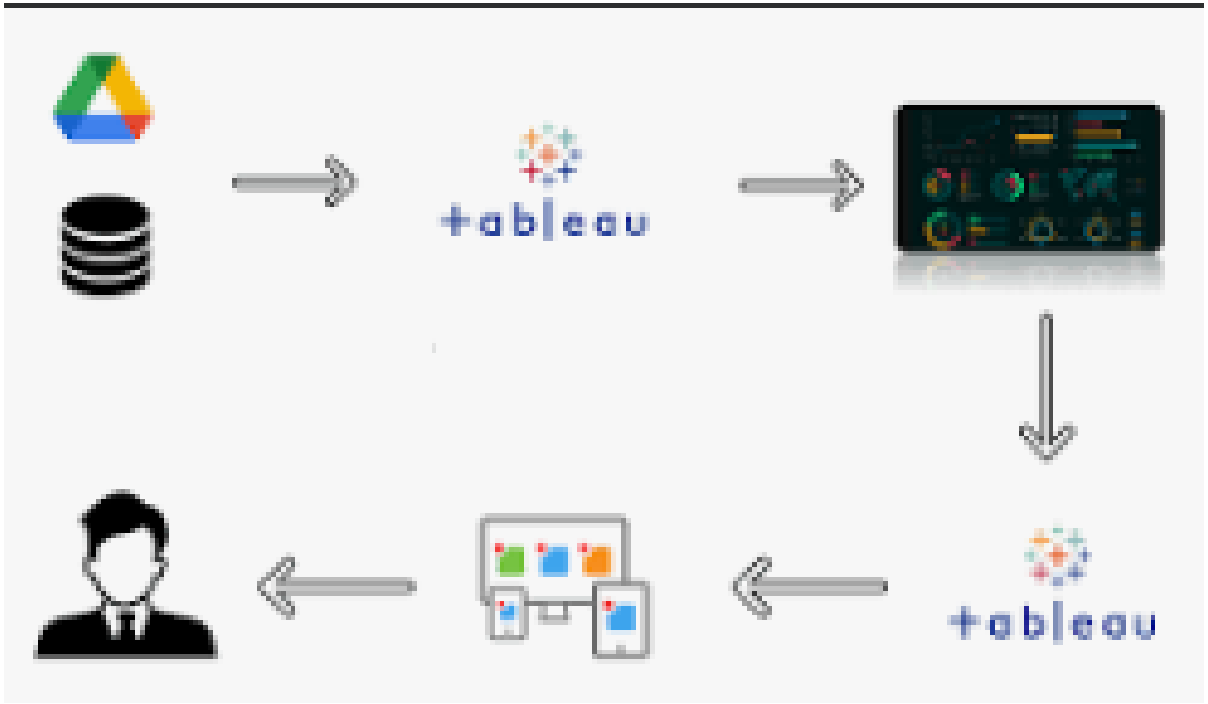
Project Design Phase-II Technology Stack (Architecture & Stack)

Date	15 Feb 2026
Team ID	LTVIP2026TMIDS43270
Project Name	Visualization Tool for Electric Vehicle Charge and Range Analysis with 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



3. 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	Application Logic-1	Logic for filtering and comparing cosmetic products	Python / Java
3	Application Logic-2	Text analysis for extracting product claims and ingredients	IBM Watson NLU / Python NLP libraries
4	Application Logic-3	Chatbot interface for product recommendations	IBM Watson Assistant / Google Dialogflow
5	Database	Storage for product, sales, and customer interaction data	MySQL, MongoDB (NoSQL)
6	Cloud Database	Scalable cloud-based data storage	IBM DB2, IBM Cloudant, Firebase
7	File Storage	Storage for product images and marketing assets	IBM Cloud Object Storage / AWS S3 / Local Filesystem
8	External API-1	Integration for real-time skin type/weather-based product suggestions	IBM Weather API / SkincareMatch API
9	External API-2	Integration with product barcode scanners or e-commerce platforms	Amazon Product API / Flipkart Open API
10	Machine Learning Model	Product recommendation engine and trend prediction	Classification Models, Recommendation Systems (Scikit-Learn)
11	Infrastructure	Deployment on local servers or cloud infrastructure	Local Server / IBM Cloud / Kubernetes / Cloud Foundry

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 (3–5 seconds).	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