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# Stock Price Prediction using Technical Analysis

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**Abstract:** *Investors must have access to timely, accurate information in order to trade stocks effectively. Since many companies are traded on a stock exchange, a variety of factors affect the choice. In addition, it is difficult to foresee how stock prices will behave. The technique of predicting stock prices is crucial and difficult for the reasons mentioned above. Finding the predictive model with the lowest error rate and highest accuracy thus becomes a study topic. This work is our suggestion for solving the issue. In this work, we develop a model based on technical analysis which used Long Short-Term Memory (LSTM) algorithm to forecast the stock price of a company for the next 30 days. We collect historical stock data from the Yahoo Finance API using the yfinance library in Python and preprocess it using MinMaxScaler. In addition to the model development, we have created a web application. This application allows users to input the stock symbol of a company and get the predicted stock price for the next 30 days. The predicted values are displayed using a line chart, which provides users with a visual representation of the predicted stock price. Overall, this work provides an effective and accurate way of predicting the stock value of a company, which can be beneficial for investors in making informed decisions. The web application provides a user-friendly interface, making it easily accessible to anyone interested in predicting the stock price of a company.*

**Keywords:** Stock Price, Technical Analysis, Long ShortTerm Memory, Web Application

## I. INTRODUCTION

The stock market is where publicly traded corporations are traded for buying and selling purposes as well as where sellers and buyers come together. The daily operations of the stock market involve share exchanges and Sensex calculations. For trading in equities, debt instruments, and derivatives, the exchange offers an effective and transparent market. To estimate the potential value of a company's stock or other economical asset that is traded during a trade is the goal of inventory fee prediction. The examination of historical market data, including price and volume, is known as a technical analysis. Technical analysts use historical results and data from market psychology, behavioural economics, and quantitative research to predict how the market will behave in the future. Comparatively, it ensures more precision. So, we try to predict stock price using technical analysis.

In the financial markets, machine learning (ML) has developed into a potent analytical tool for assisting with and managing investments effectively. Numerous models have already been created using a variety of machine learning techniques, including Decision Trees, Naive Bayes, Support Vector Machines, and Artificial Neural Networks (ANN). We developed our model using LSTM recurrent neural networks, which accurately predict stock values. Because they can store previous or past data, LSTMs are critical because they are particularly successful in tackling problems involving sequence prediction. This is critical for stock prediction since it requires the storage and analysis of historical stock data in order to properly predict future stock price movements.

## II. LITERATURE SURVEY

Stock price prediction has been the subject of extensive research up to this point. A brief summary of the earlier framed paintings is presented in this section.

Huang Y et al.,[1] research provides an overview of machine learning algorithms based on fundamental analysis, such as adaptive neural fuzzy inference system, feed forward neural network, and random forest. To boost version overall performance, the authors extensively utilized RF-based characteristic selection and bootstrap aggregation.

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G. Pradipet al.,[2] research focuses on three ways to work out the prediction issue: Technical analysis, fundamental analysis, and machine learning. Machine learning applications include artificial neural networks, multiple linear regression, and Bayesian algorithms.

K. Hiba Sadiaet al.,[3] research focus on stock price prediction using support vector machine and random forest. This study investigates the usage of a prediction system in a real-world situation and the challenges related with accuracy.

NusratRoufet al.,[4] research is a decade review on methodology, recent development and future trends in stock price forecasting. In this research, a general framework is used to analyse the systematics of machine learning-based algorithms for stock market prediction.

A. Kumar et al.,[5] they created a Machine Learning application and used the Support Vector Machine (SVM) technique written in Python to forecast future stock prices to some extent. Which will undoubtedly assist an investor or user who is absolutely new to the stock market.

Md. Rubel Miah et al.,[6] the study of listed cement businesses on the Dhaka stock exchange is known as research. This study looks into the primary elements that influence share prices in Bangladesh's capital market.

Priyadarshani A et al.,[7] research using the NIFTY Index's final fees for the period of January 2020 to December 2020, this study examines fluctuations and variations in share prices for five businesses in India's data era: Infosys, TCS, Tech Mahindra, HCL, and Wipro.

## III. METHODOLOGY

The suggested strategy makes use of the ability of machine learning algorithms that forecast the value of the intended company based on historical data. With the utilization of a Long Short-Term Memory (LSTM) neural network, we can identify patterns and trends in historical stock price movements and forecast the future. The suggested system is automated and adapts quickly to changes in the market. It is also more accurate than the existing system as it can analyze large amounts of data and make predictions based on statistical models. The proposed system also includes a web application that allows users to access the predicted stock prices and make informed decisions about their investments.

### 3.1 Modules

1. Data Collection Module: This module is responsible for collecting the historical stock data from sources like yfinance, Google Finance, Alpha Vantage, etc. The module should be designed to handle data from different sources and store it in a structured format.
2. Data Preprocessing Module: The collected data is rarely clean and consistent. This module cleans, preprocesses, and transforms the raw data into a format that can be used for training the LSTM model. The preprocessing techniques include data normalization, outlier removal, missing value imputation, feature scaling, etc.
3. Feature Engineering Module: Feature engineering is the process of adding new features or choosing the most crucial features from a datasetso as to increase the precision of the LSTM model. Popular methods of feature engineering include PCA, t-SNE, and Fourier transformations.
4. LSTM Model Building Module: The LSTM Model Building module is the most important module of the system. It defines the architecture of the LSTM model, sets the hyper-parameters, trains the model, and saves the model weights.
5. Model Evaluation Module: After being trained, the LSTM model needs to have its performance evaluated in order to determine how well it performs on unobservable data. This module's responsibility is to evaluate the performance of the model using various evaluation metrics, including the RMSE, MSE, MAE, and R-Quadrat.
6. Prediction Module: The prediction module makes predictions on the test dataset using the trained LSTM model. The test dataset is fed into this module, and the projected stock price values are output.
7. Visualization Module: This module is in charge of displaying the expected and actual values on a graph. It plots real and expected stock prices on a time-series graph using libraries such as Matplotlib and Seaborn.
8. Deployment Module: This module is responsible for deploying the LSTM model as a web application using frameworks like Flask, Django, or Streamlit. The module should ensure that the application is scalable, robust, and user-friendly. It should also provide APIs to access the predicted values programmatically.

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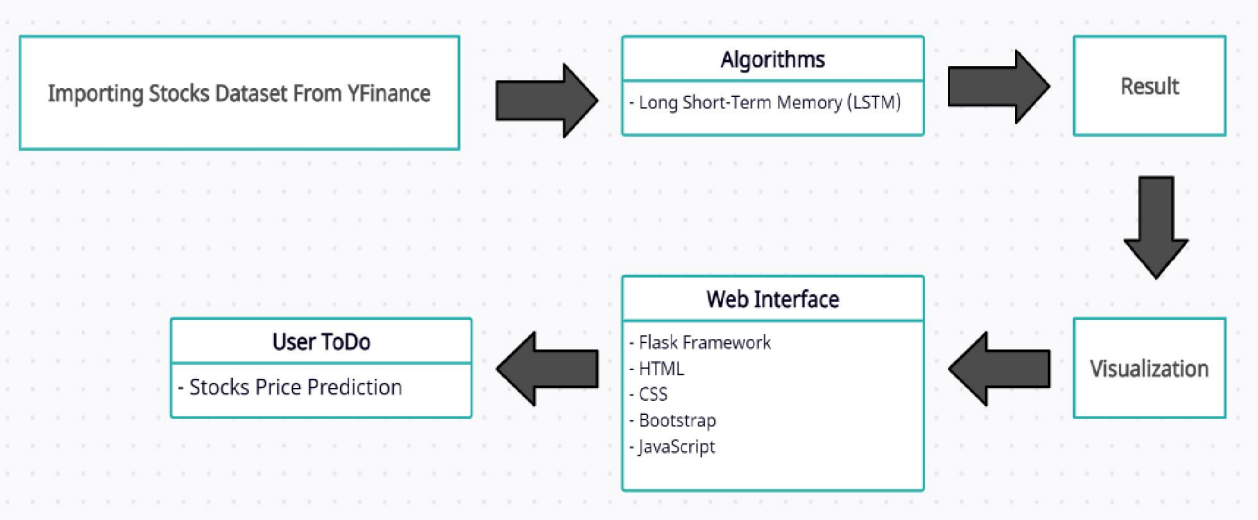


Fig.1 : Flow Chart of Proposed System

### 3.2 Proposed System

We collect data on TCS stock prices using they finance API, and pre-process the data by scaling it to a range between 0 and 1 using the MinMaxScaler. The information was then divided into two independent files, Training and Test. Eighty percent of the data are in the training dataset, and the remaining twenty percent are in the test dataset.

The training dataset is accustomed to train the LSTM model, which consists of two dense layers and two LSTM layers. The Adam optimizer and the mean squared error (MSE) loss function are accustomed tobuild the model. Then, with a batch size of 32, we train it for one epoch. We next utilise the testing dataset to assess the model's performance by computing the root mean squared error (RMSE).

Finally, we use the trained model to forecast the stock price of TCS for the next 30 days. We obtain the last 30 days' closing price values and scale them to a range between 0 and 1. Using these variables as inputs to the LSTM model, we can then forecast the stock price for the following 30 days.

To showcase our findings, we have also created a web application using Flask, HTML, CSS, Bootstrap, and JavaScript. The web application allows users to enter a stock symbol and see the expected stock price for the following 30 days using the LSTM model. The application provides a user-friendly interface for investors to make informed decisions about their investments based on the predicted stock prices. Simply user needs to select company from the dropdown button. After selecting the company the user have to enter the start date and end date. The gap between start date and end date should minimum 2 years. User can enter the start according to them but the end date should be before 30 days from the day the user want to divine the inventory value. Because the model divine the stock price after 30 days of the end date.

### 3.3 LSTM

A type of recurrent neural network is long-term memory. RNN utilize the output from the forgoing stage as the input for the following stage. Hochreiter and Schmidhuber created the LSTM. It solved the issue of RNN's dependence on long-term memory, which prevents it from predicting words that have been stored there. RNN encounters difficulties operating as the distance increases. LSTM data can frequently be preserved for a longer duration. It is used for time series analysis, forecasting, and classification.

Long Short-Term Memory (LSTM), a form of recurrent neural network (RNN), is capable of processing time series, voice, and other sequential inputs. Because LSTM networks can recognise long-term dependencies in sequential data, they are excellent for applications like language translation, speech recognition, and time series forecasting.

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## IV. RESULT

This project produced a fully functional web application that forecasts stock prices for the next 30 days using the LSTM algorithm. The accuracy of the predictions may vary hinge on the quality of the training data and the LSTM model hyperparameters utilised. However, this project provides a strong foundation for future improvements and enhancements to the stock price prediction system. Overall, this project serves as a useful tool for investors and traders who are interested in predicting stock prices and making informed investment decisions.

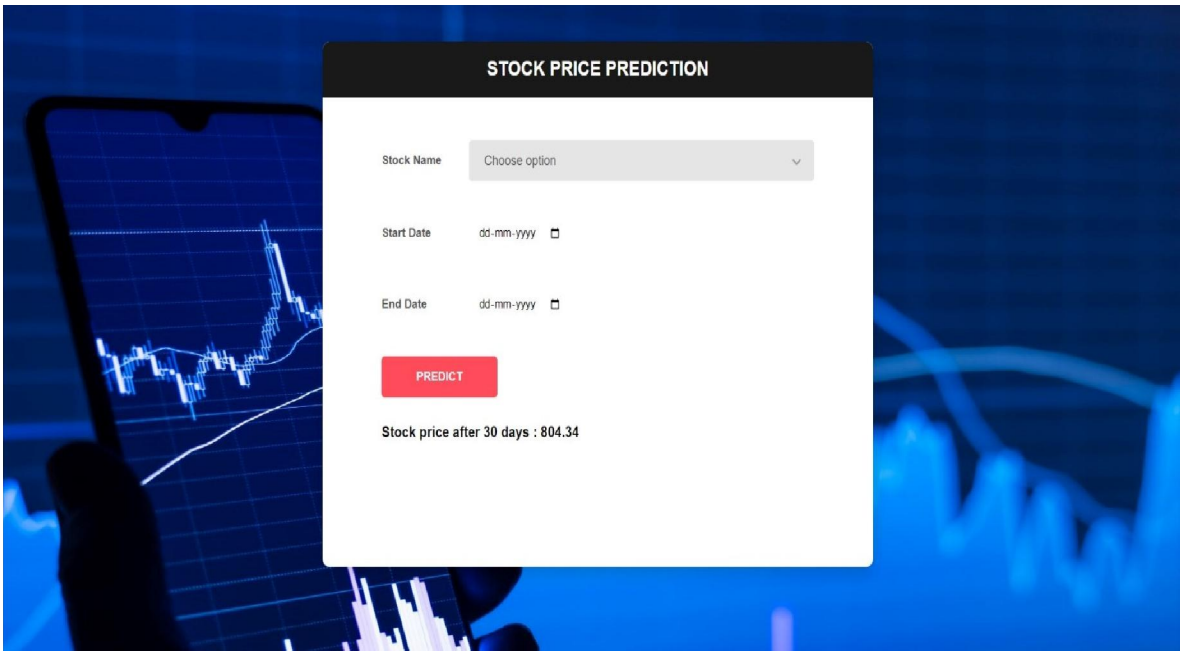


Fig. 2: Webpage of Proposed Model

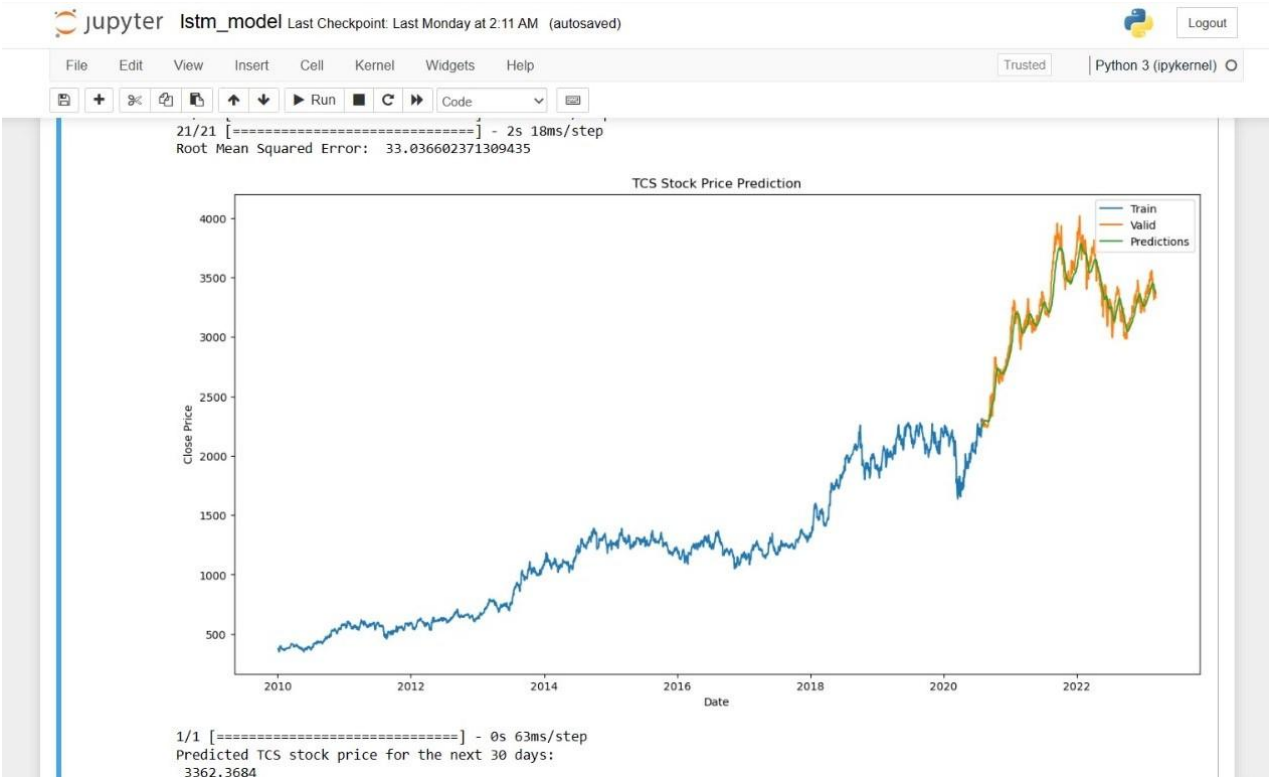


Fig.3: Graph of Predicted Values

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## V. CONCLUSION

In conclusion, the stock price prediction using LSTM algorithm has been successfully implemented in this project. The web application allows users to enter a stock symbol and retrieve the expected stock price for the following 30 days. The LSTM model was trained using historical stock data acquired from Yahoo Finance. The training data is pre-processed, scaled, and fed into the LSTM model to make predictions. The predicted stock prices are then displayed on the web application along with a visual representation of the stock price trends.

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