Phase 1: PROBLEM DEFINITION AND DESIGN THINKING

MEASURE ENERGY CONSUMPTION

PROBLEM DEFINITION:

The problem at hand is to create an automated system that measures energy consumption, analyses the data, and provides visualizations for informed decision-making. This solution aims to enhance efficiency, accuracy, and case of understanding in managing energy consumption across various sectors.

KEY COMPONENTS

Data source , Data processing , Feature extraction ,Model development , Visualization and Automation .

Design Thinking:

1. Data Source: Identify an available dataset containing energy consumption measurements.
2. Data processing : Clean, transform, and prepare the dataset for analysis.
3. Feature Extraction: Extract relevant features and metrics from the energy consumption data.
4. Model Development: Utilize statistical analysis to uncover trends, patterns, and anomalies in the data.
5. Visualization: Develop visualizations (graphs, charts) to present the energy consumption trends and insights.
6. Automation: Build a script that automates data collection, analysis, and visualization processes.

DESIGN THINKING:

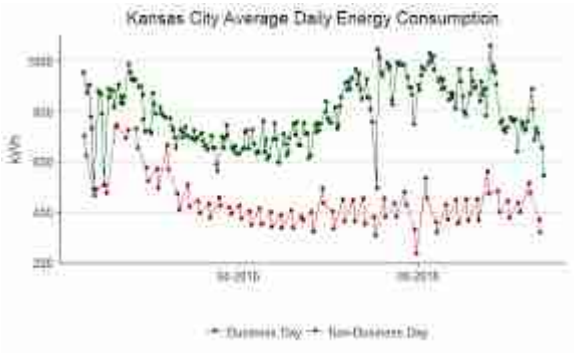
1. **Data Source**:
   This data may include electricity, gas, water, or other forms of energy usage. In industrial
   Or commercial settings , Iot sensors and systems can be deployed to measure energy consumption. Get the relevant data from various sources, including smart meters, sensors, utility bills, and historical consumption.

2. **Data Pre processing:**
   Proper data pre processing helps to clean , consistent , and ensures consistency .Clean and processed of the collected data to handle the missing values . Gather data from various sources such as sensors , meters.

3. **Feature Extraction:**
   Extract time related information from your data , such as hour of the day, day of the week, month, or season. These features can capture temporal patterns in energy consumption.

4. **Model Development:**
   Extract relevant features from the data, such as time of day, day of the week, weather conditions, and occupancy status. Get the additional information like weather condition , schedules and additional information that may helpful for the energy usage.

5. **Visualization :**
   To visualize the distribution of energy consumption values. This can help identify outliers and understand the data's central tendencies. Useful for visualizing the distribution of energy consumption within different categories or time periods.
   To compare energy consumption profiles for different time periods or locations.



6. **Automation:**
   Use machine learning algorithms to automatically detect anomalies in energy consumption patterns, triggering alerts or notifications when unusual behaviour is eliminated. Applies to manufacturing and production processes , using machines and control systems to automate tasks .

works the a vital role in a project mainly focused on measuring energy consumption .