Project II

"Public Transport Control System"

Submitted in partial fulfillment of the requirements for the degree of

Bachelor of Engineering

by

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This is to certify that the project entitled ***Public Transport Control System*** is a bonafide work of **Hiroli Rizwan Mohd Yunus Fatma, Khan Tahir Siraj Ahmed Takdirun Nisa, Shaikh Mohd Farhan Mohd Salim Razia Begum and Siddiqui Mohd Husain Shakeel Ahmed Mukimunnisa** (Roll No.: 13CO30, 13CO43, 13CO56 and 13CO60) submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of **Bachelor of Engineering** in **Department of Computer Engineering**.

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Project I Approval for Bachelor of Engineering

This project entitled *Public Transport Control System* by *Hiroli Rizwan Mohd Yunus Fatma, Khan Tahir Siraj Ahmed Takdirun Nisa, Shaikh Mohd Farhan Mohd Salim Razia Begum and Siddiqui Mohd Husain Shakeel Ahmed Mukimunnisa* is approved for the degree of *Bachelor of Engineering in Department of Computer Engineering.*

Examiners

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2. ....

Supervisors

1. ....
2. ....

Chairman

....

Declaration

We declare that this written submission represents our ideas in our own words and where others ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Abstract

Title : Public Transport Control System

As we know that public transportation service plays a vital role in our life among which one is bus. But the main drawback of traveling with bus is the inconsistent arrival time of bus which leads to various problem for the passengers, whereas the reasons behind this delays of buses could be various such as irregular vehicle dispatching times, traffic congestion, and various other issues. Therefore, there is a huge requirement for developing a user-friendly system which could provide the user real time location of their desired bus. This paper proposes an application which is android based application, which will overcome all the above mentioned problems by providing the real time location of the bus. To achieve this system, the GPS (Global Positioning System) technology is used.

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Keywords And Glossary

Keywords :

Public transportation system; Real time bus location; Bus tracking system; Estimated arrival time (ETA); Maps; GPS; GSM.

Glossary :

B
Bus: a large motor vehicle carrying passengers by road, typically one serving the public on a fixed route and for a fare.

C
Commuter: a person who travels some distance to work on a regular basis.

D
Disseminate: spread (something, especially information) widely.

Disruptinterrupt (an event, activity, or process) by causing a disturbance or problem.

G
Google Map: Google Maps is a Web-based service that provides detailed information about geographical regions and sites around the world. In addition to conventional road maps, Google Maps offers aerial and satellite views of many places. In some cities, Google Maps offers street views comprising photographs taken from vehicles.

GPS: GPS, which stands for Global Positioning System, is a radio navigation system that allows land, sea, and airborne users to determine their exact location, velocity, and time 24 hours a day, in all weather conditions, anywhere in the world.

GPRS: General Packet Radio Service (GPRS) is a packet oriented mobile data service on the 2G and 3G cellular communication system's global system for mobile communications (GSM).

GSM: GSM (Global System for Mobile communication) is a digital mobile telephony system that is widely used in Europe and other parts of the world. GSM uses a variation of time division multiple access (TDMA) and is the most widely used of the three digital wireless telephony technologies (TDMA, GSM, and CDMA).

I
Interface: a device or program enabling a user to communicate with a computer.

N
Network: a group or system of interconnected people or things.

P
PTCS Public transport control system.

S
SIM: Subscriber Identification Module, is an integrated circuit that securely stores the international mobile subscriber identity (IMSI). It is a portable memory chip that makes you able to make phone call across the world where subscriber's network is available.

SMS: Short Message Service (SMS) is a text messaging service component of most telephone, World Wide Web, and mobile telephony systems. It uses standardized communication protocols to enable mobile phone devices to exchange short text messages.

Chapter 1

Project Overview

1.1 Introduction

Among all public transportation services, bus service is the major transportation used by the commuters, mostly from the city sides as it is cost effective and convenient as driving own vehicle may lead to face traffic congestion and also lack of parking places. But there's a lot problem associated with bus services specially there's no fixed arrival time, this problem occurs because the current bus service system hasn't implemented any real time bus tracking system because of which commuters can't know the exact arrival time of bus because of which many commuters are often late to their destination since they decide to wait for the bus instead of going for alternative means of transport.

This paper focuses on developing an android application through which commuters will be easily able to track the real time location of the bus which would help the commuters to plan their journey accordingly; even they could plan their journey while being at home by using this android application. This system will boost the use of bus services as this system will provide complete track of the user desired bus like the expected arrival time, expected departure time, any kind of delay in bus service or any other incident which would be disrupting the bus service. Hence if any kind of delay is there in the service then user would be able to go for choosing any other means of transport which will result in his/her time saving. Also this system will increase the use of bus services since the user would be knowing the expected arrival time of bus then he/she might opt out of using his own vehicle or cabs which would result in reducing traffic and even reducing the pollution. The main technologies used for developing this system is Global Positioning System (GPS) and General Packet Radio Service (GPRS).The Driver or each bus will have an Android mobile which will have an android application installed on it which will send its real time location to the server and this location will be disseminated to the another application i.e. to the user side android application.

1

1.1.1 Background Introduction

The main reason behind choosing android is it is an open source mobile software environment. Also it is user friendly software hence enabling the ease of access for all users. Even today almost every second person having phones is operated on android operating system.

1.1.2 Motivation

In today's generation almost everyone has to travel with some kind of Public Transport. But somehow the public transport is not on time specially the buses. There is already an application for the Trains so we thought why not we make the similar application for the buses as well. It will help all the commuters who travel through bus. The timing of the buses are fixed but most of the times they arrive at the bus stops very late and because if the students, employees etc people face alot of problem. So, we wanted to make an application that will solve this kind off problem.

1.2 Problem Definition

The current bus transport system doesn't provide any information regarding the bus location and its arrival time to both passenger and to transport control manager which leads to waste of a lot of time of passenger and appropriate frequency from the administrator of transport isn't well defined. This system uses the GPS or GPRS in order to know the longitude and latitude and thereby calculates the exact location of the bus that can be transmitted through GPRS or GSM wireless communication. This system can reduce the waiting time of the passenger to zero and no passenger would ever have to waste their precious time.

1.3 Current Systems

There are many websites, applications available in the market who provides the services such as tracking the buses or viewing their estimated times, etc. These system are quite good but not upto the mark. Some are only web based.

1.4 The Problems with Current System

Some system was implemented on web based and it was updating the location details routes of the buses in every 40 seconds which was time consuming. Some system uses the mobile SMS (Short message Service) to send the latitude and longitude location of the bus. This indirectly increases the cost of the system. Some system was made in such a way that will save human life by monitoring the driver behavior which in turn will reduce number of times when the driver violates traffic regulations.

1.4.1 Advantages Over Current System

Our system reduces the waiting time of commuters for bus. All the current information is stored to the server and it is retrieved to remote users. When the location information of bus is disseminated to passengers by wireless media, they can save their time and reach the bus stop just before the bus arrives, or take alternate means of transport if the bus is delayed.

This system is more user friendly for users to get information visually shown on Google Map. User can freely get this application for real time tracking of bus which provide interactive interface environment. So by using this application remote user can just wait or they may reschedule their journey according to the availability of bus.

They can even plan their journeys instantaneously. The use of private vehicles is reduced when more people use public transit vehicles, which in turn reduces traffic and pollution. Our system provides the relevant information regarding all the bus numbers going from users source destination along with the route details , real time location.

1.5 Goals and Objectives

Our Goals and Objectives were :

1. To gather Information of buses, bus routes and buses no.
2. To fetch the information (location)
3. To create database server tracking server for collecting the data
4. To Develop Android app
5. To connect App with tracking system

6. Our project focuses on the implementation of a Public Transport Control system, by installing GPS devices on buses.

7. This System will enable the tracking devices to obtain GPS data of the bus locations, which it will then transfer it to centralized control unit and depict it by activating symbolic representation of buses in the approximate geographic positions on the route map.

1.6 Scope and Applications

This application will be widely used in the buses for tracking them from which the students, employees even the workers will be benefitted. We want every bus traveller to use our application and take the advantages of it. It will be a standalone system designed to display the real-time location(s) of the buses. The main scope of this system is to provide Mobile application for end user to find out bus schedules.

This Application will not cost any penny. It is very easy to operate at both levels i.e. Driver side and Client side. Also, if our application is used in a proper way it will increase the travellers through Public Transport, which will indirectly decrease the noise and air pollution since many private vehicles will not be used.

Chapter 2

Review Of Literature

Real-time tracking of Public transport vehicle has been a field of interest for many researchers and a lot of research work has been done for tracking system. Public Transport Control System will make the customer's decision taking strong and time will also be saved by improving the accuracy and by showing the estimated time.

Many System are available in the market nowadays but they have some shortcomings. We have gone through many papers and have taken all the positives from it and we have tried to overcome the problems which were present in the previous papers.

2.1   Real Time Web Based Bus Tracking System

2.1.1   Description

It was proposed by Manini Kumbhar, Pratibha Mastud, Meghana Survase, Avdhut Salunke, Shrinivas Sirdeshpande Feb, 2016.

The real time tracking of were done by their proposed system and that information is then given to remote user who want to know the real time bus information. Some technologies like GPS , Google maps and GPRS were used for development purpose.

2.1.2 Pros

Their system provided web based application, which gives real time location of bus on Google Maps to remote user. It was updating the location details routes of the buses in every 40 seconds.

2.1.3 Cons

In this paper the system was implemented on web based accuracy was also a problem and it was not an android application

2.1.4 How we overcome Those problem in Project

We are making it an android application so that it can be easily accessed by the user. Also we are making the updating of the location and routes more accurate for the users.

2.2 Implementation of Real Time Bus Monitoring and Passenger Information System

2.2.1 Description

It was proposed by Swati Chandurkar, Sneha Mugade, Sanjana Sinha, Megharani Misal, Pooja Borekar May, 2013.

This paper focused on the implementation of a Real Time Passenger Information (RTPI) system, by installing GPS devices on city buses. The Real Time Bus Monitoring and Passenger Information system is a standalone system designed to display the real-time location(s) of the buses in city. Specific software's were used to interface the data received to the map.

2.2.2 Pros

That research has enabled the tracking devices to obtain GPS data of the bus locations, which it will then transfer it to centralized control unit and depict it by activating symbolic representation of buses in the approximate geographic positions on the route map.

2.2.3 Cons

The system calculates the arrival time of the bus and displays it in the user's smart phone. They were also displaying it on the bus stops so if the user is at home then he/she will not be able to see it.

2.2.4 How we overcome Those problem in Project

We are not only showing the more accurate estimated time but also showing the route on which the bus is currently running. So that user can plan their journey in a better way.

2.3 Public Transportation Management System based on GPS/Wi-Fi and Open Street Maps

2.3.1 Description

It was proposed by Mr. Saed Tarapiah Shadi Atalla in 2015.

In this project they focused on public transportation vehicles - such as buses, and mini-buses, where the goal of the project is to design and deploy a smart/intelligent unit attached to public vehicles by using embedded microcontroller and sensors and empowering them to communicate with each other through wireless technologies.

2.3.2 Pros

The proposed Offline Intelligent Public Transportation Management System played a major role in reducing risks and high accidents rate, whereas it could increase the traveler satisfactions and convenience. Here, they proposed a method, software as well as a framework as enabling technologies to for evaluation, planning and future improvement the public transportation system. Their system even though could be as whole or parts could be applied all over the world, they mostly targeted developing countries. That limitation mostly appear by consider off-shelf technologies such as WiFi, GPS and Open Street Maps (OSM).

2.3.3 Cons

They have made the system that will save human life by monitoring the driver behavior which in turn will reduce number of times when the driver violates traffic regulations.

2.3.4 How we overcome Those problem in Project

We are removing this part since the speed of the Transport buses in India is limited to only 40 kmph. Instead in this we are adding some other features such as tracking the bus so that the user can plan their journey accordingly, Also the use of private vehicle will be reduced if the users starting travelling to public transport and that is why even the air pollution will be reduced.

2.4 GPS/GSM Based Bus Tracking System (BTS)

2.4.1 Description

It was proposed by Christeena Joseph ,A.D.Ayyappan , A.R.Aswini, B.Dhivya Bharathy Dec, 20134

Vehicle tracking systems are available vastly in market, but a good and effective product tends to be of more cost. This paper was proposed to design and develop a tracking system that is much cost effective than the systems available in the market.

2.4.2 Pros

The tracking system here helps to know the location of the college bus through mobile phone when a SMS (Short Message Service) is sent to a specific number thus noticing the bus location via SMS. By incorporating a GPS(Global Positioning System) and GSM(Global System for Mobile communication) modem the location of the device by sending a SMS to the number specified. No external server or internet connection is used in knowing the location at user end which in return reduces the cost.

2.4.3 Cons

This system uses the mobile sms to send the latitude and longitude location of the bus. This indirectly increases the cost of the system.

2.4.4 How we overcome Those problem in Project

This part is not required since our system will directly display the buses on the google map with its route and will carry every detail about it.

2.5 Smart Vehicle Tracking System

2.5.1 Description

It was proposed by Mrs. K.P.Kamble July, 2012

Smart vehicle tracking system was used for tracking the vehicles. Many a times it is not required to track your vehicle or target globally. In majority of cases tracking is more restricted to local purposes only, such as tracking movement of vehicle within city, tracking the raw materials within industrial estate or to know the present position of your daughter or son within city.

But unfortunately in the pursuit of making things complex that simple idea was forgotten. That simple yet powerful idea formed the basis of that revolutionary project.

2.5.2 Pros

You can optimize driver routes, save petrol or gas and time, reduce theft and control the vehicle functions. All that coupled with a very low cost, a robust design and tremendous market potential makes their model even more attractive.

2.5.3 Cons

The Drawback was that the system was applied only for the website so users cannot access it if they are out of their home. Messaging was also used in that system which indirectly increases the cost of the system.

2.5.4 How we overcome Those problem in Project

The system will be an application (android based) so that the user can access the application even if he/she is out of their home. Messaging part is removed because the user will be getting live information that is why it is not required.

2.6 Technological Review

2.6.1 Android Studio

We have used Android Studio for making our Application. It is an integrated development environment (IDE) from Google that provides developers with tools needed to build applications for the Android OS platform. Android Studio is available for download on Windows, Mac and Linux.

2.6.2 Google Map

Google Map is used in the Application to display the location of the Bus to the user. Google Maps is a Web-based service that provides detailed information about geographical regions and sites around the world. In addition to conventional road maps, Google Maps offers aerial and satellite views of many places. In some cities, Google Maps offers street views comprising photographs taken from vehicles.

2.6.3 GPS

GPS is the core of our project as our project is totally based on it. GPS, which stands for Global Positioning System, is a radio navigation system that allows land, sea, and airborne users to determine their exact location, velocity, and time 24 hours a day, in all weather conditions, anywhere in the world. Wehave used GPS for showing the location of the bus on the Google Map.

2.6.4 GPRS

We have also used General Packet Radio Service (GPRS) technology in our Application and it is defined as a packet-based mobile data service on the global system for mobile communications (GSM) of 3G and 2G cellular communication systems. Even this is used with GPS for showing the location of the bus on the Google Map.

Chapter 3

Requirement Analysis

3.1 Platform Requirement :

1. JAVA

3.1.1 Supportive Operating Systems :

The supported Operating Systems for client include:
1. Linux
2. Ubuntu

3.2 Software Requirement :

The Software Requirements in this project include:
1. Android Studio
2. Netbeans
3. Google Map

3.3 Hardware Requirement :

The Hardware Requirements in this project include:

1. GPS
2. GPRS
3. Mobile Phone

3.4 Feasibility Study

Our application aims at the students/commuters who travels alot for work or for education. The time is very crucial in today's world so we want them to save their time by using our application. The should have the knowledge about what time they should leave the home to take the buses and if not possible then any other public transport.

There are many applications, websites who provides these services but all of them has some kind off lack-ness in them. So we made this application to overcome all that kind of lack-ness and commuters can have the best application for their purpose.

Although both serves many similarities but they also differ in many aspects such as in terms of accuracy, timing of estimation, tracking the location, updation of location etc. So, this project is made to overcome all those shortcomings faced by the current systems.

The Application will be feasible in the context of timing, it will be helpful in managing the work for the commuters. The planning of the journey for the users or commuters will be very easily done. Therefore, this Application will be feasible for the users as it is timing saving.

Chapter 4

System Design and Architecture

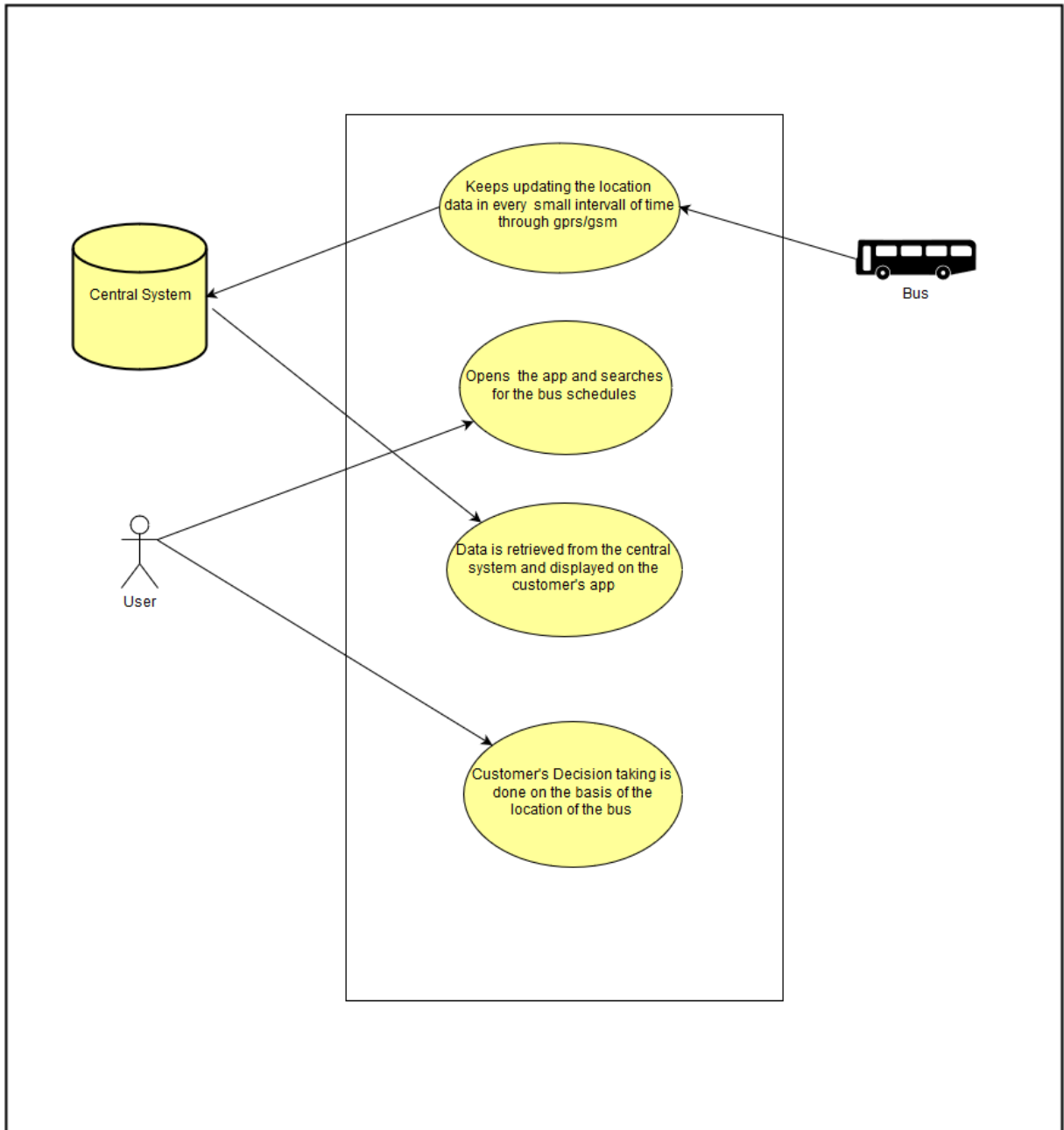## 4.1   System Architecture
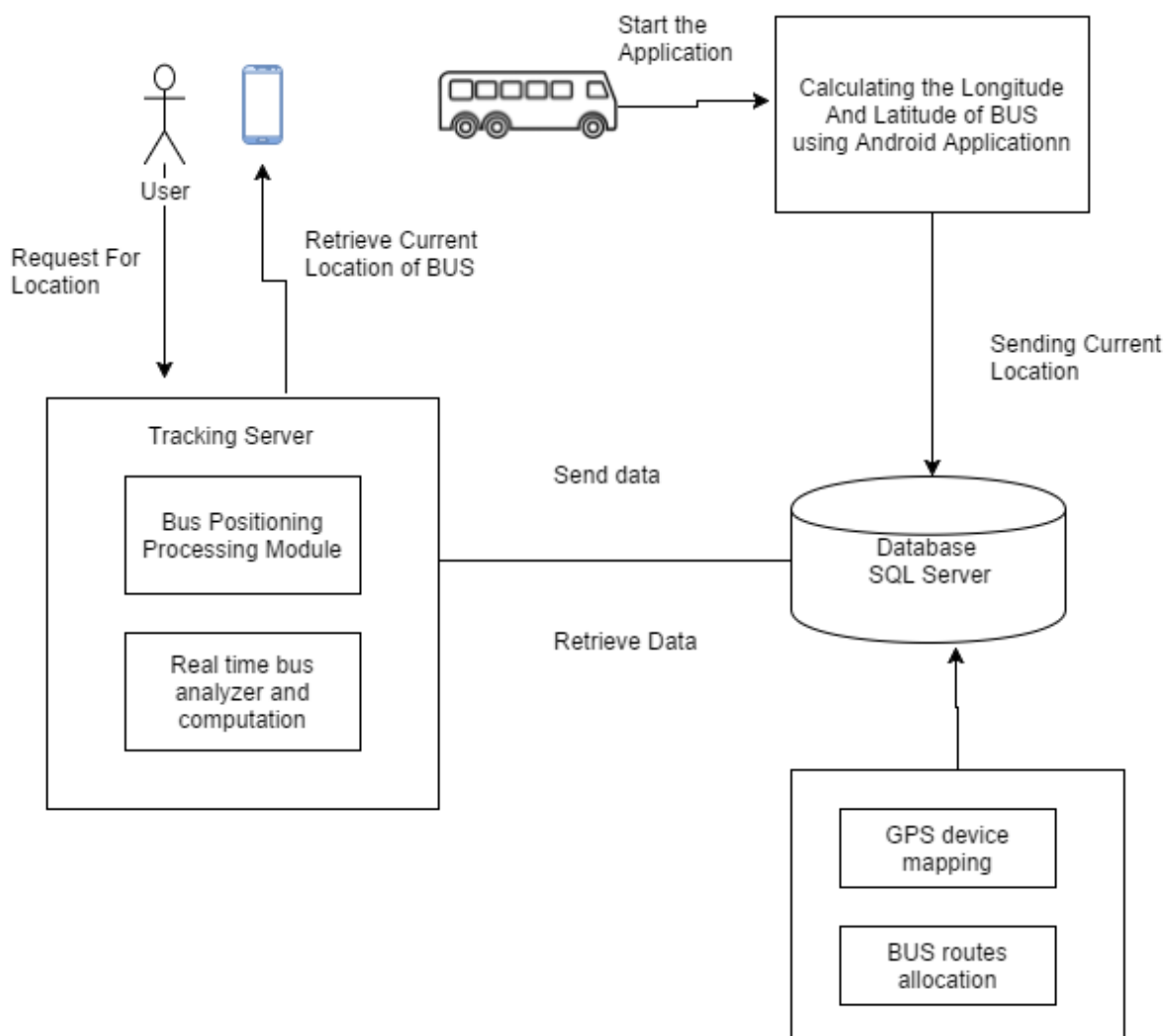
4.2 Usecase Diagram
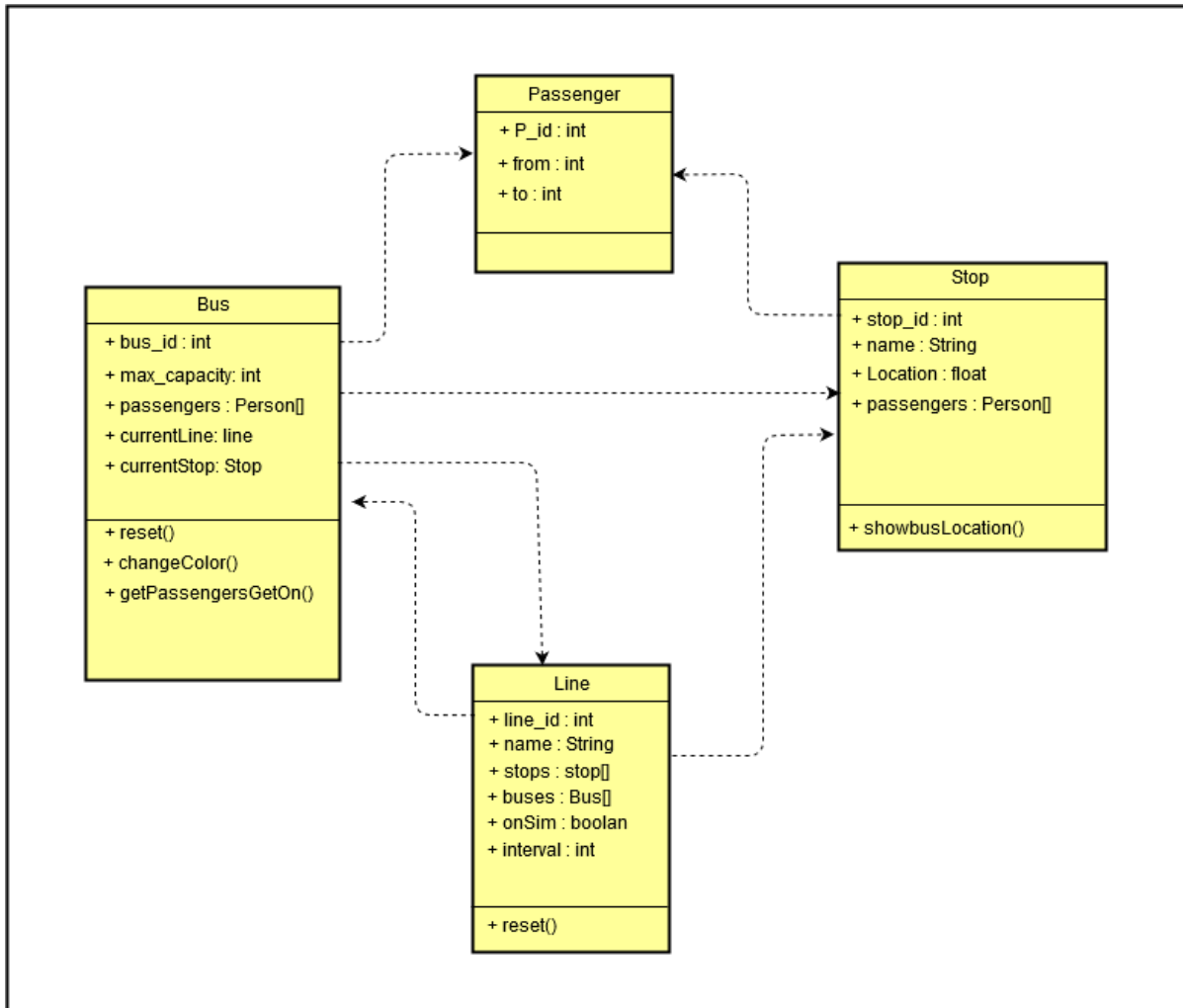

Fig. Usecase Diagram

4.3 Class Diagram

Fig. Class Diagram

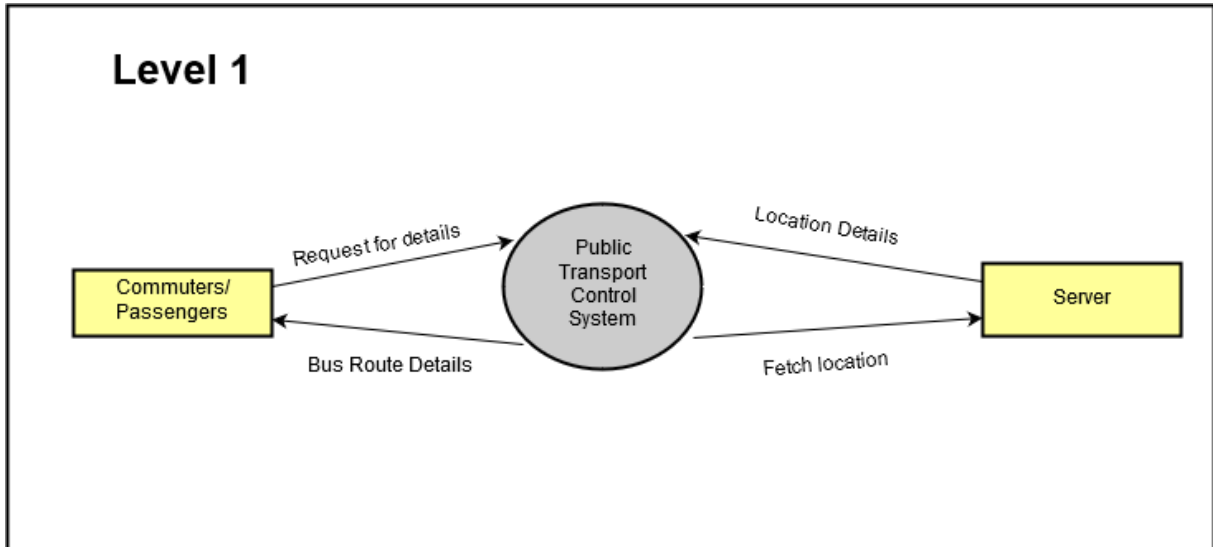## 4.4 Data Flow Diagrams

4.4.1 DFD LEVEL 0

Fig. Data Flow Diagram Level 0

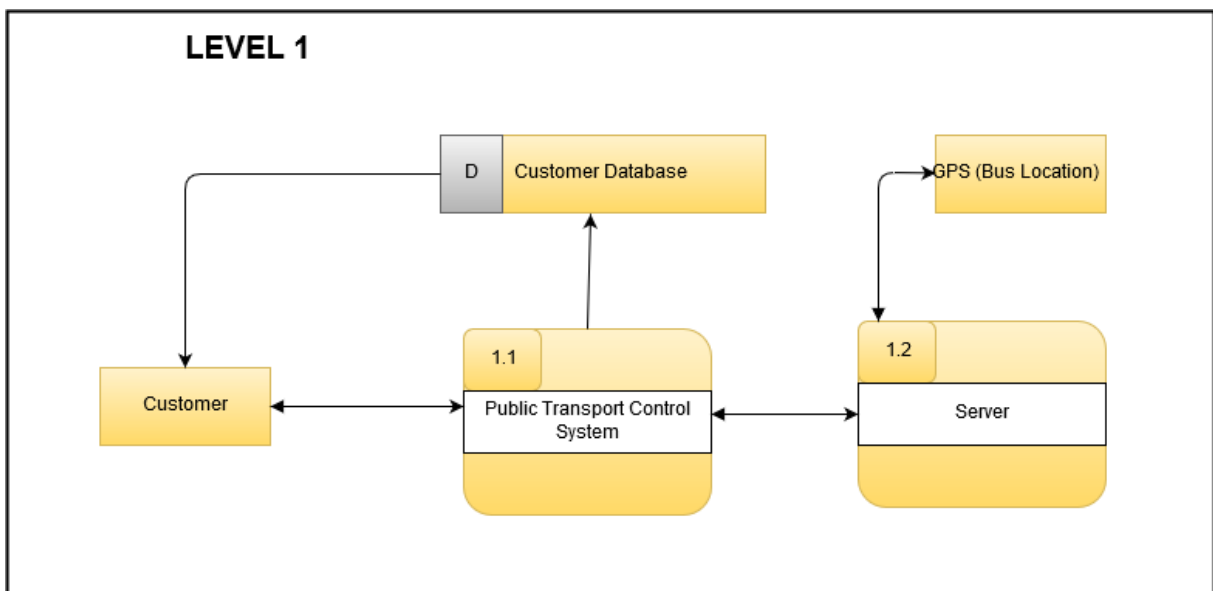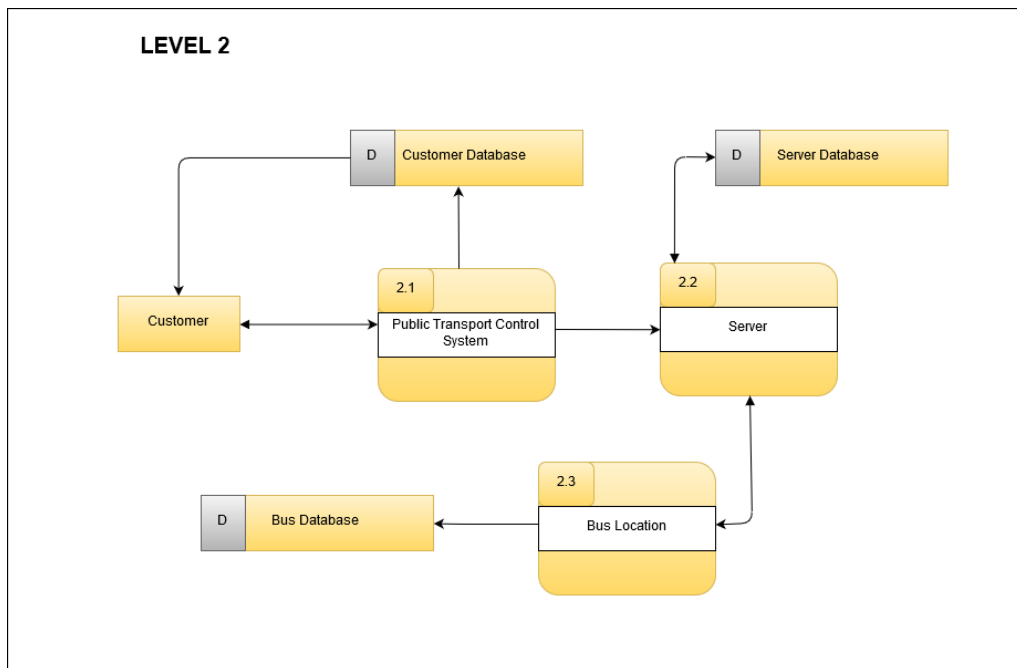### 4.4.2 DFD LEVEL 1

Fig. Data Flow Diagram Level 1

4.4.3   DFD LEVEL 2
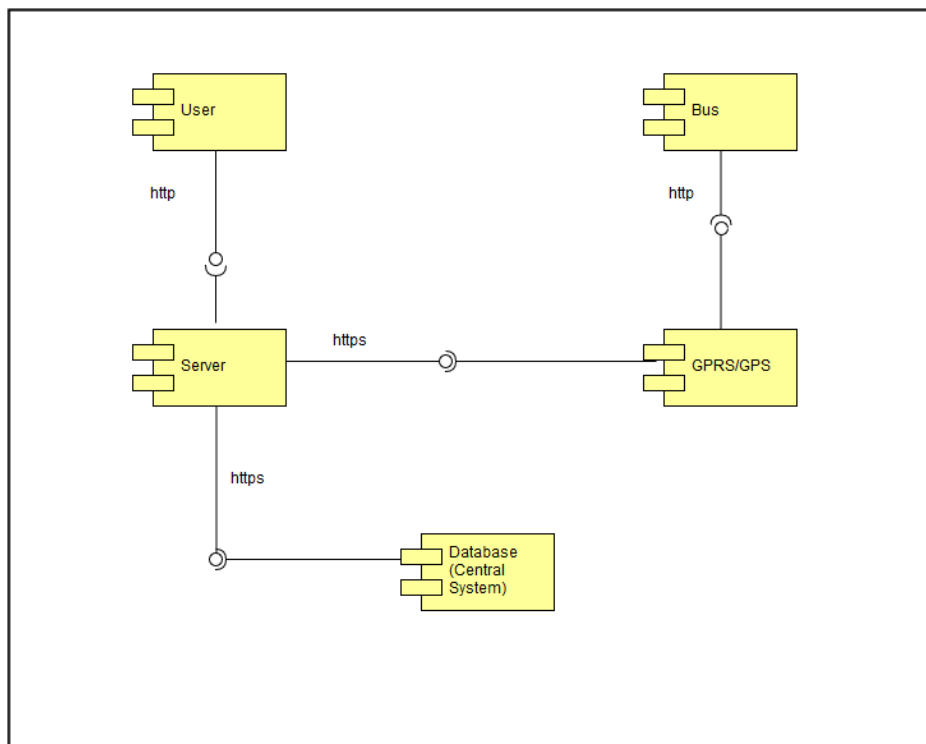

4.5   Component Diagram

Fig. Component Diagram

Chapter 5

Methodology

5.1 Modular Description

The Driver having the mobile phone will act as GPS receiver installed in the bus is the major part of the system, which is responsible for capturing the current location of the bus which is received in terms of longitude and latitude from GPS satellite or by GPRS. Best technology will be chosen from the two of them either GPS or GPRS. First of all, whether the GPS is on or not will be checked. If it is not on, then the popup will be given on the screen to set the GPS on. After that the network of the mobile is also used to fetch the location of the bus in terms of latitude and longitude and then the best technology is taken. Later this received position data needs to be transferred to central tracking server so that it can disseminate this information to the users of the proposed system for that wireless network is required to transmit this data which should also be reliable.

At central control unit the server is responsible to receive this position data and compute the exact position of the bus also computes the estimated arrival time (ETA) of the bus at each bus stations in its route, this data is stored in database available at central control unit. This central database will also contain each bus information such as Bus ID, routes, actual arrival/departure time. Further whenever a user will request for the location of a particular bus or its estimated arrival time (ETA) the information will be provided by the central tracking system through the means of GPRS.

One additional feature that would be added in this system is since the data which would be received by the user in the android application will be displayed on a map so there may a situation arise where due some network problem or slow Internet the map would take a lot time to load or might not load only so at such situation the system will detect this problem

and the location will be shown without the map.

5.1.1 Location

Location is the core module of our Application. The location will be traced of the bus via GPRS/GPS device which will be installed on the bus. The Bus driver will be having a mobile phone in which there will be an Application for the bus driver. They just need to click on the start button which will be present in the Application and then the gps will start working if the location is not on then it will popup to make it on then it will choose from network provider or gps provider, it will choose the one which is best and it will send that location to the server. This tracings will be done continuously after every 5 seconds till that Application's stop button is pressed.

5.1.2 Tracking Server

We have two modules in our Tracking Server viz. Bus Positioning Processing Module and Real Time Bus Analyzer and Computation.

In the bus Positioning Processing Module the positions of the bus are tracked. What is the latitude and what is the longitude are answered by this module. It keeps storing it in the database so that the accuracy can be maintained and the most recent location is given to the users whenever they request it.

In the Real Time Bus Analyzer and Computation module the calculation for the latitude and longitude will be done and stores it in the database.

5.1.3 GPS Mapping

GPS as it stands for "The Global Positioning System" is used for showing the location for the searched thing. Therefore we are using it to track the location of the Bus which will be sent through the Driver's Mobile. It will be calculating the latitude and longitude of the bus and then from that latitude, longitude it will search it on the map and then it will display it on the Google Map with the name of that particular location.

5.1.4 Database SQL Server

The most important thing in the database is the latitude and the longitude of the bus. The Mobile sends the latitude and longitude from the bus to the tracking server. The tracking server receives it in terms of latitude and longitude it simply means that it gets received in the table which consists of 2 columns viz. lat and lon and then it gets saved. This process happens after every 5 seconds. So, whenever the user requests for the location of any bus then that request goes to the server and then the server responds it with the name of the location on the Google map. Thus it does this process as early as possible so that the user does not have to wait much.
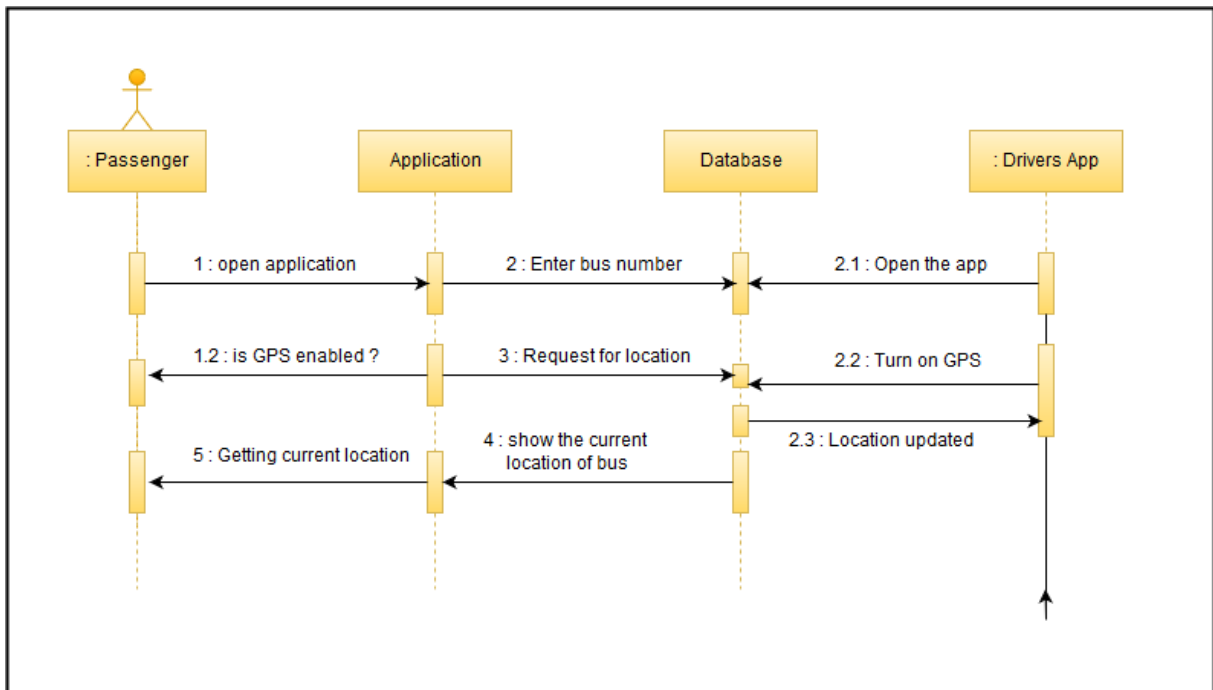
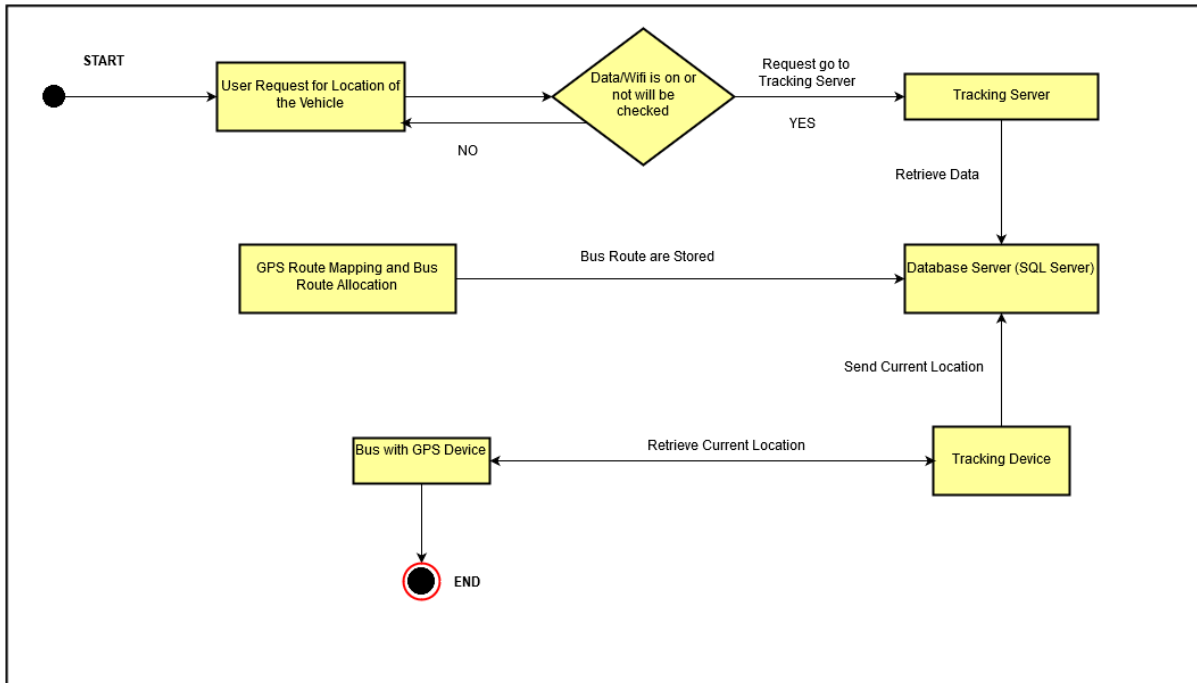## 5.2 Sequence Diagrams

Fig. Sequence Diagram

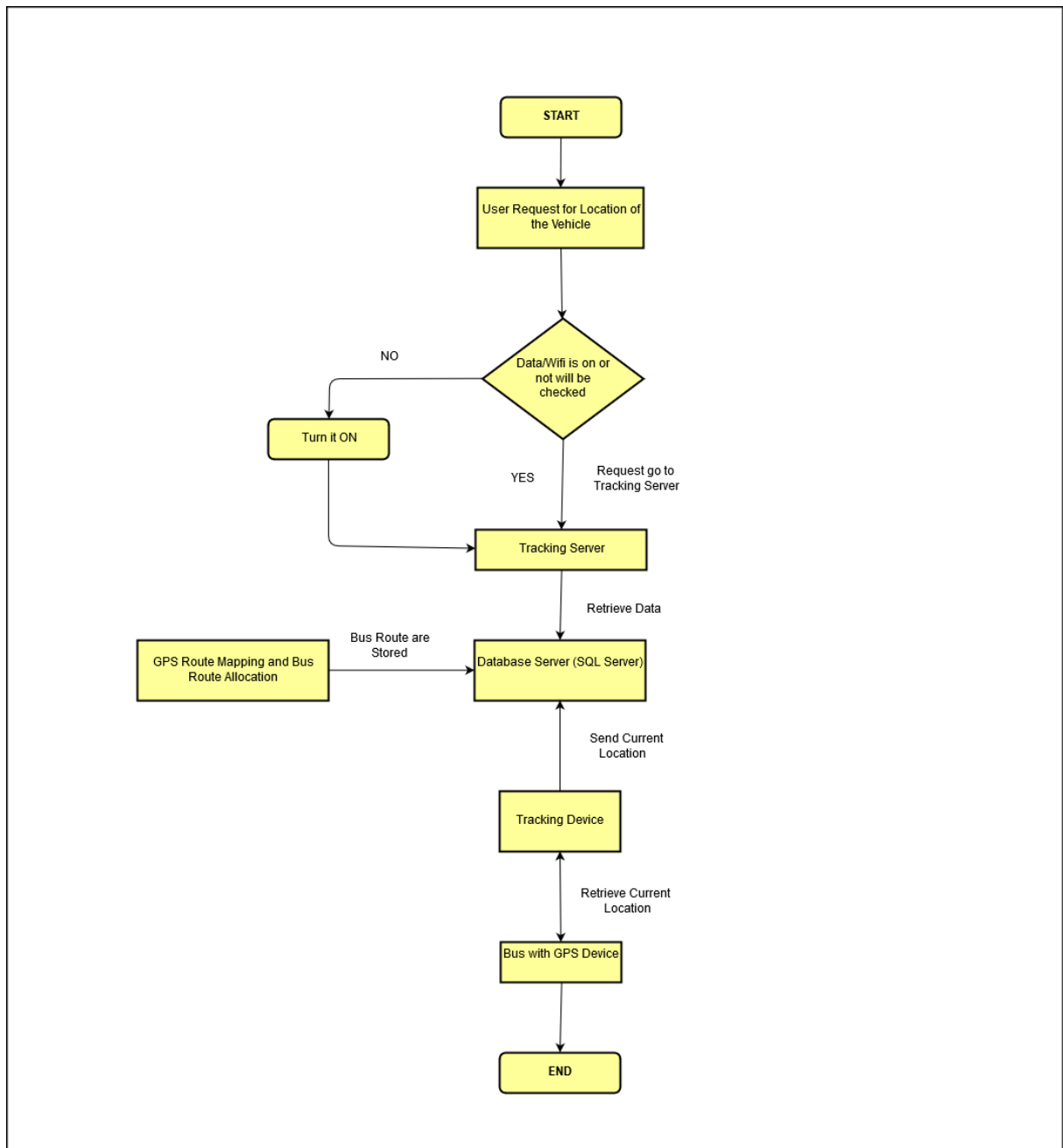# 5.3 Activity Diagram

Fig. Activity Diagram

5.4   Flow-Chart

```
                           START

                    User Request for Location of
                           the Vehicle

              NO          Data/Wifi is on or
                          not will be
                          checked
         Turn it ON
                                          Request go to
                          YES             Tracking Server

                           Tracking Server

                                    Retrieve Data

   GPS Route Mapping and Bus    Bus Route are
      Route Allocation            Stored        Database Server (SQL Server)

                                          Send Current
                                          Location

                           Tracking Device

                                          Retrieve Current
                                          Location

                           Bus with GPS Device

                           END
```

Fig. Flow-Chart Diagram

Chapter 6

Implementation Details

6.1 Assumptions And Dependencies

6.1.1 Assumptions

Few Assumptions have been made regarding this project such as:

1. The commuter should be having a phone, more specifically an Android phone which will have the GPS in it so that the tracking can be done easily.

2. If possible that phone must have a SIM card inserted in it so that when GPS doesn't work properly then it can search the location through the SIM's network.

3. The Bus Driver should also have the application installed in their phone for the tracking of location either through the GPS or SIM's network.

6.1.2 Dependencies

1. Our Application is very much dependent on GPS of the mobile and if that is not present then the network of that particular mobile.

2. Since the location is included in this Application therefore it is necessary for us to work with GPS and GPRS to trace it.

3. The GPRS and GPS tracking works very efficiently outside of the house but to make it work inside of the house also then we have network provider which will trace the location through the SIM of that Mobile.

6.2 Implementation Methodologies

The Whole project is divided into 3 stages : Driver Side, Server Side and Client Side.

6.2.1 Driver Side

The Driver will be having an android phone with our application installed in it. When he gets in the bus he just need to on the application and then press on the start button as shown in the diagram. When he presses the button on the location is checked and the it gets the location from the GPS of the mobile.
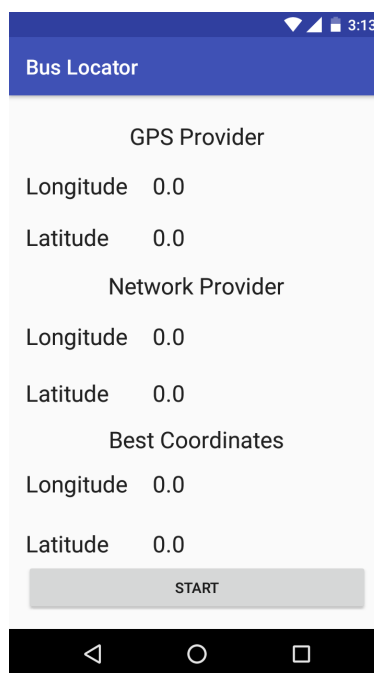

The location gets updated in every 5 seconds and the location is send continuously to the database until it reaches the Destination. So when the bus reaches the destination the bus driver just need to press the stop button which is provided on that application. When the stop button is pressed then the location tracking will stop working. This is shown in the diagram as shown below :
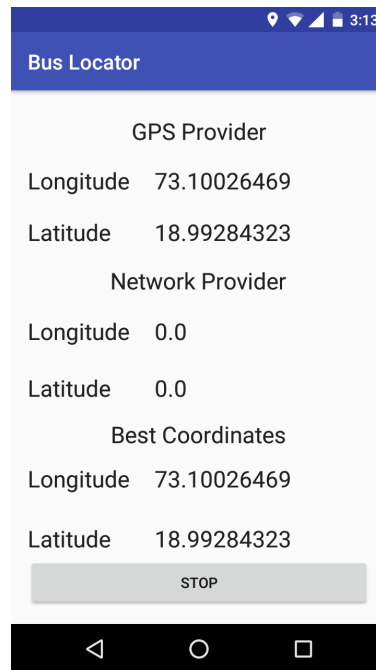
6.2.2   Server Side

The location which are continuously send by the bus driver's mobile is directly stored in the Database which has two fields "longi" and "lati" as shown in the diagram. From the database whenever the user sends the request for any particular bus then the information of that bus is provided to that user.
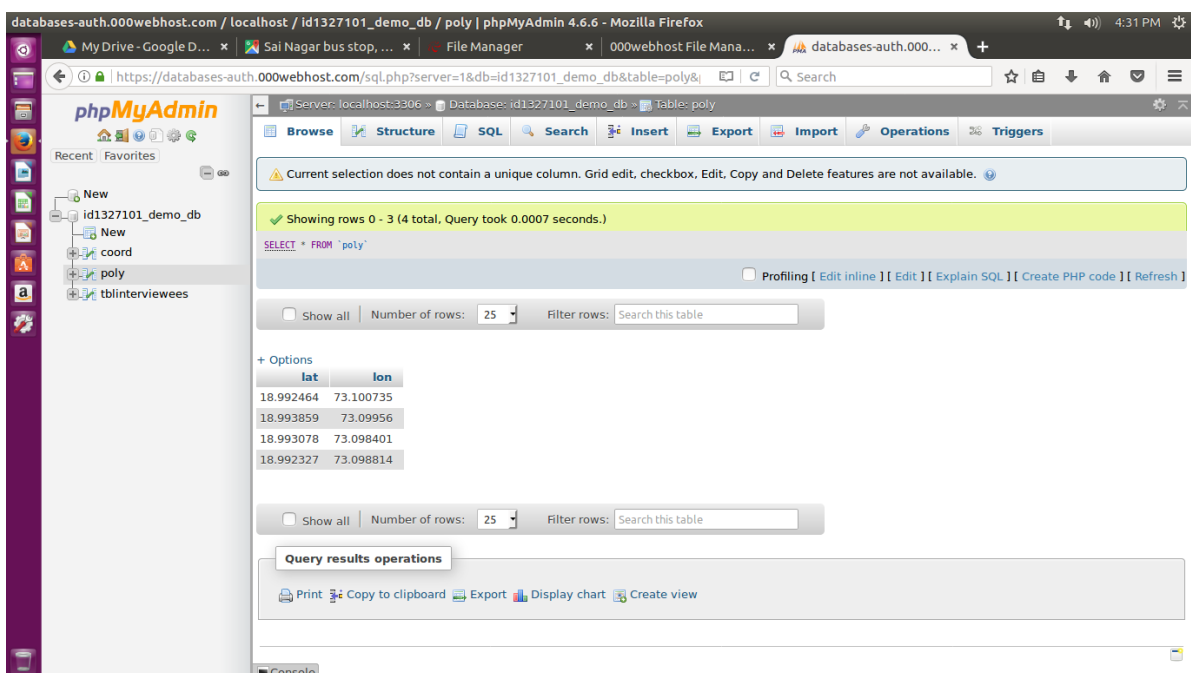
6.2.3 Client Side

The Client can search for any bus they want as shown in the diagram. The user has to put the number of the bus from which they want to travel. Then they have to put the destination so that the proper location route can be shown to them as per their request.

Whenever the Client requests any query it is directly sent to the server, the server then searches for the bus which has been requested by the user. The recent location of that particular bus is then sent to the user and all the information related to it.
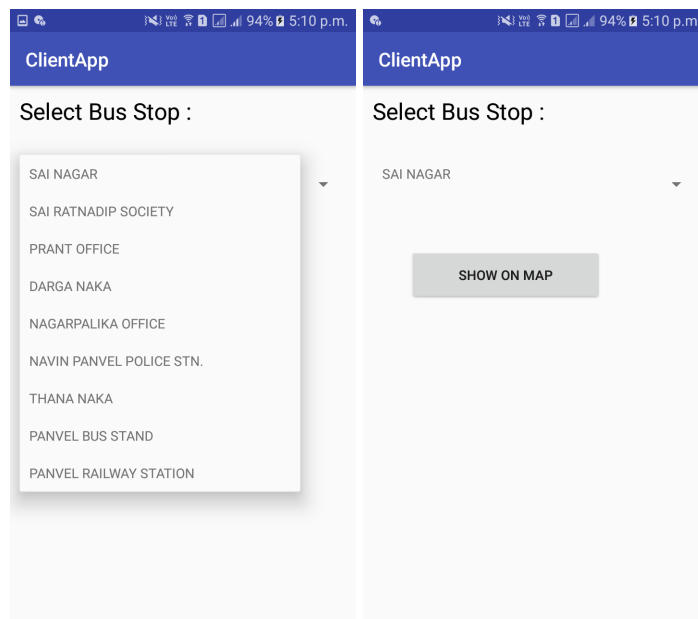
Then finally the user puts the destination and then the it is taken by the server and route is shown to the user with the source and destination on the google map as shown in the diagram.
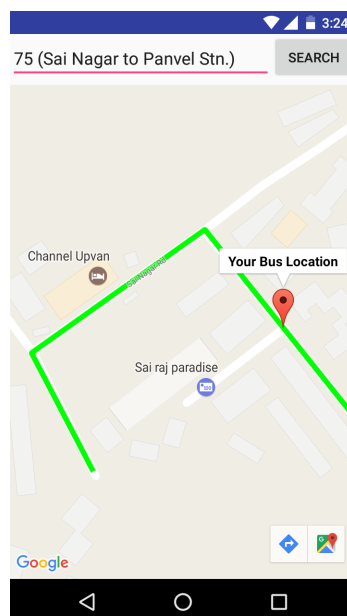
Chapter 7

Results and Analysis

7.1 Test cases and Result

In Our Project, We performed the following test cases:

Analysis: Gathering Information of Buses, Routes of the Buses and Bus numbers .
Outcome: The whole information.
Error: We could not get the information of all the buses.

Analysis: To create the database server and tracking server .
Outcome: The data which is sent by the driver's mobile will be received by the tracking server and then it is stored in the database. So whenever the user asks for the information of the bus, the recent one will be given to him as output.
Error: We did this successfully. No error came.

Analysis: To connect application with tracking system.
Outcome: Without connection between the Application and Tracking system it is impossible to answer the queries from the user. The information should be received by the user which should be the most recent one.
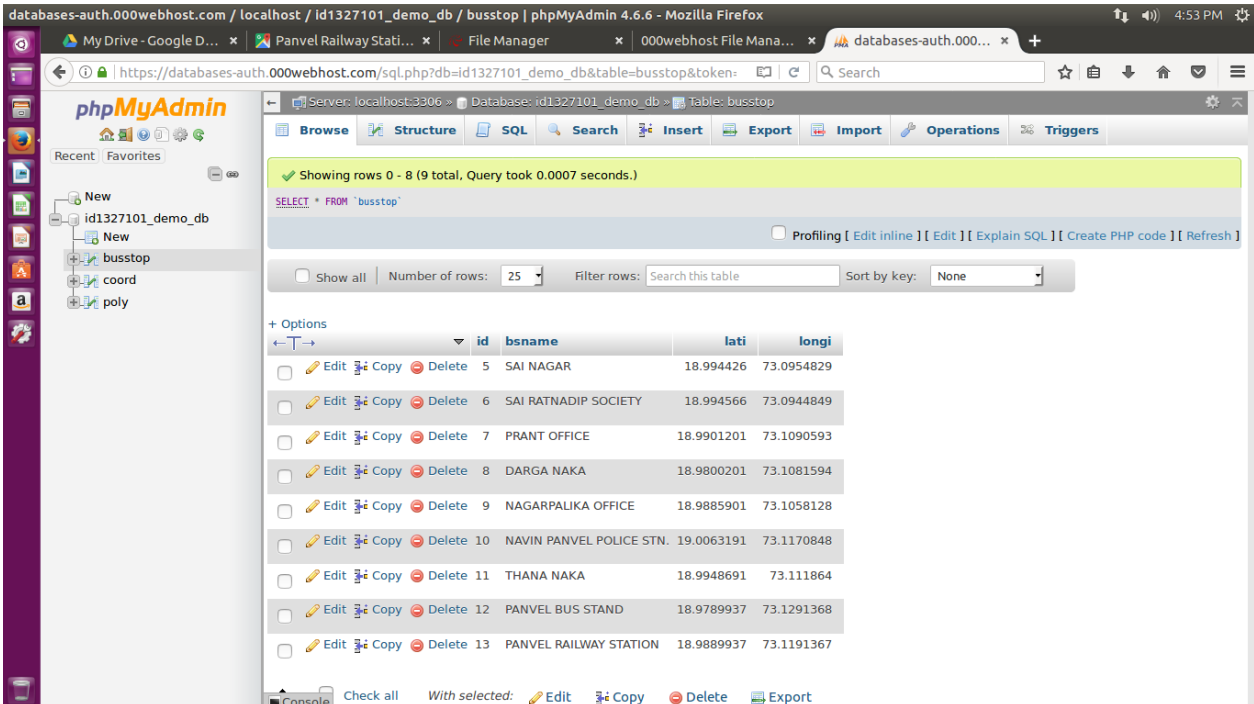Error: There was alot of error coming in the connection while coding but finally it is sorted out

7.2 Analytical Discussion

The Results of our project deals with two kinds viz. Database and Application.

7.2.1 Database

The Tracking system plays a vital role in retrieving the information of the buses, we have to store them somewhere so that whenever user requests for any buses information we can send the most recent one to them. As shown in the diagram we have created a table in which the locations of the buses are stored. In our database when we track the location we first get the latitude and longitude and then we get the name of that particular area.


All the Information is stored in a linear sequence so that it becomes very easy to send the most recent location to the requested user as shown in the diagram.

7.2.2 Application

In the Application User first requests the query for any bus, this query is sent to the database and from that database the user gets the most recent location of that requested bus. They have to just put the number of the bus in the application and the all the further process is done on server side.
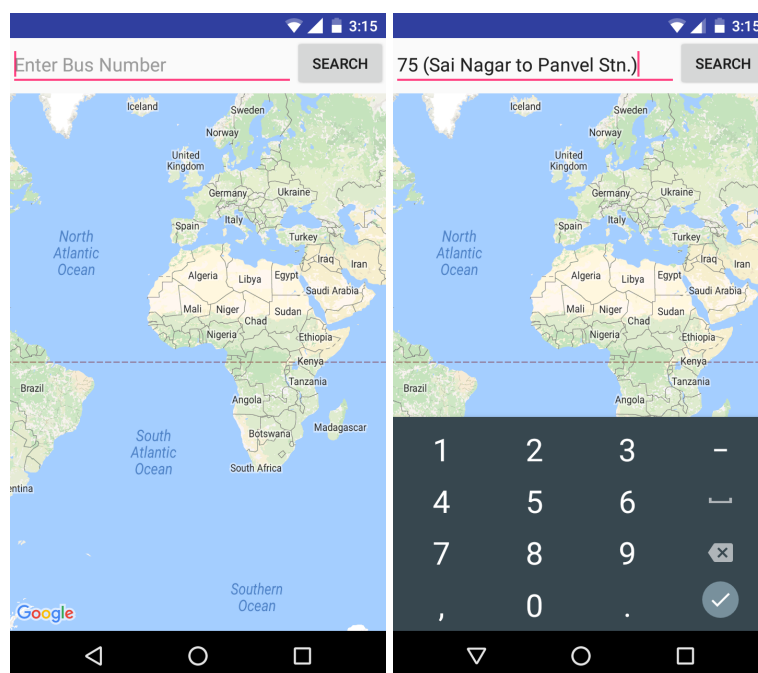
Chapter 8

Conclusion and Future Scope

8.1 Conclusion

This Public Transport Control System tracks the current location of all the buses and estimates their arrival time at different stops in their respective routes.

It disseminates this information to passengers using smart phone application which is android based. This research serves the needs of passengers, vehicle drivers and administrators of the transport system.

So this system gives a well-organized transport management which is highly recommended in this modern era to fulfill customer needs. This project contributes to the society to make their life better so that they can also get benefited by evolutions in technology.

8.2 Limitations

1. The basic limitation of our project is that, we have only made the application for mobiles, we haven't made any website for this.

2. The security in this project is not among the best ones. So video cameras can be installed in the buses and then it can be used for recording in the bus, then calculating the number of passengers and finally letting the user to know whether the seats are available in the bus or not in the application.

3. The tracking of the GPS indoor will take a bit of more time as compared to the outdoor tracking.

8.3 Future Enhancement

1. The video camera's can be installed in the buses so that the no. of passengers getting into the bus and getting out of the bus can be easily calculated.

2. This project is having a wide scope. A web based application which can be further modified using cloud. Use of video camera to this system would take this system to the next level in the field of security. It will help to monitor the crimes that happen now a days which is witnessed by common people every day. This would prove a major breakthrough in reducing the crime rates. Also, with use of motion sensors the speed of the bus can be calculated.

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Chapter 9

Appendix A

9.1 For Driver

1. Just open the Application and click on the Start Button.

2. If the GPS is not ON then make in ON by going in the SETTINGS -> Location.

9.2 For Commuter

1. Open the Application

2. Go to search box for filling the destination

3. Fill the Destination, Source will be take by default through the GPS of the phone or else the user can also fill the user if he/she wants to put any other location rather than the current one.

4. The output then will be displayed on the Map.

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