System Architecture Design

Architectural Overview

The system follows a layered pipeline architecture:

Layer 1: Data Source
CSV Dataset (Consumption.csv)

Layer 2: Database Layer
MySQL Database
Table: electricity consumption

Layer 3: Query Layer
SQL Aggregation Queries
Indexes for performance optimization

Layer 4: Visualization Layer
Tableau Desktop
Calculated Fields
Dashboard Creation

Layer 5: Publishing Layer
Tableau Public

Layer 6: Integration Layer
Flask Web Application
Embedded Dashboard

Architecture Flow

Consumption.csv
→ MySQL Database
→ SQL Aggregation
→ Tableau
→ Dashboard & Story
→ Tableau Public
→ Flask Web Interface

3. Performance Considerations

- Indexing Date and Region columns
- Pre-aggregated SQL queries
- Limited calculated fields in Tableau

4. Scalability Considerations

- Database can scale to additional years
- Can integrate real-time API data in future
- Can extend to renewable energy forecasting