

# Mumbai - Connect

## (Real time Journey Guide)

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**Abstract—** With the explosive growth of population in Mumbai over the past few decades, the dependency on public transportation has increased tremendously. This has given rise to the importance of websites/applications that can provide assistance to people in terms of planning their journey. Mumbai Connect is an android application which integrates the information and features of various modes of transport such as bus, train, auto, and cabs into a single application. The combination of various static, dynamic and real-time features, along with ticket payment feature makes it easier for people (especially for daily commuters) to plan their journey across Mumbai.

### I. INTRODUCTION

Good public transport system is an essential part of safe, affordable transport. In Mumbai, public transport is far more efficient than private transport because of many factors such as it is cheap; it saves time and is very convenient for the daily commuters. When it comes to taking public transit apps like m-indicator, it serves the purpose of providing information only to a limited extent. To name a few, unavailability of real time location, best routes options, ticket booking are a few disadvantages currently experienced by users. These drawbacks have formed the platform for the development of Mumbai Connect – Real time journey guide. This app allows a user to search for a place, address or station to compare transit options and see detailed directions all the way there (combining any and all local transit types including bus, train, and taxi/auto), find nearby places of interest, see local train/bus timetables, see next arrival times for their current position, receive regular alerts on their train/ bus routes and traffic, book cabs, share a cab using car-pooling and pay for their journey sitting home.

### II. NEED OF PROJECT

Good public transport system is an essential part of safe and affordable transport. Most of the people who travel on day to

day basis prefer public transport system owing to time and money factors. A few travel apps and websites were developed in order to make it assist users in planning their journey. But these websites and apps were either static or dynamic.

These drawbacks have led to the development of app Mumbai Connect – Real time journey guide which provides information in real time making travel simpler and convenient. This app aims at improving the usability of public transportation along with real time updates and notifications.

### III. LITERATURE SURVEY

We have referred the following for our project:

1. IIT Bombay developed a website called transit trip planner and route information system. The objective of transit trip planner was to develop a web based trip planner for a city that takes the origin and destination of any traveler and depending upon his time of departure (from origin)/arrival (at destination).
2. M-indicator- an app for schedule services. The features of m-indicator includes Static timetables for trains, bus, metro It shows the best way to reach A to B, fares, ticket payment and real time position of trains.
3. Zophop – an app designed to provide real time services on buses running in major cities in India.
4. Android is an open source architecture which is used for developing applications for mobile devices. Android works on Linux Kernel. It has an operating system, middleware and key applications. Android announced its code under the license of free software/open source in the year 2008. Android comes up with an API for mobile devices. This Linux Kernel supports Java Virtual Machine which favors Java to be most suitable programming Language for development of the applications. Google provides a SDK to all developers which include libraries, debugger and a handset emulator in Eclipse IDE. The application which is developed in Android can be tested using this emulator which works similar to a mobile phone.
5. Google Cloud Messaging (GCM) is one the service rendered by Google Play Services. GCM is an open service

that allows the developers to send downstream messages (from servers to GCM enabled client apps) and upstream messages (from GCM enabled client apps to servers).

software to be implemented, the data which is part of the system, the interfaces between the system components and sometimes the algorithms used.

#### IV. METHODOLOGY

##### A. System Requirements:

- 1) Hardware requirements:
  - o Processor: Pentium 4
  - o RAM: 4GB or more
  - o Hard disk: 16 GB or more
  - o Android Device.
- 2) Software requirements:
  - o Apache Tomcat server
  - o Windows Operating System.
  - o Android SDK.
  - o Java

##### B. Modules of the Application:

There are five modules under client main module to improve easy travelling experience module are described follow:

- 1) Find nearest places: users can find nearest places from its current location (such as Bus stop, Railway Station). User's longitude latitude is used to get its current location and nearby places is shown to user in output.
- 2) Compare routes from multiple travelling medium: user can compare travel options over multiple routes (train, bus, walking, and taxi/auto) to find out the easiest way to reach from source to destination.
- 3) Alert messages using GCM: users will receive alerts using GCM technology from the server side based on unique user registration ID with GCM server.
- 4) Real-time tracking: User can find out time required for the next train/bus to reach current location.
- 5) Time table: A database based search to give users the timetable for local trains and buses.
- 6) Ticket payment and book cab: users are allowed to book a cab sitting home. Also train/bus ticket and monthly passes can be purchased online.

Server module is server side module which:

- 1) Accepts request from multiple clients and handles it.
- 2) Manages database of users and train/bus information.
- 3) Send alerts to users using GCM

#### V. DESIGN

A software design is a description of the structure of the

##### A. Sequence Diagram

A Sequence diagram is an interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. The sequence starts with the client requesting for searching the nearby places from its current location. The server then responds by fetching the nearest trains and bus stations. The client searches for multiple routes and the server gets the route information. The client searches for the shortest route and the server gets the shortest route information. The client clicks on the view timetable pages for both the trains and buses and the server provides the client with the train and bus timetables. The server also provides the client with traffic alerts and train delay alerts. Thus the sequence diagram shows the message exchange between the client and the server.

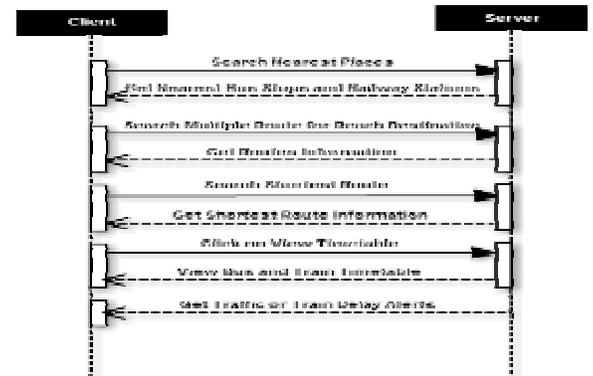


Figure5.1 Sequence diagram

##### B. 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.

The class diagram consists of two classes with the names of client and server as shown in the fig. 5.2. The client class consists of three parts with the name of the class being the first part. The middle part consists of the attributes of the class which in this case are longitude and latitude.

The final and third part of this class consists of the methods of the class namely

- GetCurrentLocation()
- GetSourceToDestinationRoute()
- SearchForParticularLocation()
- TrainBusTimetable().

The server class consists of only methods namely FetchingDataFromDB()and FetchingDataFromGoogleAPI( ).

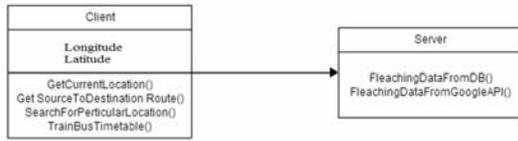
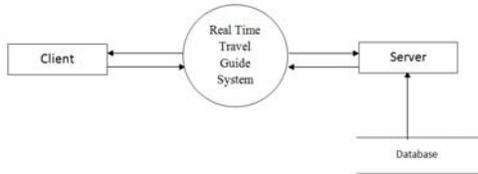


Figure5.2 Class Diagram

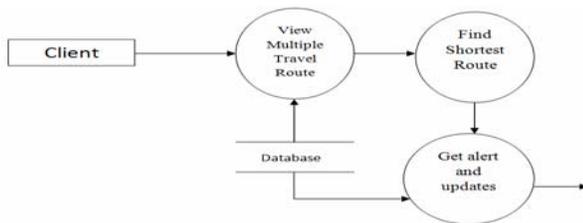
C. Data Flow Diagram

A data flow diagram (DFD) is a graphical representation of the flow of data through an information system. A data flow diagram can also be used for the visualization of data processing (structured design).Figure 3 show the levels of the data flow for this project. There are 3 levels of DFD starting from Level 0 to Level 2. The first level shows the start of the data flow of the two modules. The next level 2 shows further elaboration from the client module side ie it can view multiple travel route, Find the shortest path and get traffic and delay alerts.The next level shows how the client module flow will be. He/she can view the timetable and further find the shortest route and also get updates and alerts.

Level 0



Level 1



Level 2

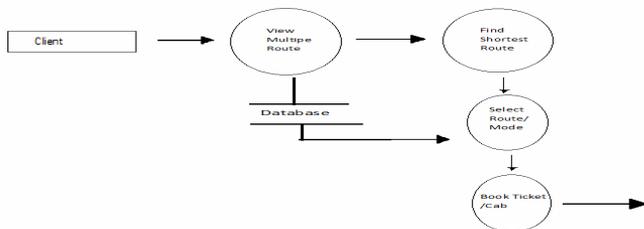


Figure5.3 DFD (3 levels)

VI. IMPLEMENTATION

System flowchart:

A flowchart is a type of diagram that represents an algorithm or process, showing the steps as boxes of various kinds, and their order by connecting them with arrows. Process operations are represented in these boxes, and arrows; rather, they are implied by the sequencing of operations. The basic flow of the project is as shown in the figures 6.1 and 6.2. The figure 6.1 shows the first half of the flowchart wherein the flow starts with the start button. When the user starts the app he/she can find the nearby places from their current location. They can also view the nearest bus stop and railway station. The next branch initiates with the start button, the user will then select its source and destination. Once this is done the user can choose from the four options i.e. walking route, train route, bus route and cab. The user can now select the shortest path from its current location. If the choice is from the bus or train route then he can view the train and bus timings. If the user opts for a cab then he will be redirected to the cab booking page. The next branch is the updates module wherein the user receives traffic alerts and other important alerts warning about delays or mega blocks. The next branch is the timetable module. If the user wants to view only the train timings then the user can directly go to this page and view the train or bus timetable. The final branch is for the ticket booking module. The user can directly issue a ticket once he/she selects the desired route. Here the user can issue a train or bus ticket as well as passes. Thus the user doesn't have to go to a separate app for booking their tick

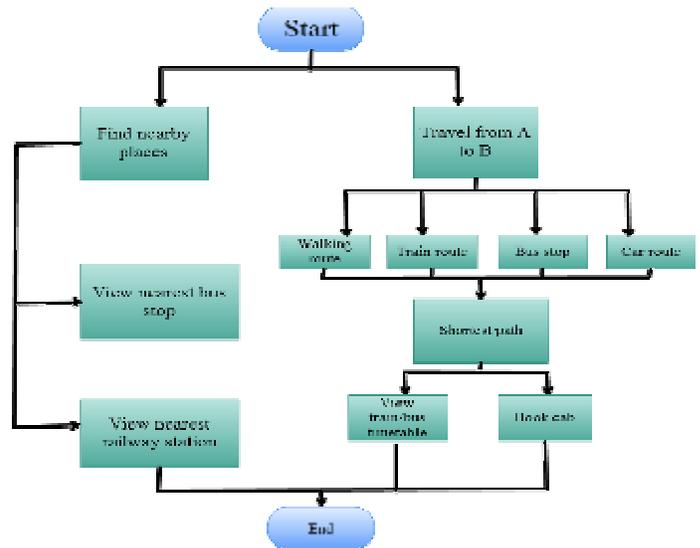


Figure 6.1 System flowchart - 1

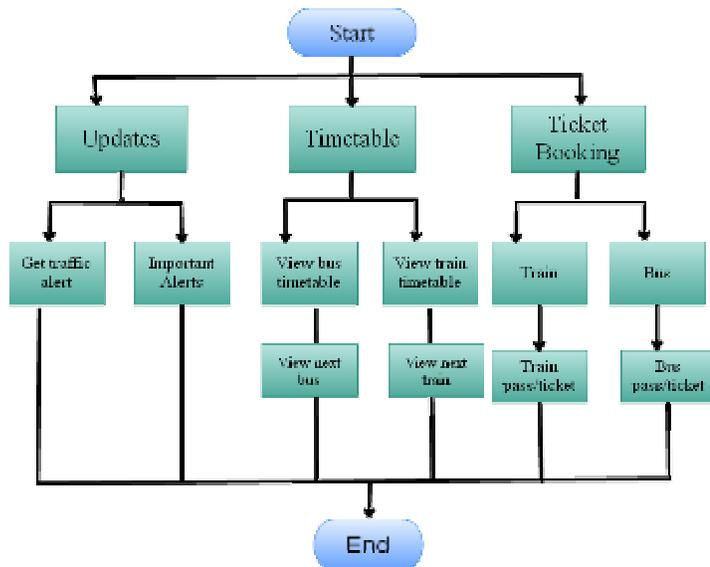


Figure 6.2 System flowchart-2

*Flow to retrieve required time and location of train:*

The figure 6.3 shows the flow to retrieve required time and location of train. The flow can be seen as below

- 1) We have given app to railway controller which is inside train .When train passes different station GPS will be traced and location will get update to our centralized database.
- 2) When user wants to access location of train. The train which is on the way will be shown to user by fetching its updated value from database.
- 3) User current location with latitude and longitude compared with the train location. Distance and time between them will be calculated and displayed to user.
- 4) To display alerts to user we are going to use GCM (Google cloud messaging system). When user registers unique id will get generated and stored it into database. When admin wants to send message GCM will be used and user will receive alerts.

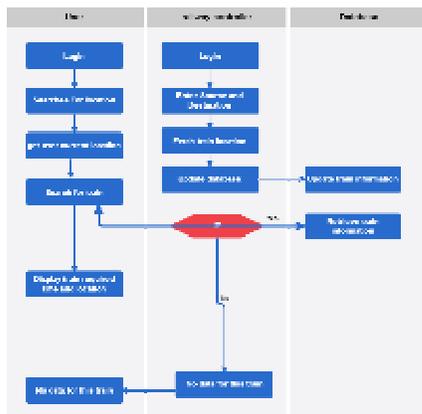


Figure 6.3 Activity diagram

VII. FUTURE SCOPE

Real-time travel offers many benefits in the area of public transportation planning over other websites and applications. Its main advantages are:

1. Online booking of tickets and monthly passes for trains/buses allows users saving their time.
2. Online booking makes the maintenance of users and ticket data easy for the government organization in charge.
3. All in one app provides all necessary features required for travel planning in Mumbai.
4. Car pooling

This gives Real-time journey guide great importance in the tourism industry. It will also benefit the government body in charge of handling daily commute data, while saving user time on the other side.

VIII. CONCLUSION

Mumbai Connect hence aims at giving its users all the facilities required for their daily commute at one place, anytime, anywhere by providing real-time, static as well as dynamic features.

IX. ACKNOWLEDGMENT

We feel privileged to express our deepest sense of gratitude and sincere thanks to our project guide Prof. Neena Jacob for her excellent guidance throughout our project work. Her prompt and kind help led to the completion of work.

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