

Natural Gas Price Prediction System Using IBM Watson Machine Learning Service

1. INTRODUCTION

1.1 OVERVIEW

This project aims at building a web App that automatically predicts the price of Natural Gas at any particular date by taking three input values day, month and year using IBM Watson Machine Learning Services. Accurate natural gas price forecasting not only provides an important guide for effective implementation of energy policy and planning, but also is extremely significant in economic planning, energy investment, and environmental conservation. Decision Tree Regression is used to create the model because it was the best performing model.

1.2 PURPOSE

Forecasting natural gas prices is a powerful and essential tool that has become more important for different stakeholders in the natural gas market, allowing them to make better decisions for managing the potential risk, reducing the gap between the demand and supply, and optimizing the usage of resources based on accurate predictions.

Accurate natural gas price forecasting not only provides an important guide for effective implementation of energy policy and planning, but also is extremely significant in economic planning, energy investment, and environmental conservation. This project aims to build data-driven machine learning models for natural gas price forecasting

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

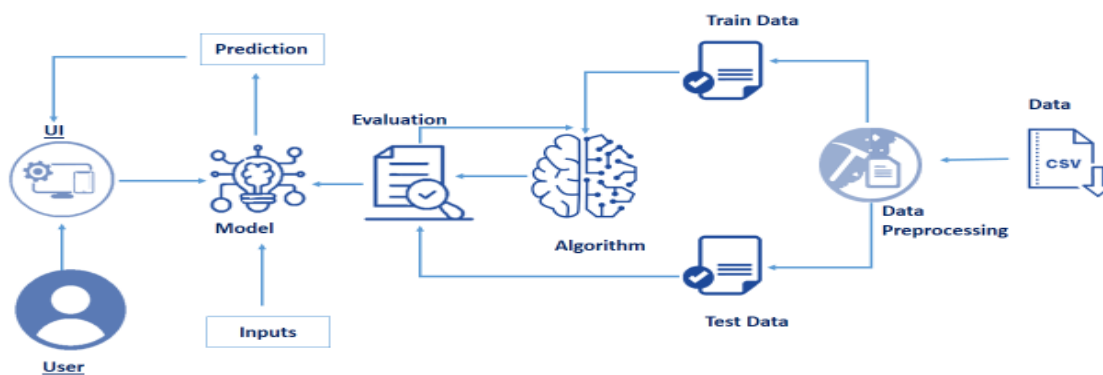
There was no system to predict the natural gas price. It was highly volatile. Forecasting natural gas prices is a powerful and essential tool that has become more important for different stakeholders in the natural gas market, allowing them to make better decisions for managing the potential risk, reducing the gap between the demand and supply, and optimizing the usage of resources based on accurate predictions.

2.2 PROPOSED SOLUTION

The project aims at building a web app using IBM Watson Studio that automatically estimates the natural gas price at a particular date. Created Several models and the user deploys the best performing model using Time Series analysis by taking only three inputs, that is the day, month and year. The model predicts the natural gas price of that particular day.

3. THEORITICAL ANALYSIS

3.1 BLOCK DIAGRAM



3.2 HARDWARE / SOFTWARE DESIGN

HARDWARE REQUIREMENTS

RAM : 8GB

Storage : 250 GB

Processor : Intel i5 Core Processor

SOFTWARE REQUIREMENTS

Operating System : Windows 10 Home

Anaconda: Anaconda must be installed as it provides jupyter notebook and Spyder

IBM Academic initiative account is required to access IBM Services

IBM Watson Studio - IBM Watson Studio helps data scientists and analysts prepare data and build models at scale across any cloud. IBM Watson Machine Learning - IBM Watson Machine Learning helps data scientists and developers accelerate AI and machine-learning deployment.

IBM Cloud Object Storage - IBM Cloud Object Storage makes it possible to store practically limitless amounts of data, simply and cost-effectively.

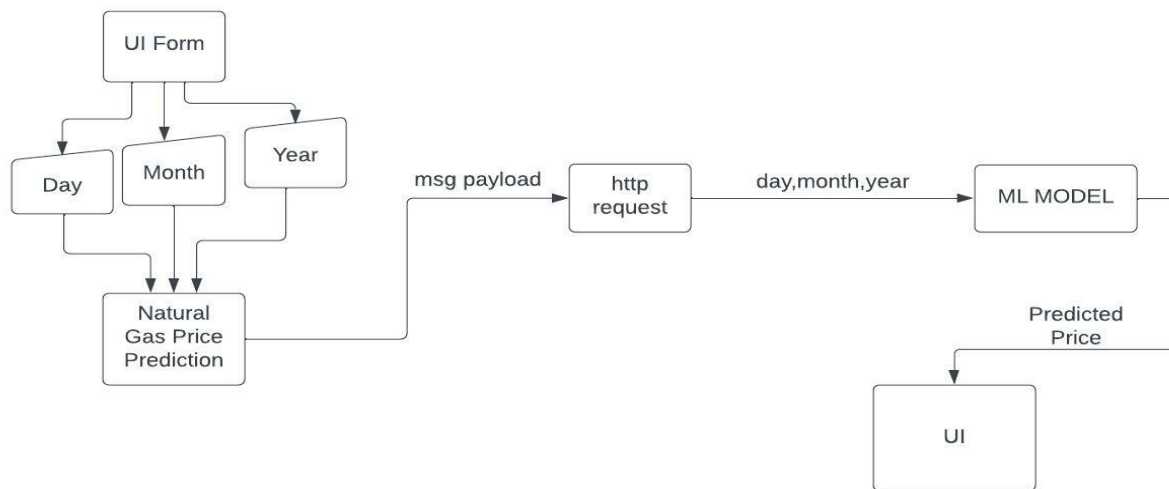
4. EXPERIMENTAL INVESTIGATIONS

Here we are going to build a machine learning model that predicts the price of natural gas at a particular date using the following parameters

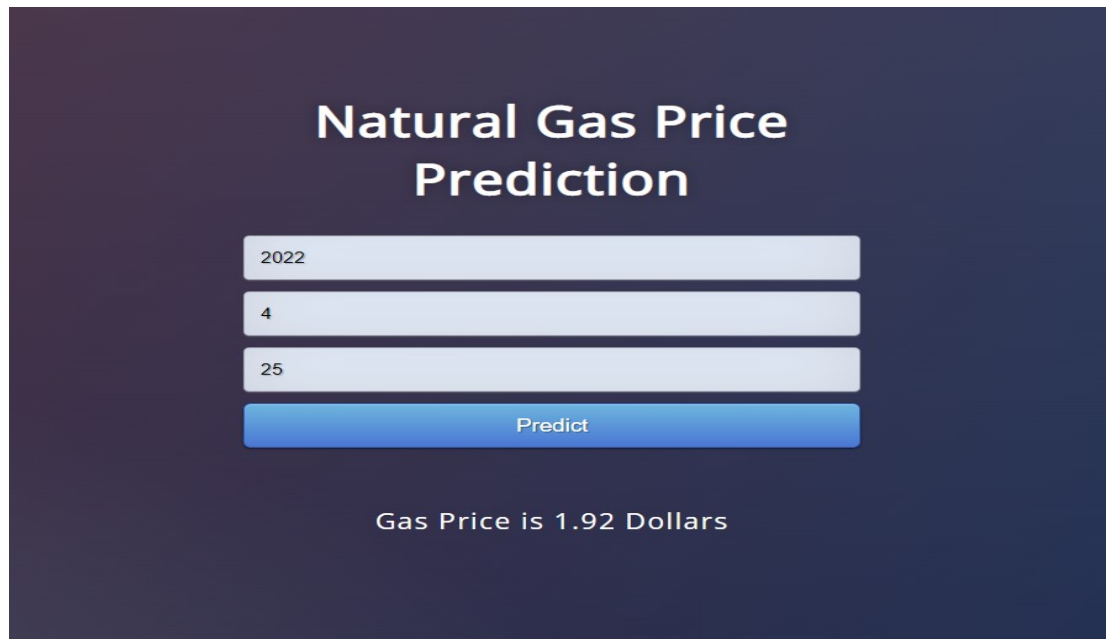
- Day
- Month
- Year

Here we are using the time series analysis to build the model. So the model predicts the price of natural gas at a particular date by using only three parameters they are day, month and year.

5. FLOWCHART



6. RESULT

A screenshot of a web application titled "Natural Gas Price Prediction". It features three input fields with the values "2022", "4", and "25" respectively. Below these is a blue "Predict" button. At the bottom, it displays the result: "Gas Price is 1.92 Dollars".

Natural Gas Price Prediction

2022

4

25

Predict

Gas Price is 1.92 Dollars

7. ADVANTAGES & DISADVANTAGES

7.1 ADVANTAGES

Prediction of natural gas prices has become increasingly important because of the association with crude oil. The energy commodity which includes natural gas prices is dramatically volatile with high risk and uncertain situations. Natural gas has been proposed as a solution to increase the security of the energy supply and reduce environmental pollution around the world. Being able to forecast natural gas price benefits various stakeholders and has become a very valuable tool for all market participants in competitive natural gas markets. Accurate natural gas price forecasting not only provides an important guide for effective implementation of energy policy and planning, but also is extremely significant in economic planning, energy investment, and environmental conservation.

7.2 DISADVANTAGES

Here we are using time series analysis for predicting the natural gas price. That is the model is built only using the past data which has only two parameters date and price at that particular date. The model is predicting the price of natural gas by only taking 3 inputs those are day, month and year. There are many other factors affecting the price of natural gas. That is not taken into consideration. So the model is predicting the price by assuming that all the other factors are not highly volatile.

8. APPLICATIONS

Forecasting natural gas prices is a powerful and essential tool that has become more important for different stakeholders in the natural gas market, allowing them to make better decisions for managing the potential risk, reducing the gap between the demand and supply, and optimizing the usage of resources based on accurate predictions. Accurate natural gas price forecasting not only provides an important guide for effective implementation of energy policy and planning, but also is extremely significant in economic planning, energy investment, and environmental conservation.

9. CONCLUSION

In this project, we have created two models using multiple regression algorithm and decision tree regression algorithm in which accuracy of multiple regression algorithm was very low and decision tree algorithm was very high so we have chosen decision tree algorithm for creating the model. Here we are using time series analysis. In which model is created using two parameters date and price at that particular date. The price of natural gas has been decided based on several other factors. So a drastic change in any of the other factors will result in a low prediction.

10. FUTURE SCOPE

While machine learning artificial intelligence may be seen as a data-hungry machine, the crucial aspect of a successful AI system is to accurately predict the natural gas price. Here we are using the time series analysis and only taking date and price at that particular date into consideration to create the model. But many other factors are deciding the price of natural gas. In future, we can include those aspects too. To accurately predict the price of the natural gas.

11. BIBLIOGRAPHY

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