Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	28 June 2025
Team ID	**LTVIP2025TMID49020**
Project Name	**Visualization tool for electric vehicle charge and range analysis**
Maximum Marks	**4Marks**

Technical Architecture:

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

Example: Order processing during pandemics for offline mode

Reference: https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/

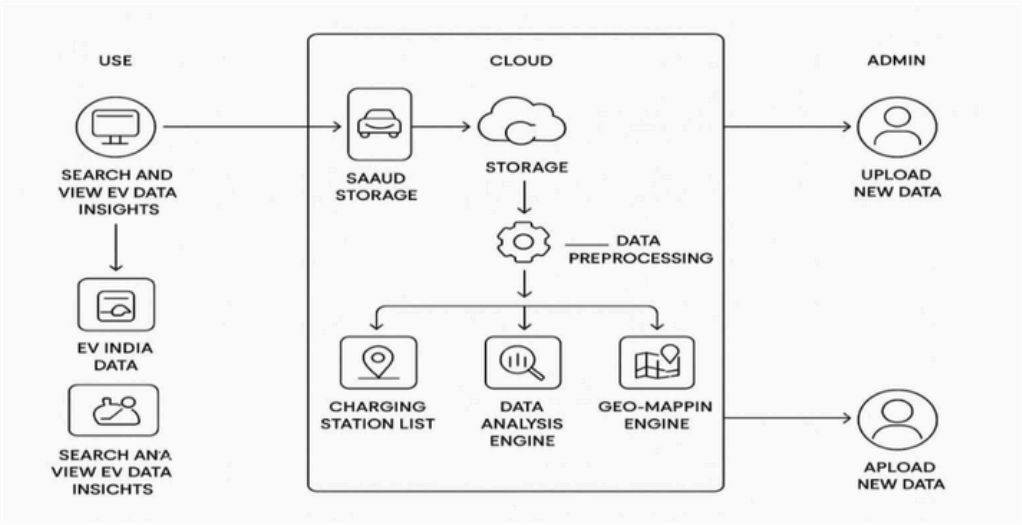

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1	User Interface	User interacts via dashboard UI	Streamlit / Tableau Public / React
2	Application Logic-1	Filtering, chart logic, dataset joins	Python / Pandas / Flask
3	Application Logic-2	Speech-to-text query input	IBM Watson STT
4	Application Logic-3	Chatbot for EV recommendations	IBM Watson Assistant
5	Database	EV specs, pricing, range, and charging data	CSV / Excel-based structured data
6	Cloud Database	Cloud-based data backup	IBM Cloudant / IBM DB2
7	File Storage	Uploaded sheets, report export	IBM Block Storage / Local Filesystem
8	External API-1	Charger map overlay	Google Maps API
9	External API-2	Regional tagging / ID verification	Aadhar API (if needed)
10	Machine Learning Model	Recommend EVs based on user filters	Scikit-learn / Custom logic
11	Infrastructure (Cloud)	Hosting and deployment	IBM Cloud / Cloud Foundry / Heroku

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1	**Open-Source Frameworks**	Uses open tools and libraries for dashboard creation and data processing	Python (Pandas, NumPy), Streamlit, Tableau Public
2	**Security Implementations**	Secures data access and API calls using encryption and access control	JWT, OAuth 2.0, HTTPS, IAM Policies
3	**Scalable Architecture**	Easily scalable to new datasets, regions, or APIs	Microservices approach with IBM Cloud / Serverless
4	**Availability**	Hosted on cloud with high uptime; accessible on any device	IBM Cloud Foundry, Load Balancer
5	**Performance**	Optimized for speed with caching and minimal loading time	Tableau Rendering Engine, Data Extracts, CDN
6	**Reliability**	Fault-tolerant storage and consistent rendering of dashboards	Cloud Object Storage + Tableau Autosave
7	**Usability**	Simple UI with interactive filters, search, and visual clarity	Drag-drop charts, dynamic filters, user-friendly layout