MAR IVANIOS COLLEGE (AUTONOMOUS)

Mar Ivanios Vidya Nagar, Nalanchira

Thiruvananthapuram-695015

B.Sc. Computer Science Major Project (Phase I) Report

EV Charging Station Finder and Slot Booking System

Submitted in partial fulfilment of the requirements for the Fifth Semester

B.Sc. Computer Science

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DEPARTMENT OF COMPUTER SCIENCE

CERTIFICATE

This is to certify that the project entitled "EV Charging Station Finder and Slot Booking System" is a bona fide record of the work done by S Arya (Reg no: 2210807), Abin Suresh (Reg no: 2210813), and Nithin A Kumar (Reg no: 2210832), in partial fulfilment of the requirements for the award of the Degree of Bachelor of Science in Computer Science by the University of Kerala.

INTERNAL GUIDE **HEAD OF THE DEPARTMENT**

EXTERNAL EXAMINERS

1.

2.

ACKNOWLEDGEMENT

We would like to express our genuine and heartfelt gratitude to everyone who has assisted us in this quest. Without their active advice, help, collaboration and encouragement, we would not have achieved headway in the project.

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ABSTRACT

The Electric Vehicle (EV) market is rapidly expanding with the increasing demand for sustainable transportation options. However, one of the major challenges of owning an EV is finding charging stations while on the go. To address this issue, an Electric Vehicle Charging Station Finder application has been developed for EV owners. This application provides users with useful information such as station availability, charging speed, and pricing. The app also allows users to reserve charging stations in advance and receive notifications regarding the slot booking. With the Electric Vehicle Charging Station Finder app, EV owners can experience a hassle-free and convenient charging experience, making electric transportation more accessible and sustainable for all. In addition to the Electric Vehicle Charging Station Finder app, we also offer a platform for EV owners to share their charging stations experience with others through ratings and review.

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1. INTRODUCTION

These days, electric vehicles that require charging are ubiquitous. Due to the overwhelming preference of drivers for electric vehicles, a variety of electric vehicle models, including two- and four-wheelers, are now available on the market. The growing number of electric vehicles is also contributing to the increase in EV charging stations. Because these vehicles are charging-only, they must be charged at the appropriate time. Unlike petrol, diesel, or CNG stations, which are found everywhere, charging stations are not readily available and locating them can be challenging for EV drivers, especially when traveling to new areas. The rider will bring his electric vehicle to the station so that it can be charged, but he might have to wait if the station is already in use. It is therefore essential to create a mobile application that will enable EV owners to find EV charging stations more quickly and effectively.

The user will find this application useful for booking slots and knowing about the station. The user must first register with the app in order to use it. Once the location has been fetched, the user can access details about every station in the nearby areas, including the number of charging slots that are available, images, ratings, descriptions, and operating hours of each station, among other information. By making a minimal advance payment, a rider can reserve a time slot in advance while taking the station's pricing and services into account. After the charging session is over, you can pay the remaining balance with the assistance of the station admin.

Electric vehicles are becoming more and more common because of their benefits to the environment and capacity to reduce reliance on fossil fuels. However, the accessibility and availability of charging infrastructure is one of the primary worries for EV owners. It encourages more people to think about switching to electric vehicles by creating an app that makes it simple for users to locate charging stations.

1.1 PURPOSE OF THE PROJECT

Our project “EV Charging Station Finder and Slot Booking System” is an android app that helps EV owners to find charging stations along the route, reducing range anxiety and increasing confidence in EV usage. In comparison to traditional internal combustion engine

vehicles, electric vehicles help to lower carbon emissions and improve air quality. Through the promotion of sustainable development and alignment with global efforts to combat climate change and achieve a greener future, the project facilitates the growth and accessibility of EV charging infrastructure. By offering a practical and dependable charging station finder app with slot booking capabilities, the project seeks to remove obstacles related to EV charging infrastructure, improve user experience, and promote the adoption of electric vehicles.

1.2 OBJECTIVE

In this project, we will create an app that allows users to locate charging stations in their area. The app will list out every EV charging station in the specified area. Thus charging stations become easily navigable by the user. Depending on the type and charging port of the user's vehicle, this app will allow them to schedule convenient times to charge their electric vehicles. Owners of electric vehicles will save a ton of time with this app. The app that we will create for this project will benefit owners of electric charging stations as well. This app will give the station owner information about every booking made by users to charge their vehicles. Upon successful completion of our project, the app will be able to:

- Charging Station Discovery
- Real-Time Availability
- Slot Booking
- User Reviews and Ratings
- Billing history

2. LITERATURE SURVEY

2.1 EV Charging Station Finder App

“Ev Charging Station Finder App" is developed by Aditya Tarle, Bhushan Pagare, Shubham Borade, Nitin Nimbekar (June 2023) to help EV drivers locate available charging stations near them.In this paper an app is developed that allows the car owners to not wait in the long queue at the charging station. The users can book the spot in advance so that they don’t need to wait at the time of need. Thus, there will be no hassle for users to charge their electric vehicles. Users can easily locate and book charging stations that meet their specific needs, saving time and ensuring a hassle-free charging experience. The goal of this study is to determine the optimal number and locations of electric vehicle charging stations in the area supplied by the main electricity grid in city, taking account the expected location, number and movement/ charging patterns of electric vehicles. (1)

2.2 EV Charging Station Finder and Slot Booking Application

"Ev Charging Station Finder And Slot Booking Application" is developed by Ashwini Deokate, Vrushali Patil, Raunak Sirsam, Vidisha Sondawale, Ajay Hedau, Abhishek Gupta. (Apr 2023). This paper focuses on a charging station app that aims to provide users with seamless access to information about the nearest charging stations, as well as the ability to book these stations conveniently through online payment. The application offers a range of features to enhance the user experience. Users can easily find information about all the charging stations in their area, including details such as the number of available charging slots, station images, ratings, descriptions, and operational hours. This comprehensive information ensures that users have all the necessary details to make informed decisions about where to charge their electric vehicles .One notable feature of the application is its ability to facilitate online booking of charging stations. Users can book a charging slot by making an online payment, ensuring that they have a designated slot reserved for their vehicle. This feature eliminates the need to physically visit a charging station to check for availability, streamlining the charging process and saving users time and effort. The application also offers regular notifications to keep users updated on important information. These notifications can include payment confirmations, charging slot availability updates, the closest charging station, and any other relevant updates. By providing timely notifications, the app ensures that users are informed and can plan their charging needs efficiently. (2)

2.3 Electric Vehicle Charging Station Finder And Slot Booking Mobile Application using Flutter

"Electric Vehicle Charging Station Finder And Slot Booking Mobile Application Using Flutter" is developed by Vinod Kumar, Trupti Panhale, Pragati Kale, Akeshrain Gedam (Mar 2023). This paper presents the development and implementation of a mobile app that helps users find electric vehicle charging stations using the Flutter framework. The app utilizes the Google Maps API to display the location of nearby charging stations. Users can easily see the available charging stations on the map and get information about each station, such as the type of connector, availability, and pricing. This information allows users to make informed decisions about where to charge their electric vehicles. One of the key features of the app is the ability to filter charging stations based on user preferences. Users can specify their desired connector type, pricing range, and other criteria to find the most suitable charging stations for their needs. This feature enhances the user experience by providing personalized results. Additionally, the app offers slot booking functionality, allowing users to reserve a charging slot in advance. This feature helps users plan their trips and ensures that they have a charging slot available when they arrive at the station. (3)

2.4 Electric Vehicle Charging Station Finding App

Electric Vehicle "Electric Vehicle Charging Station Finding App" is developed by Sumit S. Muddalkar, Nishant S. Chaturkar, Khushal D. Ingole, Shreyash B. Wadaskar, Rahul B. Lanjewar (Apr 2022). This app was created using Java in Android Studio and aims to provide users with a convenient and user-friendly experience when it comes to locating and utilizing electric vehicle charging stations. The app incorporates a variety of features to enhance its functionality and usefulness. One important feature is the Firebase email authentication, which ensures secure login and protects user data, providing an extra layer of security for users. Another key feature is the navigation system, which allows users to easily find the nearest charging stations. Through a map interface, users can locate charging stations in their vicinity and receive turn-by-turn directions to reach their desired station. To simplify the process of using charging stations, the app offers a slot booking and deletion system. This feature allows users to reserve a charging slot based on their preferences and requirements. Users also have the ability to delete their bookings if needed, providing flexibility and convenience. The app includes profile management, enabling users to create and manage their profiles within the app. This allows for personalized experiences and easy access to previous bookings and preferences. For seamless transactions, the app incorporates an online payment system. This allows users to make

payments for their charging sessions conveniently through the app, eliminating the need for physical transactions and enhancing the overall user experience. Real-time information is provided through the app, allowing users to check the availability status of charging stations. This feature helps users make informed decisions by providing the current availability of charging slots at a particular station. Additionally, the app allows for the addition of new charging stations to its database, ensuring that the app stays up-to-date with the latest charging infrastructure and provides users with accurate and reliable information about available stations. (4)

2.5 An Android Application for Electric Vehicle Utilities

"An Android Application for Electric Vehicle Utilities" is developed by Madhusudan G, Manas Adiki, Saikiran K , Syed Affan Hameed, Isaaq Shariff (Jun 2022). The purpose of this project was to create an application that focuses on providing utility services for electric vehicle owners. One of the key features of this application is the implementation of a navigation system. This navigation system displays a sorted list of electric charging stations and guides the user towards the nearest charging station. By utilizing this feature, users can easily find and navigate to the charging stations that are closest to their current location. Another important aspect of the application is its ability to showcase different electric vehicle companies. Based on the user's choice of a specific electric vehicle company, the application provides a list of charging stations that are available in the user's area. These charging stations are categorized using colour coding to indicate which firms own them, making it easier for users to identify and choose the charging stations that align with their preferences or requirements. Overall, "An Android Application for Electric Vehicle Utilities" offers a practical solution for electric vehicle owners by providing a navigation system that guides them to the nearest charging stations and categorizes them based on the ownership of different firms. This application aims to simplify the process of finding and utilizing charging stations, enhancing the overall experience for electric vehicle users. (5)

3. SYSTEM ANALYSIS

3.1 IDENTIFICATION OF NEED

The demand for EV charging infrastructure has increased dramatically as a result of the rise in electric vehicles (EVs). The market for electric vehicles is anticipated to expand significantly, with a predicted compound annual growth rate (CAGR) of 21.1%. By 2030, there will be an astounding 26,951,318 electric vehicles, up from an estimated 3,269,671 in 2019. This surge is predicted to occur. With encouraging incentives and growing corporate investments in EVs, the outlook for the electric car market is optimistic. Global studies predict that by 2025, EV sales will account for 10% of all passenger car sales worldwide. By 2030, that percentage is expected to climb to 28%, and by 2040, it is expected to reach an astounding 58%.

3.2 EXISTING SYSTEM

3.2.1 Application Name: KeMAPP

- KeMAPP can help you find charging stations across Kerala under KSEB for your electric vehicle.
- Currently not working.

3.2.2 Application Name: Tata Power EZ Charge

- Tata Power EZ Charge Mobile App facilitates locating EV Charging Stations in Tata Power EV Charging Network.
- Suitable for EV owners, Fleet EV owners & Taxi EV owners for charging at Tata Power EV Charging Network that covers EV Charging Infrastructure at Public, Home & Commercial spaces.
- Not available for every EV vehicle.

3.2.3 Application Name: Charzer – EV Charging

- Charzer is an EV charging platform is a one-stop shop for EV charging needs of an EV owner.
- EV owners can discover, book, pay and operate charging stations using the Charzer App.
- Does not have slot booking feature.
- Only available in Bangalore.

3.2.4 Application Name: Plugsurfing

- Plugsurfing makes it easy to charge your electric car across Europe.
- It is one of the fastest growing networks of major European operators to get fast, flexible and transparent public charging.
- Not available in India.

3.3 PROPOSED SYSTEM

In the proposed EV Charging Station App, developed using Kotlin, users will have the convenience of managing all their electric vehicles through the app. This means they can easily keep track of their EVs, access important information, and efficiently handle their charging needs. One of the key features of this app is the ability to search for available charging stations based on the user's location. This location-based search functionality ensures that users can quickly find nearby charging stations in their vicinity. To further enhance the user's search experience, the app also includes searching and filtering options. These features allow users to specify their preferences, such as the type of charging station, charging speeds, and availability of additional amenities. This helps users find the most suitable charging station that meets their specific requirements. Once users have identified a charging station, they can proceed to book a slot in advance. This booking feature allows users to secure a charging spot at their chosen station, ensuring they have a dedicated space to charge their vehicle when they arrive. The app also integrates with Google Maps for navigation purposes. Users can take advantage of this feature to receive turn-by-turn directions to the selected charging station. This simplifies the process of finding and reaching the desired charging location. To keep users informed, the app utilizes push notifications. Users will receive updates on their booking status, charging progress, and any other relevant information. These notifications ensure that users stay up to date with their charging sessions and any changes that may occur. Additionally, the app provides comprehensive details about each charging station. Users can access information such as available charging speeds, connector types, and any additional amenities offered at the station. The app also includes a Q&A feature, which allows users to ask questions, share experiences, and provide feedback about the charging stations. This feature promotes community engagement and collaboration among EV drivers. For seamless transactions, the app offers a payment option that allows users to make payments for their charging sessions directly within the app. This eliminates the need for cash transactions and provides a convenient and secure

payment method. Users can also access their billing history within the app. This feature enables them to track their charging sessions and monitor their usage over time.

3.4 FEASIBILITY STUDY

A feasibility study is carried out before the project is developed to assess the likelihood that the suggested system will be successful. To ascertain whether developing a new or enhanced system is compatible with cost, benefits, operation, and technology, a feasibility study is required.

3.4.1 TECHNICAL FEASIBILITY

One of the initial investigations carried out after the idea has been chosen is technical feasibility. The hardware and software devices are included in the technical feasibility study. Because of the extremely high processing speed and decreased maintenance work, management is persuaded that the project is operationally feasible. Android platform, a brand-new Google technology, will be used to create the Android organizer. Therefore, it is safe to undertake this project in terms of technology.

3.4.2 SOCIAL FEASIBILITY

The goal of the study is to determine how much the user accepts the system. This includes the instruction needed for the user to operate the system correctly. The system shouldn't make the user feel threatened; instead, they should view it as a need. The proposed system is very user-friendly and can be used to perform a variety of tasks using a mobile device, so the user doesn't need to provide any more resources.

3.4.3 OPERATIONAL FEASIBILITY

Operational feasibility is a metric used to assess how successfully a proposed system addresses issues, seizes opportunities identified during scope definition and satisfies requirements found during the requirements analysis stage of system development.

3.4.4 ECONOMIC FEASIBILITY

The system being developed is economic with respect to common people’s point of view. Any system is economically feasible if the expected benefits equal or exceed the expected cost of its implementation. The project is economically feasible as it only requires a mobile phone with android operating system. In the web server the project is published freely. The application is free to download through mobile phone.

4. METHODOLOGY

The EV Charging Station App offers a seamless experience for both users and station administrators. Let's break down the working of the app step by step.

For users, the first step is to either login or register an account. This ensures that their data and preferences are securely stored within the app. Once logged in, users can access the main dashboard, where they have various options available. One of these options is to view the list of available EV stations. Users can browse through the list and explore different charging stations based on their location and preferences. This allows them to select the most convenient station for their charging needs. Once a station is selected, users can proceed to choose a preferred time slot for their charging session. The app displays the available time slots, allowing users to pick a suitable time that fits their schedule. As a part of the booking process, users are required to make a minimum advance payment to secure their selected time slot. When the time arrives, users can head to the chosen charging station. The app provides navigation directions by linking it with Google Maps, making it easy for users to reach their destination. At the station, users have the option to start charging their vehicle. This can be done either manually by the user or by the station administrator, depending on the setup.
Once the charging session begins, users can monitor the progress and track the units consumed. When the charging session is complete, users can choose to stop charging. At this point, the station administrator enters the units consumed and the corresponding amount into the station's website. This information is then linked with the app. Users are then prompted to make the balance payment for the charging session, either through the app's integrated payment system or with the station administrator directly.

For station administrators, the process starts with login or registration using their station license. Once logged in, they have access to a profile section where they can manage their station details, such as available chargers and connector types. Administrators can also view the booking details for their station. This includes information about upcoming bookings, allowing them to manage and cancel bookings if necessary. They can also receive the advance payment made by users to secure their time slots. When a user arrives at the station, the admin has the option to start the charging manually on behalf of the user. This ensures a smooth charging experience for the user without any additional steps. Once the charging session is complete, the admin can stop the charging and manually enter the units consumed and the corresponding amount for the balance payment. This information is then reflected in the user's billing history within the app.

For app admin, after logging in, the admin can access the admin dashboard. From there, they have several options: Approve or reject new charging stations: The admin can review and approve or reject requests from station owners who want to list their charging stations on the app. This ensures that only verified and reliable stations are available for users. View app users: The administrator can access a list of registered app users. Add or delete FAQ questions for the app: The administrator has the ability to manage the frequently asked questions section of the app. They can add new questions or delete existing ones to provide accurate and helpful information to users.

4.1 MODULE DESCRIPTION

4.1.1 USER MODULE:

- **Register:** User can register using personal details.
- **Login:** User can login to their account using email and password.
- **Find and select EV stations:** User can find EV station by fetching current location and select it.
- **Check slot availability:** User can choose their convenient slot.
- **Book slots:** User can book their required slot.
- **Navigation:** User can navigate towards the booked station with the help of Google map.
- **View bookings:** User can view latest and previous bookings from billing history.
- **Payment:** User can pay for their slot and charging.
- **FAQ:** User can query questions related to EV.
- **Ratings and reviews:** User can rate and review about the charging station.

4.1.2 STATION MODULE:

- **Register:** Station admin can register using personal details.
- **Login:** Station admin can login to their account using email and password.
- **Update Station entities:** Station admin can edit station details like station name, address, chargers, pricing details etc.

- **View bookings:** Station admin can view slot bookings.
- **Payment:** Station admin can select a specific booking for payment process by fetching charger details for price calculation.
- **Ratings and reviews:** Station admin can view their station ratings reviews from the users.

4.1.3 ADMIN MODULE:

- **Login:** Admin can login to their account using email and password.
- **Approve Station:** Admin can approve a station.
- **Reject Station:** Admin can reject a station.
- **FAQ:** Admin can edit the frequently asked questions and answers.

5. SYSTEM SPECIFICATION

5.1 SOFTWARE REQUIREMENTS

Client side (user):

- Operating System: Android OS
- Front End: Kotlin
- Back End: MySQL
- Editor: Android Studio

Server side (admin):

- Operating System: Windows
- Front End: PHP
- Back End: MySQL

5.2 HARDWARE REQUIREMENTS

- Processor: Intel Core i3(5th Gen)
- Clock Speed: 2.86GHZ Processor minimum
- Hard disk: 40 GB minimum
- RAM: 8GB minimum

5.3 LANGUAGE DESCRIPTION

5.3.1 Android Operating System

Android is an operating system based on Linux with a Java programming interface. It provides tools, e.g. a complier, debugger and a device emulator as well as its own Java Virtual machine. Android is created by the Open Handset Alliance which is led by Google. Android uses a special virtual machine, e.g. the Dalvik Virtual Machine. Dalvik uses special bytecode. Therefore, you cannot run standard Java bytecode on Android. Android provides a tool “dx” which allows to convert Java Class files into “dex” (Dalvik Executable) files. Android applications are packed into an .apk (Android Package) file by the program “aapt” (Android

Asset Packaging Tool). To simplify development Google provides the Android Development Tools (ADT) for Eclipse. The ADT performs automatically the conversion from class to dex files and creates the apk during deployment. Android supports 2-D and 3-D graphics using the OpenGL libraries and supports data storage in a SQLite database. Every Android application runs in its own process and under its own userid which is generated automatically by the Android system during deployment. Therefore, the application is isolated from other running applications and a misbehaving application cannot easily harm other Android applications.

5.3.2 Android Studio

The official IDE for developing Android applications is called Android Studio. More capabilities offered by Android Studio increase our ability to produce high-quality Android apps.

A quick and feature-rich emulator is available in Android Studio for testing apps, and it features a configurable Gradle-based build system. It supports the Native Development Kit (NDK) and C++. It has built-in Google Cloud Platform compatibility. It makes integrating App Engine and Google Cloud Messaging simple.

5.3.3 phpMYadmin

In order to manage MySQL administration over the web, phpMyAdmin is a free Hypertext Preprocessor (PHP) coded software solution. Numerous operations on MySQL and MariaDB are supported by phpMyAdmin. While you can still manually run any Structured Query Language (SQL) statement, frequently used tasks can be carried out through the user interface.

For managing MySQL databases, it is the most widely used programme. Using this software, we can create, update, drop, change, remove, import, and export MySQL database tables. On both MySQL and MariaDB, phpMyAdmin offers a wide range of operations, including managing databases, relations, tables, columns, indexes, permissions, and users, among other things. We still have the option to run any SQL statement while carrying out these activities via user interface.

5.3.4 Kotlin

Kotlin is a modern programming language that runs on the Java Virtual Machine (JVM) and can be used to develop a wide range of applications. It was developed by JetBrains and first

released in 2011. Kotlin is designed to be concise, expressive, and interoperable with existing Java code, making it a popular choice for Android app development.

Kotlin provides a variety of features and functionalities that make it easier to manage and manipulate code. With Kotlin, developers can perform numerous operations, such as creating, updating, and removing data, as well as defining classes, functions, and variables.

Kotlin offers a user-friendly and intuitive syntax, which allows developers to write clean and readable code. It also provides extensive tooling support, including integrated development environments (IDEs) like Android Studio, which offers features like code completion, debugging, and refactoring.

5.3.5 MySQL

MySQL is a popular and widely used relational database management system (RDBMS) that allows users to store, manage, and retrieve structured data. It was first released in 1995 and has since become one of the most widely used database systems in the world. MySQL offers a comprehensive range of operations and functionalities for managing databases. With MySQL, users can perform various tasks such as creating, updating, and deleting databases and tables, as well as inserting, updating, and deleting data within those tables.

MySQL also supports the Structured Query Language (SQL), which is a standard language used for interacting with relational databases. This means that users can run SQL statements to perform advanced operations, such as querying data based on specific criteria, joining tables, and performing calculations.

5.3.6 PHP

PHP, which stands for Hypertext Preprocessor, is a popular server-side scripting language used for web development. It was originally designed in 1994 by Rasmus Lerdorf and has since evolved into a powerful and versatile language. PHP offers a wide range of functionalities and operations for building dynamic and interactive websites. With PHP, developers can create web pages that can process forms, interact with databases, and generate dynamic content based on user input. PHP is known for its ease of use and flexibility

6. SYSTEM DESIGN

6.1 SYSTEM ARCHITECTURE DIAGRAM

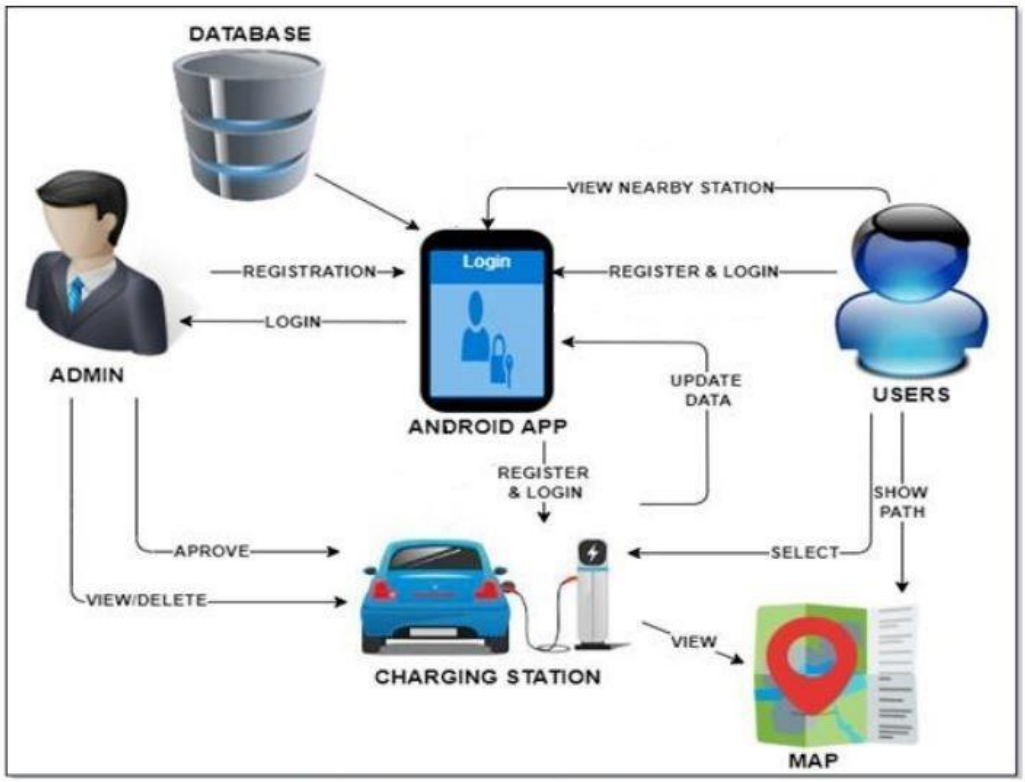

Figure 1: System Architecture

6.2 DATA FLOW DIAGRAM

6.2.1 Level 0: Context Level DFD

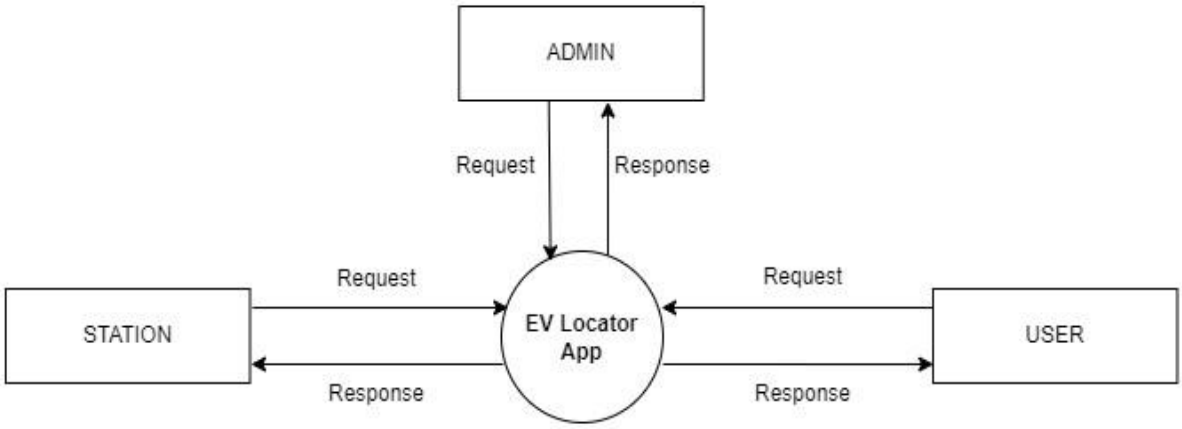

Figure 2: Level 0 DFD

6.2.2 Level 1: STATION DFD

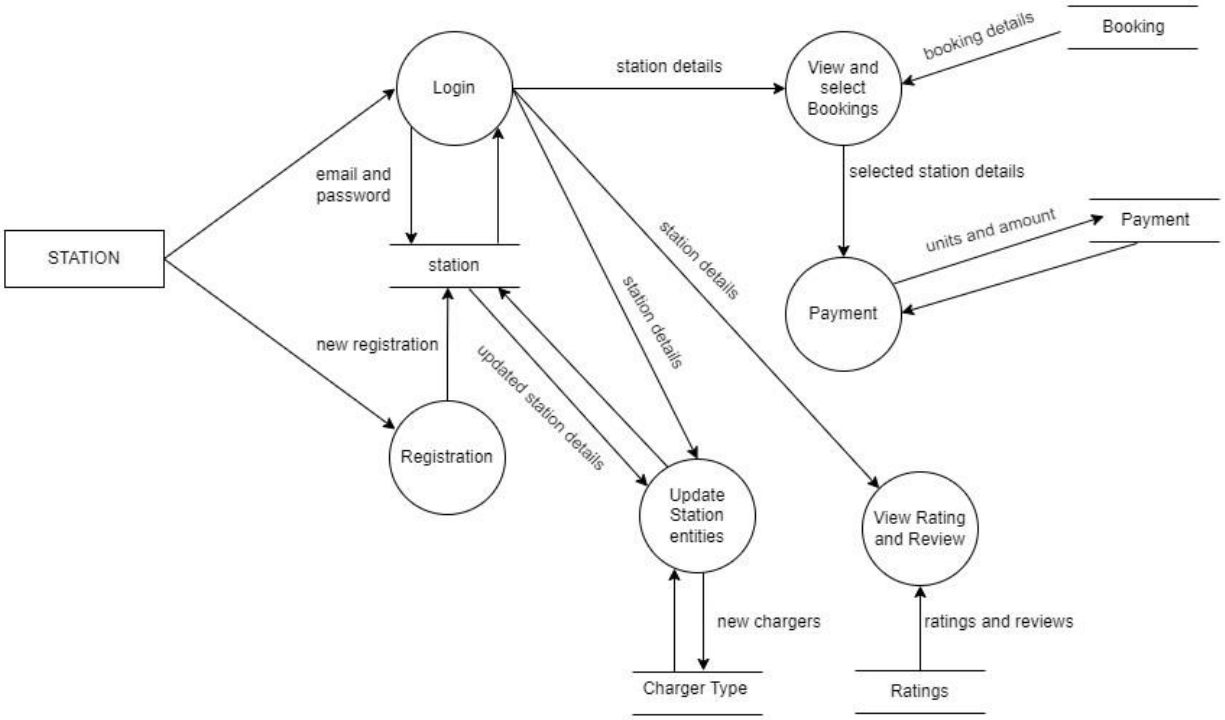

Figure 3: Level 1 Station DFD

6.2.3 Level 1: ADMIN DFD

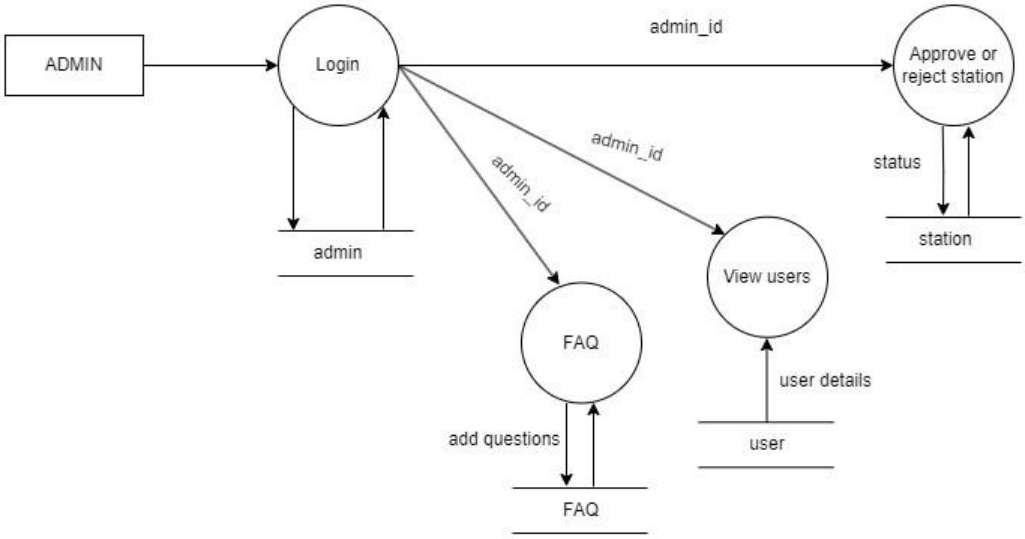

Figure 4: Level 1 Admin DFD

6.2.4 Level 1: USER DFD

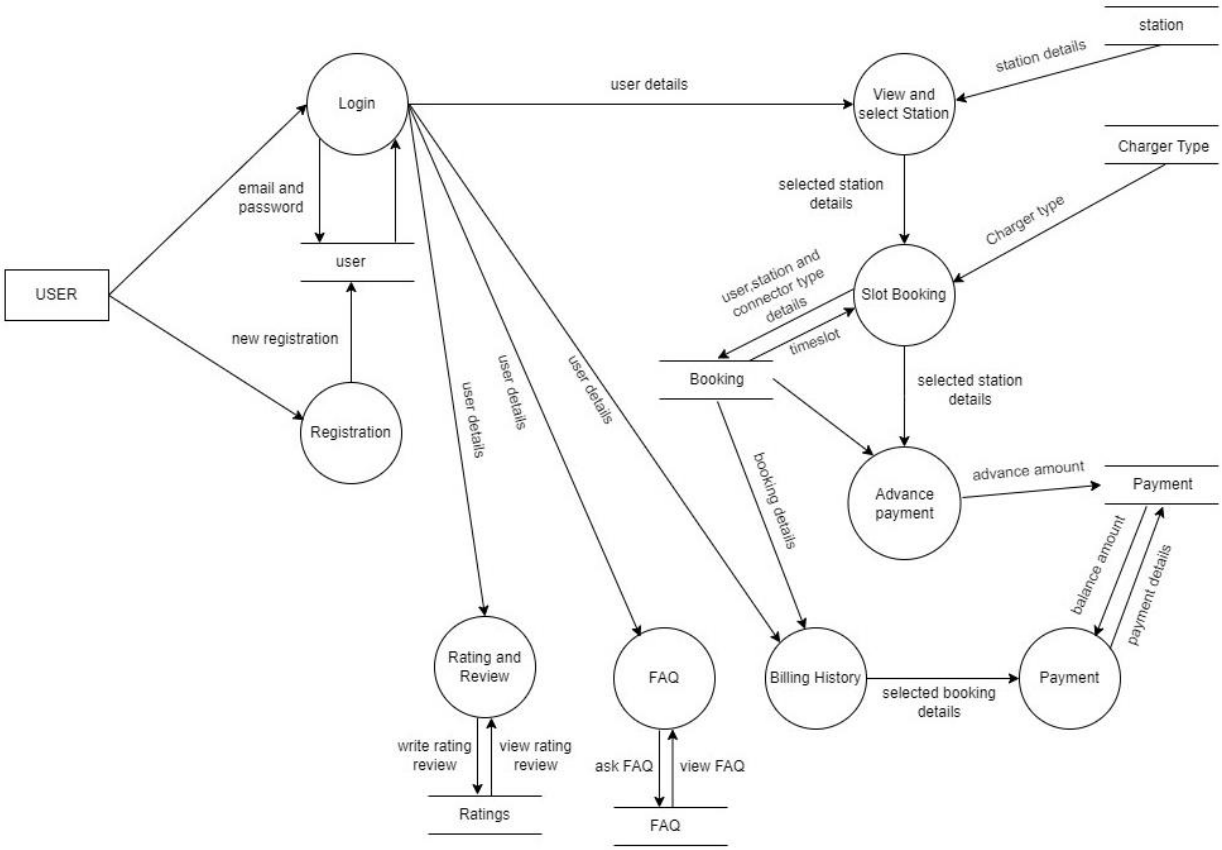

Figure 5: Level 1 User DFD

6.3 ER DIAGRAM

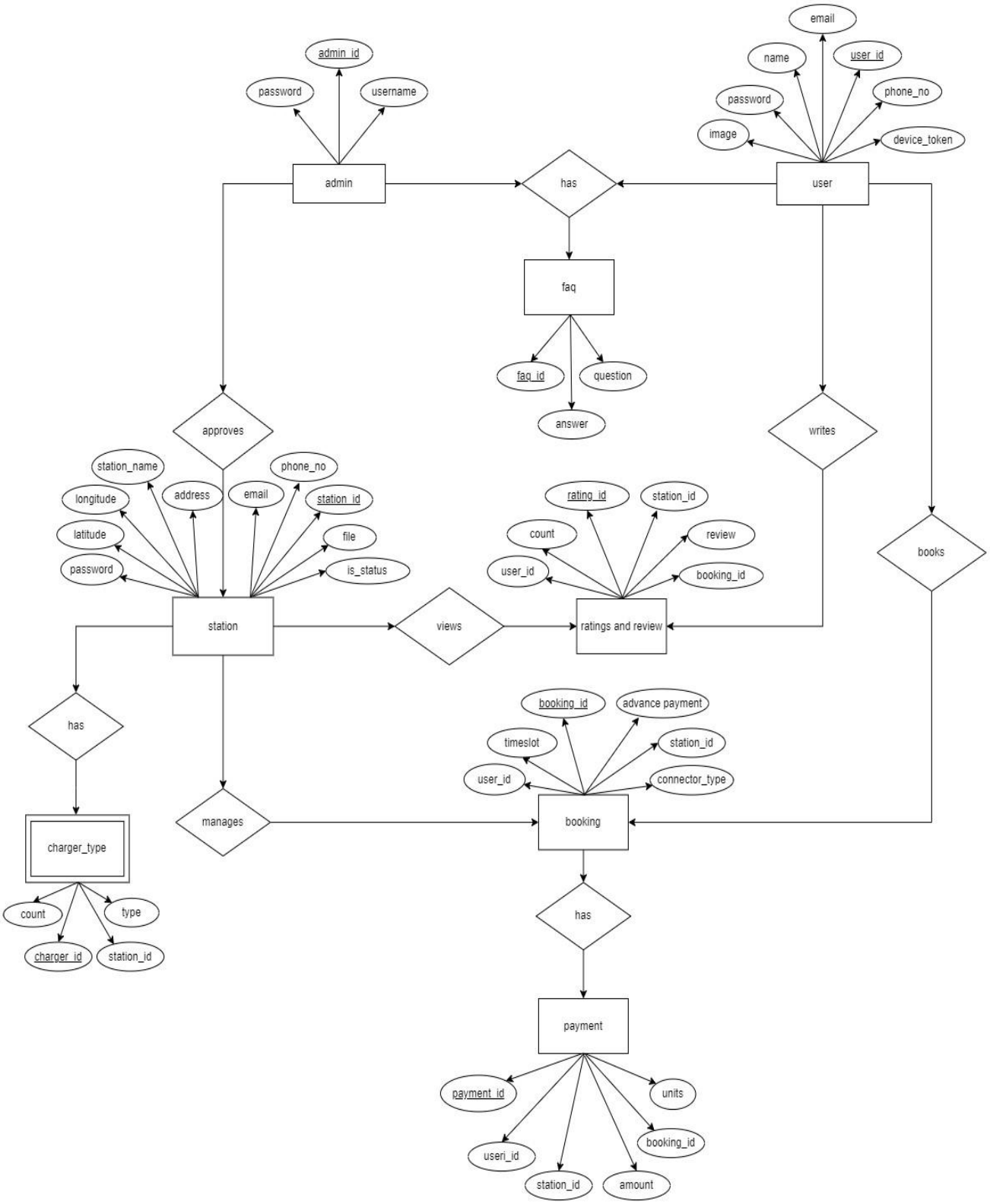

Figure 6: ER Diagram

6.4 USECASE DIAGRAM

6.4.1 ADMIN

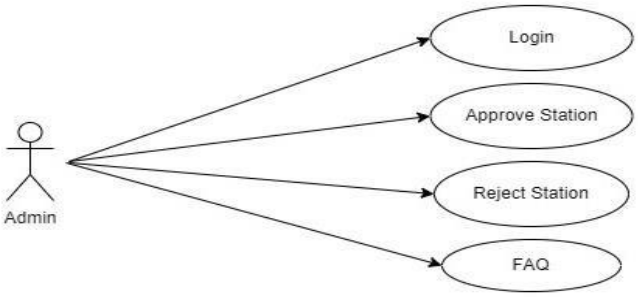

Figure 7: Admin Use case Diagram

6.4.2 USER, STATION

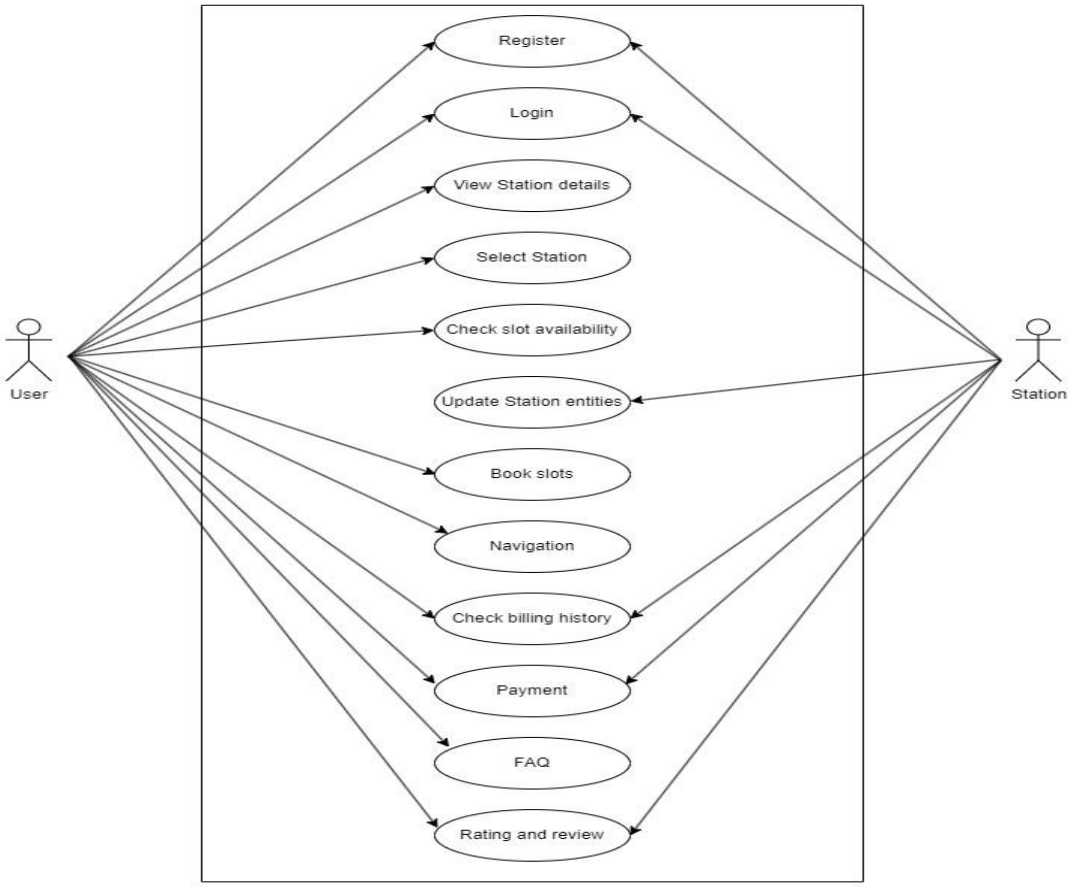

Figure 8: User, Station Use case Diagram

6.5 TABLE DESIGN

6.5.1 Station

Field Name	Data Type	Constraints	Description
Station_id	Int(11)	Primary Key	Id of Station
Name	Varchar(100)		Name of Station
Email	Varchar(100)		Email of Station
Phone	Varchar(100)		Phone number of Station
Password	Varchar(100)		Password of Station
Address	Varchar(250)		Address of Station
Latitude	Varchar(100)		Latitude of Station
Longitude	Varchar(100)		Longitude of Station
File	Varchar(100)		To store link of station's license
Is_status	Int(11)		To request, approve and deny station

6.5.2 User

Field Name	Data Type	Constraints	Description
User_id	Int(11)	Primary Key	Id of user
Name	Varchar(100)		Name of user
Phone_Number	Varchar(100)		Phone number of user
Email	Varchar(100)		Email of user
Password	Varchar(100)		Password of user
Device_Token	Varchar(500)		To receive notification
Image	Varchar(100)		User image

6.5.3 Admin

Field Name	Data Type	Constraints	Description
Admin_id	Int(11)	Primary Key	Id of Admin
Username	Varchar(100)		Username of Admin
Password	Varchar(100)		Password of Admin

6.5.4 Booking

Field Name	Data Type	Constraints	Description
Booking_id	Int(11)	Primary Key	Id of Booking
User_id	Int(11)	Foreign Key	Id of User
Station_id	Int(11)	Foreign Key	Id of Station
Timeslot	Varchar(100)		Timeslot for booking
Connector_type	Varchar(100)		Type of connector

6.5.5 Charger Type

Field Name	Data Type	Constraints	Description
Charger_id	Int(11)	Primary Key	Id of Charger
Type	Varchar(100)		Type of Charger
Count	Int(11)		Number of chargers
Station_id	Int(11)	Foreign Key	Id of Station

6.5.6 FAQ

Field Name	Data Type	Constraints	Description
Faq_Id	Int(11)	Primary key	Id of Faq
Answer	Varchar(500)		Answer for Question
Questions	Varchar(500)		Questions

6.5.7 Payment

Field Name	Data Type	Constraints	Description
Payment_id	Int(11)	Primary Key	Id of Payment
User_id	Int(11)	Foreign Key	Id of User
Station_id	Int(11)	Foreign Key	Id of Station
Booking_id	Int(11)	Foreign Key	Id of Booking
Advance_payment	Int(11)		Advance payment amount
Amount	Int(11)		Amount to pay
Unit	Int(11)		Unit of charge

6.5.8 Rating

Field name	Data Type	Constraints	Description
Rating_id	Int(11)	Primary Key	Id of Rating
Count	Int(11)		Number of rating
User_id	Int(11)	Foreign key	Id of User
Station_id	Int(11)	Foreign key	Id of Station
Review	Varchar(500)		Review from user
Booking_id	Int(11)	Foreign Key	Id of Booking

6.6 USER INTERFACE DESIGN

6.6.1 Application User interface

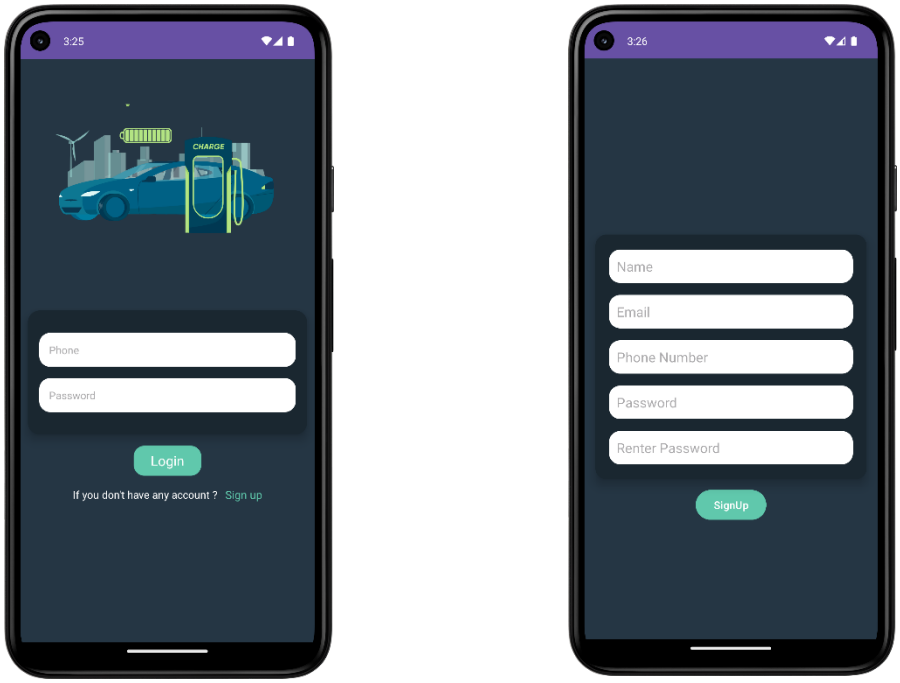

Figure 9: User login, registration

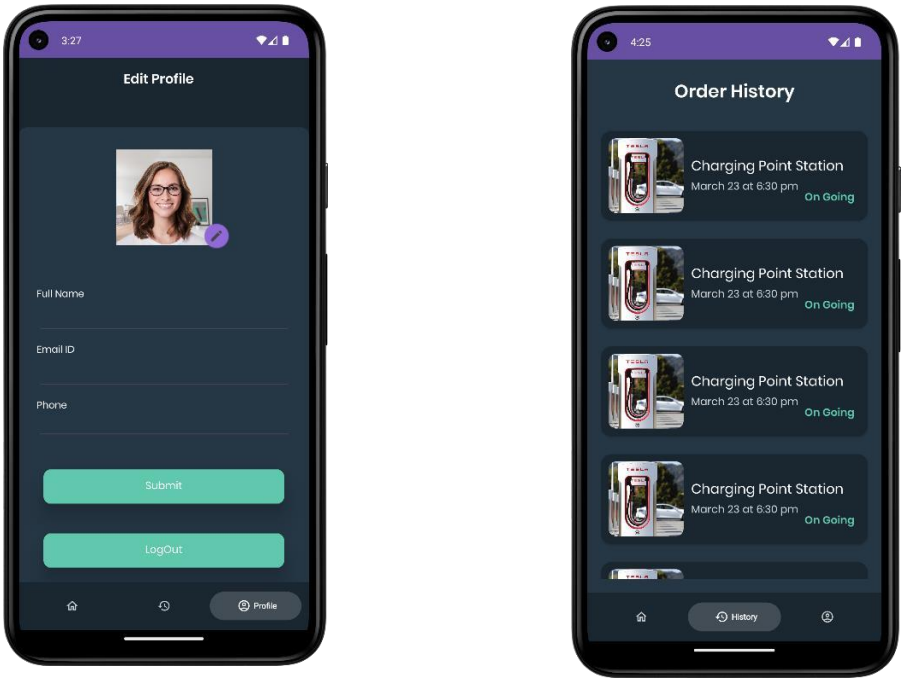

Figure 10: User profile, Order history

6.6.2 Admin Website User interface

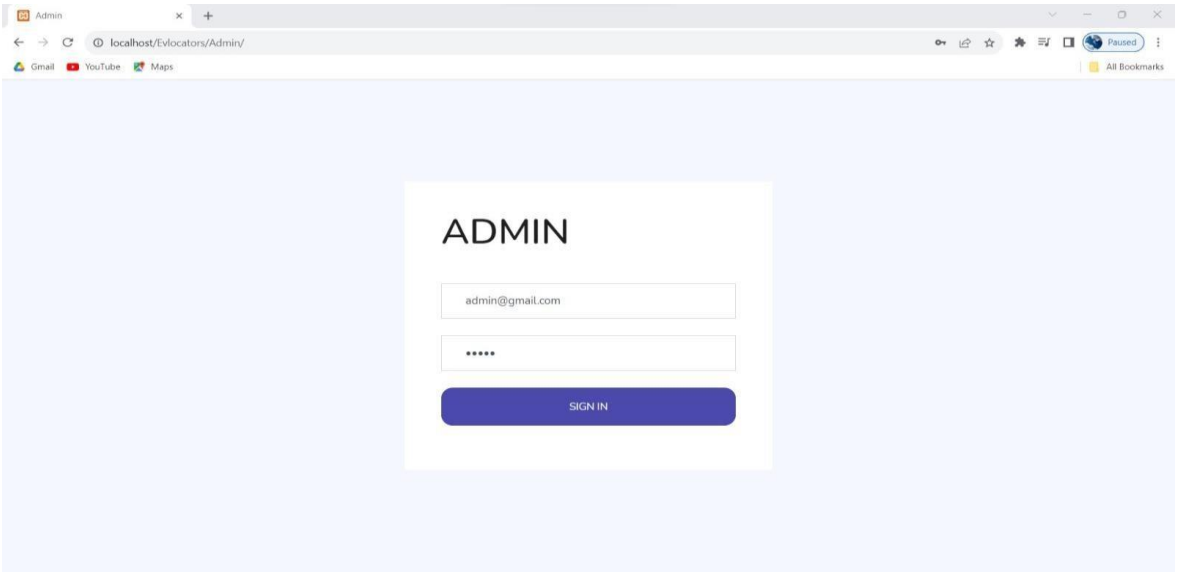

Figure 11: Admin login

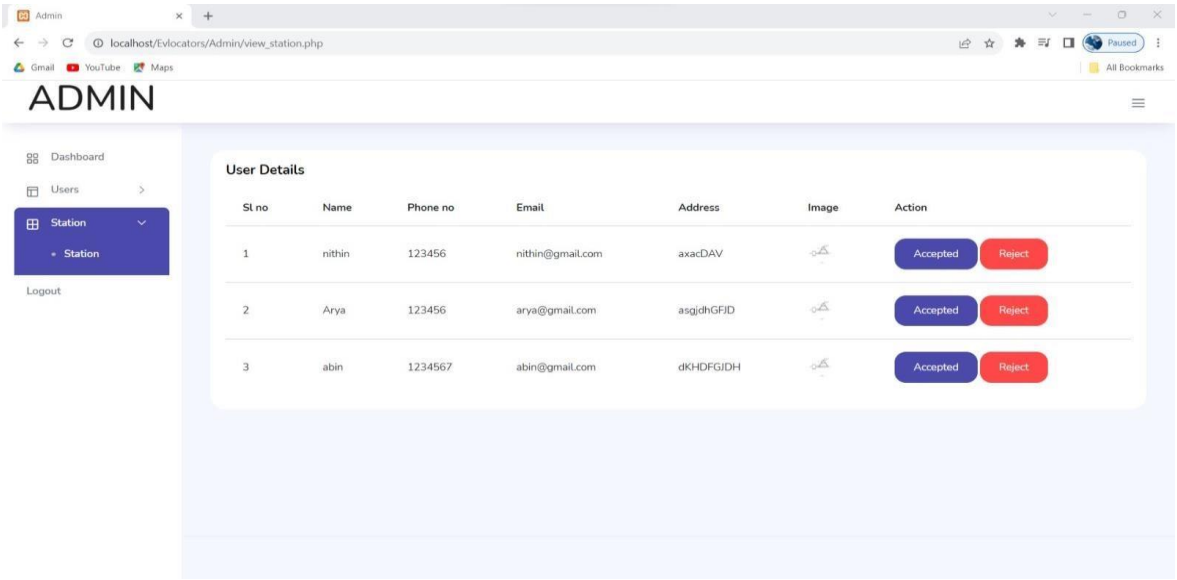

Figure 12: Admin page

6.6.3 Station Website User interface

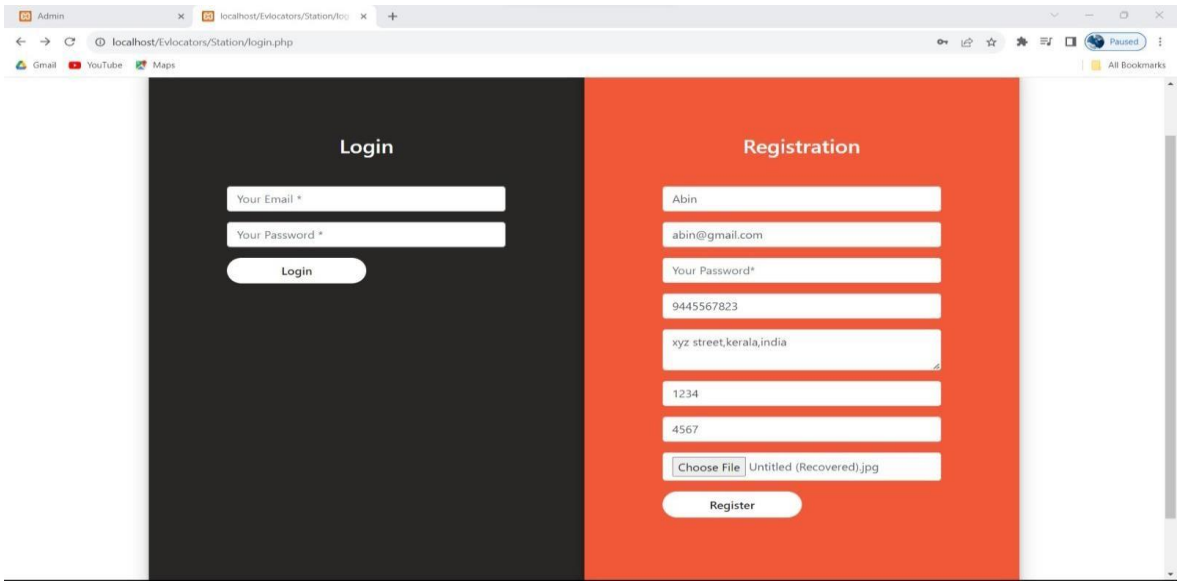

Figure 13: Station login and registration

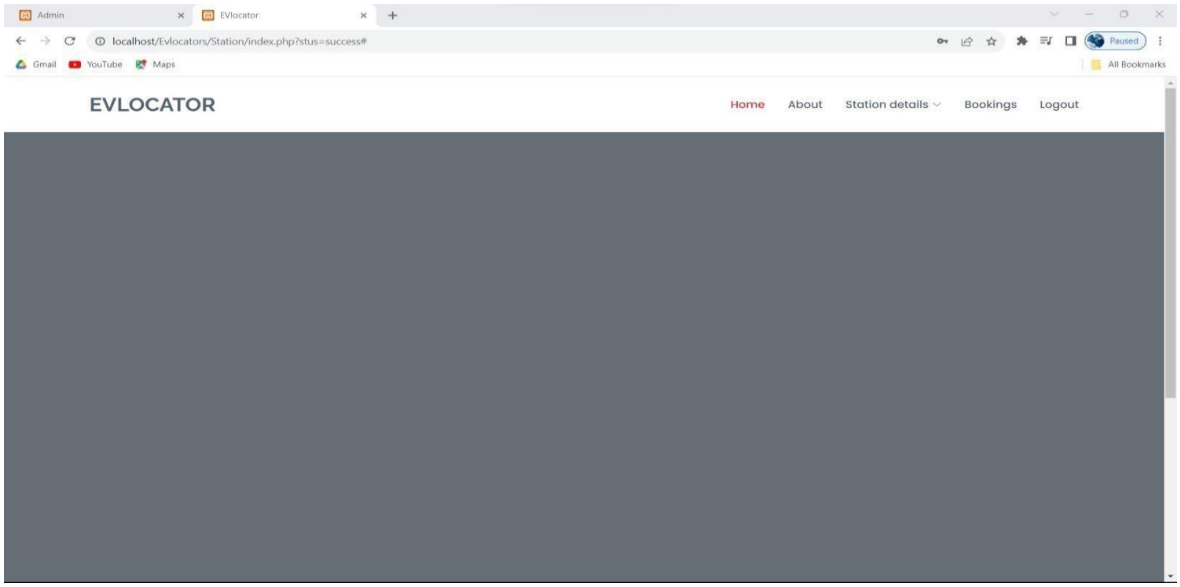

Figure 14: Station page

7. CONCLUSION

In conclusion, an EV charging station finder and slot booking system can provide significant benefits for EV owners, helping them locate and reserve charging stations more efficiently, reduce congestion, and promote sustainable transportation. Features such as location-based search, charging station details, slot booking, payment integration, notifications, user reviews and ratings, filter options, and navigation can make the system user-friendly, convenient, and effective. As EVs become increasingly popular, the need for charging infrastructure is growing, and a charging station finder and slot booking system can help ensure that charging stations are available when and where they are needed, contributing to the widespread adoption of EVs and a cleaner, more sustainable future.

8. BIBLIOGRAPHY

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