

Project Design Phase Solution
Requirements (Functional & Non-functional)

Team Id	LTVIP2025TMID51076
Project Name	Visualization Tool for Electric Vehicle Charge and Range Analysis
Date	23/06/2025

Functional Requirement :

1.	Data Collection Interface	<ul style="list-style-type: none">• Web interface or IoT device integration to collect real time EV data• API integration with EV chargers, fleet management software, or smart grid systems
2.	Data Storage & Management	<ul style="list-style-type: none">• Centralized cloud based database to store raw EV usage and sustainability matrices• Capability to update records in real time.
3.	Data Cleaning & Preprocessing	<ul style="list-style-type: none">• Tools or scripts to remove duplicates, handle missing values.• Categorization by Ev types eg:- 2-wheeler, 4-wheeler, commercial
4.	Interactive Visualization (Tableau)	<ul style="list-style-type: none">• Dashboards showing key matrices like CO2 emissions avoided, battery efficiency, range trends, and energy• Filters by vehicle type, geography, owner profile, and usage type.

		<ul style="list-style-type: none">• Trend analysis,
5.	Analytics & Insights	<ul style="list-style-type: none">• Pattern recognition (e.g., peak charging hours, degradation in battery performance).• Group-wise comparison (commercial fleets vs private users, urban vs rural EV users)

Non Functional Requirement :

1.	Scalability	Should handle data from hundreds or thousands of users at a time
2.	User-Friendliness	Dashboard and reports should be easy to navigate, with minimal training required.
3.	Performance	Fast data processing and dashboard loading, even for large datasets.
4.	Data Privacy & Security	<ul style="list-style-type: none">• Comply with data protection standards (like GDPR, ISO 27001).• Secure login and role-based access control to location data
5.	Compatibility	Should work on various devices (laptops, mobiles) and support data export (PDF, Excel)