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Land Vehicle Tracking System

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Abstract: ***A land vehicle tracking system combines the use of automatic vehicle location in individual vehicles with software that collects the fleet data for a comprehensive picture of vehicle locations. Modern vehicle tracking systems commonly use GPS or GLONASS technology for locating the vehicle, but other types of automatic vehicle location technology can also be used. Vehicle information can be viewed on electronic maps via the Internet or specialized software. Urban public transit authorities are an increasingly common user of vehicle tracking systems, particularly in large cities. Recently, vehicle tracking technologies have brought some breakthrough in these areas: commercial vehicle operations, fleet management, dispatching, emergency rescue, hazard material monitoring, and security.***

Keywords: Android, Eclipse, GPS, Java, Land Vehicle Tracking

1. Introduction

As urban living environment is becoming more and more complex, the road condition is becoming worse because of heavy traffic, increase of traffic accidents and high ratio of empty vehicles. To solve such problems, a land vehicle tracking system has been developed. A vehicle tracking system combines the installation of an electronic device in a vehicle, or fleet of vehicles, with purpose-designed computer software at least at one operational base to enable the owner or a third party to track the vehicle's location, collecting data in the process from the field and deliver it to the base of operation. Modern vehicle tracking systems commonly use GPS or GLONASS technology for locating the vehicle, but other types of automatic vehicle location technology can also be used. Vehicle information can be viewed on electronic maps via the Internet or specialized software. In this case the device used is an android phone and the vehicles will be watched by an administrator using a web application.GPS tracking uses elements of both time and location to provide data points for the user. GPS, or Global Positioning System, is a satellite navigation system that receives data via satellites in space. GPS tracking can be used to track vehicles, equipment, mobile phones, people, animals, and more. A common use for GPS is for the user to set and receive live step-by-step directions. Tracking vehicles helps keep track on the assets of the business, which can help reduce insurance costs. Vehicle tracking also protects company assets as a vehicle can be tracked if it is stolen. In addition, using the GPS function of a vehicle tracking system can help reduce time spent finding locations for drivers in unfamiliar areas. The final reason vehicle tracking is important for businesses are to be able to track employees by monitoring their movements during the day. As the vehicle tracking devices also measure speed then the device can help ensure employees are not exposing companies to the risk of speeding fines. Vehicle tracking is most often used by non-business customers as a theft deterrent and to help retrieve the vehicle if it stolen. In addition if a vehicle is involved in an emergency the vehicle tracking device can be important in ensuring assistance arrives in a timely fashion.

Positioning And Tracking

The ability to locate the position of a mobile phone has emerged as a key facility of existing and future generation mobile systems. Many value added location-based services have been enabled by this feature. For instance, vehicle positioning and tracking by locating mobile phones traveling on-board vehicles has become feasible. However, no single standard positioning method can provide decent trade-off between accuracy and coverage. Hence, there is a challenge on tracking the position and velocity of the mobile phone along the journey with appropriate accuracy. To address this issue, we implement one of the mobile phone-based vehicle location solutions, a scheme that combines location estimates from a GPS.

2. Literature Survey

In light of the many possible combinations of navigation aids that can be used in these systems, one is led to question what criteria navigation system designers have used when selecting sensors for use in their vehicle navigation system. One could probably say with some certainty that the set of sensors selected by a design team is heavily influenced by the team's dual goals of maximizing the system's performance while minimizing its total cost. Unfortunately for system designers, however, system cost and performance are usually directly, rather than inversely, related—very accurate sensors may improve the performance of a system, but they tend to cost more than similar, less accurate sensors. Therefore, designers of land-vehicle navigation systems are faced with trading off system cost and performance and must judiciously select that set of sensors deemed to be most cost effective. This paper includes an examination of the impact that individual navigation sensors have on the performance of a land-vehicle navigation system. The quantitative results of this work reveal the influence that individual navigation sensor error parameters have on navigation system performance. These results should be valuable to navigation system designers because they can be used to identify cost-effective navigation system designs.

2.1 Android

ANDROID (Automated Numeration of Data Realised by Optimised Image Detection) Android is an operating system for mobile devices such as smart phones and tablet computers. It is developed by the Open Handset Alliance led by Google. **Android 2.1:** To get started developing or testing against the Android 2.1 platform, use the Android SDK and AVD Manager tool to download the platform into your SDK.

2.2 Adt Plug-In For Eclipse

Android Development Tools (ADT) is a plug-in for the Eclipse IDE that is designed to give you a powerful, integrated environment in which to build Android applications.ADT extends the capabilities of Eclipse to let you quickly set up new Android projects, create an application UI, add components based on the Android Framework API, debug your applications using the Android SDK tools, and even export signed (or unsigned) .apk files in order to distribute your application. Developing in Eclipse with ADT is highly recommended and is the fastest way to get started. With the guided project setup it

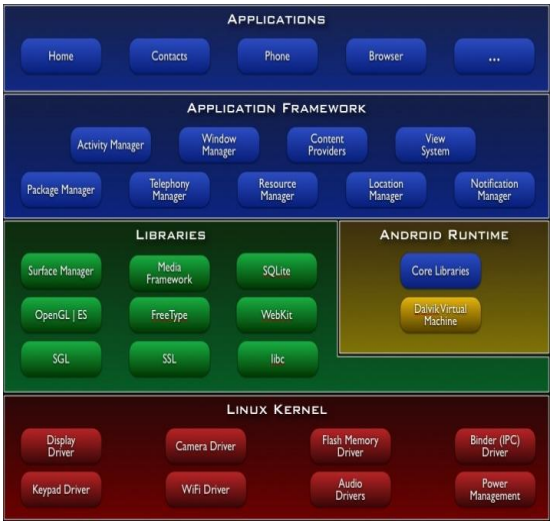

Figure 1: Android architecture

Android Features

Table 1: Android Features

Handset layouts	The platform is adaptable to larger, VGA, 2D graphics library, 3D graphics library based on OpenGL ES 2.0 specifications, and traditional Smartphone layouts.
Storage	SQLite, a lightweight relational database, is used for data storage purposes
Connectivity	Android supports connectivity technologies including GSM/EDGE, IDEN, CDMA, EV-DO, UMTS, Bluetooth, Wi-Fi (no connections through Proxy server and no Ad hoc wireless network) LTE, NFC and WiMAX.
Messaging	SMS and MMS are available forms of messaging, including threaded text messaging and now Android Cloud To Device Messaging Framework(C2DM) is also a part of Android Push Messaging service.
Multiple language support	Android supports multiple human languages. The number of languages more than doubled for the platform 2.3 Gingerbread. Android lacks font rendering of several languages even after official announcements of added support (e.g. Hindi).
Web browser	The web browser available in Android is based on the open-source WebKit layout engine, coupled with Chrome's V8 JavaScript engine. The browser scores a 93/100 on the Acid3 Test.
Java support	While most Android applications are written in Java, there is no Java Virtual Machine in the platform and Java byte code is not executed. Java classes are compiled into Dalvik executables and run on Dalvik, a specialized virtual machine designed specifically for Android and optimized for battery-powered mobile devices with limited memory and CPU. J2ME support can be provided via third-party applications.

Objectives of the Proposed Project

We are going to use GPS for locating the position of vehicle. We will also find the speed of the vehicle in real time to find whether a driver is adhering to the speed limits.

A. We can track vehicles through android application using GPS to find out where a bus is using a web application which requires login of administrator.
B. We can also find out speed and if driver breaks speed then we can fine them accordingly.
C. Parents can also see the current location of their kids through real time update.
D. When a stop comes we can intimate the administrator and the people sitting in bus to come in front for their stop.
E. Vehicle tracking systems can also be popular in consumer vehicles as a theft prevention and retrieval device. Police can simply follow the signal emitted by the tracking system and locate the stolen vehicle.
F. Asset tracking:- Companies needing to track valuable assets for insurance.
G. Field service management:- Companies with a field service workforce for services such as repair or maintenance, must be able to plan field workers' time, schedule subsequent customer visits and be able to operate these departments efficiently.
H. Field sales:- Mobile sales professionals can access real-time locations.
I. Trailer tracking:- Haulage and Logistics companies often operate lorries with detachable load carrying units.

3. Methods/Approach

We are proposing three modules for the vehicle tracking system which shows the how system works with detailed structure.
The proposed approaches are as follows –
A. Tracking System
B. Monitoring and Control System

C. Android App

A. Tracking System

In this approach the GPS device or GPS installed Mobile receives signals from satellite and calculates its position on earth and this data sends to server using mobile network for storing purpose.

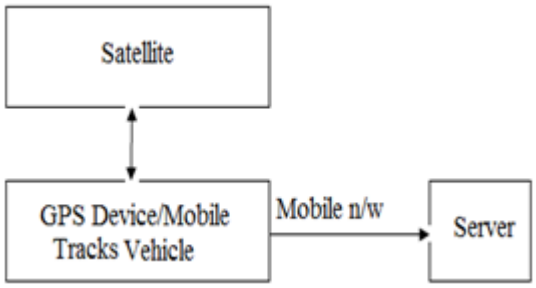

Figure.2 Tracking System

B. Monitoring and Control System

In this approach data access from server on web application using internet.

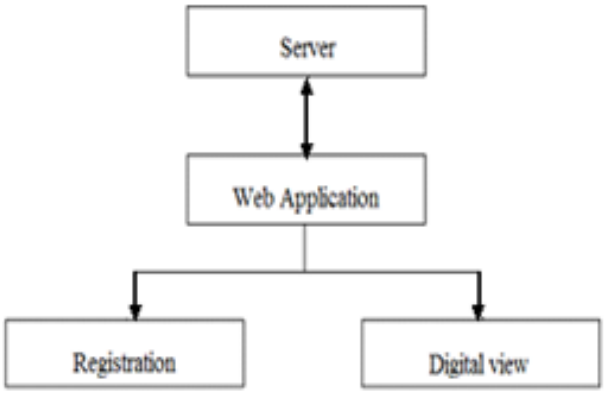

Figure 3: Monitoring and control System

C. Android App

In this approach data access from server on mobile android application using internet.

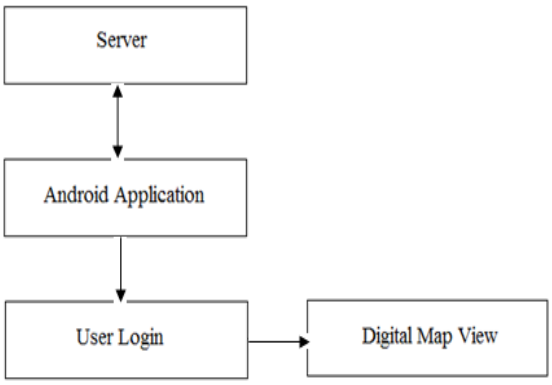

Figure 4: Android Application

System Architecture

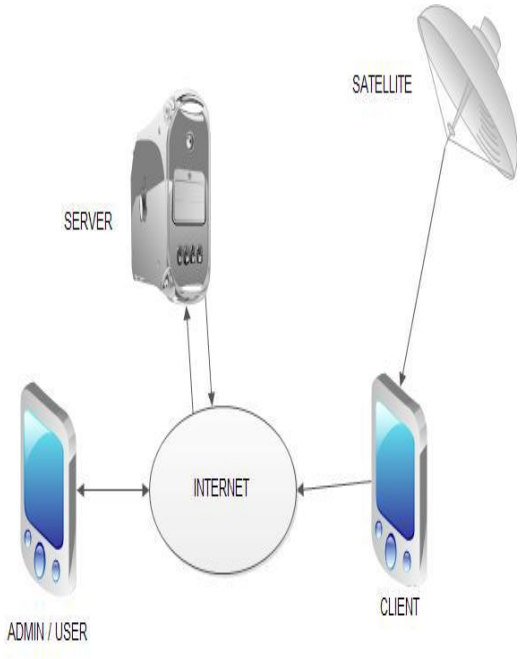

Figure 5: The overall system architecture

System Flow Diagram

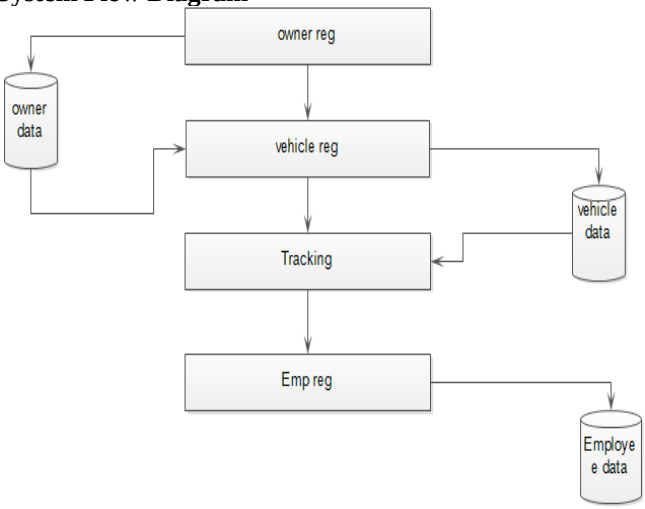

Figure 6: This diagram reflects the how system will work after implementation.

Activity Diagram

Figure 7: The overall activities done from login to logout.

4. Result and Analysis

Table 2: Result and Analysis

Description	*Input Data*	*Result*
Add vehicle	Vehicle no., owner details, driver mobile no.	Vehicle details are added to database
Set Route	Enter longitude and latitude	Longitude and Latitude are added to database
Calculate Speed	Enter vehicle number	Location is tracked and speed is calculated
Display Map	Select vehicle number to be tracked	Showing location of selected vehicle on the digital map in moving state
Setting Alarms	Enter the name of stop	Giving intimation to user

5. Conclusion

Vehicle tracking system resulted in improving overall productivity with better fleet management that in turn offers better return on your investments. Better scheduling or route planning can enable you handle larger jobs loads within a particular time. Vehicle tracking both in case of personal as well as business purpose improves safety and security, communication medium, performance monitoring and increases productivity. The very important feature provide to the admin is finding the location and speed of the bus or client vehicle.

6. Future Scope

This system can also be used to prevent car theft by combining the device with the car alarm and also obtaining a map containing the car location if the car is thought to be stolen. Tracking vehicles in our system utilizes a wide range of new technologies and communication networks including GPRS, GSM, the Internet or the World Wide Web and GPS. All the services provided by this system had been tested in the real life. We implemented a system which is composed of a combination of a low-cost hardware unit and a user-friendly Android-based mobile application software utilized to create an on-board vehicle diagnostic system. For future work, more services could be added to the mobile application and also the graphical user interface could be improved.

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