GPS BASED BUS TRACKING SYSTEM USING ANDROID APP

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Abstract:
Nowadays public Transports are not on time in order to catch a bus we have to wait for long time. Basically it’s odd in our town (Chennai) to catch a bus on time due to traffic. So here I use an Android app which not only locates a bus remotely with the help of GPS (Global Positioning System) and also sends notification to your mobile once the bus crosses your bus stop. Android is an open source, user friendly and the most widely used mobile operating system in India so I preferred Android platform. In this app we can search for bus number or the route of the bus. This application locates the bus with the help of GPS and Google maps.

Keywords: GPS, android, mobile operating, Google maps.

Introduction:

Mostly passengers don’t have complete details about a bus, Bus number, routes through which the bus would pass, when it starts and when it reaches the destination, traveling time, the exact position of the bus. Even if they know those details due to some external factors that bus may not be on time. Those external factors are Traffic, accidents, breakdown etc.

The proposed system helps you to overcome the above mentioned problems. This Application provides those above mentioned facilities. Many Application are developed in this topic but this application will help you to get even notification to your mobile if the bus crosses your stopping. And the user interface is good when compared to all other applications. Hence, android is the most widely use operating system we prefer Android platform, and also it is user friendly and open source mobile software environment. Android is a Linux based operating system and uses java language. It is easy-to-customize, easy-to-use operating system that is widely used in more than a billion devices across the world from phones and tablets to watches, TV, cars and more to come.
This application is developed using Eclipse which is a Android development tool (ADT) and Android SDK (software development kit). There are several number of restraints that is to be satisfied. Some of them are listed below:

1. The user should have a GPS enabled phone.
2. The phone should not take much time while retrieving the bus details from the server
3. All bus details should be saved inside the server.
4. If there is any change in the details, then we have to update the changes
5. Timing of the bus should match with the practical timing
6. The GPS should give the exact location of the bus.
7. Irrespective to the external factors such as traffic, breakdown, accidents the bus reaching time should be shown approximately.
8. No bus route should be left in the database
9. The user interface should be made easy understandable even by an illiterate.
10. If in case a passenger has marked a bus and a bus stop, once the bus crosses that bus stop, that passenger should get notification that bus have crossed his bus stop.

Many applications are developed under this topic but none of them will give you accurate results as this app. I have also included the Notification feature in this application which is not available in any other application.

The main objective of this proposed work is to enhance the Bus tracking system with the addition features such as notifying the user about the bus if it has crossed the respective bus stop.

**Existing System:** There is an application which is developed in Chennai named “Chennai Bus Route” has got some major drawbacks such as

- Timings of the bus has not been denoted properly.
- There is no details about all the bus stops
- The map view is not available.
- Notification feature also not available.

**Proposed System:** The overall idea of this project is to provide the people who use public transport with the accurate bus details, such as timing, location, and even I add the notification feature where the application will notify you once if
the bus crosses the bus stop which you have marked. Once you get the notification you need not wait for that bus, you can manage your travelling either with another bus or some other means of transport. We can also set that notification in an audio form i.e. the notification will be a kind of alarm. Which you have to set a unique audio for that or even it has a default recorded message which says Bus have crossed the bus stop. The alarm will not go off until you manually turn it down.

i. Module 1 (Maps and Routes)

This module helps you to set the source and the destination. And it will show the shortest way to reach the destination in a short period of time. And also it will show the respective bus in that respective route. If there is any road block or any heavy traffic jam in that particular area then it will suggest you to find some other Route which is clear without any obstacles such as traffic jam or road block.

![Flowchart for Module 1](image1.png)

**Fig. 1: Flowchart for Module 1,**

ii. Module 2(Stages and Stops)

This module portrays the process of selecting the stop which the passenger locked as destination. The location tracker will spot the exact location where the bus and send the location to the mobile of the passenger in which this app is being installed. Here they use client server technology, where the mobile phone act as the client and the GPS in the bus acts as the server.

![Flowchart for Module 2](image2.png)

**Fig. 2: Flowchart for Module 2.**
Development Environment:

The main requirement for the development of this application is Eclipse. Eclipse is an integrated development environment (IDE). It consists a base workspace and an extensible plugin system for customizing the environment. It is mostly written in java, but also it can be developed in even some more programming languages such as C++, Ruby, Python, php etc.

i. Android SDK

Integrated Development Environment (IDE) is cast-off in Android application development to make it more forthright and rapid. It has been recommended for the developer because of its simplicity in working. Android is a platform where we can do multiple task at a time. For example, we can play games, download songs and copy files in background. This property of Android is known as multitasking.

ii. ADT plugin

ADT is a tool developed by google. It is mainly used for Android application development in Eclipse. It is very easy to develop an application in Eclipse Environment to quickly create Android applications and debug those programs inside it. Eclipse is a platform which helps us to code easily that gives you suggestion while typing the code and even it shows if there is any error.

iii. Android Emulator

Android emulator is a virtual Android device that runs inside a computer to run Android applications which includes inbuilt Android SDK. It replaces the physical Android phone. Android emulator supports AVD (Android Virtual Device) configuration, which has a inbuilt Android Smartphone operating system. Using the Feature of AVD, developer can run his application before installing it in a physical device. Any application that is executed in this emulators can use the features of Android Platform such as play store, Store and Retrieve data. It has also got some disadvantages such as no Bluetooth connectivity, and it doesn’t support SMS/MMS communication.

A. Functionalities of the system

The Major Functionalities of the system are mentioned below

√ Route Information
Stop Information

Bus Information

Location Tracking

Map Generation B. Database

Hence it is a Android application we use SQLite for Database. The request by the user is passed to the database as a query. All the rows and columns are compared with the query and the required information is fetched back to the user.

This Database will have Bus information, Stop information, as well as the Route information (i.e. Stages available in that Particular Route)

C. Location Based Service

Location Based Service (LBS) is the most broadly used application which helps in Location positioning technologies. It uses GPS to locate the moving bus.

The GPS is tracked and the data is sent to the server which has the database, the server fetches the data from the database about that bus and sends it to the user. So that the user can keep track on the exact location of the moving bus and also he/she can estimate the time left for that bus to reach the stop where the user is waiting.

Fig. 3: Location Based Service.

D. System Requirements

Software Requirements:

1. JDK 1.6
2. Android SDK 4.0
3. IDE Eclipse Helios
4. Backend: MySQL SERVER 4.0

□ Hardware Requirements:

1. i3, with 2 or 4GB RAM
2. 500 GB Hard disk
3. Netspeed@mbps

E. Client Server Technology

The system is based on the client-server technology, which consists of a server side part as well as a client side part. The boundaries of both the parts have been considered during the project development. The user should enter his destination name in the application. The application sends the destination as a request to the server, the server looks up for the destination in the database and this detailed information will then be sent to the user mobile phone.

Fig 4: Client-Server Technology in Android.

Conclusion

The conclusions of this project recommend that knowledge of specific domain improves the results. This Project has been developed on Android platform. Also, different additional features have been added to the project which will mend to be beneficial to the project. The specifications and requirements have been mentioned above. This project is implemented for Android platform. With the help of GPS, the application will display the routes maps to the different locations according to the user needs and also it will be helpful to track the bus location using client-server technology, and send that to the user mobile.

Future Scope

It will be implemented on the cloud platform, so it will be accessible by each and every Android phone user. It will be helpful for any of the passenger or traveler to travel all over the world without any travel guide.

References


