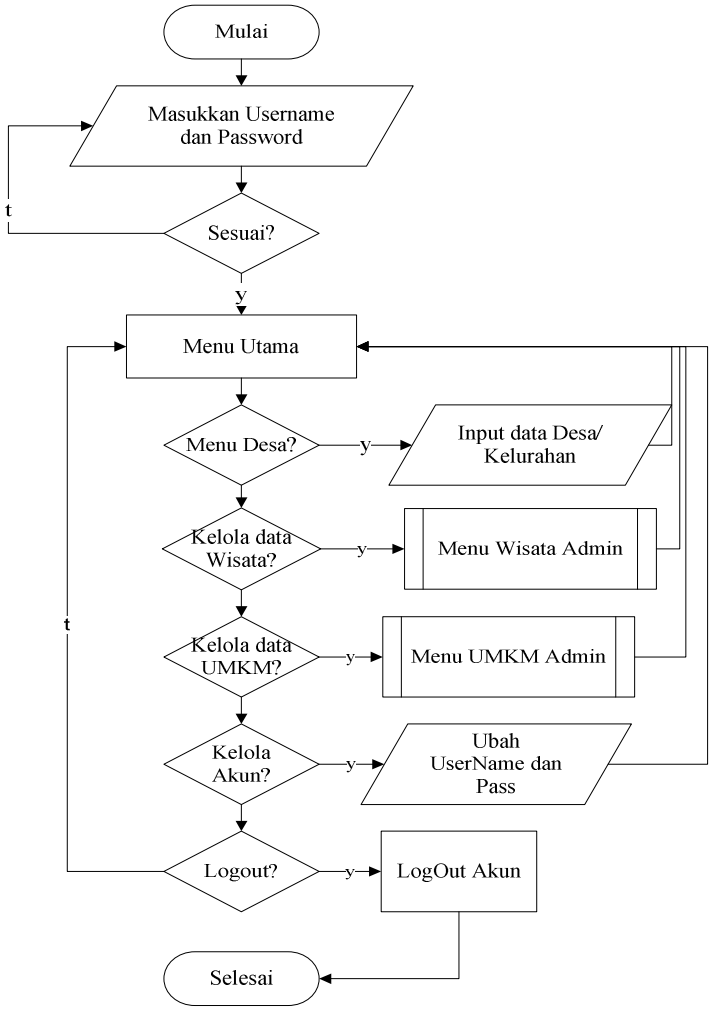


Figure 9. Admin menu flowchart

5. Flowchart for managing UMKM/Tourism and Village data

The flowchart for managing tourism data shown in Figure 10 is the same as the flowchart in the MSME menu. Figure 10 shows the admin can add tourist data, edit data and delete data that has been previously entered.

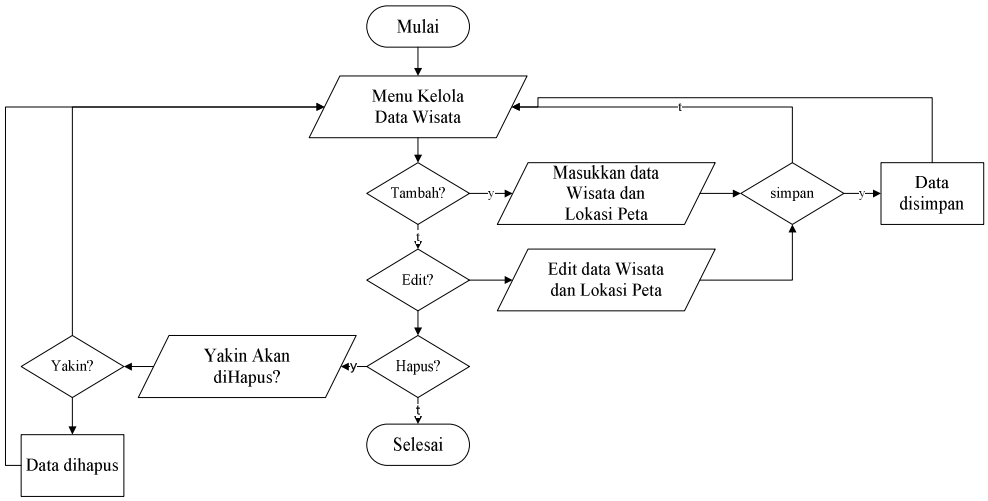


Figure 10. Flowchart for MSME/ Tourism data management

Database Design

The database is used for data storage media which is then used to produce information. The tables used in designing the database consist of user tables, MSME tables, tourism tables, village tables and map tables.

1. User table

The user table is used for users to log into the system and maintain data security in the system and admins can change usernames and passwords. The user table consists of 2 (two) fields which can be seen in Table 1. Table Userstable1.

Table 1. Table Users

No	Fields	Type	Information
1	Users	Varchar (16)	Primary keys
2	pass	Varchar(16)	Pass

2. Village Table

The village table is used to Table 1. Table Usersstore village and sub-district data in the Tanggetada sub-district.

Table 2. village table structure

No	Fields	type	Information
1	Village Code	Varchar (10)	Primary Key
2	Village name/ Ex	Varchar (50)	

3. Location table

Table 3. Location table structure

No	Fields	type	Information
1	Code_umkm	Varchar (10)	Primary keys
2	Name place tourism and MSMEs	Varchar (50)	
3	Category	Enum (MSME, Tourism)	
4	Village Code	Varchar (10)	Foreign keys
5	Description	Text	
6	LU coordinates	geometric	
7	LS Coordinate	geometric	
8	Photo	Blob	
9	Address	Text	

Relations Between Tables

The process of the relationship between attributes is a combination of attributes that have the same primary key so that these attributes become a single unit connected by key fields. In the process of table relations, the elements are grouped into one database file and its entities**.** The relationship can be seen in Figure 11

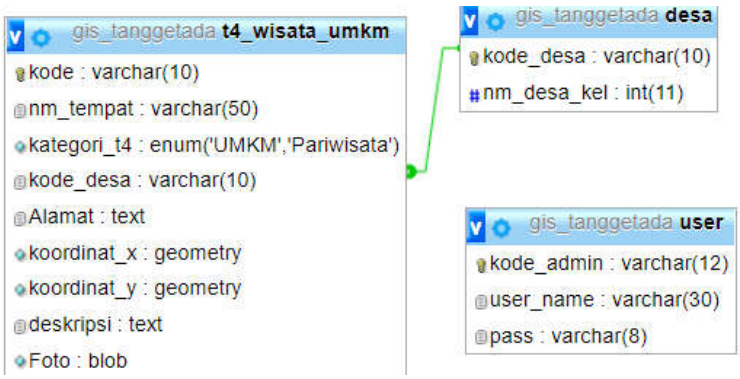


Figure 11. Relationships between tables

Implementation

The implementation stage is the stage where the system that has been designed and built is then tested for its feasibility to then operate properly according to its function and feasibility to be used by those who need it to realize the system that has been designed. The implementation of the system must be supported by the software used so that the system can run as it should.

1 . Application Implementation

The description of the appearance of the system that has been built is as follows:

1. Display community home page: On is the display of the Home menu which displays the start page which helps people to find out the location of MSMEs and tourism in the sub-district Tanggetada. Figure 12 and 13 shows the appearance of the home menu, where there are photo galleries of tourist objects and MSMEs that have been included in the web application.

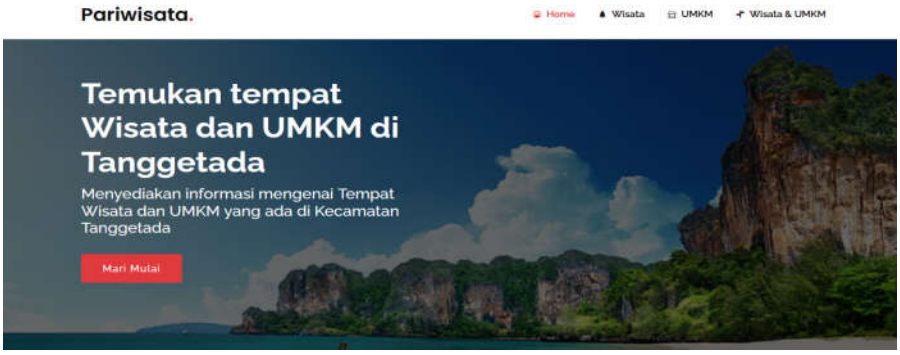


Figure 12. *Home* Menu

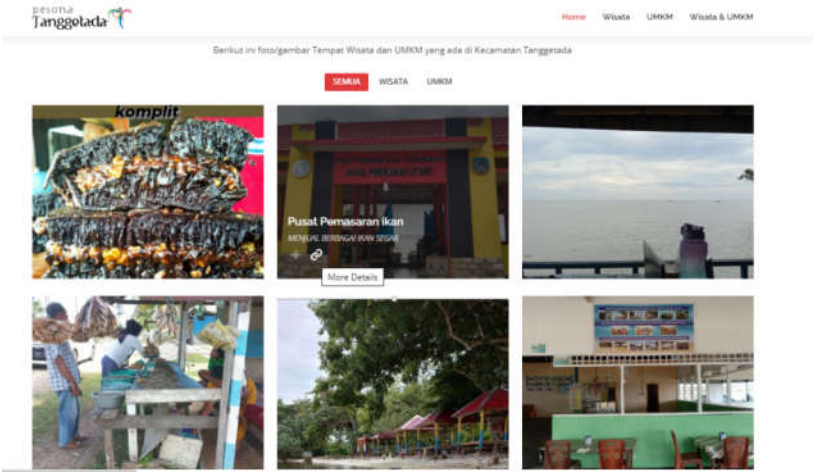


Figure 13. Gallery home menu

2. MSME search menu display: Figure 14 displays the Figure options menu display MSME location is a menu that functions to display the location of the desired MSME In accordance location shown on the GIS Map

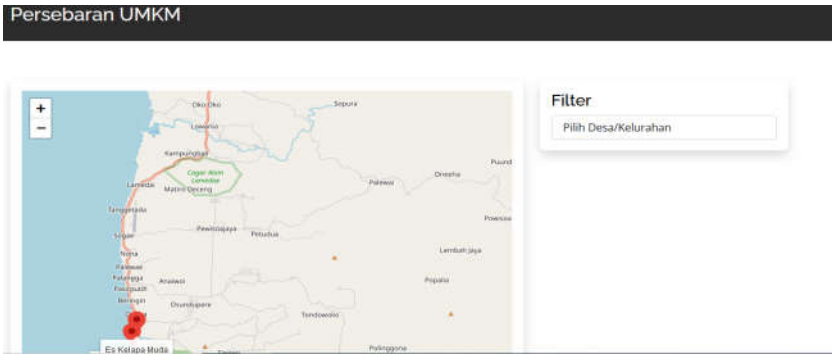


Figure 14. Display of the MSME search menu

3. Travel search menu display: In Figure 15 the options menu display l location tourism is a menu that functions to display the location desired tour in accordance location shown on GIS Map

4. Tourism and MSME map display: Figure 16 shows a satellite map display showing tourist

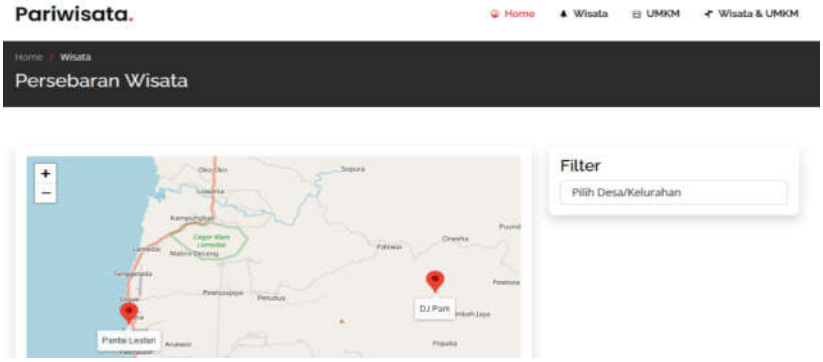


Figure 15. Tampilan menu pencarian wisata

sites marked in yellow and MSMEs locations marked in green. Users can click on these points to see in detail the appearance of the selected tourist and MSME locations.

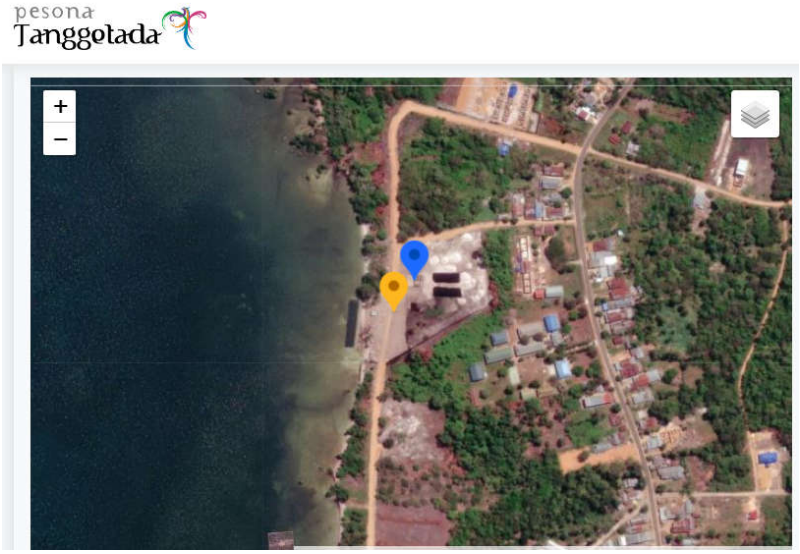


Figure 16. Display of a satellite map of one of the tours and MSME

5. Admin login view: In Figure 17 the admin login display explains that the admin can use this application if you log in first by entering a username and password after that press the login button and the system will check the username and password in the database. If the username and password are in the database, the system will display the main page and if it is not in the database, the system will display a message that the username and password are incorrect.

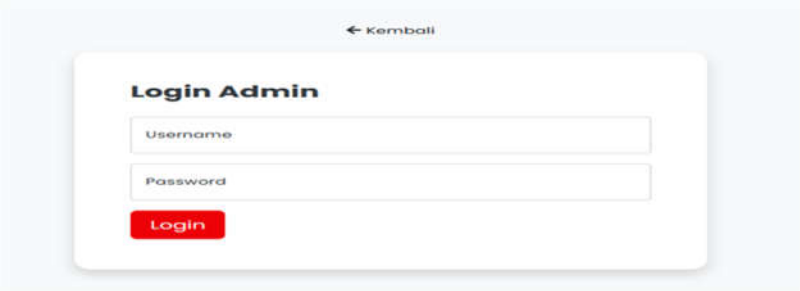


Figure 17. Admin login display

6. Display added tourist data: Figure Figure the first stage of entering tourism data into the application. The data added is in the form of location names, location descriptions, address descriptions and village or sub-district names, as well as the coordinates of the selected tourism location on the map. The appearance of adding tourist data is not much different from the display of adding the MSMEs menu.

Figure 18. Display of the added tourist data form

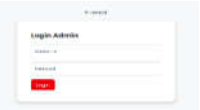
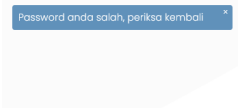
2 . Testing Software

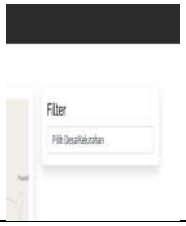
System testing is carried out to check the performance of the implemented system components. The main purpose of system testing is to ensure that the elements or components of the system are functioning as expected. The testing method used is the Black Box testing method.

Black box testing is a fundamental aspect of the system without regard to the internal logic structure of the software. This method is used to find out if the software is working properly. Black box testing is a method of designing test data based on software specifications. The test data is generated and executed in the software, and then the output of the software is checked whether it is as expected or not.

The testing of the system to be tested with the Black Box testing technique can be seen in table 4

Table 4. Software testing

No	Name *Forms*	Test Step	Which is expected	Ket
1	Login Menu	Clicking the login button on the system without filling in *the user*name and *password* *Test Cases:* 	The system will deny access by giving the message "wrong combination of *user* name and *password* " Test result : 	Valid
2	Home Menu	Enter the Home menu *Test Cases:* 	Knob Starting from, the system will display the MSME and tourism menu Test result :	Valid
3	MSME menu	Clicking the MSME button *Test Cases:* 	The system will display MSME locations in the district of Tanggetada	Valid

4	Tourism Menu	Clicking the Tourism button *Test Cases:* 	The system will display the location of Tourism in the district of Tanggetada	valid
5	Button Select village	Choose your Preferred village *Test Cases:* 	The system has displayed the location specifically MSMEs and tourism in the village correctly.	valid

Test results in table 4, software testing is carried out by using system testing with the BlackBox method. Based on the results of the black box testing that has been done, it can be concluded that the system is running well, in this test it is proven that the software has run according to its functionality and can produce the expected results.

Study and suggestion

System Studies that have been produced

Information system has been successfully created that can be used to develop existing tourism promotion facilities in the Tanggetada sub-district. Apart from being a medium for tourism promotion, GIS can be utilized by micro, small and medium enterprises in promoting and increasing their sales. Users in this case are people who need detailed information regarding tourism in the Tanggetada sub-district and the location of food sellers can use this application to find the information needed.

Advice on Utilization, Dissemination, and Further Product Development

The suggestion for the use of research is to add features not only limited to tourism and small and medium enterprises but also in the lodging sector, as well as boarding houses spread across the Tanggetada sub-district, especially Popalia village and Anaiwoi sub-district. Hold promotions widely related to the use of applications, to introduce them to the wider community. Collaborate with sub-districts to jointly develop applications to become part of e-government to the citizen.

Referances

Anisah, 2007. Geographic Information System Definition and Application

BPS. (2017). Statistics Indonesia 2017. Retrieved from https://www.bps.go.id/

Choridotul Bahiyah, Wahyu Hidayat R, S. (2018). Strategy for developing tourism potential at Duta Beach, Probolinggo Regency. *Journal of Economics*, *2* (1), 95–103.

Fair, A. (2017). *Geographic Information System*. Yogyakarta: Andi.

Fandeli, C. (2002). *Natural Tourism Planning*. Bulaksumur, Yogyakarta: Faculty of Forestry, Gadjah Mada University.

I Kadek Agus A, I Wayan Treman (2018), mapping potential tourism objects with geographic information systems in the Nusa Penida sub-district, Klungkung regency, *JJPG*, 6(2), 87-94

Ismail Ahmad, Nadila, et al (2021), Geographic Information System (GIS) for Android-Based MSME Locations to Improve the MSME Economy, *INOVASI*, 2(2),62-75

Kendall, KE, & Kendall, JE (2011). *Systems Analysis and Design* (8th ed). Upper Saddle River, NJ: Pearson Prentice Hall.

Lengkong, CM, Sengkey, R., & Sugiarso, BA (2019). *Web-Based Tourism Information System in Minahasa District* . *14* (1), 15–20.

Rohendi, K., & Setiawan, L. (2017). Boarding and Rented Mapping Applications around Campuses and Agencies in the City of Padang. *Indonesian Journal of Computer Science*, *6* (1), 116–124.

Sarfiah, SN, Atmaja, HE, & Verawati, DM (2019). MSMEs as Pillars of Building the Nation's Economy. *Journal of REP (Development Economic Research)*, *4* (1), 137–146.

Suharto, E. (2017). *Building Communities Empowering the People Study of Social Welfare Development Strategies and Social Workers*. Bandung: PT. Aditama Refika.