

# Cloud Based Stock Price Prediction Using News Sentiment Analysis.

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## ABSTRACT

*Stock price prediction is a difficult task, since it very depending on the demand of the stock, and there is no certain variable that can precisely predict the demand of one stock each day. However, Efficient Market Hypothesis (EMH) said that stock price also depends on new information significantly. One of many information sources is people's opinion in social media. People's opinion about products from certain companies may determine the company's reputation and thus affecting people's decision to buy the stock of the company. When using opinion as primary data, it is necessary to make a suitable analysis of it. A famous example using opinion as data is sentiment analysis. Sentiment analysis is a process to determine emotion/feeling within people opinion about something, in this case products of some companies. There are some researchers about sentiment analysis used to predict the stock prices. Bollen on his research concludes that people opinion on social media such as Twitter can predict DJIA value with 87.6 percent accuracy. This shows that there is a relation between sentiment analysis and stock prices. Our purpose on this research is to predict the Indonesian stock market using simple sentiment analysis. Naïve Bayes and Random Forest algorithm are used to classify tweet to calculate sentiment regarding a company. The results of sentiment analysis are used to predict the company stock price. We use linear regression method to build the prediction model. Our experiment shows that prediction models using previous stock price and hybrid feature as predictor gives the best prediction with 0.9989 and 0.9983 coefficient of determination*

**Keywords:**— *Stock Price Prediction, Machine Learning, Linear Regression, News Sentiment Analysis*

## I. INTRODUCTION

To develop a machine learning based application to accurately predict the predicting stock prices using financial news article. The purpose of this work is to find correlation between some features we can measure about the company and the stock price. An intelligent investor might have observed, however, that the stock price is not exactly related to business performance. Instead, it can be influenced by numerous factors such as large and small economic events, public perception, expectation of change, new trends in products, new trends in consumer behavior and many others. The purpose of this work is to find correlation between some features we can measure about the company and the stock price. An intelligent investor might have observed, however, that the stock price is not exactly related to business performance. Instead, it can be influenced by numerous factors such as large and small economic events, public perception, expectation of change, new trends in products, new trends in consumer behavior and many others.

## II. LITERATURE SURVEY

Using various statistical approach, one way to forecast the stock market price is to utilize Fbprophet. Fbprophet is a python library typically used to forecast seasonality, trend, weekly, and yearly. This method is very useful to forecast its behavior. Exponential Smoothing is commonly used for time-series analysis. This method smoothes out the historical graph data to better visualize the future stock price. Mean Squared Error (MSE) is a measure to show how many points are close to the line of best fit. Furthermore, this would show how far apart are the data points on the scatter plot. Deploying the above-mentioned statistical tools to the dataset would assist this research in analysis

and forecast stock prices. This task will include extracting historical dataset as well as studying about the data at timed intervals in years, weekly, seasonality and trend behavior. Stock market prediction has been a chosen research topic for years. Investors and traders in the stock market have been relying on historical stock data and future trends to see whether they will gain or lose money invested in the stock exchange. The role of stock prediction plays a critical part to know whether the market will have a bull or bear. This paper will concentrate on using several statistical methods for stock market price prediction. Specifically, the following methods would be discussed: Exponential Smoothing, Mean Squared Error (MSE), and Fbprophet (Python Forecasting Library).

### III. PROPOSED ARCHITECTURE

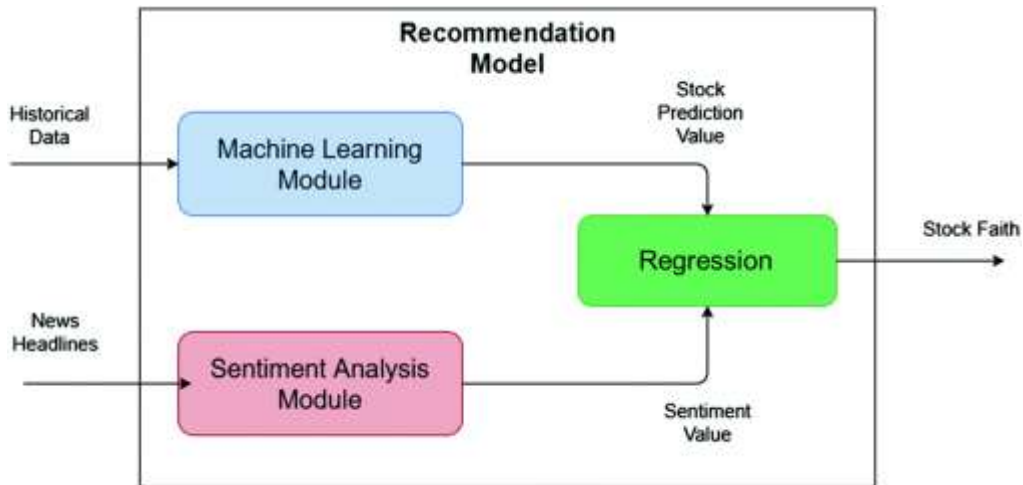


Figure 1 - System Architecture

In this paper, we mined tweets using Twitter’s Search API and subsequently processed them for further analysis, which included Natural Language Processing (NLP) and Sentiment Analysis. Thereafter, we applied NLTK library to predict each tweet’s sentiment. After predicting every tweet’s sentiment, we mined historical stock data using Yahoo finance API. Then use linear regression for stock market prediction using sentiment score and stock price’s change for each day and at the end we proposed our own trading strategy.

### IV. RESULT

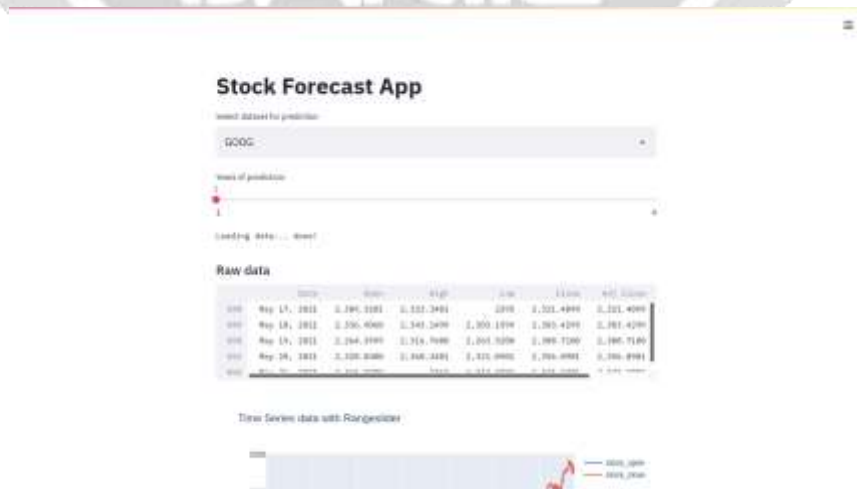
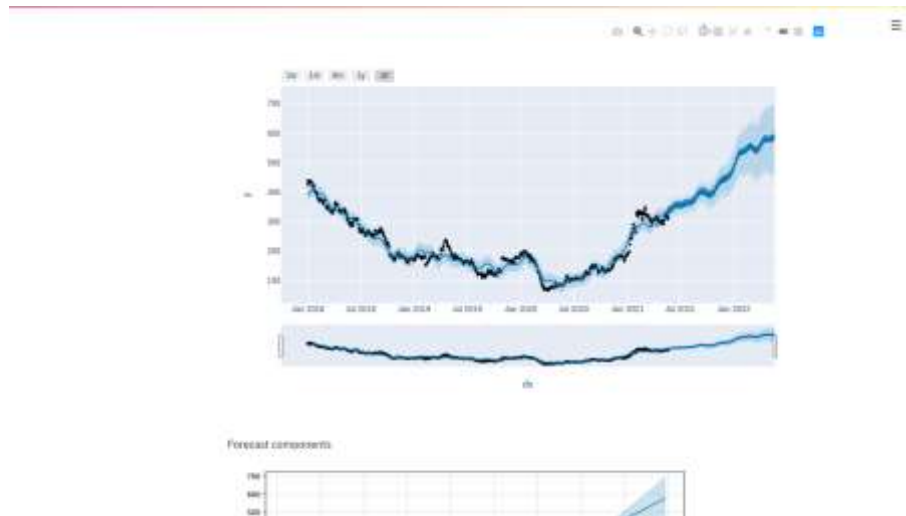


Figure 2 - Fetched Data



**Figure 3 - Prediction**

## V. CONCLUSION

We accomplished the stock prediction system using financial news articles. Our system automatically analyzes and classifies news articles and generates recommendations for investors. Success ratio of our system can be increased by using more proper news articles. Because some articles in the dataset may have not been directly related to the selected stock. Online sources that we used to get articles publish some articles originally related to stocks of other companies in the same sector under our stock's category. If articles that are not directly related to the selected stock are eliminated, success of the system would increase.

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