



Bus Transport Application

¹Rushikesh Ghosalkar, ²Vipinkumar Gupta, ³Aditya Hirlekar, ⁴Dr. Chhaya S. Pawar

¹Student, ²Student, ³Student, ⁴Assistant Professor

^{1,2,3,4}Computer Engineering Department,

^{1,2,3,4}Datta Meghe College of Engineering, Airoli, Navi Mumbai, India

Abstract: Everyone is in hurry to reach their destination in this fast life. In this case waiting for the buses is not reliable. People who rely on the public transport their major concern is to know the real time location of the bus for which they are waiting for and the time it will take to reach their bus stop. This information helps people in making better travelling decisions. This report gives the major challenges in the public transport system and discuss various approaches to intelligently manage it. One of the major approaches is Real Time Bus tracking. In this system current position of the bus is acquired by integrating GPS device on the bus (mobile) and co-ordinates of the bus are sent by either GPRS service provided by GSM networks. GPS device is enabled on the tracking device and this information is sent to centralized control unit (Server). This system is further integrated with the facilities like online ticket booking, geofencing and some other features. Online Bus Ticket Booking System as should be used in a bus transportation system, a facility which is used to reserve seats, cancellation of reservation and different types of route enquiries used on securing quick reservations. Also, the upcoming generation of Location Based Service (LBSs) will be significantly determined by geofencing applications and background tracking. The Geofence implemented is not the default geofence with a circular radius but a polygonal geofence.

Index Terms - Geofence, LBS, GPS, coordinates, ticket booking.

I. INTRODUCTION

Among all public transport services, bus transport service is one of the major means of transportation used by public on daily basis. Especially in a busy city or town, bus is the most easy, convenient and cheaper transportation. Various reasons why people prefer to take bus instead of driving their personal vehicles such as traffic jams, heavy parking fees and lack of parking space.

However, bus transportation service currently available is very poor. Bus users do not know the exact arrival time of the bus, they only know the scheduled arrival time. Compared to train and flight transportation systems, bus transportation system does not have appropriate services that are needed and are useful for the commuters like the bus transport service that is in use can only give scheduled arrival time as mentioned earlier in addition to this there is no online ticket booking system as well.

In order to overcome these problems and enhance the current bus service system a complete bus transport application has to be developed. This bus transport application will contain features like bus tracking, through which a person can see the location of the bus sitting at home and get at the bus stop just before the bus arrives, there is even geofencing to monitor the location of the bus, also if the user forgets his belongings in bus due to rush, there is no need to worry as he can easily find it in through the app with the help of Lost and Found section. Even if a user gets last minute call that his meeting venue has changed, he can easily rebook through the app. This app is also safe for women as live tracking of the bus is done, so, her parents who sit at home holding their breath can breathe easily till she reaches home. This app surely will add up in making a smart and safe city!

The current position and estimated arrival time of the bus is provided to the passenger by the Bus Tracking System. In relation to the estimated arrival time the passengers can decide whether to wait for the bus or not. This helps in making better travelling decisions by the passengers. From this system it can also be determined whether the bus is yet to come or has been missed. To make life more efficient the system provides necessary basic information.

II. LITERATURE SURVEY

[1] Authors “M. A. Hannan, A. M. Mustapha, A. Hussain and H. Basri” have implemented the system “Intelligent Bus Monitoring and Management System” The proposed system uses Artificial intelligence with the help of RFID module which is used in-order to reduce the manual work carried out in the Bus-Management & Monitoring System. In this a RFID is used to track a bus when it crosses the bus stop. Hence the exact location of the bus is not shown, only an approximate location is shown based on the bus stops. In today’s world, accuracy is very important and hence this was the limitation of this project.

[2] Authors “Ajay Shingare, Ankita Pendole, Nikita Chaudhari and Parikshit Deshpande” GPS Supported City Bus Tracking & Smart Ticketing System gives 1. Public transport and private buses tracked to citizens with traffic and transportation details like location, crowd, position of bus from remote location using location of the bus can be observed continuously using GPS system. Having limitations, the given system does not provide the facility like ticketing and also it has shortcoming like passengers can’t buy tickets, who don’t have smart card.

[3] “Dr D Durga Bhavani and S C V S L S Ravi Kiran” presented a paper for Smart tracking system for buses using Wi-Fi and the real time tracking Mobile Application. The system consists of Wi-Fi routers at some Access Points say at Bus terminals and the Wi-Fi module in the buses. When the bus come to the bus terminal, the Wi-Fi module gets connected to the router and sends the address i.e., latitude and longitude of the bus terminals to the cloud then the data is retrieved from the cloud and displayed to the user in the mobile application, also gets notified when the bus is nearer to the bus terminal. The major drawback it has is that the bus can be tracked only when in the range of the access point.

[4] Authors “Daivshila R. Jagtap, Gitanjali S. Borate, Sarika D. Kute, Varsha R. Jagtap, Mayur A. Doifode, Mr. Prasad P. Pratape” developed a College Bus tracking system to help students know the bus location so that the students don’t get delayed or don’t arrive at the stop too early.

III. PROBLEM DEFINITION

Implement a complete bus transport application which will enable the users to book tickets, live track the bus and view schedule of the buses all in one application. Along with these there will also be Geofence to keep track of the route and Lost and Found Section where the lost belongings of a commutator can be found.

IV. METHODOLOGY

We have implemented an app that encloses different functionalities. The functionalities are implemented as follow-

4.1 Live Tracking

The bus tracking system consists of 3 modules:

1. Bus Module.
2. Passenger/User Module.
3. Server Module.

Bus Module

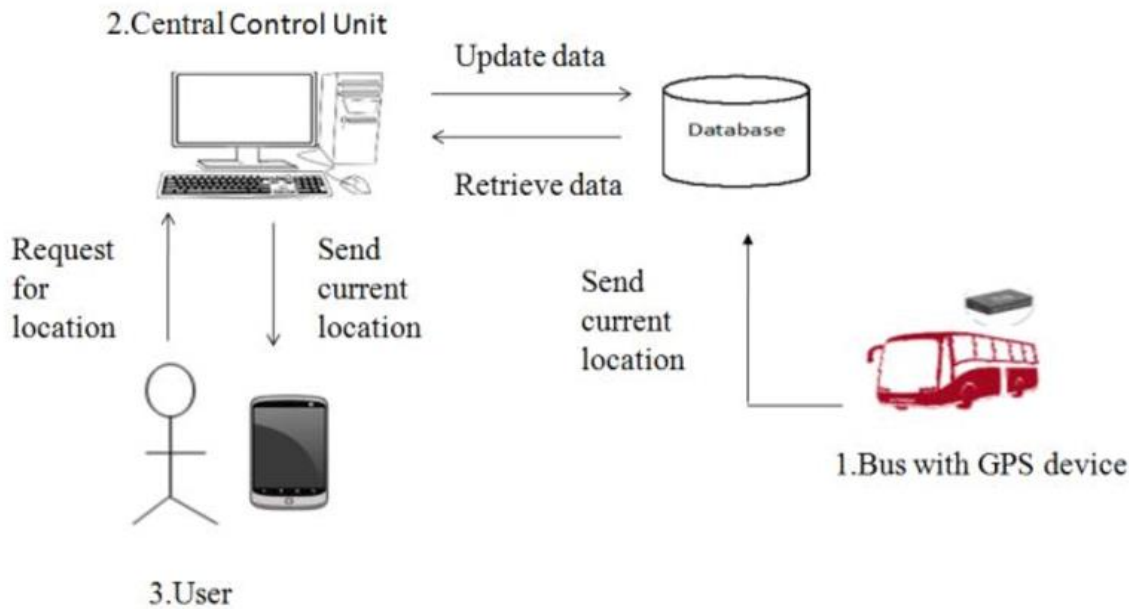
Bus Module is the Client side of the Android application. This application is installed on the Android platform smart phone which is placed on the bus whose position is to be tracked. The Requirement for this application is GPS and GPRS. In the beginning of the route, bus driver initializes the application with the bus number. Once this initialization is done it initializes the server side with this bus number and its coordinates. This application uses Location based services (LBS) to get the current GPS location of the Bus. Location services automatically maintain the user’s current location, so application has to retrieve it as needed. Accuracy of the location depends on the location permissions that have been requested and the location sensors that are currently active for the device. Once the tracking has been initiated Bus module submits its coordinates frequently, every 6 seconds to the server. These frequent submissions are used to track current location of the bus on the route.

Passenger/User Module

This module is another type of the client application. This android application is installed by the passenger who wants to track the location of the bus and get its arrival time. The basic requirement of this application is the GPS and GPRS. This application uses Location based services to get the passenger’s current GPS coordinates. The arrival time is predicted with respect to the distance between the bus’s current location and the passenger’s nearest bus stop. The passenger selects the Bus number from the bus nos displayed and request is sent to the server. After processing server the server will send back the location of the bus which will be displayed in the maps.

Server Module

This module is the server side of the android application where most of the processing is done. Web service is used that facilitates the submission and request of information to the database server. SQLite and Firebase is used where tables for all the user and buses are present.



4.2 Geofencing

To use geofencing, we start by defining the geofences we want to monitor. Although usually to store geofence data in a local database or download it from the network, we need to send a geofence to Location Services as an instance of Geofence, which you create with geofence. The geofence used is not circular but a polygonal one. The Geofence is implemented using three classes – Polygon, Line and Point. To define the border of the geofence co-ordinates of different locations on the route are needed. Lines will connect these co-ordinates to form a polygon. These co-ordinates or to be given statically before starting the geofence. No once the border is set and the bus has started its route, the status of the bus will be tracked timely to check whether the bus is in defined boundary or not. If a bus exits the geofence then a notification will be sent to the user regarding the change in route. Now to avoid reiteration that is repeatedly set the geofence for a specific route, the coordinates that define the border will be stored in the database.

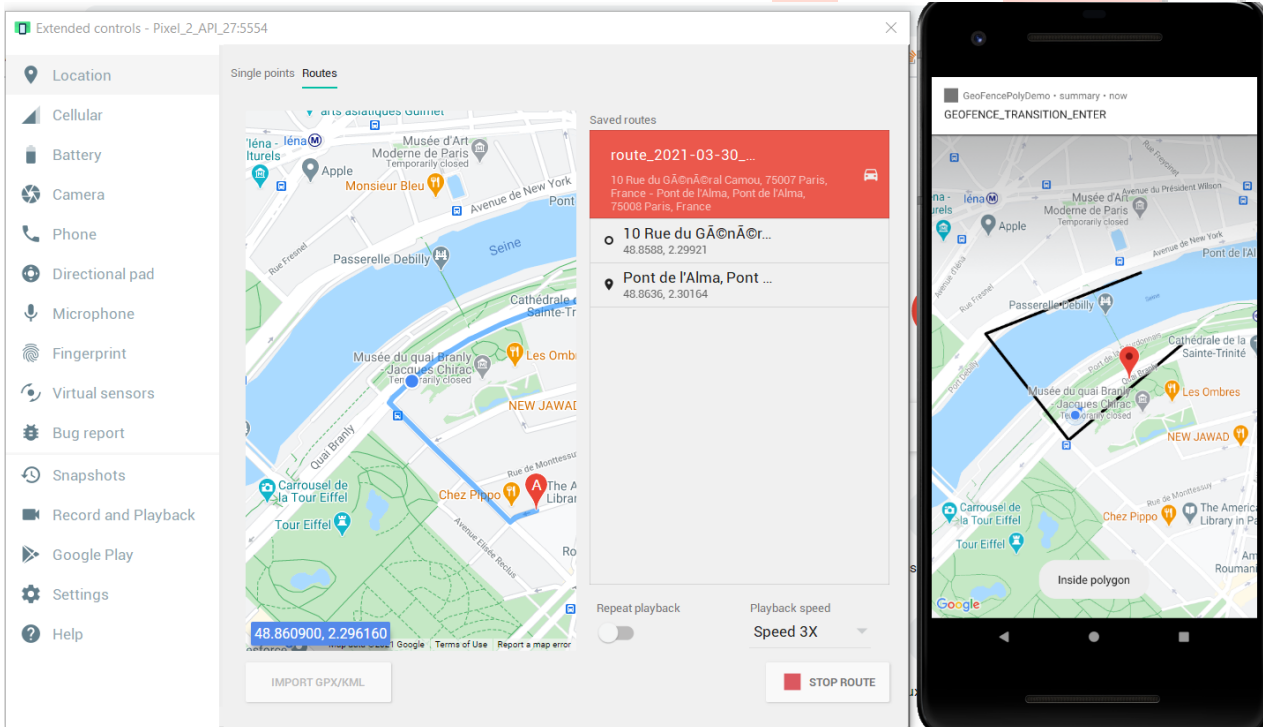


Figure 4.2.1 Geofence entered

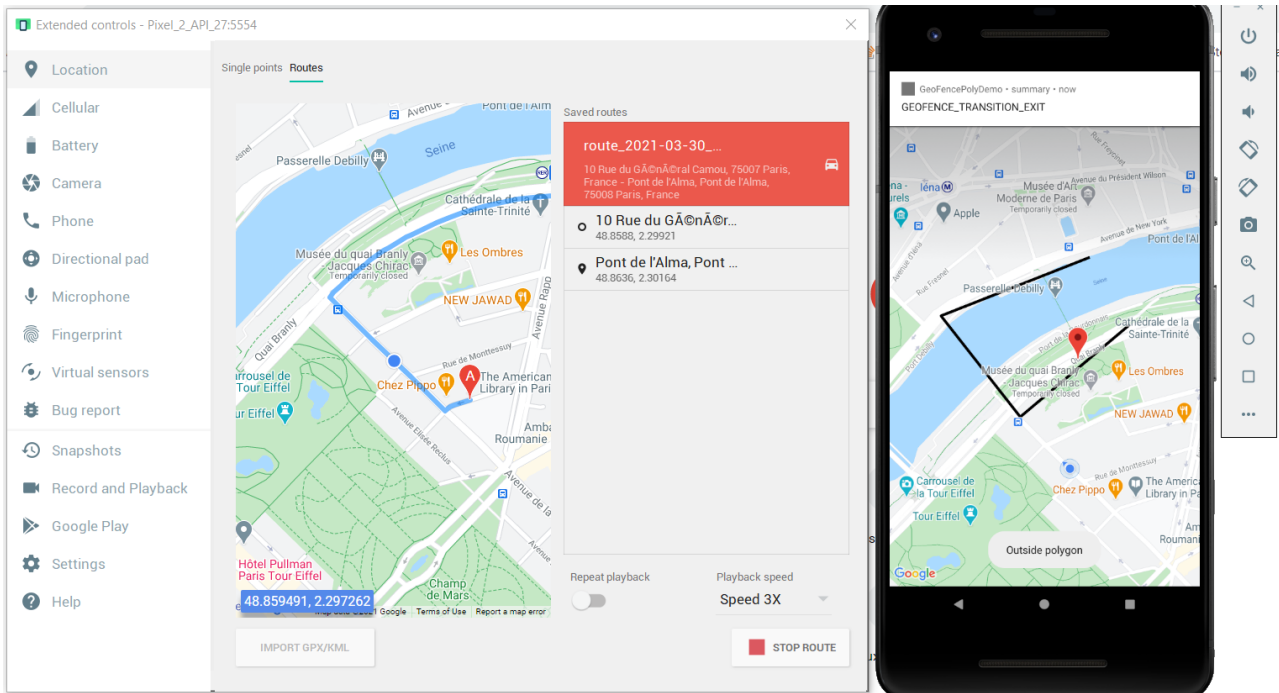
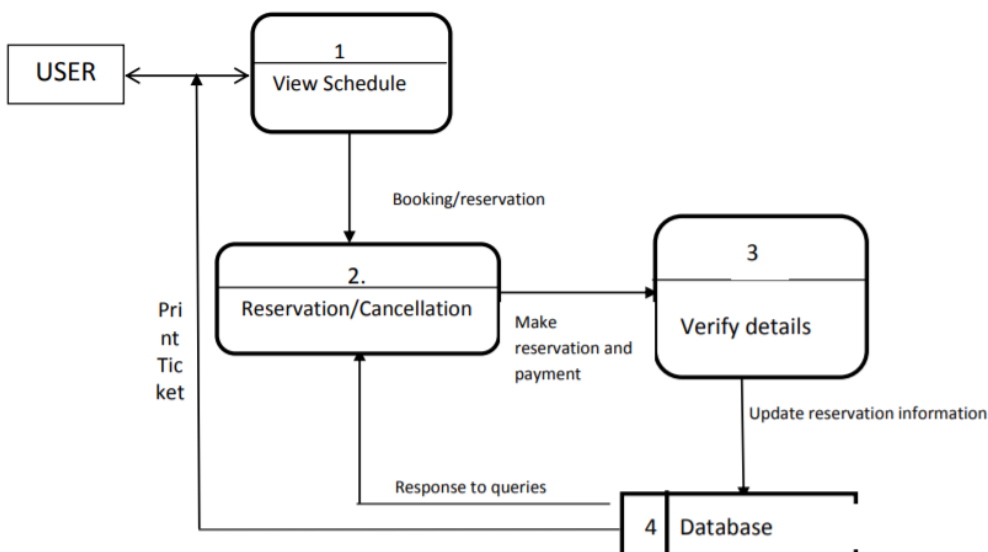


Figure 4.2.2 Geofence exit

4.3 Online Ticket Booking

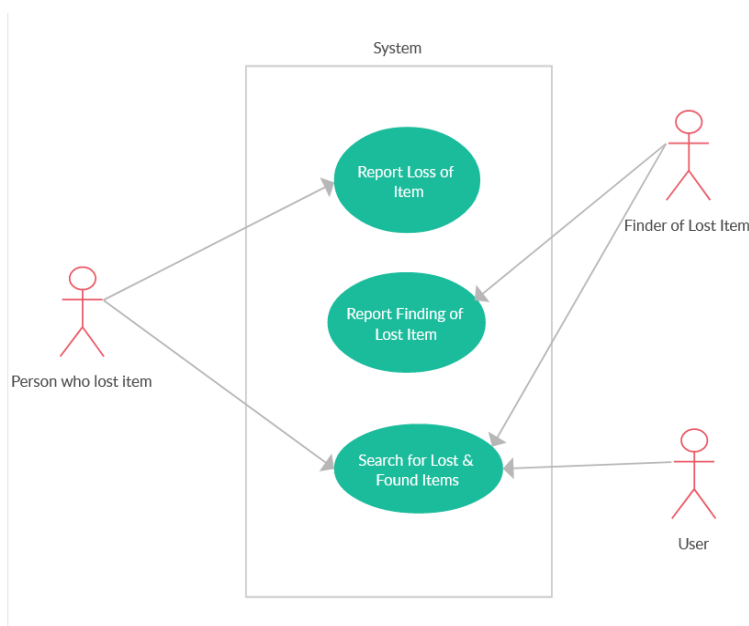
This is a three-tier architecture that comprises of user interface, process management and Database Management System (DBMS). This can be implemented using a payment gateway. Steps for Payment Gateway integration in android:

- a. Add permission to your AndroidManifest.xml file
- b. Declare SDK service and activities in your
- c. Create a Payment gateway Configuration object
- d. Start gateway Service when your activity is created and stop it upon destruction:
- e. Create the payment and launch the payment intent, for example, when a button is pressed
- f. Implement onActivityResult ()
- g. User will select Source, Destination and Bus Number to book ticket.
- h. Source, destination and bus number details will be fetched from bus database
- i. After this user will be redirected to the Next Activity i.e., Payment Activity
- j. Here Server will calculate the cost between source and destination automatically
- k. Finally, to pay that amount we will use payment gateway methods.



4.4 Lost and Found Section

The application has two main screens, Lost and Found tab. Lost tab is for user who lost their items. The Found tab is for user who found items through the bus. Users can create post by taking a photo and writing a description of the lost/found item. The owner of the item can contact the user who found the item through Message, Call or Track features. Users can message each other by using the built-in messaging system. To return the item to the owner, user can use the Track feature. The Track is a feature that send an email to the user who found the item so that he/she can contact the owner of the item. User must fill out a form to verify the user identify. Then, the user needs to sign the form through the built-in signature pad to accept the terms and conditions.



V. RESULTS AND DISCUSSION

We have successfully implemented a Bus Transport Application which includes all the necessary functionalities that a transport service application need. This system is easy to implement on vehicles, also it will be effective. This system grants us to get equipped with work custom, eco-system and person. This application will provide great assistance for the commuters to plan their journey effectively and thus leading to minimum waiting time for the buses.

The proposed system plays an important role in real time tracking and monitoring of buses. With the implementation of the project a complete track of the buses can be kept around the city through the android application. Addition of online ticket booking and lost and found section enhances the capabilities of the app. Thus, we have successfully proposed a fully functional system which a user needs in this busy life.

The working of the system is highly dependent on the coordinates provided by the GPS. Many android applications and many other important systems are working on the grounds of coordinates provided by the GPS. To overcome this problem Transmitters could also be deployed over the bus and the stops but this is very less efficient way.

The working of the system entirely depends upon the availability of the internet. The passengers should have smartphones with the availability of the internet in it. To overcome this problem LCDs or LEDs could be deployed at each bus stop which displays the required information.

V. ACKNOWLEDGMENT

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