Journal of Geomatics Engineering, Technology, And Sciences (JGETS)
ISSN 2830-1811, 2023, VOL. 01, NO. 02, 60 – 65
https://doi.org/10.51967/gets.v1i2.22

Geographic Information System for Fishermen's Market Kutai Kartanegara Marine and Fishery Service

Erwin Samuel Situmorang[a], F. V. Astrolabe Sian Prasetya[b], & Annafi' Franz[a]

[a] Software Engineering Technology, Agriculture Polytechnic of Samarinda, Samarinda
[b] Geomatics Technology, Agriculture Polytechnic of Samarinda, Samarinda

ABSTRACT

Activities to process various kinds of data regarding data management are always endeavored to be ready to be presented to anyone who needs it. Geographic Information System (GIS) is an information system designed to work with spatially referenced data or geographic coordinates in other words GIS is a database system with special capabilities to handle spatially referenced data, together with a set of work operations. This study uses two methods of data collection, namely: The interview method (interview) and Document Study. The interview is a data collection method that is carried out by seeking information or data directly through sources so that the data obtained can be more accurate while conducting document studies, in document studies researchers rely on documents as one source of data to support research. The Geographic Information System of the Fishermen Market of the Kutai Kartanegara Marine and Fisheries Service was created with several programming languages Hypert Text Markup Language (HTML). The development of the system used in this study is the Waterfall model, which starts with the stages of analysis, design, coding, testing, and maintenance. The Geographic Information System of the Fisherman Market of the Kutai Kartanegara Marine and Fisheries Service aims to make it easier for service members to input fish prices and make it easier for the public to see fish prices and locations from the market.

ARTICLE HISTORY

Received: February 01, 2023
Accepted: March 4, 2023
Published: March 5, 2023

KEYWORDS

Geographic Information System, Laravel, MySQL, UML, PHP.

CORRESPONDING AUTHOR

F. V. Astrolabe Sian Prasetya
Email: astrolabesp@politanisamarinda.ac.id

How to cite: Situmorang, E. S., Prasetya, F. V. A. S., & Franz, A. (2023). Geographic Information System for Fishermen's Market Kutai Kartanegara Marine and Fishery Service. *Journal of Geomatics Engineering, Technology, and Sciences (JGETS)*, 1 (*2*), 60 - 65. https://doi.org/10.51967/gets.v1i2.22

1. INTRODUCTION

Activities to process various kinds of data regarding data management always endeavor in a state that is ready to be presented to anyone who needs it. This is the work that must be done in providing services and data management must be carried out efficiently. This means that data can be searched easily and quickly when it is needed so that in serving the presentation of information about data management it can run smoothly and orderly, so in serving the presentation of information about data processing can run smoothly and orderly. Geographical Information Systems (GIS) or Geographic Information System (GIS) is an information system designed to work with spatially referenced or coordinated data geography in other words GIS is a database system with the special ability to handle spatially referenced data (spatial) in conjunction with a set of work operations.

GIS applications can be used for various purposes as long as the processed data has a geographic reference, meaning that the data consists of phenomena or objects

CONTACT F. V. Astrolabe Sian Prasetya astrolabesp@politanisamarinda.ac.id

that can be presented in physical form and have a spatial location. The main purpose of using Geographic Information Systems is to make it easier to get information that has been processed and stored as an attribute of a location or object. The main characteristic of data that can be used in Geographic Information Systems is data that has been tied to location and is basic data that has not been specified (Husein, 2000). The data that is processed in GIS basically consists of spatial data and attribute data in digital form, thus the analysis that can be used in spatial analysis and attribute analysis. Spatial data is data related to spatial locations which are generally in the form of maps. Meanwhile, attribute data is table data that serves to explain the existence of various objects as spatial data. This application will be used at the Marine and Fisheries Service Office in the Fish Cultivator Small Business Empowerment section, for the public display it can be used by the general public, and for the admin section, it will only be used by service members in the market location. All fishermen's markets in the Kutai Kartanegara area

The Kutai Kartanegara Marine and Fisheries Service are one of the services that have a very wide area coverage. The Department of Marine Affairs and Fisheries of Kutai Kartanegara has many members of fishermen and aquaculture. Along with the development of technology, it encourages authors to create a website at the Department of Marine Affairs and Fisheries that is useful to make it easier for members of the Department to find data about markets in Kutai Kartanegara Regency. Thus the work that must be done in providing services and data management must be carried out efficiently. This means that data can be searched easily and quickly when needed so that in serving the presentation of information about data management it can run smoothly and orderly. Geographic Information System (GIS) or Geographic Information System (GIS) is an information system designed to work with spatially referenced data or geographic coordinates in other words GIS is a database system with special capabilities to handle spatially referenced data together with a set of work operations.

According to research conducted by Sutejo (2016), with the title "UML Modeling of Geographic Information Systems for Pekanbaru City Traditional Markets". Benefits of the application of geographic information systems This traditional market was built as a development and manufacture of traditional market promotion media whose existence was threatened by the modern market.

According to research conducted by Yuliani et al. (2016), entitled "Application of Geographic Information System (GIS) for Mapping Traditional Markets in Semarang City Based on Web". That is because web-based GIS provides convenience in accessing, storing, editing, and updating data. This application is expected to provide convenience for the public to obtain information about traditional markets quickly, and accurately and can be accessed by anyone, anywhere and anytime.

According to research conducted by Firmansyah et al. (2019), with the title "Mobile Based Samarinda Night Market Geographic Information System". Develop a web-based information system to be mobile-based by displaying the location and schedule of the night market and displaying the travel route from the user's location to the desired night market location.

According to research conducted by Prapitasari et al. (2016), with the title "Geographical Information System for Traditional Markets in the Denpasar Region using the YII Framework". That the geographic information system can provide accurate information about the distribution of more informative spatial and non-spatial locations in the District of South Pontianak. This system also contains information about the spatial location of the gas station, the address of the gas station, the facilities of the gas station, and the mapping of the location of the need to build a new gas station.

According to research conducted by Sastrawan et al. (2020), with the title "Geographic Information System for Web-Based Traditional Markets in the Badung Regency Region". By using GIS, it will be very easy for developers, consumers, governments, or related parties to easily find out the conditions and data from places, buildings, roads, environments, parks, and sports fields and even easily find out the condition of the place.

Based on the information above, according to the author, the Web-Based Information System for Fishermen's Market at the Kutai Kartanegara Department of Marine and Fisheries is created to make it easier for service members to manage fisher market data in Kutai Kartanegara, so as to create easier and faster governance and work.

Based on the above background, a problem formulation can be taken as follows. How to help the Department of Marine Affairs and Fisheries in finding data about the geographic location of the market? How to design a web-based Fisher Market Geographic Information System design?

In connection with the formulation of the problem above, the author has limitations on the problems that must be studied, while the limitations of the problems that are studied are as follows: This Web

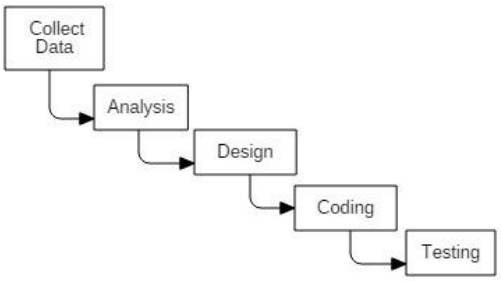
Map only provides information regarding the geographic location of the market, commodity prices in the market and images of the market. Point coordinates are used only from that market point.

The objectives of this study are to create a Geographic Information System that can be used as a means of delivering market information in Kutai Kartanegara through the Website and to develop a website for the Department of Marine Affairs and Fisheries so that it looks more updated. Expected results facilitate the work of service members in searching for data, and speed up market data retrieval.

2. METODE

2.1. Research Procedure

The research procedure can be seen in Picture 1.



Picture 1. Waterfall Model

Description:

a) Collect Data
   Data collection is done by requesting data from the Department of Marine Affairs and Fisheries regarding the required data such as the location of the coordinates, tagging the place or location of the fish market and its attributes, latitude and longitude records.

b) Analysis
   Analysis of the problem is the decomposition of a complete information system into its component parts. With a view to identifying and evaluating problems or obstacles that occur and the expected needs so that they can be improved. The existence of deficiencies in the system that is currently running, it is necessary to have a system that improves the system. The system that was developed is inseparable from the information needs needed.

c) Design
   System Design helps in hardware and system requirements and also helps in defining the overall system architecture.

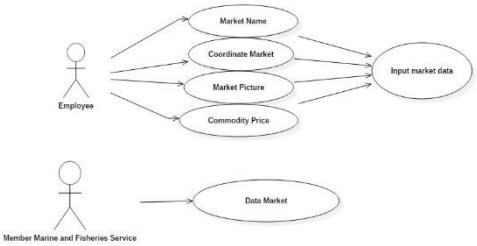
d) Coding
   Making the system that is done is to create a mapping information system application with the web that runs well. Making this system is the main stage because at this stage the process of building a system that can solve problems and process the data that has been collected. At this stage, the design process that has been made is also implemented.

e) Testing
   System testing is a process carried out to find errors in a system that later these errors can be corrected. At this stage, it can also be determined whether the application will be suitable for use or not by Kutai Kartanegara Marine and Fisheries Service.

2.2. System Design

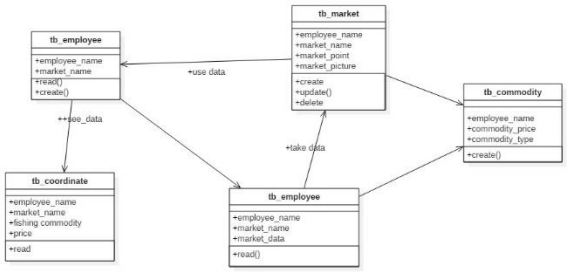
The design is carried out after the development stage after analyzing the problem. At this stage, a system design is carried out that requires a process.

a) Use Case Diagram
   Use Case Diagram is a scenario illustration of the interaction between the user and the system. A use case diagram illustrates the relationship between actors and activities that can be carried out on the application. The use case diagram design can be seen in picture 2.



Picture 2. Use Case Diagram

b) Class Diagram
   It has 5 database tables, the class diagram design can be seen in picture 3.



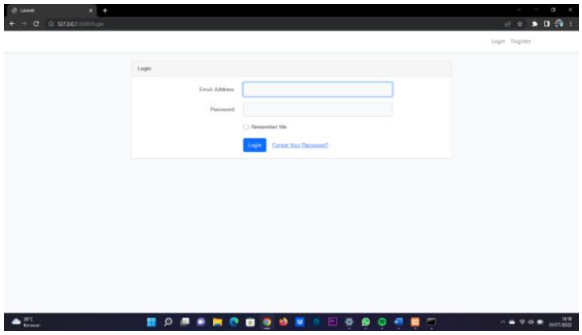
Picture 3. Class Diagram

3. RESULTS AND DISCUSSION

The results of the application of the Fisherman's Market Geographical Information System at the Kutai Kartanegara Maritime Affairs and Fisheries Service which have been carried out by the author are as follows.

3.1. Login Page

The login page is the page used by the admin to enter the next menu. So, the admin has to login first. The Login page can be seen in Picture 4.

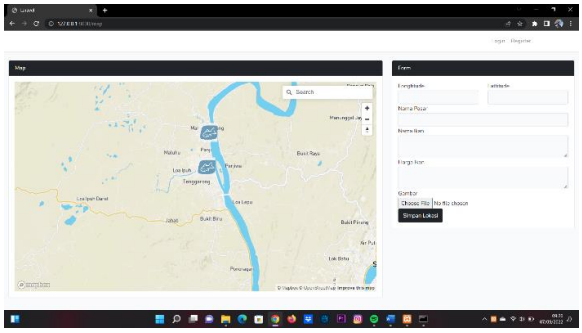


Picture 4. Login Page

Picture 4 is the login page that is provided for admins to enter the next page. So that other users can't use the website. The login page consists of an email and password.

3.2. MapForm Page

The MapForm page functions as a page to input data from the SeKutai Kartanegara Market by the admin in charge. The mapForm page can be seen in Picture 5.



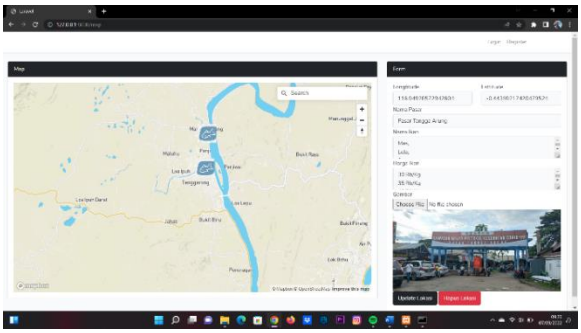
Picture 5. MapForm Page

In Picture 5, the MapForm page of the Kutai Kartanegara Market contains the Longitude, Latitude, Title (Market name), Description, and Image from the Kutai Kartanegara market. MapForm page is a form created to input market data needed by the Department of Fisheries and Marine Affairs of Kutai Kartanegara to determine the price of fish in each fish market.

3.3. Input Form Page

Data Input page, here we can input data from the existing market in Kutai Kartanegara. The Data Input page can be seen in Picture 6.

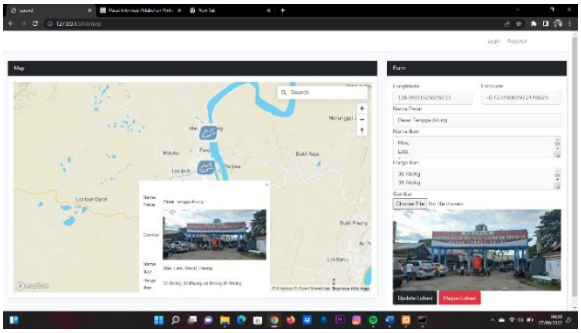
In Picture 6, we try to input the fish market data that we just got into the map, by filling in according to the column provided, after that the data we input through the form will enter the map and there will be a pointer sign on the map.



Picture 6. Input Form Page

3.4. Update and Delete Form

On this page, we can update and delete data from the map. The update and delete pages can be seen in Picture 7.

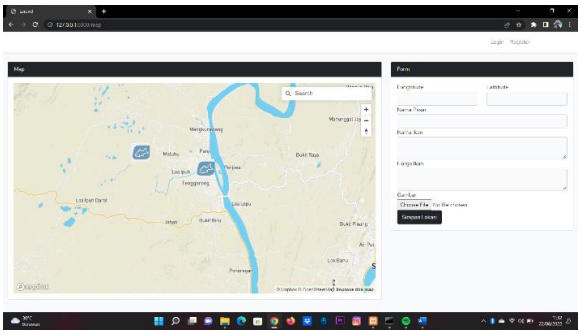


Picture 7. Update and Delete Form

In Picture 7, after inputting data, the admin can update the data on the map without having to create a new one if there is data missing or something is wrong, and also the admin can also delete the map pointer if the data is incorrectly input.

3.5. Search Button on the Map

In this section, the admin can search for market locations using the search button, which can be seen in Picture 8.

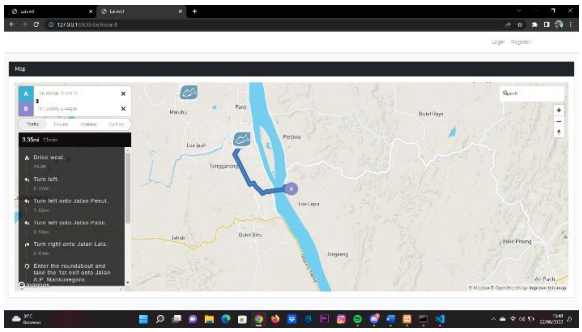


Picture 8. Search Button on the Map

In Picture 8, the Location Search Result is that it displays the market point that the admin is looking for, after the market point is found, the Admin can input the market data.

3.6. Directions Navigation

In this section, the public can search for market direction navigation from the place they want to be determined, as shown in Picture 9.

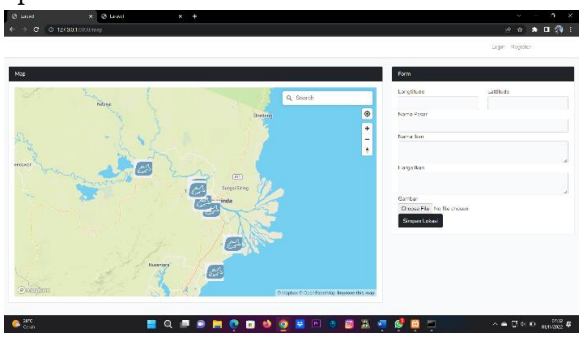


Picture 9. Directions Navigation

In Picture 9, Directional Navigation will give directions to that market. Also available if you want to use a vehicle, walk or also use a bicycle.

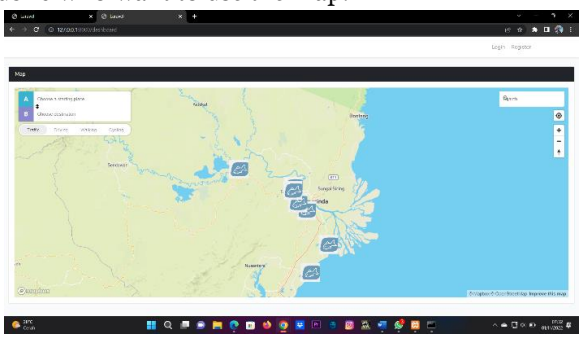
3.7. Zoom-in and Zoom-out Map

In this section, admins and the public can zoom in and zoom out on the map. The zoom-in and zoom-out map buttons can be seen in Picture 10.



Picture 10. Zoom-in and Zoom-out in Admin Page

In Picture 10, on this part, the admin can use the zoom button with the + logo, which can be useful for zooming in on the map and using the – logo to zoom out the map. And In Picture 11, will be a view of the public who want to use the map.

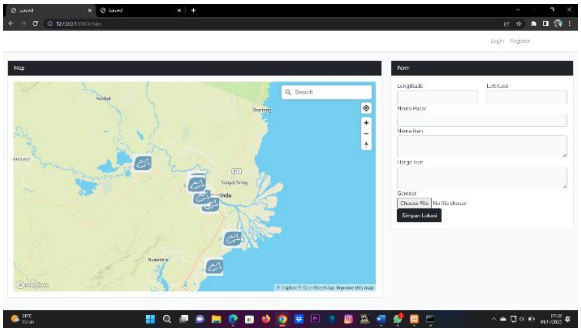


Picture 11. Zoom-in And Zoom-out in Public Page

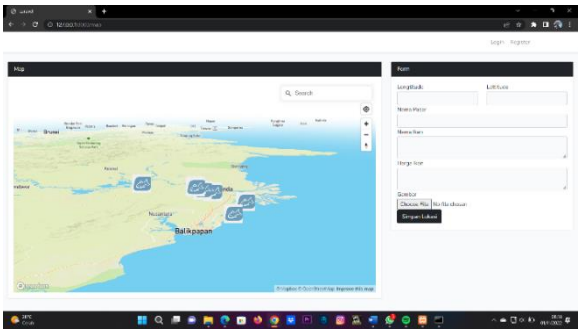
Same as admin, In Picture 11, the Public can use the zoom button with the + logo to zoom in on the map, and the zoom out button with the – logo to zoom out the map.

3.8. North Button and Changes Map Position

In this section, the admin and the public can find the direction of the north map (N) on the map by clicking the ^ sign on the map and can also shift the map position by right-clicking on the Mouse/Touchpad. The North button can be seen in Picture 12 and the shift map position can be seen in Picture 13.



Picture 12. North Button



Picture 13. Shift Position Map

In Picture 12, Admin and Public can click the North button if you want to know where the North is. And in Picture 13, Admin and Public can shift the map position.

3.9. System Test

The test was carried out on the application of the Geographic Information System of the Fish Market of the Kutai Kartanegara Marine and Fisheries Service. Testing is done by running all the functions one by one that already exists. Then see whether the results are in accordance with what was designed and expected for the application. The results from testing this application can be seen in Table 1.

Table 1. System Testing

Input	Output	Test Results
Click Register	Showing Register Page	Succeed
Click Login	Showing Login Page	Succeed
Click map	Showing Longitude and Latitude	Succeed
Click choose File	Display add Picture	Succeed
Click Submit Location	Input data to map	Succeed
Click pointer on map	Showing all data	Succeed
Click Pointer on map	Showing update and delete button	Succeed

Input	Output	Test Results
Click Update Location	Showing data update on pop-up	Succeed
Click Delete Location	Delete pointer and all data on map	Succeed
Right Click on mouse	Displaying oblique map	Succeed
Click + and – on map	Zoom in and Zoom out map	Succeed
Click north button	Show north on map	Succeed
Click Search Location	Search market location	Succeed
Click Directions Navigation	Showing Navigation to market	Succeed

4. CONCLUSION

From the results and discussions that have been carried out in making a web-based Geographic Information System for Fishermen's Market Kutai Kartanegara Marine and Fishery Service. This web will assist the work of each field in the Kutai Kartanegara Marine and Fisheries Service in inputting fish market data and viewing the fish market data, facilitate the work of each field because the display is easy to understand, does not need to use excel and can be accessed anywhere. This application has the advantage that service members do not need to use other apps and also save time also if you want to add something, you don't have to delete the old data and this application is also useful for ordinary people who want to see or search for Fish Market data, consisting of Photo, Market Name, Market Addresses, and Fish Prices at Kutai Kartanegara Market.

5. ACKNOWLEDGMENTS

The authors would like to thank the Software Engineering Technology and Geomatics Technology Study Program, Department of Engineering and Informatics, Agriculture Polytechnic of Samarinda which has given the author the opportunity to carry out research. This research is one of the requirements for completing the Diploma 4 Study Program at the Samarinda State Agricultural Polytechnic. The authors also thank the Department of Engineering and Informatics which has provided media for publishing scientific papers in the form of journals.

6. REFERENCES

Firmansyah, W., Budiman, E., & Pohny. (2019). Sistem Informasi Geografis Pasar Malam Kota Samarinda Berbasis Mobile. JURTI, Vol.3 No.1, Juni 2019, ISSN: 2579-8790.

Hakim, M. L., & Martha, D. (2017). Aplikasi Informasi Hasil Penangkapan Ikan Berbasis Web (Studi Kasus : Pelabuhan Perikanan Nusantara Kejawanan Dkp3 Kota Cirebon). *JURNAL DIGIT* Vol. 7, No.1 Mei 2017, Pp.14~24 ISSN : 2088-589X, 7(1).

Josi, A. (2017). Penerapan Metode Prototyping Dalam Membangun Website Desa (Studi Kasus Desa Sugihan Kecamatan Rambang). *Jti*, *9*(1), 50–57.

Nuraini, R. (2015). Desain Algorithma Operasi Perkalian Matriks Menggunakan Metode Flowchart. Jurnal Teknik Komputer Amik Bsi, 1(1), 144–151.

Prapitasari, L. P. A., Sumiari, N. K., & Jayanti, N. K. D. A. (2016). Geographic Information System of Traditional Market in Denpasar using YII Framework. Page 205-216 vol. 6 ,2016.

Sastrawan, I. G. G., Wijaya, I. N. Y. A., & Putra, I. G. J. E. (2020). Sistem Informasi Geografis Pasar Tradisional Berbasis Web di Wilayah Kabupaten Badung. *Jurnal Ilmu Komputer dan Teknologi*. Page 1-4.

Sutejo. (2016) Pemodelan UML Sistem Informasi Geografis Pasar Tradisional Kota Pekanbaru. JURNAL Digital Zone: *Jurnal Teknologi Informasi dan Komunikasi*. Page 89-99.

Yuliani, S. T., Sudarsono, B., & Wijaya, A. P. (2016). APLIKASI SISTEM INFORMASI GEOGRAFIS (SIG) UNTUK PEMETAAN PASAR TRADISIONAL DI KOTA SEMARANG BERBASIS WEB. Jurnal Geodesi Undip: 2337-845X.