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Real time vehicle monitoring

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ABSTRACT

The paper has a monitoring the vehicle through GPS. It is the combination of electronic devices and in a vehicle and computer software. The main purpose of the paper is to desing and developed to construct handheld wireless device to monitor vehicles through GPS tracking through internet. It has the Global Positioning System(GPS),Global System for Mobile Communication(GSM) it is controlled by ARM7 LPC2148,and General Packet Radio Service(GPRS) to visble current Location. The modern vehicle tracking uses the GPS or Global Navigation Satellite System (GLONASS) for locating vehicle.

Keyword: GPS, GSM, Androidmobile, Software, Server

1. INTRODUCTION

As the growing population increasing, rising in land vehicles. The increase in vehicles need to update with a tracking vehicles through electronic device,hardware,software installation,and handheld devices to avoid the car theft and to detect the location of business vehicles like Fuel tanks, Travel agencies cars,Volvo,buses,and Transporting system to track where the vehicle is located and how far away from the destination can be track through GPS or GLONASS. Due to rich in GIS (Geographic Information System) this functionality improves in the electronic maps to view the zoom in and zoom out of the maps to traced the vehicles. The paper consist of modern vehicles tracking system with new techniques. These follows with the location track,traffic analyzing,protect from vehicle theft,Vehicle viewing information in business point and sensor system to trace the vehicles.

2. LITERATURE SURVEY

The system shows the real time location of the vehicle on the Google Map by using GPS and GCM (Google Cloud Messaging).

The existing model of vehicle tracking include the tracking of the vehicle using GPS and web server show the location onGoogle Map whereas, our propose system show the location of the vehicle to the owner or third party who requests the location.

2.1 Objective of research

The main objective of the research is navigation and tracking vehicle in a large area environment based onthe GPS and GSM.

To provide a solution to avoid car stolen in the lower cost than advance security car system.

3. SYSTEM

The real-time land vehicle monitoring system is composed of four components.GPS Device, server and database, GCM & propose system as shown in Figure. 1

GPS tracking is done though GPS enable android mobile that transmitsLocation information to the server by GPRS and GCM networks. The server is personal Computer receives the information and save into the database. The database formats the information in special form that can search and display on Google Earth software or Google Map.

3.1 System building blocks

3.1.1 GPS (Global Positioning System)

The GPS has made tracking and navigation system a number of land-vehicle navigation applications.Today, GPS navigation can found in car vehicles, farming & mining, and other land-based vehicles.GPS system compose network of many satellites launch by United States, which used for military purpose, and then after few year allow for commercial use.

The satellite periodically emit radio signal of short pulses to GPS receivers.A GPS receive the signal from satellites to calculate the total distance and uses a triangulation to compute its 2D (latitude and longitude), satellites to compute its 3D (latitude, longitude, & altitude) position of the user.

Once a location compute, then it can calculate average, speed and direction of traveling vehicle. Therefore, GPS is key technology system for giving device and its position.

3.1.2 GCM (Google Cloud Messaging)

GCM is a mobile messaging service developed by Google that enable third-party application developer to send notification data or information from developer-run server to application

that target the Android Operating System, applications or extensions developed for the Google Chrome is used as internet browser. It is available to developer free of charge. The GCM Service announced in 2012 as a successor to Google's now-defunct Android Cloud to Device Messaging (C2DM) service, citing improvement to authentication and delivery, new API endpoints and messaging parameters, and the removal of limitations on API send-rates and message sizes. It has been superseded by Google's Firebase Cloud Messaging

3.1.3 Google Map

Google Maps is a web mapping system developed by Google. It offers satellite image, street view, and 360° point views of streets, real-time traffic, and planning for traveling by foot, car, bicycle, or public transportation.

3.2 Algorithm for system

- GPS Device receive the system co-ordinates and sends it to the server after every fix time.
- The server receive the information from the GPS Device and stores it into the database for future use.
- The passenger request for selected vehicle.
- The server processthe request and shows the position to the passenger.

3.3 System architecture

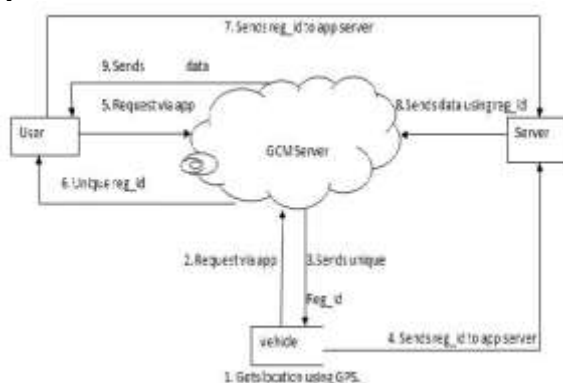


Fig. 1: Architecture of vehicle tracking system [3]

4. IMPLEMENTATION

4.1 GPS Module

The GPS Module is based on GPS enable android device. The android device based on version 2.2 or above. This version of mobile device can access to GCM service. Android Mobile in the land vehicle gets its position using GPS.

From that position get the latitude, longitude and time. We have to send that position to Application Server by GCM. This process repeat in every 2 minutes i.e. set by the system admin.

4.2 GPS Firmware

The firmware of GPS module is written and compiled by open source compiler. The firmware perform three step, initialization, GPS reading, and the GPS data formatting and transmitted to GCM server via GPRS networks.

The initialization step prepare the module for reading and transmitting location information.

It is composed three functions. The first function is to initialize the GPS Device for GPS reading. The second function is to initialize GPRS/GPS module to set up parameters to warm up GPS engine, to make a connection to a GPRS network and to connect to the GCM server via TCP/IP socket. The third function is to initialize MMC module into SPI mode for data read/write.

4.3 GCM Server

Once the GPS Tracking Module is connected to GPRS networks, it transmits position information to GCM Server. The server has three functions to receive the information from the GPS device, to send the information to the application server, and to send the information to the client device when requested. The receiving function opens a non-blocking socket to receive data from multiple GPS Tracking Modules simultaneously.

4.4 Application server

The application server receives the information from the GCM server.

The storing function formats the receiving data into our database that is designed to provide real-time query response for real-time tracks and to provide search query response for the post- analysis of vehicle tracks. On request from the client for location for a particular vehicle the server sends the information to GCM server and GCM server then sends the location information to the client.

4.5 Hardware

Server: Processor: 1.0GHz or more RAM: 2 GB

GPS Device: Android Mobile Processor: 1GHz or more RAM: 1 GB or more

Client Device: Android Mobile: Processor: 1GHz or more RAM: 1 GB or more

4.2. Software: Server: OS: Windows Server 2003

Firewall: Windows Firewall or any other firewall. Database: SQL Server 2005

GPS Device: OS: Android 4.0(ICS) or later

Client Device: OS: Android 4.0(ICS) or later

4.3. Tools & Technologies: GPS (Global Positioning System)

5. CONCLUSION

In this research we have proposed a GPS tracking system which will track the current position of the vehicle and show it to the passenger who wants to travel by the vehicle. The system will reduce the waiting time for travelling. The GPS Device will send vehicle current position to the server.

The server on request from the client will show the client the current location of the vehicle on the Google Map.

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