Technology Stack

Date	26 June 2025
Team ID	LTVIP2025TMID48669
Project Name	Visualization Tool for Electric Vehicle Charge and Range Analysis.
Maximum Marks	4 Marks

TITLE :

Visualization Tool for Electric Vehicle Charge and Range Analysis.

Team ID : LTVIP2025TMID48669

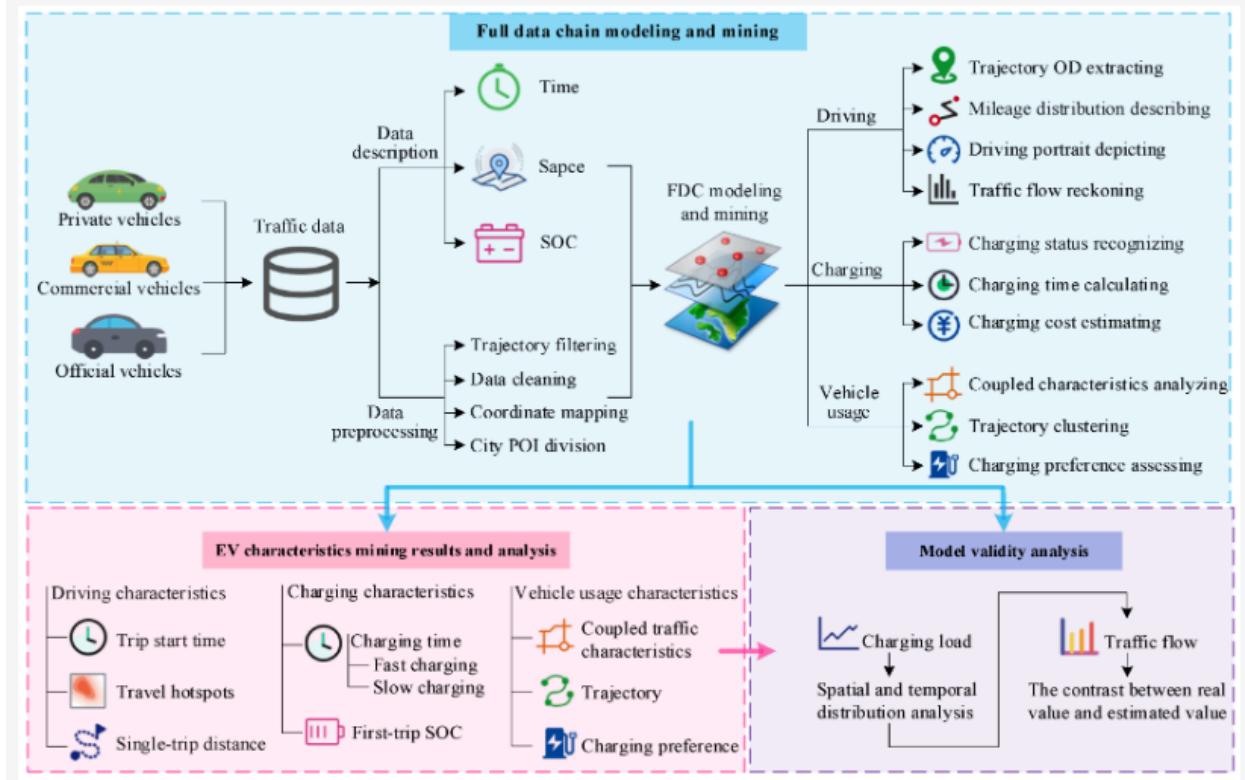## Team Members :

Team Leader : Likitha Dadi
Team member : Ella Likhitha
Team member : Gandi Dinesh
Team member : Allada Vasanth
Team member : Goona Ganapathi Swamy

TECHNICAL ARCHITECTURE

Figure 1. Architecture of the FDC-based EV modeling and analysis.

APPLICATION DEVELOPMENT

S.No	Component	Description	Technology Used
1	User Interface	Front-end for users to interact with dashboards and reports	Tableau Web UI, Tableau Server
2	Application Logic-1	Data Cleaning, Data Transformation	Python, SQL
3	Application Logic-2	Data Blending, Joining datasets	Tableau Prep, SQL
4	Application Logic-3	Dashboard Logic, Calculations, Filters	Tableau Calculated Fields, LODs
5	Database	Structured data storage	PostgreSQL, MySQL
6	Cloud Database	Cloud-based scalable data warehouse	Snowflake, AWS RDS
7	File Storage	Storage for raw data uploads, extracts, and exports	AWS S3, Azure Blob Storage
8	External API-1	Fetch government data for EV sales, policies	Indian Govt Open Data API
9	External API-2	Fetch market research and OEM data feeds	Automotive Market APIs (e.g. Statista)

| 10 | Machine Learning Model | Optional for future predictions (battery life, range) | Python ML Libraries (scikit-learn) |
| 11 | Infrastructure (Server/Cloud) | Deployment and hosting | AWS EC2, Azure VM, Kubernetes |

APPLICATION CHARACTERISTICS

S.No	Characteristics	Description	Technology Used
1	Open-Source Frameworks	Tools for data prep and transformation	Python, Pandas, SQLAlchemy
2	Security Implementations	Authentication and access control, data encryption	IAM (AWS/Azure), SSL/TLS, Tableau Permissions
3	Scalable Architecture	Architecture capable of handling increasing data volume and user load	Cloud-based Snowflake, Kubernetes
4	Availability	High availability via cloud infrastructure and load balancers	AWS ELB, Azure Load Balancer
5	Performance	Caching, fast extracts, optimized queries, low dashboard load times	Tableau Hyper Extracts, Tableau Cache, CDN for web access