MINISTRY CATEGORY- <u>GAS AUTHORITY OF INDIA</u>
PROBLEM STATEMENT- NATURAL GAS PRICE PREDICTION
INSTITUTE CODE - C-46076

PROBLEM CODE - SK 793
TEAM LEADER - MOHAN GUPTA
TEAM NAME - : EXPLORERS

**TEAM MEMBERS - MANAN MEHROTRA, MOHAN GUPTA, NIRBHAY ARORA, PARAS PANDEY, PRASHANT BANSAL, PRACHI CHAUHAN**

It is required to forecast Natural Gas Price in the international Market for the period 2021 to 2026. The historical data is to be extracted programmatically from public websites and models need to be built upon the data.

Desired Solution:

- The solution will take data input and provide the output with the time-stamps in MS Excel CSV format.
- To develop 5 forecasting models:
  - Exponential Smoothing
  - ARIMA
  - Boosting
  - RNN/ LSTM/GRU
  - Transformer
- The models should be built from scratch with a comprehensive explanation of data (using EDA), trend analysis, assumptions, data cleaning and validation, data augmentation (if required).

- The Performance of various models needs to be clearly evaluated and the best model needs to be recommended based on some robust evaluation criteria.

Idea of Approach
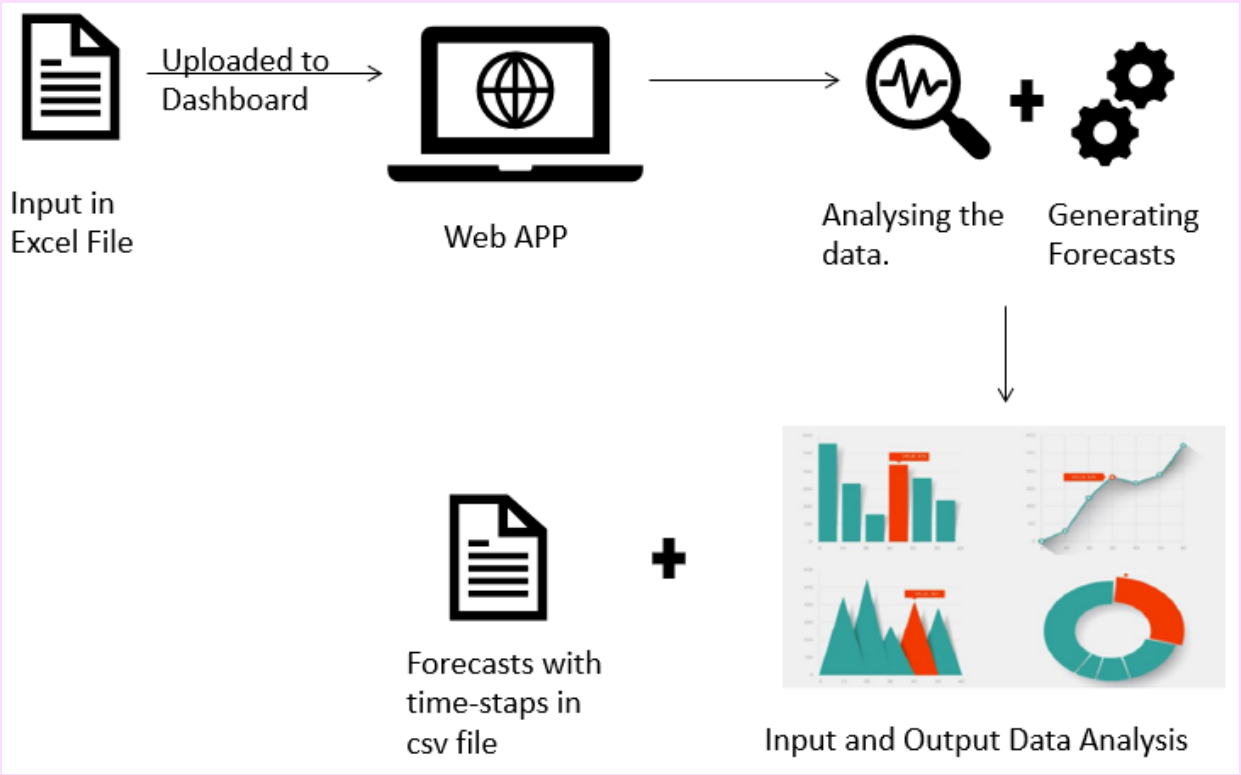
Technology Stack
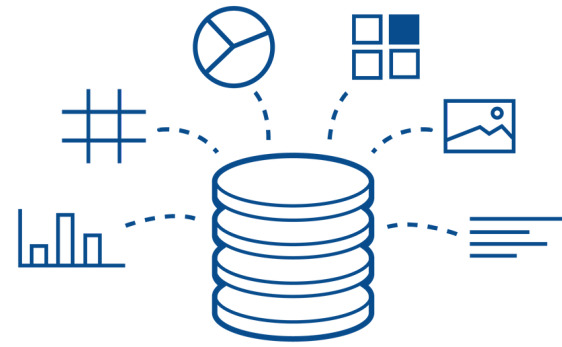
React Js → **Python + Flask + Machine Learning Models** → **Spreadsheet/Excel/CSV /Notepad**

Front-End ⟷ Back-End ⟷ Data Files
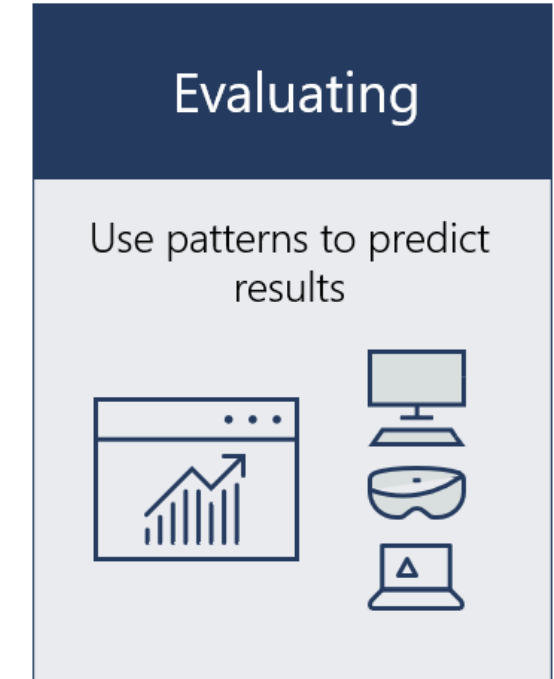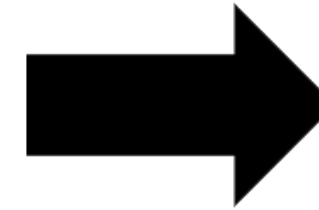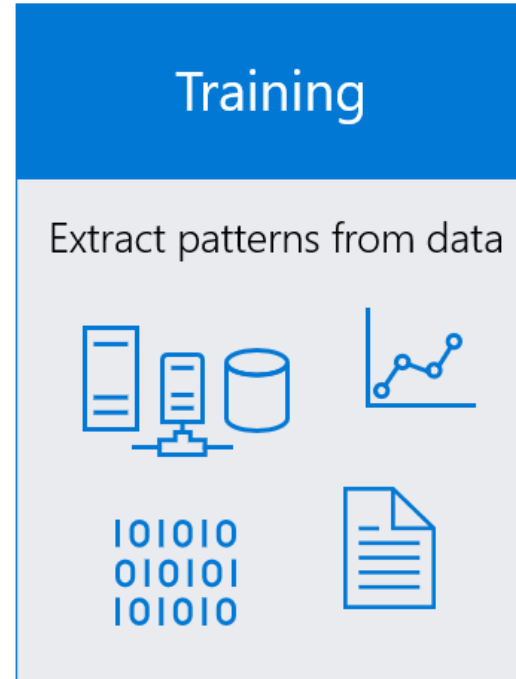
ANALYSIS METHOD

- **Data Gathering**: Collecting data from public sources

- **Exploratory Data Analysis:** Discovering hidden patterns in the data using time-series analysis

Training

Extract patterns from data

- **Model**: Training 5 different models to forecast the price

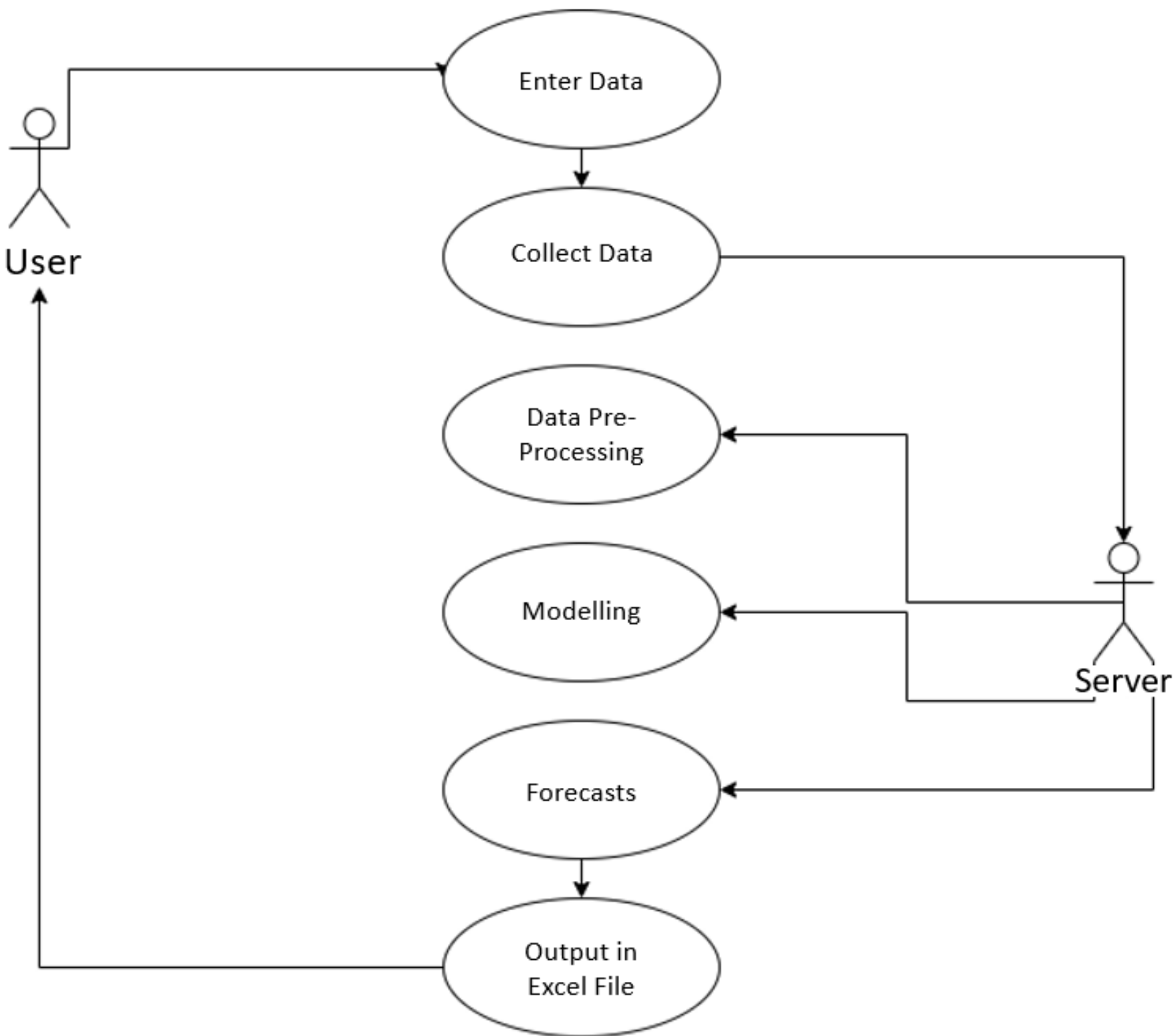**Evaluating**

Use patterns to predict results

- **Evaluation**: These trained models will be evaluated on various factors such as:
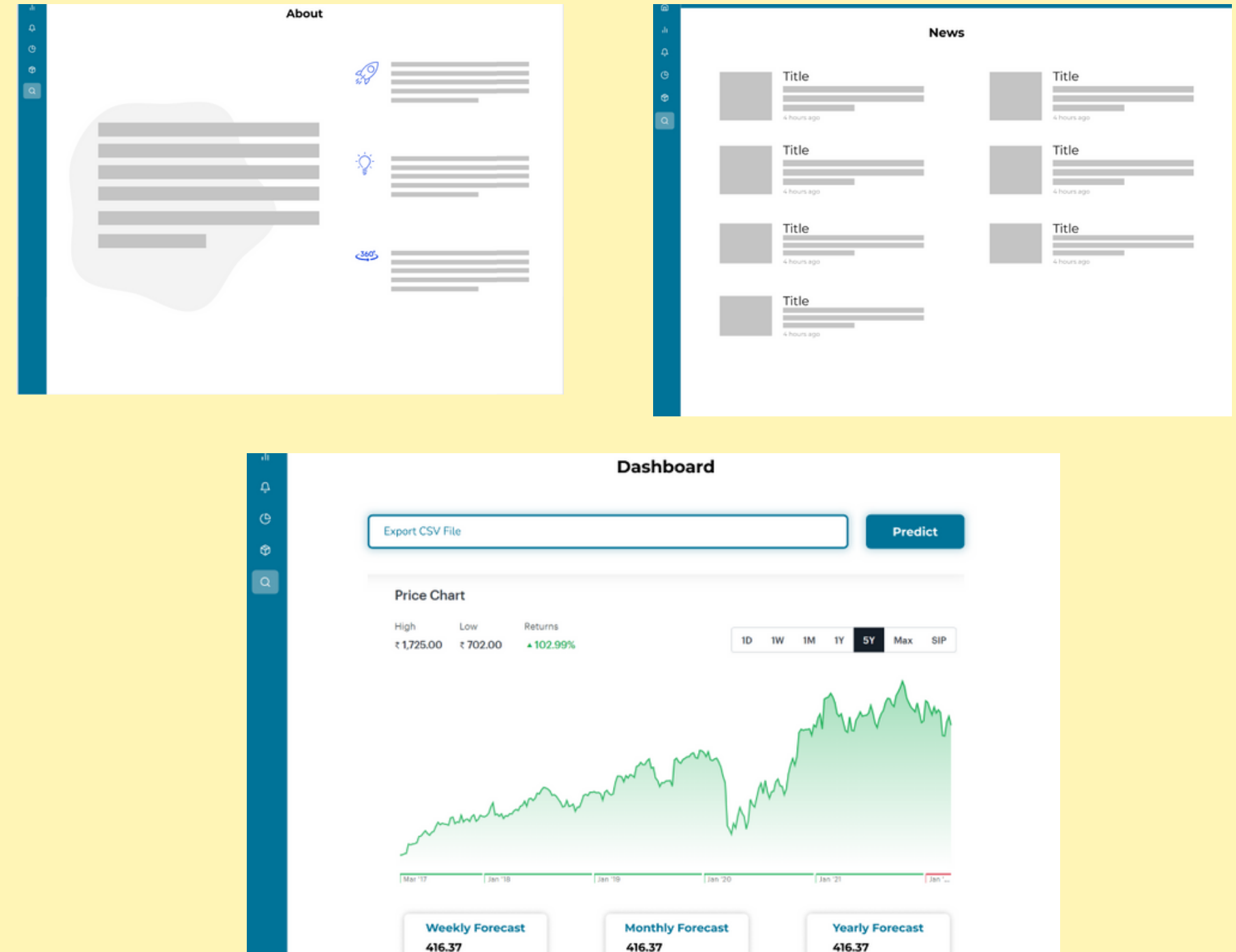 - R2 Score
  - Mean Absolute Percentage Error(MAPE)
  - Root Mean Squared Error(RMSE)
  - Residual Analysis
  - Homoscedastic Test

USE - CASE

DASHBOARD DESIGN

DEPENDENCIES

- Web Browser
- Data Files From the service providers