Project Design Phase

Solution Architecture

Date	25-06-2025
Team ID	LTVIP2025TMID20838
Project Name	Plugging into the Future : An Exploration of Electricity Consumption Patterns
Maximum Marks	4 Marks

Solution Architecture:

Solution architecture is a structured process that bridges the gap between real-world energy consumption challenges and advanced data analytics using Tableau. It ensures the design and delivery of a scalable and insightful solution tailored for analysing electricity usage patterns.

Its goals in the context of this project are to:

• **Find the best tech solution** to collect, process, and visualize electricity consumption data for better decision-making and resource optimization.

• **Describe the structure, flow, and components** of the Tableau-based dashboard

solution to stakeholders, including how data flows from sources to insights.

• **Define the key features** (such as peak consumption detection, time-based usage trends, location-wise patterns), the project's development phases (data gathering, processing, visualization), and system requirements (storage, processing, access control).

• **Provide clear technical specifications** for how the solution should be defined, developed, and deployed—ensuring performance, scalability, and usability.

How It's Applied in This Project:

• **Business Problem**: Inefficient energy use and lack of data-driven visibility in consumption patterns.

• **Technology Solution**: A Tableau-powered dashboard connected to processed electricity data from smart meters, weather APIs, and utility records.

• **Structure & Behavior**: ETL pipelines feed cleaned and structured data into a central database, which Tableau uses to generate interactive and dynamic visualizations.

• **Development Phases:**

1. Data Collection & Integration

2. Data Cleaning & Transformation

3. Dashboard Design in Tableau

4. User Testing & Feedback

5. Final Deployment & Training

• **Specifications:** Includes data schema, visualization types, update frequency, access levels, and backup strategies.
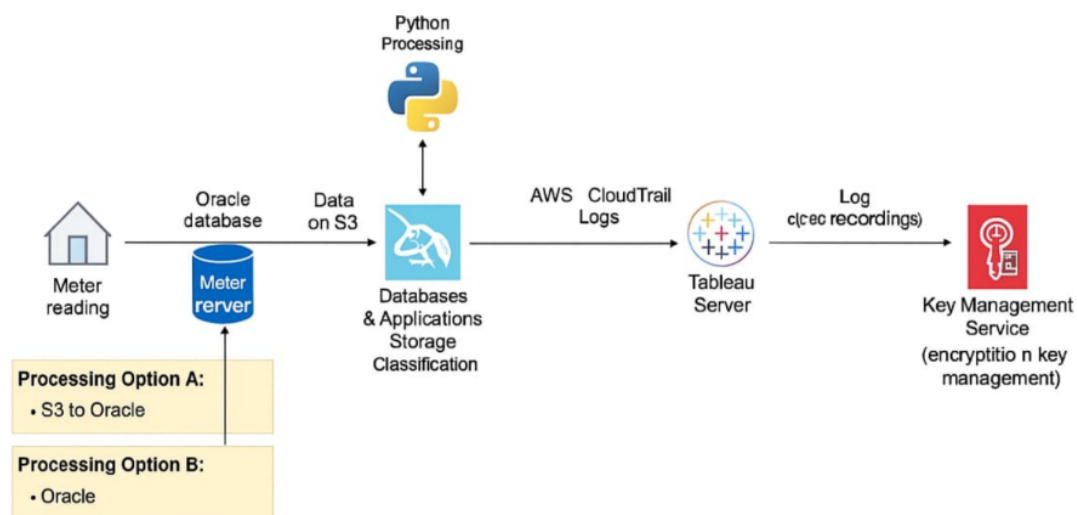
Solution Architecture Diagram:

Figure 1: Architecture and data flow of the electricitiy consumption app using Tableau

Reference: https://www.tableau.com/blog/plumbing-future-exploration-electricity-con-usng-tableau

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