DEVELOPMENT APPLICATION FOR VEHICLE MOVEMENT MONITORING SYSTEM BASED ON GPS TRACKING

Asep Jamaludin

Universitas Komputer Indonesia (UNIKOM)
Jl. Dipati Ukur No. 112-116, Bandung 40132
Email: asep.jamaludin2@gmail.com

ABSTRACT

Tracking system was first built for the shipping industry because they want to know every means of transports every time. At first, passive systems are used to meet this need. For applications that require real-time location information of vehicles, this system can not be employed because they store information in internal storage sites and location information can be accessed only when the vehicle there. To achieve automatic vehicle location system device to transmit location information in real time, then the active system is built. Vehicle tracking system with real time in the company's hardware is installed inside a vehicle and a remote server. Information transmitted to the tracking server using a modem GSM / GPRS on the GSM network using a socket connection TCP / IP over GPRS. Information on the location tracking server is there to provide vehicle position information from users..

***Key Word** : GPS Tracking System, Data Flow Diagram, waterfal methodl.*

1. INTRODUCTION

The rise of vehicle theft with a variety of motives at this time of unrest caused many users of the vehicle. Users anticipate every vehicle in many ways including security, namely: by using an alarm system and double lock. Nevertheless but thieves can still commit crimes with various motifs such as by destroying or damaging to disable the alarm and double lock, so the author was inspired to build applications for monitoring movement of vehicles on GPS-based tracking system.
Application of GPS (Global Positioning System) at this time have been widely used in determining the position, especially in the field of transportation as an example in vehicle monitoring system or the Vehicle Tracking system, this system is an integration of three technologies ie technologies with GPS positioning, GIS technology (System Geographic Information) and data communication technology in this case GSM. In this system, GPS serves as a vehicle positioning equipment, GIS as spatial information providers and GSM as communication media sending position data to a central control. This application progress very rapidly along with the three technology developments supporting the application. On the other hand the development of internet technology is currently causing the dissemination and exchange of information can be done quickly globally without any time limitation. Technology World Wide Web (WWW) or the web as one type of service provided by the Internet is a type of service the fastest growing and most widely used today. The development of supporting software such as web server side programming language, API, active x, and others have added web capabilities than originally could only display static pages where users can only view the information without any interaction between the user and the web, this time be more dynamic Web that allow for interaction between users and the web. Integration of web technologies into the vehicle monitoring application enables vehicle position information can be visualized into the web so that information can be accessed globally without any limitation of time and place.

2. MODEL,ANALYSIS,DESIGN, AND IMPLEMENTATION

2.1 Model

Data analysis techniques in the making software using modeling software with waterfall method, which involves several

processes including:

a. System Requirements Analysis

This model begins with the search needs of the entire system to be applied in the form of software. It is very important, considering that the software must be able to interact with other elements such as hardware and databases.

b. Analysis

Finding, defining and understanding the needs of the software. To know the nature of the program to be made, such as the functions you need, performance (ability) and the interface is needed. This stage should be documented and presented to the user system.

c. Design

Design is a process used to alter the above needs to be representation in the form of software design before coding begins. Design should be able to implement the requirements mentioned in the previous stage. Like the previous activity, then this process must also be documented as the configuration of the software.

d. Coding

To be understood by machines, in this case is a computer, then the design must be transformed into a form that can be understood by machines, ie into the programming language through a process of coding. This stage is the implementation of the design phase.

e. Testing

Testing is something that is made must be tested. So it is with software. All software functions should be tested, so that the software is free from error, and results should be in strict accordance with the needs that have been defined previously.

f. Maintenance

A software maintenance is required, including the development, because software that is made is not always just like that. When the run may still have minor errors that are not found before, or are there additional features that did not exist in the software. Development is required when a change from an external company such as when there is change of the operating system, or other devices..

2.2 Analysis

2.2.1 Analisis Prosedur

Analysis of system procedures used to identify how the algorithm of the system to be built that work. The procedure to be the author of the analysis: The analysis procedure of the device system, the analysis procedure on the socket system and analysis procedures for tracking vehicle system.

2.2.2 Requirment analysis

2.2.21. Functional

Functional requirement of this system are as follows:

1. Can login to the user and admin
2. Customers can manage data
3. Can manage vehicle data
4. Can manage device data
5. Can manage data as an input socket GPS data based on specific time
6. Can manage the report covers appear and Print
7. Can display the google map that has been equipped with navigation, such as show all, zoom in, zoom out, recenter, query, index, scalebar and legend.
8. Showing the position of the vehicle can

2.2.2.2. Non Functional

Non-Functional Requirements here needs associated with accessing methods, performance, reliability and data security services that are owned by the system to be developed. With some of these considerations, the system is built consists of:

1. Method of accessing applications

Applications can support any Internet browser application can be designed to work on a monitor with a resolution of 1024 x 768 or higher.

2. Instructions for use

Instructions for use are made in order to facilitate the user in using the system.

3. Security

The system integrates with the security table verification mechanism for authenticating users, with that legitimate users are users who have accounts

4. Reliability Services

Services who presented the system more reliable, with built

system

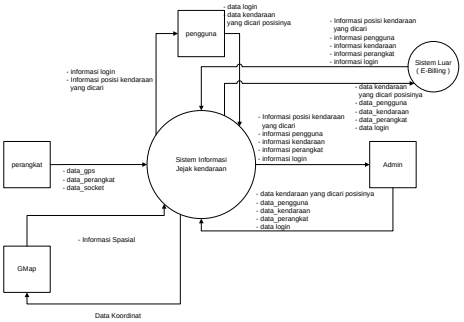
Web-based users can access directly from a computer or cell phone using internet services, has a complete feature required the user.

2.2.3. System Design

The design of the system aims to find the optimal form of application to be built by considering various factors problems and needs that exist in the system as specified in the analysis phase. Efforts are made is to try to find a combination of hardware technology (hardware) and software (software) is appropriate in order to obtain optimal results and easy to implement.

2.2.3.1. Context Diagram

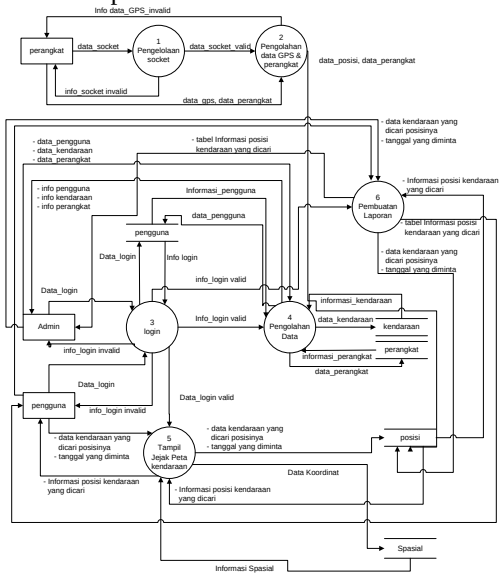
The data will be sent a device on a vehicle to the server are: RMC NMEA, if the owner requested to display the data the system will display it on a web page and can also be downloaded in tabular form of travel in spreadsheet format.
The depiction of the system context diagram is as shown below.



Gambar 1. *Context* Diagram Aplication for Monitoring Vehicle Movement

2.2.3.2. DFD Level 1

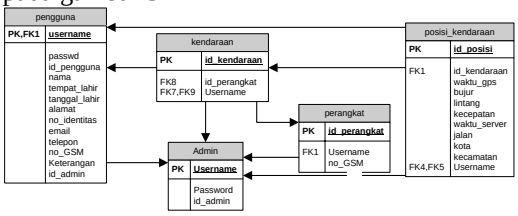
In Diagarm data flow (DFD), level 1 will occur six processes on the system, namely: (1) Management data sockets, (2) GPS data processing and software (3) login, (4) data processing, (5) travel Map Information , (6) Information table travel. The series of the process is as follows: the device will transmit data in the form of RMC NMEA GPS, by communicating with the system using a socket and then the system will perform the GPS data processing comprising: parsing data and converting data that results will be stored in a database and then if there is a demand from vehicle owners to display data on maps, then the data will be displayed on web pages that contain live or history on the map and in table form html on the screen or in the form of a spreadsheet file that can be downloaded. The description is as follows DFD



Gambar 2. DFD Level 1 Aplication for Monitoring Vehicle Movement.

2.2.3.3. Tabel Relation

Skema relasi dari Pembangunan Aplikasi Pemantauan Pergerakan Kendaraan, terlihat pada gambar 3



Gambar 3. Tabel Relasi Aplication for Monitoring Vehicle Movement

2.3 Implementation

Implementation of the system include the development environment, the implementation of web applications, and implementation of communication interface modules.

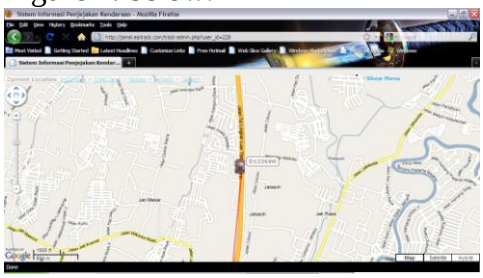
2.4. Testing

Plan testing will be done by testing the alpha and beta systems. Based on the results of

alpha testing and test samples that have been the case can be concluded that the vehicle position information has to overcome the problems of theft even though the accuracy of GPS is limited to 10 meters.

3. RESULTS AND DISCUSSION

From analysis and design that has been done, the results from one application built to look like in Figure 4. below:



Gambar 4. Tampilan Aplikasi

4. CONCLUSIONS AND SUGGESTIONS

4.1. CONCLUSIONS

Broadly speaking, "Development of Applications for Monitoring the movement of vehicles on the web-based GPS tracking system", were appropriate to the goal of helping the public cope with fears to keep each vehicle either for personal or corporate.

4.2. SUGGESTIONS

To be able to give, benefit more from application built this, maybe this application can be developed with facilities - other facilities that may be around we need it.

5. BIBLIOGRAPHY

[1] PT. Elda Sarana Informatika, *ESITrack User Guide*

[2] www.scribd.com, *GPS Tracking system*, 10 Mei 2010 Jam 11:33 WIB

[3] Abidin, Hasanuddin Z. (2000). *Penentuan Posisi dengan GPS dan Aplikasinya*, CV Pradnya Paramita, Jakarta.

[4] Hardiyanto, Romi (2002). *Basis Data dan Query Spasial pada RDMS PostgreSQL/PostGIS*. Tugas Akhir. Jurusan Teknik Geodesi, Fakultas Teknik Sipil dan Perencanaan. Insititut Teknologi Bandung.

[5] Prahasta, Eddy. (2001). *Konsep-Konsep Dasar Sistem Informasi Geografis*. 1. CV. Informatika, Bandung.