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VEHICLE TRACKING SYSTEM USING GPS AND ANDROID OS

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ABSTRACT

An efficient vehicle tracking system is designed and implemented for tracking the movement of any equipped vehicle from any location at any time. The proposed system made good use of a popular technology that combines a Smartphone application with a . This will be easy to make and inexpensive compared to others. The designed in-vehicle device works using Global Positioning System (GPS) and Global system for mobile communication / General Packet Radio Service (GSM/GPRS) technology that is one of the most common ways for vehicle tracking. The device is embedded inside a vehicle whose position is to be determined and tracked in real-time used to control the GPS and GSM/GPRS modules. The vehicle tracking system uses the GPS module to get geographic coordinates at regular time intervals. A Smartphone application is also developed for continuously monitoring the vehicle location. The Google Maps API is used to display the vehicle on the map in the Smartphone application. Thus, users will be able to continuously monitor a moving vehicle on demand using the Smartphone application and determine the estimated distance and time for the vehicle to arrive at a given destination. In order to show the feasibility and effectiveness of the system, this paper presents experimental results of the vehicle tracking system and some experiences on practical implementations.

INDEX TERMS— GPS, GSM,, Tracking Unit

INTRODUCTION

India has progressed on enormous rate that many companies have establish themselves here. These companies have a huge work force. Arranging the transportation to such huge force is difficult task. This transportation is arranged through local transport vehicles on yearly basis. But this has causes many mishaps like rape, burglary etc. Therefore the proposed tracking system will help users in finding the location of vehicle through satellite communication.

GPS and GSM based vehicle location and tracking system will provide effective, real time vehicle location, mapping and reporting this information back to monitoring device and improving the level of service provided. A GPS based vehicle tracking system informs user where the Vehicle is and where it has been, how long it has been. The

system uses geographic position and time information from the Global Positioning Satellites.

Delivery vehicle is travelling in a planned path. Therefore, we need to use an alternative technique that allows continuous monitoring of travels, obtaining information of probable deviations or even emergency situations.

This system consists of an android mobile which contains GSM and GPS modem along with the processor that is fitted in the vehicle permanently. This device is called as tracking device which is continuously accessing its current location and is sending updates to server. At monitoring device which is an android application is providing the user with the exact location of the vehicles of his interest.

The paper is organizes as following sections:

- I. Literature Survey is explained in this Section.
- II. Proposed System is described in this Section.
- III. Result of the System is shown in this Sectionin.

LITERATURE SURVEY

To determine précised location of object Abid khan And Ravi Mishra have proposed tracking unit which it is attached and using GSM modem this information can be transmit to remote user. This system contains GPS and GSM modems along with ARM processor that is setup in the vehicle. Through SMS the location of vehicle can be reported. GSM and GPS technologies helps to track the vehicles exact information. Real time control is provided by SMS system. You can monitor the location from anywhere using this system

Rodrigo R. Oliveira, Felipe C. Noguez, Cristiano A. Costa, Jorge L. Barbosa and Mario P. Prado has proposed a model to get the exact position of vehicle. The device used for tracking the location of vehicle is named as SWTRACK. The distributor companies use this model to get the location of their respective vehicles. It also provides the mechanism to monitor the detours coming in the planned route and sends a alarm message through the device.

The vehicle positioning monitoring system was designed by CORS and Mobile GIS. The accuracy and precision is provided by CORS service network and Mobile which has also verified the feasibility to integrate CORS and Mobile GIS for mobile location services. PS helps in to get accuracy and high speed for performing in faster way. It is best suited for taxi monitoring and navigation, vehicle anti-theft and other fields.

Tushar Saxena, Deepak Kumar and J.S. Jadon has presented all the satellite navigation systems available or in process today. Every system from GPS to IRNSS has been properly introduced and signalling schemes and modulation schemes are studied. Satellite navigation now days are what every country desire to have to become on great power as most importantly it serves military applications and rescue operations. The next generation of satellite navigation are giving services to the civil users and hence a very good market for commercial point of view

To help individuals in finding addresses and locate their services of interest using their mobile devices Hassan I. Mathkour has propose and develop a GPS-based Mobile Service Locator System. To determine the approximate distances between the user and the locations of the desired place this system was developed. This system is flexible and extendible to easily get the location of the users interest places. A main purpose of departure from existing similar systems is that it is the GPS-based rather than the mobile-based service provider to allow for a more accurate location calculation.

Using GPS and GLONASS Changsheng Cai and Yang Gao has proposed a model which provides precise point positioning. In order to assess the positioning accuracy and convergence time improvement of the combined GPS and GLONASS data processing, a 2-hour and four 3-hour sessions of datasets have been used in the data analysis .

In Vehicle Tracking System for tracking the vehicle any tracking device is required. Now a days, three navigation systems are available and people use those for tracking any object. The GNSS consist of three main satellite navigation systems. They are GPS (Global Positioning System), GLONASS and Galileo. The comparative study of these three navigation systems is mentioned in following table: construction and costly. GPS (Global Positioning System) is highly available GNSS technology. As per the system is concern, GPS is the best technology considering its availability and receiver cost. Because today every Android phone comes with inbuilt GPS receiver installed in it. Therefore there is no need of purchasing a separate GPS receiver for each client. In this system author is decided to use an android mobile which consist of inbuilt GPS and GSM modem.

In existing system owner use to get SMS from tracking device, which did not provide the exact location of tracked vehicle. But it didn't provide the exact location of the tracked vehicle. So as to overcome this system author made a solution. As per the observation existing system provides only some features like SMS services and tracking user location. The contribution which author made was like locating multiple vehicles location on Google Map. This will enhance the user with complete information about his organization vehicle location.

Login interface to user and to show the Google map with vehicle locations. Server woks as a central connector for transmitting unit and monitoring unit. As both transmitting side and monitoring side communicate with each other through Server only. As shown in Fig. 1 mobile application communicates with server and access the remote database. Where at transmitting side Tracker application obtained its

urrent location through GPS technology and update it to server.

This will be useful for organization to easily track their vehicles. And help the organization to Bann the illegal activities performed by the vehicle carrier.

PROPOSEDMETHODOLOGY

a) GPS:

GPS based vehicle tracking system uses the GPS technology, GSM service and Android mobile. As per shown in Fig. 1 this system has three main modules transmitting unit, monitoring unit and server. Transmitting side performs tracking functionality. It tracks the vehicle through GPS and transmits its current location to the server. The main function of monitoring side is to provide

1) Project Components: It consists of one units:

2) Transmitting Unit:

Transmitting Side contains Android mobile which has inbuilt GPS, GSM modem and GPRS functionality. Therefore the mobile will be used as transmitting unit.

GPS stands for Global Positioning System. The Global Positioning System (GPS) is a satellite radio navigation system developed by the Department of Defence (DoD) owned by the United States Government (USG) and operated by the United States Air Force (USAF) [3].GPS has provided positioning, navigation, and timing services to military and civilian users on a continuous worldwide basis since first launch in 1978. An unlimited number of users with a civil or military GPS receiver can determine accurate time and location, in any weather, day or night, anywhere in the world .The system makes use of a medium earth orbit satellite constellation transmitting microwave signals allowing a GPS receiver to determine its position, velocity and time. Different types of positioning can be carried out using GPS receivers depending on the algorithms, type of measurements and corrections used in the navigation solution.

GPS is a main module in this Vehicle tracking system. As vehicle is tracked using GPS technology. Author has used it to get the exact location of respective vehicles. But to get exact location of any vehicle it need to be in a focus of four satellites.

b.GSM:

GSM is a Global System for Mobile Communications. It is developed by European Telecommunications Standards Institutes (ETSI). It describes the protocol for Second Generation digital cellular networks. A GSM modem is wireless modem that works with a GSM wireless network. It behaves like a Dial-up modem.

B.Work Flow

The workflow of GPS based Vehicle Tracking System is as per the given Fig.1. Users can use this system by performing actions mentioned in flowchart.

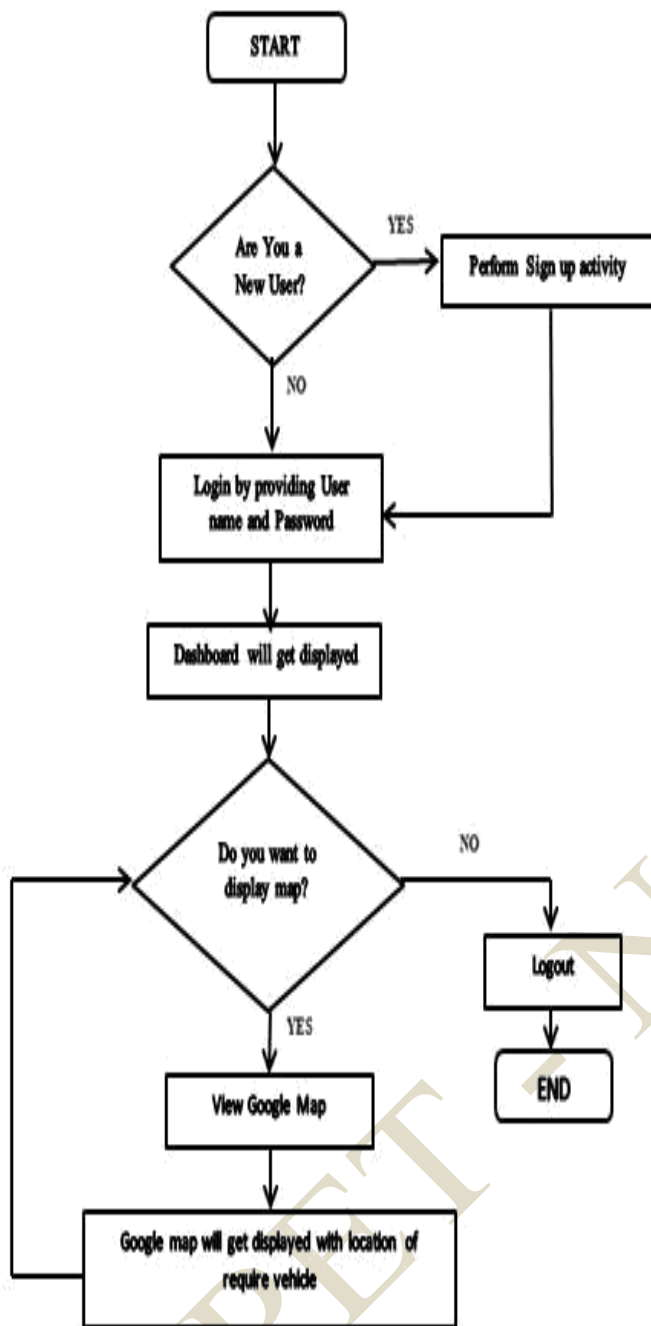


Fig. 1 Work Flow Tracking

DEVICE:

- 1) The tracking device will continuously request to the GPS satellite for its location information.
- 2) At the same time GPS satellite will provide the location information to tracking device installed in vehicle.
- 3) The tracking device will send the location information back to the server through GPRS and continuously update the database.

DATABASE FROM SERVER.

- 1) From that database the location information will be plotted on Google maps. Monitoring unit, tracking unit and server are the main pillars of GPS based vehicle tracking system. In this system GPRS service is used to perform

communication between monitoring and tracking unit to server. Author has used Android platform and Java language for implementation of Monitoring as well as tracking unit. Monitoring side consist of Login page, Signup page and Google Map with the location of required vehicles. As user can easily use this application by sign up and he will get all login rights.

At monitoring side Google Map is obtained by using Google APIs. Author has created online MySQL database server to stores the information receiving from tracking and monitoring units. The database operations are performed through the Structured Query Language (SQL). Tracking device will continuously communicate with GPS satellites and it will provide the current location of vehicle. The tracking device will receive its current location in the form of longitude and latitude and it will send the update to server by using HTTP post method. On the Google map the tracked location of vehicle will get plotted. And we are plotting it with by using the Java Script.

RESULT

After successful implementation of Vehicle Tracking System we obtained following results:

At monitoring side, initially user needs to perform Login activity. Login page provides Login interface to the user. When user will enter user name and password then system will do validation to check whether the entered username and password is correct or not. If the entered username or password is wrong then system gives an error message. And if it is correct then user gets directed to next page with successful login.

If user is operating system for first time then firstly he need to perform signup activity. While signing up user need to provide some basic information i.e. First name, Last name, Email Id etc. Fig. 4 shows the necessary fields which user must fill while signing up. After sign up users all data gets store at server. The user name and password provided at a time of sign up is used for login to application.

As this application is made for an organizational so the all vehicles of organization must be registered. Registration of vehicle required organization name, vehicle no. and username as shown Fig 6. But for registering vehicle user must do login to the application. The login is done by providing username and vehicle no. As you can see in Fig. 6 vehicle registration also requires username. This is because to provide more security to application user.

After clicking on sign up button the following page get displayed. The given information gets store at server. So that when user wants to see his organizational vehicles sever will provide the required vehicles only. And user can register vehicles by providing valid user name only.

For plotting the location of vehicle its Longitude and Latitude must be known. For tracking vehicle author has designed Transmitter Page. Transmitter page provides the current location of vehicle in the form of longitude and latitude

At monitoring side when user login to the application the dash board get displayed. Dash board provides choice selection to user. As shown in Fig. 8 Dash board have two buttons i.e. show map and log out. It gives two options i.e. user wants to leave or stay login.

If user click on show map button then Google map will get displayed with the location of required vehicle as shown in Fig. 8.

CONCLUSION

This proposed system allows organizations to track their vehicles and to get exact location of vehicle. The system allows those companies to monitor the travelled routes through a web client that uses the Google Maps API and shows colors on the map to indicate if the devices on route. The general evaluation result is that the system proved to be reliable as to view the positioning of the devices.

FUTURE SCOPE

In the proposed system we can add features like Car locking, thief photo capturing. This will help the user to have an anti-thief feature.

Upgrading this system is very easy which make it open to future requirement without the need of rebuilding everything.

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