A Project Report on

TRAVEL GUIDE:A SMART CLICK NAVIGATION

Submitted in partial fulfillment of the requirements for the award
of the degree of

Bachelor of Engineering

in

Information Technology

by

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Approval Sheet

This Project Report entitled *"TRAVEL GUIDE:A SMART CLICK NAVIGA-TION"* Submitted by *"Ashutosh Joshi"(17104001),"Rahul Guduri"(16104032),"Pranay Jain"(17104038)*is approved for the partial fulfillment of the requirement for the award of the degree of **Bachelor of Engineering** in **Information Technology** from **University of Mumbai**.

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CERTIFICATE

This is to certify that the project entitled **"TRAVEL GUIDE:A SMART CLICK NAVIGATION"** submitted by **"Ashutosh Joshi" (17104001),"Rahul Guduri" (16104032),"Pranay Jain" (17104038)** for the partial fulfillment of the requirement for award of a degree **Bachelor of Engineering** in **Information Technology**,to the University of Mumbai,is a bonafide work carried out during academic year 2020-2021.

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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

Due to immense development in technology , every field is making the best use of technology so why not our public bus transportation . Today 's transportation system still uses the traditional ways for ticketing . Also people need to stand in queues for long hours . Therefore user needs a smart system which provides real time information of bus and gives an easy way to purchase a ticket .So we proposed a new android application which overcomes the disadvantages of the current public transportation system .Our application will handle all the data like current location of bus , punching of bus-passes having QR code ,On -time ticketing using E-wallet .The real time tracking of bus can be done by our proposed system and this information is then given to remote user . Technologies like GPS (Global Positioning System),Cloud ,E-wallet are used for development purpose .Our system provides an Android application ,which gives bus pass which gives bus pass with QR code, real time location of bus to user.

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List of Abbreviations

IDS: Intrusion Detection System
WSN: Wireless Sensor Network
MANET: Mobile Ad-Hoc Network
AODV: Ad-Hoc On-demand Distance Vector Routing
DSR: Dynamic Source Routing Protocol
NS2:   Network Simulator 2
ACK: Acknowledgement
AGT: Agent
RTR: Router

Chapter 1

Introduction

There are buses made available for passengers travelling distances, but not many passengers have complete information about these buses. Complete information namely the number of buses that go to the required destination, bus numbers, bus timings, the routes through which the bus would pass, time taken for the bus to reach, maps that would guide the passenger with his/her route and most importantly, track the current location of the bus and give the correct time for the bus to reach its bus stop. The proposed system deals with overcoming the problems stated above. The system is an Android application that gives necessary information about all the buses travelling in Pune. This information overcomes the problems faced in the previously built application Bus Guide". The platform chosen for this kind of system is android, reason being Android Operating System has come up on a very large scale and is owned by almost every second person. 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 advent. Android is an open source mobile software environment. Brought up by Google, the operating system has been made Linux based and uses Java programming language. It has a virtual machine that is used to optimize memory usage as well as resources. This application has been developed using IDE (Android Studio 1.6) with ADT (Android Development Tools) and Android SDK (Software Development Kit). There are a number of constraints that need to be satisfied.

1.1 Purpose

The main goal of the proposed work is to improve the Bus system by adding the necessary additional features into the application, like accurate bus timings, correct bus numbers and moreover adding a GPS tracker into it. This study accepts input in the form of selection of the source and destination and selection of the bus travelling the distance to display the entire details about the routes and also track the location of the respective bus and give the map for the same. The last two decades have seen growing interest in the development of Android based plat- form. Our review of this area shows that there have been only few approaches that provide automated tools for the functioning of the application: 1. An application has been implemented in Pune, named Bus Guide". This ap- plication gives the way to the destination correctly, but the number of drawbacks that it has is greater than the number of advantages. It does not show the passengers current location even if he/she is connected to the GPS. Also, this application has been proven useless as it does not display

the bus numbers, so the passengers

nd it very hard to know the number and time of arrival of the respective buses. It does not have a real time bus tracking service or does not even generate maps for the users ease. This application has never been updated ever since its development. Moreover, this application has bugs which makes it all the more dicult for the user to use it. 2. Another application that was implemented in Mumbai, named -Indicator Mum- bai" has drawbacks like: It displays matter which is the same as what is online. Its latest updates have given issues on every Android mobile supporting even the most recent device version. The to B" module of buses has given problems. Whenever an option for the source to destination is selected, the field still remains blank, i.e. no bus routes are displayed. 3. The application built in Delhi named Bus Navigator" has drawbacks like: The application works smoothly when offine, but works very badly when connected to the Inter- net. The application gives information about direct routes only. It does not give information about the alternate routes. This application has bugs due to which it lags all the time. Most of the time the application crashes when requested for specific bus routes. 4. The application developed in Bengaluru named BMTC Info" has draw- backs like: The application is never in an updated condition. The application has fed in wrong routes on several buses and given no updates to

x them. After the minimization and restoration of the application, it cannot search anything. This application crashes almost always. The application is not user friendly with a complicated User Interface (UI).

1.2 Objectives

The main objective of the proposed system is to apply GPS tracking technology into bus transportation system currently operating in UTAR. The proposed system will install GPS receiver on buses to perform real time position tracking bus during operating hours. The bus position data will send to central server and process become bus trac information which needed to provide for bus users. By this real time position tracking system, it will increase the accuracy of bus timetable scheduling. In proposed system, a real time platform is developed between student and bus management team. With this platform, students able to check on real time bus arrival time for particular bus stop and latest or updated bus trac information. Moreover, bus management team able to update latest bus trac information on time to bus users through real time platform. Compare to current bus system in UTAR which still posting bus timetable on notice board in paper form, the proposed system is more effectiveness. Besides, bus tracking system able to reduce major workload done by bus management team. First of all, real time bus position tracking system will automatically calculate the arrival time for next bus stop of particular bus. Second, this system provides a platform allow bus management team to update bus schedule through Internet instead of posting paper form bus timetable on notice broad. By reducing workload of bus management team, they can utilize the time in other matters in order to enhance quality of bus service.

- To implement bus tracking system to get real time location of the bus.

- To alert the users through voice and notification system whenever the stop is about to come.

- To show users popular places in real time.

- To implement android app to provide users with schedule between two places

1.3   Scope

Many cities have found that GPS tracking system not only improve the eciency of city bus operation, but also encourage commuters to take the advantage of city bus system. Many city bus system have discovered that GPS tracking system which allows to monitor the location and arrival time of their bus actually increase the number of people using city buses for routine communing. The application is a user friendly one that anyone can access for free of cost. The basic idea for this project was to guide the bus travelers with the routes, all the possible stops that come on their way to the destination and moreover, display maps and track their locations and show the estimate remaining time required to reach. The aim is to overcome all the drawbacks faced in all the previous applications and generate fast and accurate results. The proposed system has been divided into two modules as follows. Module 1 gives information about all the routes from the source to the destination and give maps for the same. Module 2 give information about all the buses along with the bus numbers that go through the selected stops, track the location of the selected bus and send this information to the passenger giving him/her the estimate time required for the bus to reach. This is done using the Client-Server technology.

1.4   Chapter Summary

The following chapter would be Chapter 2 Literature Reviews which will describe the studies on existing systems, technologies needed and methodologies. Next would be Chapter 3 Methodology which discuss more about the Methodology chosen after studies on Chapter 2, requirements analysis and project timeline. Following by Chapter 4, System design which discuss about interface design, database design. Chapter 5 would be System Features which describe about few important feature of proposed system. Continue with Chapter 6, it is System Implementation. Describe about system development and implementation. Chapter 7 will be the System Testing and the last chapter would be Chapter 8 Conclusion and future enhancements. 3

Chapter 2

Literature Review

In literature [1], the author Dr. Chaya Bagrecha and Sadiq Alam authors suggested that the online booking companies have to provide the service should be provided as per the desire of the passengers and the companies have to maintain the secrecy in respect of passengers personal information. It is also suggested that the refund must be done as per the period mentioned on the websites. In literature [2], the author Sujo Thomas, Bharthi Pathak concluded that redbus has a volume driven business and it plans to expand further into the Indian market by opening regional oces to serve the customers better. The current strategy followed by redbus is to aggregate bus tickets by any means close at hand and later delivering to the consumers through any channel that is accessible by them. redbus has to put forward a growth model in existence which would provide a sustainable growth in the long term. redBus owners have a challenge that maintaining strong 7 relationship with bus operators and gaining the trust of new operators/agents was a challenge right from the inception. In literature [3], the author R. Ramya undertook the project entitled satisfaction on online bus ticket booking" with an objective to analyze and evaluate the level of customer satisfaction. The main aim of this study was to

nd out the level of customer satisfaction towards online reservation of bus tickets. The sample size is of 110 respondents. The study revealed that socio-economic factors like age, educational quali

cation, occupation, monthly income earnings of the family have direct impact on the level of customer satisfaction of the customers in relation to online reservation of bus tickets. In literature [4], the author Sulaiman, A., Ng, J., Mohezar, S. in their research paper entitled -ticketing as a new way of buying tickets" try to focus on the motivational factors that 4 in uence online buying. According to I.A.M.A.I., India has a big pool of techno savvy population that is not only browsing the internet but also purchasing products that are available online. Using internet as a medium to attract the customers and sell products or services is the basic concept of online marketing. This paper theoretically attempts to connect critical motivational factors that in uence online buying. It was found in the study that the motivational factors do not have signi

cant dierence between men and women.

Chapter 3

Project Design

The Android app provides a location-aware application for quickly accessing real-time arrival information for nearby public transit stops. Unlike the interfaces described thus far, the Android has built-in localization capabilities, using a fusion of sensor data from GPS, WiFi, and cell-tower localization to quickly get a location fix on a users phone. This location information can significantly reduce the time it takes to access real-time arrival information for a nearby stop. Beyond the key addition of the location-aware capabilities, the Android app has a lot of the same features available in the other interfaces: a map view, bookmarks, recent stop view, and search for stops by route, address, and stop number.
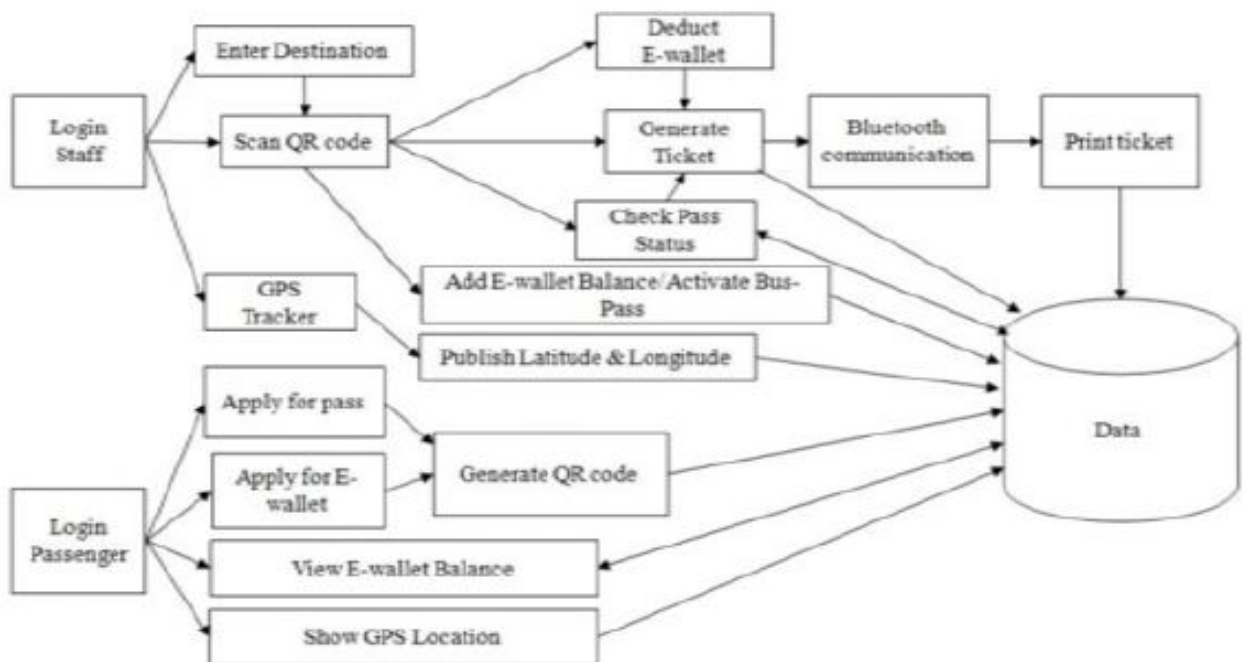
3.1   Proposed System Architecture

Figure 3.1: Proposed System Architecture

The Below Project Application will be useful for the Local People as well as Bus Organization. The Passenger will be able to save his time as he will get the current location of the bus of his required destination. Also our Application provides cash- less transaction. As all the information will be stored on a cloud it will be helpful for the Bus Organization. Our application provides many facilities that will help to increase public means of transportation. The conductor will first Login to the application. After boarding the bus the passenger is asked for his destination. Then conductor will enter the route details as per passenger's requirement. According to the route amount would be charged. If the passenger has bus-pass then the QR-Code would be scanned from conductor mobile app. Then the app would check bus pass status and for that particular day the pass will get punched from the database.
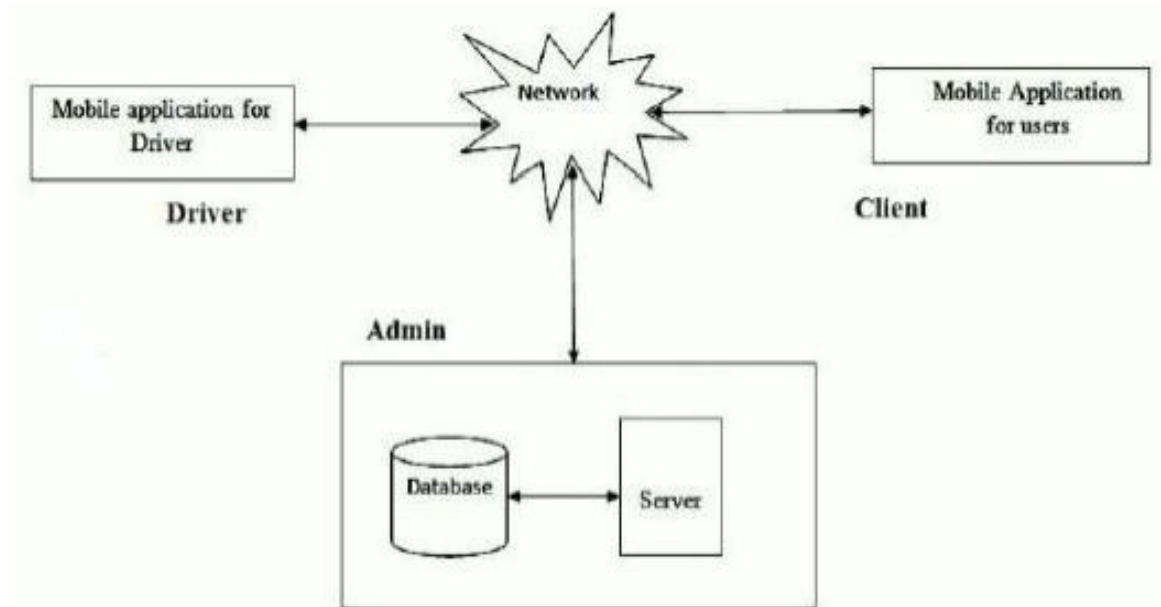
3.2 System Block Diagram

Figure 3.2: System Block Diagram

Client has to enter in the application. To search for a bus, client 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 application is launched, the home Activity fetches the routes from the server and binds it to the spinner 20 for the client to select it. When the client selects a route, corresponding stops are fetched from the server and bind-ed to the spinner for the client to select. If the client selects Bus" then the location details of the bus for that route is fetched. If the client selects Map" then the location of the bus on the map will be displayed.

3.3 Flow Chart

In server side, Bus driver enter the bus number and select the root and press the send-button. The bus number is store in database and this information displayed on the user side. After each 6 second the location will be update.To search for a bus.Then user has to enter source and destination and then available bus number is displayed and after that user can track the location of bus and also book ticket. He can also received an alert notification when the bus came to the nearest stop.
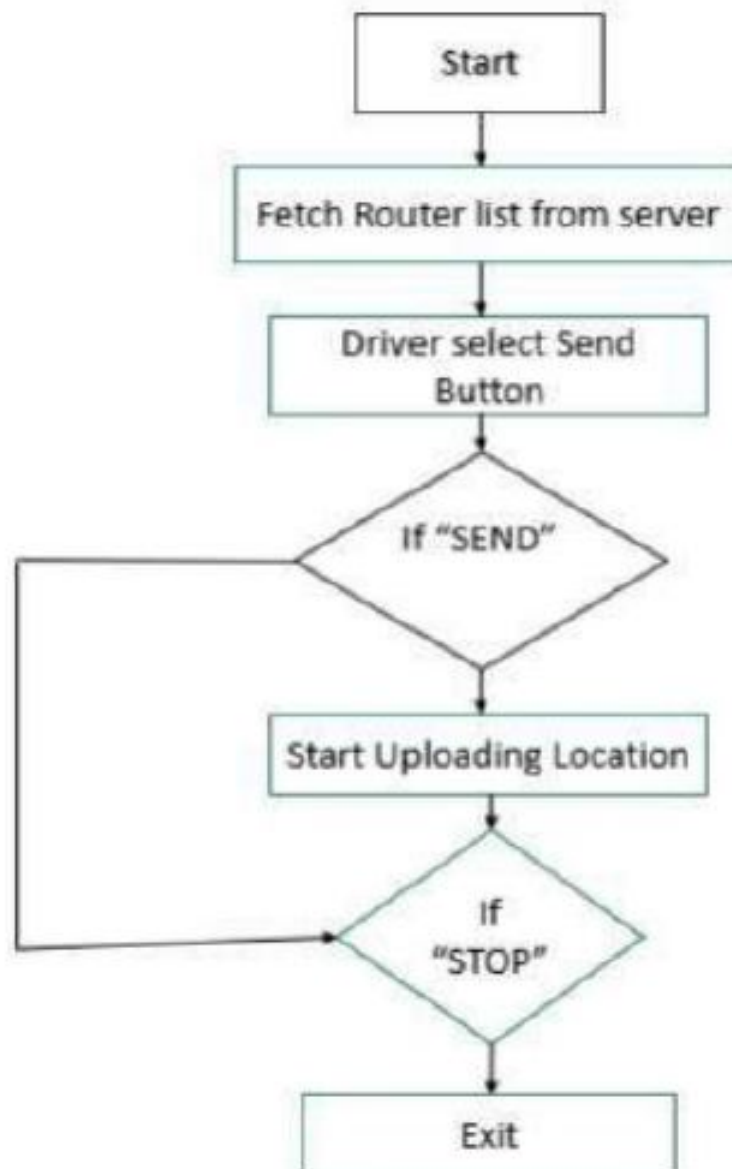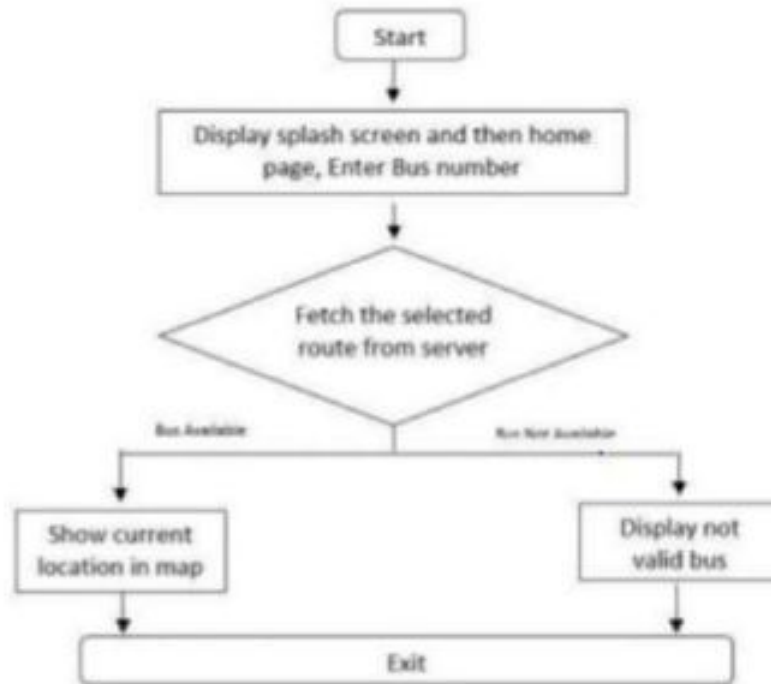

Figure 3.3: Server side

Figure 3.4: Client side

To search for a bus,.Then user has to enter source and destination and then available bus number is displayed and after that user can track the location of bus and also book ticket. He can also received an alert notification when the bus came to the nearest stop
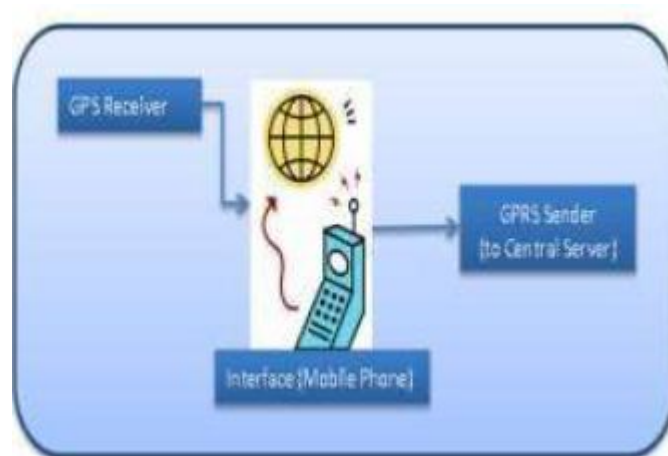
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3.4 Gps Architecture

Figure 3.5: GPS Architecture

This is the main operating unit. It will store all the user accounts and bus routes. It will receive GP RS signals from the Bus Modules every 5 seconds and depending on the bus number and the location of the bus it would send the required notification alerts to the Users registered for that stop. So this unit will have a module for GPS receiving and also a module for sending Notifications.

Chapter 4

Project Implementation

In this stage, prototype will be deployed and implemented in real environment. Selected users will test on the prototype and evaluate the system. First, users will test on the first prototype based on the test plan created in stage 3 and test result will be recorded for further evaluation. Evaluation for the first prototype will be performed based on the test result gathered from users. To implement our system, we are using a basic technological stack of:
• Languages: , Java language will be used to develop the necessary modules which are required in order to build the proposed application system.
• Testing Devices: Ubuntu, Windows and any supported Browsers. These are the devices which can be used to access the application which will be developed.
• Apache Web Server: Apache HTTP Server is a free and open-source web server that delivers web content through the internet. It is commonly referred to as Apache and after development, it quickly became the most popular HTTP client on the web.

4.1 USE Case Diagram

A use case diagram at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved. A use case diagram can identify the different types of users of a system and the different use cases and will often be accompanied by other types of diagrams as well.
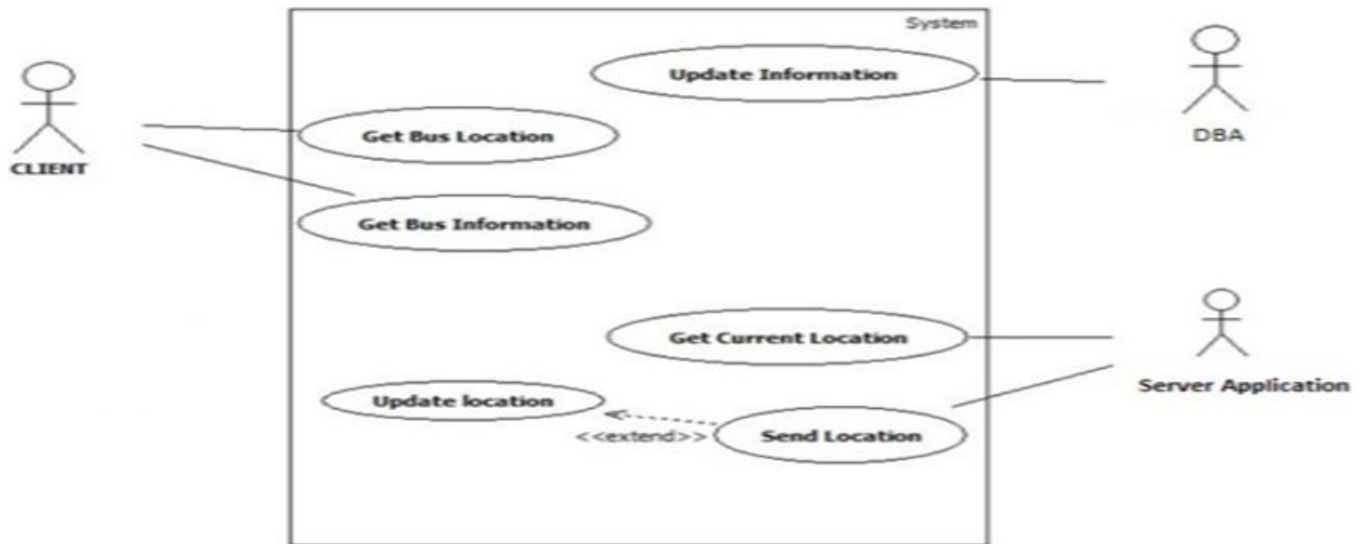

Figure 4.1: Use Case Diagram

4.2   Activity Diagram

Activity diagram is basically a ow chart to represent the ow form one activity to another activity. The activity can be described as an operation of the system. So the control ow is drawn from one operation to another. This ow can be sequential, branched or concurrent.
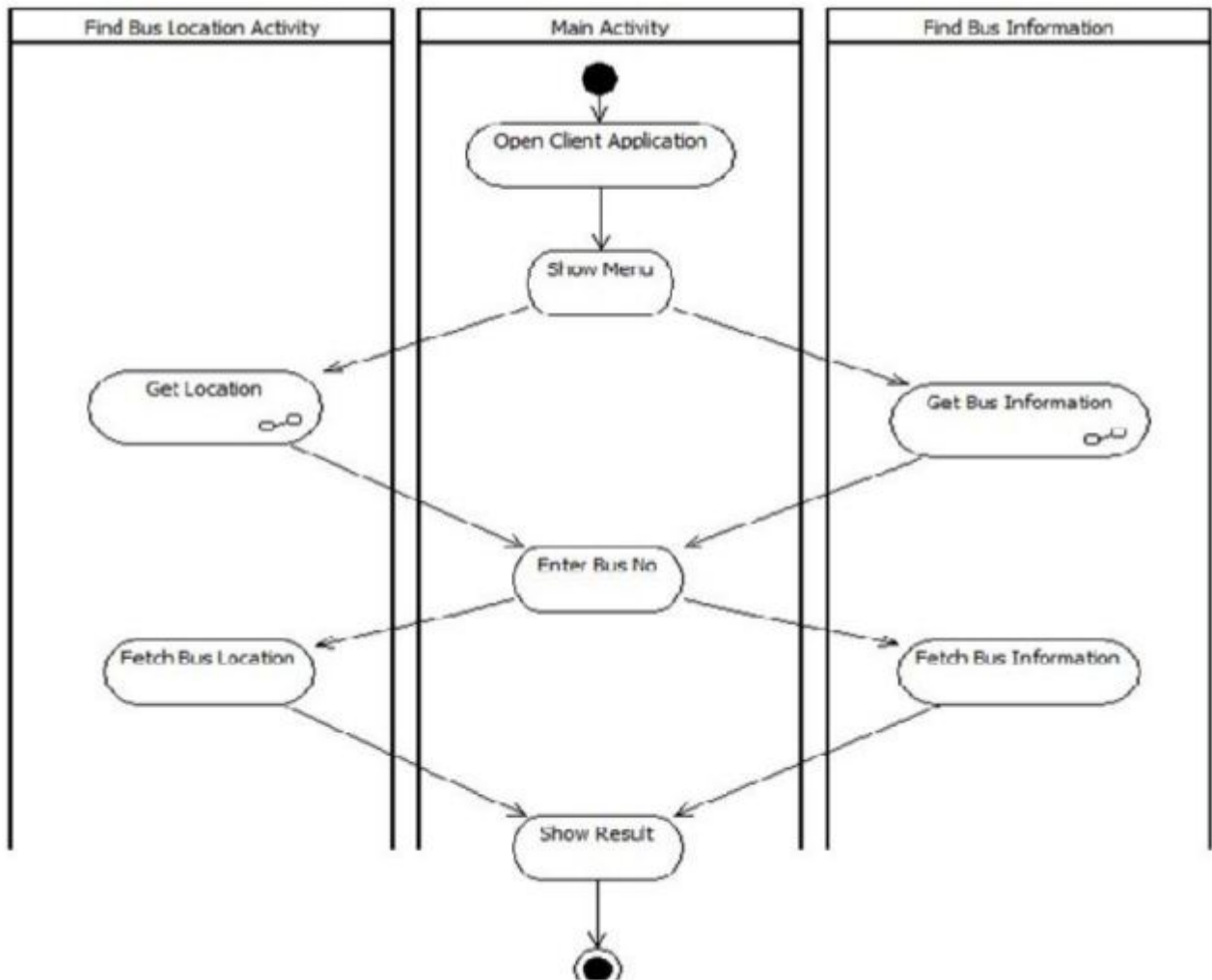

Figure 4.2: Activity Diagram

4.3 Class Diagram

A class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.
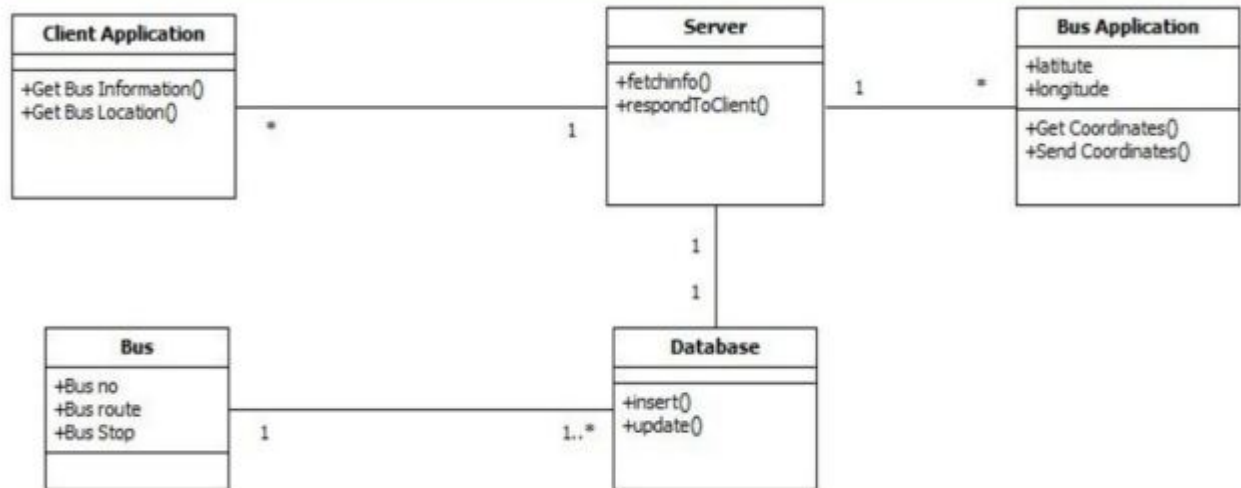
Figure 4.3: UML Diagram

4.4 Code

```
package com.thecodecity.mapsdirection;

import ...

public class userLogin extends AppCompatActivity {
    EditText uname,pass;
    Button log;
    TextView newUser,txNext;
    public static String userdata="";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_user_login);

        uname = findViewById(R.id.editText1);
        pass = findViewById(R.id.editText2);
        log = findViewById(R.id.button1);
        newUser = findViewById(R.id.textView2);
        txNext = findViewById(R.id.textView3);

        newUser.setOnClickListener((view) -> {
                Intent io = new Intent( packageContext: userLogin.this,userRegister.class);
                startActivity(io);
        });

        txNext.setOnClickListener((view) -> {
                Intent io1 = new Intent( packageContext: userLogin.this,AuthForgotPass.class);
                startActivity(io1);
        });
```

Figure 4.4: User Login

```
package com.thecodecity.mapsdirection;

import ...


public class busLogin extends AppCompatActivity {
    EditText eduname,edpass;
    Button btn;
    TextView txNew,tx;
    public static String userdata="";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_bus_login);

        eduname = findViewById(R.id.editText);
        edpass = findViewById(R.id.editText1);
        btn = findViewById(R.id.button);

        txNew = findViewById(R.id.textView1);
        tx = findViewById(R.id.textView2);
        txNew.setOnClickListener((view) -> {
                Intent io = new Intent( packageContext: busLogin.this,busRegister.class);
                startActivity(io);
        });

        tx.setOnClickListener((view) -> {
                Intent io = new Intent( packageContext: busLogin.this,AuthForgotPass.class);
                startActivity(io);
        });
```

Figure 4.5: Bus login

In the below the main code snippet of the home page i.e. the index page is given. It has all the options to register a user, log in to the existing account of a patient or a Driver. The second is of the Admin page code which is responsible for creating or deleting user/driver records, user/driver records and password recoveries.

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```
package com.thecodecity.mapsdirection;

import ...

public class userBookbus extends AppCompatActivity {
    EditText Searchtext;
    private ExampleAdapter adapter;
    ImageButton bt_mic;
    private List<ExampleItem> exampleList;
    private List<ExampleItem> examples;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_user_bookbus);

        fillExampleList();
        setUpRecyclerView();
        initToolbar();
        this.Searchtext = (EditText) findViewById(R.id.search_input);
        this.Searchtext.addTextChangedListener(new TextWatcher() {
            public void beforeTextChanged(CharSequence charSequence, int i, int i1, int i2) {
            }

            public void onTextChanged(CharSequence charSequence, int i, int i1, int i2) {
            }

            public void afterTextChanged(Editable editable) { filterQuery(editable.toString()); }
        });
    }
```

Figure 4.6: BookBus

```
package com.thecodecity.mapsdirection;

import ...

public class busUpdatelocation extends AppCompatActivity {
    EditText edate, edlong, edlati, edloc, edtime;
    Button btn;
    private static final int REQUEST_LOCATION = 1;

    int t1Hour, t1Minute;

    LocationManager locationManager;
    String latitude, longitude;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_bus_updatelocation);

        edate = findViewById(R.id.editText);
        edlong = findViewById(R.id.editText1);
        edlati = findViewById(R.id.editText2);
        edloc = findViewById(R.id.editText3);
        edtime = findViewById(R.id.editText4);

        btn = findViewById(R.id.button);

        Calendar calendar = Calendar.getInstance();
        final int year = calendar.get(Calendar.YEAR);
        final int month = calendar.get(Calendar.MONTH);
        final int day = calendar.get(Calendar.DAY_OF_MONTH);
```

Figure 4.7: Maps

In the above the main code snippet of the bus booking page i.e.location of bus is given. It has all the option to locate the bus and its route also a snippet of bus ticket or pass booking

Chapter 5

Testing

Testing is a process, which reveals errors in the program. It is the major quality measure employed during software development. During software development. During testing, the program is executed with a set of test cases and the output of the program for the test cases is evaluated to determine if the program is performing as it is expected to perform.

5.1   Testing Strategies

In order to make sure that the system does not have errors, the different levels of testing strategies that are applied at differing phases of software development are:

Unit Testing:

Unit Testing is done on individual modules as they are completed and become executable. It is confined only to the designer's requirements. Each module can be tested using the following two Strategies: Black Box Testing: In this strategy some test cases are generated as input conditions that fully execute all functional requirements for the program. This testing has been uses to find errors in the following categories:

- Incorrect or missing functions

- Interface errors

- Errors in data structure or external database access

- Performance errors

- Initialization and termination errors.

In this testing only the output is checked for correctness. The logical flow of the data is not checked. White Box testing: In this the test cases are generated on the logic of each module by drawing flow graphs of that module and logical decisions are tested on all the cases. It has been uses to generate the test cases in the following cases:

- Guarantee that all independent paths have been executed.

- Execute all logical decisions on their true and false Sides.

- Execute all loops at their boundaries and within their operational bounds

- Execute internal data structures to ensure their validity

Integrating System:
Integration testing ensures that software and subsystems work together a whole. It tests the interface of all the modules to make sure that the modules behave properly when integrated together.

System Testing:
Involves in-house testing of the entire system before delivery to the user. Its aim is to satisfy the user the system meets all requirements of the client's specifications

Acceptance Testing:
It is a pre-delivery testing in which entire system is tested at client's site on real world data to find errors.

5.2   Test Approach

Testing can be done in two ways:

Bottom up Approach::
Testing can be performed starting from smallest and lowest level modules and proceeding one at a time. For each module in bottom up testing a short program executes the module and provides the needed data so that the module is asked to perform the way it will when embedded within the larger system. When bottom level modules are tested attention turns to those on the next level that use the lower level ones they are tested individually and then linked with the previously examined lower level modules.

Top Down Approach:
This type of testing starts from upper level modules. Since the detailed activities usually performed in the lower level routines are not provided stubs are written. A stub is a module shell called by upper level module and that when reached properly will return a message to the calling module indicating that proper interaction occurred. No attempt is made to verify the correctness of the lower level module.

5.3   Validation and Verification

The system has been tested and implemented successfully and thus ensured that all the requirements as listed in the software requirements specification are completely fulfilled. In case of erroneous input corresponding error messages are displayed. In software project management, software testing, and software engineering, verification and validation (VV) is the process of checking that a software system meets specifications and that it fulfills its intended purpose. It may also be referred to as software quality control. It is normally the responsibility of software testers as part of the software development lifecycle. Validation checks that the product design satisfies or fits the intended use (high-level checking), i.e., the software meets the user requirements. This is done through dynamic testing and other

forms of review. Verification and validation are not the same thing, although they are often confused. Boehm succinctly expressed the difference between Verification: Are we building the product right? Validation: Are we building the right product? According to the Capability Maturity Model (CMMI-SW v1.1), Software Verification: The process of evaluating software to determine whether the products of a given development phase satisfy the conditions imposed at the start of that phase[IEEE-STD-610]. Software Validation: The process of evaluating software during or at the end of the development process to determine whether it satisfies specified requirements[IEEE-STD-610]. In other words, software verification is ensuring that the product has been built according to the requirements and design specifications, while software validation ensures that the product actually meets the user's needs, and that the specifications were correct in the first place. Software verification ensures that "you built it right" Software validation ensures that "you built the right thing". Software validation confirms that the product, as provided, will fulfill its intended use. From testing perspective: Fault – wrong or missing function in the code. Failure – the manifestation of a fault during execution. Malfunction – according to its specification the system does not meet its specified functionality.

Chapter 6

Result

In results we r providing are working of the app,through snapshots of the interface of the app.We have kept it serial wise so it is easy to understand.All interfaces are working accordingly as shown and information provided by us
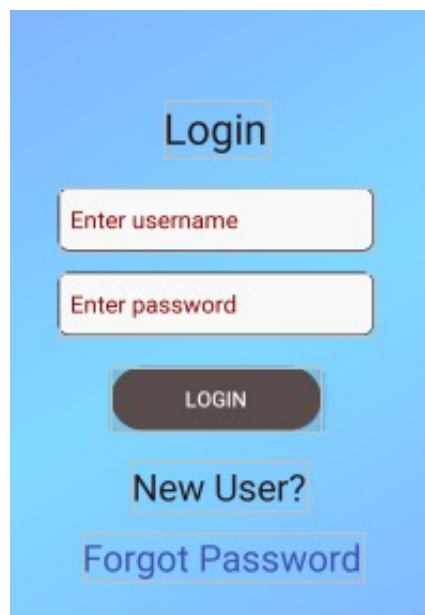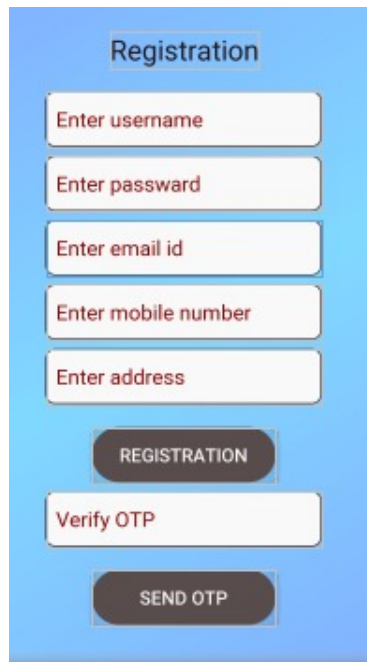

Figure 6.1: Login Page

This is the login page of our app here the user has to provide his username and password if he have already registered in the app or else the user has to select New User below to create an account if the user forget the password he can click on forget password for the One Time Password(OTP) to come on the given number at the time of registration After this user will be given option to change the password

Figure 6.2: Registration Page

1.If someone is new to the app then the user has to create an account by giving the details asked accordingly 2.after providing the information an One Time Password(OTP) is generated on the mobile no which was provided on registration page

Figure 6.3: Options Page

Once the user enters the app user is has to select the task in the app, user wants to do such as bus route,Nearest bus stop,bus time table and other option as shown in above figure On selecting Bus timetable a direct link will pop for the timings of the bus. On selecting bus route the app will ask for source and destination. Book bus/Monthly pass option is used to generate a ticket/pass directly online by paying through the payment gateway provided by the app. There is also a travel history option in order to check the past travellings done by the user
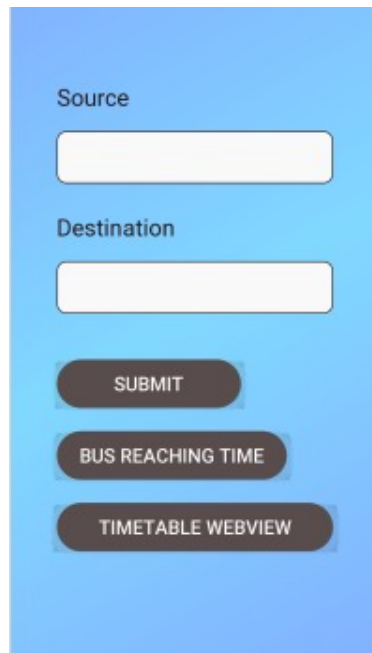
Figure 6.4: Source Destination Page

Here user will provide the source and destination he wants to travel on clicking submit the bus location will be given with help of gps and tell how many kilometers far is the bus and how much time it will take to arrive at the stop. Further the user can book the ticket if user wants
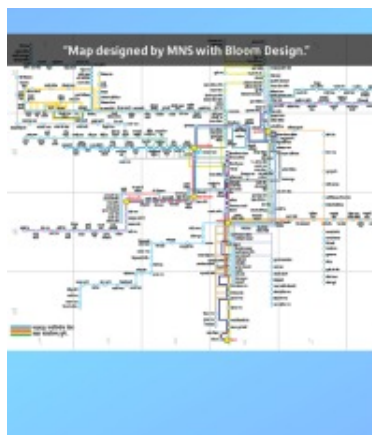

Figure 6.5: Maps Page

This is the maps where user is able to see the details of the bus and arrival time and km according to Gps system provides

Chapter 7

Conclusions and Future Scope

7.1   Conclusion

Bus tracking ticketing system is very useful and important mainly in cities . This system has many advantages like easy to use , wide area range , easy to implement in vehicles , more effective , huge capacity etc. This system is made of a tracking module containing GPS model to access dynamic vehicle location and send it to server . Then people can access this information from their android mobile phones. The main purpose of this application is to identify the current place of the bus without the help of external Hardware devices. The system will allow the user to find the bus current place without the help of other persons. In future we try to implement this application based on server

7.2   Future Scope

This project will be put up on the cloud platform, so that it will be accessible by every Android user. The application will prove beneficial for every bus traveler, or even tourists. Not just buses, but this application will be useful for every person travelling by any means of transport. The Location Tracker will give the exact location of the bus which will make it easy for the passengers to travel.

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