

An Analytical Approach for Stock Market Forecasting Based on Machine Learning

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ABSTRACT

Stock Market act as a mechanism for organizations to mean their capitals by introducing their organization shares to market and furthermore ends up being a helpful stage for investors to procure past the edge of interest rates of offered by banks. Main objective of Stock Market Prediction (SMP) is to forecast expected values of companies financial stocks. Recently SMP utilizes machine learning (ML) for prediction in light of estimations of current stock market for that they train their previous values. ML present numerous models for making prediction easier and authenticated. This paper reviews on different available SMP techniques mainly utilizing Regression and LSTM based ML for making prediction of stock values. Main aspects well thought-out for prediction are close, open, high, low and volume.

Keywords : Machine Learning, Stock Market Prediction, Classification.

I. INTRODUCTION

The stock market is collection of n number of stock buyers and sellers. The prediction of future value is known as stock market prediction and is most vital thing for gaining profit so it needs to be robust, accurate and efficient. Buyers have been attempting to detect a path to anticipate stock costs and to locate correct stocks and right planning for buying or selling. To achieve those objectives, and according to some previous research used the techniques for predicting. Considering threat present in stock market exchanging coming about out of the unpredictability which is impacted by a different factor, foreseeing the conduct and present moment or long haul capability

of a stocks has been one region of enthusiasm of various Data Analyst from quite a while now. Different calculations have been presented by using various strategies of adapting however have been neglected to exact expectation of any stock development.

Stock market value forecast for brief time frame windows is by all accounts an arbitrary procedure. Stock value development over a significant time frame for the most part builds up a straight bend. Individuals will in general purchase those stocks whose costs are required to rely in the close to term. Vulnerability in stock market shuns people putting resources into stocks. Along these lines, there is a

need to decisively anticipate the money related trade which can be used in a genuine situation. Techniques utilized to forecast the stock market prices incorporates a period arrangement determining alongside specialized examination, predicting the variable stock market and machine learning modeling. The datasets which used for stock market price forecast model incorporate subtleties like the end value opening cost, 52-weeks high and 52-week low of particular stock and some different factors, which are expected to anticipate article variable that is cost on that day. Past system utilized conventional strategies for expectation like multivariate investigation with a forecast time arrangement model. Financial exchange expectation beats when it acts as relapse issue however performs well when treated as an arrangement. Point is to plan framework that gains from market data using AI methodologies and check the future examples in stock worth improvement. High level of exactness and accuracy is important aspect in foreseeing financial exchange. Stockbrokers use various techniques or methods while making forecasts. These techniques are not trustable sometime so need to offer supportive technique for predicting stock market. The ML algorithms are utilized for categorization. Here, presented Machine Learning (ML) technique that will be prepared by utilizing accessible stocks information, gain insight and afterward utilizes the picked up information for precise expectation.

Utilization of dataset is important part in ML. Database provided ought to be as concrete as conceivable in light of the fact that small modify in information can reflect enormous changes in results. Here administered AI is applied on database gained from Yahoo Finance. Open, close, low and high are various offered costs for stock at independent occasions with almost direct names. Volume is quantity of stocks that move starting with one proprietor then onto the next during time span. Model is tried on test information.

Remaining of paper contains following sections, Section I introduce topic, next in section 2 described literature survey. Section 3 consists of system architecture, Section IV consist of dataset description, Section V concludes paper and followed by the references.

II. LITERATURE

Vivek Kanade et al. [1] considered fundamental and technical analysis. By applying sentiment analysis process on social media data fundamental analysis is done. Now a day's Social media data has high impact, it can helpful in predicting the trend of the stock market and Technical analysis is done by utilizing historical data of stock prices by applying ML algorithms. The method consists collecting news and collecting social media data and extracting sentiments expressed by individual. Then the correlation among the sentiments and stock values is analyzed. The learned model can then be utilized to do future predictions about stock value. It's can be shown that this method is able to predict the stock performance and sentiment and social data are also closely correlated with recent news.

Mr. Yuvraj M.Wadghule et al. [2] proposed a forecasting method to offer better accuracy rather traditional method. Forecasting stock return is a crucial financial subject that has attracted professional's attention for many years. It consists of an assumption that fundamental data publicly available in the past has some predictive relationships to the future stock returns. Here author present relative study in the area of Neural Network, Data Mining, Hidden Markov Model and Neuro-Fuzzy system utilized to predict the stock market fluctuation. Neural Networks and Neuro-Fuzzy systems are identified to be the leading ML techniques in stock market index prediction area. The Traditional techniques does not wrap all the possible relation of the stock price fluctuations. There are new approaches to known in-depth of an analysis of stock

price variations. NN and Markov Model can be utilized exclusively in the finance markets and forecasting of stock price.

Raut Sushrut Deepak et al. [3] proposed a ML approach that will be trained from available stocks data, gain intelligence and then utilizes the obtained knowledge for accurate prediction. After the complete research of numerous algorithms and their fitness for various problem domains, Artificial Neural Network (ANN) was found to be the most practical consideration. NN models having the features and customizable parameters makes it possible to implement wide number of features with the cross validation sets. The main significant approach, utilized by author for the predicting result is a concept of ML and result tested on the Bombay Stock Exchange (BSE) index data set.

C.Chandana et al. [4] presents a modified design of Area-Efficient Low Power Carry Select Adder (CSLA) Circuit. In digital adders, the speed of addition is limited by the time needed to propagate a carry through the adder. The sum for each bit position in an elementary adder is generated sequentially only after the previous bit position, the speed of addition is limited by the time required to transmit a carry through the adder. Carry select adder processors and systems. Has been summed and a carry propagated into the next position. The Major speed limitation in any adder is in the production of carries. In time series prediction, the time series are typically expanded into three or higher-dimensional space to exploit the information that is implicit in them.

The major motive of K. Hiba Sadia et al. [5] is to detect the best model to predict the value of the stock market. During the process they considered numerous techniques and variables, they found out that techniques such as random forest, support vector machine were not exploited fully. Author presented and reviewed a more feasible method to predict the stock movement with higher accuracy. The first thing

they have taken into account is the dataset of the stock market prices from previous year. The dataset was pre-processed and tuned up for real analysis. Hence, they focus on data preprocessing of the raw dataset. Secondly, after pre-processing the data reviewed the utilization of random forest, support vector machine on the dataset and the outcomes it generates. In addition, the proposed paper examines the utilization of the prediction system in real-world settings and problems associated with the accuracy of the overall values given. They also present a ML model to predict the longevity of stock in a competitive market. The successful prediction of the stock will be a great asset for the stock market institutions and will provide real-life solutions to the problems that stock investors face.

Alice Zheng et al. [6] focused on short-term price prediction on general stock utilizing time series data of stock price. In finance world, share marketing is one of the most vital activities. Professional traders have developed a variety of analysis methods such as fundamental analysis, technical analysis, quantitative analysis, and so on. Such analytically methods make utilization of various sources ranging from news to price data, but they all focus at predicting the company's future share prices so they can make educated decisions on their trading. Now a day the increasing prominence of ML in numerous industries have enlightened many traders to apply ML techniques to the field, and some of them have produced quite promising results.

Predicting SMP is very complex task that traditionally involves extensive human-computer interaction. There are numerous prediction methodologies for share price forecasting. Time Series Forecasting is basic for share price forecasting and other financial model forecast. As share price are more nonlinear, more intelligent time series prediction systems are necessary. Present systems accuracy is not efficient enough in predicting. Mrs. Nivethitha, Pavithra.Vet al. [7] proposed system using LSTM Machine

Learning Algorithm for efficient forecasting of stock price. This will provide more accurate results when compared to existing stock price prediction algorithms.

The aim of Stock market prediction is to predict the future value of a company shares or other financial instrument traded on a financial exchange. The successful prediction of a share future price will increase buyer's gains. Ketaki Bhoyar et al [8] proposed a ML model to predict stock market price. Forecasting accuracy is the most vital factor in choosing any forecasting methods. The appropriate stock selections those are suitable for investment is a very hectic task. The key factor for each buyer is to earn maximum profits on their investments. By utilizing dataset of stock market they are going to utilizes preprocessing, processing and regression analysis. And then they will review the use of ML and deep learning algorithm on dataset and the result it generates.

Jay Kakkad et al. [15] proposed a novel method of predicting share market prices depends on the integration of sentimental value of the news article related to the asset data along with the intermediate prediction made by the Support Vector Regression (SVR) machine learning model for accomplishing more accurate outcomes. The ML model will train and fit the training asset data in such a manner so that it decreases as much error as possible. On the other side, the natural language processing model will find the sentimental polarity of the news data predicts most of the variation caused by such news article and its corresponding impact on the asset price. Hence, they aim to find the predicted value of asset considering all the above-mentioned factors and attributes.

The goal of this work is to analyze stock market trends using some ML and nature inspired techniques, these were first studied and then implemented. After analyzing the trends with the help of standard

techniques, Dr. Devpriya Sonil et al [16] proposed an entirely new approach to analyze stock market indices over which accuracy is estimated and compared over different techniques and algorithms. We outline the design of the proposed model with its salient features and customizable parameters. We finally tested our model on the one year of Nifty stock index dataset at real time where we analyzed the values on the basis of data from the past days for three months.

Gourav Kumar et al. [17] presents an ANN depends approach to forecast Nifty 50 Index. A feed-forward neural network utilizing multiple back propagation algorithm has been utilized to forecast next day's OHLC data. This model has utilized the pre-processed dataset of Open price (O), High price (H), Low price (L), Close price (C), Volume Traded (V) and Turnover (T) for the period of 10 years. The root mean square error (RMSE) is selected as performance indicators of the network.

Precisely anticipating the securities exchange is a difficult assignment, yet the cutting edge web has end up being a valuable device in making this task simpler. Because of the interconnected arrangement of information, it is anything but difficult to separate certain conclusions therefore making it simpler to build up connections between different variable and generally scope out an example of venture. Speculation design from different firms give indication of likeness, and the way to effectively anticipating the securities exchange is to abuse these equivalent textures between the informational collections. The way financial exchange data can be anticipated effectively is by utilizing something other than specialized verifiable information, and utilizing different techniques like the utilization of opinion analyzer to infer a significant association between people's feelings and how they are impacted by interest in explicit stocks. One increasingly significant fragment of the expectation procedure was the extraction of significant occasions from web news to perceive how it influenced stock costs is proposed by

authors at el Xi Zanag,Siyu Qu, Jieyun Huang, Binxing Fang, Philip Yu in paper [18].

In paper [19] authors Loke K. S. at el focuses on the utilization of AI and machine learning procedures to anticipate the costs of the stock is an increasing pattern. An ever increasing number of specialists put their time each day in thinking of approaches to show up at procedures that can additionally improve the precision of the stock expectation model. Because of the tremendous number of choices accessible, there can be n number of ways on the best way to foresee the cost of the stock, however all techniques don't work a similar way. The yield shifts for every system regardless of whether similar informational collection is being applied. In the referred to paper the stock value forecast has been done by utilizing the irregular backwoods calculation is being utilized to foresee the cost of the stock utilizing money related proportions structure the past quarter. This is only one way of taking a gander at the issue by moving toward it utilizing a prescient model, utilizing the irregular woodland to anticipate the future cost of the stock from authentic information. Notwithstanding, there are constantly different elements that impact the cost of the stock, for example, assessments of the financial specialist, popular supposition about the organization, news from different outlets, and even occasions that cause the whole securities exchange to change. By utilizing the monetary proportion alongside a model that can adequately investigate feelings the exactness of the stock cost forecast model can be expanded.

Research gap found are:

1. Sentiment calculations not performed which may give better results [1].
2. Need to add more parameters such as multiple instances, financial ratios etc. More parameters may lead to more accuracy [5].
3. Comparison of different techniques is required.

III. SYSTEM ARCHITECTURE

Following fig 1. Show the system architecture.

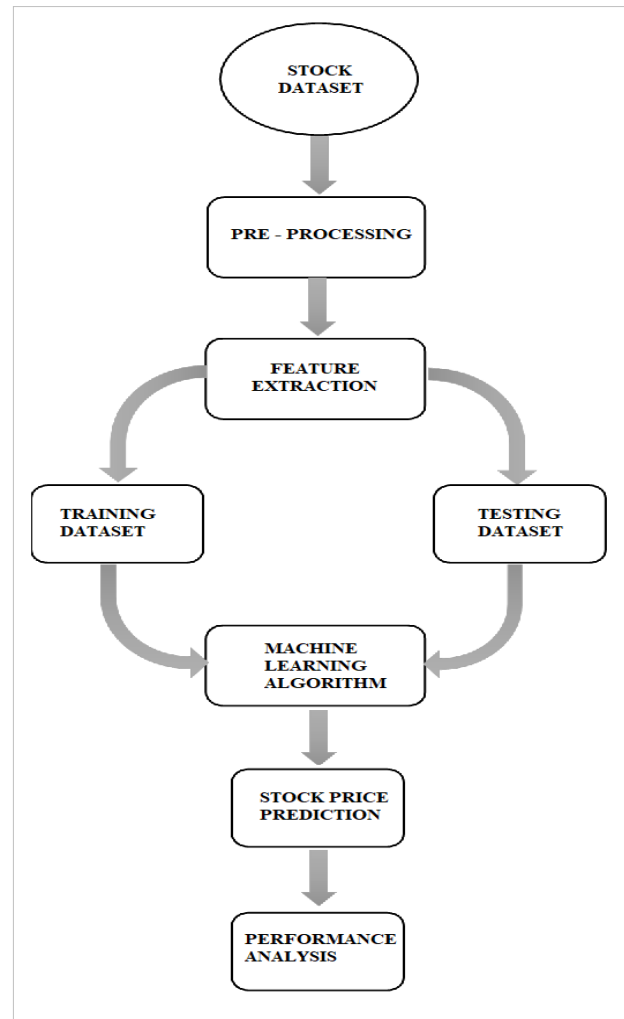


Fig.1 System Architecture

The proposed system consist of the following step:

Firstly we need to select the dataset. The dataset will be the input for the system. The basic aim here is to forecast the market value of any stock financially. In the following stage the dataset of the stock needs some preprocessing, like converting the data into appropriate form (.csv format). After pre-processing, then next stage will be the feature extraction and selection. Once this is done, the train and test data will be ready. We usually consider the standard 70% and 30% train and test data ratio. In the testing phase the machine learning algorithm will be implemented

so as to get the forecasting the stock values. The performance analysis will be done with the help of graphical analysis.

IV. DATASET DESCRIPTION

High-quality financial data is expensive to acquire and is therefore rarely shared for free. Here we provide the full historical daily price and volume data. It's one of the best datasets of its kind you can obtain. Dataset taken from Yahoo Finance trained and tested over that It is split into training and testing sets respectively and yields the Regression Based Model Results, LSTM Based Model Results.

V. CONCLUSION

We attempt to predict the future prices of the stocks or shares of a company with higher accuracy and reliability by utilizing machine learning techniques. Here we used novel LSTM Model for determining the stock prices. Both these techniques have shown an enhancement in the accuracy of predictions, by generating positive results with the LSTM model proving to be more efficient. The outcomes are quite promising and has leads to the conclusion that it is possible to predict stock market price with more accuracy and efficiency by utilizing ML techniques.

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Cite this article as :

Swati D. Killekar, Dr. Sanjeev S. Sannakki, Prashant Y. Niranjana, Girish R. Deshpande, "An Analytical Approach for Stock Market Forecasting Based on Machine Learning", International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), Online ISSN : 2394-4099, Print ISSN : 2395-1990, Volume 7 Issue 2, pp. 414-420, March-April 2020. Journal URL : <http://ijsrset.com/IJSRSET207298>