# SMART TRAIN TRACKER APPLICATION (STTA)

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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# APPROVAL

This Project titled "**Smart Train Tracker Application (STTA)**", submitted by *Rony Ahamad* and *Doyananda Roy* to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on *June 2, 2021*.

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# DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Md. Jueal Mia**, **Sr. Lecturer, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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# ABSTRACT

Bangladeshi's People are facing many problems train management System. Because of People our country depending analog system in our country, we develop all system in our country including of smart train tracker management. We will connect to direct our train management system and connect to pass passenger information. Passenger know to control own time and save own passenger's time. So I clearly to say that it's to save passenger's time and save train authorization's time. Bangladeshi's people join the digital management of our train system. Al lest, many people directly benefit travel's scheduling and comfort to know about train information easily. This is why the project is developed as a general platform for easy information about train information and actual schedules. Approve and discuss it under the supervision of an expert as it is very helpful to know about this project and how to get accurate information about the train.

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# CHAPTER 1
# INTRODUCTION

## 1.1 Introduction

This report will highlight the application and reveal about the method. We thought and ordered well to reach the ultimate success. This announcement Contains specifics specifically for goals, structure displays, opportunities, requirements and see prerequisites, and finally taken and taken strategies.

Our train management system is weak in our country. Most of the train is late to come stations. Then, People seem to disgusting situation and waste our time. It is the biggest problem in our country we need to solve the problem and upgrade our train management system. So we use to upgrade GPS train tracking system. We know where the train stand. Then People can reach easy the station. They also knew which train is running in the route and location. People also knew their target current train location. They find their emergency another way. We will get our easy life and comfortable. So Passenger will find another route in the situation and Vehicles.

The total length of the Bangladesh railway system is 3,600 kilometers (2,200 miles). In 2009, BR (e.g. Bangladesh Railway) had 34,168 employees. In 2014, BR (e.g. Bangladesh Railway) carried 65 million passengers and 2.52 million tons of cargo [1].The project can help to people directly and indirectly. Because of knowing our people information, which train is running in the route and location. People will also know their target current train location. Otherwise management will give their information to Bangladeshi's people. Management will comfort to control train and manage their systems. The project may be a better solution to this problem [1].

## 1.2 Motivation

In recent time, we are face many problem in train journey like train reached late, lot of people gather in the station, many time waste. So we are going to develop this project.

Many people cannot maintain own their time and miss train. Facing many harassment of peoples, fall down maintaining time problems. So, the idea of inspiration came to create such a social application for frustrated passengers and to maintain their time.

People are used so they can learn about train information to use the app, the app has been created to improve these.

## 1.3 Objective

By this Application user can know: Where train stand, when train reach the station, which train running in the route and location, user target current train location, in emergency time user find another way.

This project will help people who know among about information train in our country. We know that this apps connect the Bangladesh Railway [BR] Authority Where we will be monitoring information, and if people go astray, BR authorities will do it Send accurate information to this user. There is also a shop GPS map in real time.

## 1.4 Expended Outcome

The project can give information to help passenger that BR Authority can also help to maintain their management of train system. It gives them a real time GPS map which can be shown. This project will guide them so that they can find the right path. People will be got their easy life and comfortable.

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### 1.5 Project Management and Finance

The whole project manage by our team. We try to get a beneficial output and hopefully we did.

We use free Google map so didn't need financial support. In future, to get smarter feature we had to need finance for update this application.

### 1.6 Report Layout

This project has seven chapters. We will talk in the first chapter of the introduction name

Related –

Introduction, Motivation, Objectives, Expected Outcome, Project Management and Finance, and Report Layout. We will write in the second chapter of the background title Project Terminologies, Related works, Comparative Analysis, Scope of the problem, Challenges of our project. The Chapter 3 of the Requirement Specification, It contains Business Process Modeling, Requirements collection and Analysis, Use Case Modeling and Description, Logical Data Model and Design Requirement of our project. In the fourth chapter named Design Specification, where we will be told about Front-end Design, Back-end Design, Interaction Design and User Experience (UX) and Implementation Requirements of our project. In the fifth chapter, which is named of Implementation and Testing. Here we will be discussed of Implementation of Database, Implementation of Front-end Design, Testing Implementation and Test Results and Reports. In our sixth chapter, which is named of Impact on Society, Environment and Sustainability. Here we will be discussed of Impact on Society, Impact on Environment, Ethical Aspect and Sustainability Plan. In our seven chapter, also, the final chapter named Conclusion and Future scope of our project. In this chapter, we will be told about Discussion and Conclusion and Scope for Further Development. This report, we talk about our application and its various problems, solutions and its use Project.

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# CHAPTER 2
# BACKGROUND

## 2.1 Terminologies

In fact our project has been created because the common man stays away from the railway station and due to the shortness of time. However, we can get all kinds of information about train travel by innovating our technology. For this reason, this train tracker app can make people aware of the increase in train communication. With this app, people are able to find their desired place, time and date of their choice. Using technology, users have been able to keep in touch with each other and on the other hand Bangladesh Railway is also able. The concept has been implemented in developed countries and for the convenience of train travel for people to play introduction to project implementation.

## 2.2 Related Works

Smart train tracker mainly use for tracking train on exact location. There are such of application of tracking train.

The "BD Train Tracker" application is for Bangladeshi train travelers only. So if you are Bangladeshi and tickets already reserved on the train with the intention of going home, this app is for you. The special features of this application detects any train, tracks train delay time, and expires to get station name and station name and distance after departure[2].

"Pak Rail Live" is a free application for the general public that provides real time train Pakistan Railway Tracking. In addition, it provides schedule updates, estimated arrivals next station and pre-arrival notification features [3].

Traveling around Chicago City with the best Chicago CTA train tracker can be so much easier now. The app is a transit app for collecting information on CTA trains on the go for your daily commute Chicago. The best part about this CTA train tracker app is the high speed and accuracy. You can use this app to track real time CTA train time conveniently

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and efficiently. This app is capturing free data feeds from CTA using Global Positioning System (GPS) hardware and wireless communication technology to track real-time location of trains [3].

"Where is my train" is a unique train application that shows live train status and up to date Schedule. The application can work offline without the need for internet or GPS. It is also packed with useful features like destination alarm and a speedometer [3].

"Locate My Train" is a full-featured Indian Railways search application that shows Indian Railway live train status and latest timetable of all trains offline. You can spot any a single click train. The application provides a lot more information like train between trains. The train is arriving at the station offline, with the possibility of confirming PNR status & seat availability. And the next few hours leave from your station, station alarm, near the station and so on.

We hope that our application run successfully and calculate exact result.

Figure2.1: Related Application

## 2.3 Comparative Analysis

Our main motive to track exact location. The project focus on the track the train location that can show by user. Figure 2.1 are the most working related work which use to track location.

In this application user easily can see the train location. Our application name is "Smart Train Tracker" are divided into three part user application, driver application, Super Admin. Super admin maintain the whole system include user and driver system. Driver share the location by GPS user can get it and can see location.

All the process work simultaneously. We try to make our application easy so that we use only essential point as if anyone can use this application easily.

All class people can feel comfort to use this application. The can use this application not for personal it can be used for others issues. Smart train tracker a run in smart way.

## 2.4 Scope of problem

When the system run, it has been observed that under a few circumstances, it will be face some Problem, and this application fails to deliver hundred percent accuracy.

The location tracking system still available is basically GPS (Global Positioning System). Used exclusively for space orientation and navigation. In this we face some problems systems such as –

- GPS (Global positioning system) can be down.
- All time internet is needed.
- In our firebase, free memory can go end.
- Free map does not have more advance feature.
- Driver should have android device.
- Large experience man power is need to maintain this system.
- This system implementation cast is high.
- Government permission have to need to input some data on this system.

The first error is tracking the train via GPS when the weather is cloudy. Due Device limitations, uninterrupted tracking process is sometimes annoying. A second error occurred while trying to send GPS data to the command upload it to the center and web server. Due to device limitations, use the same both GSM and GPRS are sour for communication, which sometimes creates turmoil consequences of system failure. (Automatic railway track switching system is a smart rail Station control system).

### 2.5 Challenges

At a starting time we was confused, then we make a plan and set our mind. Then step by step we go ahead, when we work about our super-admin part we face a problem that when we input our train schedule it copy properly but if needed to delete it can't working, after working with patience it solved. At the part of location tracking first we didn't know that we can use Google map free. To solve this confusion we started to browse net. But didn't clear about this Google map. After asking some android developer they told us we can use Google map free. At the data base part we cannot connected with our apps. Then we did it. From starting to end some problem we face but after that we solve it keeping patience.

Maintaining the entire system is a great challenge, the privacy of that location matter the track was a challenge. To get accurate GPS or GSM a good network have to build. We need to provide in our application, which is a very unique feature in this system. It will also have an update that will help the passenger to update regularly version. To make it more effective, our Android app has used the advanced feature, which will always help passengers to know the exact location of the train. These features our system will ensure it is effective and unique. Be sure to update regularly.

We also need to make sure that the tracking process is ongoing or that we are updating the relevant information. We also need to get regular updates on a regular basis so that any user gets started once. Make sure our tracking process and data retrieval are together. In case if any problem show on System have to find out the essential solution as soon as possible and have to effective. Whole process have to maintain carefully.

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# CHAPTER 3

# REQUIRMEN SPECIFICATION

## 3.1 Business Process Modeling

This is a live location tracking application. The whole process start to run by register. In train register option there all train have been register which are used on rail communication.

The driver register option use for entry driver information. Schedule management make schedule by take information from train and driver register option. A journey schedule create.

After create a schedule if it is show active then it ready to start a new journey. At the same time, if it inactive then it back to management phrase. View the schedule and waiting for the active schedule.

Active schedule start the journey by active the live Location. Now the user can see the live location of the train. Which train are search by user to find the live location if it match to active train then the location view by user. If is not match it back to schedule phrase and waiting for activation.

User view the live location all over it would be active. After finish a journey driver stop the location then a journey could be finish successfully and End. For making a new schedule same process have to follow and all details save to the database.

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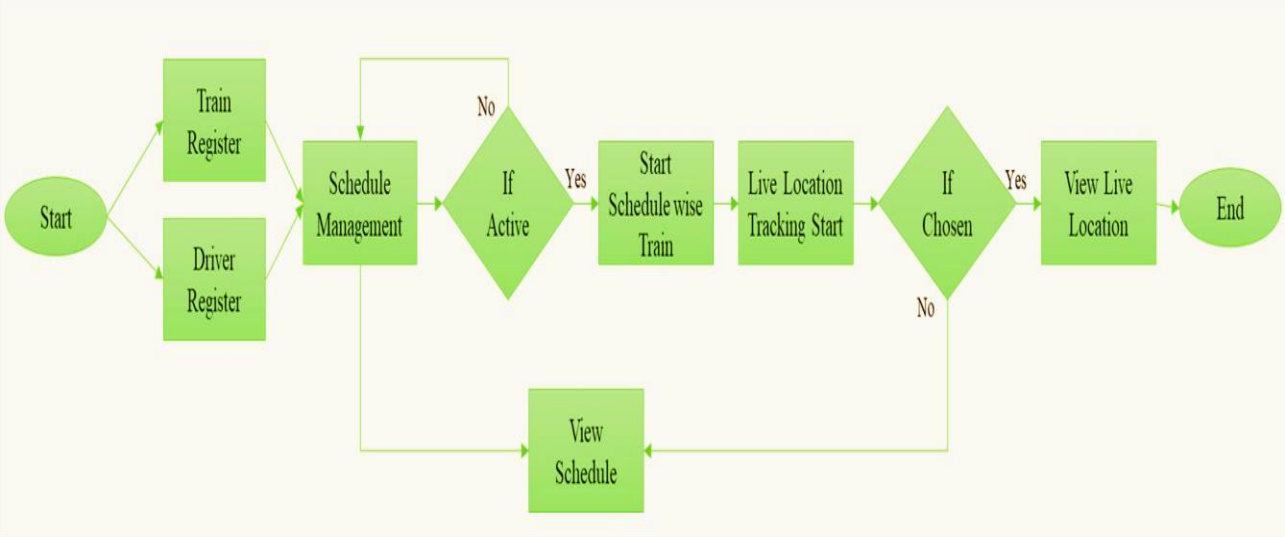


Figure 3.1: Business process model

## 3.2 Requirement Collection and Analysis

### 3.2.1 Software Requirements:

- Android Studio IDE: Android Studio is the official IDE of Android. It provides equipment customized for android developers with rich editing, debugging, testing and profiling tools.
- Android Virtual Device: An Android Virtual Device (ADV) is a device configuration that runs on the Android emulator. It provides virtual device-specific the Android environment where we can install and test our Android application.
- Database (Firebase): Firebase Cloud Messaging (FCM) provides a reliable and battery-efficient connection between your server and device that allows you provide and receive messages and notifications on the web on iOS, Android and numbers cost. You can send notification messages (2KB limit) and data messages (4KB Limit).

- Adobe XD: Adobe XD for Adobe Prototyping tools interaction Designer. Adobe XD features are used to create wireframes, prototype and screen design for digital products such as websites and mobiles apps.

### 3.2.2 Hardware Requirements:

- Operating system: Windows
- Android supported device
- Android supported device:
  - RAM-8GB (min)
  - Hard Disk- 150GB (min)
  - Processor- 1.5GHz (min)

## 3.3 Use Case Modeling and Description

The use case diagram is a graph of the actor, a set of usage bounded by system boundaries, generalization between communication associations and uses between actors and users. Case use defines the outside (actor) and inside (case of use) of the case model system behavior.

The following is figure 3.2 on the use of train trackers.

Here in "Train Management" part that is control under Super Admin and make management by log in Application. "Schedule" part manage by super admin then driver active the schedule.
User can see the active schedule and can view the location by "User interface". Use this case extends the generalization of information as it relates directly to the level of privacy generalization.

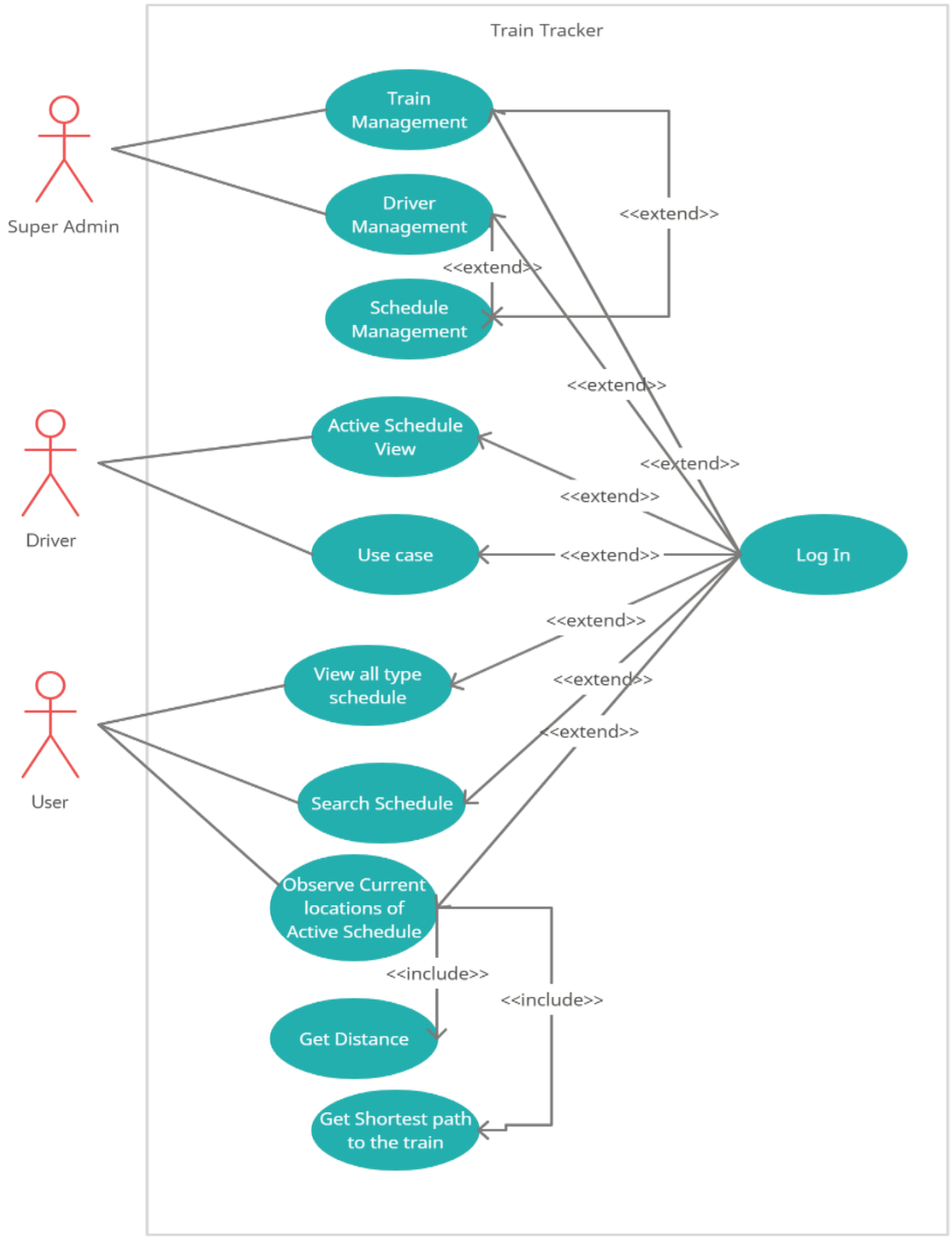


Figure 3.2: Use Case Model

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Table 3.1: Use Case for Train Management

| | |
|---|---|
| Use case Name | Train Management |
| Use case details | The actor will create, edit & delete the schedule and maintain the Management sector. |
| Pre-condition | Log In |
| Actor | Super Admin |
| Post condition | Schedule Management |

Table 3.2: Use case for active schedule

| | |
|---|---|
| Use case name | Make Schedule |
| Use case details | Start the journey by get activation which schedule is active. |
| Pre-condition | Log In |
| Actor | Driver |
| Post condition | |

Table 3.3: Use case for User activity

| | |
|---|---|
| Use case name | User interface |
| Use case details | User can search active train, view the live location, find out distance between train and his current location. |
| Pre-condition | Log in |
| Actor | User |
| Post condition | Find out the short path to get the train |

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### 3.4 Logical Data Model

A logical data model is a model that is not specific to a database that describes related issues. No organization wants to collect data and the relationship between these things. A logical model consists of representations of entities and features, relationships, unique identifiers, subtypes and super types and barriers to relationships. A logical the model may contain domain model objects, or one or more domains or dictionaries model. Once logical objects and relationships are defined in the logical data model, you can use the workbench to transform the logical model into a database-specific physical presentation in the form of a physical data model [4].

In this application the logical data model define that every process connected with each other. Super Admin maintain and create the process. Schedule are create for both driver and train. Though the schedule driver could able to start journey and share latitude and longitude marking value. This a visible to user and user can see location.

User also have to give some information to login this application by create an account. Same process are held on driver and train part. All of are different to each other because there id, name and other option are not same.

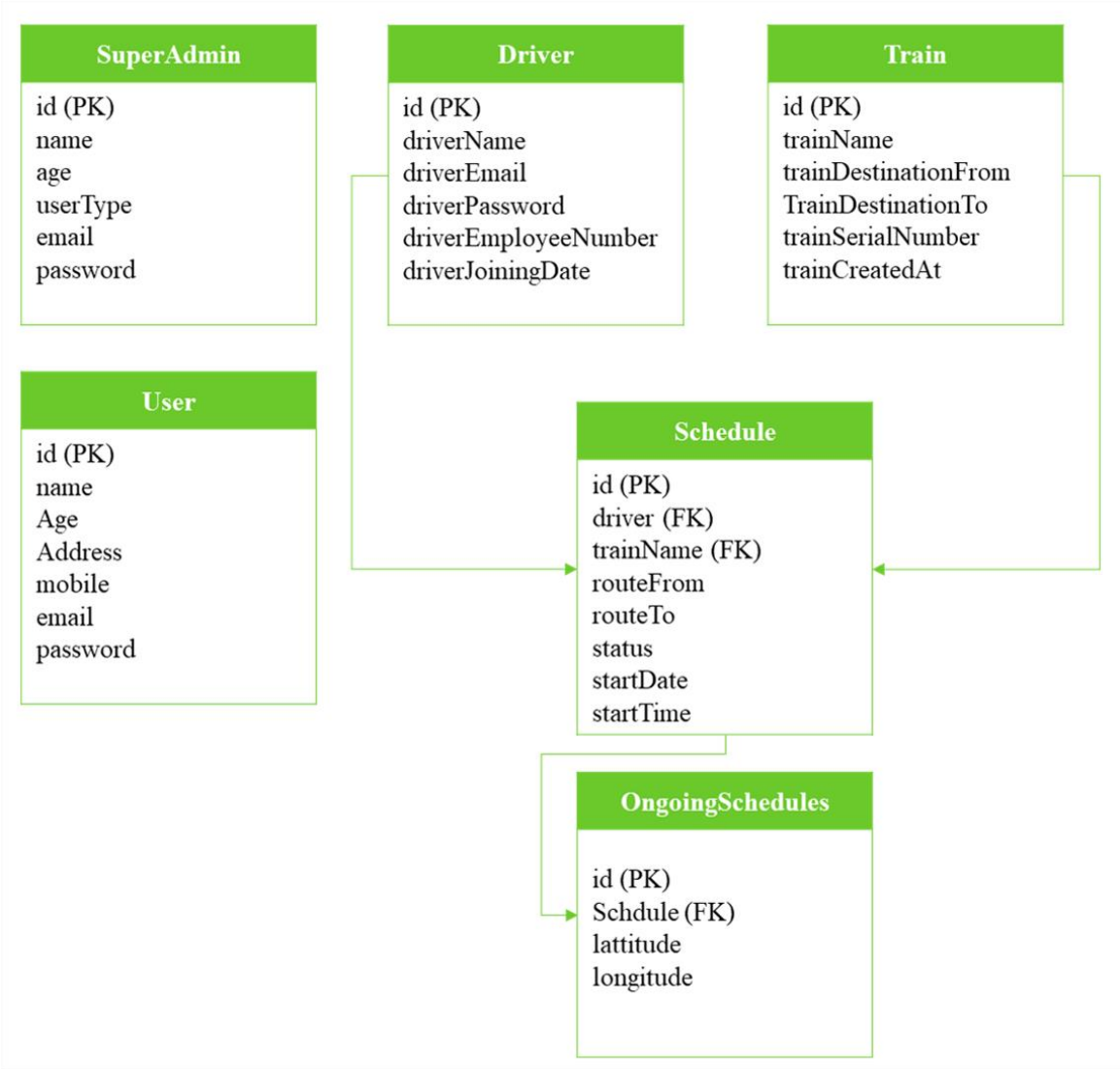


Figure 3.3: Logic Data Model

### 3.5 Design Requirement

We know that design requirements are a functional feature that transforms ideas into design features

From the statement of design requirements, it is necessary to develop a product demographic, physiological, ethnographic, and physiological data needed to get started. Actions must be performed to develop (design requirements) the device [5].In this project we have done some paper work and case diagram show in figure 3.2. We draw a business process model that show the whole process running system.

In logical data model show the basic attribute and they connected with each other.

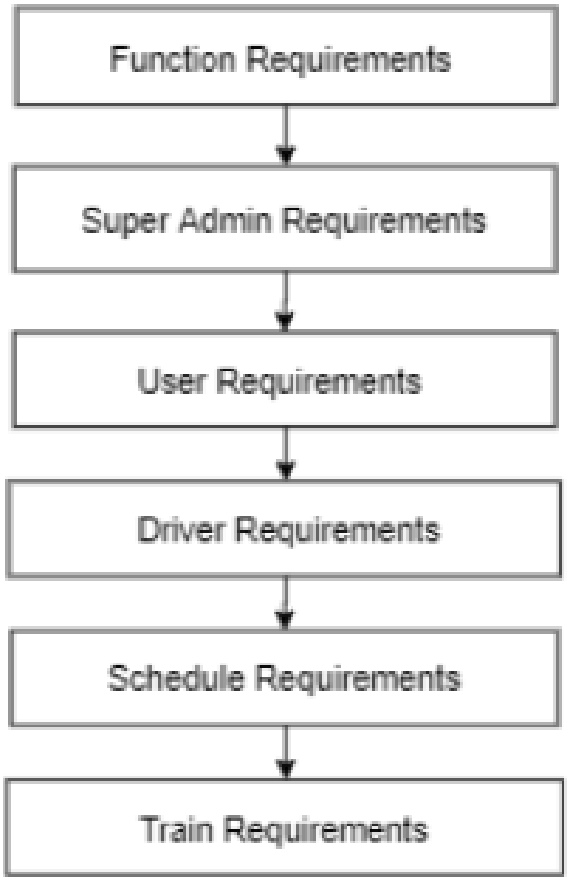


Figure 3.4: Design Requirement

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# CHAPTER 4
# DESIGN SPECIFICATION

### 4.1 Front-end Design

Front-end design is the small gray area that joins the oh so beautiful world of design Size, texture, balance, color, and symmetry and that involves logical entities, Boundary Radius, Background Image, Floating, and Grid Integrated Front End Development and flex box [6].

An Android application consists of two parts: the front end and the back end. The front edge is the visual part of the application that the user uses, application driven code. The front end is written using XML [7].

## User Interface

#### 4.1.1 Splash Screen

This application will start with a splash screen that first contains the application logo, then it will open the login method users can login using e-mail and password. Need to register for new user / before signup.

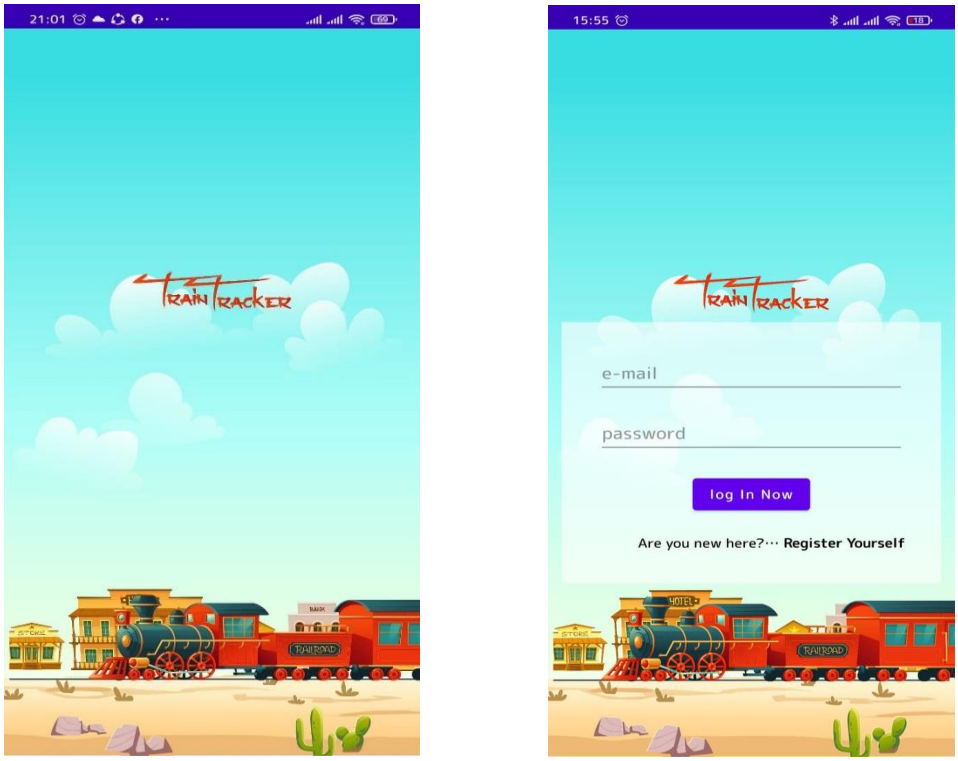


Figure 4.1: Splash Screen and Login Option

### 4.1.2 Sign Up from

For a new user, the user have to register to be a user. A user complete the registration to sign up from. In sign up form there are some option/field required. Some basic information have to fill in the form like Name, Gender, Age, Phone number, District, E-mail, Password are required. After fill up the field a user account will be created.

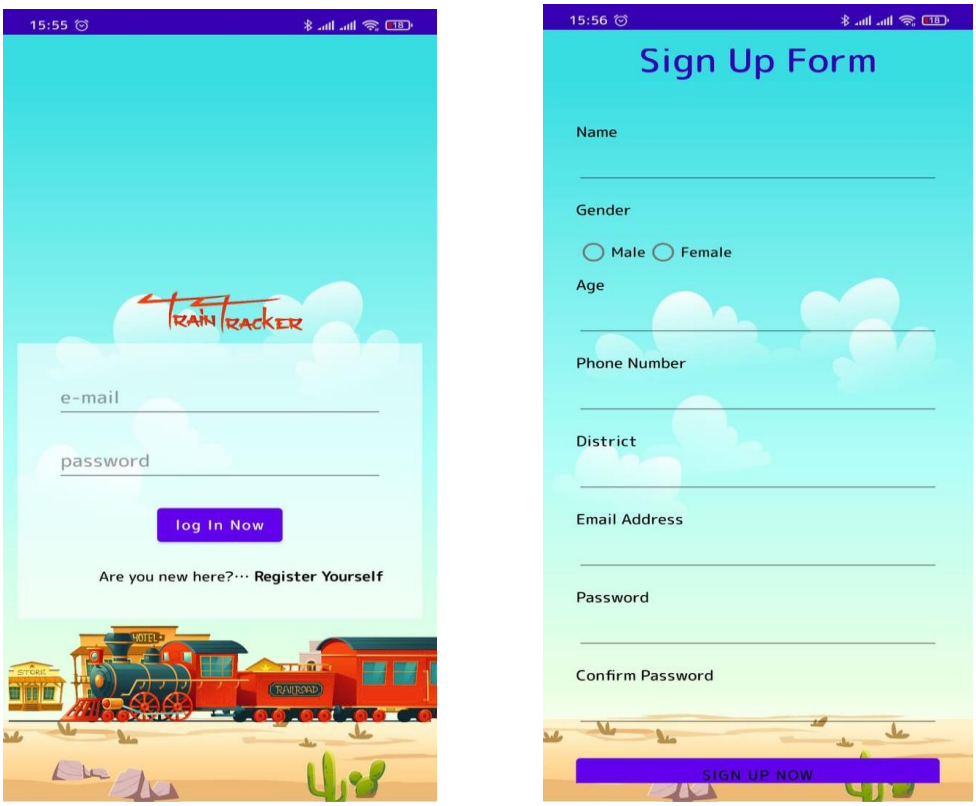


Figure 4.2: Sign Up From

### 4.1.3 Profile

After sign up by given some information a profile will be created. All information are visible to User.

In case, if a user want to log out from the application a log out option is added in profile, from here he/she can log out easily.

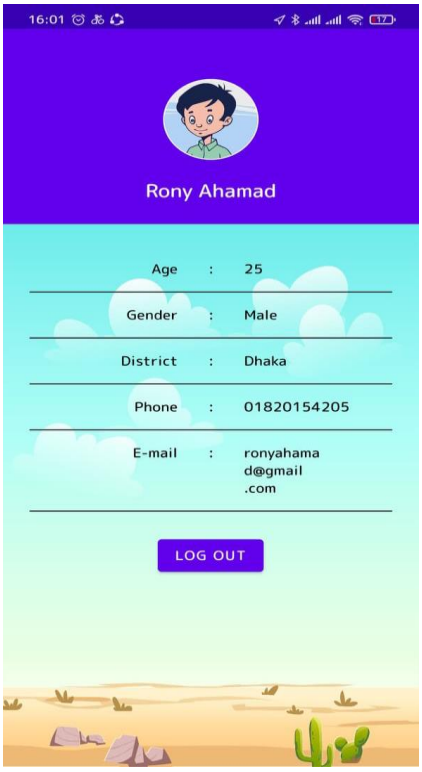


Figure 4.3: Profile Details

### 4.1.4 Options

After sign up every user can see the options. Those option are include three part.

1. Ready to Start: In this option user can see the active train which are ready to start their journey. In this option user can know the starting place to ending place of journey. There are driver name, journey date and Time when then journey will be start. In ready to start All "Active" train is visible to user.
2. Ongoing Train: Those train are already start their journey to last destination are seen in ongoing option. User can know the train location in this option by Click on ongoing train icon. Then it run to the Google map and track the train location.
3. Complete Journey: All the completed journey seen in this part after complete a journey.

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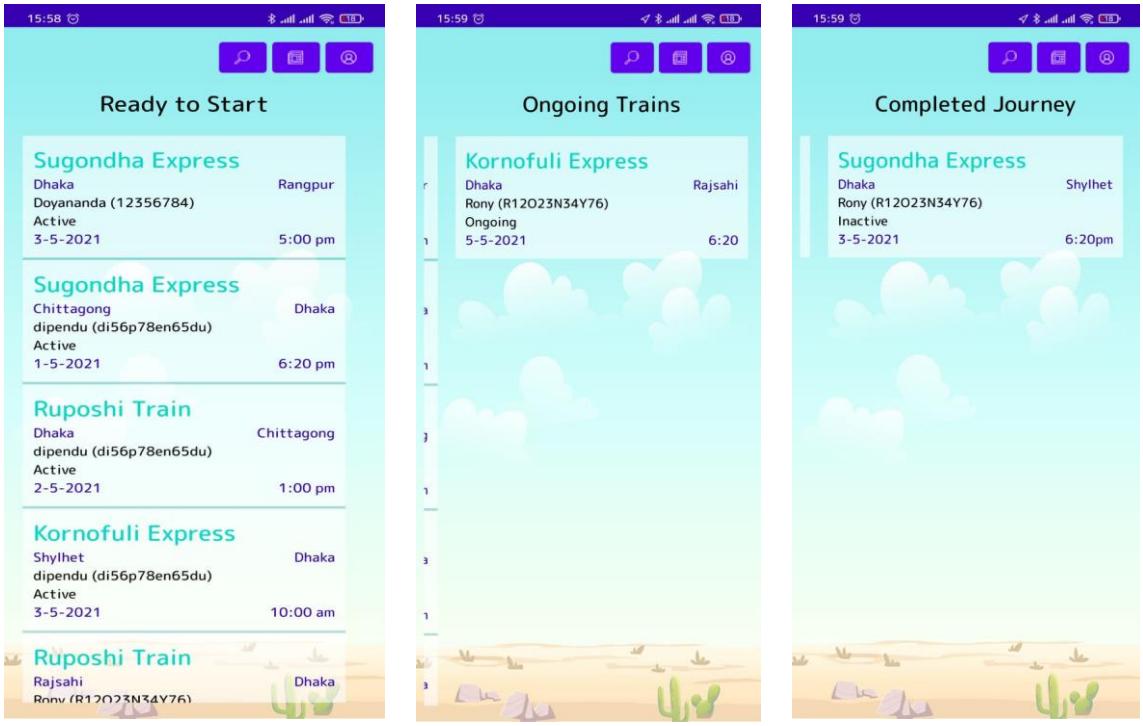


Figure 4.4: Option after Login

### 4.1.5 Search for a Schedule:

For search any schedule, a user can search by place, date, driver and train.

Place: User can search any schedule by place name. If it match it will be show.
Date: User can search by date. Match date schedule will be show.
Driver name: In ready to start, Ongoing, and complete Journey all part contain driver name, so by a driver name user can search any schedule.
Train name: By a train name user can search a schedule.
In short, we can say by place name, date, driver name, train name a schedule can be search easily when it match. From search user can see present and old activity.

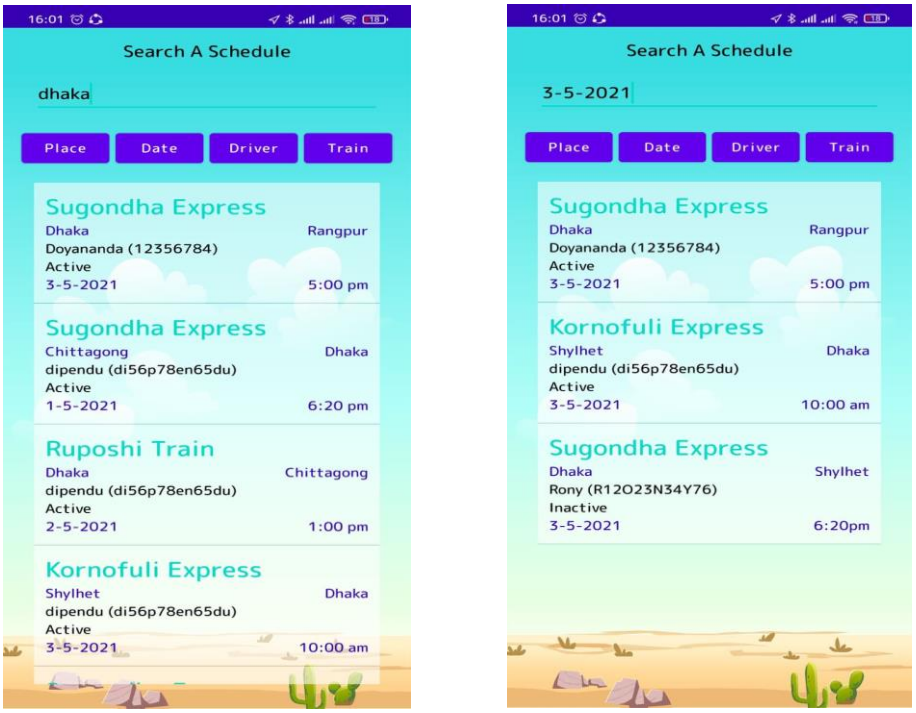


Figure 4.5: Search by Place/Date

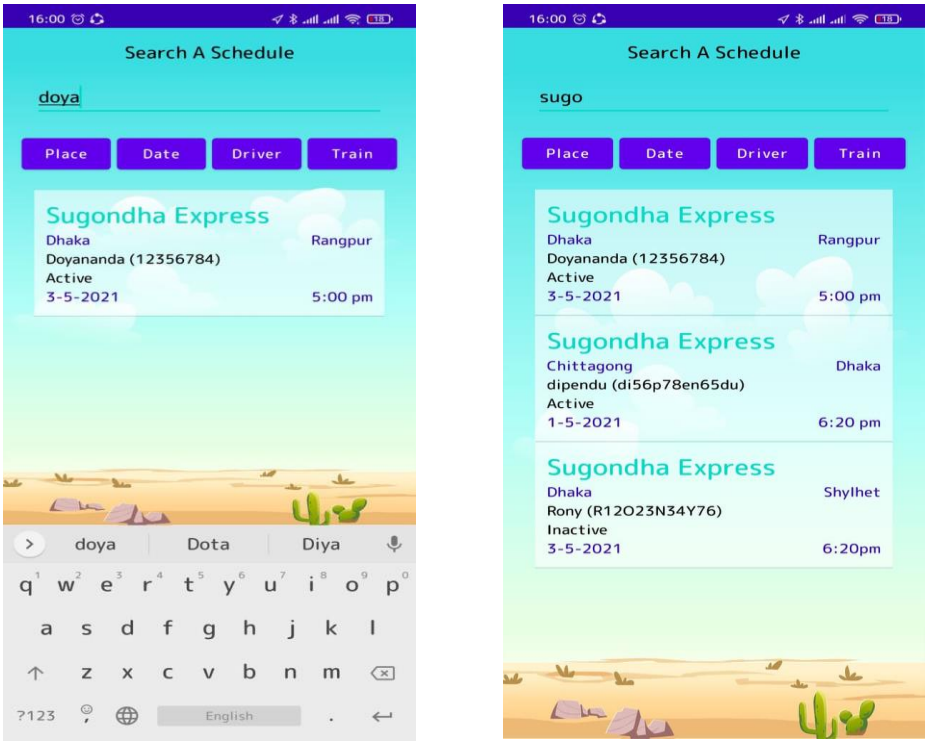


Figure 4.6: Search by Driver/ Train Name

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### 4.1.6 News:

News icon work to show the news of train management system. All kind of railway news is update on news icon. User can get information from news icon. If there have any issue user can know before by news part.

Figure 4.7: News Part for User

### 4.1.7 Header

There are three button option in header.

Search: It works to search schedule by data.

News: User can see important news, announcement on this button.

Profile: User can see his own profile in this button. User can edit from here and log out from the application.

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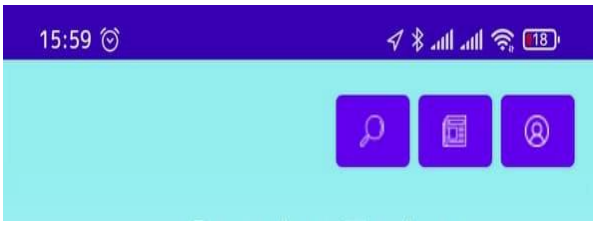


Figure 4.8: Header

**Driver Interface**

### 4.1.8 Login:

Driver login information is given by Super Admin to driver.

Driver able to login by using e-mail and password.

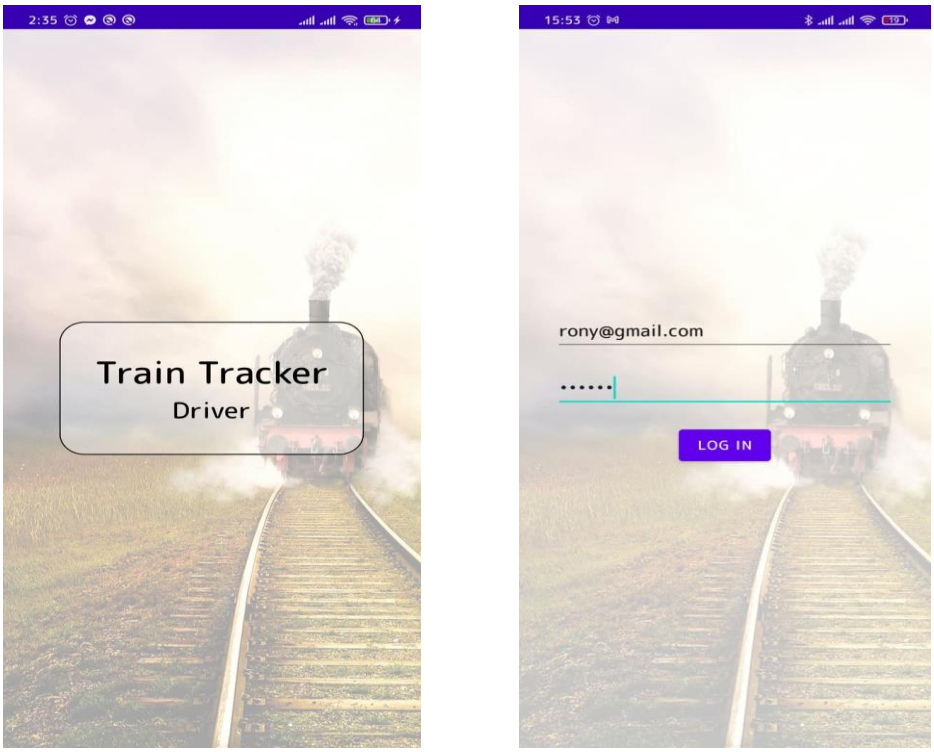


Figure 4.9: Driver Login

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### 4.1.9 Active Schedule

After successful login by driver the active schedule option open. Driver see his upcoming schedule in this part.

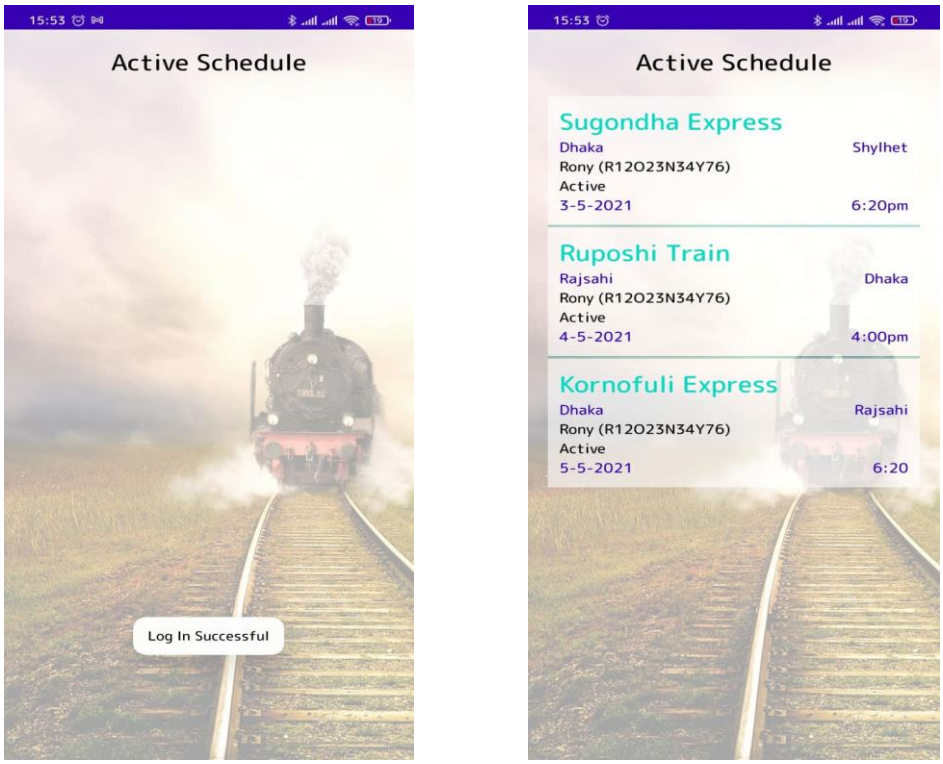


Figure 4.10: Active Schedule

### 4.1.10 Start Journey

In figure 4.10 from the active schedule, driver can start the journey. At the time of starting a journey a notification show the screen. Driver confirm the starting after that the journey started.

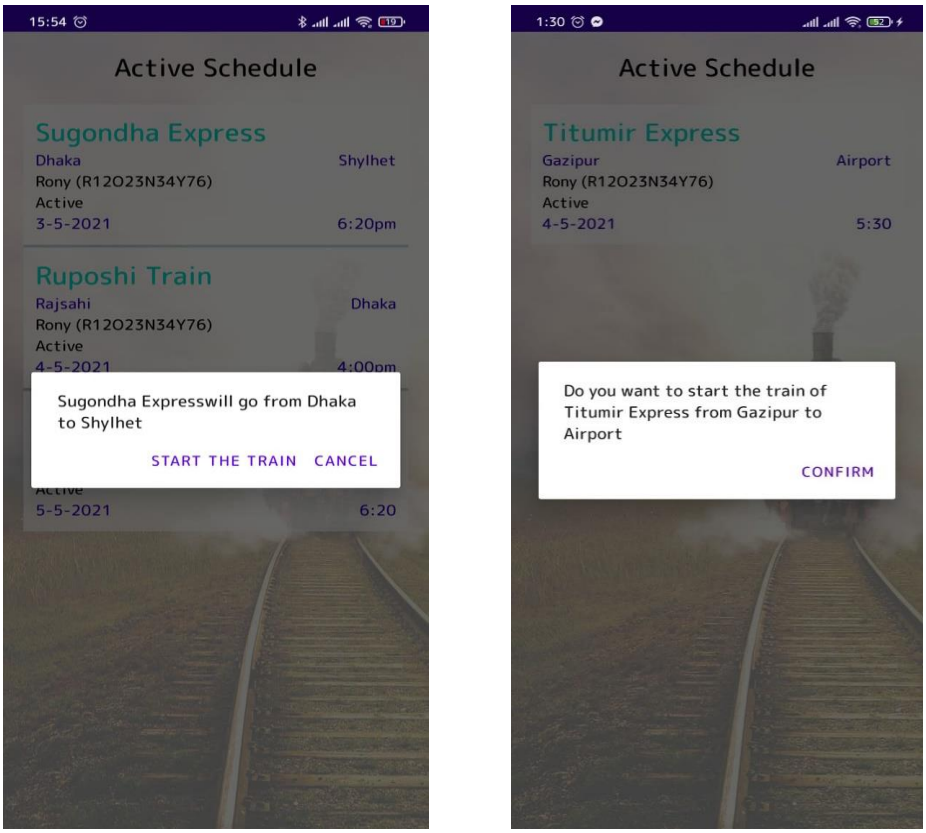


Figure 4.11: Start Schedule

### 4.1.11 End Journey

Complete journey means the end of the journey in last Destination. Driver can turn off the journey by complete the activity by the End option. Driver confirm the end of journey then the journey end by getting the confirmation.

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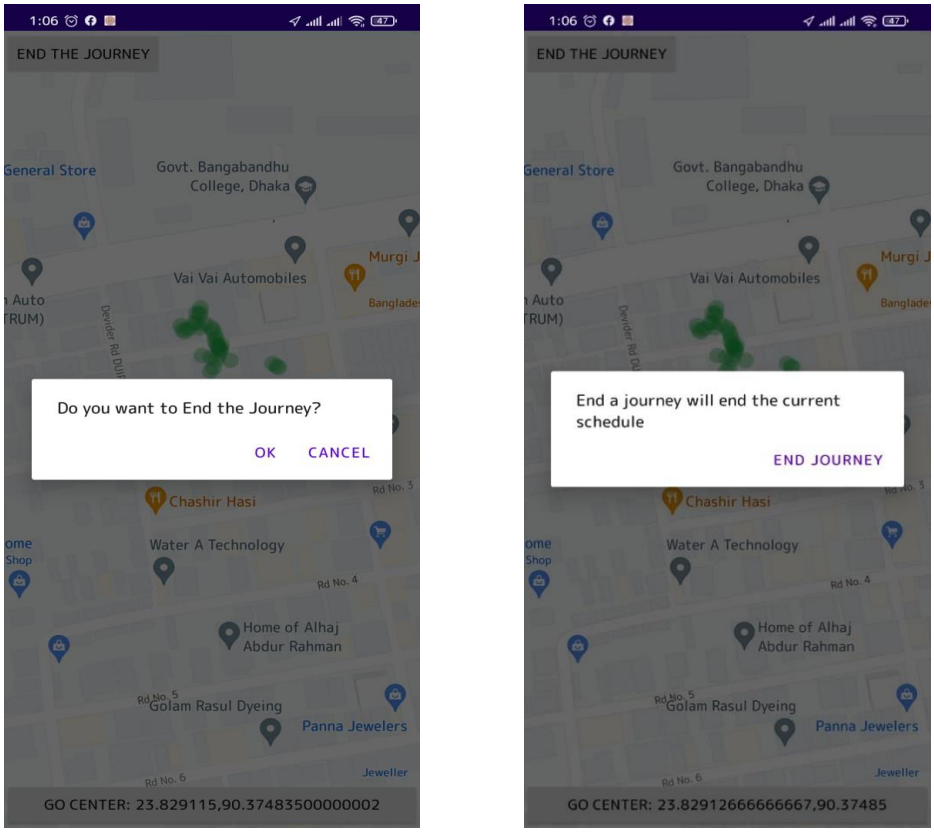


Figure 4.12: End Journey

**Super Admin interface**

### 4.1.12 Login

In the part of Super admin is play a vital role of this Application. Maintain the all process super admin create his own mail and password to enter the Process. By using valid E-mail and password allow to login successfully.

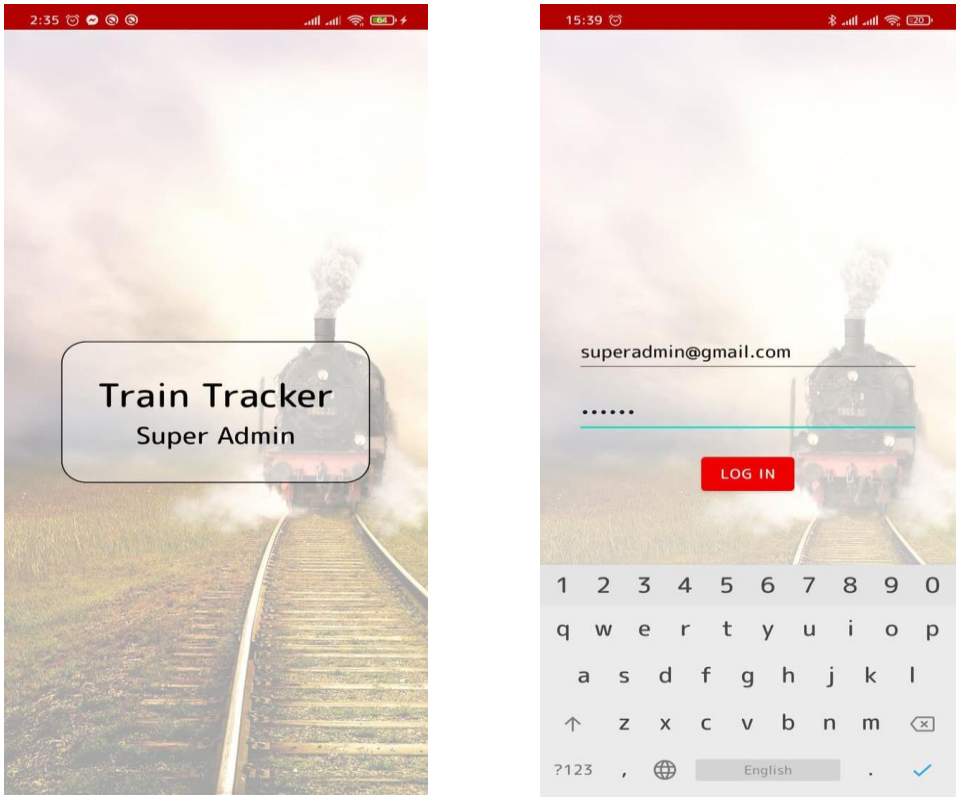


Figure 4.13: Super Admin Login

### 4.1.13 Options

There are four main option in this part.

1. Train Management: This part maintain the train activity and manage the train related issues.
2. Driver Management: All driver information are manage, create in this part.
3. Schedule Management: Schedule of train and driver are included in this part. Manage, publishes, add schedule done by this part.
4. News Management: From this part news are create, manage, publish and maintain.

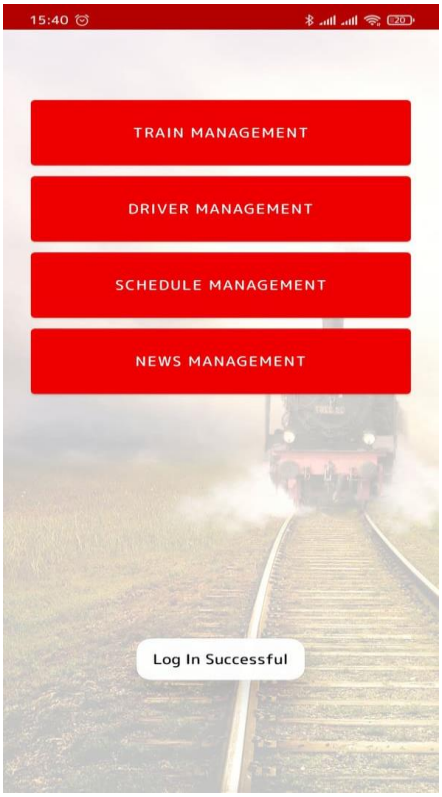


Figure 4.14: Super Admin Options

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### 4.1.14 Train management

Train management work to entry new train that work in this sector.

Here some fill are used to add new train.

Every train have a name and aerial number are required in this part

There also a regular route which work to display the running route of train.

Super admin have the access to add new train, delete, and edit. Further, if any train will not able to perform it can be remove from the system.

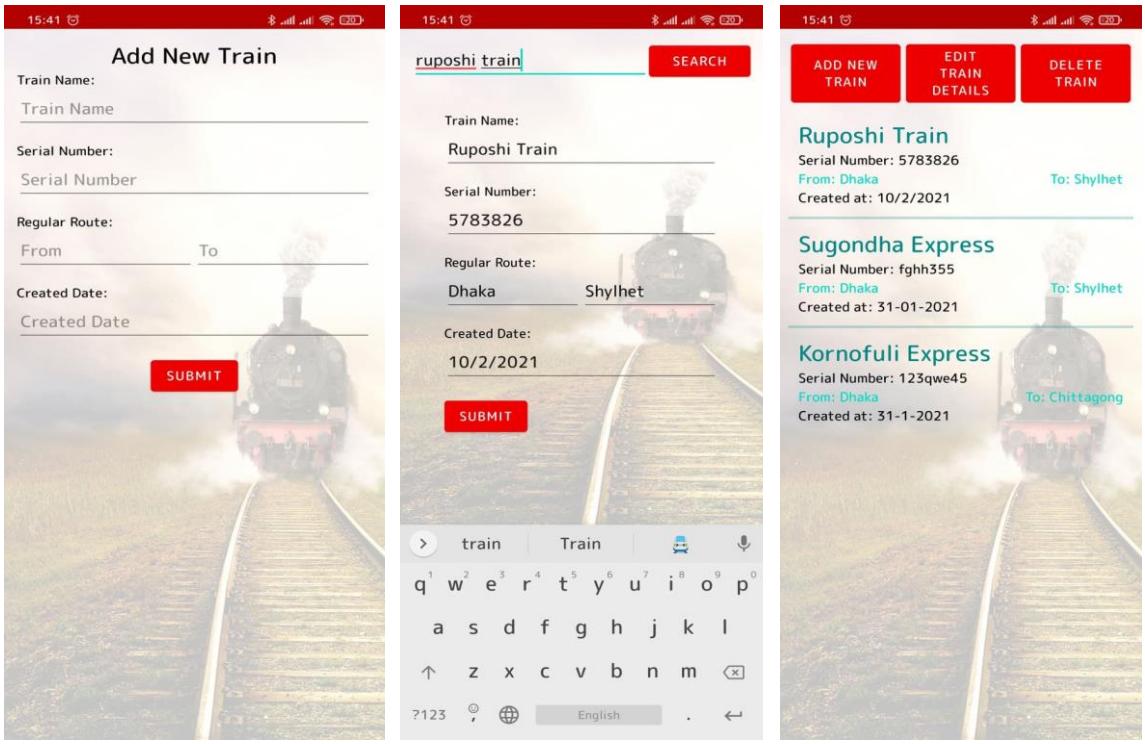


Figure 4.15: Add new Train

### 4.1.15 Driver Management

Driver need to valid e-mail and password to login driver app. Driver management part require the information and entry driver.

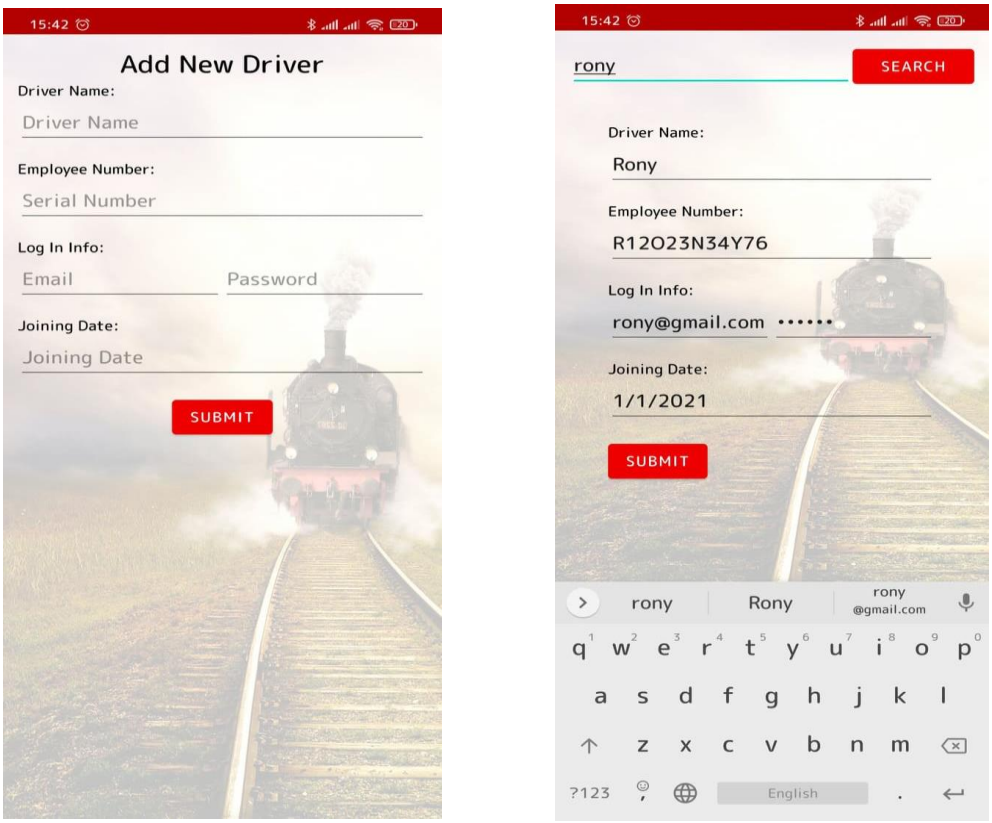


Figure 4.16: Add new Driver

### 4.1.16 Schedule Management

Super admin assign the drive of all running train and make a schedule for a driver when he start his journey in the specific train. All the active schedule show by driver and they can start journey on assigned schedule.

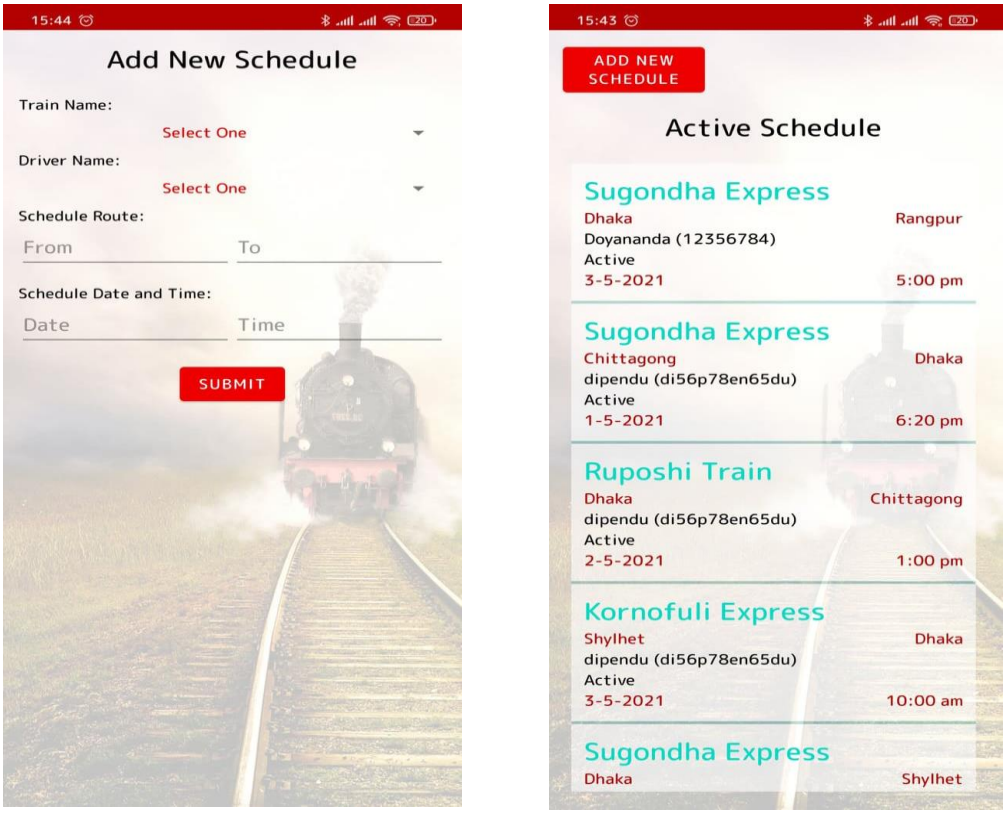


Figure 4.17: Add new Schedule

It also the edit and delete options works to edit and delete any schedule. For delete and edit need to confirmation.

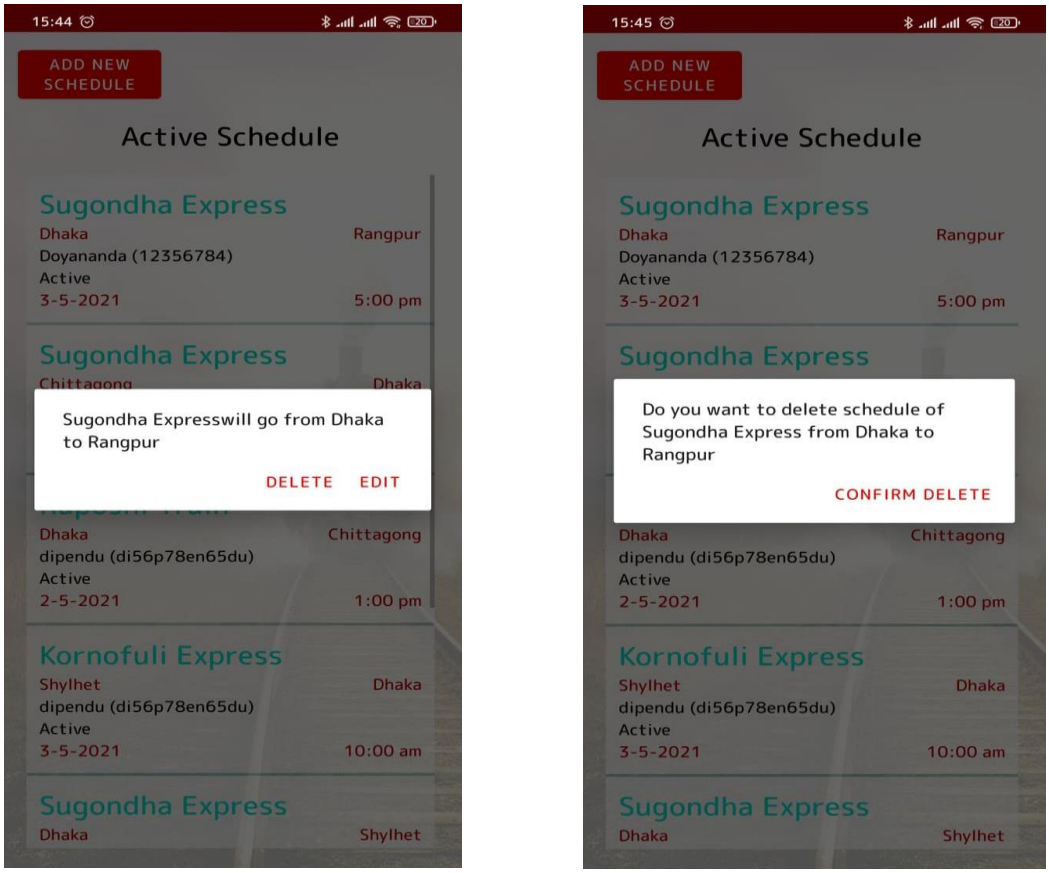


Figure 4.18: Delete/Edit Schedule

### 4.1.17 News Management

From news management super admin create new news that can show by user. All important announcement announce in news part.

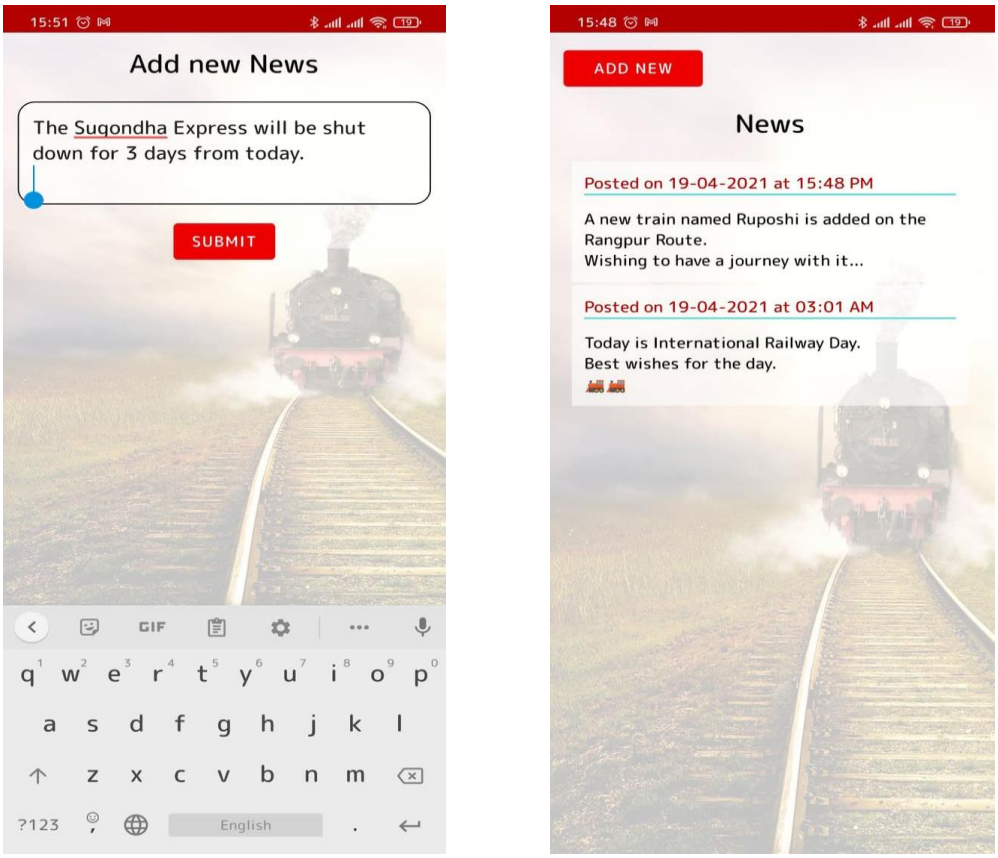


Figure 4.19: Add News

There also edit and delete part if any news have to edit or delete it can be. For delete or edit there show a confirmation notification then it published after confirmed.

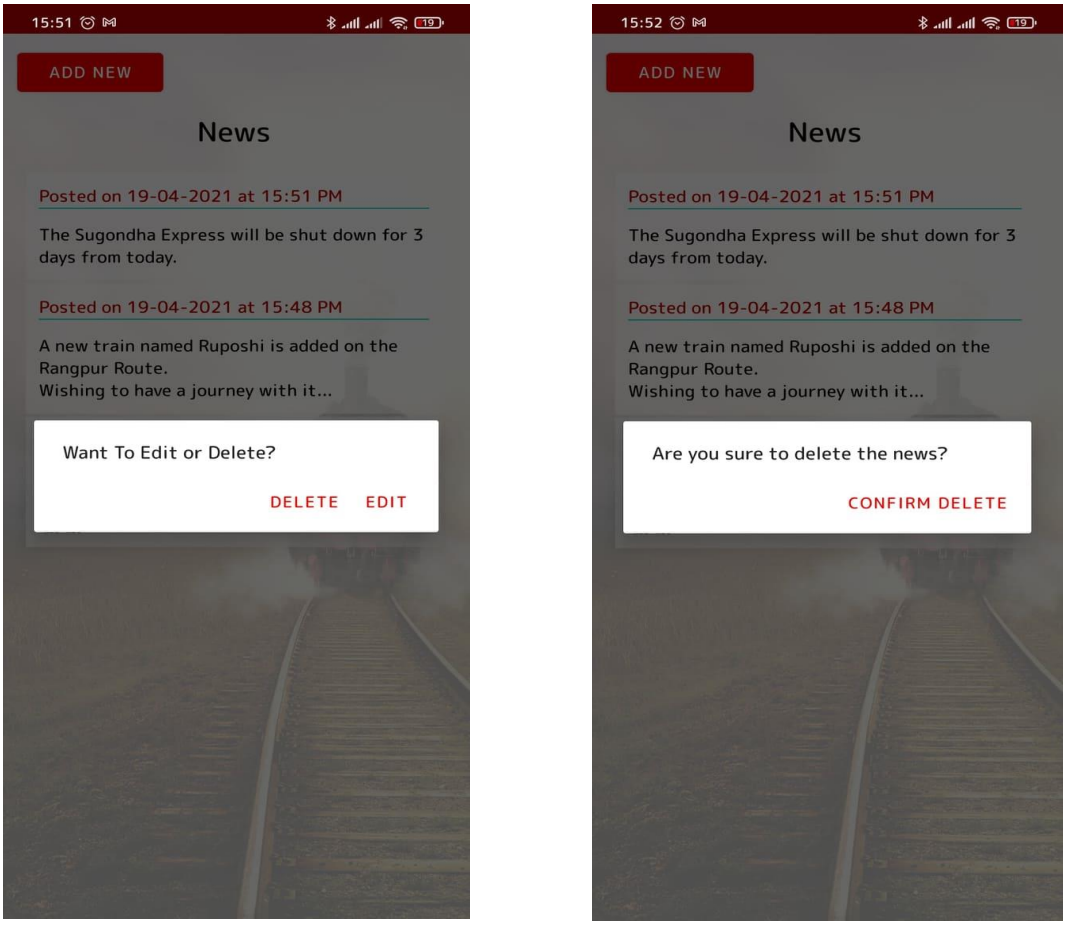


Figure 4.20: Delete/Edit Schedule

## 4.2 Back-end Design

Back-end is an important part of a mobile application that stores data, security, and business logic. An application backend is like a server for mobile applications, as it stores and sorts important information that the end user does not see [7].

The back edge is written in Java, which is great. In addition to the Java Standard Library android library during application coding. It gives access to a ton of pre-made objects, and the APIs are documented online by Oracle and Google [8].

In this application we use the Firebase database, based on the Firebase cloud-hosted database. Users using mail have storage in this database and display it in a table.

Figure 4.2 shows the user using mail and password. This is Firebase logging in by saving part of the authentication and its work in storage.

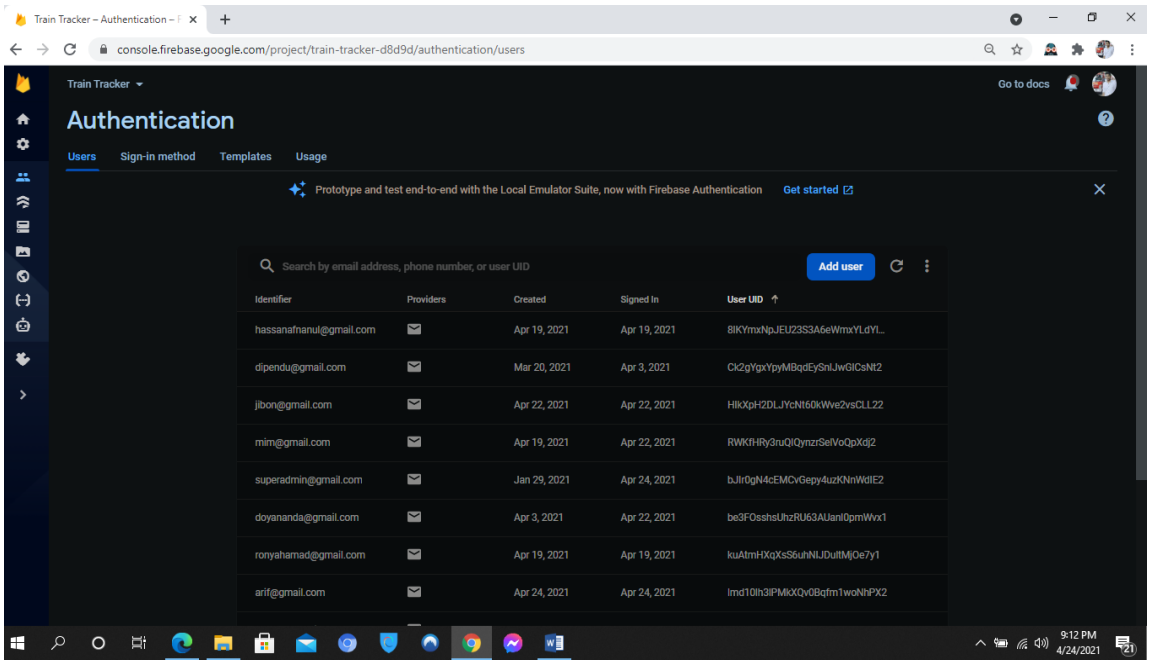


Figure 4.21: User Table

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Figure 4.3 displays the user's initial information. All additional information is stored in the database in the following trees.

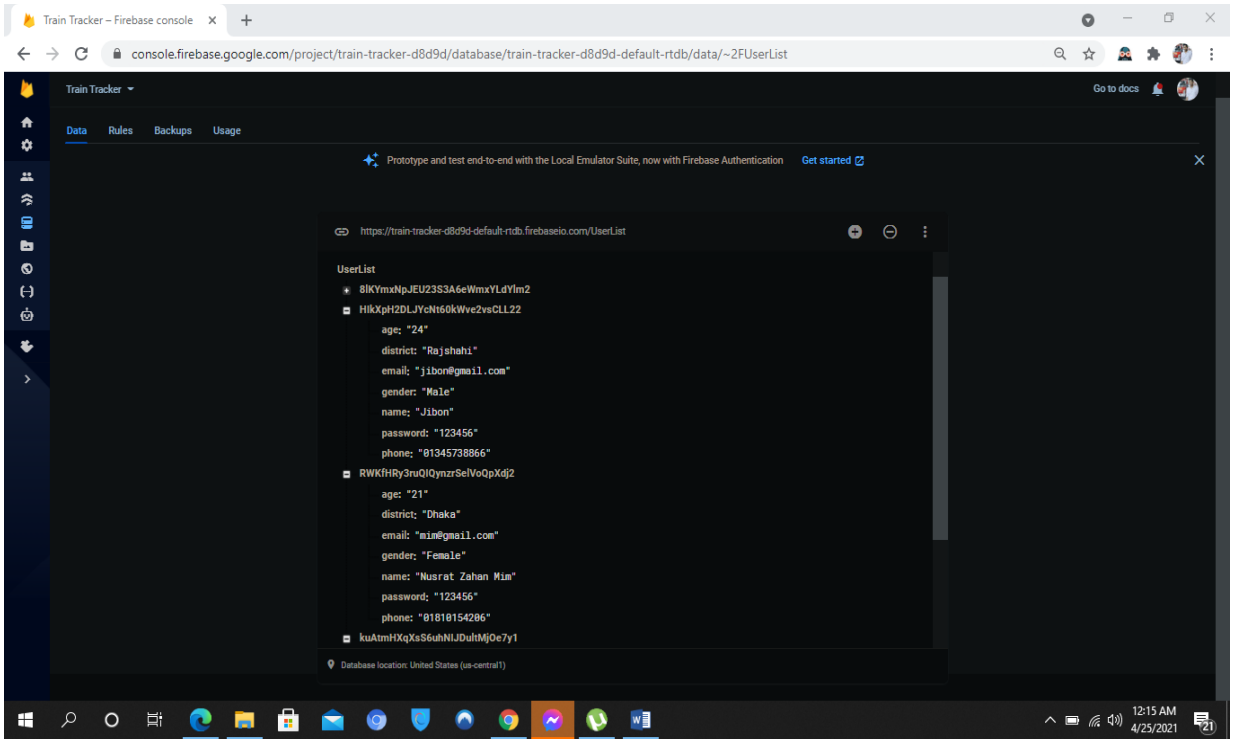


Figure 4.22: User Details

Figure 4.13 Super Admin use mail and password to login the system. And the other hands, some important information also have Super Admin those information saved in firebase in following tree.

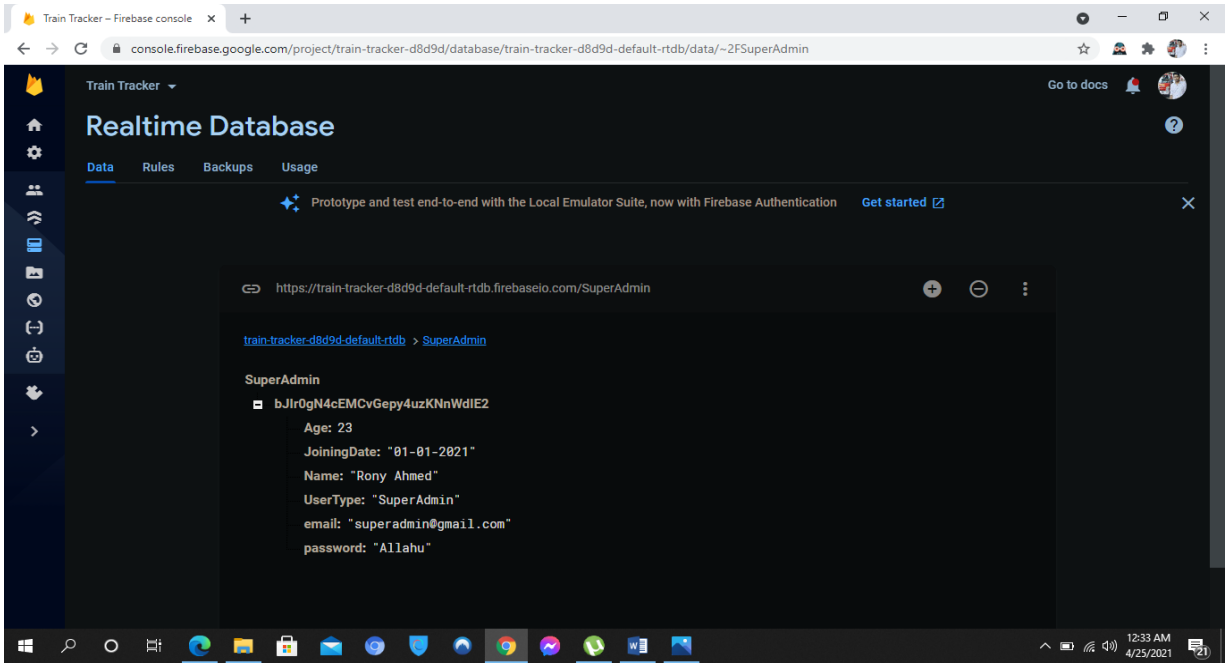


Figure 4.23: Super Admin Details

Every train have some inevitable information and significant number of data. Figure 4.15 make sure and entry the data. Figure 4.24 are the storage of the data in a sequential way.

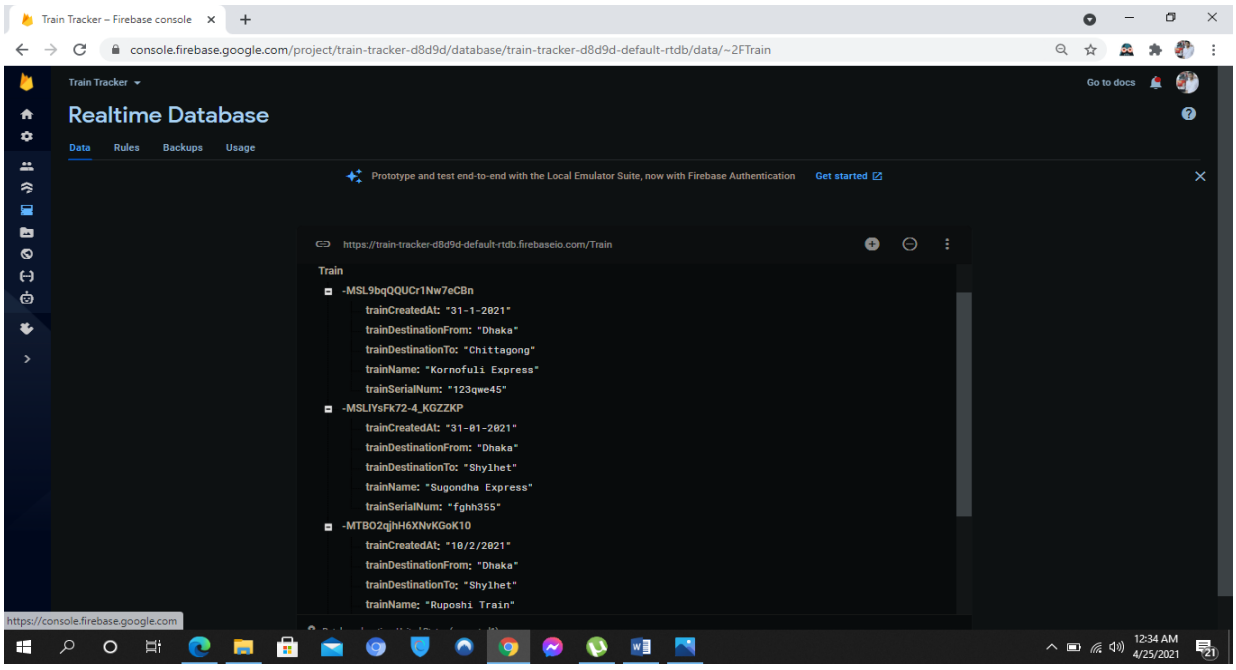


Figure 4.24: Train Details

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Figure 4.16 show the new driver adding part and fill the basic information of a driver. Those information are saved in database figure 4.25 following tree.

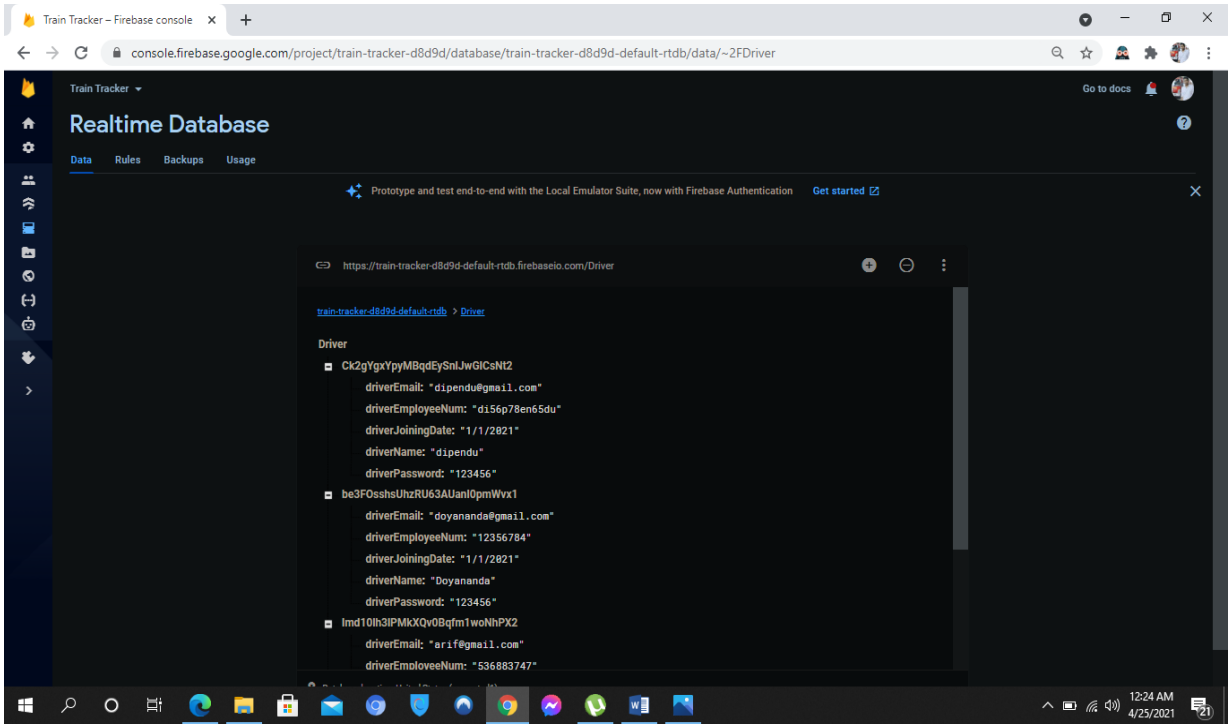


Figure 4.25: Driver Details

The schedule are created on figure 4.17. All the schedule of train active, ongoing, completed manage on schedule management option. Here figure 4.26 show the all created schedule and storage in the firebase.

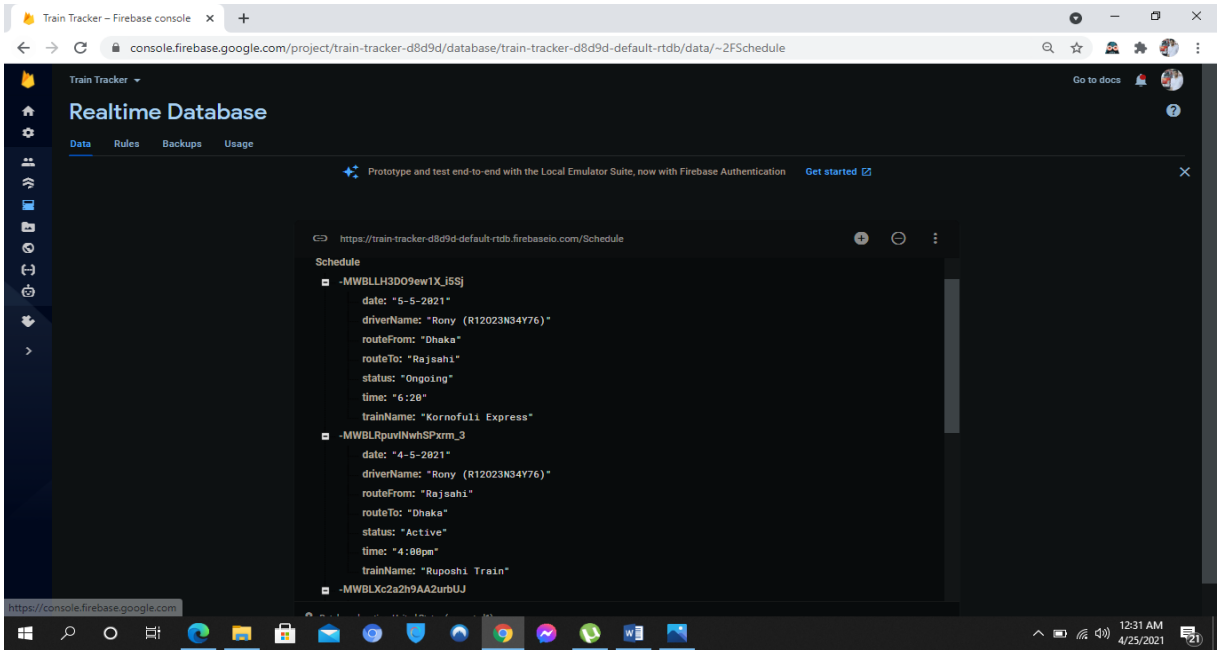


Figure 4.26: Schedule Management

The Ongoing train start journey from starting point from the starting of a journey the location could be tracked by user. Driver start the active journey and user can track by Google map using this application. Figure 4.27 are the storage of location tracking data.

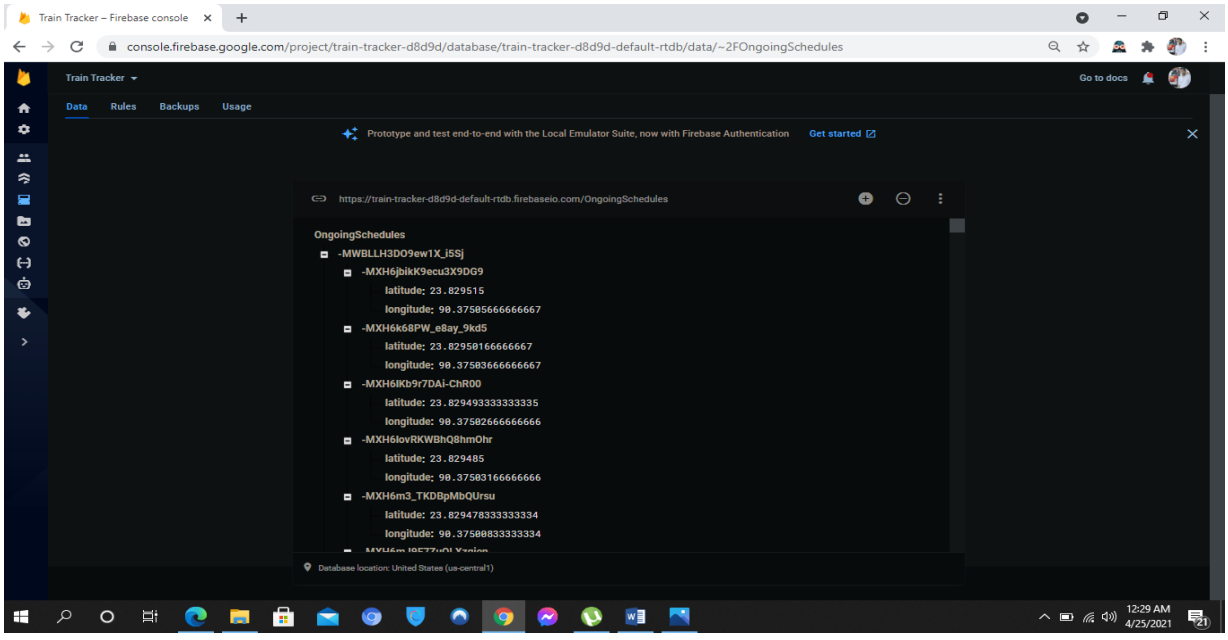


Figure 4.27: Ongoing Activity

Figure 4.19 and figure 4.20 create, edit, delete news and publish to the user. The news also save the database in following tree.

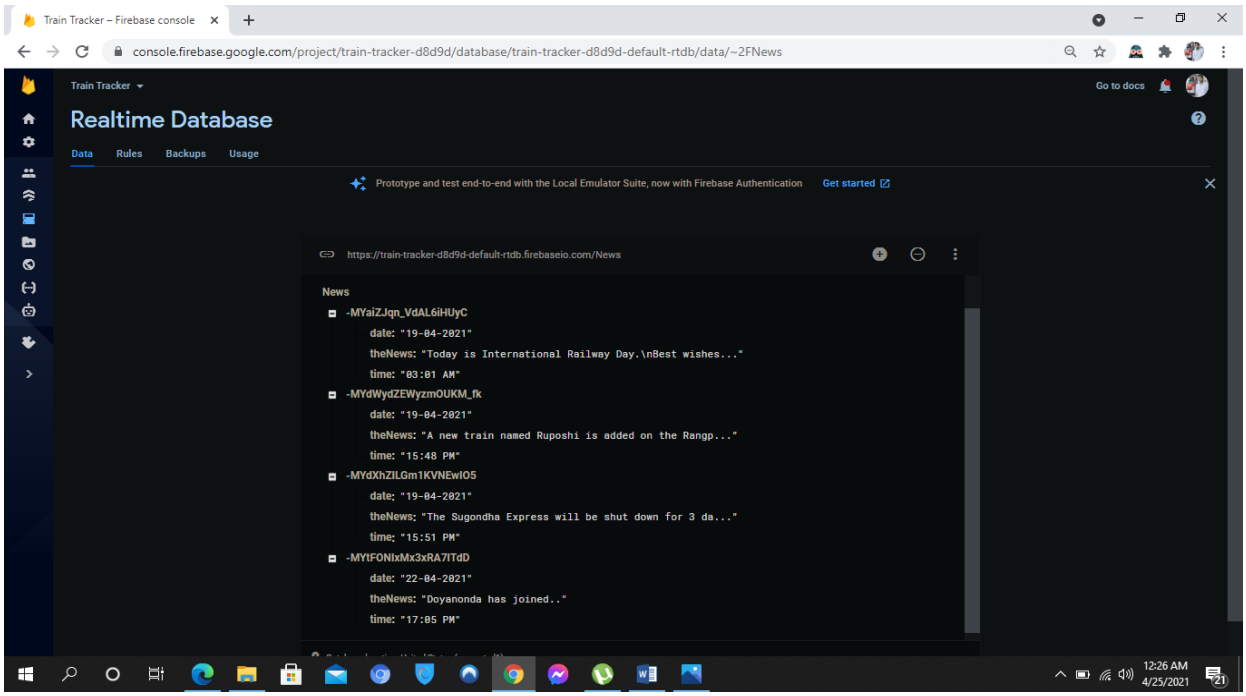


Figure 4.28: News Details

### 4.3 Interaction Design and User Experience (UX)

Interaction design is the creation of a conversation between a person and a product, system or within service. This conversation is both physical and sensitive in nature and it is revealed interplay in technology as experienced in form, function and time [9].

The user experience (UX) is not the product they use as an overall travel user. This includes their direct interaction with the product and how it fits them. The process of completing the overall task [10].

In train tracker application necessary function show in first page in simple way. So that, user can feel to use comfort and easily. Eye healing color use for no effect and pressure on eyes while user work in this system. Avoid unnecessary function so that all class people

can use this application. All the function are easy and generated. In user interface user can see location by short path from ongoing options directly go through Google map and track train.

### 4.4 Implementation Requirements

The technology used as follows:
Programming Languages: JAVA, XML.
Database: Firebase

# CHAPTER 5
# IMPLEMENTATION AND TESTING

## 5.1 Implementation of Database

In this project, we use Firebase Database to restore the database to store data. The data is stored synchronize JSON format and real-time access to all devices and platforms. The Firebase real-time database is a cloud-hosted database. Here we use three system on database, they are firebase authentication, real-time and storage.

Real-time database receives updates with examples and automatically updates new data. Store and syncs data with our NoSQL cloud database. Sync data between all users in real-time, and your application is available offline [11].

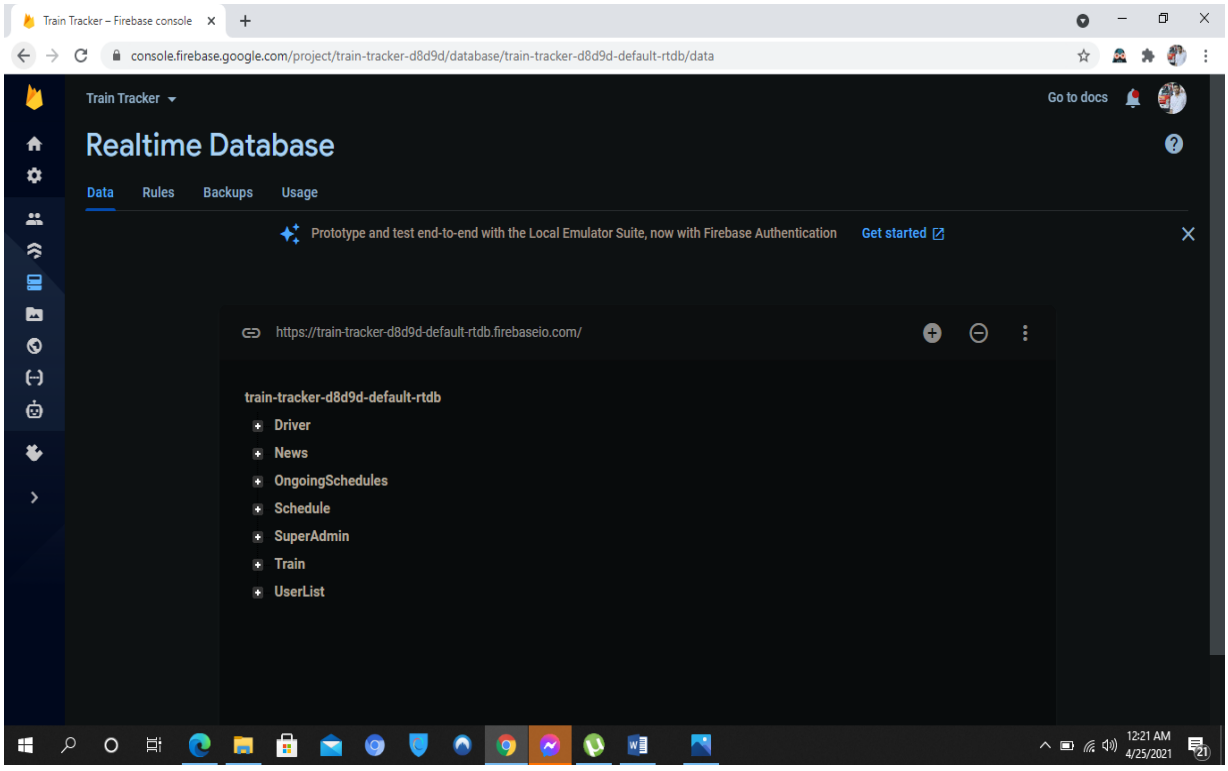


Figure 5.1: Collection of Database

## 5.2 Testing Implementation

In android there are some type of testing. There are local unit tests, Instrumented tests, unit tests, Integration tests, system tests.

The local unit are Connect with local computer where the android studio installed and connected with database. They use Java on computers so it works very fast because they didn't be an emulator is needed to do this.

We know that system tests test the whole system. These are the tests used to check the code test. Unit testing is important because software developers sometimes try to save time minimum unit test and cost is high as a result of this mythical reason inappropriate unit test error fixing during system testing, integration testing and even beta testing the application is built. If initial unit testing is done at an early stage, it saves time and money in the end [12].

For more testing by integrating test frameworks test android is called Unit test.

## 5.3 Test Results and Reports

Figure 4.11show that driver start a journey on active schedule. After activation the Google map automatically open and start to work.

User get the location and can track train easily. Figure 5.2 is the result that match to driver and user mapping location. In user mapping screen User can track his distance from running train.

The test of this application runs successfully.

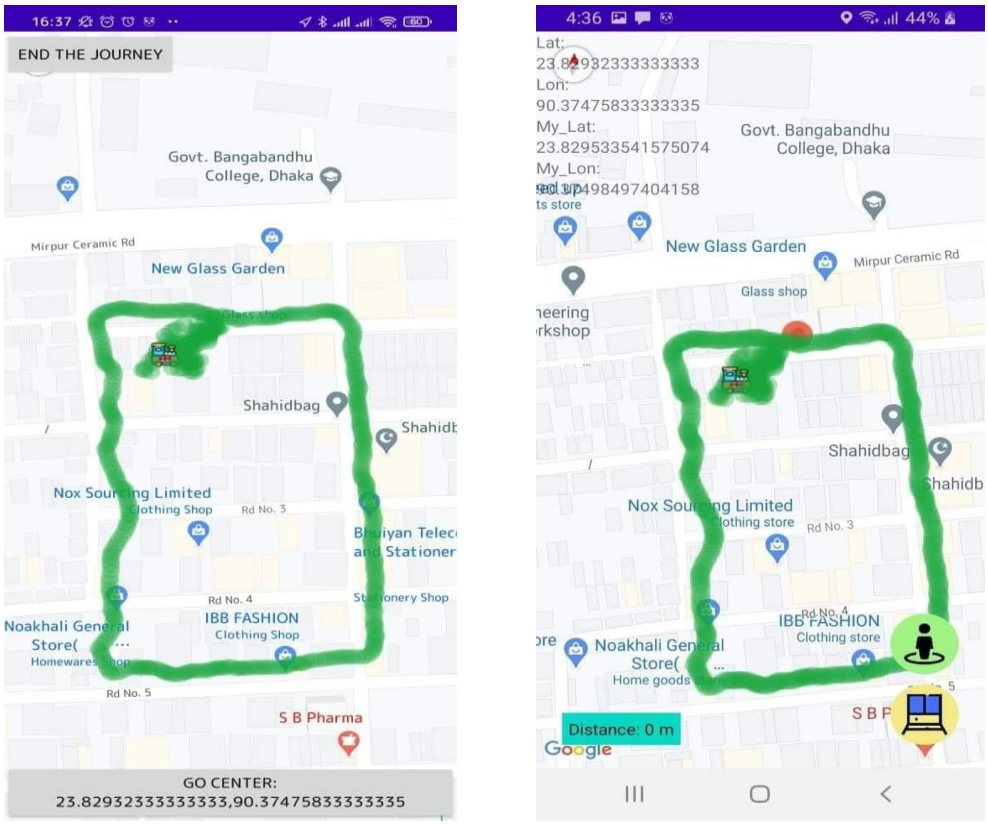


Figure 5.2: Test Results

# CHAPTER 6

# IMPCT ON SOCIETY, INVIRONMENT AND SUSTAINABILITY

## 6.1 Introduction

This project have deigned easy and comfortable for using people. The future of railways the industry is expected to rely on society's smart transportation system. New service BR, such as integrated security, ticket management and predictive maintenance etc. Expect improvement in timely decision making for issues such as security, scheduling and systems power. Smart railroads represent a combination of interconnected technological solutions and components as well as modern transport infrastructure such as train tracking application. As such, these arrangements require easy connection and integrated non-stop tracking applications, solutions to optimize people's use for training in secure services society [13]. This project impact to do easy of people's life in society and comfortable. These factors of society include the increasing importance of sustainability and environment of management 'BR'.

### 6.2 Impact on Society

Now, train services play an important role in society. . It is expected that the train tracking apps is satisfied to know proper about train information of people's in the society. Surely, it's to give properly information and impact people's to play an important role in the society. Project there may be a better solution to this problem. People are used so they know about trains. The application has information to use and applications have been created to improve them.

So, this project is very useful to know about train scheduling and safe to people's time in the society.

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### 6.3 Impact on Environment

All the phrase of this project design simply. We are using online System. We hope that it don't make any impact on environment.

### 6.4 Ethical Aspects

In this application the main data will controlled by super admin who is directly requite by government so application privacy would be maintain and safe. By using this application only Driver and user can be see their live location. So the data is safe.
User and driver will only use the data to get their live location. User and driver basic data control and save by super admin so database safe by administration.

### 6.6 Sustainability Plan

This is a development project. It is able to develop any time. In recent Technology are developed day by day.
Hopefully, we use more significant features on this application. It can be fulfill user demand.

# CHAPTER 7
# CONCLUATION AND FUTURE SCOPE

## 7.1 Discussion and Conclusion

Nowadays, All Bangladeshi's people want to travel easy way and get about information in proper way. Hopefully this project will play an important role for the common man for train travel. We are completing our project for the people of the country in general to get advanced train travel services. Users can use it from anywhere on any smartphone via internet connection. Users can easily search, find the place, date, driver and train etc. of the schedule as needed.

The proposed model is a common prototype that will come in handle to the public with train contact information. This system is highly reliable and effective at any rural area, sub urban area and the train routes. Needless to say, through this project we can get our easy train travel service. And it will be possible to make the most of our busy schedule. Therefore, it can be said that undoubtedly all the modules of this system will work and train travel will be convenient.

## 7.2 Scope for Further Developments

This is an open application. Everyone can use it easily. Yet we are trying to improve it. Applications by removing restrictions. Our first goal is to develop web views. This, the user of this app can imagine the train and it will be more realistic the same. This system will have more advanced features if we are able to use payment maps over time. Us too IOS and Windows versions are trying to develop this application for users.

We can be use this application for metro-rail in our country perspective. In future we will try to add a massaging part where driver and super admin can be discuss with each other, super admin can be through direction to driver.

# REFERANCES


[1] Bangladesh Railway, available at << https://en.wikipedia.org/wiki/Bangladesh_Railway >>, last accessed on 25 February 2021

[2] BD train tracker, available at << https://apkpure.com/bd-train-tracker/com.walton.bdtrainlocator >>, last accessed on 26 April 26, 2021; 01:03 AM

[3] Google play store, available at << https://play.google.com/store/apps/details?id=com.webnewsapp.indianrailways&hl=en_IN&gl=US >>, last accessed on April 26, 2021; 01:23 AM

[4] Logical data model, available at << https://www.ibm.com/docs/en/ida/9.1.2?topic=modeling-logical-data-models >>, Last accessed on April 26, 2021; 02:44 AM

[5] Design requirement, available at << https://www.sciencedirect.com/topics/engineering/design-requirement# >>, last accessed on April 26, 2021: 05:50 AM

[6] Front end designer, available at << https://medium.com/nybles/front-end-designer-cb9198e9801e >>, last accessed on April 23, 2021; 08.36 PM

[7] Goodfirms, available at<< https://www.goodfirms.co/glossary/backend/ >>, last accessed on April 25, 2021; 7:57 AM

[8] The basic of an android app, available at << https://codeyourenthusiasm.wordpress.com/2012/08/29/the-basics-of-an-android-app/ >>, last accessed on April 23, 2021; 08:42 AM

[9] Adobe, available at << https://xd.adobe.com/ideas/principles/human-computer-interaction/what-is-interaction-design/ >> last accessed on April 25, 2021; 11:14 PM

[10] Product plan, available at << https://www.productplan.com/glossary/user-experience/ >>, last accessed on April 25, 2021; 11:03 PM

[11] Firebase, available at << https://firebase.google.com/docs/database >>, last accessed on April 25, 2021; 01.02 PM


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[12] Guru 99, available at << https://www.guru99.com/unit-testing-guide.html >>, last accessed on April 25, 2021; 10:17 PM

[13] Towards the Internet of Smart Trains, available at << https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5492363/ >>, last accessed on 1st March 2021

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