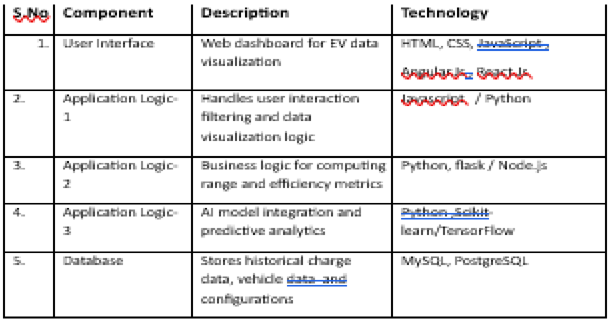
Project Design Phase-II

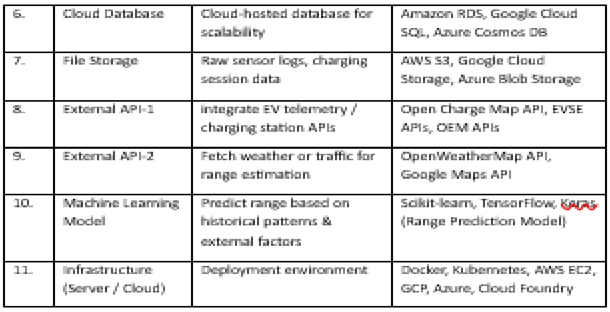
Technology Stack (Architecture & Stack)

Date	31 January 2025
Team ID	LTVIP2025TMID52073
Project Name	Visualization tool for electric vehicle charge and range analysis-updated
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2





S.No	Component	Description	Technology
1.	User Interface	Web dashboard for EV data visualization	HTML, CSS, JavaScript, Angular Js, React Js
2.	Application Logic-1	Handles user interaction filtering and data visualization logic	Javascript / Python
3.	Application Logic-2	Business logic for computing range and efficiency metrics	Python, flask / Node.js
4.	Application Logic-3	AI model integration and predictive analytics	Python, Scikit-learn/TensorFlow
5.	Database	Stores historical charge data, vehicle data and configurations	MySQL, PostgreSQL
6.	Cloud Database	Cloud-hosted database for scalability	Amazon RDS, Google Cloud SQL, Azure Cosmos DB
7.	File Storage	Raw sensor logs, charging session data	AWS S3, Google Cloud Storage, Azure Blob Storage
8.	External API-1	integrate EV telemetry / charging station APIs	Open Charge Map API, EVSE APIs, OEM APIs
9.	External API-2	Fetch weather or traffic for range estimation	OpenWeatherMap API, Google Maps API
10.	Machine Learning Model	Predict range based on historical patterns & external factors	Scikit-learn, TensorFlow, Keras (Range Prediction Model)
11.	Infrastructure (Server / Cloud)	Deployment environment	Docker, Kubernetes, AWS EC2, GCP, Azure, Cloud Foundry

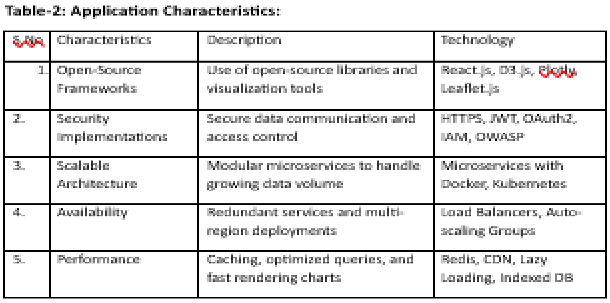


Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Use of open-source libraries and visualization tools	React.js, D3.js, Plotly Leaflet.js
2.	Security Implementations	Secure data communication and access control	HTTPS, JWT, OAuth2, IAM, OWASP
3.	Scalable Architecture	Modular microservices to handle growing data volume	Microservices with Docker, Kubernetes
4.	Availability	Redundant services and multi-region deployments	Load Balancers, Auto-scaling Groups
5.	Performance	Caching, optimized queries, and fast rendering charts	Redis, CDN, Lazy Loading, Indexed DB