IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Issue 6, June 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 6, June 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1106033 |

Stock Market Prediction using Machine Learning

Mr.Brijesh Laxman Sonawane[1], Prof. Sneha Tirth[2]

PG Student, Department of Computer Engineering, Trinity College of Engineering and Research, Pune, India[1]

Faculty, Department of Computer Engineering, Trinity College of Engineering and Research, Pune, India[2]

ABSTRACT— It has never been easy to invest in a portfolio of assets since simple models cannot more accurately predict future asset values due to the abnormality of the financial market. The hottest area of research in science now is machine learning, which includes teaching computers to carry out tasks that would typically need human intelligence. In order to estimate future stock market values, this article uses Deep Learning, more specifically the Long-Short Term Memory model (LSTM). This study's main objective is to ascertain how accurately a machine learning system can forecast. Predicting stock market prices is a challenging task that has usually needed significant human-computer interaction. This will yield more accurate findings in comparison to current stock price prediction methods. With data of various sizes, the network is trained and accuracy checked, and the findings are summarised. This study's objective is to forecast stock market values so that investors can make more knowledgeable and exact investing decisions.

KEYWORDS–:Data Analysis, Stock Prediction, Deep Learning, Stock Market.

I. INTRODUCTION

Stock is a type of investment that represents ownership of a certain percentage of a company. In proportion to the number of shares they possess, this entitles the stockholder to a percentage of the corporation's assets and profits. "Shares" is the term for stock units. Any company's ownership certificates are referred to generally as "stocks" in this context. Stock prices change every day as a result of market dynamics. This indicates that supply and demand affect share prices. A stock's price increases when there is greater demand for it than there is for it to be sold (supply). There would be greater supply than demand if more individuals wanted to sell a stock than buy it, which would result in a decrease in price. Supply and demand are well understood. What makes people appreciate one stock and loathe another is difficult to comprehend. Determining which news is beneficial for a firm and which is negative for it is what it all comes down to. This issue has several answers, and practically every investor has their own ideas and strategies. The fundamental idea is that a stock's price movement reflects what market participants think a company is worth. Contrast a company's value and stock price carefully. Market capitalization, which is the stock price multiplied by the number of outstanding shares, is used to calculate a company's value. For instance, a company with 1,000,000 shares outstanding that trades at $100 has a lesser value than one with 5,000,000 shares outstanding that trades at $50 ($100 x 1,000,000 = $100,000,000, while $50 x 5,000,000 = $250,000,000). Even more confusingly, in addition to a firm's current value, a stock's price also takes into account the expected growth of the company in the future.

II. RELATED WORK

DarmadiKomo et al. The radial basis function (RBF) and multilayer percept (MLP) were employed in algorithmic models to provide and price predictions, which were individually trained on different sets of data. Actual data from the Wall Street Journal (Dow Jones Industrial Average) was used as a reference in these experiments. The suggested Dow Jones index by the models achieved a significant level of accuracy, providing index funds that tracked more than 80% of the average monthly return. In actuality, the data demonstrate that the RBF network outperforms the MLP network significantly.

D. VenugopalSetty et al. An in-depth investigation of the efficiency of various data mining methodologies for business results was conducted. This is offered for further information on the fundamentals of the Indian stock market, such as how significant data mining is in the field of prediction, as well as other relevant data mining techniques, which are explained in the article. In other words, the gap between stronger storage and more efficient retrieval technologies is growing. There is a completely new sequence of discovery that should be implemented in order to improve end-user information layout and resolution.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 6, June 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1106033 |

Dase R.K. et al. He broadened his knowledge by doing a literature review on the application of neural networks to stock prediction. They discovered that time series analysis could not accurately predict indexes, but it appears that an artificial neural network may be suitable for this purpose. Neural networks can extract an astonishing amount of knowledge from massive amounts of data. Based on past research, they conclude that a market Artificial Network model is useful in forecasting the world's financial markets. They suggested, with evidence, that this is a unique field of application for Artificial Neural Networks, with high expectations for their use in accurate stock market index analysis.

Akhter Mohiudd et al., In his study, he forecasted stock price changes using a neural network-based approach. To estimate potential stock returns, a neural network was used. Several ways have been used to examine the indicator's ability to produce false findings. Real data from the National Stock Exchange of India (NSE) was used in controlled studies to test the correctness of this technique. TCS, Wipro, Axis Bank, Maruth, and Tata Steel were among the companies that began operations on January 2, 2007 and ended on March 3, 2010. In his perspective, neural PERSISTEMBLE did not fulfil the standard, but he also created novel neural system design and training methodologies to reduce inaccuracy in prospective forecasts.

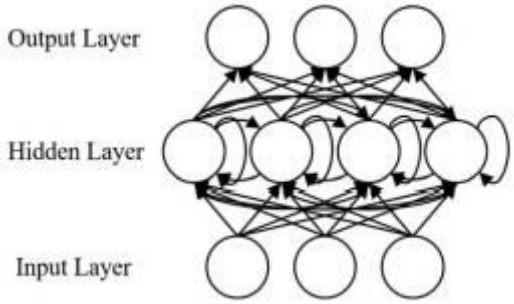
D. Ashok kumar et al. General time series concepts were discussed, as well as the necessity for market indexes and the implications of applying an ANN to time series. A review of past work was also undertaken to investigate models employing neural networks for time series forecasting. NIFICS ranks in the middle of the stock market index (MIDCAP) and the neural network market model (BSE). The findings indicate that the score is slightly above average. According to their findings, the best performance is attained with an ideal weighting factor of 0.28, a momentum of 0.5, and a best epoch of 2960. In the industry, the model achieved a lower-than-expected fit and could be used to any type of stock outcomes.

AdityaNawani et al. A comparison of data mining techniques and market forecasting methods can be investigated for use in constructing market capitalization models for trading firms. Their thesis looks on how neural networks are used in conjunction with the Graphical User Interface for the MATLAB Graphical Digital Toolbox to produce reliable results. When the qualified technique is utilised, forecasts regarding the parameters involved in supply and demand in a certain sector can be made.

III. PROPOSED SYSTEM

In the proposed approach, we want to precisely determine the next day's closing value so that investors can purchase or sell shares with certainty. Long Short Term Memory (LSTM) is a deep learning artificial neural network. The LSTM is a sophisticated neural network with a memory cell that temporarily stores a chunk of data for future use. To efficiently predict stock prices, we propose using the LSTM (Long Short Term Memory) algorithm.

Algorithm:



As shown in Fig. , for a RNN, let our input x be a sequence whose length is T, x = {x1 , x2 ,...,xT }, and each item xt is a feature vector. At time step t, given the previous hidden layer state ht−1 , the current hidden layer state ht and the output layer state yt can be calculated by,

$$h_t = \sigma_h(w_h x_t + U_h h_{t-1} + b_h)$$
$$y_t = \sigma_y(w_y h_t + b_y)$$

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 6, June 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1106033 |

where Wh and Wy denote the input-to-hidden and hidden-to-output weight matrices, respectively, Uh is the matrix of the recurrent weights between the hidden layer and itself at two adjacent time steps, bh and by are the biases, and σh and σy denote the activation functions.

At each time step, the input is propagated in a standard feedforward fashion, and then, a learning rule is applied. The back connections lead to the result that the context units always maintain a copy of the previous values of the hidden units (sincethey propagate over the connections before the learning rule is applied). Thus, the network can maintain a state, allowing it to perform such tasks as sequence prediction that are beyond the power of standard multilayer perception.

Formula for calculating current state:

$$h_t = \int (h_{t-1}, x_t)$$

Where,
h_t-> Current state
h_{t-1} -> Previous state
x_t-> Input state

Formula for applying Activation function:

$$h_t = \text{activation}(W_{hh} h_{t-1} + w_{xh} x_t)$$

Where,
W_{hh}->Weight at recurrent neuron
w_{xh}->Weight at input neuron

Formula for calculating output:

$$y_t = w_{hy} h_t$$

y_t->Output
w_{hy}->Weight at output layer

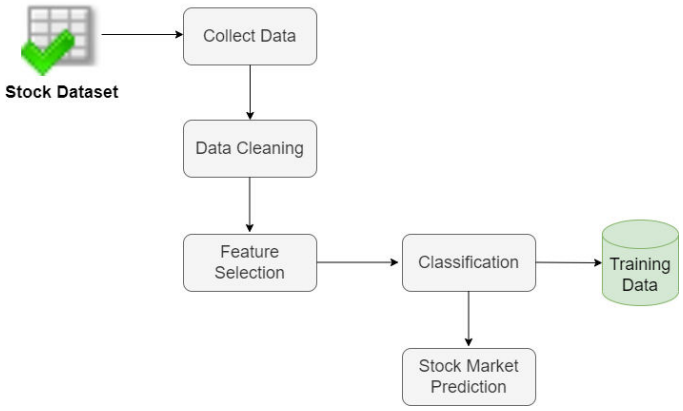


Figure 1. System Architecture

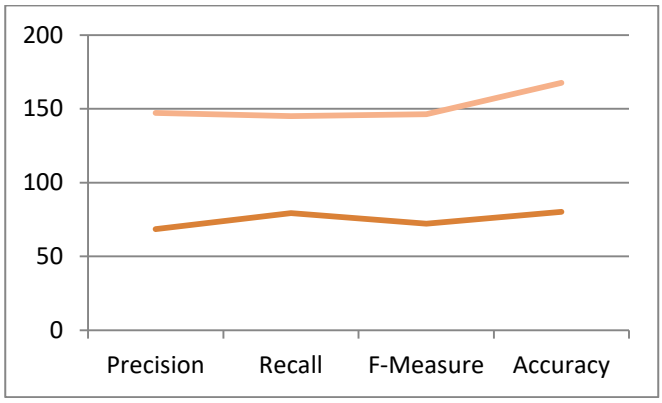
IV. RESULTS AND DISSCUSSION

We compared the proposed stock price prediction accuracy on number of samples and show the result graphically. Let see the following graph and table shows the stock price prediction accuracy result based on classification technique.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 6, June 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1106033 |



	Existing System	Proposed System
Precision	68.45	77.70
Recall	79.44	65.64
F-Measure	72.11	74.31
Accuracy	80.29	88.26

V. CONCLUSION

Because they desire to know their return on investment, investors are highly popular with stock price forecasting. Historical stock market forecasts were based on historical rates, sums, price dynamics, and fundamental patterns and were used by technical analysts and traders. Forecasts for stock prices are now extremely optimistic. Not just the financial position, but also the complicated when nation economics, political environment, and natural disasters, among other things, have an impact on equities markets. Getting back to the transaction In nature, standard procedures cannot be predicted with precision. Because they desire to know their return on investment, investors are highly popular with stock price forecasting. Stock market forecasts based on prior rates, sums, price dynamics, and basic trends have traditionally been used by analysts and traders.

REFERENCES

[1] DarmadiKomo, Chein-I Chang, Hanseok KO, "Neural Network Technology for Stock Market Index Prediction", International Symposium onSpeech, Image Processing and Neural Networks, 13-16 April 1994

[2] D. VenugopalSetty, T.M.Rangaswamy and K.N.Subramanya, "A Review on Data Mining Applications to the Performance of Stock Market",International Journal of Computer Applications, (0975 – 8887) Volume 1 – No. 3, 2010

[3] Dase R.K. and Pawar D.D., "Application of Artificial Neural Network for stock market predictions: A review of literature", InternationalJournal of Machine Intelligence, ISSN: 0975–2927, Volume 2, Issue 2, pp-14-17, 2010

[4] AkhterMohiuddin Rather, "A prediction based approach for stock returns using autoregressive neural networks", IEEE, 978-1-4673-0126-8,2011

[5] D. Ashok kumar and S. Murugan, "Performance Analysis of Indian Stock Market Index using Neural Network Time Series Model",International Conference on Pattern Recognition, Informatics and Mobile Engineering (PRIME), IEEE, 978-1-4673-5845-3, 2013

[6] AdityaNawani, Himanshu Gupta, Narina Thakur, "Prediction of Market Capital for Trading Firms through Data Mining Techniques",International Journal of Computer Applications (0975 – 8887) Volume 70– No.18, May 2013

[7] Chi Kin Chow, Tong Lee, "Construction of multi-layer feed forward binary neural network by a genetic algorithm Neural Networks", IJCNNProceedings of the 2002 International Joint Conference, Honolulu, HI, USA, 2002

[8] Cao Q, Leggio KB, SchniederjansMj., "A comparison between Fama French's model and artificial neural network s in predicting the Chinese stock market", Computers & Operations Research, Vol. 32, pp. 2499-2512, 2005.

[9] SatyajitDhar, Tuhin Mukherjee, Arnab Kumar Ghoshal, "Performance Evaluation of Neural Network Approach in Financial Prediction:Evidence from Indian Market", Proceedings of the International Conference on Communication and Computational Intelligence, pp.597-602, 2010.

INNO SPACE
SJIF Scientific Journal Impact Factor

Impact Factor: 8.379

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details