

# **Proposed Analytical Model for Electricity Consumption Analysis**

## **Overview**

The proposed analytical solution transforms raw time-series electricity consumption data into structured insights using a multi-layered architecture consisting of:

Data Layer

Processing Layer

Visualization Layer

Presentation Layer

## **Data Layer**

Source:

Consumption.csv

Attributes:

- State
- Region
- Latitude
- Longitude
- Date
- Usage (Mega Units)

Data stored in MySQL table:  
electricity\_consumption

Primary Design:

- Date stored as DATE type
- Usage stored as FLOAT
- Indexed columns: State, Region, Date

## **Processing Layer**

SQL Aggregations:

Yearly Total Consumption:

```
SELECT YEAR(Date), SUM(Usage) FROM electricity_consumption GROUP BY  
YEAR(Date);
```

Monthly Consumption:

```
SELECT YEAR(Date), MONTH(Date), SUM(Usage) GROUP BY YEAR(Date),  
MONTH(Date);
```

Region-wise Aggregation:

```
SELECT Region, SUM(Usage) GROUP BY Region;
```

Quarter-wise Aggregation:

```
SELECT QUARTER(Date), SUM(Usage) GROUP BY QUARTER(Date);
```

Lockdown Classification:

```
CASE  
WHEN Date < '2020-03-25' THEN 'Pre-Lockdown'  
ELSE 'Post-Lockdown'  
END
```

## Visualization Layer

Minimum Visualizations:

1. Time-Series Line Chart
2. Region-wise Bar Chart
3. Geographic Map
4. Top N States Bar Chart
5. Bottom N States Bar Chart
6. Monthly Trend Line
7. Quarter-wise Comparison
8. Lockdown Impact Chart
9. Dashboard Design Principles
  - User-centered layout
  - Minimal clutter
  - Clear labeling
  - Dynamic filters
  - Consistent color scheme
6. Story Design Structure

Scene 1: Overall Consumption Overview

Scene 2: 2019 vs 2020 Comparison

Scene 3: Regional Analysis

Scene 4: Lockdown Impact

Scene 5: Strategic Insights

