CUSTOMER MAPPING SYSTEM WITH WEB TECHNOLOGY ON THE SIDEAK MOTOR TO IMPROVE EFFICIENCY AND ACCURACY

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Abstract: The implementation of Geographic Information Systems (GIS) within organizations has become essential in accomplishing work activities in the modern era. Sideak Motor is a financing company in Kisaran City, Asahan Regency, that provides loans using motorcycle registration certificates (BPKB) as collateral, with a customer base reaching 6,052. Sideak Motor faces difficulties in data management. During meetings concerning customer locations, data communication with owners and office staff is often problematic. Additionally, when duties are transferred, new field officers struggle to locate customers because the previous officers could only provide textual information. As a result, office staff have no precise knowledge of customer locations—only the field officers do. This study aims to design a web-based customer mapping system to facilitate information storage, reduce costs, save time, and produce an information system that enhances the efficiency and accuracy of customer data management. The resulting system presents the distribution of customer locations and provides accessible information such as personal data, addresses, route details, and photos of customers' homes, thereby simplifying the operations of Sideak Motor.

Keywords: customer distribution mapping; geographic information system (GIS); sideak motor.

Abstrak: Penerapan sistem informasi geografis dalam organisasi menjadi hal utama untuk menyelesaikan suatu aktivitas pekerjaan pada era sekarang ini. Sideak Motor merupakan salah satu perusahaan pembiayaan dengan agunan BPKB sepeda motor di Kota Kisaran Kabupaten Asahan yang memiliki nasabah mencapai 6.052, Sideak Motor kesulitan dalam pengelolaan data, saat melakukan rapat mengenai lokasi nasabah sulit dilakukan komunikasi data dengan pemilik dan petugas kantor lainnya, serta pada saat pergantian tugas, petugas lainnya kesulitan mencari lokasi nasabah, karena petugas lapangan hanya bisa memberikan informasi berupa teks, dengan begitu petugas kantor tidak mengetahui lokasi pasti nasabah Sideak Motor, jadi yang mengetahui lokasi mengenai tempat tinggal nasabah hanya petugas lapangan. Penelitian ini memiliki tujuan untuk merancang sebuah sistem pemetaan nasabah berbasis web yang dapat mempermudah dalam penyimpanan informasi, mengurangi biaya, menghemat waktu serta menghasilkan sistem informasi yang dapat meningkatkan efisiensi dan akurasi pengelolaan data nasabah. Hasil sistem ini menyajikan sebaran pemetaan lokasi nasabah menyediakan informasi berupa biodata, alamat, rincian rute, dan gambar rumah nasabah yang dapat diakses secara cepat dan akurat sehingga dapat mempermudah pihak sideak motor.

Kata Kunci: pemetaan sebaran nasabah; sistem informasi geografis (SIG); sideak motor.

INTRODUCTION

The use of geographic information systems within an organization can present geographic data in the form of maps that are informative and easy to understand [1]. Geographic information systems in daily life aim to make it easier to find the location of a location through visualization owned by geographic information systems [2]. GIS is a part of software, hardware, and human resources that work effectively in the process of data input, storage, management, manipulation, analysis, and visualization [3].

Information systems are used to collect and process data in the form of detailed facts [4]. Geographic information systems unify the existing coordinate points on the map by combining them, analyzing them, and determining the results [5]. The map projection is digitally created and implemented into a Geographic Information System (GIS) that is integrated with the website [6]. Map projection is a method that uses distortion to show part or all of a three-dimensional, spherical surface on a two-dimensional flat surface [7].

GIS technology integrates data-driven processing operations, such as on-demand data retrieval, as well as statistical analysis using visualization [8]. The basic concept of creating a GIS-based system by using information from data processing, namely spatial data so that data can be accessed in a map that is presented digitally [9]. A finance company is a business entity that procures goods or services. The existence of financing institutions is increasingly in demand. For example, consumer financing is in great demand by the public because the procedure is relatively uncomplicated [10].

Sideak Motor is one of the means of crediting with motorcycle BPKB collateral in Kisaran City, Asahan Regency. Currently, Sideak Motor has difficulties in data management, such as when collecting data on customer locations, when conducting meetings about customer locations with the communication office is difficult to do and when changing duties, other officers have difficulty finding customer locations, because when they want to know the location of customers, field officers can only provide information in the form of text, that way office officers do not know the exact location of Sideak Motor customers, So the only ones who know the customer's location are field officers.

Therefore, a customer mapping system is needed regarding the location of Sideak Motor customers. The results obtained in customer mapping are information systems for the distribution of customer mapping, information about customer biodata, home addresses, route details and pictures of customer houses that can be accessed quickly, efficiently and accurately. The purpose of building this system is to design a web-based customer mapping system that can make it easier to store information, reduce costs, save time and produce an information system that can improve the efficiency and accuracy of customer data management.

The previous research by Sri Rafika Dewi in 2021 entitled "Location Mapping of Trafficked Creditor Customers Based on Geographic Information Systems" was

the result of the research was to make it easier for collectors to find customer locations, the system built provided locations based on coordinate points and accurate travel routes [11]. Furthermore, the research conducted by Muammar Rizky entitled "Geographic Information System for Mapping the Location of Motorcycle Credit Customers"This research aims to classify the distribution locations of PT. FIFGROUP Pontianak branch using a geographic information system [12].

Based on previous research, the study has similarities, namely using Gis with location analysis using the hotspot analysis method where identifying locations with phenomenal concentrations. Based on previous research, this study has similarities, namely using Gis with location analysis using the hotspot analysis method where identifying locations with phenomenal concentrations. This research has novelty with different results, not only showing the route but being able to show the distribution of the customer's location map, the location object is the Sideak Motor customer with the geocoding location analysis method, which is converting the address into geographical coordinates for mapping.

METHOD

The research method used is qualitative research. It is a research that only collects data and explains descriptively/narratively without having to be processed with statistical testing. The description of the framework in this study namely:

Problem Identification

During the evaluation with the owner and office officer to find out the location of the customer, the field officer can only provide information in the form of text to the owner and office officer, that way the owner and office officer do not know the exact location of the Sideak Motor customer. Sideak Motor does not yet have an information system that can be accessed quickly, efficiently and accurately about customer location information. If there is a change in field duties, other officers will have difficulty finding customer information.

Problem Formulation

The formulation of the problem in this study is: How to design a geographic information system that is able to show the distribution of mapping the location of Sideak Motor customers, How can the geographic information system be accessed quickly, efficiently and accurately to determine the location of Sideak Motor customers, How can a system be used to find out the location of Sideak Motor customers so as to help Sideak Motor employees find the location of customers' homes.

System Planning

There are 3 actors, where admins access login and logout, input customer distribution data, view distribution data, routes, update and delete distribution data and print reports. Field officers log in and log out and see distribution data and routes. Owners have role log in and out, view distribution data, routes, update and delete distribution data, and print reports.
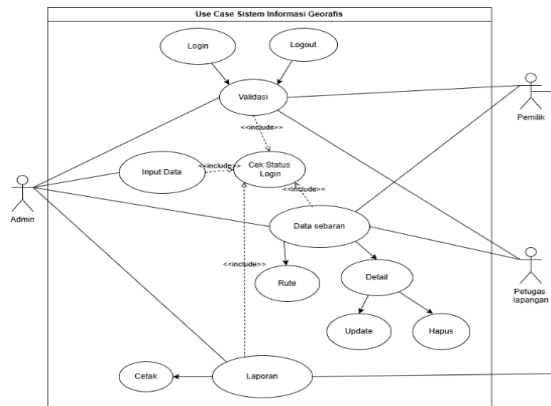
Image 1. Use case diagram

System Development

The development of the system is carried out to make it easier to store information, reduce costs, save time and produce an information system that can improve the efficiency and accuracy of customer data management through the development of a web technology system with system development steps using Google Maps API, PHP and MYSQL database software.

Process analysis

The process first collecting information related to the location of Sideak Motor customers, including addresses and other additional information. Data collection is carried out by taking data directly from the Sideak Motor office. After the data is collected, the data will be processed to ensure accuracy. This data is entered into a database that can be accessed through software. The mapping uses GIS software to map Sideak Motor's customer data.

The data is visualized in the form of a map that shows the location of each Sideak Motor customer. The system to be built can provide detailed information

about the customer's location, including biodata, address, route details, and pictures of the customer's house.

RESULTS AND DISCUSSION

Geographic Information System (GIS) Customer Mapping With Web Technology On Sideak Motors which will provide information to users, this system utilizes the Google Maps application as a map provider to provide detailed information about the customer's location, including biodata, address, route details, and pictures of the customer's house.

Admin Home Page View

This page displays the main page after the admin successfully logs into the system. On the admin, it is equipped with features for inputting distribution, distribution data, customer data and report data.
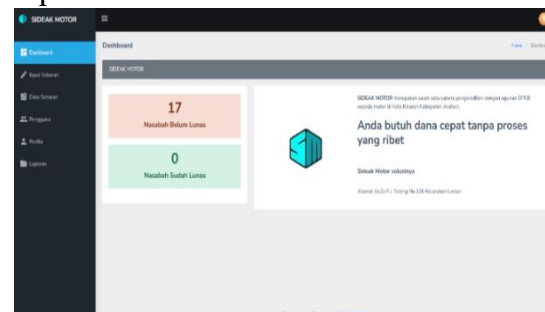

Image 2. Admin Dashboard

Owner Home Page View

This page displays the main page after the owner successfully logs into the system. On the owner dashboard, it displays the number of data on how many customers have not paid off and who have paid off their loans.
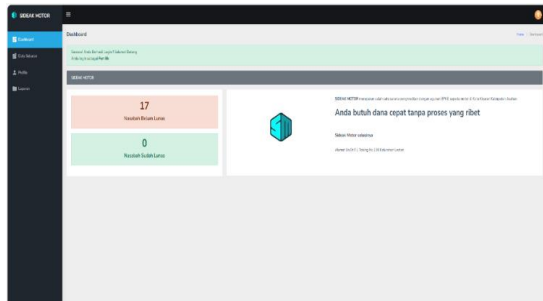
Image 3. Owner's Page

Data Input Page View

The page display on this menu is to display the data input page, where the admin must fill in all the data that has been provided and then the account data is saved into the database.
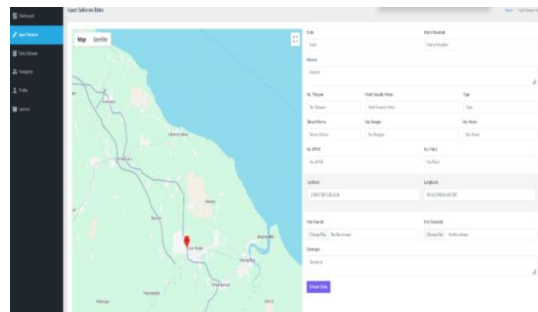

Image 4. Admin Distribution Data Input Menu Page

Spread Data Page View

This page displays the distribution of customer locations that have been input by the admin, on this page users can access the route menu and view detailed customer data
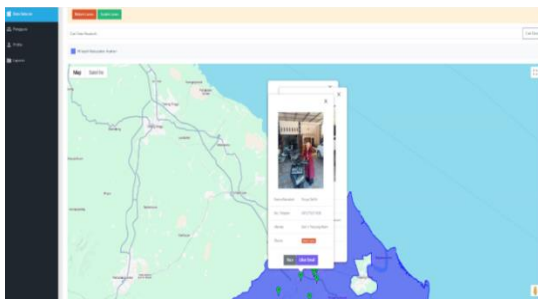

Image 5. Distribution Data Menu Page

Profile Page View

This page displays the profile of the user who is accessing the system, on this page the user can change the profile account
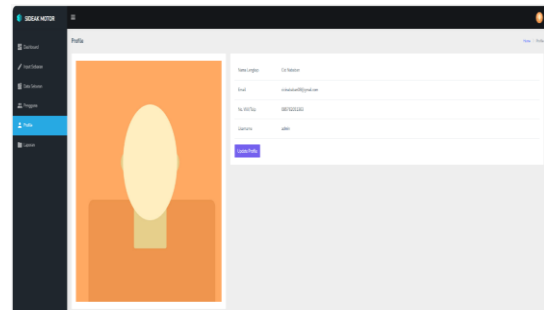

Image 6. Profile Menu Page View

Report Page View

This page aims to display the output of customer data inputted from the system.
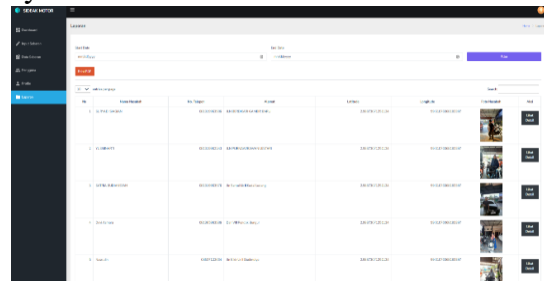

Image 7. Report Menu Page

Route Page View

The location route page shows the route from the user's location to the destination location and displays the distance and time.
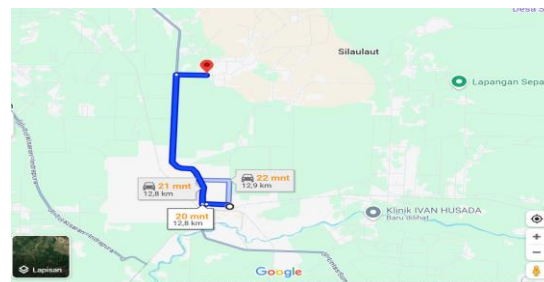

Image 8. Route Menu Page

Detail Page View

The detail page displays all customer data starting from customer identity, vehicle identity and customer location points on the map
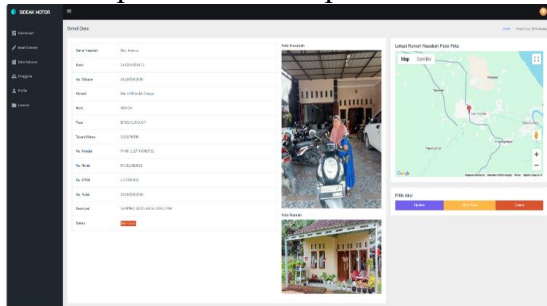

Image 9. Detail Menu Page

Blackbox Testing

Black-box testing is a software testing method that focuses on the functionality or output produced by a program without paying attention to how the program works internally. The tester only knows the input given and the output produced, but does not know how the program code in it runs.

Table 2. Blackbox Testing

Feature	Test Scenarios	What to expect	Observation	Conclusion
Home	Displays the number and status of customers who have been input into the system	Displays the number and status of customers who have been input into the system	Number and status of successful customers	Accepted
Distribution Data Input Page	Input customer data starting from customer identity, motorcycle identity and location points on the map	If the data is filled in then the data will be stored in the database	Successful Customer Distribution Data Input	Accepted
Distribution data	Displays customer location markers on the map	If the marker is clicked, the route feature will appear and see the details of the data that has been input in the database	Markers appear on the map, the data corresponds to the database	Accepted
Profile Menu Page	Displays the identity of the user who is currently using the system	View signed-in users	Login users appear	Accepted
Reports menu page	Filter, Print	Display report data according to the selected date and process to print pdf.	Data displayed successfully, Print successfully	Accepted

CONCLUSION

The development of a web-based customer mapping system using Geographic Information Systems (GIS) technology has introduced a practical solution that enhances the internal coordination and service efficiency of financing institutions such as Sideak Motor. Beyond addressing operational challenges, the system fosters better data transparency and accessibility, particularly in managing customer location information. The implementation also reflects the growing necessity for digital tools that support decision-making and field operations. Overall, this innovation signifies a step forward in digital transformation.

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