PHASE 1: Problem Definition and Design Thinking

Problem Definition:

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

Key components:

Data Source, data processing, feature selection, Visualization, Automation.

Design Thinking:

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

Short review of the model:

1.Data Source:

To begin addressing this problem, the first step is to identify and acquire a dataset containing energy consumption measurements. The dataset should ideally be comprehensive, reliable, and up to date. Potential sources for obtaining this data include:

- Public energy utility companies
- Government agencies responsible for energy regulation
- Private energy monitoring systems
- Smart meters and IoT devices

Dataset link:

99.6% of the country's population (as of 2021) has access to electricity. In rural areas, the share was 99.3%

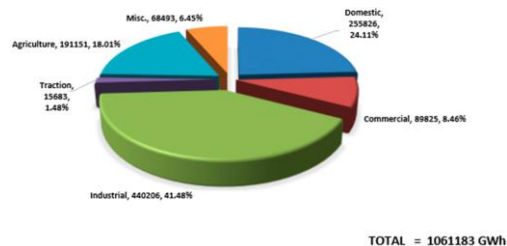| ELECTRICITY	TOTAL/YEAR	INDIA PER CAPITA
Own consumption	1.229 Tn kWh	862.26 kWh
Production	1.504 Tn kWh	1,054.71 kWh
Import	5.79 bn kWh	4.06kWh
Export	9.49 bn kWh	6.66kWh

2.Data Preprocessing:

Once the dataset is obtained, it must be cleaned, transformed, and prepared for analysis.

Data preprocessing involves:

- Data Cleaning: Handling missing values, duplicates, and outliers.
- Data Transformation: Converting data types, standardizing units, and handling categorical variables if present.
- Data Integration: Merging data from multiple sources if necessary.

3.Visualization:

The insights gained from data analysis need to be communicated effectively. Visualizations such as graphs and charts are powerful tools for presenting energy consumption trends and insights.

FLOW CHART:

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│         DATA SOURCE         │
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│       DATA PROCESSING       │
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│      FEATURE EXTRACTION      │
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│         AUTOMATION          │
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