



Application of Webgis Distribution Location Puskesmas in Labuhanbatu District

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ABSTRACT

The community finding a place for health services is difficult, so a research was conducted in the form of creating a puskesmas map application to assess the puskesmas in Labuhanbatu Regency. Since this research has gone well, Labuhan Regency people can know the information and help them find health centers faster after this webgis is installed. Study of the life cycle of system development using SDLC (Systems Development Life Cycle) using UML to design spatial information systems to help solve problems. This will help the public to locate the nearest health center.

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1. Introduction

Labuhan Batu Regency is a district in North Sumatra, Indonesia. The district capital is Rantau Prapat, famous for its oil palm and rubber plantations. Labuhan Batu Regency has a strategic position on Sumatra's eastern route, at the junction between the provinces of West Sumatra and Riau, connecting Sumatra and Java growth centers. Has ample access to foreign countries due to proximity to Malacca Strait. One square kilometer is 2.561.38 km². 498,178 people learned how to build a geographical information system (GIS). Can provide specifics of the location and distribution of healthcare facilities in Labuhan Batu Regency as puskesmas [1]. Labuhan Batu District has about 15 health centers, including 9 non-inpatient health centers and 6 inpatient health centers. Puskesmas distribution in Labuhan Batu Regency is not determined by population density, particularly in areas where the population continues to rise year after year.[2]. A GIS is an information system used to handle spatial data or geographic coordinates. In other words, sig is a database device uniquely capable of simultaneously managing spatial data or building data using a sequence of work operations.[3]. The project aims to create a mapping application as a puskesmas management tool that uses a geographic information system for better location identification.. [4]. SDLC digunakan untuk membangun sistem informasi geografis untuk puskesmas dalam proses ini, sedangkan UML digunakan untuk mendefinisikan desain sistem.[5]. This study aims to establish the Geographical Information System (GIS), which can provide community information about health services via the Labuhan Batu Regency Puskesmas. The benefits of this research were realized, with Labuhan Batu Regency now having better access to district puskesmas information and place.

2. Method

This is a significant step in developing a Sommerville-based waterfall system. [6][7].

- Requirements definition
This method gathers all applicable data in its entirety and analyzes it for potential software requirements. This stage is complete, producing ready-made design.
- System and design software
After collecting and processing the data, the next step is to turn it into a software design type.
- Implementation and Unit Testing
At this stage, design is converted into software, and no programmatic or logical erroneous operation exists.
- Integration and System Testing
The developed program will be tested as a full system to decide whether it is software-compatible and worth delivering to the customer.



- e. Operation and Maintenance
a system solution and maintenance and boost system machine.

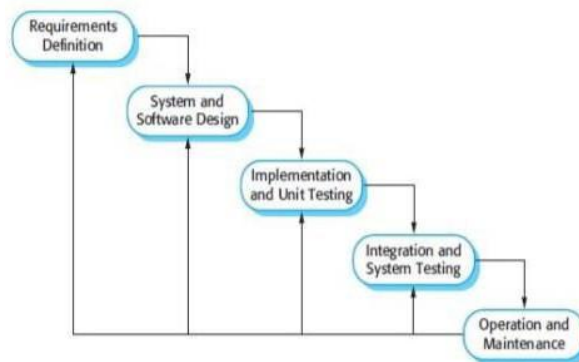


Fig 1. The SDLC Method Stages

3. Results and Discussion

3.1 System Analysis

This data collection method aims to collect data through observation, direct interviews, and questionnaires at the Health Office.

- a. Observation
Researchers performed direct observation techniques at the Health Office to obtain current data from the Labuhanbatu Health Office [8].
- b. Interview
This technique is carried out directly in the question-and-answer process at the Labuhanbatu District Health Office, which will help a system to be developed, namely the application of the webgis of the Labuhanbatu District Public Health Center.[9].
- c. Questionnaire
The questionnaire is a written query containing data required to create a geographic information system [10]

3.2 System Design

a. Use Case Diagram

Fig 1.Below is a system running, illustrated using a use case diagram, where this system has an input, processing and family of 2 actors between the admin and the community..

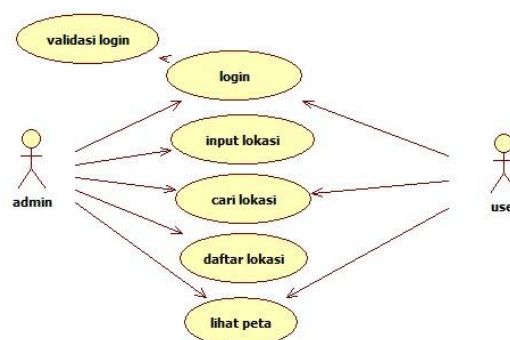


Fig 2. Use Case Diagram of Puskesmas Distribution GIS

b. Database Design (Class Diagram)

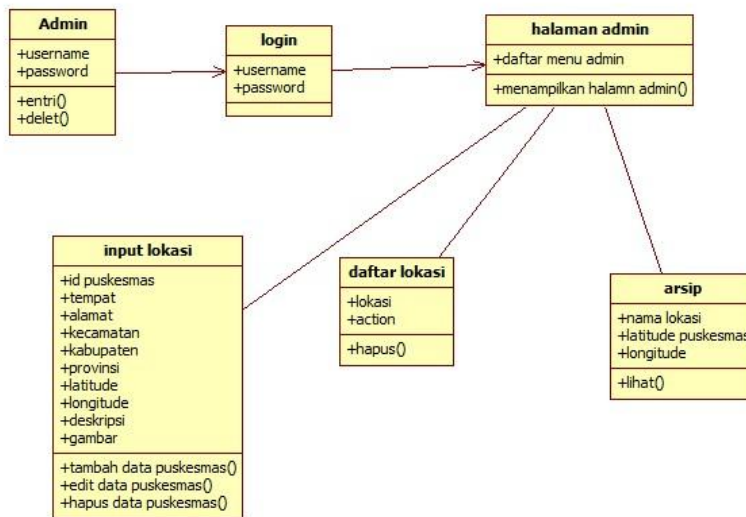


Fig 3. Class Diagram of SIG Puskesmas in Labuhan Batu Regency.

Fig 3. The Class Diagram shows the database architecture for Puskesmas distribution in Labuhanbatu Regency. Class map. A sequence diagram depicts a protocol based on the Labuhanbatu District GIS scheme for puskesmas distribution. This process is represented in a three-stage sequence diagram. Input, method, output. Two actors, namely Admin and Community, did this. This describes login method, site inspection, puskesmas data input delivery, and puskesmas distribution data. Fig 3 demonstrates the administrator's initial stage of developing a data processing system. A login mechanism exists. To login, several steps must be completed, such as entering an email address and password and connecting to the user table database automatically. There are also e-mail addresses and passwords. If login attempt fails, the page returns to login form

c. Squence Diagram Login

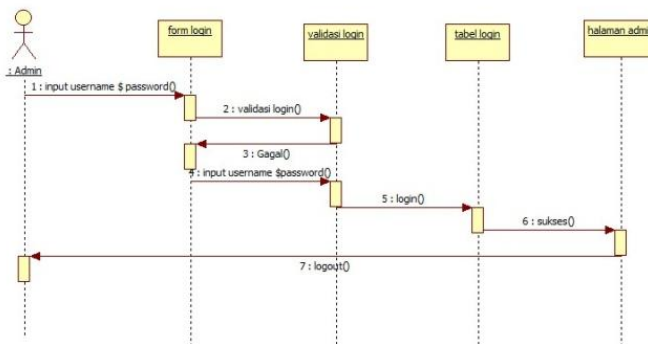


Fig 4. Squence Diagram Login

d. Squence Location Input Diagram.

In Fig 5. Describes a device process running to input the GIS delivery position, played by the administrator who completely controls the running system. Meanwhile, the population (user) renders the administrator's input before system outputs as seen in the sequence diagram below. There are two processes to be executed.

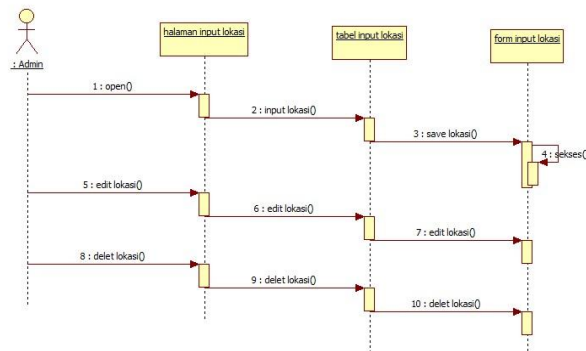


Fig 5. Squence Diagram of Input Location.

e. Squence Diagram of health center search

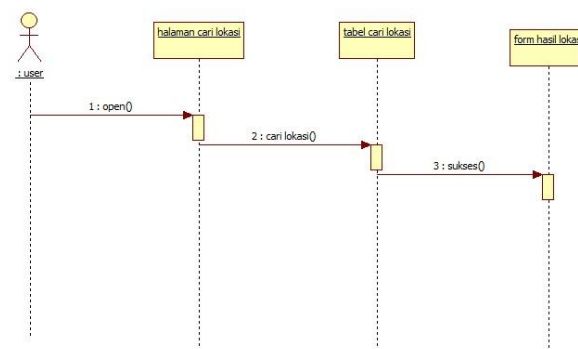


Fig 6. Squence diagram for health center search

Fig 6. In this scheme, the admin lists the position of the GIS distribution and inputs GIS distribution data.

f. Squence diagram of a list of locations

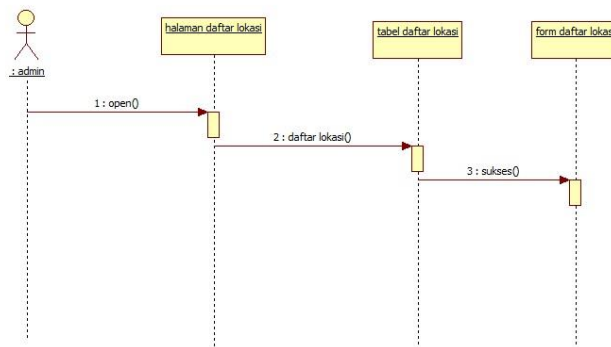


Fig 7. Squence Diagram of GIS Distribution Data

3.3 Implementation

Fig 9-based. The login menu is the first move to open the application by entering your email and password.

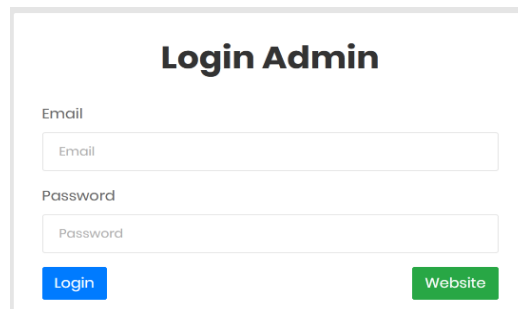


Fig 9. Login Access

Based on Fig 10, the user can see health center distribution map and Labuhanbatu Regency health center info. While the admin should add the latest puskesmas data.

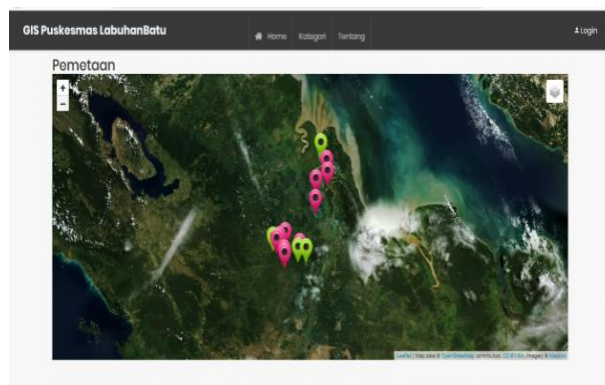


Fig 10. The main view of webgis

Fig 11-based. Below the user can see the address and other labuhanbatu Puskesmas distribution info.

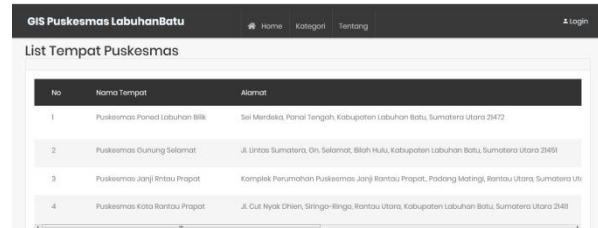


Fig 11. GIS distribution data page

Based on Fig 12, the admin can input the puskesmas data in Labuhanbatu district and can adjust it and add Puskesmas data.

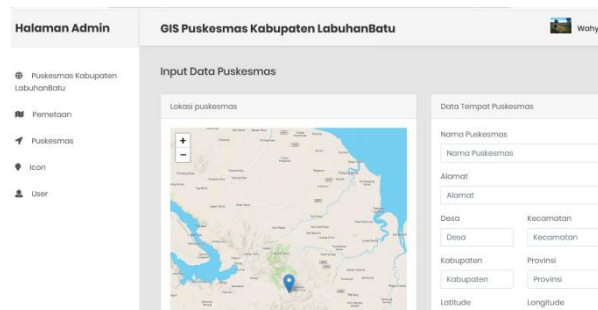


Fig 12. The data input page

3.4 Making Program Code

Based on Fig 12. Evaluating and constructing GIS distribution centers in Labuanbatu. This operation is performed in making a logic system and a software that gets a gis feature to distribute health centers in the district of Labuhanbatu according to the needs of the system.[11].

3.5 Testing Phase

In this operation, the system being designed must also be performed in a test phase so that system functions can be understood whether or not it is feasible and what the consumer wishes can be realized. [12].

Table 3.
Black Box Testing on Webgis

Part in test	Testing on the system	Model Testing	Test Results
Login view	Verifikasi pass & username	Black box	valid
Location input	puskesmas	Black box	valid
Input Data Puskesmas	Type puskesmas	Black box	valid
GIS distribution data	View GIS Distribution Data	Black box	valid

4. Conclusion

This study aims to create a Geographic Information System (SIG) to provide community health services information through puskesmas. Built using UML to define its architecture. Using SDLC (Systems Development Life Cycle) use UML to design spatial information systems to help solve problems. Using Webgis to spread puskesmas' location in Labuhanbatu district will benefit the community.

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