



Geographic information system of station stop points web-based cross-terrain train

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ABSTRACT

North Sumatra is one of the metropolitan cities in Indonesia with a population density in various fields and education and has various kinds of information related to its geographical location, such as information on roads and the location of a train station, school, office, shopping area and so on. Of course, this information is needed by various parties for their respective needs. The absence of media for the community in finding a location makes it difficult for the community to find a place, especially a train station. The public needs information about the geographical location of train station stop points and the mileage of each station digitally so that it is easier for the public to find locations and information about train station stop points. With this problem, then giving the author an idea to raise the title "Web-Based Geographic Information System of Stop Point Railway Station Lintas Medan-Siantar Line" in the preparation of this thesis. With this web application, the author hopes to help the community in finding the location of the Medan-Siantar train station stop points. The programming language used to design this application is PHP, MySql as the database and ArcView as the map making application.

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1. INTRODUCTION

Geographic Information System is a special information system that manages data that has spatial information (spatial referenced). (Kurniawati et al., 2020). Or in a narrower sense, is a computer system that has the ability to build, store, manage and display geographically referenced information, for example data identified by location, in a database. (Ramadhani et al., 2020).

In simple terms, a system can be interpreted as a collection of elements, components, or variables that are organized, interact with each other, are interdependent, and integrated. Systems theory gave birth to futuristic concepts (Fitri Amalia, 2022). One of the well-known concepts is the concept of cybernetics (cybernetics). (Yunita, 2019). The concept of scientific study is mainly related to efforts to apply various scientific disciplines, namely behavioral science, physics, biology and engineering. Therefore, cybernetics is usually related to efforts to automate tasks performed by humans so that the study of robotics, artificial intelligence, and others is input, processing, and output. (Fitri Amalia, 2022).

Another concept contained in the definition of the system is the concept of synergy. This concept presupposes that within a system. The output of an organization is expected to be greater than the individual output or the output of each part (Fauzi, 2020).

A system consists of parts or components that are integrated for one purpose. The basic model of this form of system is input, processing, and output (Rini et al., 2021). However, this system can be expanded to include storage media. Systems can be open and closed, but information systems are usually open systems (Rini et al., 2021). That is, the system can receive some input from its external environment.

The train station is raising and lowering passengers who use rail transportation services (Almunawaroh, 2019). Large stations are usually equipped with more equipment than small stations to support the comfort of passengers and prospective train passengers, such as waiting rooms (VIP air-conditioned), restaurants, toilets, prayer rooms, parking areas, security facilities (special police train), communication facilities, locomotive depot, and refueling facilities (Muhlis et al., 2019).

However, in reality the conditions regarding the GIS for the location of the Medan-Siantar cross-road train station stop are inadequate. Besides that, various information data about the location of the Medan-Siantar cross-track Railway station stops have not been inventoried in a spatial-based on-line information system, the mapping data for the location of the Train station stops are still using Microsoft Excel (Mudjanarko et al., 2020).

2. RESEARCH METHOD

Method is a systematic way or technique to work on a case. In completing this thesis the author uses 3 (three) study methods, namely:

a. Field Studies (Field Research)

It is a method that is carried out by conducting direct studies in the field to collect data, namely direct observation to the Medan Train Station by collecting data such as data on the location of the stop of the Medan-Siantar Train station.

b. Library Studies (Library Research)

And data collection carried out by the author in the method of library research (Library Research) as follows: Is a way to find references and to find out more deeply to analyze. The research was carried out by collecting library materials which were carried out in libraries, library research was also carried out through searching via the internet. By visiting sites such as journals that can help discuss material.

c. Interview

It is a direct statement regarding the problem that the author wants to know by asking directly to Mr. Jasrin Sibarani who serves as the Head of the Medan Besar Station.

The questions posed by the author are as follows: how far is the distance traveled by the train at each station, how many points are the stations from Medan-Siantar

3. RESULTS AND DISCUSSIONS (10 PT)

3.1 Results Display

The program interface page is in the results display. The display of these results becomes a program interface that connects the admin and the user, from the application of a web-based geographic information system stop point to the cross-terrain – Siantar railway station which will be explained in the following sub-chapter.

a. User Main Page Display (Home)

The following is the display of the user's main page (Home) that the author made in the web-based geographic information system of stoppoints for cross-field-Siantar railway stations as shown in Figure 1 below:



Figure 1. User Main Page Display (Home)

b. Display of User Pages About the Railway Station

The following is a display of the user page about the railway station that the author made in the geographic information system of the cross-field line railway station stop point – siantar berweb base as shown in figure 2. below:

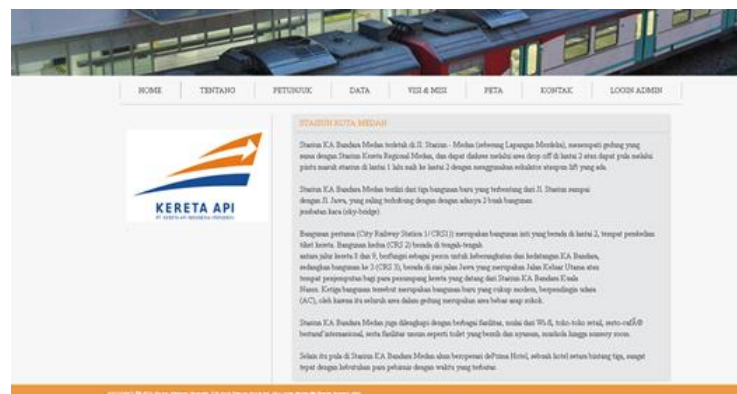


Figure 2. User Menu Page Display About Trains

c. User Menu Page Display Instructions for Payment

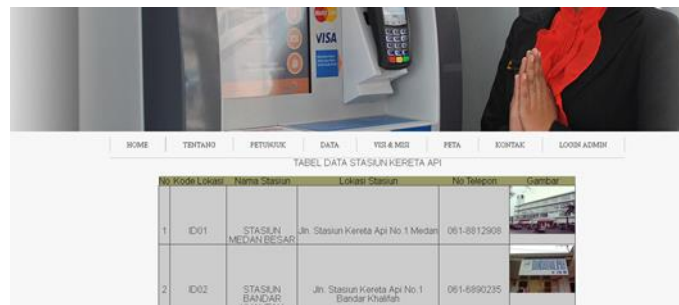
The following is a display of the user menu page for payment methods on the web-based geographic information system of stop points for the cross-terrain – Siantar railway station.perti in figure 3. below:



Figure 3. User Menu Page Display Instructions for Payment

d. Display of Station Data User Menu Page

The following is a display of the Station Data user menu page on the geographic information system of the stop point of the cross-terrain – siantar berb railway stationweb asis as shown in figure 4. below:



No	Kode Lokasi	Nama Stasiun	Lokasi Stasiun	No. Telepon	Gambar
1	ID01	STASIUN MEDAN BESAR	Jln. Stasiun Kereta Api No 1 Medan	061-8812908	
2	ID02	STASIUN BANDAR KUALA KUALA	Jln. Stasiun Kereta Api No 1 Bandar Kuala	061-6990295	

Figure 4. Display of Station Data User Menu Page

e. Display of Vision & Mission User Menu Page

The following is a display of the vision & mission user menu page on the geographic information system of the cross-field railway station stop points – siantar berbweb asis as shown in figure 5. below:

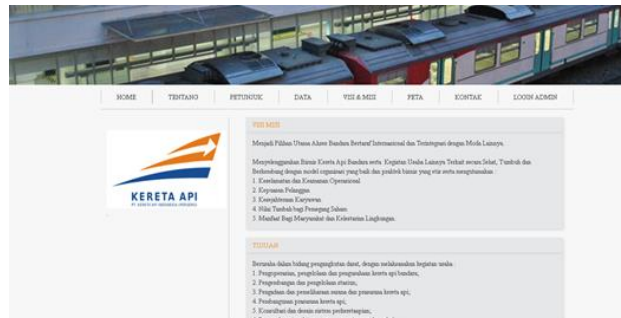


Figure 5. Display of Vision & Mission User Menu Page

f. Location Map Menu Page Display

The following is a display of the menu page for the location of the train station map that the author made in the geographic information system of the cross-field line railway station stop points – siantar beweb base as shown in figure 6. below:

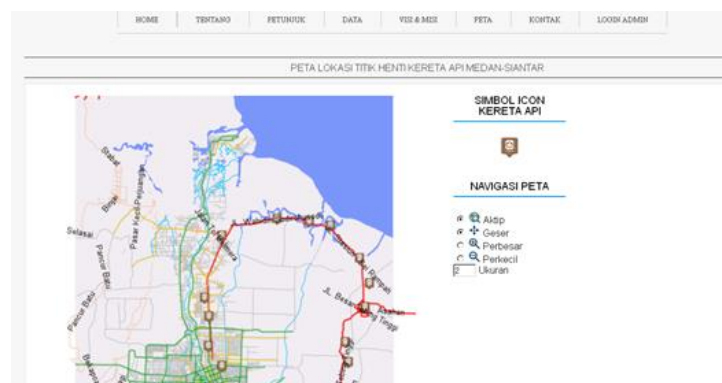


Figure 6. Display of Railway Location Map Menu Page

3.2 User Contact Person Menu Page Display

The following is a display of the user contact person menu page on the geographic information system of the cross-field line railway station stop point – Siantar Berbweb asis as shown in figure 7. below:

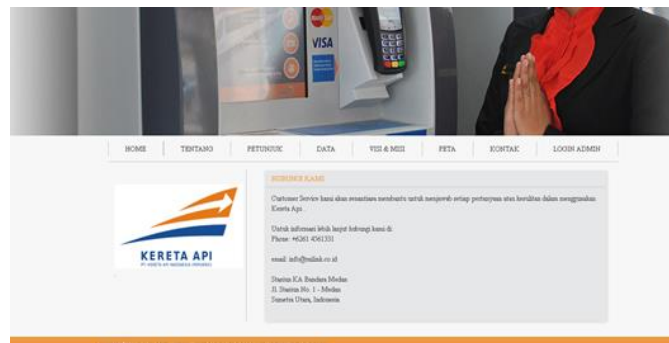


Figure 7. User Contact Person Menu Page Display

g. Administrator Login Page Display

The following shows the administrator login page, where each admin must first login to this system to process train data. The following can be seen in Figure 8. below:

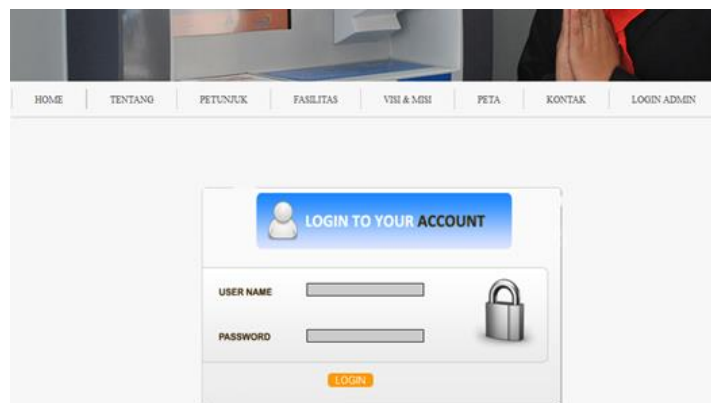


Figure 8. Administrator Login Menu Page Display

h. Admin Menu Main Page Display

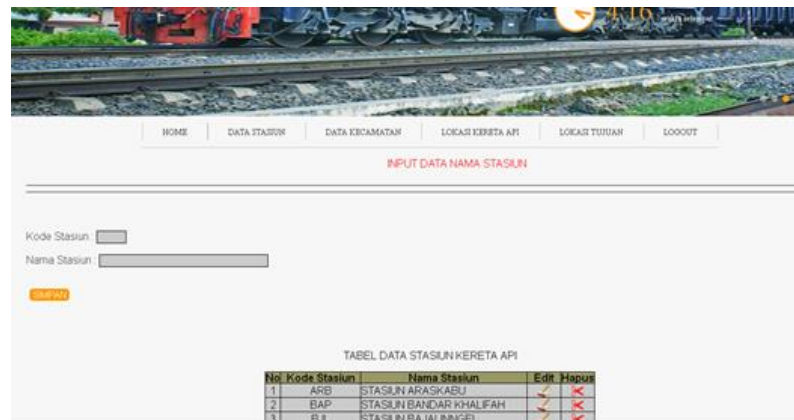
The following is the display after the admin has successfully entered the system, an admin menu page will appear which contains a menu of station data tables, sub-district data tables, train location tables, the menu exits the system. Give met can be seen in Figure 9. below:



Figure 9. Admin Menu Main Page Display

i. Display of Admin Menu Page Table of Railway Station Data

This page is the admin menu page for the railway station data table to be able to input, edit, and delete train station data. Display of the admin menu page for the train station data table ap can be seen in Figure 10. The following:

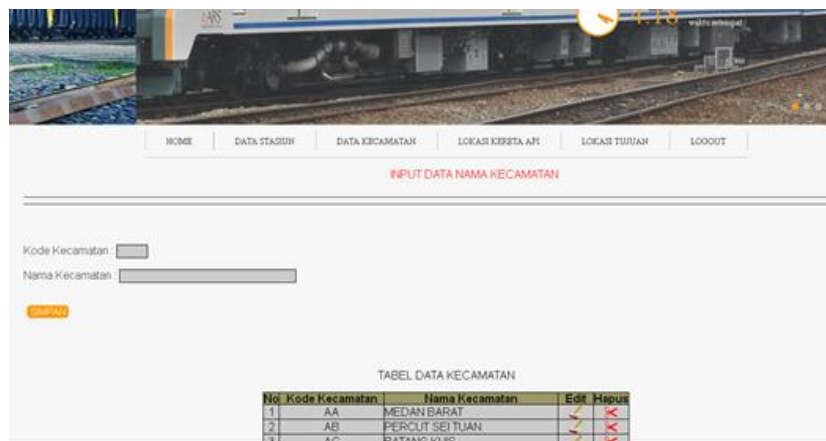


No	Kode Stasiun	Nama Stasiun	Edit	Hapus
1	ARB	STASIUN ARASKASU		
2	BAP	STASIUN BANDAR KHALIFAH		
3	BJL	STASIUN BAJALINGEI		

Figure 10. Display of Railway Station Data Table Menu Page

j. Display of Admin Menu Page District Data Table

This page is the sub-district data table admin menu page to be able to input, edit, and delete sub-district data. Display of the glasses table admin menu page can be seen in Figure 11. the following:



No	Kode Kecamatan	Nama Kecamatan	Edit	Hapus
1	AA	MEDAN BARAT		
2	AB	PERCUT SEI TUAN		
3	AC	BATANG KUIS		

Figure 11. Display of Admin Menu Page District Data Table

k. Display of Admin Menu Page Table of Railway Location Data

This page is the admin menu page for the train location data table to be able to input, edit, and delete train location data. And this table can change at any time if needed by the train stationsuch as: Departure Time, Travel Duration, Station Distance, Mileage, Ticket Prices. The appearance of the admin menu page for the railroad location data table can be seen in Figure 12 below:

HOME DATA STASIUN DATA KECAMATAN LOKASI KERETA API LOKASI TUJUAN LOGOUT

INPUT DATA LOKASI STASIUN KERETA API

Klik Perbesar/Cari Lokasi Pada Peta Untuk Mendapatkan Titik Koordinat X dan Y

Titik Koordinat X:

Titik Koordinat Y:

Kode Lokasi:

No Kereta Yang di Berangkatkan:

Tanggal Keberangkatan:

Nama Stasiun:

Tujuan:

Waktu Keberangkatan:

Durasi Perjalanan:

Jarak Stasiun:

Jarak Tempuh:

Harga Tiket:

Lokasi Titik Henti Kereta Api:

Figure 12. Admin Menu Page Display Table of Train Locations

I. Admin Menu Page Display Table of Train Destinations

This page is the admin menu page for the train destination data table to be able to input, edit, and delete train destination data. Display of the admin menu page for the train destination data table can be seen in figure 13. the following:

HOME DATA STASIUN DATA KECAMATAN LOKASI KERETA API LOKASI TUJUAN LOGOUT

INPUT DATA LOKASI STASIUN

Id Stasiun:

Tujuan:

TABEL DATA LOKASI STASIUN KERETA API

No	Id Stasiun	Tujuan	Edit	Hapus
1	D01	STASIUN MEDAN BESAR	Edit	Hapus
2	D02	STASIUN BANDAR KHALFAH	Edit	Hapus
3	D03	STASIUN BATANG KUIS	Edit	Hapus
4	D04	STASIUN ARASKABU	Edit	Hapus

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Figure 13. Admin Menu Page Display Table of Train Destinations

3.3 Discussion

In designing a web-based geographic information system for stop points for the cross-terrain-Siantar railway station, the author uses a web-based program with Macromedia Dreamweaver as a programming language for web design, in processing Medan city map data the author uses Arcview, and uses a local server application, namely Mapserver(ms4w). The commands that exist on the system that the author made are also quite easy to understand, because the user only needs to click on the buttons that are already available on the system as needed to input new information.

4. CONCLUSION

The conclusions that can be given in writing this thesis are as follows: In accordance with current technological developments, the development of information systems has led to a more accurate geographic information system. The geographic information system developed in this application can be used as stop point information for the Medan-Siantar train station effectively and efficiently. Facilitate the user in searching for the stop point of the Medan-Siantar train station. In designing this system using the programming language PHP and MySQL as the database.

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