Survey Paper on Stock Prediction Using Machine Learning Algorithms

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Abstract - *Stock Market Prediction is a challenging and trending topic for researchers in recent years. Although it contains significant risk, it is frequently utilized in investment schemes that promise big returns. The returns on stocks are quite erratic. They are influenced by a number of variables, including prior stock prices, current market trends, financial news, social media, etc. There are many methods used to forecast stock value, including technical analysis, fundamental analysis, time series analysis, and statistical analysis, however none of these methods has been demonstrated to be a reliable forecasting method. In order to improve the accuracy of stock price prediction, a variety of machine learning approaches and algorithms are examined in this study.*

Key Words: CNN, ARIMA, LSTM, Stock price, Machine learning

1.INTRODUCTION

The stock market has a significant impact on a country's economic performance. Its prediction has been very tiresome and troublesome since markets' existence, and one of the most significant problems faced by many stockholders is predicting its price. It is an area where prediction does not follow any rules as the nature of the market is very volatile. Due to its volatile nature and high risk, there is a high return on investments, but 95% of the traders make losses in the stock market because they try to gamble by randomly speculating the prices or movement and lack a proper trading setup. The share market is based on the concept of demand and supply. If the demand for a particular company's stock is higher and the supply is low, then that company's share price would tend to increase and if the demand for company's share is low then the company share value tends to decrease. The successful prediction of a stock's price by its analysis could lead to a significant profit. This reinforces the idea that time series patterns have great predictive potential and a high likelihood of producing lucrative trades and high returns for investment in company by using extraordinarily large historical data sets to show different conditions. The primary goal of this research is to improve stock price prediction systems so that investments grow, and investors can optimize their earnings. PREDICTION METHODS: 1. By attempting to calculate a security's native value, fundamental analysis estimates securities. It is a technique for figuring out the true or "fair market" value

of a stock. The stock is seen as being underestimated and a buy recommendation is issued if the fair market value is higher than the current market price. 2. Technical analysis seeks to anticipate price fluctuations in the future, giving retailers the information, they need to turn a profit. Charts are used by traders to identify entry and exit points for potential trades using technical analysis tools.

2. Related Work

The artificial neural network work that has been proposed by K. Srinivas, M. Sreemalli, P. Chaitanya [1] is a very well-liked method for support vector machines and stock market price prediction. List the benefits and drawbacks of each model and contrast how the stock market is executed using these models. On machine learning issues like categorization and prediction, artificial neural networks (ANN) look to have a lot of potential. using a nonlinear mapping technique in which the input vector is fed into a high-dimensional feature space to execute nonlinear class partitions using a linear model. Time series data are handled by the ARIMA model. The prediction of Nifty bank data is done in this paper using machine learning techniques like Support Vector Machine, Artificial Neural Network, and Auto Regressive Integrated Moving Average. Here, the 2015 Nifty bank dataset is used. Chetna Utreja, Indu Kumar, Kiran Dogra, Premlata Yadav [2] proposed to get over these stock issues, by machine learning approaches that have been used for stock price prediction. Five models have been built and their performance in predicting stock market trends is compared in this research. Support Vector Machine (SVM), Random Forest, K-Nearest Neighbor (KNN), Naive Bayes, and SoftMax are the five supervised learning methods. The findings of the probing indicate that the Nave Bayesian Classifier performs better for smaller datasets and the Random Forest algorithm performs best for larger datasets. Kamal Nayan Reddy Challa, Venkata Sasank Pagolu, Ganapati Panda [3] proposed the project to investigate the relationship between public opinions expressed on Twitter and changes in a company's stock price, including climbs and declines. In this research, they analyse the relationship between stock market movements of a firm and attitudes on twitter by using sentiment analysis and supervised machine learning methods on tweets extracted from twitter. Wassim El-Hajj, Mariam Moukalled, Mohamad Jaber [4] proposed to increase stock expectation precision and enable profitable

exchanges, by a trading system that uses machine learning, mathematical calculations, and external inputs like news sentiment. They focus on forecasting a stock's price or trend during the day's final trading hours by taking into account the morning's trading activity. They created a technique for predicting stock price trends in this study. They used information from two sources—historical stock market data from Reuters and news sentiment produced about a certain stock—to develop these models. The information was acquired over a ten-year period for four different stocks. A machine learning strategy to forecast stock market price was proposed by Osman Hegazy, Omar S. Soliman, and Mustafa Abdul Salam [5]. The suggested method combines particle swarm optimization (PSO) and least square support vector machine (LSSVM) (LS-SVM). The PSO algorithm is used to improve LS-SVM's ability to forecast daily stock prices. The proposed model is built using historical stock data and technical indicators. It effectively addresses the over-fitting issue that arises in ANNs, most commonly in the context of stock market swings. To estimate stock valuations, Ishita Parmar, Navanshu Agarwal, and Sheirsh Saxena [6] proposed utilizing regression and LSTM-based machine learning. Open, low, high, close, and volume are taken into consideration. Because even small modifications to the data might have significant effects on the results, the dataset should be as precise as feasible. A dataset obtained from Yahoo Finance is used in this paper to demonstrate the use of supervised machine learning. It was suggested by Aparna Nayak, M. M. Manohara Pai, and Radhika M. Pai [7] to make stock market forecasts. One model is created to predict daily data, and the other to predict monthly data. The models are produced by algorithms for supervised machine learning. The daily forecast model incorporates sentiments and previous pricing. Using supervised machine learning techniques on a daily prediction model, up to 70% of accuracy may be distinguished. The goal of the monthly prediction model is to determine whether the trends of any two months are similar. Social media is mined for news and sentiment. Later, a prediction model will be built using the extracted sentiments and historical price data. T. Manojlović and I. Štajduhar [8] proposed a 5-days-ahead and 10-days-ahead predictive models used to construct the random forests algorithm. The models are based on the CROBEX index's historical data. The suggested approach achieves an average classification accuracy of 76.5% for 5-days-forward models and 80.8% for 10-forward models, as calculated using 10-fold cross validation. Two methods that are frequently used to forecast stock market behaviour. This approach usually requires treating the historical data as time series data, feeding the distinct time frame signals to an algorithm and trying to model the future time points in the signal. The second is based on forecasting the future price direction of a stock. Kunal Pahwa and Neha Agarwal [9] proposes, in order to help

make this risky format of business a little more certain, to use open-source frameworks and existing algorithms to leverage machine learning to anticipate the future stock price for exchange. The result is purely dependent on math and makes a lot of assumptions that may or may not be true at the time of projection.

A machine learning approach similar to ANNs (artificial neural networks) with alternative feature selection was proposed by Radu Iacomin [10]. The findings of this study will demonstrate that the classification algorithm SVM (Support Vector Machines) will be successful in turning a profit with the aid of feature selection PCA (Principal Component Analysis).

3. CONCLUSIONS

The act of attempting to control the future value of a business stock or other financial instrument sold on an exchange is known as stock market prediction. An impressive return could result from a successful prediction of a stock's future price. We discovered from the literature review that the LSTM and arima model is the best algorithm for predicting the market price of a stock from historical data based on various data points. Given that it has been trained on a sizable amount of historical data and was chosen after being drilled on a sample set of data, this algorithm will be extremely helpful for dealers and other stakeholders investing money in the stock market. The goal of this survey is to investigate several conventional approaches, machine learning, and deep learning techniques that are employed in stock market forecasting. These algorithms consist of SVM, Random Forest, neural networks, LSTM, and various regression techniques.

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