

# FuelFinder: Unified EV Charging and CNG Station Locator System

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*Abstract* — The EV and CNG Station Locator is a technology-driven web and mobile application designed to help vehicle users easily locate nearby Electric Vehicle charging stations and Compressed Natural Gas (CNG) fuel stations through intelligent navigation and real-time location services. With the increasing adoption of electric and eco-friendly vehicles, users often face difficulties in identifying available charging or fueling infrastructure. The proposed system addresses this challenge by providing an integrated digital platform that allows users to search, locate, and navigate to nearby EV charging stations and CNG filling stations using geographic information systems (GIS) and location-based services. The system enables users to access station details such as location coordinates, charging type, availability status, operating hours, and navigation directions through an interactive map interface. The application integrates GPS tracking, Google Maps API, and cloud-based data storage to ensure accurate station discovery and efficient route guidance. Users can also filter stations based on vehicle compatibility, distance, and fuel type, which enhances convenience and reduces travel time. On the administrative side, the platform provides centralized management for adding, updating, and monitoring station data, ensuring the system remains updated with the latest infrastructure information. The platform integrates real-time navigation modules, location tracking services, and database management systems to provide reliable and scalable station-locator functionality. By improving accessibility to EV and CNG fueling infrastructure, the system encourages sustainable transportation adoption, reduces fuel search time, and promotes environmentally friendly mobility solutions.

**Keywords:** EV Charging Stations, CNG Fuel Locator, Location Based Services, Smart Transportation System, GPS Navigation, Sustainable Mobility

## I. INTRODUCTION

The global transition toward sustainable transportation has accelerated the adoption of Electric Vehicles (EVs) and Compressed Natural Gas (CNG) vehicles due to their lower environmental impact and improved fuel efficiency. Governments and transportation authorities are actively promoting eco-friendly fuel alternatives to reduce carbon emissions and dependence on fossil fuels. However, one of the major challenges faced by EV and CNG vehicle users is the difficulty in locating nearby charging or fueling stations, especially in unfamiliar areas or during long-distance travel. Traditional fuel-station search methods rely on manual exploration or external map searches, which may not always provide accurate or updated information. Many vehicle users struggle with identifying available EV charging points, compatible charging types, and operational CNG stations, leading to travel inconvenience and increased range anxiety.

This issue becomes more significant in developing regions where EV infrastructure is still expanding.

To address these challenges, the EV and CNG Station Locator introduces a centralized digital platform designed to assist users in discovering nearby stations through real-time location services. The system integrates GPS-based navigation, interactive mapping tools, and cloud-based station databases to provide accurate information about station locations and accessibility. Users can easily search for nearby EV charging stations or CNG fueling stations, view detailed station information, and navigate directly to the selected location.

The platform also allows administrators to manage station records, update availability information, and monitor station coverage through a centralized management system. This ensures the data remains reliable and up-to-date for users. By combining geographic information systems, navigation technologies, and digital infrastructure management, the system improves accessibility to sustainable fuel stations and encourages wider adoption of eco-friendly vehicles.

### A. Goals of the EV and CNG Station Locator Project

- 1) Improve Accessibility to Fuel Infrastructure – Enable vehicle users to easily locate nearby EV charging stations and CNG filling stations through an interactive map-based platform.
- 2) Digitize Fuel Station Discovery – Provide users with real-time location services and navigation tools for efficient station searching and route planning.
- 3) Promote Sustainable Transportation – Encourage the use of eco-friendly vehicles by reducing the inconvenience associated with locating charging or fueling infrastructure.
- 4) Centralized Station Data Management – Allow administrators to update station details, monitor infrastructure coverage, and maintain accurate station information through a digital management system.

## II. METHODOLOGY

The EV and CNG Station Locator system is developed as a location-based smart navigation platform that assists vehicle users in identifying nearby charging and fueling stations through GPS technology and digital mapping services. The system follows a modular architecture consisting of frontend interfaces, backend processing systems, and geographic information services to ensure accurate station discovery and real-time navigation. The platform ensures seamless interaction between users and the system through integration of map services, location tracking modules, and cloud databases. The methodology focuses on providing a user-friendly interface, reliable station information, and efficient route navigation to enhance overall user experience.

### A. System Architecture

The System Architecture defines the structural components of the EV and CNG Station Locator. The system consists of frontend and backend components integrated with location services and mapping APIs.

#### 1) Frontend

- Technologies: HTML, CSS, Bootstrap, JavaScript or React.js.

- Responsibilities: Provides a responsive interface where users can search for stations, view maps, filter fuel types, and navigate to nearby stations.

#### 2) Backend

- Technologies: PHP (Laravel) or Node.js with MySQL or Firebase database.
- Responsibilities: Handles station data management, location processing, user authentication, and integration with map services.

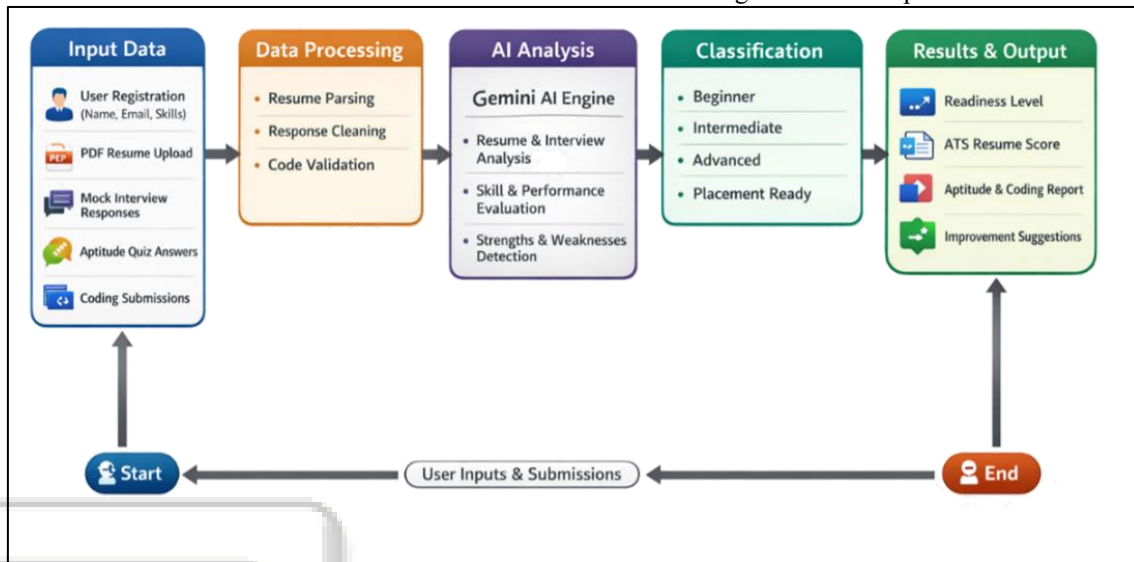


Fig 1: System Architecture

### B. Frontend Development

- HTML, CSS, and Bootstrap are used to design a responsive and interactive user interface for searching nearby stations.
- JavaScript and mapping APIs provide dynamic features such as location detection, route navigation, and station filtering options.

- Data relationships ensure proper linkage between station records and user search queries for efficient retrieval.

### E. Deployment and Security

- The system is deployed using XAMPP or cloud hosting environments for accessibility and scalability.
- Authentication mechanisms ensure secure administrator access for managing station information and updates.

### C. Backend Development

- PHP or Node.js manages server-side logic and station data processing.
- Backend modules include station database management, location-based queries, user requests handling, and navigation services.
- Map APIs such as Google Maps API are integrated to retrieve geographic coordinates and generate navigation routes.

### D. Database Management

- MySQL or MongoDB stores station records including station name, fuel type, geographic coordinates, and operational details.

## III. MODELING AND ANALYSIS

### A. Use Case Diagram

The Use Case Diagram represents interactions between the User and the EV and CNG Station Locator system.

#### 1) Actor

User – The external entity interacting with the system.

#### 2) Use Cases

- Register or Login
- Detect Current Location
- Search EV Charging Stations
- Search CNG Fuel Station
- View Station Details
- Navigate to Selected Station

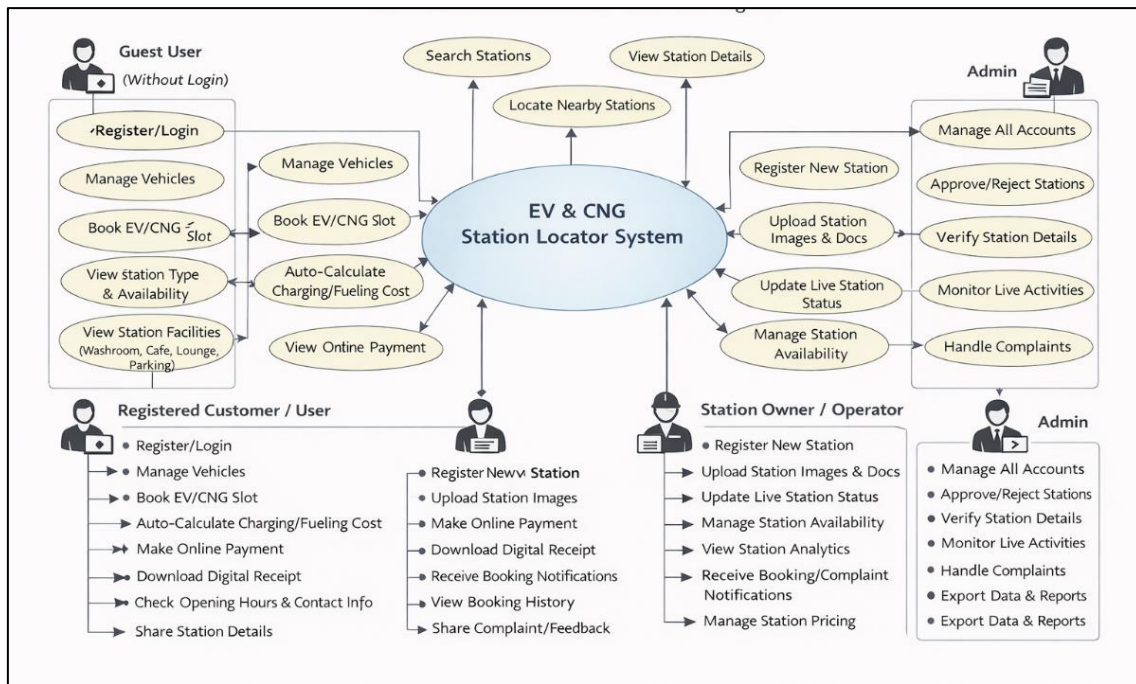


Fig. 2: Use Case Diagram

B. Data Flow Diagram (DFD)

The Data Flow Diagram describes how user input is processed by the system and converted into station location results.

1) Level-0 (Context Diagram)

- The user sends location requests to the system.
- The system processes the request and returns nearby station details and navigation routes.

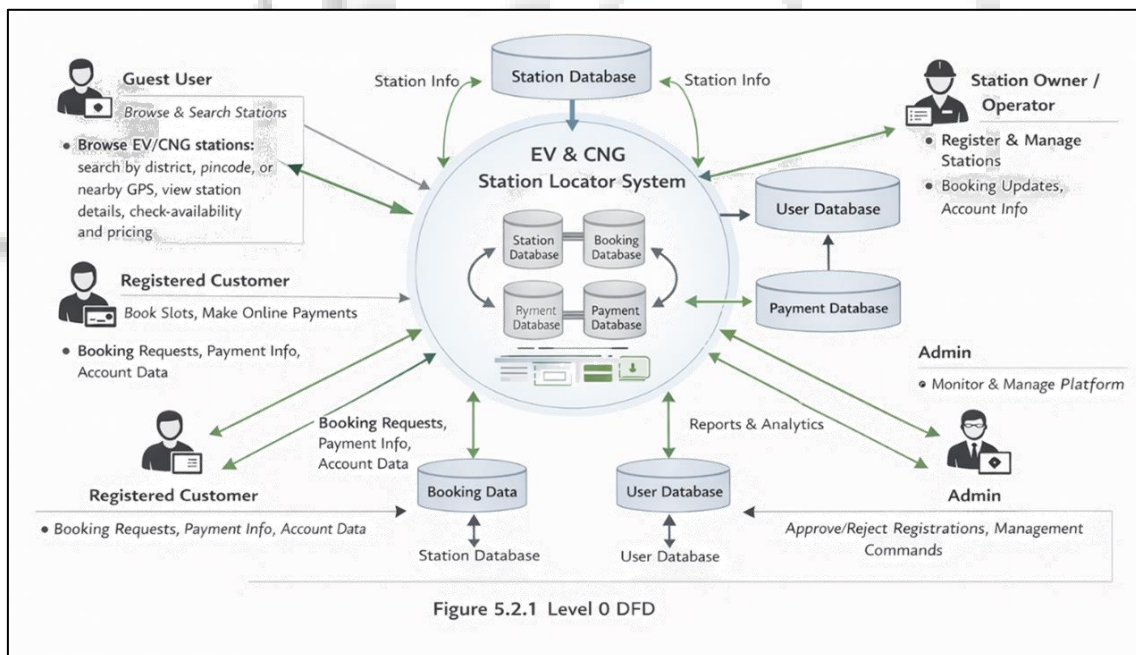


Figure 5.2.1 Level 0 DFD

Fig. 3: Data Flow Diagram (DFD)

2) Level-1

Processes include:

- User Location Detection
- Station Search Processing

- Map Navigation Service
- Station Data Retrieval
- Result Display

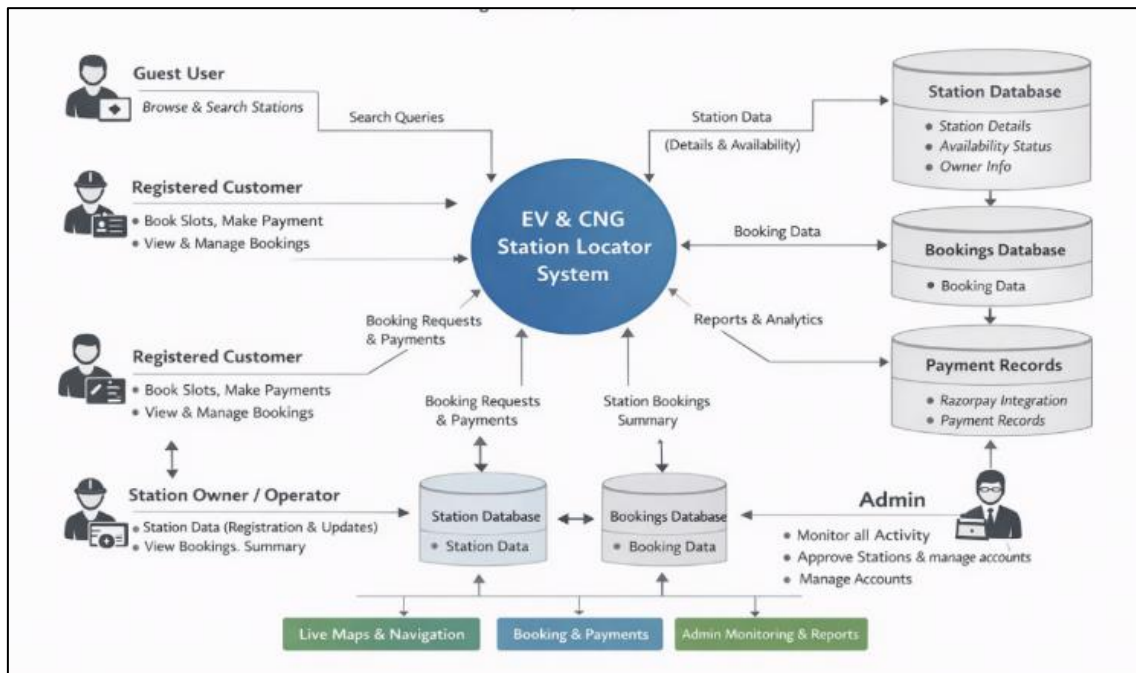


Fig. 4: Data Flow Diagram (DFD)

#### IV. RESULTS AND DISCUSSION

##### A. Improved Fuel Station Accessibility

- The EV and CNG Station Locator allows users to quickly identify nearby fueling infrastructure, reducing the time required to search for charging or refueling facilities.

##### B. Efficient Navigation and Route Planning

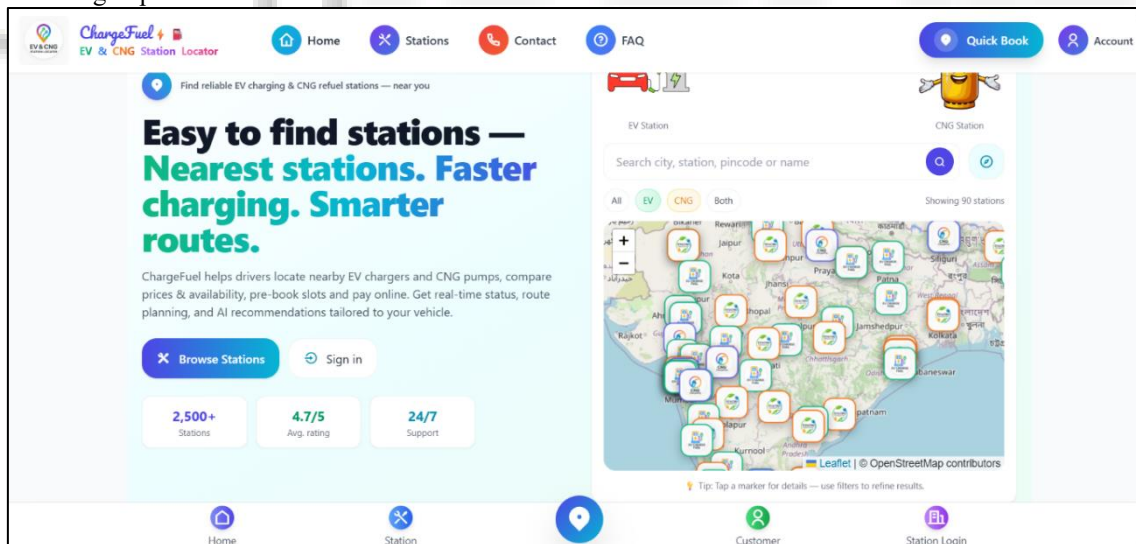
- The system provides real-time navigation directions using integrated map services, enabling users to reach stations through optimized routes.

##### C. Simplified User Experience

- The platform integrates station discovery, map navigation, and station details in a single interface, improving convenience for vehicle users.

##### D. Support for Sustainable Transportation

- By making EV charging and CNG stations easier to locate, the system promotes environmentally friendly transportation and encourages adoption of clean fuel vehicles.



## How ChargeFuel Works ⚡

Locate, book, and charge your EV or CNG vehicle seamlessly. Fast search, live maps, secure payment, and digital billing.

- 1. Auto Locate Station** ~1-2 sec  
Enable GPS to automatically detect nearby EV & CNG charging stations on the map.  
▶ Smart GPS   ▶ Real-time map view
- 2. Check Nearby Stations** ~2-3 sec  
See all available EV and CNG stations with distance, type, and slot info.  
☐ Live availability   ▾ Filter by type
- 3. See Station Details** ~2-4 sec  
View station name, charger type, open hours, amenities like washroom & fresh water.  
📄 Details & facilities   ⭐ Ratings & reviews
- 4. Book & Pay** ~1-2 min  
Reserve your slot instantly and make secure payment via Razorpay or UPI.  
🔒 Secure pay   ⏱ Instant confirmation

### Ready to Charge?

Locate EV or CNG stations nearby & book instantly.

**Secure Payment**  
UPI / Razorpay

**Digital Bill**  
Instant receipt

**Live Map**  
Real-time navigation

**Free Amenities**  
Washroom & water

Book Now

View Stations

Chat on WhatsApp

Need help? Contact support

Home
Station
📍
Customer
Station Login

EV & CNG Station Locator

Home
Stations
Contact
FAQ

Quick Book
Account

### Stations

Search stations by name, city or pincode. Choose a district to filter.

Search
All districts ▾
Locate me

Showing 90 stations Sort: Relevance ▾

EV

**HP EV Station - Bandra** open

Linking Rd, Bandra West

400032

EV: ₹16.00/kWh
CNG: —

Parking Restroom Security
—

More Details
Book
Open Live Map

CNG

**IOCL CNG Pump - Karol Bagh** open

Ajmal Khan Rd.

110003

EV: —
CNG: ₹48.50/kg

Restroom Lighting
—

More Details
Book
Open Live Map

BOTH

**BharatPetrol Both - Koramangala** open

60 Feet Rd, Koramangala

560004

EV: ₹24.50/kWh
CNG: ₹52.00/kg

Cafe Parking EV Assist
—

More Details
Book
Open Live Map

EV

**HP EV Station - T Nagar** open

Ustun Road

600017

EV: ₹28.00/kWh
CNG: —

Loounge Washroom
—

More Details
Book
Open Live Map

CNG

**IOCL CNG Pump - Salt Lake** open

Sector V Main Rd

720091

EV: —
CNG: ₹47.75/kg

Shop Washroom
—

More Details
Book
Open Live Map

EV

**BharatPetrol EV Hub - Pimpri** open

Munshi Panch Raj

411018

EV: ₹22.50/kWh
CNG: —

Parking Washroom
—

More Details
Book
Open Live Map

EV & CNG Station Locator

Quick Book
Account

#### Pricing & Quick Calculator ✔ Verified by ChargeFuel

Last updated: 2025-10-17 06:26:59

EV

**EV Charging**  
Price per kWh

Enter kWh (or distance & efficiency)

kWh  km per kWh (option)

₹26.00

per kWh

Calculate Cost
Full Charge (50 kWh)

CNG

**CNG Refuel**  
Price per kg

Enter kg (or liters)

kg  kg

₹147.75

per kg

Calculate Cost
Half Tank (10 kg)

#### Facilities

Washroom

Parking

Cafe

Food Court

Drinking Water

AC Waiting

Shop

EV Assist

CCTV

Loounge

Secure

No Mix Fuel

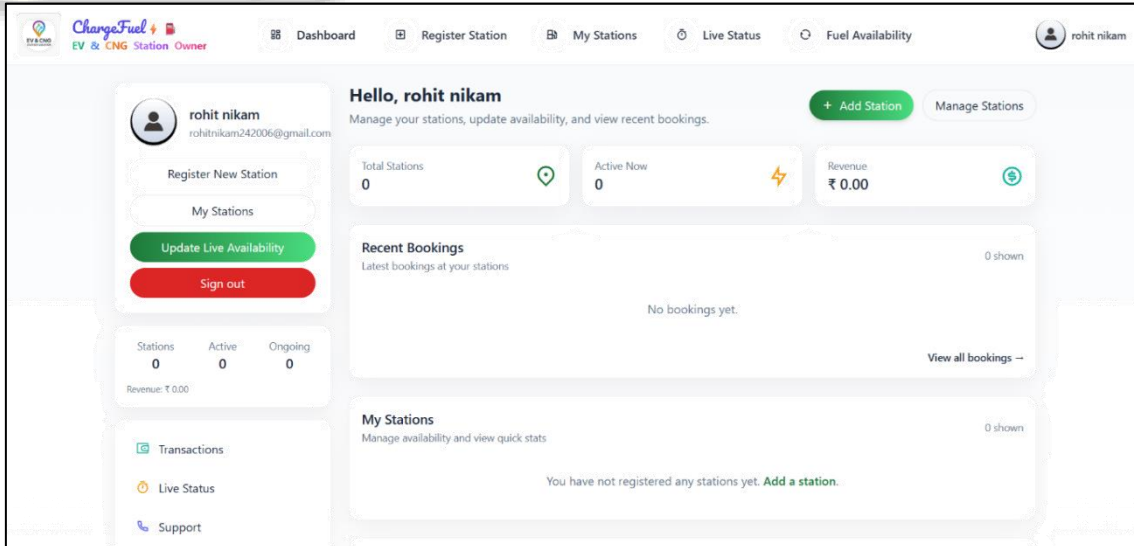
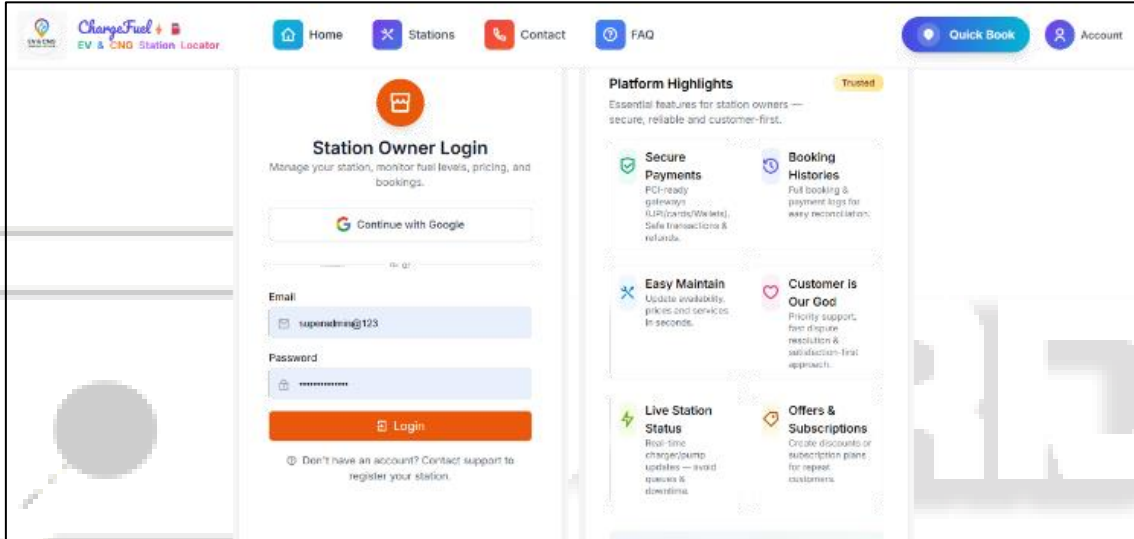
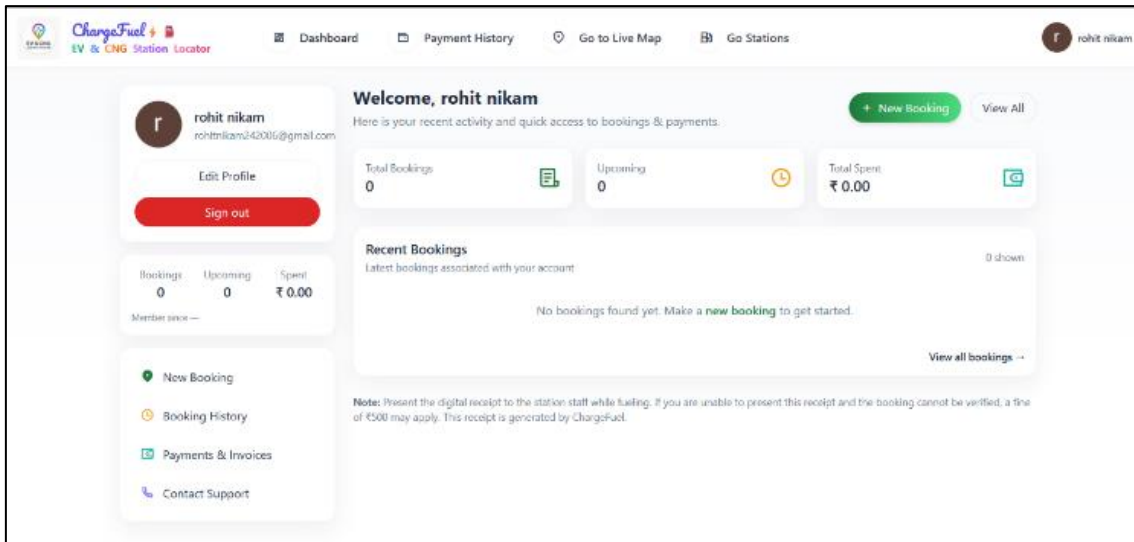
✔ **Verified by ChargeFuel**

Ensuring trusted, safe, and reliable charging experiences

No Mix Fuel
Booking = No Queue
Free Cost Services
Quality Checked

Still need help?

Contact Support
Book Now



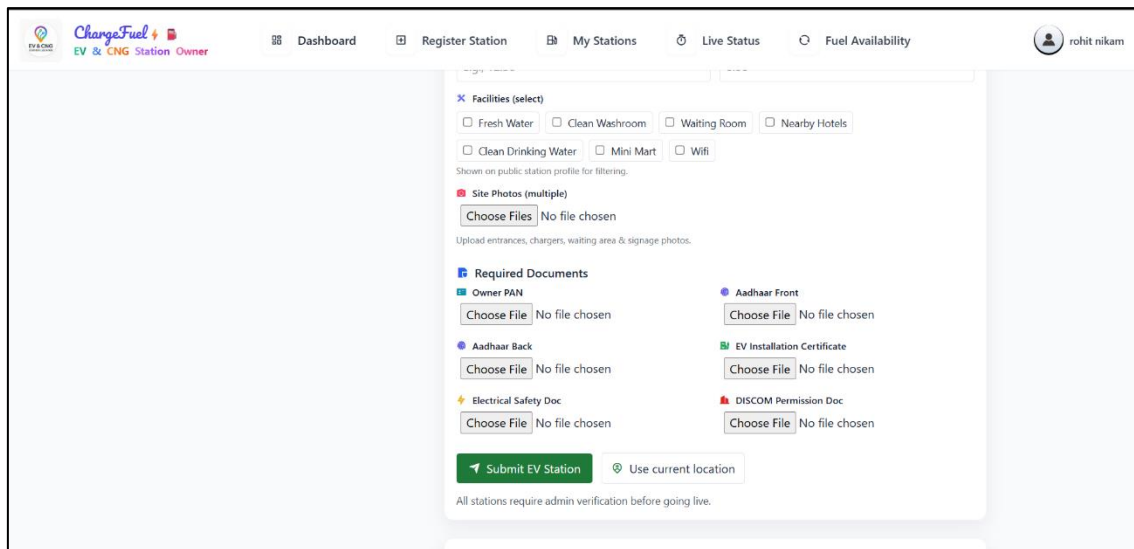


Fig. 6: Result

## V. CONCLUSION

The EV and CNG Station Locator provides an efficient and intelligent solution for locating sustainable fuel infrastructure through digital mapping and location-based services. By integrating GPS tracking, geographic information systems, and centralized station databases, the platform allows users to easily discover nearby charging and fueling stations.

The system significantly reduces the inconvenience associated with searching for EV charging points or CNG stations during travel. Through real-time navigation and detailed station information, users can plan their journeys more efficiently while minimizing fuel-search time and route uncertainty.

Furthermore, the platform supports the growing adoption of electric and eco-friendly vehicles by improving accessibility to required fueling infrastructure. By enabling centralized station management and real-time updates, the system ensures reliable information availability for users.

Overall, the EV and CNG Station Locator contributes to smart transportation systems and sustainable mobility solutions, helping users transition toward environmentally friendly travel while improving infrastructure accessibility and operational efficiency.

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