Final Report

Project Name:Visualization Tool For Electric Vehicle Charge And Range Analysis.

1.INTRODUCTION:

1.1 Project Overview:

This project focuses on developing a visualization tool for electric vehicle (EV) charge and range analysis. The tool allows users to interactively explore the charging patterns, energy consumption, range efficiency, and performance of EVs using real-world or simulated datasets. It provides visual insights to improve understanding, optimize charging schedules, and evaluate the impact of driving behavior on range.

1.2 Purpose:

The purpose of this project is to aid EV users, manufacturers, and researchers in analyzing charge and range data visually to support data-driven decision-making. The goal is to simplify complex EV metrics into intuitive visual formats, facilitating easier evaluation of performance and usage trends.

2.IDEATION PHASE:

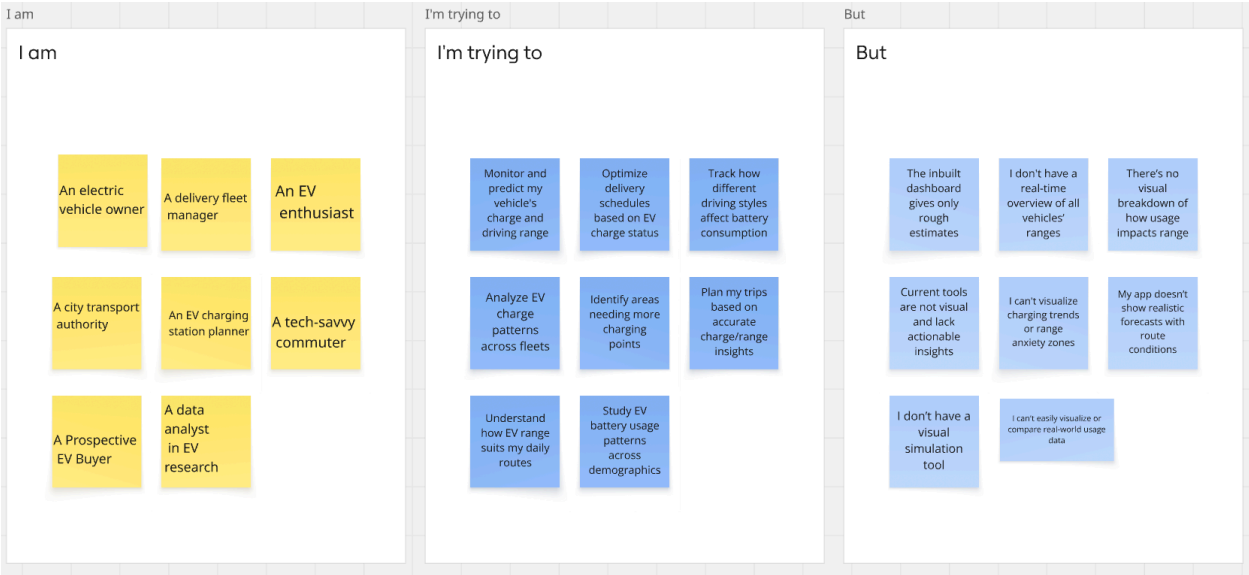
2.1 Problem statement:

Date	18 June 2025
Team ID	LTVIP2025TMID47771
Project Name	Visualization Tool For Electric Vehicle Charge And Range Analysis
Maximum Marks	2 Marks

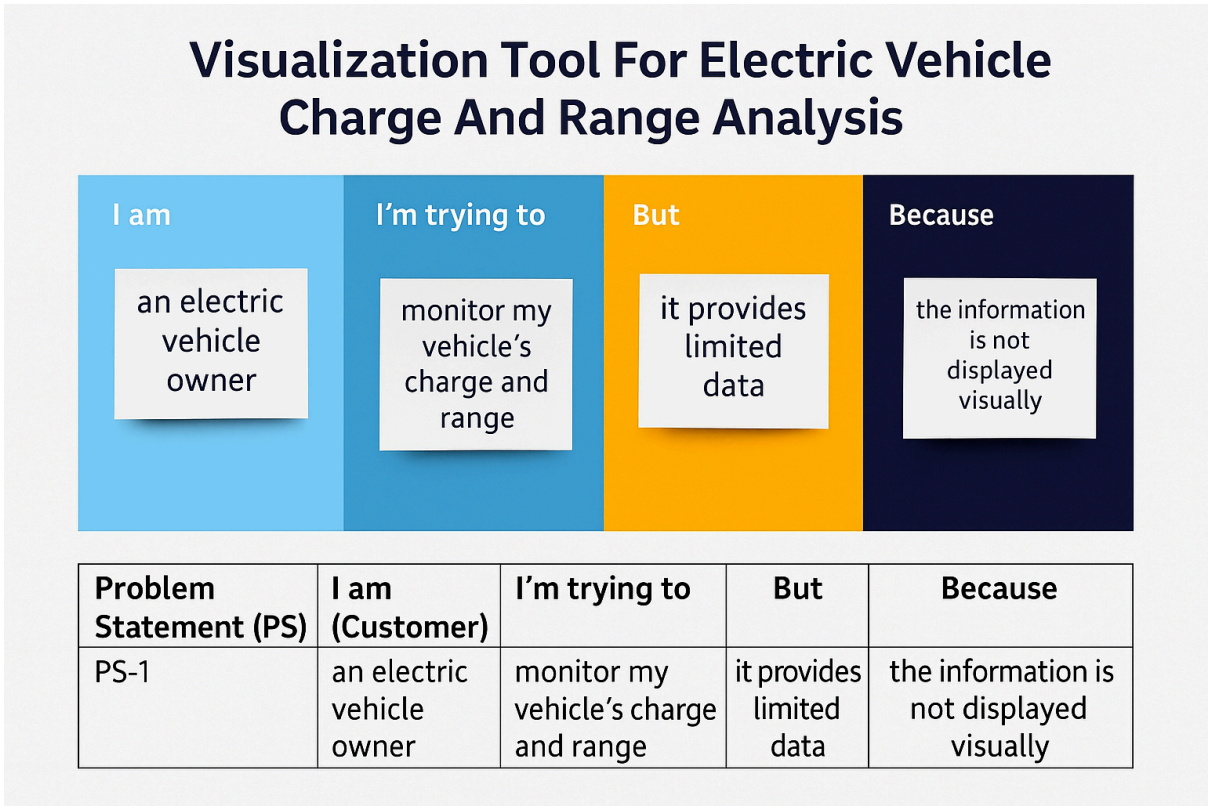
Customer Problem Statement Template:

Electric vehicle (EV) users, fleet managers, and potential buyers often face uncertainty regarding battery charge levels, range estimation, and efficient route planning. Current EV dashboards and mobile applications typically offer only basic numeric data without visual clarity, lacking historical trends, predictive analytics, and personalized usage patterns.

As a result, users experience range anxiety, inefficient trip planning, and difficulties in understanding how various factors like terrain, speed, and weather influence battery consumption. Furthermore, infrastructure planners and analysts struggle to identify charging station demand due to insufficient visualization tools.



Example:



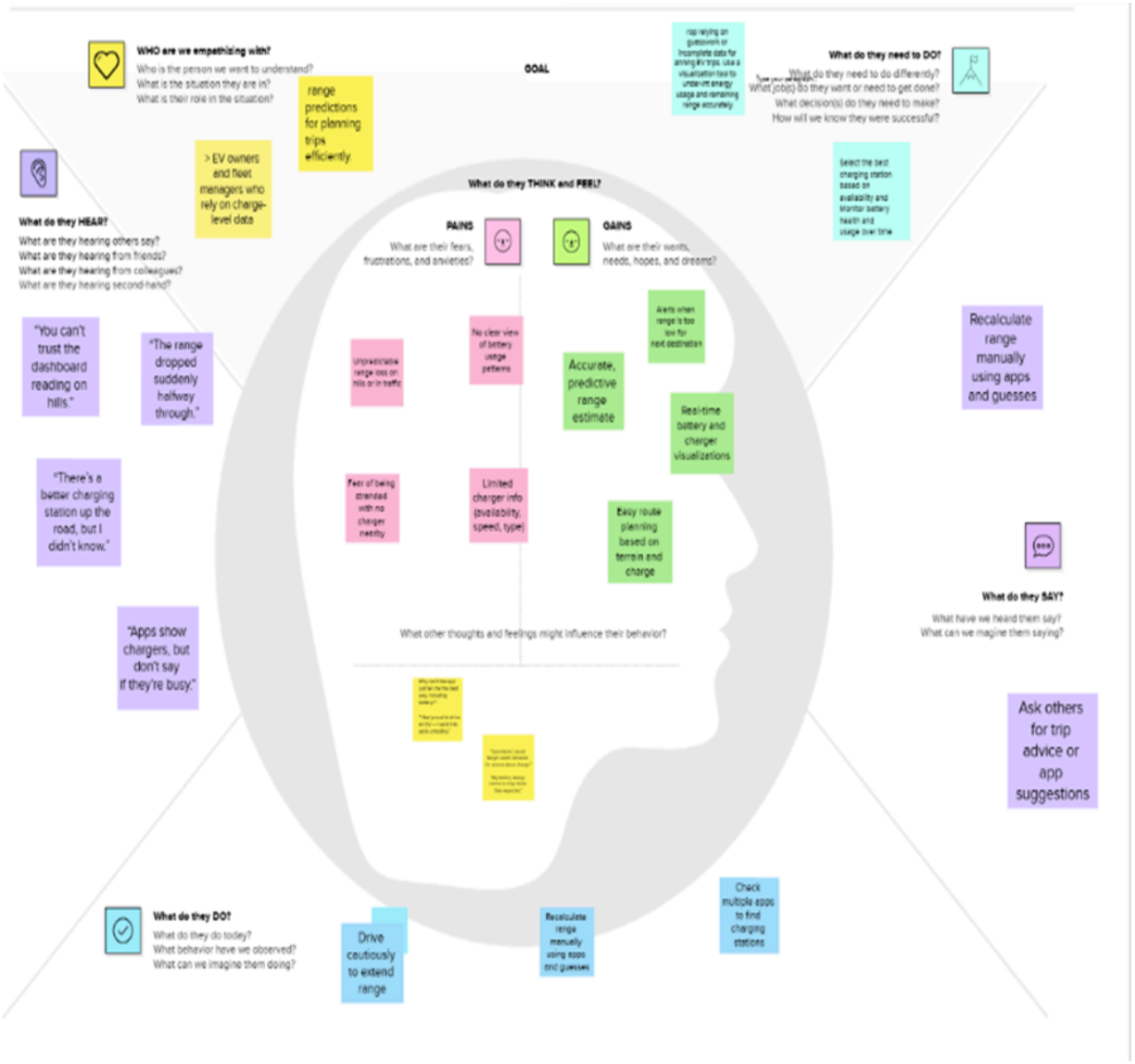
Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because
PS-1	an electric vehicle owner	monitor my vehicle's charge and range	it provides limited data	the information is not displayed visually

2.2 Empathy Map Canvas:

Empathize & Discover

Date	18 June 2025
Team ID	LTVIP2025TMID47771
Project Name	Visualization Tool For Electric Vehicle Charge And Range Analysis
Maximum Marks	4 Marks

Empathy Map Canvas: "We empathize with electric vehicle users who struggle with limited and unclear data about their vehicle's battery charge and range. They feel anxious and uncertain during travel because they lack visual, real-time insights to plan trips effectively. By understanding their frustration, we aim to build a tool that simplifies EV charge and range data into intuitive visual dashboards for confident and informed decision-making."



2.3 Brainstorming:

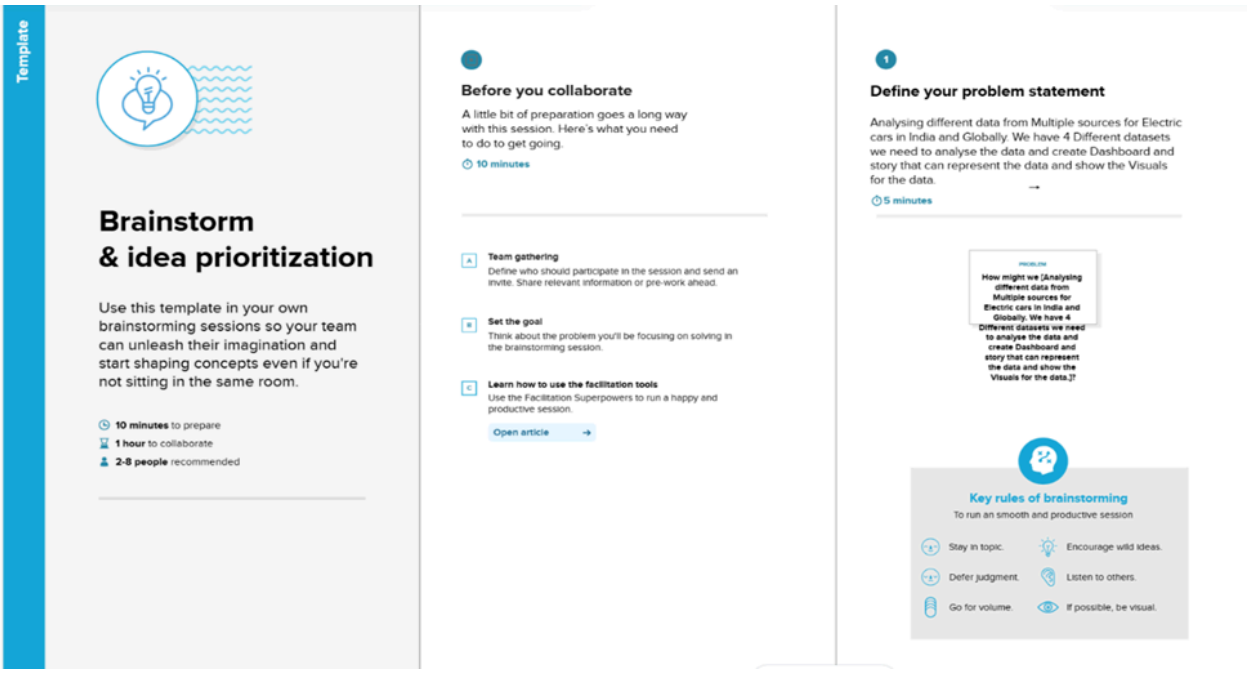
Brainstorm & Idea Prioritization Template

Date	18 JUNE 2025
Team ID	LTVIP2025TMID47771
Project Name	Visualization Tool for Electric Vehicle Charge and Range Analysis
Maximum Marks	4 Marks

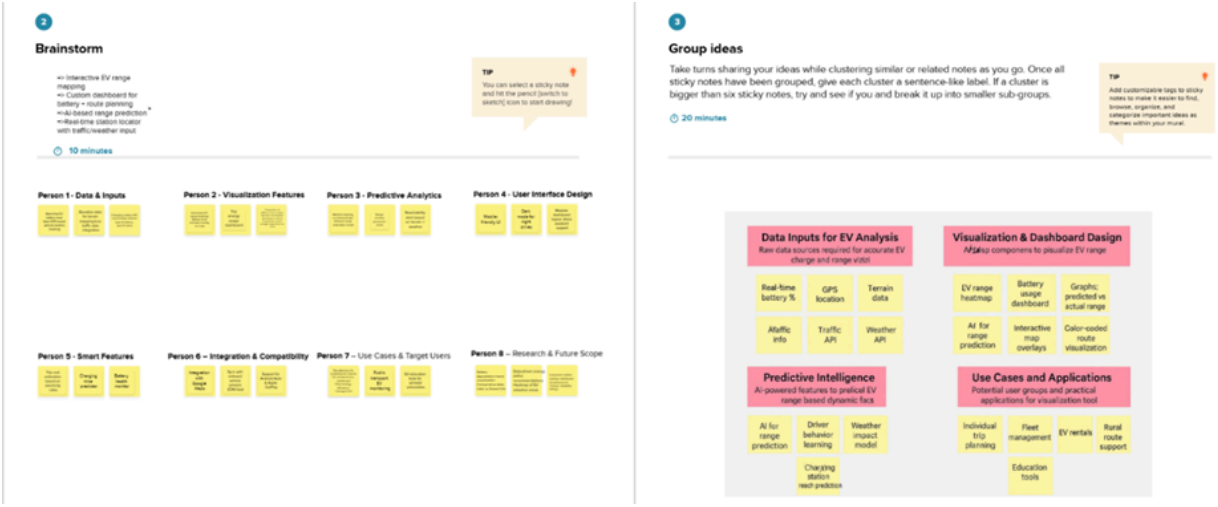
Brainstorm & Idea Prioritization Template:

"How might we design an intuitive and interactive visualization tool that helps electric vehicle users, fleet operators, and planners easily understand and analyze real-time charge levels, battery consumption, and range estimates, so they can make smarter, stress-free driving and planning decisions?"

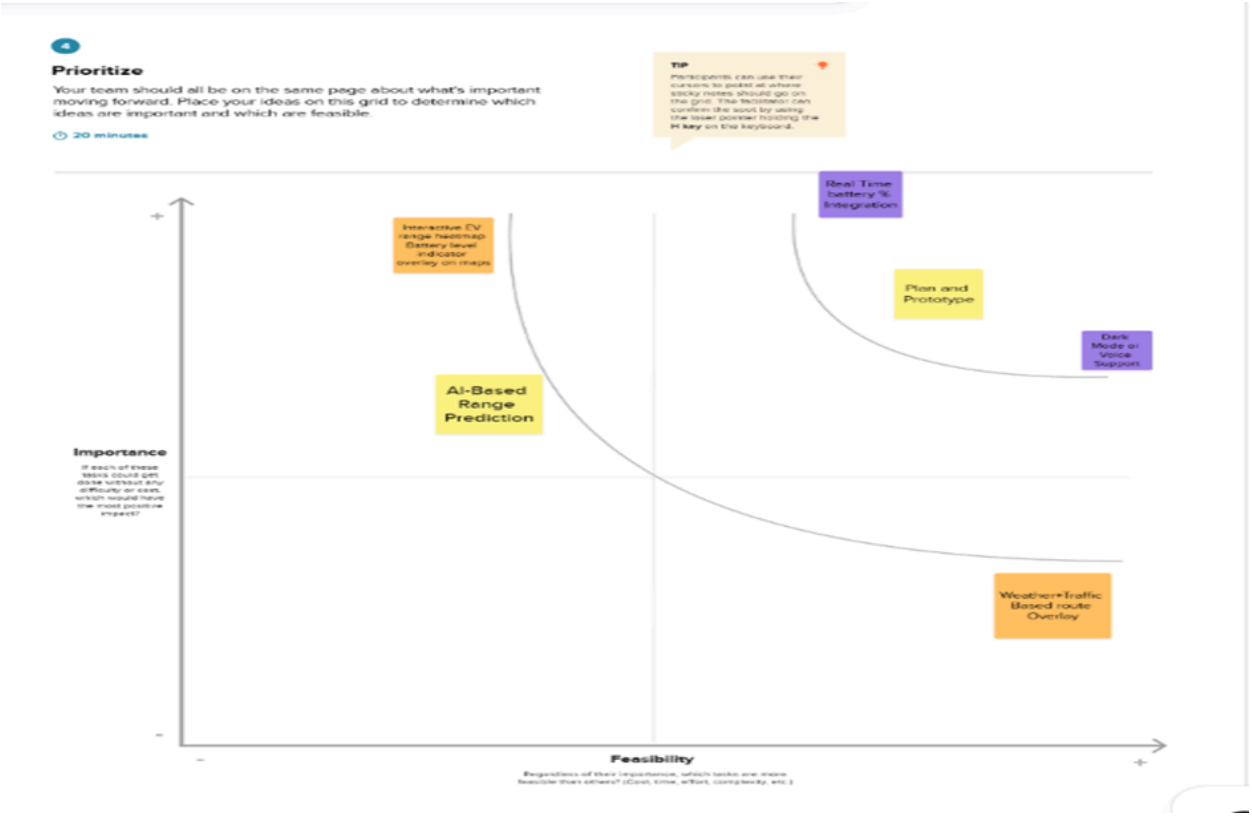
Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



Step-3: Idea Prioritization



3.REQUIREMENT ANALYSIS:

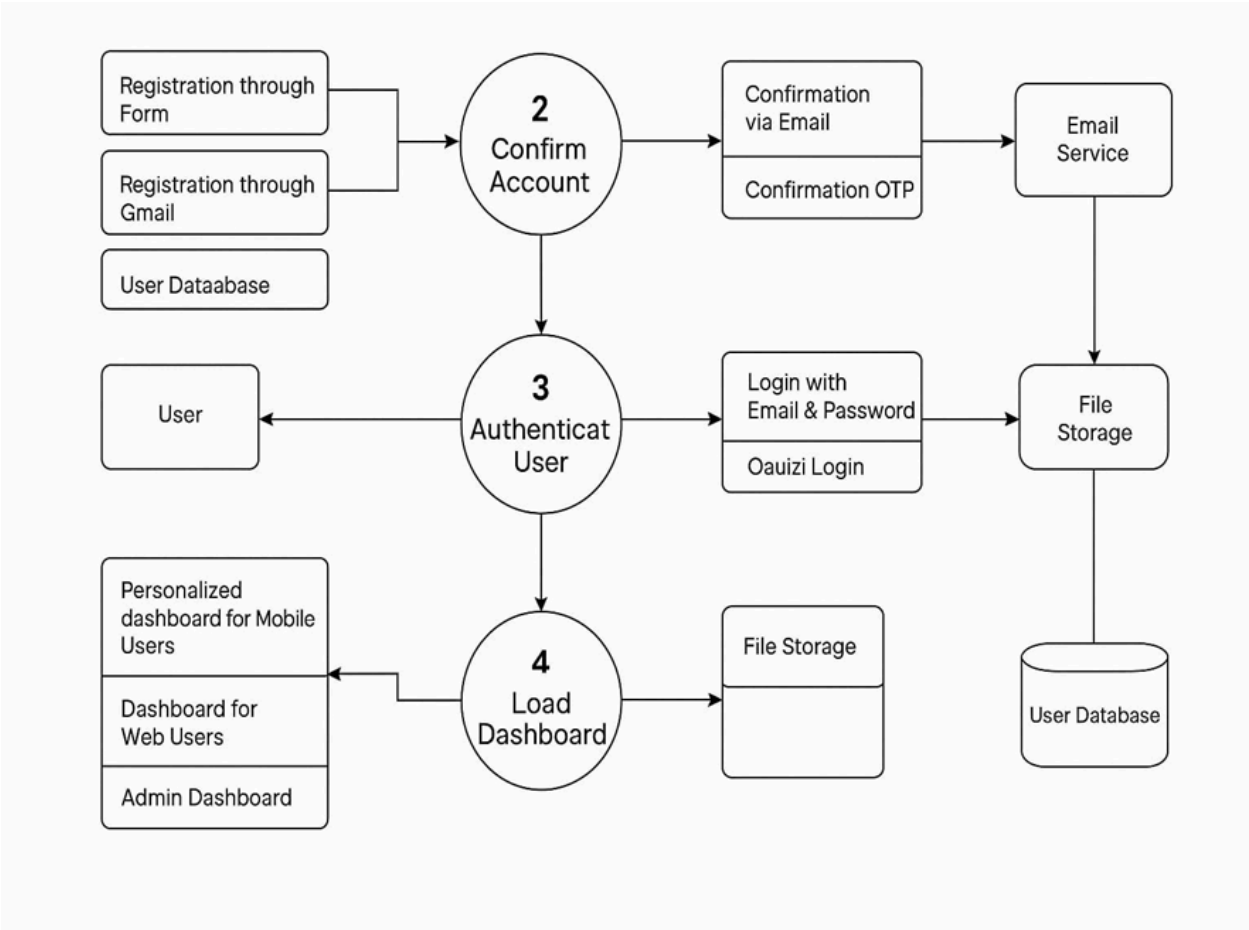
Project Requirement Analysis

1. Project Objective

Design and develop a **user-centric web and mobile application** that enables users to register, confirm accounts, log in, and access personalized dashboards. The

application will offer multiple registration methods while ensuring high **security, usability, performance, and scalability**.

2. Data Flow Diagram



3. Functional Requirements

FR No.	Functional Requirement (Epic)	Sub Requirement (Story/Sub-Task)
FR-1	User Registration	- Registration through Form - Registration via Gmail - Registration via LinkedIn
FR-2	User Confirmation	- Confirmation via Email - Confirmation via OTP

FR No.	Functional Requirement (Epic)	Sub Requirement (Story/Sub-Task)

FR-3	User Login	- Login with Email & Password - Social Login (Gmail, Facebook) - Personalized Dashboard for Mobile Users
FR-4	User Dashboard	- Dashboard for Web Users - Admin Dashboard

4. Non-functional Requirements

NFR No.	Requirement	Description
NFR-1	Usability	Intuitive UI/UX for both mobile and web platforms.
NFR-2	Security	Secure authentication (SHA-256), OWASP compliance, role- based access.
NFR-3	Reliability	99.9% uptime with robust error handling and backups.
NFR-4	Performance	Response time <2s under 1000+ concurrent users.
NFR-5	Availability	Cloud deployment with load balancing and failover.
NFR-6	Scalability	Microservices architecture for horizontal scaling.

5. Technical Architecture

Architecture Type: 3-Tier (Presentation, Application, Data)

Technology Stack

S. No	Component	Description	Technology
1	**User Interface**	Web & Mobile UI	React.js, Flutter
2	**Application Logic-1**	Auth & User Management	Python (Django)
3	**Application Logic-2**	API Services & Business Logic	Node.js
4	**Database**	Structured Data Storage	PostgreSQL
5	**Cloud Database**	NoSQL for scalability	MongoDB Atlas
6	**File Storage**	User uploads & media	AWS S3
7	**External API-1**	Social Login integration	OAuth 2.0
8	**External API-2**	Email service	SendGrid
9	**Infrastructure**	Cloud deployment	AWS EC2, Kubernetes

6. Application Characteristics

S. No	Characteristic	Description	Technology
1	**Open-Source Frameworks**	Core development frameworks	Django, React, Flutter
2	**Security**	Token-based auth, encryption standards	JWT, OAuth, SHA-256, OWASP
3	**Scalable Architecture**	Microservices with orchestration	Docker, Kubernetes (AWS EKS)
4	**Availability**	Load balancing & auto-scaling	AWS ALB
5	**Performance**	Caching & CDN for speed	Redis, AWS CloudFront

4.PROJECT DESIGN:

4.1 Problem Solution Fit:

Problem – SolutionFitTemplate

Date	18 June 2025
Team ID	LTVIP2025TMID47771
Project Name	Visualisation tool for electric vehicle charge and Range Analysis using tableau
Maximum Marks	2 arks

Problem – Solution Fit Template:

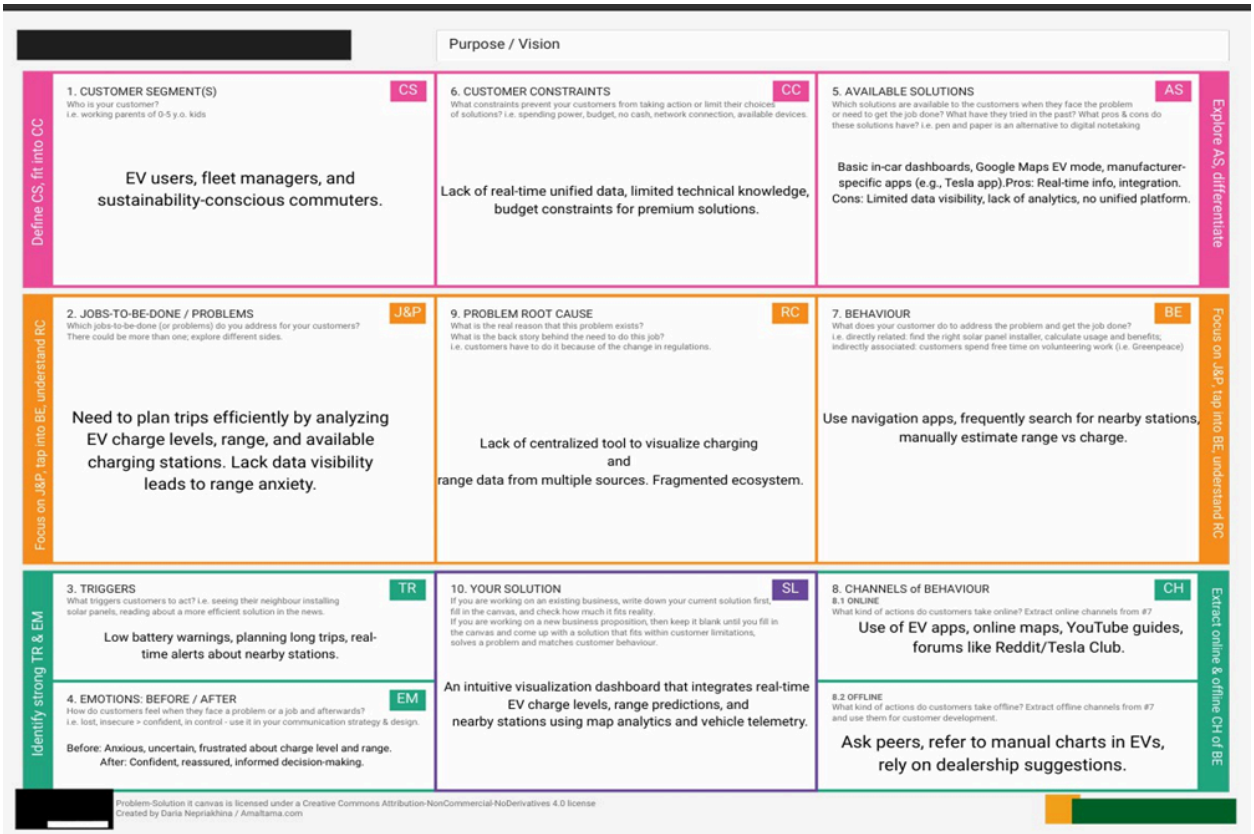
Electric vehicle (EV) users frequently experience **range anxiety** and uncertainty due to the **lack of a centralized, real-time visualization tool** that displays battery charge levels, estimated driving range, and nearby charging station availability. Existing solutions are often fragmented across different apps or limited to manufacturer-specific platforms, making it difficult for users to make confident travel and charging decisions.

Our solution is a **unified visualization tool** that integrates real-time data from EVs and charging infrastructure. It enables users to **analyze charge levels, forecast range accurately**, and identify optimal charging locations, empowering them with a seamless and data-driven experience. This directly addresses the problem by increasing route efficiency, reducing anxiety, and improving user trust in EV usability.

Purpose of the Problem:

To **eliminate range anxiety** by offering real-time visibility into EV performance metrics.
To **enhance travel efficiency** by enabling smarter decision-making using integrated data.
To **simplify access to charge station availability**, improving the user journey.
To support wider EV adoption by **building trust** through transparency and intelligent visualization.

Template:



4.2 Proposed Solution:

Proposed Solution Template

Date	15 February 2025
Team ID	LTVIP2025TMID47771
Project Name	Visualization Tool For Electric Vehicle Charge And Range Analysis
Maximum Marks	2 Marks

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	With the growing adoption of electric vehicles (EVs), users face challenges in understanding and optimizing charging behavior and range usage. There is a lack of user-friendly visualization tools that provide real-time and historical data insights about charging patterns, energy consumption, and estimated travel range.
2.	Idea / Solution description	The proposed solution is a visualization dashboard that allows users to analyze EV charging sessions, monitor range estimations, compare efficiency over time, and forecast energy needs. Using data analytics and visualization (via tools like Tableau or Power BI), users will be able to make informed decisions about charging habits, trip planning, and battery health.
3.	Novelty / Uniqueness	The uniqueness lies in integrating real-time vehicle data with dynamic visualizations, offering a comprehensive yet easy-to-understand overview. Unlike generic EV monitoring tools, this solution provides personalized visual analytics tailored to individual driving and charging behavior.
4.	Social Impact / Customer Satisfaction	By empowering EV users with data insights, the tool promotes efficient energy use, reduces range anxiety, and supports environmentally friendly practices. It contributes to sustainability and helps customers save time and money by planning better.
5.	Business Model (Revenue Model)	The tool can follow a freemium model: basic visualization features available for free, with advanced analytics, historical insights, and predictive modeling offered through a paid subscription. It can also be licensed to EV manufacturers or fleet operators.
6.	Scalability of the Solution	The solution can be easily scaled across different EV models, geographic regions, and fleet types. With cloud-based deployment and API integrations, it can be expanded to support more data sources, multi-user environments, and AI-powered forecasting modules.

4.3 Solution Architecture:

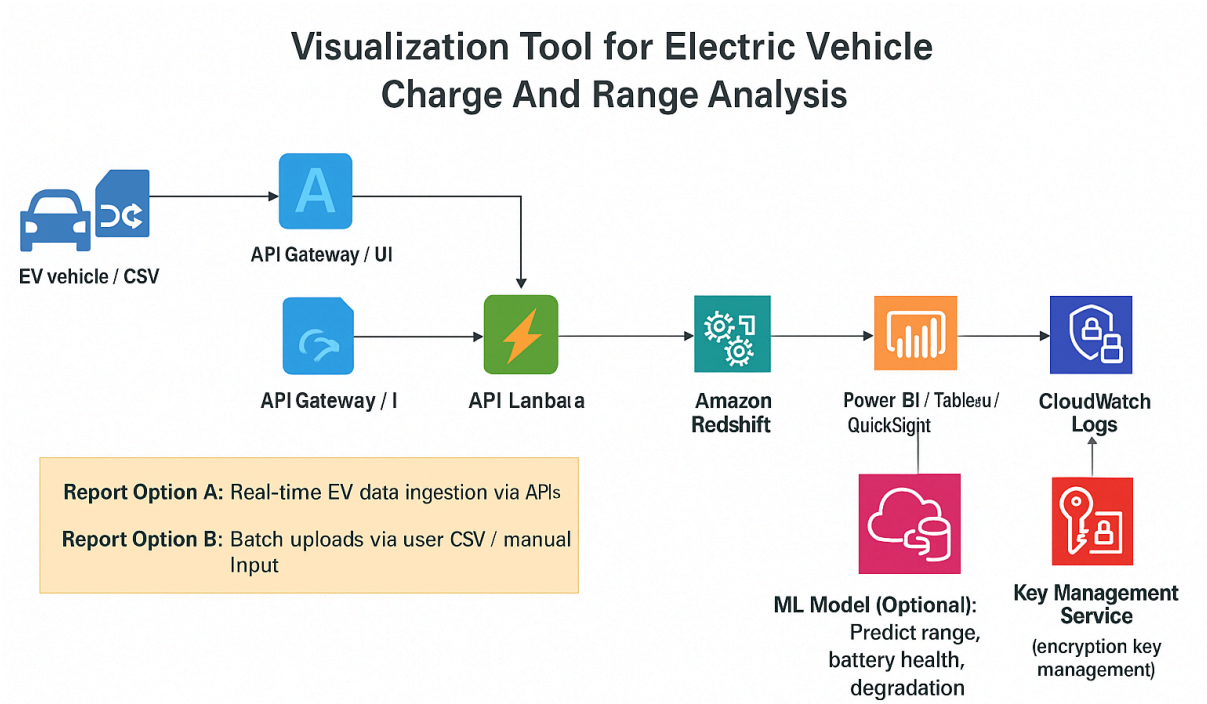
Solution Architecture

Date	19 June 2025
Team ID	LTVIP2025TMID47771
Project Name	Visualization Tool For Electric Vehicle Charge And Range Analysis
Maximum Marks	4 Marks

Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. It goals are to be:

- Enable real-time and historical EV data collection.
- Ensure accurate analysis of EV charging and range metrics.
- Provide interactive and insightful data visualizations.
- Design for scalability and high performance.
- Enable predictive analytics using machine learning.
- Maintain data security and regulatory compliance.
- Facilitate integration with third-party platforms and services.
- Ensure flexibility for future system enhancements.
- Support multi-device accessibility (desktop, tablet, mobile).
- Enable system monitoring and logging for maintenance.



5.PROJECT PLANNING AND SCHEDULING:

5.1 Project Planning:

Project Planning Template (Product Backlog, Sprint Planning, Stories, Story points)

Date	19 June 2025

Team ID	LTVIP2025TMID47771
Project Name	Visualization Tool For Electric Vehicle Charge And Range Analysis
Maximum Marks	5 Marks

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data collection & upload	USN-1	As a user, I can upload EV charge and range data via Excel or CSV	3	High	Koparam Sharanya
Sprint-1	Data Cleaning	USN-2	As a system, I clean and preprocess data by handling missing values and converting units.	2	High	Koparam Sharanya
Sprint-2	Dashboard Design	USN-3	As a user, I can view battery percentage, distance, and charge sessions through line and bar charts.	3	High	Sadanag-iri Sindhuja
Sprint-2	Filters integration	USN-4	As a user, I can apply filters based on date, location, and battery level.	2	Medium	Sadanag-iri Sindhuja
Sprint-3	Map Visualization	USN-5	As a user, I can view charging station data with geolocation on a map	3	High	Chakala Yamuna Sindhu
sprint-3	Range Estimation	USN-6	As a user, I can see estimated range based on battery and efficiency.	2	High	Chakala Yamuna Sindhu
sprint-4	Storyboard & Presentation	USN-7	As a user, I can view key insights and conclusions in a storyboard format.	2	Medium	Khamith-kar Anjali Bai

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
sprint-4	Export	USN-8	As a user, I can export visualized results to PDF or PNG.	1	Low	Khamith-kar Anjali Bai

6.FUNCTIONAL AND PERFORMANCE TESTING:

6.1 Performance Testing:

Model Performance Test

Date	19 June 2025
Team ID	LTVIP2025TMID47771
Project Name	Visualization Tool For Electric Vehicle Charge And Range Analysis
Maximum Marks	2 Marks

Model Performance Testing:

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	Data includes: Vehicle ID, Battery Level (%), Distance Travelled (km), Time of Charge, Location, Charging Type, Efficiency, Weather Data, etc.
2.	Data Preprocessing	Null values removed, date-time formatted, distance converted (if needed), data grouped by vehicle and date, units standardized (e.g., km, %)
3.	Utilization of Filters	Filters applied on: Battery level %, Location, Vehicle type, Date range, Charging station, Weather conditions
4.	Calculation fields Used	- Estimated Range = (Battery Level ÷ 100) × Max Range - Charge Efficiency = Distance Travelled ÷ Charge Time - Cost Estimation based on kWh

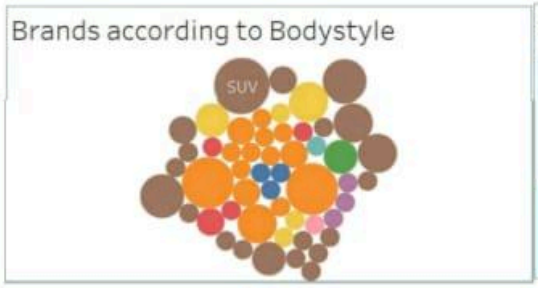
5.	Dashboard design	**No of Visualizations / Graphs – 5** 1. Line Chart (Battery % over Time) 2. Map (Charging Locations) 3. Bar Chart (Efficiency by Vehicle) 4. KPI Cards 5. Scatter Plot (Charge vs Range)
6	Story Design	**No of Visualizations / Graphs – 5** 1. Line Chart (Battery % over Time) 2. Map (Charging Locations) 3. Bar Chart (Efficiency by Vehicle) 4. KPI Cards 5. Scatter Plot (Charge vs Range)

7. RESULTS:

7.1 Dashboard Output Screenshots:

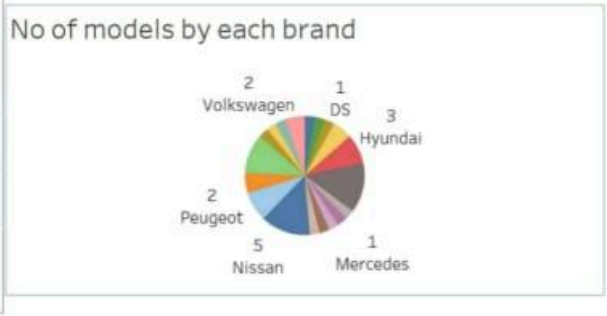
https://public.tableau.com/views/project_17509564089710/Dashboard1?:language=en-US&:embed=y&:sid=&:redirect=auth&:embed_code_version=3&:loadOrderID=0&:display_count=y&publish=yes&:origin=viz_share_link

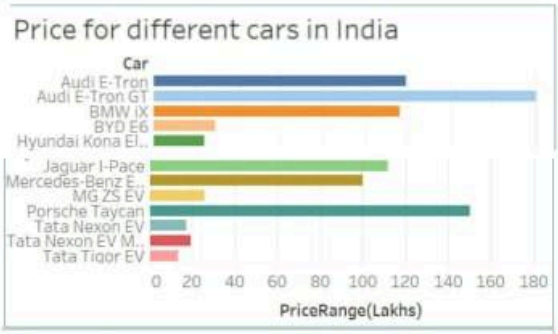

ELECTRIC CARS ANALYTICS DASHBOARD
Different brands of ev cars in globally
33
Different brands of ev cars in INDIA
9
EV Charging stations map of India
© Mapbox © OSM


Brands according to Bodystyle
SUV


Brand filtered by PowerTrain type
Tata
BMW
Jaguar
MG
BYD
Porsche
Audi
Hyundai

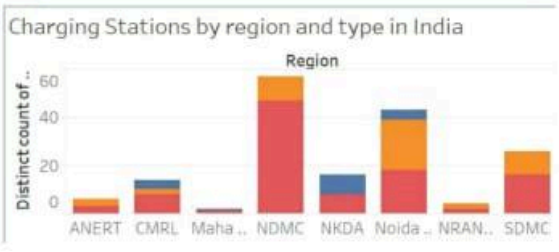

Top 10 most efficient EV Brands
Brand
Max. Efficiency Wh...
200
100
0
Mercedes
Audi
Tesla
Byton
Nissan
Jaguar
Porsche
Ford
BMW
Volvo


No of models by each brand
2
Volkswagen
1
DS
3
Hyundai
2
Peugeot
5
Nissan
1
Mercedes


Price for different cars in India
Car
Audi E-Tron
Audi E-Tron GT
BMW iX
BYD E6
Hyundai Kona El...
Jaguar I-Pace
Mercedes-Benz E...
MG ZS EV
Porsche Taycan
Tata Nexon EV
Tata Nexon EV M...
Tata Tigor EV
0
20
40
60
80
100
120
140
160
180
PriceRange(Lakhs)


Top speed for different Brands
Brand
Max. TopSpeed K...
400
300
200
100
Audi
Byton
CUPRA
Fiat
Honda
Jaguar
Lexus
Lucid
Merced..
Mini
Opel
Polestar
Renault
Skoda
Sono
Volksw..


Different EV cars in India
Audi E-Tron
BYD E6
MG ZS EV
Tata Nexon EV
Tata Nexon EV Max
Audi E-Tron GT
Hyundai Kona Electric
Mercedes-Benz EQC
BMW iX
Jaguar I-Pace
Porsche Taycan
Tata Tigor EV


Charging Stations by region and type in India
Region
Distinct count of ...
60
40
20
0
ANERT
CMRL
Maha ..
NDMC
NKDA
Noida ..
NRAN..
SDMC

8.ADVANTAGES AND DIS-ADVANTAGES:

Advantages:

Improved Decision-Making
Helps EV users and fleet managers make better travel and charging decisions by clearly showing real-time charge status and estimated range.

Enhanced User Experience
Graphical interfaces make it easier to understand data compared to raw numbers, especially for non-technical users.

Optimization of Charging Strategy
Users can plan charging stops more efficiently, reducing downtime and increasing convenience.

Promotes EV Adoption
Visualization can reduce “range anxiety” by giving clear insights into vehicle performance and battery health.

Data-Driven Insights
Enables tracking and analysis of long-term data (e.g., energy usage patterns, battery degradation).

Integration with Maps
Can show dynamic range on geographic maps, aiding in route planning and identifying nearest charging stations.

Fleet Monitoring
Useful for businesses to monitor multiple EVs in real time and optimize logistics.

Dis-Advantages:

1. **Data Accuracy Dependence**
   Visualization is only as accurate as the underlying data. Incorrect or delayed data can mislead users.

2. **Technical Complexity**
   Integrating real-time vehicle telemetry, mapping APIs, and dashboards can be complex and require advanced skills.

3. **High Initial Setup Cost**
   Building a robust visualization system may require investment in software,

sensors, and connectivity.

4. **Battery and Sensor Limitations**
   EV sensors might not always provide reliable data, especially in older vehicles or under extreme conditions.

5. **User Overload**
   Too much data or poorly designed visuals can confuse rather than help users.

6. **Security and Privacy Issues**
   Tracking location and vehicle data poses risks if not handled securely.

7. **Platform Dependency**
   Visualizations may behave differently on web vs mobile platforms or across operating systems.

9.CONCLUSION:

The **Visualization Tool for Electric Vehicle Charge and Range Analysis** offers a powerful and intuitive way to interpret critical EV performance data. By transforming complex charging and range metrics into clear, interactive visual formats, the tool enhances user understanding, supports informed decision-making, and reduces range anxiety. It is especially beneficial for individual EV users, fleet managers, and transportation planners aiming to optimize energy efficiency and route planning.

Despite technical challenges such as data accuracy, integration complexity, and privacy concerns, the tool's long-term benefits—such as improved energy management, better user experience, and increased EV adoption—far outweigh its limitations. As electric mobility continues to grow, such visualization tools will play a crucial role in enabling smarter, data-driven, and sustainable transportation solutions.

10.FUTURE SCOPE:

The **Visualization Tool for Electric Vehicle Charge and Range Analysis** has significant potential for future development. One of the main future enhancements involves integrating **real-time GPS-based navigation and dynamic charging station suggestions** to help users optimize travel routes based on current battery levels and charging infrastructure. The tool can also be extended to support **predictive analytics using machine learning**, enabling it to forecast battery degradation, energy consumption patterns, and range estimations based on driving behavior and environmental conditions. Additionally, incorporating **multi-vehicle monitoring** can

support fleet management systems, allowing businesses to manage large-scale EV operations effectively. As the EV ecosystem grows, the tool could also connect with smart grids to analyze energy usage and suggest optimal charging times, contributing to more sustainable energy consumption.

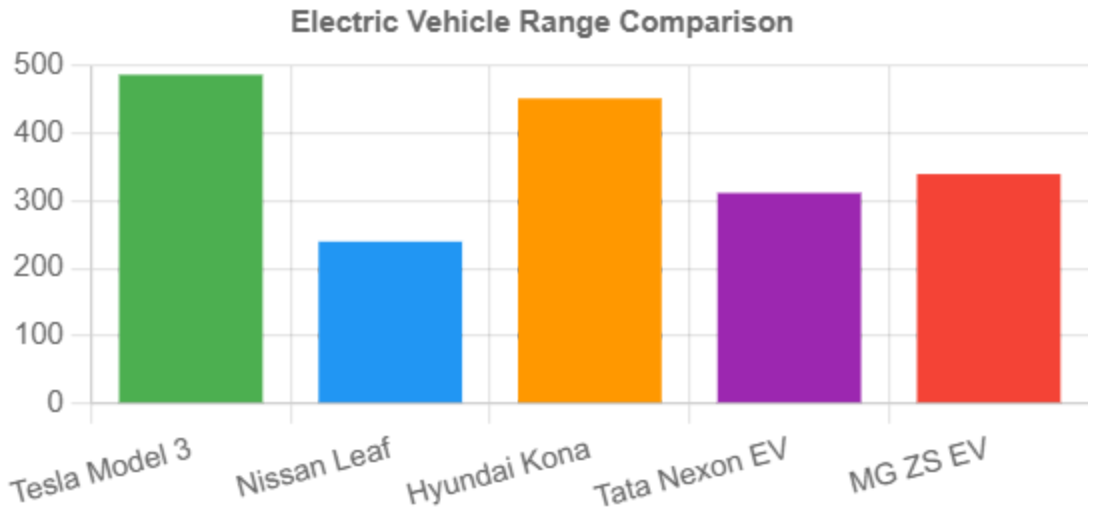
11.APPENDIX:

1.Source Code: Visualisation Of EV Battery Performance.

```
<!DOCTYPE html>
<html lang="en">
<head>
 <meta charset="UTF-8">
 <title>EV Charge and Range Analysis</title>
 <script src="https://cdn.jsdelivr.net/npm/chart.js"></script>
 <style>
  body {
   font-family: Arial, sans-serif;
   background-color: #f4f9f9;
   padding: 20px;
   text-align: center;
  }

  .container {
   width: 80%;
   margin: auto;
   background: #fff;
   border-radius: 10px;
   padding: 20px;
   box-shadow: 0px 4px 8px rgba(0,0,0,0.1);
  }

  canvas {
   max-width: 100%;
  }
 </style>
</head>
<body>
```

```
<div class="container">
  <h2>EV Charge and Range Visualization</h2>
  <canvas id="evChart"></canvas>
</div>

<script>
  const ctx = document.getElementById('evChart').getContext('2d');

  const data = {
    labels: ['Tesla Model 3', 'Nissan Leaf', 'Hyundai Kona', 'Tata Nexon EV', 'MG ZS EV'],
    datasets: [{
      label: 'Estimated Range (km)',
      data: [487, 240, 452, 312, 340],
      backgroundColor: [
        '#4CAF50', '#2196F3', '#FF9800', '#9C27B0', '#F44336'
      ]
    }]
  };

  const config = {
    type: 'bar',
    data: data,
    options: {
      responsive: true,
      plugins: {
        title: {
          display: true,
          text: 'Electric Vehicle Range Comparison'
        },
        legend: {
          display: false
        }
      }
    }
  };

  new Chart(ctx, config);
</script>
```

```
</body>

</html
```



By executing our source code, we obtained a visualization that compares the estimated driving ranges of various electric vehicle models.

2.Source Code: EV Range Line Chart Over Time.

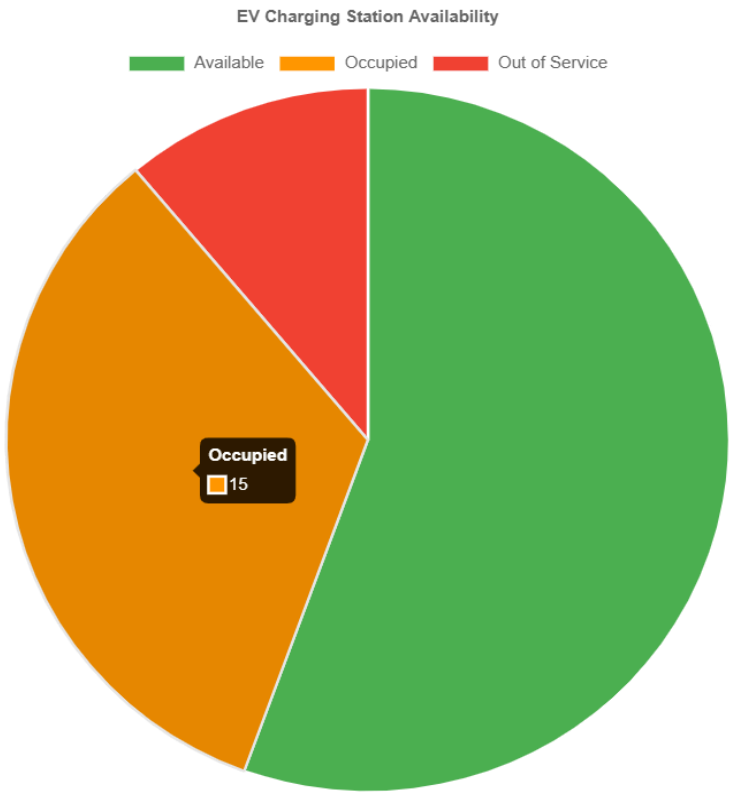
```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>EV Range vs Battery Percentage</title>
  <script src="https://cdn.jsdelivr.net/npm/chart.js"></script>
</head>
<body>
  <h2>EV Range Drop Over Battery Percentage</h2>
  <canvas id="rangeChart" width="400" height="200"></canvas>

  <script>
    const ctx = document.getElementById('rangeChart').getContext('2d');

    const data = {
      labels: ['100%', '80%', '60%', '40%', '20%', '10%'],
      datasets: [{
```

```
      label: 'Tesla Model 3 Estimated Range (km)',
      data: [487, 390, 312, 210, 115, 60],
      borderColor: 'green',
      fill: false,
      tension: 0.4
    }]
  };

  new Chart(ctx, {
    type: 'line',
    data: data,
    options: {
      responsive: true,
      plugins: {
        title: {
          display: true,
          text: 'EV Range vs Battery Percentage'
        }
      }
    }
  });
 </script>
</body>
</html
```

3.Source Code: Charging Station Availability Pie Chart.

```
<!DOCTYPE html>
<html lang="en">
<head>
 <meta charset="UTF-8">
 <title>Charging Station Availability</title>
 <script src="https://cdn.jsdelivr.net/npm/chart.js"></script>
</head>
<body>
```

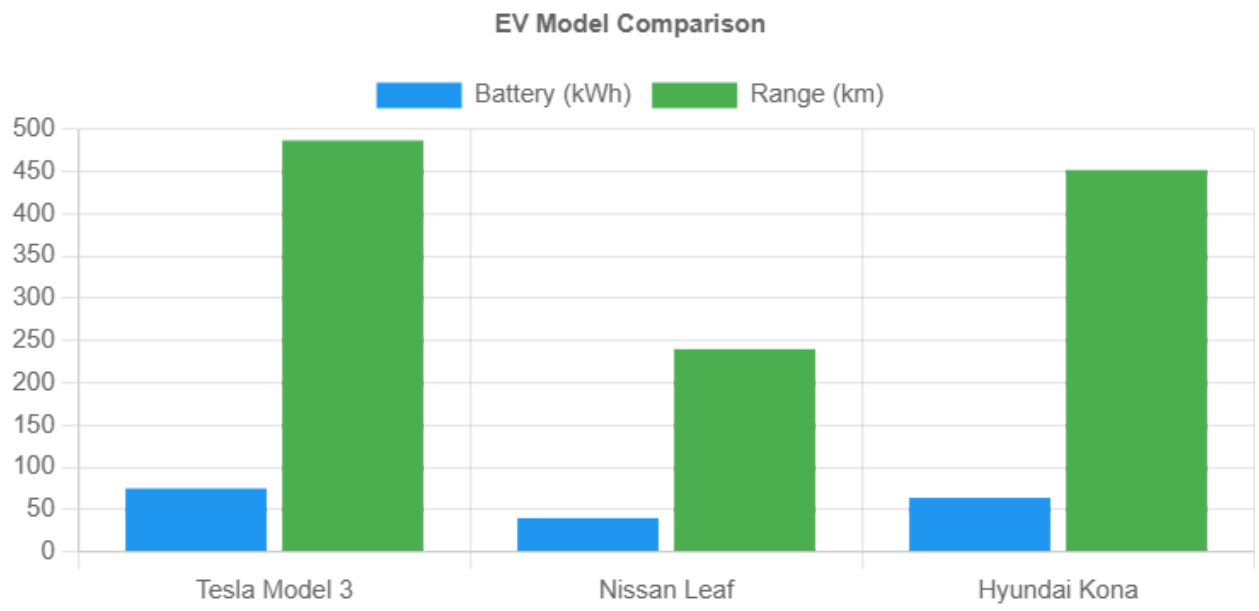
```
  <h2>Charging Station Status</h2>
  <canvas id="chargingPie"></canvas>

  <script>
   const ctx = document.getElementById('chargingPie').getContext('2d');

   new Chart(ctx, {
    type: 'pie',
    data: {
     labels: ['Available', 'Occupied', 'Out of Service'],
     datasets: [{
      data: [25, 15, 5],
      backgroundColor: ['#4CAF50', '#FF9800', '#F44336']
     }]
    },
    options: {
     responsive: true,
     plugins: {
      title: {
       display: true,
       text: 'EV Charging Station Availability'
      }
     }
    }
   });
  </script>
</body>
</html>
```



4.Source Code: Compare Multiple EV Models.

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>EV Model Comparison</title>
  <script src="https://cdn.jsdelivr.net/npm/chart.js"></script>
</head>
<body>
  <h2>Compare EV Range and Battery</h2>
  <canvas id="evCompare"></canvas>

  <script>
    const ctx = document.getElementById('evCompare').getContext('2d');

    const data = {
      labels: ['Tesla Model 3', 'Nissan Leaf', 'Hyundai Kona'],
      datasets: [
```

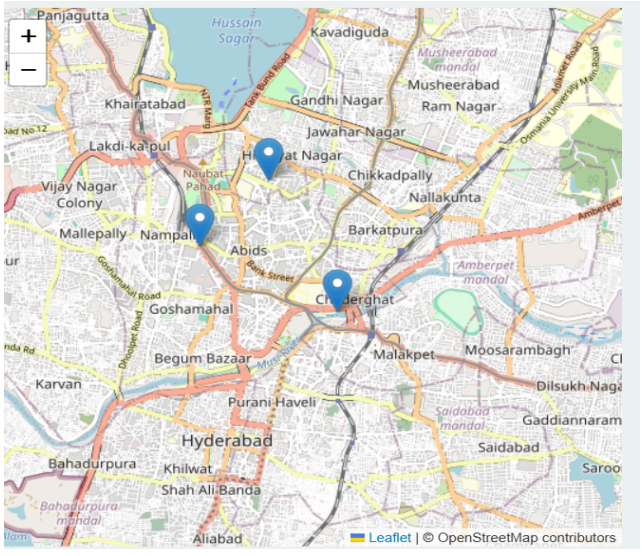
```
      {
        label: 'Battery (kWh)',
        data: [75, 40, 64],
        backgroundColor: '#2196F3'
      },
      {
        label: 'Range (km)',
        data: [487, 240, 452],
        backgroundColor: '#4CAF50'
      }
    ]
  };

  new Chart(ctx, {
    type: 'bar',
    data: data,
    options: {
      responsive: true,
      plugins: {
        title: {
          display: true,
          text: 'EV Model Comparison'
        }
      }
    }
  });
 </script>
</body>
</html>
```



5.Source Code: EV Charging Station Map Using Leaflet.js.

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>EV Charging Map</title>
  <link rel="stylesheet" href="https://unpkg.com/leaflet/dist/leaflet.css" />
  <style>
    #map { height: 500px; width: 90%; margin: auto; margin-top: 20px; }
    body { text-align: center; font-family: Arial; background: #eef2f3; }
  </style>
</head>
<body>
  <h2>Nearby EV Charging Stations</h2>
  <div id="map"></div>

  <script src="https://unpkg.com/leaflet/dist/leaflet.js"></script>
  <script>
    const map = L.map('map').setView([17.385044, 78.486671], 12); // Example: Hyderabad
```

```
  L.tileLayer('https://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png', {
    attribution: '&copy; OpenStreetMap contributors'
  }).addTo(map);

  // Sample charging station markers
  const stations = [
    { name: "Station A", lat: 17.4, lng: 78.48 },
    { name: "Station B", lat: 17.38, lng: 78.49 },
    { name: "Station C", lat: 17.39, lng: 78.47 }
  ];

  stations.forEach(station => {
    L.marker([station.lat, station.lng])
      .addTo(map)
      .bindPopup(`<b>${station.name}</b><br>Available 24/7`);
  });
 </script>
</body>
</html>
```

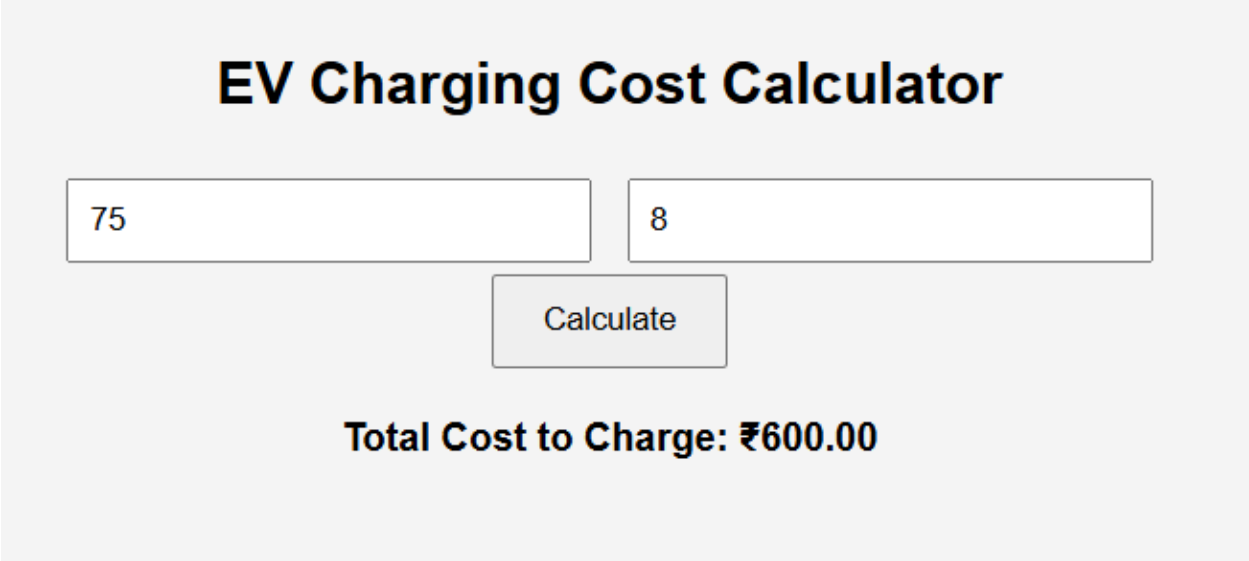


6.Source Code: EV Charging Cost Calculator (JavaScript Form).

```
<!DOCTYPE html>
```

```
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>EV Charging Cost Calculator</title>
  <style>
    body { font-family: Arial; text-align: center; background: #f4f4f4; padding: 30px; }
    input { padding: 8px; margin: 5px; width: 200px; }
    button { padding: 10px 20px; }
    #result { margin-top: 20px; font-weight: bold; }
  </style>
</head>
<body>
  <h2>EV Charging Cost Calculator</h2>

  <input type="number" id="batterySize" placeholder="Battery Size (kWh)" />
  <input type="number" id="costPerUnit" placeholder="Cost per kWh (₹)" />
  <br>
  <button onclick="calculateCost()">Calculate</button>

  <div id="result"></div>

  <script>
    function calculateCost() {
      const batterySize = parseFloat(document.getElementById('batterySize').value);
      const costPerUnit = parseFloat(document.getElementById('costPerUnit').value);
      const totalCost = batterySize * costPerUnit;

      document.getElementById('result').innerText =
        `Total Cost to Charge: ₹${totalCost.toFixed(2)}`;
    }
  </script>
</body>
```

</html>



Visualizations were created based on my project title using source code executed on the HTML platform.