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ANDROID BASED VEHICLE TRACKING SYSTEM

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Abstract

Vehicle Tracking System is an application that tracks a bus and gathers the distance to each station along its route. Tracking System Application on any Android smart phone enables the Administrator/User to track the vehicle's location. There are two applications, one for server and the other for User. The driver is supposed to carry Android mobiles to track their positions. By this, positions to server are periodically updated. User application displays a map showing the position of the bus. It shows where the buses are on a map and provides user the updated information at different time intervals. The server will monitor location and will store its data in the database. As it is a real-time system, it makes use of GPS to track the location of the vehicle. The users will get flexibility of planning travel using the app, to decide which bus to take or when to catch the bus. The waiting time for the user can be reduced. Simple mode of communication is the key feature of the Vehicle Tracking System

1. Introduction

Safety of people travelling in private and public vehicles is a major concern nowadays. There are automobiles made available for passengers travelling distances, but not many commuters have complete information about these vehicles. Complete information namely the number of the vehicle, the route through which it would pass, time taken for the vehicle to reach its destination, maps that would guide the passenger with his/her route and most importantly, track the current location and display the time for the vehicle to reach its terminus. Bus Tracking System gives the necessary information about all the buses travelling, and deals with overcoming the problems stated above using GPS technology to ensure commuters safety by pin pointing bus location with fair accuracy.

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location information. This system will track the location of the vehicle and will send details about the location of driver to the user.

GPS is used to access all the tracking information from Amazon cloud. Cloud Computing plays a major role to manipulate, configure and access the hardware and software resources remotely. It uses cloud server platform provided by Amazon.

The platform chosen for this kind of system is Android, the reason being Android Operating System is, it is becoming very popular in market for

two mainstream reasons first, Android is highly suitable for expansion as per developer. Second, source code is completely free and is under every second person's possession. Also, Android is a user-friendly platform, thereby enabling ease of access for all the users. A number of applications made for the Android Operating System is increasing on a large scale ever since its inception.

Vehicle tracking systems are commonly used by fleet operators for fleet management functions such as routing, dispatch, on-board information and security. Other applications include monitoring driving behavior, such as an employer of an employee, or a parent with a teen driver. This system can also be used in vehicles which give necessary information about all the buses carries goods by roadways.

2. System Architecture

The system is composed of client and server interface. At client side, we have an android application which runs on device attached in the bus or provided to driver. At server side, we have website to store all details related to services like student details, bus details, and driver details. Student can track the current location of bus on Google map fetch from server. Admin maintains all information on the server.

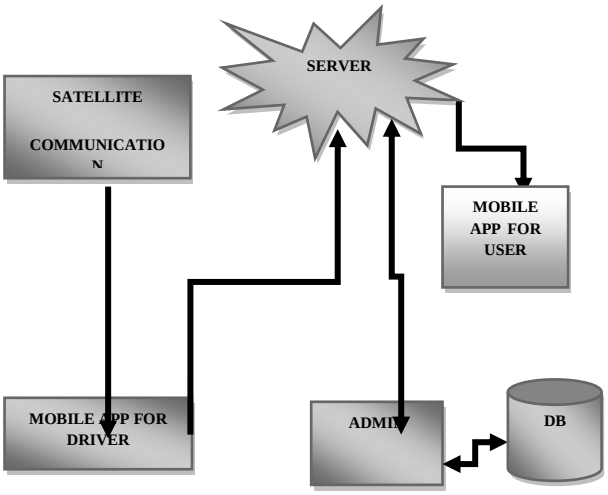

Figure 1 System Architecture

3. Module Description

This application contains three modules:

1. Admin:
   - Admin Login
   - Driver/ User Registration
2. User:
   - User Login
   - Select Bus
   - View bus location on the Google Map
3. Driver:
   - Driver Login
   - Start Location Tracking
   - Stop Location Tracking

3.1 Admin

Admin can login to the admin account after authentication and authorization. He can enter new route details and also, he can select the route from the list of routes. He has the options to add or remove a route. He also has the option to modify or remove a stop from the route. If admin want to say any information to the driver then he can send the message to the driver's mobile via

the browser. He can also enter new user details and can view the list of students and their details on cloud. He has the options to add or remove a student detail.

- Admin Login: Admin will Login with his Admin ID and password.
- Driver/User Registration: Admin will register the driver and user by entering their details. Only Admin has the authority to registration a new user to the application.

3.2 User

User has to enter the registration number and mobile number to login to the application. To search for a bus, User has to enter the bus number in the search bar. Then map is displayed which shows the current location of the bus. He can also receive an alert notification when the bus came to the nearest stop. When the User taps on "Select Bus", corresponding bus numbers are fetched from the server and binded to the spinner for the User to select. If the User selects a particular bus then the location details (Latitude and Longitude) of the bus for that route is fetched. If the User selects "Show Map" then the location of the bus on the map will be displayed.

- **User Login:** User can login by entering User ID and password.
- **Select Bus:** The user can select a bus from the bus numbers displayed through the spinner.
- **Show Map:** Latitudes and longitudes of the bus location will be displayed.
- **Vehicle Tracking:** System will track location of both vehicle and driver using GPS, and bus location can be viewed through Google map.

3.3 Driver

Driver has to enter the Driver ID and password to login the application. Driver work is only to start and stop the tracking of bus.

When the application is launched, the MainActivity fetches the routes from the server and binds it to the spinner for the driver to select it. If the driver selects "Start", the location of the bus will be uploaded to the server. If the driver selects "Stop" then the uploading of location of the bus is stopped.

- **Driver Login:** Driver can login by entering Driver ID and password.
- **Start Location Tracking:** The vehicle tracking system uses the driver GPS Enabled Android Mobile to track the vehicle on Google Maps.
- **Stop Location Tracking:** Halts the tracking of Driver's location

4. Conclusion

The system has the advantages of small size and powerful expansibility. The Graphical User Interface (GUI) of this application is user friendly where users can easily track their vehicles. The cost of the system is relatively very low which makes it a perfect choice for customers to install it and make themselves secure. It can be easily installed and used in the buses to ease the burden of transport department as the educational institutions have large number of buses.

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