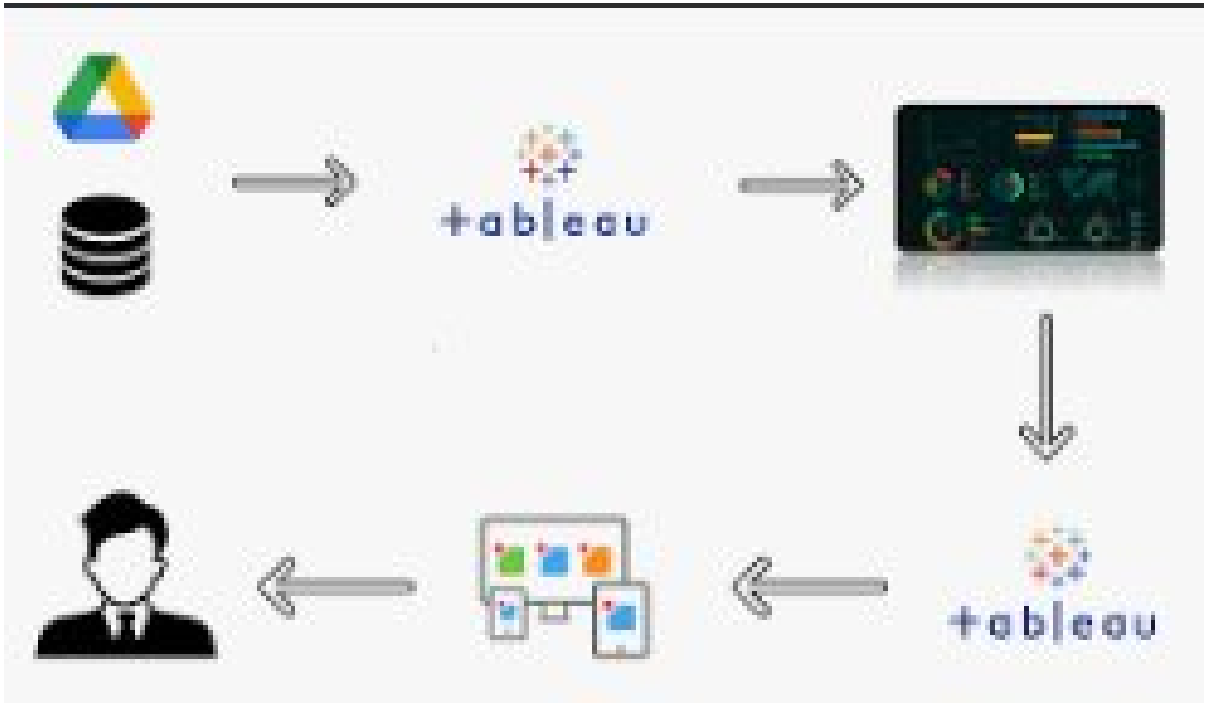
Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	16 February 2026
Team ID	LTVIP2026TMIDS55781
Project Name	Plugging into the Future: An Exploration of Electricity Consumption Patterns Using Tableau
Maximum Marks	4 Marks

Technical Architecture:

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



Technology Stack

Below is the technology stack used in the iRevolution Tableau project.

Table-1: System Components

Sno	Components	Description	technology
1	User Interface	How user interacts with the analytics platform (Web UI, Mobile App, etc.)	HTML, CSS, JavaScript / Angular JS / React JS
2	Data Integration Layer	Connects and imports electricity consumption datasets from files or databases.	Python,Tableau
3	Data Preparation & Transformation	Cleans, formats, and prepares raw electricity data for analysis (handling null values, standardizing formats).	Tableau Prep , Python(Pndas,NumPy)
4	Analytics & Visualization Engine	Creates charts, maps, and dashboards to visualize consumption patterns and trends.	Tableau Desktop
5	Calculated Metrics & Business Logic	Computes KPIs such as Year-over-Year growth, peak demand, and regional consumption comparisons	Tableau Calculated Fields, Python
6	Database	Stores structured electricity consumption datasets and processed extracts.	MySQL / PostgreSQL / CSV Data Sources
7	Cloud & File Storage	Stores datasets and dashboard assets for sharing and backup.	Google Drive / AWS S3 / Local Storage
8	Dashboard Publishing Platform	Publishes dashboards for stakeholder access and public viewing	Tableau Public / Tableau Server
9	External Data Sources	Integrates supplementary datasets such as regional demographics or weather factors influencing electricity use.	pen Government Data APIs / CSV datasets
10	Performance Optimization	Improves dashboard responsiveness and refresh performance.	Tableau Extracts (.hyper), Data Indexing
11	Infrastructure & Deployment	Hosts dashboards for access by stakeholders and ensures availability.	Local Server / Cloud Hosting

Table-2: Application Characteristics:

S.No	Category	Description	Technology Used
1	Open-Source Frameworks	Libraries used for data cleaning, analysis, and modeling.	Python, Pandas, NumPy, Scikit-Learn
2	Security Implementations	Access control and authentication for dashboard usage.	Role-Based Access Control (RBAC), OAuth 2.0
3	Scalable Architecture	Design supports addition of new EVs, charging stations, and historical datasets.	Cloud Storage, REST APIs
4	Availability	Ensures dashboard is accessible during stakeholder meetings and reviews.	Tableau Server Deployment / Cloud Hosting
5	Performance	Optimized data extracts and filtering for fast dashboard loading.	Tableau Extracts (.hyper), Indexed Queries
6	Data Accuracy	Validation of KPIs against raw EV datasets before publishing.	Data Validation Scripts (Python)
7	Usability	Clean layout with clear legends and consistent color coding for battery, range, and energy metrics.	Tableau Design Principles
8	Reliability	Handles missing charging or trip data without calculation errors.	Error Handling in Python / Data Cleaning Logic