PARSHWANATH CHARITABLE TRUST'S
A.P. SHAH INSTITUTE OF TECHNOLOGY
Department of Computer Science and Engineering
Data Science

EV Charging Station Availability Using Flask

Sneha Gupta 22107042
Priyal Madvi 22107020
Ayush Gupta 23207007
Rushikesh Palekar 23207004

Project Guide

Prof. Sheetal Jadhav

Outline

- Introduction
- Literature Survey of the existing systems
- Limitations of the existing systems
- Problem statement
- System Design
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- Implementation
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Introduction

- An Electric Vehicle (EV) charging station is a facility that provides electrical energy to recharge electric vehicles. As the popularity of electric cars continues to grow, the demand for infrastructure to support them has led to the widespread installation of EV charging stations.
- EV charging stations contribute to the reduction of greenhouse gas emissions by promoting the use of clean energy sources for transportation.

1.1 Motivation

- Improving EV charging accessibility and enhancing the user experience
- Promoting eco-friendliness through prevelant EV adoption and optimized charging infrastructure

1.2 Objectives

- To enhance the user experience by providing information about nearby charging stations, including their locations.
- To promote efficient use of charging infrastructure by offering real-time updates on charging station availability, reducing wait times, and optimizing charging schedules for EV owners
- To optimize EV infrastructure utilization, the project seeks to efficiently allocate charging resources, ensuring stations meet demand without excess downtime.
- To enhance EV user experience, the project offers a reliable tool with accurate charging station information
- To minimize inconvenience from unavailable charging stations, the project provides real-time updates to ensure reliable access to charging facilities.

Literature Survey of the existing system

Sr. No	Title	Author	Year	Outcomes	Methodology	Merits
1	[1] Charging behavior of electric vehicles	ENEA C.R. Casaccia ,Andrenacci , Valentini, M.P	30 Nov 2023	Charging processes for electric vehicle owners, leading to reduced wait times and optimized schedules.	Html, CSS , bootstrap - making GUI to display station information	Electric vehicle owners will not faced inconvenience due to the variety of battery types and charging requirements. Reducing wait times, and optimizing charging schedules for EV owners

Literature Survey of the existing system

Sr. No	Title	Author	Year	Outcomes	Methodology	Merits
2	[2] Electric Vehicle and its impact on distributio n system	Vikas Mahala Mansi Mutreja	06 JUNE 2023	User convenience and transparency through access to charging port usage history and a secure payment system for slot booking	Html, CSS , bootstrap, -making GUI to display station information SQL-for storing the details of the user	Users can access the history of booked slots, enabling them to review the usage history of their charging ports. The proper payment system is available, allowing users to pay for booking the slot.

Literature Survey of the existing system

Sr. No	Title	Author	Year	Outcomes	Methodology	Merits
3	[3]Electric Vehicle Charging Station Finder App	Dr Omar A. Ibrahim, Khalid J. Mohsen	2023	User will able to express their view regarding station services by giving feedback.	Flask Framework SQL-to retrieve and store the feedback in database	An user feedback system within application, allowing users to provide reviews for charging stations. Provide users with information on optimized charging schedules.

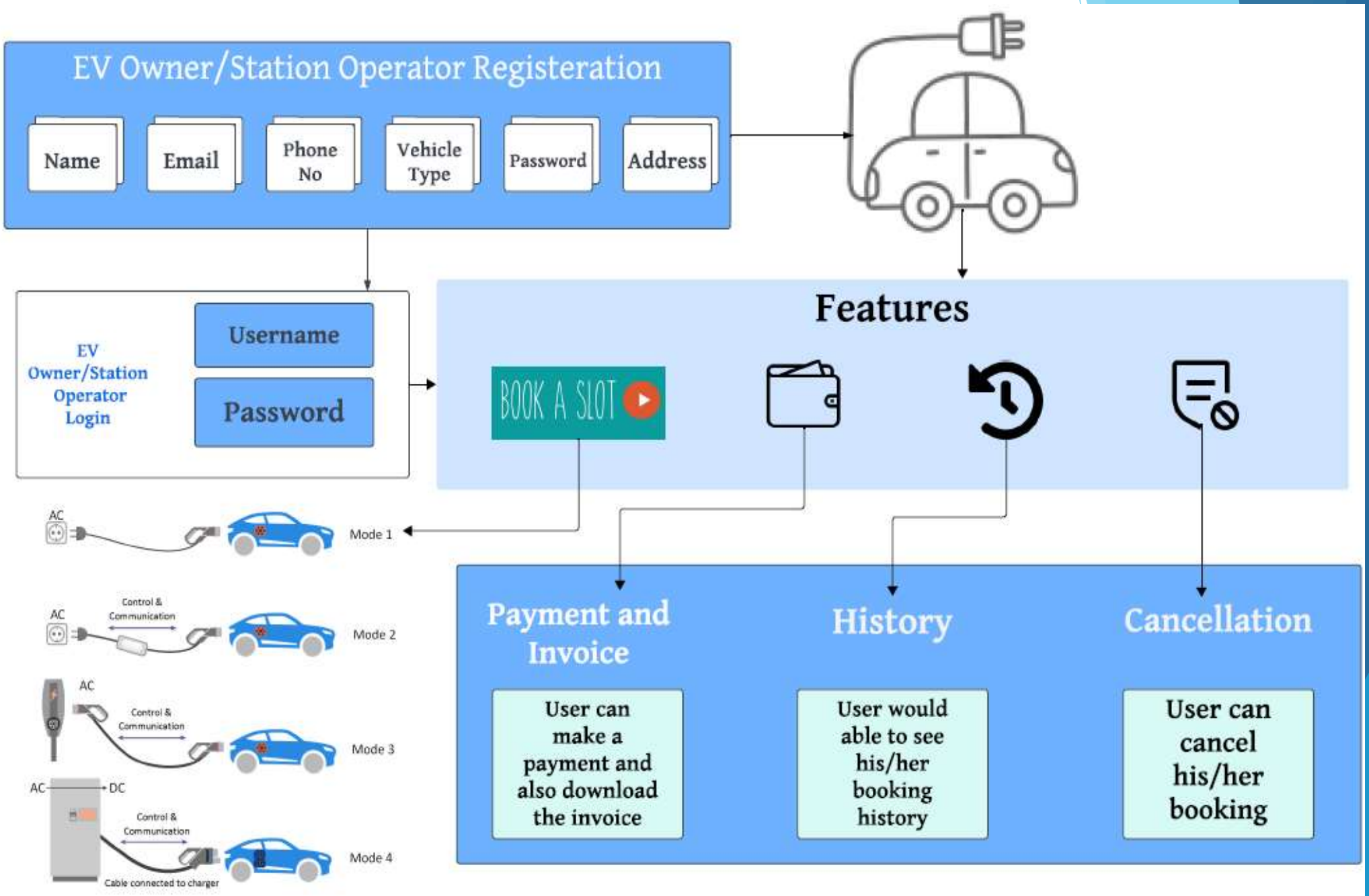
LIMITATION OF EXISTING SYSTEM

- **Booking System** : The essential booking system for operations is currently down, posing a significant challenge until it's back online
- **Cancellation :** Operational interruptions are still going on because there is no cancellation system, which in return obstructs management.
- **History**: Operational setbacks arise from the absence of a history system, impeding access to vital records.
- **Payment :** We cant download payment details.

Problem statement

- Provide essential information such as charging station locations, availability, compatibility with various EV models, pricing details, and user reviews.
- Responsive design refers to the approach of designing and developing websites or applications in a way that ensures optimal viewing and interaction experience across a wide range of devices and screen sizes, including desktops, laptops, tablets, and smartphones give it in human simple sentence
- Simplifying the process of finding and using charging stations involves making it easy for electric vehicle (EV) owners to locate nearby stations and seamlessly initiate charging.

System Design



Technologies and methodologies

Frontend Technology :

- Bootstrap 5
- CSS 4.15
- HTML 5

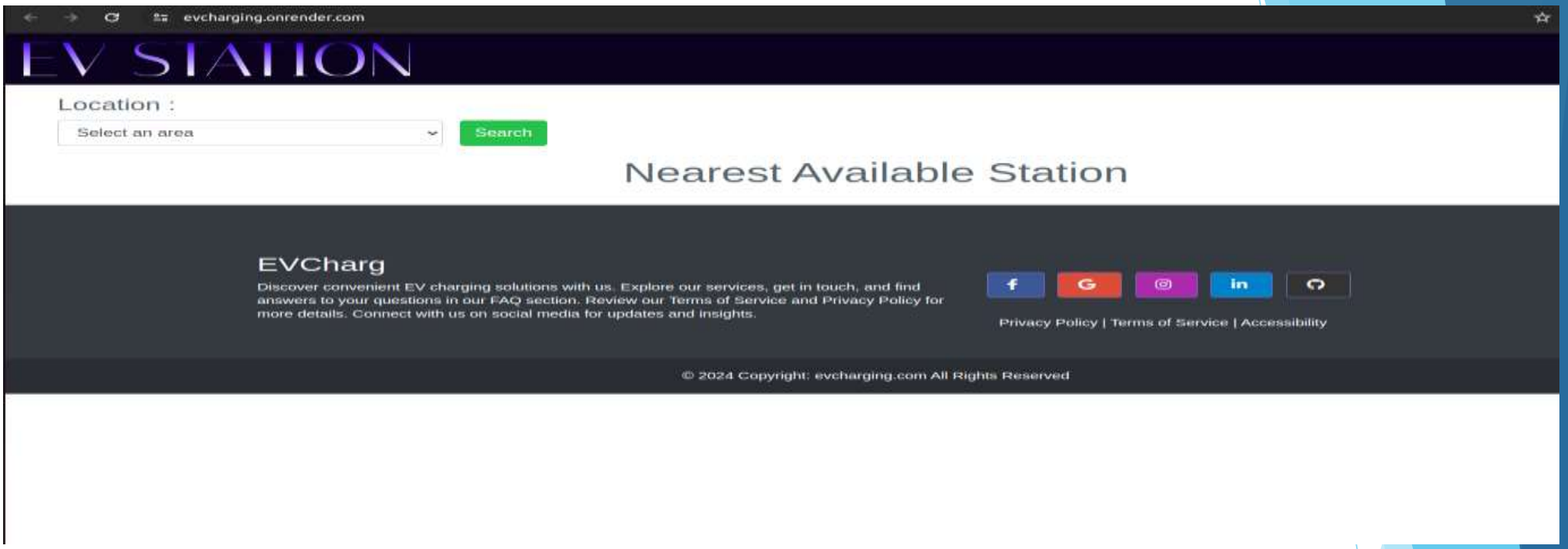
Backend technology :

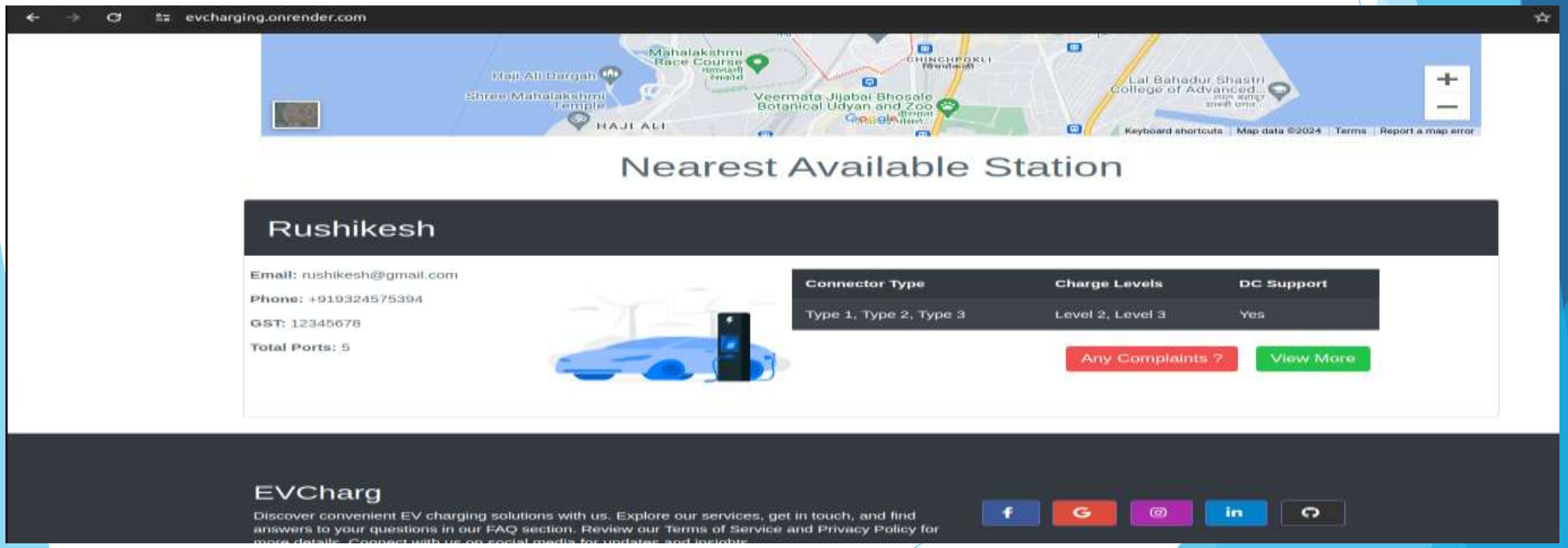
- Flask (3.0.2)
- SQL (8.0.36)
- Python (3.11.0)

Implementation

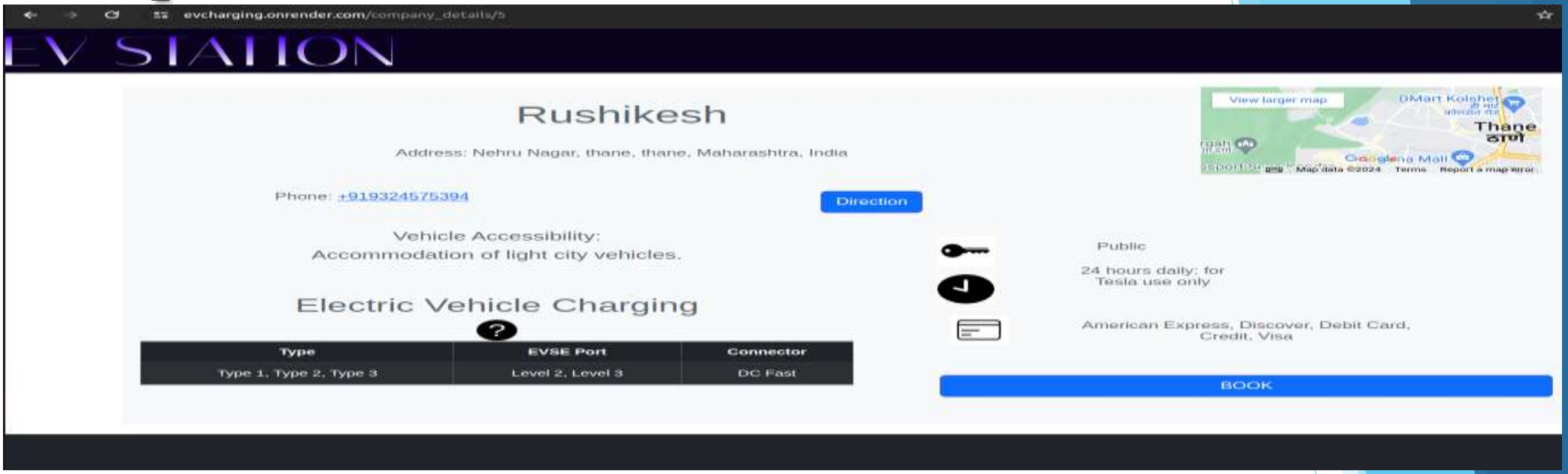
- **Station Search and Booking Feature**: Design a search functionality for EV owners to find nearby charging stations based on their location. Implement a booking system allowing users to reserve available charging slots at selected stations.
- **Invoice Generation and Download**: Develop a feature to generate invoices for booked charging sessions, including details such as date, time, duration, and cost. Enable users to download invoices in a printable or digital format for their records.

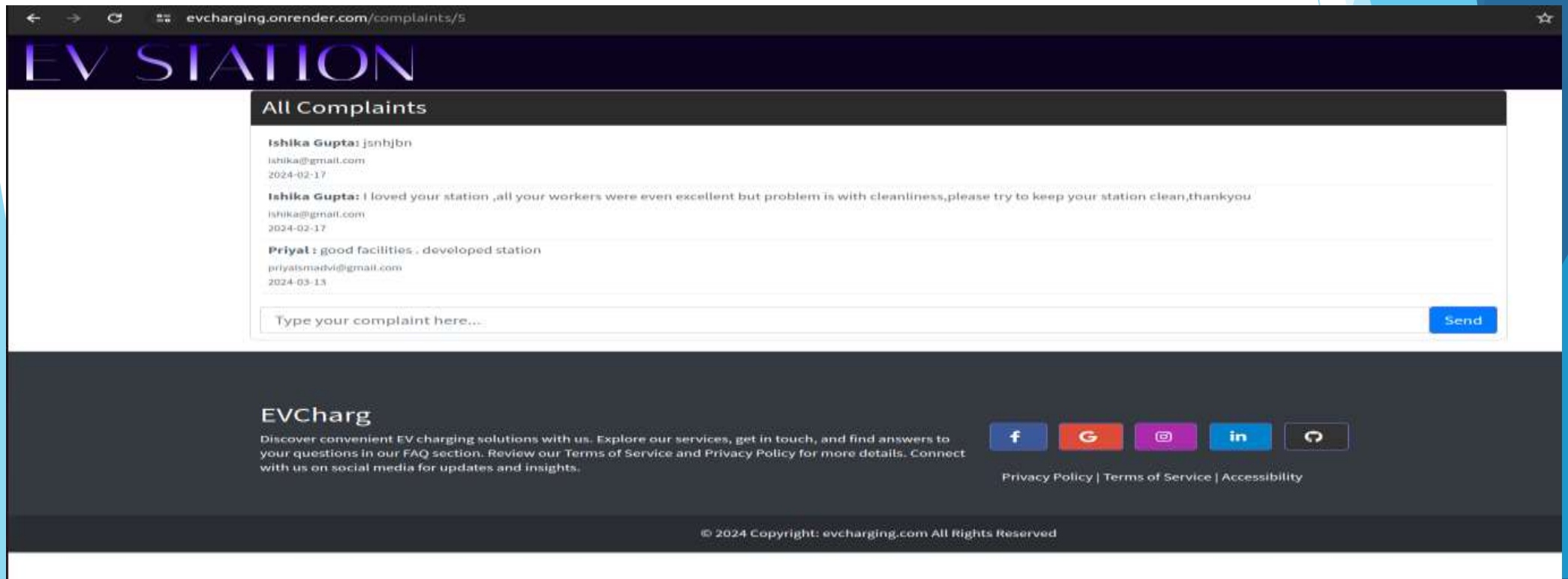
Implementation



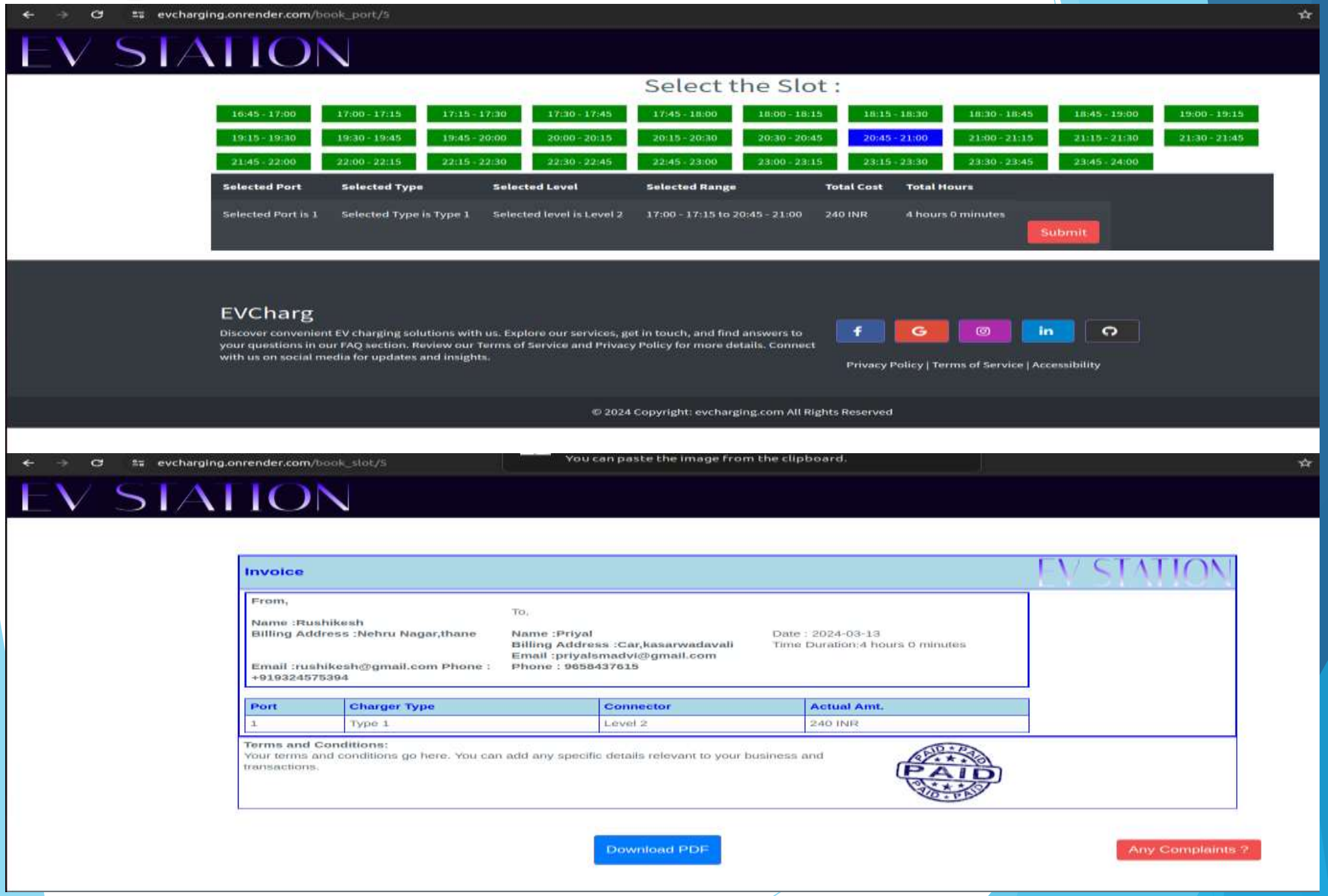


Implementation





Implementation



Conclusion

- As cities embrace electric vehicles (EVs), there's a big demand for charging spots, but not enough places to charge up. The challenge is figuring out how to manage EVs in busy traffic and make sure everyone gets a turn at the charging station without wasting time. Our goal is to make charging stations work better and help EV drivers save time.

- With the rising demand for EV charging in urban areas and limited charging facilities available, there's a challenge in effectively managing the dispatch of EVs in a constantly changing traffic environment and coordinating interactions among different user.

References

[1]ENEA C.R. Casaccia ,Andrenacci, Valentini, M.P **, "Charging behavior of electric vehicles" , 30 November 2023**

[2]Vikas Mahala ,Mansi Mutreja , "**Electric Vehicle and its impact on the distribution system" , 06 JUNE 2023**

[3]Dr. Omar A. Ibrahim, Khalid J. Mohsen ,"**Electric Vehicle Charging Station Finder App" , 2023**

Thank You...!!