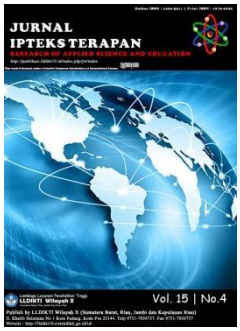

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IMPLEMENTATION OF GIS LOCATION DETERMINATION OF CATTLE IN ASAHAN REGENCY

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Abstract

Background: Cattle farming is one of the sources of food ingredients in the form of meat which has high economic value and is important in people's lives. There are many cattle breeders to go to to do the program every week or about 30 cattle farmers. The large number of cattle breeders makes it difficult for relevant agencies to map their locations. **Method:** This study uses qualitative methods in terms of data collection. Qualitative method is a method that focuses on understanding the overall aspect of the problem being discussed. **Result:** This research produces a system that can have the ability to map all cattle farms with an accurate distribution of locations. **Conclusion:** The application of GIS in this study allows the community to search for the location of cattle farms based on this application in Asahan and improve the quality of the mapping system of farm locations at the Livestock Service Office of Asahan Regency.

Keywords: *Geographic Information System, GIS, Mapping, Cattle, Asahan*

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INTRODUCTION

Geographic Information System (GIS) is one of the technologies created with the aim of handling referenced data. The final results issued by this system will later be used in terms of making decisions related to geographical problems [1]. GIS also has a function in terms of mapping an area where the mapping is based on latitude and longitude data on the condition of the area [2]. GIS can help and facilitate the user in terms of obtaining information about an area in which there is special information and data contained in the GIS.

Cows are one of the livestock whose main production is meat, milk, and leather. Apart from being a producer of meat, cattle in Indonesia are also used as a source of labor, organic fertilizer, biogas, and savings in the future. [3]. The Department of Livestock and Animal Health of Asahan Regency is one of the partners for cattle farmers who want to develop their cattle farms with outreach programs and cow health monitoring. There are many cattle breeders that must be addressed to carry out the program every week or around 30 cattle farmers. Of course, this makes employees who have to come directly to the location points of cattle farmers as a form of responsibility in reporting the extension program.

However, the problem now is that the Livestock and Animal Health Service employees of Asahan Regency do not know all the points of location for cattle breeders to be addressed, due to the lack of access from google map to that location. Usually employees have to make a new trip or even remember the previous trip by asking the community where the location of the cattle farmer will be. This will only take a long time, because the location point information is not fully known. So we need a tool by utilizing technology as an alternative that makes it easier to find location points or mark locations with Geographic Information Systems.

Research that applies geographic information systems has been carried out including entitled "Designing Geographic Information Systems Mapping Pharmacy Locations in the Bogor City Region Web-Based" [4]. Research entitled “Analysis and Design of Geographic Information Systems for Population Land Distribution (Case Study of Tanjungasari Village, Cianjur Regency [5]. Research entitled “Geographical Information System (GIS) Web-Based School Mapping in Wonodadi District, Blitar Regency” [6]. Research entitled “Geographical Information System for Mapping the Location of the Malang City Bird Contest on Android” [2]. Research entitled "Designing a New Student Admission System for Zoning Paths with a Mobile-Based Geographic Information System (GIS)" [7].

Based on these references, this study focuses on assisting the Department of Livestock and Animal Health in Asahan Regency in determining the location of cattle in Asahan Regency as an alternative to getting to that location quickly using a geographic information system. It is hoped that this geographic information system can provide geographic information on the locations of cattle in Asahan Regency to facilitate and save time for employees of the Department of Livestock and Animal Health of Asahan Regency.

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RESEARCH METHODS

This study uses qualitative methods in terms of data collection. Qualitative method is a method that focuses on understanding the overall aspect of the problem being discussed. The following are the stages of research using qualitative methods:

1. Problem Identification, the problem identified in this study is that the employees of the Department of Livestock and Animal Health in Asahan Regency have difficulty in conducting counseling and monitoring of cow health because they do not know the intended location so it takes time. long time to get to that location.
2. Data collection, data collection is carried out by taking data on cattle in Asahan Regency at the research location, namely the Department of Livestock and Animal Health, Asahan Regency. The following is data on the location of cattle breeders that have been successfully summarized, which can be seen in table 1.

Cattle Name	Livestock Address
Qadi's Cow Farm	East Sumatran Highway, Sidomulyo
Kedai Ledang Cow Cage	Kedai Ledang, Kec. East Kisaran City
Jumiran Cattle	East Sumatran Highway, Sidomulyo
Klawu Cattle Breeders	Sumber Harapan, Kec. Tinggi Raja.
AR Cattle	Dusun 1 Sumber Harapan, Kec. Tinggi Raja,
Joni's Cow Farm	Serdang, Kec. Meranti, Asahan Regency.
Sitorus Cattle	Padang Sari, Kec. Tinggi Raja, Asahan Regency.
Apan's Cattle	Hessa Air Genting, Kec. Air Batu
Shabana Beef Group 2	Banjar, Kec. Air Joman, Asahan Regency.
Andrew's Broiler Cattle	Danau Sijabut, Air Batu.
Gentong Cow Cage	Dusun V Sumber Harapan, Kec. Tinggi Raja.
Siti Halimah's Cow Cage	Pulau Rakyat Pekan, Kec. Pulau Rakyat
Livestock Jaya Asian Highway	No.25, Aek Teluk Kiri, Simpang Empat, Asahan.
Sugiran	Kp. Baru Street, Danau Sijabut, Kec. Air Batu,.

Table 1. Location of Asahan District Cattle

3. System Design, the system design will start from UML design, namely use case diagrams, class diagrams, activity diagrams, sequence diagrams, flowcharts after that make coding from sublime text, XAMPP, and MySql databases for the process of making geographic information systems.
4. Implementation and Testing, the implementation of the system is to ensure whether it is in accordance with the application of the geographic information system. System implementation is carried out to complete the design in the document, namely the approved system design, testing, installing, starting and using a new system or an improved system. Furthermore, at the system testing stage, namely the activities in testing the system that has been built whether it is in accordance with system requirements or in accordance with the expected results.
5. Analysis of Results, analysis of results is carried out to ensure that the results obtained can help with problems in determining the location of cattle in Asahan Regency so as to obtain solutions from the results of the study.

RESULTS AND DISCUSSION

A. System Analysis

System analysis is one of the knowledge that must be possessed by an analyst or programmer before he can make a software, because analysis is the first step when someone wants to make a good system and is one of the stages of building a computer system.

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Analysis of Current System Procedures

The analysis of the system that is being compiled in principle is to study the existing system by conducting research and observations of the work units involved in processing the data in management. The following is a description of the current system flow in the search for cattle locations by the Livestock Service Office of Asahan Regency:

1. The Cattle Husbandry Service collects data on Cattle Cattle areas.
2. Then the data taken is made into a report in the form of cattle information.
3. Cattle data is conveyed by the Asahan community by providing information on cattle through social media and paper leaflets.
4. The Asahan community received information on cattle only in the form of cattle areas.

Analysis of The Proposed System Procedures

Observation of the new information system in principle is to study the existing system by conducting research and observations of the work units involved. The flow of this new information system consists of an information system flow that will be built on the search for cattle locations by the Livestock Service Office of Asahan Regency which is described as follows:

1. The Livestock Service Office of Asahan Regency logs in.
2. Then input data on cattle areas in the system.
3. Then the cattle area is inputted with detailed information on cattle.
4. The results of the detailed input of cattle will be processed in location mapping by matching the coordinates of the location of the cattle.
5. Then the community can access the system by registering and logging in to be able to find out detailed statistics on the location of cattle easily and in detail.

Process Analysis

Process analysis contained in this study describes the process carried out by the system in serving the needs of its users. Based on the needs of the Department of Animal Husbandry and users, the main functions that must be performed by the system are as follows:

1. The system can display information on mapping the location of cattle.
2. The system can display the variety, price, number of cattle and types of cattle.

There are several activities that occur at this stage, some of which can be seen in Figure 1 below.

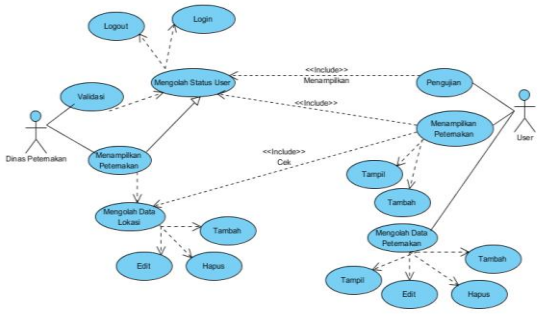

Figure 1. Use Case Diagram

The use case diagram illustrates an outline of the process that has been designed including:

a. Admin login
b. Then the admin inputs cattle data in the form of location, mapping and detailed assessment of cattle

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c. The results of the assessment in each area of cattle will appear in the form of locations and details of cattle.
d. The community registers by entering the data of prospective users
e. Then the public/users log in with their username and password.
f. Check the results of mapping the location of cattle in the Asahan Regency area.

After designing activities that can be carried out by users later, the next step is to describe the classes and functions into the class diagram shown in Figure 2.

Figure 2. Class Diagram

The system made consists of several classes including: (1) User Login class describes the relationship between the user and the system when doing the login process. (2) The Location class displays objects related to the location of the existing data. (3) The Livestock Details class describes the location of the existing data more explicitly and in detail. (4) The Farming Class connects the Location Class with other classes through a connection from the database.

User Analysis

The system designed is expected to have the following:

1. Usability, which can be easily used by administrators in adding data. And it can be easily accessed by users when they want to access cattle input data consisting of location, image, price of cattle and number of cows.
2. Functionality, which makes it easier to view finished GIS-based mapping information and supporting facilities and systems that can be used 24 hours a day.

B. System Implementation

The implementation describes the display of the results of the application for mapping the location of livestock in the Asahan Regency where this system uses PHP programming. The following are the results of the system implementation:

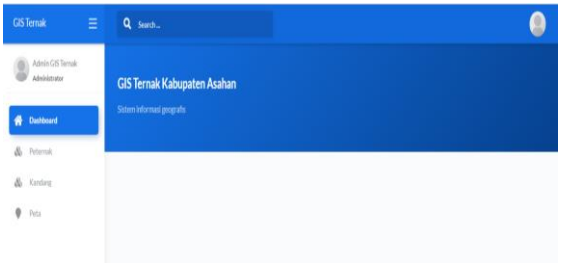

Figure 3. Home Menu Display

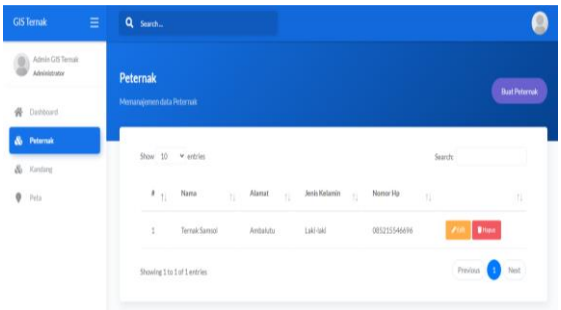

Figure 4. Farm Category Menu Display

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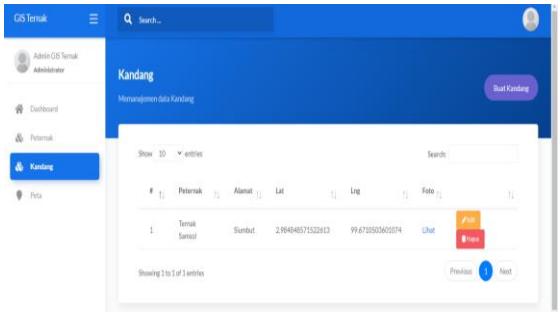

Figure 5. Cage Data Display

Figure 6. Livestock Location Display Admin

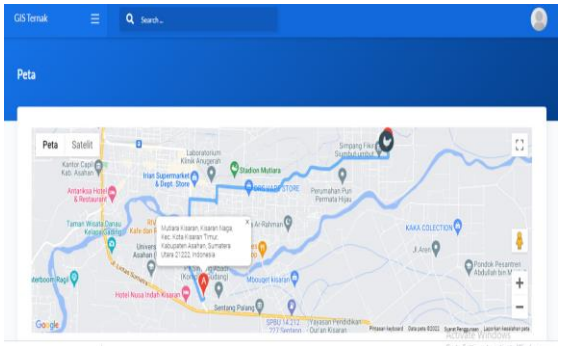

Figure 7. Livestock Location Results Display

System Test Results

The testing process carried out through the implementation phase of the assessment system in mapping livestock in the Asahan area during the work period using PHP programming was designed in a simple way. Here are the test results of the system that the author has made:

1. The system successfully performs the necessary data input process carried out by the admin which will later be in the form of output information about the location of the farm to the user.
2. The system is able to display the results of livestock location assessment decisions.

CONCLUSION

Applications designed using PHP programming with Mysql Database can help recapitulate farm information including farm locations. With this application, the community can search for the location of cattle based on this application in Asahan and will improve the quality of the cattle location mapping system at the Livestock Service Office of Asahan Regency.

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