Stock Price Prediction Using Machine Learning

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Abstract
Shares in publicly traded companies, or equity shares, can be purchased and sold on the stock market. There are three basic types of stock market investors. All three types of investors: FII (foreign institutional investors), DII (domestic investors), and retail investors. Foreign Institutional Investors, such as mutual funds and banks, who have the experience and knowledge necessary to make their investment. Non-professional investors are known as retail investors. Machine learning is used to make an accurate prediction with less risk management in the stock market because there is a lot of uncertainty there. Through forecasting and LSTM (Long/Short Term Memory), we can theoretically predict stock prices through the use of machine learning. Effective stock market prediction gives us some suggestions on trading strategies, which is why stock market prediction is so important when it comes to investments. There is, however, no way to guarantee that the data will be 100% accurate because of future uncertainty in the field of study. For stock price prediction, this paper reviews studies on machine learning techniques and algorithms.

I. INTRODUCTION
When it comes to managing investments, machine learning plays a critical role. It has been widely adopted in the financial sector as a new mechanism for assisting investors in making better investments and managing risk. If you want to buy and sell shares in publicly traded companies known as equites (equities securities), the stock market is the place to do so. However, investors must make an effective investment decision at the right time if they want to get a good return.

It is possible for software applications to learn to better predict outcomes on their own using a technique known as machine learning. Attempting to predict stock prices based on a few factors would be simple, but the results would be inaccurate because other factors may play a significant role. That’s why technical analysis could benefit from the use of tools. Investment in the stock market isn’t all about putting in a tonne of money, but rather when to put in the money. There has been an increase in the recognition of machine learning in finance as a result of the success of machine learning in many other fields.

Stock Market
It is possible to buy and sell shares of a company in both electronic and physical form on India’s stock market, equity market, or share market. There are two stock markets One of the oldest stock exchanges in the world, the Bombay Stock Exchange (BSE), was founded in 1875. Different types of markets can be found. a place where securities are sold for the first time, such as an initial public offering (IPOs) (Initial public offering) 2. Secondary markets: these markets refer to trading between investors, such as the NSE and BSE. There are three types of investors in the stock market[1].

1. FII:(foreign Institutional Investors)
2. DII:(Domestic Institutional Investor)
3. Retail investor Institutional Investor uses his experience and knowledge to set a good example for mutual funds and banks in his own investment portfolios a retail investor is a non-professional investor or an individual.

Equity
An equity asset, also known as a share, is issued to represent a portion of the company’s equity. Those who are known as stockholders or shareholders will be able to own a portion of the business. Increased funding may be required if the company wishes to expand its operations. After shareholder approval, the company can issue new
shares and sell them to investors in order to raise this amount of money. If the business is a success, the stock’s quoted value will rise. As a result, the stock investment’s performance depends on the company’s success as well as its tangible assets.

For investors, stock trading is a major challenge because trading decisions and stock prices can be affected by a wide range of information, including economic conditions, local and international political and social factors. Investing in the stock market involves buying and selling company stock. Day traders, position traders, swing traders, and scalpers are just a few of the many strategies employed by traders.

**Behaviour of without Brick Masonry in R.C Framed Structure**

The first crack grow to be located on the frame joints is 21 kN. After the formation of crack inside the frame, final load is reached. At this last load level, the diagonal movement is passed in among diagonal of people. The crack have become decided in the frame at an final load degree of 27.8 kN. The load Vs deflection curves as validated in determine 7.7.

![Fig [1]](image1.png)

![Fig [2]](image2.png)

**Stock Analysis**

Analysis of the stock market Before making a purchase, investors can learn about a security’s true value through stock market analysis. Experts conduct extensive research before formulating any stock market recommendations. A stock analyst’s job is to predict how an instrument, sector, or market will perform in the near future. [2]
There are two types of stock market analysis: fundamental and technical.

- Basic Research

**Analytical Study of Technology**

The underlying value and future growth potential of a company can be determined by performing a fundamental analysis on its revenues, earnings, future growth, return on equity, profit margins, and other relevant data.

1. Market capitalization is a simple way to simplify fundamental analysis
2. This ratio measures the current share price in relation to its earnings per share and is used to value a company (EPS).
3. Borrower equity
4. Divided ownership
5. The value of the face.

**Amounts held by investors**

1. It is used to evaluate investments and identify trading opportunities based on price trends and patterns seen on charts.
2. It’s easier to pick stocks if we use indicators and moving averages.
Artificial Intelligence (AI) has been used in a wide range of fields, including finance and economics, over the past few years. In order to make better investment decisions, many researchers have used ML algorithms to create tools that analyse historical financial data and other relevant information. Using financial news and social media data, ML algorithms predict the stock prices of Taiwanese construction firms using a promising non-linear prediction model. To produce accurate results, it is critical to use historical or time series financial data, as well as to carefully select appropriate models, data, and features. Effective infrastructure, a thorough collection of data and appropriate algorithms are critical to obtaining accurate results. The more accurate a machine learning model can be, the better the quality of the data used to generate it. ML has revolutionised the way investors use information and provides the best analytic opportunities for all types of investors. Thus, ML is a valuable tool for financial investment. Forecasting asset returns or discovering patterns or distributions in asset returns can both be accomplished using machine learning techniques, as shown in Table 1. Clustering, prediction, classification, and other techniques are among them.

**LSTM (Long Short Term Memory)**

One of the most advanced RNNs on the market is the Long Short Term Memory Network (LSTMN). Unlike RNN, it can deal with the vanishing gradient problem. RNN, or recurrent neural network, is a technique for maintaining long-term memories. Complex problem domains like machine translation, speech recognition, and more require this type of behaviour. [5]

The field of deep learning is complicated by LSTMs. In order to understand what LSTMs are, and how bidirectional and sequence-to-sequence terms relate to the field, it can be difficult to grasp the concepts. [3]

RNNs work in a similar fashion in that they keep track of previous data and apply it to the processing of the current input. Because of the vanishing gradient, RNN cannot remember long-term dependencies. Long-term stability is a primary concern for LSTM developers.

**LSTM Architecture**

LSTM cells function similarly to RNN cells at a high level. The LSTM network’s internal workings are shown here. LSTM has three parts, each of which performs a specific task.

An LSTM cell has three parts, collectively referred to as “gates.” There are three parts to this circuit: a “forget gate,” a “input gate,” and a final “output gate.” [4]
CONCLUSION and FUTURE SCOPE

Many investors around the world have expressed an interest in stock investments. The decision-making process is difficult because there are so many variables to consider. In order to make wise investments, investors must be able to predict the stock market's future trends. Even modest increases in the accuracy of one's predictions can result in substantial gains. With the help of a well-developed prediction system, investors will be able to make more accurate and profitable investments. As a result, stock price forecasting is an essential activity that can pay off handsomely for investors. A review and comparison of the current state of ML algorithms and techniques in finance, particularly stock price forecasting, was conducted in this paper. Numerous algorithms and techniques have been discussed in terms of input, purposes, advantages and disadvantages. Some ML algorithms and techniques have been widely selected because of their characteristics, accuracy, and acquired error for stock price prediction.

Other factors, such as politics, economic growth, financial news, and social media, may have an impact on the stock's value. Studies have shown that the analysis of investor sentiment has a large impact on future stock prices. As a result, combining technical and fundamental analyses could improve prediction accuracy, making it an interesting addition to current ML research.
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