

MINI PROJECT:

EV-NAVASSIST

SUBMITTED BY:

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Introduction

EV-NAVASSIST is a comprehensive application designed to cater to the specific needs of electric vehicle (EV) owners.

The application offers a range of features aimed at providing a seamless and convenient experience, ensuring efficient navigation, access to charging stations, and breakdown assistance services.

It empowers EV owners to make well-informed decisions regarding their charging needs and emergency assistance requirements.

Objective

- Optimize the charging process, EV-NAVASSIST incorporates a convenient slot booking mechanism.
- Minimizing wait times and maximizing charging efficiency, the slot booking feature enhances user convenience.
- EV-NAVASSIST aims to provide a reliable and user-centric system that benefits EV vehicle owners.

Project Overview

Key features

Smart Navigation for EVs

Our website integrates real-time charging station data with navigation capabilities.

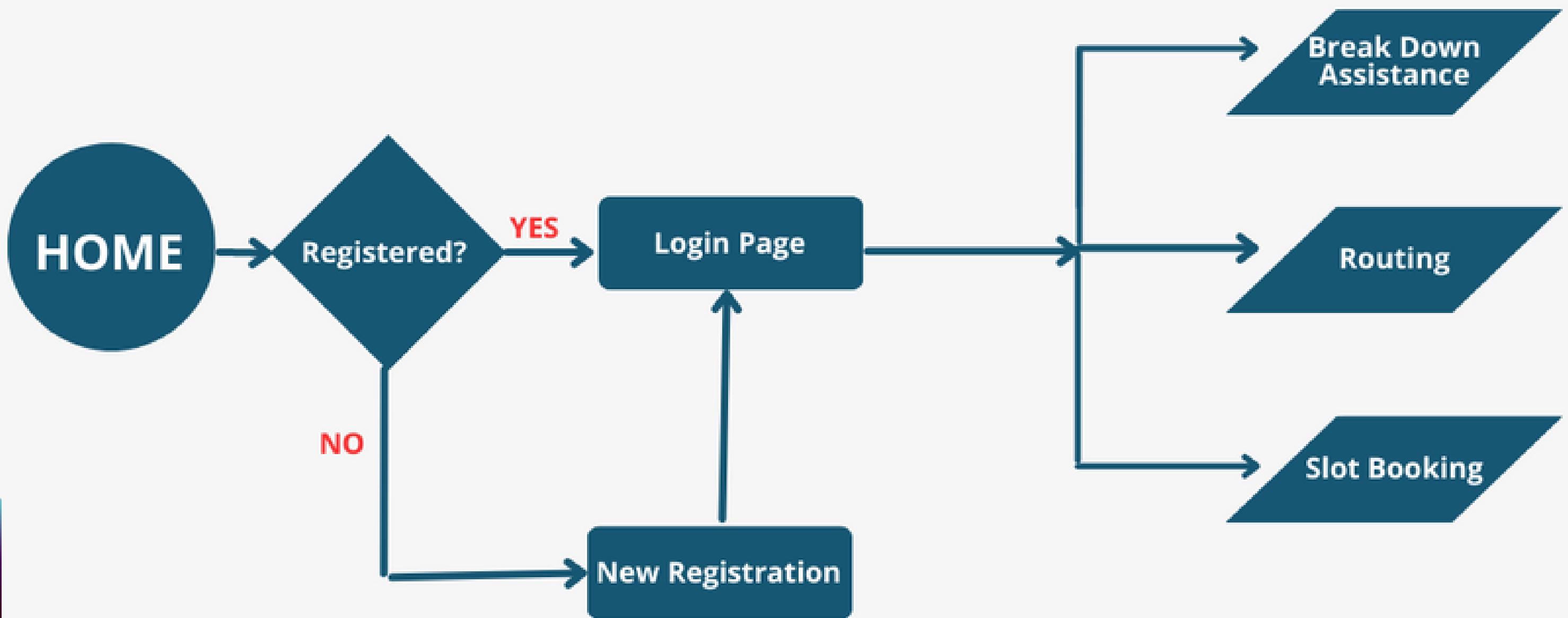
Hassle free charging

Enable EV users to reserve and pay for charging slots in advance through a secure online platform.

On-Demand Roadside Assistance

Provide real-time assistance for EV users in the event of a breakdown or other issue through our website

Process Flow Chart



Technologies Used



django



Technologies Used

- Database:** MongoDB a NoSQL database is used to store charging station data.
- Mapping libraries:** Google Maps API is used to display charging station locations and the route on a map.
- Web frameworks:** Django and Php is used to build the web application backend.
- Frontend technologies:** HTML, CSS, and JavaScript are used for building the user interface

Demonstration

System Design

- **Source and Destination input functionality:** The implementation includes text input fields for users to manually enter source and destination locations, a "Current Location" option using geolocation, and an interchange feature to easily swap inputs. Validation checks to ensure non-empty fields and non-identical source/destination.
- **Map Integration:** The design integrates map APIs (e.g., Google Maps) to visualize routes, display charging station markers, and show service center locations. Users can interact with the map, zoom, and access additional details.
- **Charging Station and Service Center Information Display:** The user interface presents detailed information about charging stations and service centers, including addresses, contact details, charging rates, services, reviews, and operating hours. Users can access this information through map markers or a dedicated screen.
- **Slot Booking Mechanism:** The design incorporates a calendar-based view to show available time slots for each charging station. Users can select a date and time slot, make reservations, and book charging slots for their convenience.

Code Snippet

```
def create_route_line(source, destination, waypoints):
    route_coordinates = [(source['lat'], source['lng'])]

    if waypoints:
        route_coordinates.extend([(waypoint['lat'], waypoint['lng']) for waypoint in waypoints])

    route_coordinates.append((destination['lat'], destination['lng']))

    route_line = LineString(route_coordinates)

    return route_line
```

```
def calculateStations(request):
    if request.method == 'POST':
        print("Request received on calculateChargingStations endpoint")

        route_data = json.loads(request.body)

        source = route_data.get('source')
        destination = route_data.get('destination')
        waypoints = route_data.get('waypoints')

        if not source or not destination:
            return JsonResponse({'error': 'Missing source or destination'})

        route_line = create_route_line(source, destination, waypoints)

        charging_stations = ChargingStation.objects.all()

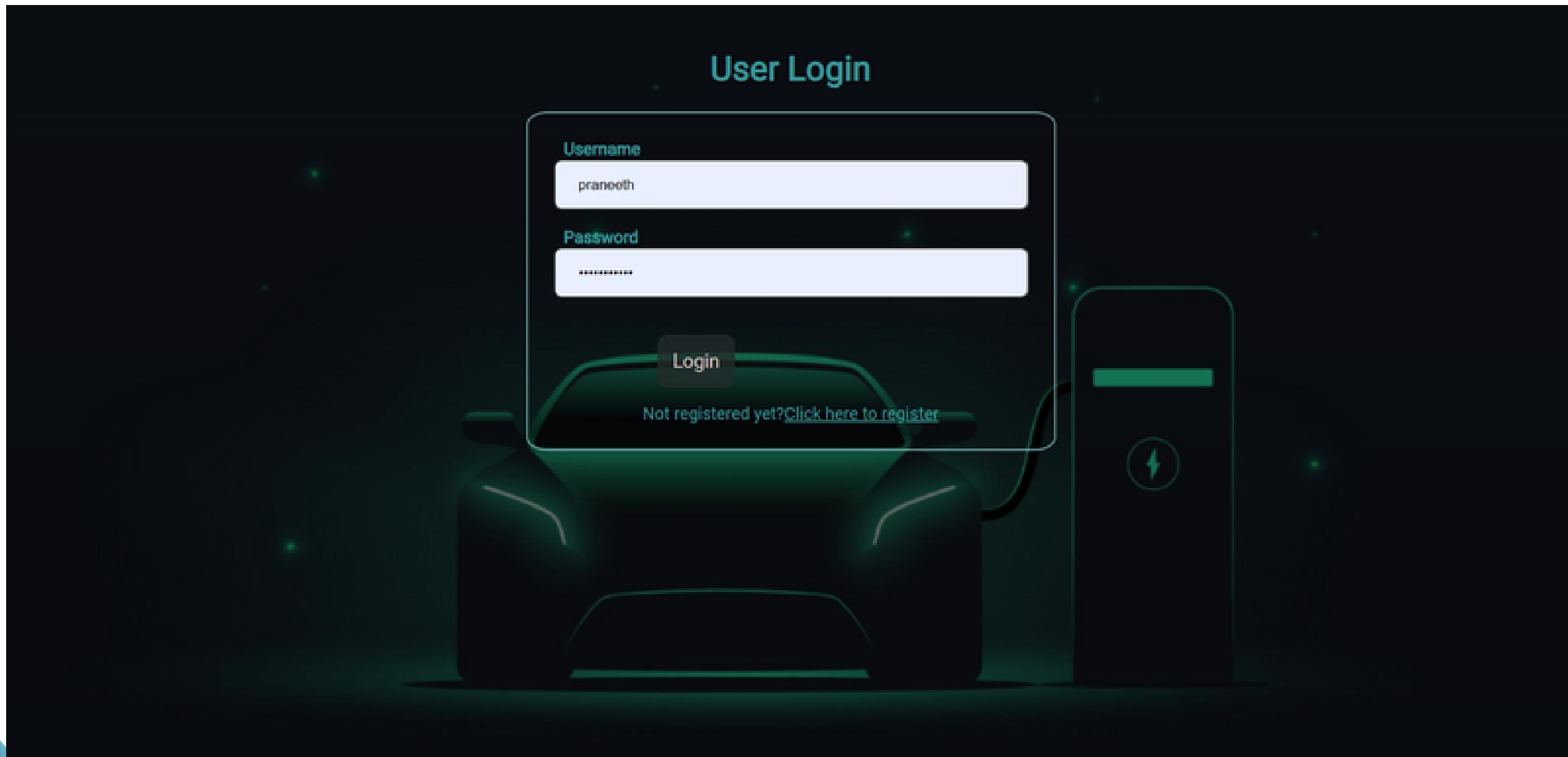
        filtered_charging_stations = []
        for charging_station in charging_stations:
            charging_station_location = Point(charging_station.latitude, charging_station.longitude)
            if route_line.distance(charging_station_location) <= 0.1: # Adjust the threshold as needed
                charging_station_dict = {
                    'id': charging_station.id,
                    'name': charging_station.name,
                    'latitude': charging_station.latitude,
                    'longitude': charging_station.longitude
                }
                filtered_charging_stations.append(charging_station_dict)

        charging_station_count = len(filtered_charging_stations)

        data = {
            'charging_stations': filtered_charging_stations,
            'charging_station_count': charging_station_count,
        }

        return JsonResponse(data)
    else:
        return JsonResponse({'error': 'Method not allowed'})
```

Results



PATHAWAY

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Why Choose Us ?

Planning Trips
A navigation system that provides EV users with an optimized route from their source location to their destination, ensuring the presence of charging stations along the way. The system accurately displays the map, indicating the locations of charging stations.

Book Slots for Charging
A seamless, user-friendly, efficient, and reliable booking mechanism for EV users to reserve a charging slot at the selected charging station. The system allows customers to view the availability of charging slots in real-time, select a preferred charging station based on their route, and successfully book a slot for the desired time.

Breakdown Assistance
A system that assists EV users in case of breakdowns or emergencies during their journey. The system that is capable of identifying the user's location when a breakdown occurs and display relevant information, such as nearby assistance centers that can provide the necessary help.

Headquarters: Mysuru, India

A-148, Radison Corporate Tower, Sector- 137, Mysuru, Karnataka (570016)

Home Features User Logout

Mysore < Choose current location > Bengaluru Choose current location

Find Routes

Charging Stations Found 10 Breakdown Assistance Found

Map Satellite

The map displays a route from Mysore to Bengaluru. The route is marked with a blue line. Two red markers, labeled 'A' and 'B', indicate specific locations along the route. Marker 'A' is located in Mysore, and marker 'B' is located in Bengaluru. The map also shows several other towns and villages, such as Srirangapatna, Chikmagalur, and Hosur. Numerous roads are marked with yellow numbers, indicating their route numbers. The map is a satellite view, showing green land and blue water bodies.

Achievements

Ensuring availability

Pre-booking an EV charging station ensures availability for long-distance travel and effective journey planning.

Planning your journey and saving time

Planning charging locations and times helps with route planning and stop scheduling. Pre-booking a charging station saves time and avoids waiting in line.

Avoiding range anxiety

Alleviating range anxiety by knowing where and when to charge increases confidence in travel plans

Challenges and Lessons Learned

- **Collaboration and Diverse Expertise:**

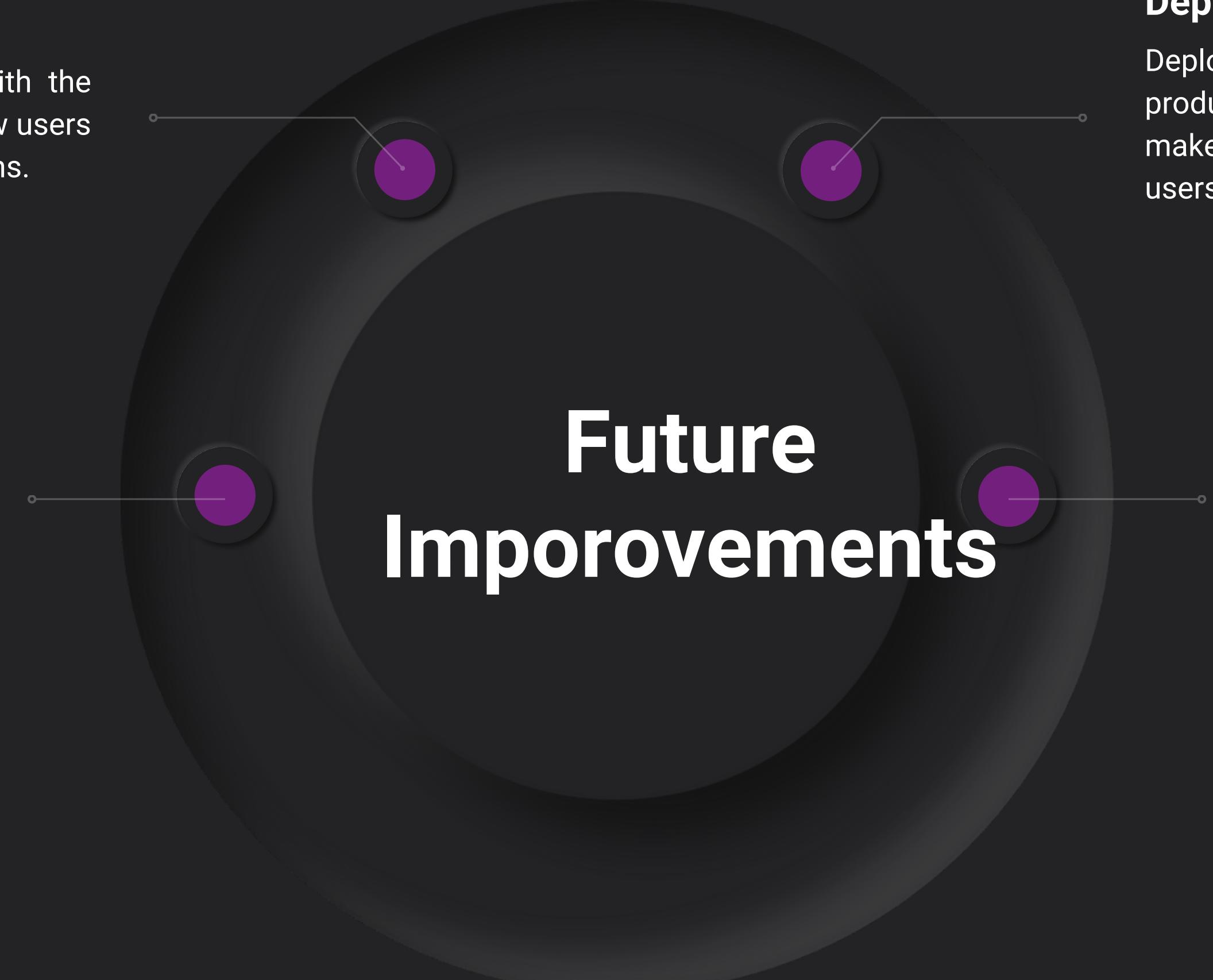
Challenge: Working collaboratively with team members possessing different areas of expertise and backgrounds.

Lesson Learned: Effective communication and regular team meetings were crucial to ensure a shared understanding of project goals and smooth collaboration. Leveraging each team member's strengths and expertise proved beneficial in overcoming challenges and producing high-quality results.

- **Availability and Time Management:**

Challenge: Balancing project commitments alongside individual schedules and availability.

Lesson Learned: Prioritizing tasks and setting clear deadlines helped manage time effectively. Regular progress updates and task delegation ensured everyone stayed on track. Flexibility and understanding were essential in accommodating individual availability and maintaining a cohesive team dynamic.



Future Improvements

Google Maps

Complete the integration with the Places API of Google to allow users to search for charging stations.

Routing Algorithms

Implement the routing algorithm to calculate the best route with charging stops.

Deploy

Deploy the website to a production server and make it available to users.

Monitor

Monitor the website performance and user feedback, and make improvements as necessary.



CONNECTION

EV Nav-Assist provides an intuitive platform for efficient electric vehicle navigation. By simplifying route planning, providing real-time charging station access, and offering comprehensive support, we aim to accelerate the transition towards a sustainable transportation future.

