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Land Vehicle Tracking Application on Android Platform

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ABSTRACT
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. It increases the cost of transportation and wastes time of vehicle movement. To solve such problems, a land vehicle tracking system has been developed. A land vehicle tracking system determines the position of land rover with a terminal with embedded GPS receiver or PCS phone and displays the position on a digital map. 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
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 case of our software the device that we are going to use is an android phone and the vehicles will be watched by an administrator using a web application.

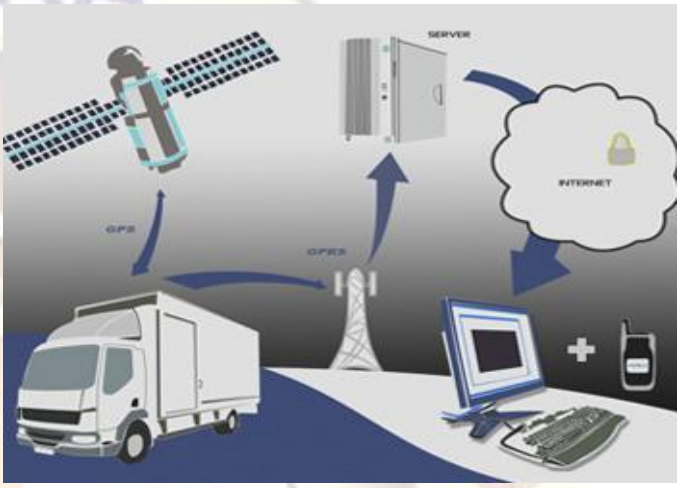

Fig.1.0 working of vehicle tracking system

2. 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.

- 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.
- We can also find out speed and if driver breaks speed then we can fine them accordingly.
- Parents can also see the current location of their kids through real time update.
- When a stop comes we can intimate the administrator and the people sitting in bus to come in front for their stop.

3. Scope of Project
A land vehicle tracking system, which can efficiently monitor and control the vehicles, has been researched and developed continuously in the area of commercial vehicle operations. Such a system should be able to satisfy users, who want to track a vehicle or a cargo, by providing its position on digital map in real time. So far, several GIS strategies have been devised and adopted to develop a land vehicle tracking system,

but there is no proper solution suitable for Internet environment. **As** a new solution to develop such a system, this paper introduces and describes the Internet-based hybrid client-server methodology using Java.

4. The Research in This Paper

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.

5. 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.

Fig.2.0 android architecture

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.

6. 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

Table.1.0-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[62] and no Ad hoc wireless network),[63] 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[*citation needed*] 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.

7. Comparison with Other Mobile Operating System

In 2006, Android, iOS, Windows Phone, and Bada did not yet exist and just 64 million smart phones were sold. Today, nearly 10 times as many smart phones are sold and the top mobile operating systems marketed as "Smartphone" by market share are Android, Symbian, Apple iOS, RIM BlackBerry, MeeGo, Windows Phone, and Bada.

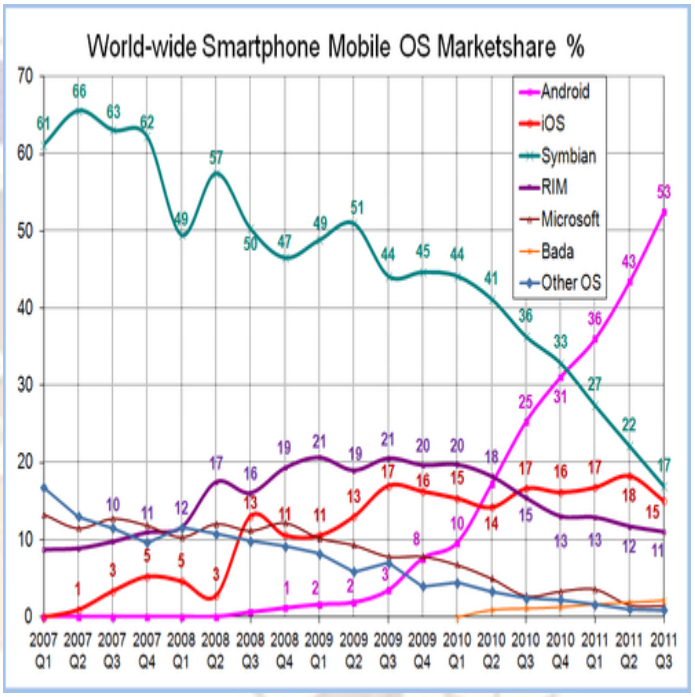

Fig.3.0 comparison with other mobile operating system

8. System Architecture

The functionality available to the Client mobile includes:
A) Client mobile module at bus:

1. Create Bus account.
2. Collect Bus Data (GPS location and speed of the bus).
3. Post Bus Data.

The functionality available to the Server mobile includes:
B) Server module:

1. Read Bus location API.
2. Save Bus Location API.
3. Create Bus API.

The functionality available to the Admin Mobile application / Parent mobile application includes:
C) Admin Mobile application / Parent mobile application:

1. Select Bus Screen.
2. Map view with live bus marker.
3. Set alert for bus reaching at particular location.

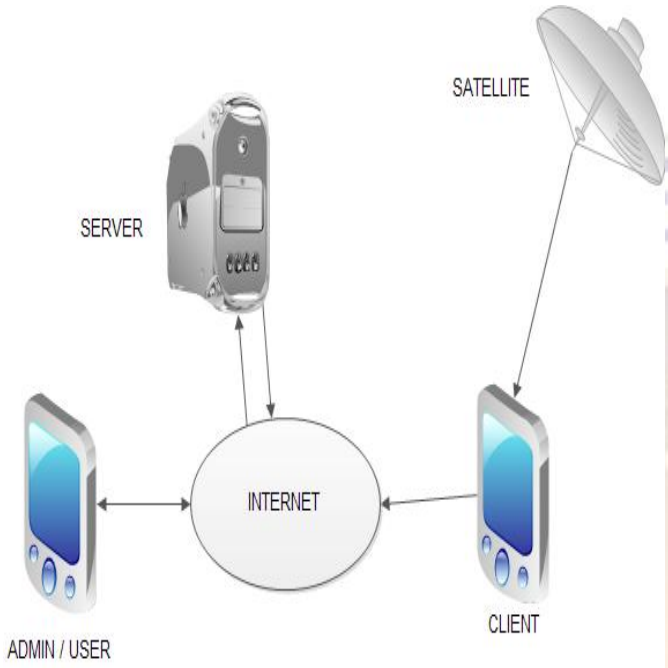

Fig.4.0 system architecture

9. Location Technology

Nowadays, a substantial number of smart phone have multimedia ability and geo-locating ability. While some people may get confused with GPS and AGPS here we provide a brief background study about them.

9.1 Global Positioning System (Gps)

Global Positioning System is composed of satellites and GPS receivers.GPS receivers receive signals from the satellites orbiting in space in 6 different planes 20 kilometres away from Earth (Porcino, 2001). There are 24 satellites orbiting in space at present originally owned by United States government for military purposes and are now opened for commercial use. The GPS receiver installed in the mobile handsets will receive radio signals from satellites and compare with the local duplication of geo data to calculate its actual location on Earth. To increase the accuracy, data received from three satellites can perform the calculation of two-dimensional location, including the longitude and latitude. For three- dimensional location information, consisting longitude, latitude and altitude, data from at least 4 satellites are required.

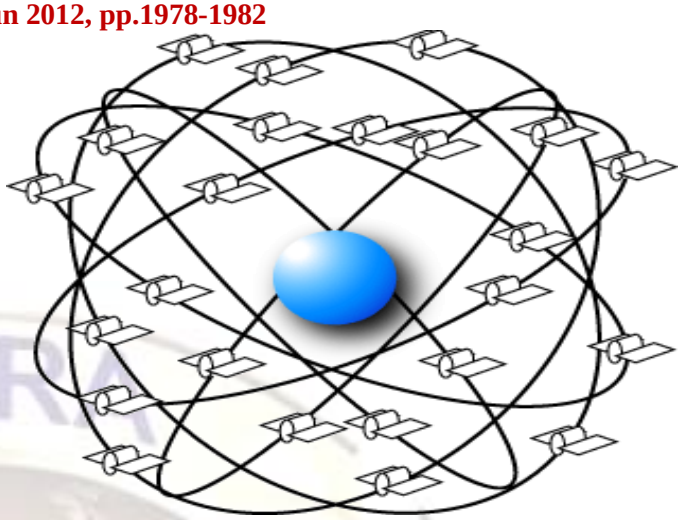

Fig.5.0 global positioning system

10. Product Perspective

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 case of our software the device that we are going to use is an android phone and the vehicles will be watched by an administrator using a web application. Such a system should be able to satisfy users, who want to track a vehicle or a cargo, by providing its position on digital map in real time.

11. Overview

The system will be basically a project that consists of client part, server part and GPS part. Also will look at the information's of routes, drivers and give the most optimal options to the user. Moreover, user may see and search the users' and vehicles' information in to the system repository. The most important component of our system is GPS. The coordinates of the vehicles that incoming build up the system's treatment. The purpose of this document is to model and design the project with the requirements defined in the SRS document. 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. Vehicle tracking systems are devices used for tracking location of vehicles in real time. This is made possible by installing electronic devices in the vehicle; it is the signals

sent out by the devices that enable owners or other parties entrusted with the tracking job to trace and follow the vehicle.

10. Future Scope

A land vehicle tracking system, which can efficiently monitor and control the vehicles, has been researched and developed continuously in the area of commercial vehicle operations. Such a system should be able to satisfy users, who want to track a vehicle or a cargo, by providing its position on digital map in real time. Vehicle tracking system heralded a new era of convenience and affordability in fleet management. Thus due to its easy availability it is going to stay for long.

12. Applications

1) Vehicle tracking systems are commonly used by fleet operators for fleet management functions such as fleet tracking, routing, dispatch, on-board information and security.
2) Vehicle tracking systems are also 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.
3) Asset tracking:- Companies needing to track valuable assets for insurance.
4) 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.
5) Field sales:- Mobile sales professionals can access real-time locations.
6) Trailer tracking:- Haulage and Logistics companies often operate lorries with detachable load carrying units.

13. 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. So in the coming year, it is going to play a major role in our day-to-day living.

14. Acknowledgment

During the course of this Preliminary Project report we found that it is not only sharpened our logical skills but also taught us value of joint efforts and hard work. On the successful completion of our report work, we take this Opportunity to thank every person associated with it. It gives us great pleasure to present this project on:

"Land Vehicle Tracking System using Java in Android Platform".

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