

STOCK INQUISITION AND PROGNASTICATION USING LSTM

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Abstract: Stock investments provide one of the highest returns in the market. Investor can visualize the share price and other statistical factors. This paper focuses on an approach for analysing and forecasting a company's share price using the LSTM algorithm. The stock's data is derived from Yfinance, using this data, the investors can view all of the previous company's equity pricing data, company's stock previous pricing and current pricing is used to create a candle graph, Implying the option chain for the listing of Calls and Puts and the strike for the firm tend to invest in the firm within an eternity. A dividend graph is used to determine the firms profit information, the most recent trend and news regarding the stock are notified. The algorithmic model may initially trained with the past dataset and based on the accuracy of the trained data value and the testing of the model can be implemented after the best accuracy obtained in the past testing algorithm. As a result, the investor may have extensive information about the stock's future value, including the high and low points at a particular time frame, with references included in the graphical structure. Furthermore, it must be possible for buyers to receive free stock market information that is as accurate as possible and leads to an investment, as well as comprehensive guidance on the company in which they might consider investing their money.

Keywords-Dataset, Yfinance, Chatbot, Candle Graph, Dividend graph, User Interest Module, LSTM, Predicted graph .

1. INTRODUCTION

The stock market is where investors buy and sell shares of companies. Investor can visualize the share price and other statistical factors which helps in investors carefully decide on which company they want to spend their earnings on. This paper focuses on a method for analyzing and forecasting a company's share price using the LSTM (Long Short-Term Memory) algorithm. This is primarily done to provide a integrated application where the investor can log in or register to access the data. If any enquiries arise, the investor may reach out to the ChatBot. The stock's past data is derived from Yfinance, using this data, the investors can view all of the previous company's equity pricing data that they commonly use to make their investment decisions, company's stock previous pricing and current pricing is used to create a candle graph which will be displayed for enhanced understanding of the stock, Referring the option chain for the listing of Calls and Puts and the strike for the firm tend to invest in the firm within an eternity. A dividend graph is used to determine the firms profit information. For a clearer understanding of the business, the most recent trend and news regarding the stock are provided. The algorithmic model may initially trained with the past dataset and based on the accuracy of the trained data value and the testing of the model can be implemented after the best accuracy obtained in the past testing algorithm. As a result, the investor may have extensive information about the stock's future value, including the high and low points at a particular time frame, with references included in the graphical structure. Furthermore, it must be possible for buyers to receive free stock market information that is as accurate as possible and leads to an investment, as well as comprehensive guidance on the company in which they might consider investing their money.

II. LITERATURE SURVEY

Despite the increase in stock market prediction techniques, some analysts and scholars believe that the stock market is unpredictable. According to the authors in (Fama 1995) and (Malkiel 2005), the stock market is stochastic and is therefore not predictable. This leads to the two well-known theories, the efficient market hypothesis (EMH) and the random-walk hypothesis (RWH). EMH is one of the popular theories in financial economics. Fama hypothesized that the stock market is "informationally efficient." The reliability of this theory is difficult because the hypothesizer Fama revised it and graded it in three stages of effectiveness as weak, semistrong and the strong form (Fama 1970). On the other hand, the RWH holds the belief that the stock price is essentially stochastic; thus, any attempt or effort to predict the future stock price will ultimately fail (Alkoshi and Saeid 2018). Nevertheless, the EMH is vulnerable to debate about which one, if any, is closely testing these two theories, since one has fundamental and technical knowledge about the equity market, there is new issue to forecast the stock market. Through understand- ing and knowledge of a firm's historical stock data and fundamental or technical data, we can contribute to a reliable forecast of the company's future stock price. The study of (Dahir et al.

2018) explores the dynamic relationships between exchange rates and stock returns in Brazil, Russia, India, China, and South Africa (BRICS) using wavelet analysis. The findings show that in the medium and long term, there is a high correlation between exchange rates and stock returns, indicating that exchange rates in Brazil and Russia lead stock returns .

Also, these findings have significant consequences for investors in frequency-varying exchange rates and stock returns, as well as regulators who should consider developing appropriate regulatory measures to avoid financial risk. Researchers in (Aziz and Ahmad 2018) examined the link between minimum daily returns and future monthly returns during the period (1999–2014) in India's emerging stock market. The findings show that stocks with higher minimum daily returns in 1 month offer larger returns in the following month. They also demonstrate that the relationship between mini- mum daily returns and future stock returns is dynamic and quantile dependent by using quantile regression. By analyzing the historical data, forecasts can be described as predictions of any future events. Many of the issues of forecasting include time analysis. Time-series data analysis helps to recognize patterns, trends and phases or cycles that are present in the data. The early understanding of bullish or bearish mode helps to spend capital wisely in the case of the stock market. The pattern analysis also helps to classify the highest performing companies over a given period of time. This makes analysis and forecasting of time series an important research area. The existing stock price forecasting approaches can be listed as follows:

- (1) FundamentalAnalysisandTechnicalAnalysis
- (2) MachineLearningModels
- (3) NeuralNetworkModels.

Tsai [49] discussed to find the relationship between stock price and exchange rate. The study found that the variables are negatively correlated. Therefore the least square estimation is not able to find the accurate correlation between exchange rate and stock. To overcome this, the authors proposed a quan- tile regression model. Andersen et al. [4] proposed a frame- work for intraday trading and stock price forecast based on volatility and return distribution. The study highlighted that forecasting based on asset return volatility and its distribution is complicated to fit in the Auto-Regressive Conditional Het- eroscedasticity (ARCH) model due to negative correlations. Kim [27] proposed the Support Vector Machine (SVM) model to forecast stock prices. KOSPI(Korean composite stock price index) daily stock price data were considered in the experiment. The study considered two variables based on the stock price movements, i.e., one indicates up, and 0 indicates down. Two thousand nine hundred twenty-eighttrading samples have been considered, in that 20% of data is used for holdout and 80 % data for training. The original data scaled by performing normalization [-1.0,1.0]. To accom- plish the work, 12 technical indicators raw data are given to the SVM model. The experimental work investigates SVM parameters upper bound C and kernel parameter sigma square. An Artificial Neural Network(ANN) is a popular method for classification and pattern identification in stock prices. ANN has been adopted in most of today's applications to design smart and intelligent machines for business and sci- ence purposes. The ANN is learned from training data and identifies the future pattern based on experience. The ANN model is flexible because it can handle nonlinear data without prior knowledge of the relationship between input and output data. Deep neural network are considered for stock price prediction [22], [54]. The Autoregressive Integrated Moving Average(ARIMA) model is widely used to find a linear relationship in the time-series application. However, most researchers found that the ARIMA model cannot identify the nonlinear pattern in data. Therefore, most of the methods considered SVM and ANN. Pai et al. [40] proposed a hybrid ARIMA and SVM model for stock price prediction. The residuals are obtained using ARIMA and given input to SVM for forecasting. Blair et al. [6] considered two variables daily stock returns and volatility index(VIX). The ARCH model is applied to estimate the volatility between daily returns and VIX. The study concludes that VIX outperformance for forecasting the volatility compared to daily returns. Tsaih et al. [50] proposed a hybrid artificial intelligence method for stock price forecasting. This approach combines a rule-based method and a neural network to predict the daily stock prices. The results are compared with backpropaga- tion(BP) and perceptron. The S&P 500 stock is considered in the experiment. The advantage of reasoning neural networks is the fast learning rate compared to BP, and the number of hidden nodes is less compared to BP.

III.SYSTEM IMPLIMENTATION

A.EXISTING SYSTEM

The vast majority of the stock brokers while making the analysis need to referred providing only of the dataset and the basic graph of that, these techniques could not be trusted completely so there is emerged the need to give a strong strategy to financial exchange analysis. To find the result, the methodology to be implemented using Natural Language processing. But the internal analysis cannot be effective.

B. PROPOSED SYSTEM

The investors want to analyze the previous stock status to invest in the company without loss and to get good profit. The investors want an updated daily stock status to invest in the company. The investors should know the current live news to know more about the company which is selected to invest by the investor. The option percentage of the company's stock will be displayed and prediction based on that. ChatBot can be accessed in case of enquiry situation of the investor.

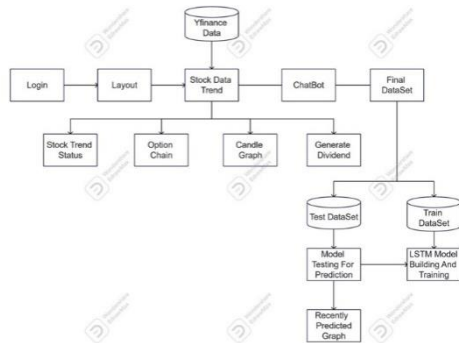


FIG (1) System Architecture.

IV. SYSTEM METHODOLOGIES

LOGIN: Enter your registered email or phone number and password. If already registered then directly login; if not registered then you have to register and login.

LAYOUT: The user needs to enter the company they need to invest. The user needs to enter the time period for stock which they want to analyze and invest. The user wants to enter the type of market (NSE OR BSE) they tend to invest.

DATASET AND DATA TREND: Fetching of the dataset from the Yahoo Finance database based on the user-provided firm they tend to invest. Providing live data trend of the stock and the nature and current trend and issues of the firm. Based on the data trend, the investor has an in-depth understanding of the trend of the firm.

DATA NEWS AND PRICING: Providing the live pricing and news of the stock data where the investor tends to invest, based on the live pricing and news, the investor must have a clear knowledge about the last closing and the current price of stock.

USER INTEREST MODULE: User interest is an indicator of a change in prevailing market trends. For instance, an increase in open interest would mean that fresh money will be flowing into the market; this would mean that the prevailing market trend (upward, downward or sideways) will continue.

DIVIDEND: A portion of a company's profit paid to shareholders. In our web application, that provides a dividend graph of the firm in order to know about the depth of the profit of the firm and the relationship of the shareholders and the firm based on the financial criteria, here for the depth analysis about the firm, the dividend needs to be provided.

PREDICTION: Prediction is the act of trying to determine the future value of the company stock or other financial instrument based on the data trend and the previous data set of the system. Using machine learning, the prediction can be performed using the LSTM algorithm with the reference of the training data set.

OPTION CHAIN: A call option gives the right to buy a stock while a put gives the right to sell a stock. The price of an options contract is called the premium, which is the upfront fee that an investor pays for purchasing the option.

CHATBOT: Chatbot can consistently manage customer interactions while continuously improving the quality of the responses and keeping costs down. Chatbots automate workflows and free up employees from repetitive tasks. A chatbot can also eliminate long wait times for phone-based customer support, or even longer wait times for email, chat and web-based support, because they are available immediately to any number of users.

LONG SHORT-TERM MEMORY: LSTM networks are an extension for recurrent neural networks that extend their memory essentially. It's one of the most successful RNN's architectures. Such networks are specifically designed to avoid the issue of long-term dependence but their normal behavior is to retain knowledge for a long-time period back. This is because LSTM's store their information in memory similar to a computer's memory since this network can read, write and remove information from its memory Hiransha et al. (2018). The LSTM model comprises a specific set of memory cells that replace the RNN's hidden layer of neurons and its key is memory cell status. This model extracts information via the gate structure to retain and update the memory cell state. LSTM structure includes three gates: input, forget and output gate. Also, each memory cell has three layers of sigmoid and one layer of tanh. These gates decide whether to let new input into (input gate) or not, remove the information (i.e input) because it is not necessary (forget gate) or allow it to affect the output at the current time stage (output gate). In other words, the gates are used to manage and control the interaction of memory cells among themselves and neighbors.

V. IMPLEMENTATION

The user interface to login and register will appear at the start of the page. Then the user should enter the symbol of the stock to analyze and predict and the type of market whether NSE OR BSE. The user also starts the date and end date to analyze.



FIG (2) User interface.

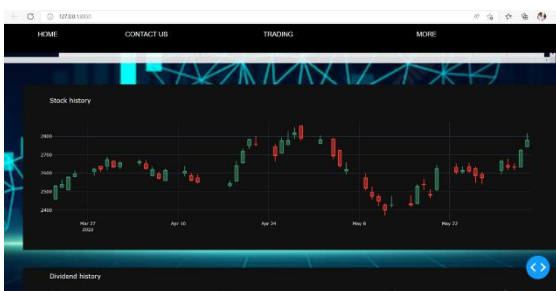
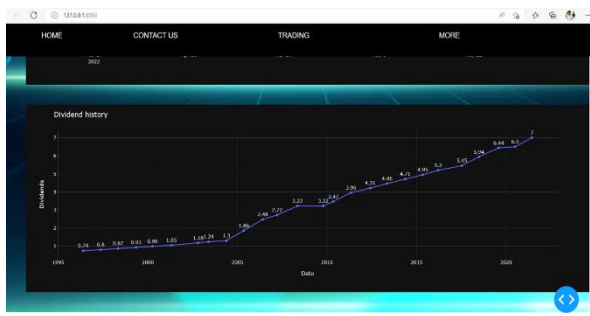


FIG (3) Candle Graph



.FIG (4) Generated Prediction Graph.

VI.FUTURE ENHANCEMENT

Currently, due of its prevalence our stock inquisition and prognostication allows the user to see the analysis and prediction of user specified stock. our future work is to allow the users to buy or sell stocks in the website. This is the analysis and prediction of stock only for NSE OR BSE in future there will be analysis and prediction for international stocks which will be more accurate. The accuracy will be more than 90% currently we are at 80% using LSTM algorithm.

VII.REFERENCES

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