КОМПЬЮТЕРНЫЕ НАУКИ

ADVANCED VEHICLE TRACKING SYSTEM BY GPS USING ANDROID APPLICATION

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Abstract

Global Positioning Systems (GPS) are used for various applications. This paper mainly focuses on developing advancement in GPS based vehicle navigation system using Android apps. Now a day management of buses is one of the main problems with college transport. Their management involves a lot of problems to the staff. Moreover, while dealing with the management of college transport, one should also keep in mind the cost of operation. This paper gives a possible, efficient and low cost solution to the above problem. This system is helps to locate the routes of the buses by which they are travelling and displaying the current position of bus on Android apps so that it helps in tracking the bus timely.

Keywords: GPS, Vehicle Tracking, Real Time System, Mobile Devices, Restful web services, JSON, Android Apps

Introduction

Now a day, one of the main problems with the college is transporting system is management of buses. Buses are the main means of transport. Their management includes a lot of problems to the staff. To avoid this problem, one of the possible solutions is there. While dealing with the management of college transport, this paper has given a possible, efficient and less cost solution to the above problem. In this paper, it is proposed to design an android application which is used for tracking the position of every vehicle by using (Global Positioning System) GPS and GPRS. The current application of android will continuously monitor a moving Vehicle and report the status of the Vehicle on demand or automatically. This tracking can be automatically done without the intervention of the user and the tracking report is used to updating the (GPRS) General Packet Radio Services. These GPS modules are placed in bus with using mobile application and the shows timing. At the pickup point, with the help of a mobile application which is interfaced with these modules, travelling and also a plot can be made of using this information on the google map. This map is also updated the time of Apart from the prime objective of cab management it is also advantage in many different ways. This paper helps us for tracking the bus timing and many applications like time monitor etc. can be implemented. This paper helps the bus authorities in providing timing and reliable services to the college teaching and non-teaching staff.

Overview

A Location-dependent Service (LDS) is an information of service which can used to accessed location with mobile devices using application and utilize the geographical position on the mobile device.
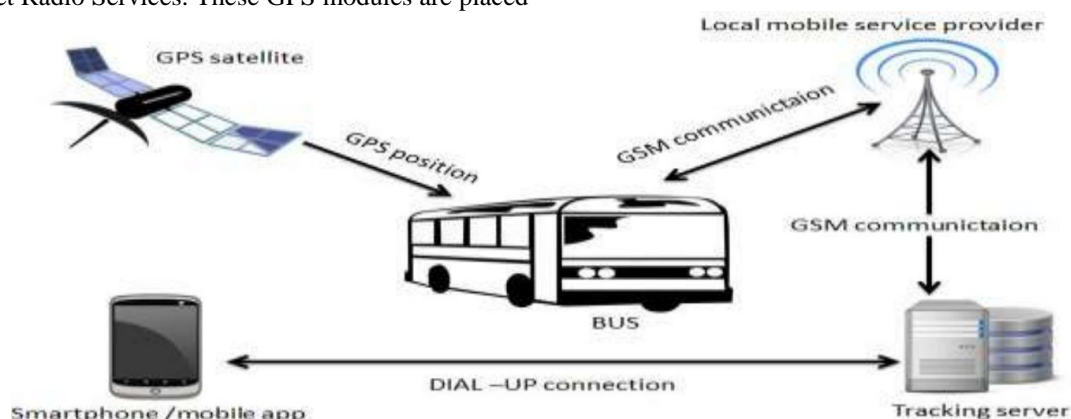

Fig. 1: System Architecture

As shown in the above figure there are different components of the Real time Navigation system.
Bus
Employee
Satellite
Tracking Server
Andriod Application
Mobile Service Provider

While the BUS is connected to the SATELLITE after starting the BUS the Satellite will access the position of the BUS then the actual processing between the satellites and tracking server for exchange the access location between both of them. Employee is connected to the application through the username and password. After connected to the Official Website Employee will get the location through service provider which can update location coordinate within 10 seconds.
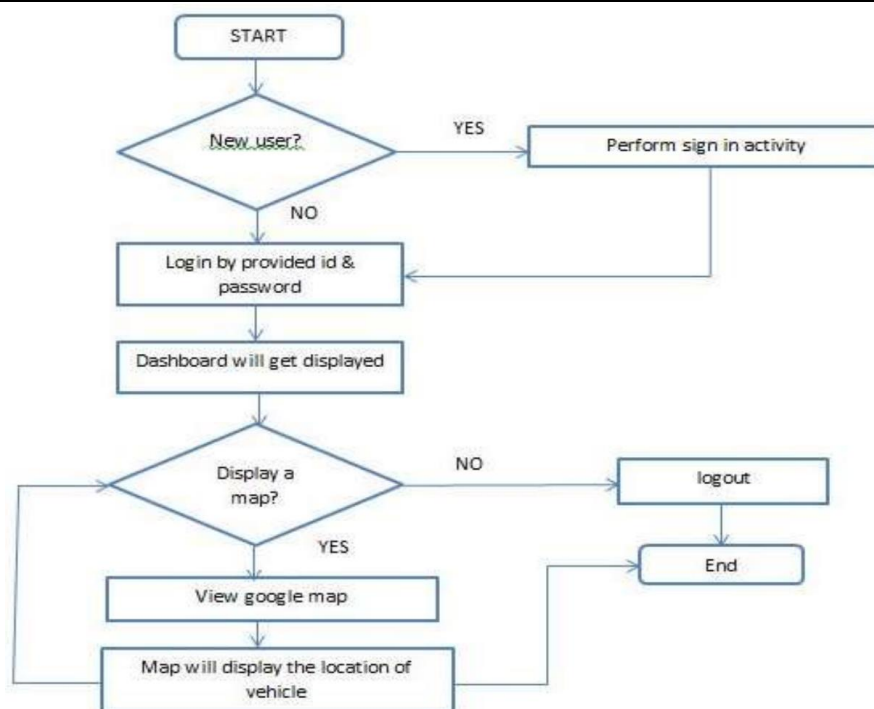
A. Workflow

Fig. 2: Work Flow

Implementation of system

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 and Google Map with the location of 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. online MySQL database server is used 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.

A. Here we used a RESTFul web services to implement Serverside

A RESTFul web services are HTTP methods and the concept of REST. A RESTFul web service defines the base URI for the services, the supported MIME-types like XML, JSON and the set of operations like POST, GET, PUT, DELETE which are supported. RESTful web services are designed to work best on the web. Representational State Transfer (REST) is an architectural style that applied to a web service induce desirable properties, such as scalability, and modifiability, performance that enable services to work better on the Web. In the REST architectural style, data and functionality are considered resources, and these resources are accessed using URIs (Uniform Resource Identifiers) , typically links on the web. The resources are acted upon by using a set of well-defined operations. The REST architectural style constrains an architecture to a client-server architecture .typically HTTP. In the REST architecture , clients and servers exchange resources using a standard interface and protocol. These principles helps RESTful applications to be simple and have high performance.
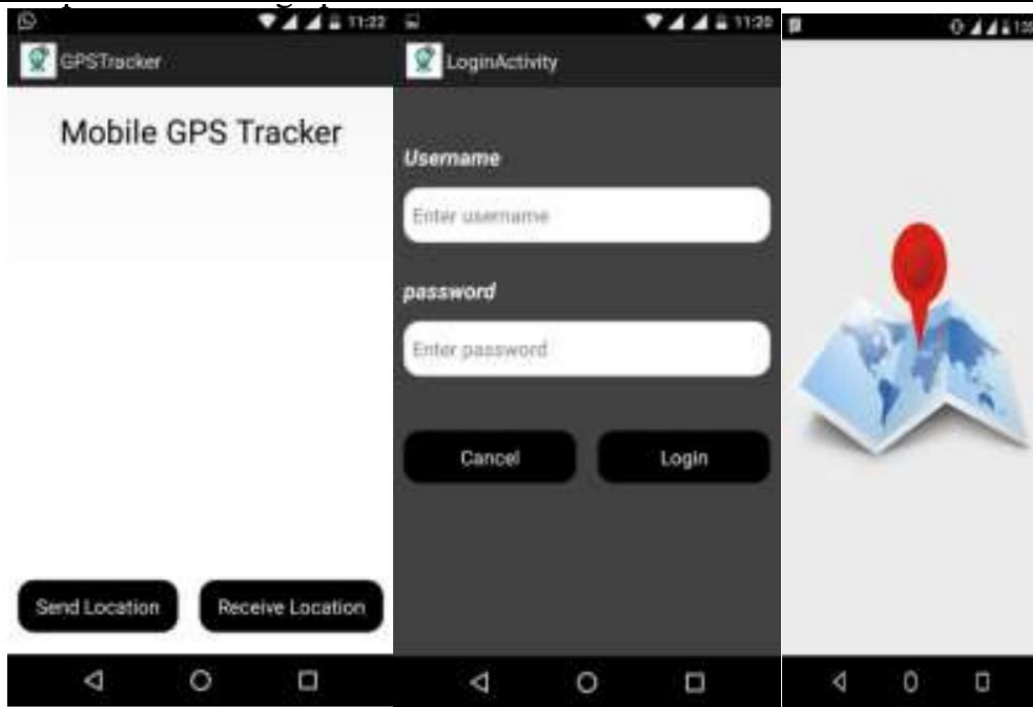
Fig. 3: Splash activity and main activity

As shown in figure above there are two activity at the time of initiation send location & receive location respectively.to send location & receive location both employee and admin must registered by using username and pass word. after registration both can login into the system and send or receive locations per requirement.
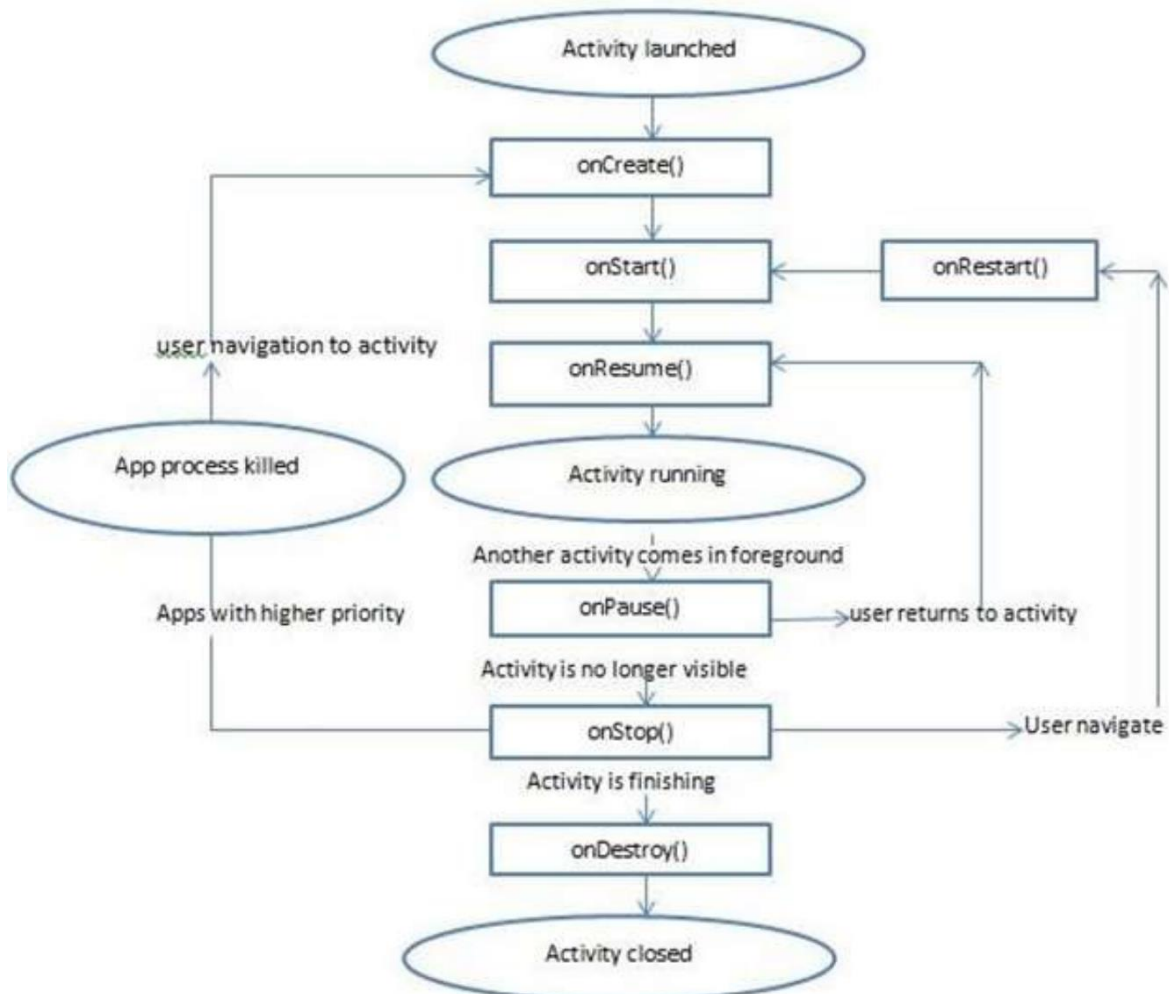

Fig. 4: Activity lifecycle of android app

Starting State: An activity not yet exist in memory, this state called as starting state.

Resumed/Running State: when an activity that is in the running state. Any activity that is currently on the screen and interacting with the user is the running activity

Paused State: An activity is not in focus i.e. not interacting with the user, but is still visible on the screen,

Stopped State: An activity that is not seen on the screen, but present in the memory it is the Stopped State.

Destroyed State: A Destroyed activity results from that is no longer require (the removal of an activity) from the memory. Such removals generally occur, when the activity manager decides that there is no use for such activities anymore.

Conclusion

Hence, we have implement the system that provides the various services to the client related to the bus application like as bus route, bus timings, bus stops. GPS signals are successfully received and processed by the server and send location information to employee through android application and shows current location of vehicle. Map will be automatically refresh after every 10 seconds.

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