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Stock Market Analysis and Prediction using Deep Learning

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Abstract - This study is mainly confined to the stock market behavior and is intended to devise certain techniques for investors to make reasonable returns from investments. Though there were several studies, which deal with the analysis of stock price behaviors, the use of control chart techniques and failure time analysis would be new to the investors. The concept of stock price elasticity, introduced in this study, will be a good tool to measure the sensitivity of stock price movements. This model will be helpful for fund managers as well as investors. Stock Market is one of the most flexible sectors in the financial process, and Stock Market plays a vital role in profit-making. Stock Market is a center where resources are provided to the investors to purchase and sell their Shares, Bonds, etc. In other words, the Stock Market is a platform for trading various securities and derivatives without any hassle-free. In the Stock exchange, various companies are listed to their business venture through public issues. Improved markets continue to provide over a long period with higher returns constituting low volatility. The Indian market has started becoming informational more efficient as compared to developed countries.

Key Words: Stock, Investor, KNN, Neural, Machine Learning, Deep learning, etc

1. INTRODUCTION

Stock market prediction is that the act of trying to see the long-run value of a corporation stock or other financial instruments traded on an exchange. The accurate prediction of a stock's future price could yield a significant profit. Others disagree and people with this standpoint possess myriad techniques and technologies which purportedly permit them to achieve destiny price data. The stock market could be a place where people buy/sell shares of publicly listed companies. It offers a base to facilitate the seamless exchange of shares. In simple terms, if A wants to sell shares of Reliance Industries, the exchange will help him to satisfy the vendor who is willing to shop for Reliance Industries. However, it's important to notice that an individual can change the exchange only through a registered intermediary referred to as a stockbroker. The buying and selling of shares ensue through the electronic medium. We'll discuss more the stockbrokers at a later point. The workings of the exchange may be confusing. Some people believe investing could be a variety of gambling and feel that, if you invest, you may likely find yourself losing your money. These fears can stem from the private experiences of relations and friends who suffered similar fates or lived through the good Depression. Someone who beliefs during this line of thinking might not have an in-depth understanding of the exchange, why it exists, and the way it works.

Other people believe that they ought to invest in the long-term but don't know where to start. Before learning about how the exchange works, they appear at investing like some style of magic that only many people acumen to use. More often than not, they leave their financial decisions up to professionals and can't tell you why they own a specific stock or investment firm. Since new securities are sold in the primary marketplace, they are available to trade in the secondary market—where one investor buys shares from any other investor at the prevailing value or at whatever price each the purchaser and vendor agree upon.

The secondary market or stock exchanges are regulated by the administrative unit. In India, the secondary and first markets are governed by the protection and Exchange Board of India (SEBI). An exchange facilitates stock brokers to trade company stocks and other securities. A stock is also bought or sold providing it's listed on an exchange. Thus, it's the installation of the stock buyers and sellers. India's premier stock exchanges are the Bombay exchange and therefore the National exchange.

2. LITERATURE SURVEY

Zhihao PENG [1], big data analytics are used to optimize stock market analysis and prediction. Such an approach will act as a Hadoop based pipeline to learn from previous data and make decisions based on real-time updates. Linear regression targets to accurately predict stock prices. The analysis processes using scheduling module, then obtain periodic recommendations for trading the stocks.

In Hui Do [2], the help of an improved FOA clustering algorithm can be used to analyze the stock market. According to the current financial situation of companies, the company is clustered. According to the results of this analysis, the operation scale and management strength of companies are achieved, which proves the effectiveness and feasibility of the improved approach.

In Fei Qian [3], in this, we have studied the influence of the difference in stability on LSTM stock price prediction. The stability has little effect on the experimental results of the prediction results, but it has a slight influence on the convergence processing of the algorithm. Therefore, we

can conclude, that the LSTM algorithm performs better in prediction and has smaller errors. However, the other side of the LSTM algorithm is that it takes a lot of time to train the model and requires a large sample of data.

In ZHU Ming-Hua [4], This prediction algorithm is based on big data analysis for real-time link travel time. A real-time link travel time dynamic prediction algorithm based on traffic big data analysis.

In Akshay Sachdeva, Geet Jethwani, Adapalli V N Krishna [5], deep learning method for the stock price and NIFTY50 index predicting has increased in performance. Here they trained deep learning – Recurrent Neural Network (RNN) model to predict stock prices.

In R. Yamini Nivetha [6], This model predicts daily prediction and monthly prediction. Sentiment Analysis is integrated with the best predicting algorithm to refine the result in the stock market. Thus, the prediction model acts as a stock market broker in finance and business streams.

In Du Peng [7], Given the current situation of flexibility in stock market, to enhance the ability of investors to measure and guard against volatility risk in the stock market, investor sentiment and behavior indicators are constructed, and stock market volatility index based on large data strategy is compiled to reflect the unpredicting of the stock market.

The scheme innovation combines big data to quantifiable index compilation and model construction. It realizes the value application of huge Internet data, breaks through the bottleneck of the basic data source of market sentiment description, and provides a new way to measure the risk of the non-active stock options market.

In Saloni Mohan1, Sahitya Mullapudi1, Sudheer Sammeta1 [8], In this model, predicted stock prices using time series models, neural networks, and a combination of neural networks and financial news articles.

3. THE PROPOSED METHOD

Investment in Stock is one of the most rated businesses for making money for middle-class investors. After that, it is the actual trading business of hig1h-class investors and traders. The company's share price is the most important point for an investor which always fluctuates up and downwards.

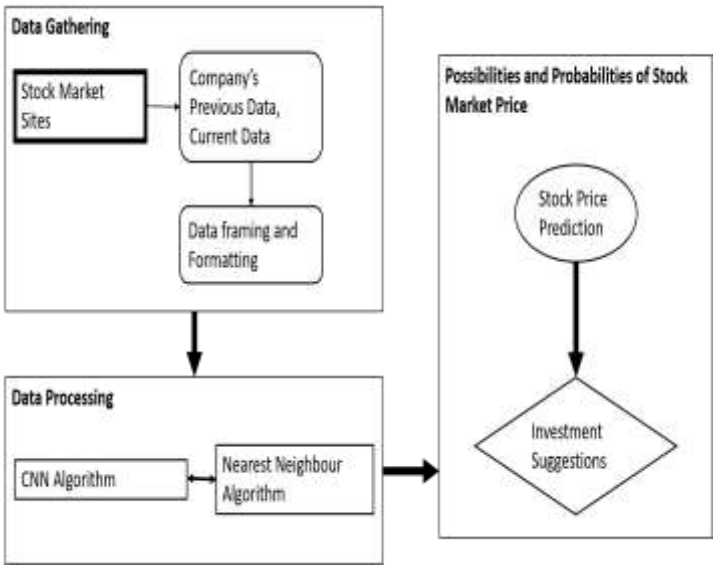

Fig.1. Proposed system architecture.

Dataset: System uses different stock market company dataset. Following different attributes involved in a stock market dataset like date, time, high, low, open, close, etc.

Pre-processing: The stock market dataset contains a NULL value and unwanted data. Datasets can be pre-treated to enhance the quality of the dataset. By using different statistical methods like means, median, standard deviation, mode, etc.

Feature Extraction: In this kind of function extraction we're predicting the inventory price of each agency by using locating a relation among distinct businesses. This inter-relation between these corporations will be used to forecast the stock prices of a particular enterprise in a better manner. Each agency's records may be for my part used to predict their organisation's stock fee. The top three businesses, that could expect a particular corporation with more accuracy, will be used collectively to predict the inventory charge of a particular organization.

1) Previous three days:- In this the information of the previous three days for the organisation who have had highest charge we're trying to predict is used.

2) Previous 5 days:- Similarly in this the facts of the previous five days for the organization who have had highest rate we're predicting is used. Machine getting to know strategies used for the experiments are defined here:-

Neural Network:

The neutral network is stimulated from organic neural networks. It includes inter-connected neurons, for you to procedure the records using a connectionist technique. The community adapts itself depending at the records flowing thru community and attempts to predict the required information.

Predicting stock prices using neural network:-

When the neural community is used to expect the highest fee along with opening price for each employer, it's far determined that the characteristic extraction from the Company unmarried headedly performed the excellent as compared with the different function extraction methods.

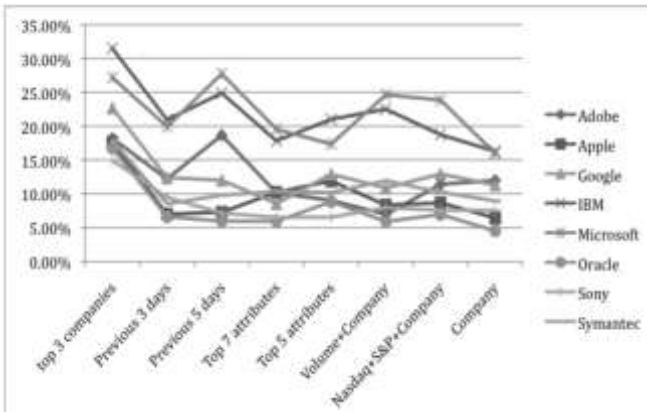

Fig.2. Relative absolute error for predicting the highest price for eight companies using neural networks.

K-Nearest Neighbour Classifier (KNN):

K-nearest neighbour method is a gadget getting to know algorithm this is taken into consideration as simple to implement. The inventory prediction problem can be mapped right into a similarity-based totally type of classification. The past inventory facts and the test statistics is mapped into a fixed of vectors. The prediction of the stock market closing price is computed using KNN as follows

a) Determine the number of nearest neighbors, k.

b) Compute the distance between the training samples

4. CONCLUSION

Here, we found for stock market prediction we can use machine learning technology. A person can't read and learn deeply about the graph of any company's stock price. In practice, we need to analyze data on a vast level with multiple companies. Hence, we can take the help of Machine Learning algorithms and can have a much better prediction. We are using the KNN algorithm and neural network. So, we can have much more accuracy in prediction.

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