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Stock Market Analysis And Prediction

A Report for the Evaluation 3 of Project 2

Submitted by

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ABSTRACT

A Stock market is an open market for the exchanging of organization stock at a concurred cost. It involves the trading between two investors so it is also known as Secondary Market. One of the important components of a stock market is stock exchange. A stock exchange is an organization which offers trading facilities for traders and stock brokers to trade stocks. Stock Market prices are volatile in nature and are affected by factors like inflation, economic growth, etc. Prices of a share market depend heavily on demand and supply. High demanded stocks will increase in price whereas heavily sold stocks will decrease in price. Fluctuating stock prices affects the investor's belief and thus there is a need to predict the future stock value. Stock market prediction is the act of trying to determine the future value of a company stock or other financial instrument traded on an exchange. Various types of trading can be done in the stock market. It could be short term trading or even long term trading but if someone can predict the value or class of that entity, it can yield a very good return for the investment done. Predictors continued to use paper work methods like fundamental and technical analysis for stock prediction. These types of analyses have shown a definite, but weak ability to forecast the direction of share prices. In this paper, we study the use of Sentimental Analysis and Opinion Mining on extracted dataset from social media using NLP and Text Analysis methods. Methods like Price Only, Human Sentiment Analysis, JST- based Method and Support Vector Machine are used to study the datasets and then it is represented in the form of graphs. Further, Data Mining Regression- Predictive Model is used to predict the longevity of stock in a competitive market.

INTRODUCTION

Today we live and breathe data. Forecasting the stock exchange data is an important financial subject which involves an assumption that the fundamental information publicly available in the past has some predictive relationships to the future stock returns. Stock market forecasting contains uncovering the market trends, planning investment tactics, identifying the best time to purchase the stocks and which stocks to purchase. A stock exchange or equity business sector is a non-direct, non-parametric framework that is difficult to model with any sensible exactness. It is the mix of speculators who need to purchase or offer or hold a share at a specific time. Prediction will continue to be an exciting locale of research, making scientists in the analytics field always desiring to enhance the existing forecasting models. The motivation is that companies and individuals are empowered to make investment decisions to develop viable systems about their future endeavors.

Stock price prediction is a heated topic in prediction study of the financial area. The stock market is essentially a non-linear, nonparametric system that is extremely hard to model with any reasonable accuracy. Investors have been trying to find a way to predict stock prices and to find the right stocks and right timing to buy or sell. Most of the techniques used in technical analysis are highly subjective in nature and have been shown not to be statistically valid. Recently, data mining techniques and artificial intelligence techniques like decision trees, rough set approach, and artificial neural networks have been applied to this area. Data mining refers to extracting or mining knowledge from large data stores or sets. Some of its functionalities are the discovery of concept or class descriptions, associations and correlations, classification, prediction, clustering, trend analysis, outlier and deviation analysis, and similarity analysis. Data classification can be done in many different methods; one of those methods is the classification by using Decision Tree. It is a graphical representation of

all possible outcomes and the paths by which they may be reached. The idea of forecasting using a neural network is to find an approximation of mapping between the input and output data through training. The trained neural network is then used to predict the values for the future. This research work presents the use of artificial neural networks as a forecasting tool for predicting the stock market price.

Mostly the approaches are in terms of fundamental approach and technical approach. For the long-term valuation fundamental approach is used. Every stock is having its own value that does not depend on the price of the stock that is known as Intrinsic value. The proposed model works through phases of data collection, feature processing, fuzzy logic mapping and stock value calculation. Fuzzy logic is used to map the quality as well as quantity valuation factors. The IF THEN rules are applied on the linguistic variable. The fuzzy model outcomes the stock value which is used to provide stock worth. The stock value is calculated by the Dividend discount model. Accuracy of the system is 0.77. The results offer the backbone for the value and not the price.

Another method is DATA MINING. Decision making process for business can be risky. Corporate decision makers have to make decisions to protect the company's benefit and lower the risk. In order to evaluate a data mining approach on forecasting, a tool, called IFF, was developed for evaluating and simulating forecasts. Specifically, data mining techniques and simulation's ability to predict, evaluate and validate Port Industry forecasts is tested. Accuracy is calculated with data mining methods. Finally the probability of the user's and simulation model's confidentiality is calculated. The results of the research indicate that data mining approach on forecasting and Monte Carlo method have the capability to forecast on Port industry and, if properly analyzed, can give accurate results for forecasts.

Purpose Of Project

Prominent features of the Project:

Analyzing stock data

We have obtained stock data of some companies that affect the Sensex. The data is from 2nd January 2006 to September 2007. The data has date as well as the value of the company's stock at the end of trading session of that date.

Analyzing the factors

We have to obtain the data in the same period for the following factors-

Dollar value: We will obtain the variation of dollar value as compared to the rupee.

Corporate results: Companies declare their performance results and profit at the end of each quarter.

Inflation: From financial experts we can obtain inflation rate over a period of time. We have to analyze the variations in the stock value of the companies with respect to these factors using some data mining algorithms. We will also verify our results with the results obtained by "DB miner" software.

Scope of the project

Application of Analysis of stocks in our selected domain:

Stock Market Analysis of stocks using data mining will be useful for new investors to invest in the stock market based on the various factors considered by the software. Stock market includes daily activities like Sensex calculation, exchange of shares. The exchange provides an efficient and transparent market for trading in equity, debt instruments and derivatives.

Our software will be analyzing Sensex based on the company's stock value. The stock values of company depend on some of the following factors:

- **Dollar value:** The fluctuations in the dollar value day by day will be playing a crucial part in the stock values of companies (basically I.T based companies) The impact of dollar values will be different for different companies.
- **Corporate results:** This will be regarding the profits or progress of the company over a span of time say 3 months.
- **Inflation:** The overall rise in price of all the products which affects purchasing power. The stock value depends on other factors as well, but we are taking into consideration only these particular factors.

SYSTEM REQUIREMENTS

Functional Requirements

User Interface: The user is required to select which company he is interested in amongst the various companies that have been provided.

Visual Studio 2010 to Stock Database connectivity: As communication with user is performed in C#.net and data required for processing is in a Database, a connectivity has to be implemented between the Database and Asp .Net application

Database to DB miner connectivity: Pattern Analysis on the data in the database has to be performed using various mining tools provided by Db miner. Hence a connectivity between the two is required.

Advantages:

- Helps the users in detecting the market trend patterns and other conditions.
- The project report contains a number of filter elements ranging as per the market trends that helps the users to analyze the registered stocks
- The project report contains a number of shares, their prices and Volume Breakouts
- It contains stocks that have an unanticipated rise in the business volume and a rapid rate escalation in terms of cost.

Disadvantages:

- Requires an active internet connection.
- May generate inaccurate results if data inputted incorrectly.

LITERATURE REVIEW

Over the past two decades many important changes have taken place in the environment of financial markets. The development of powerful communication and trading facilities has enlarged the scope of selection for investors.

Forecasting stock return is an important financial subject that has attracted researchers' attention for many years. It involves an assumption that fundamental information publicly available in the past has some predictive relationships to the future stock returns. In order to be able to extract such relationships from the available data, data mining techniques are new techniques that can be used to extract the knowledge from this data. For that reason, several researchers have focused on technical analysis and using advanced math and science. Extensive attention has been dedicated to the field of artificial intelligence and data mining techniques. Some models have been proposed and implemented using the above mentioned techniques, empirical study on building a stock buying/selling alert system using back propagation neural networks (BPNN), their NN was codenamed NN5. The system was trained and tested with past price data from Hong Kong and Shanghai Banking Corporation Holdings over the period from January 2004 to December 2005. The empirical results showed that the implemented system was able to predict short-term price movement directions with accuracy about 74%.

The research by Wu, M.C., Lin, S.Y., and Lin, C.H., used decision tree technique to build on the work of Lin. where Lin tried to modify the filter rule that is to buy when the stock price rises k% above its past local low and sell when it falls k% from its past local high. The proposed modification to the filter rule was by combining three decision variables associated with fundamental analysis. An empirical test, using the stocks of electronics companies in Taiwan, showed Lin's method

outperformed the filter rule. According to Wu, M.C., Lin, S.Y., and Lin, C.H., in Lin's work, the criteria for clustering trading points involved only the past information; the future information was not considered at all. The research by Wu, M.C., Lin, S.Y., and Lin, C.H., aimed to improve the filter rule and Lin's study by considering both the past and the future information in clustering the trading points. The researchers used the data of Taiwan stock market and that of NASDAQ to carry out empirical tests. Test results showed that the proposed method outperformed both Lin's method and the filter rule in the two stock markets.

Wang, J.L., Chan, S.H. (2006) "Stock market trading rule discovery using two-layer bias decision tree", applied the concept of serial topology and designed a new decision system, namely the two layer bias decision tree, for stock price prediction. The methodology developed by the authors differs from other studies in two respects-

First, to reduce the classification error, the decision model was modified into a bias decision model. Second, a two-layer bias decision tree is used to improve purchasing accuracy. The empirical results indicated that the presented decision model produced excellent purchasing accuracy, and it significantly outperformed than random purchase.

The authors Enke, D., Thawornwong, S. presented an approach that used data mining methods and neural networks for forecasting stock market returns. An attempt has been made in this study to investigate the predictive power of financial and economic variables by adopting the variable relevance analysis technique in machine learning for data mining. The authors examined the effectiveness of the neural network models used for level estimation and classification. The results showed that the trading strategies guided by the neural network classification models generate higher profits under the same risk exposure than those suggested by other strategies.

The research by Cao, Q., Leggio, K.B., and Schniederjans, M.J., was basically a comparison between the work of Fama and French's model and the artificial neural networks in order to try to

predict the stock prices in the Chinese market. The purpose of this study is to demonstrate the accuracy of ANN in predicting stock price movement for firms traded on the Shanghai Stock Exchange. In order to demonstrate the accuracy of ANN, the authors made a comparative analysis between Fama and French's model and the predictive power of the univariate and multivariate neural network models. The results from this study indicated that artificial neural networks offer an opportunity for investors to improve their predictive power in selecting stocks, and more importantly, a simple univariate model appears to be more successful at predicting returns than a multivariate model.

Al-Haddad et al., presented a study that aimed to provide evidence of whether or not the corporate governance & performance indicators of the Jordanian industrial companies listed at Amman Stock Exchange (ASE) are affected by variables that were proposed and to provide the important indicators of the relationship of corporate governance & firms' performance that can be used by the Jordanian industrial firms to solve the agency problem. The study random sample consists of (44) Jordanian industrial firms. The study finds a positive direct relationship between corporate governance and corporate performance.

Anass Nahil proposed a new method on stock market prediction which will help many investors to invest their money in the right time by which they will get more benefit in near future. Their proposed method was about a support vector machine (SVM). It is a popular tool in time series forecasting for the capital investment industry. This machine learning technique which is based on a discriminative classifier algorithm, forecasts more accurately the financial data. By examining the stock price of 5 Moroccan banks, the experiment shows that the SVM can perform better when we add the global evolution of the market to the independent variables. To express the global evolution of the market, three indices of the Casablanca Stock Exchange are used : MASI, MADEX and Banks Sector Index.

SYSTEM ANALYSIS

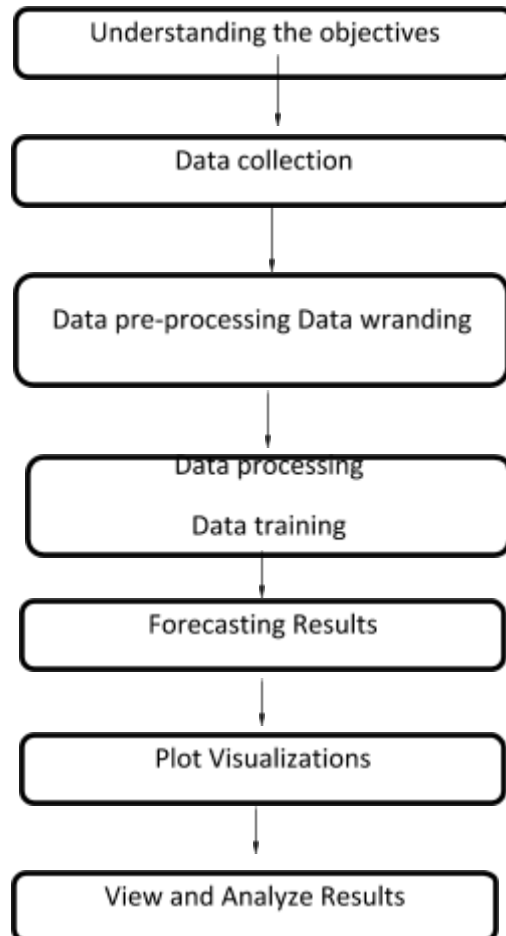
Problem Statement :- A stock exchange market depicts savings and investments that are advantageous to increase the effectiveness of the national economy. The future stock returns have some predictive relationships with the publicly available information of present and historical stock market indices. The investors decide the best time to sell/buy/hold a share in the stock market based on the former relationship. Every investor is interested in predicting the future stock prices, whether the investor may be a long-term investor or a day-trader. This possesses a major challenge to design and develop an effective and efficient predictive model that assists the investors to take appropriate decisions.

Existing Systems :- One of the significant financial subjects that has engrossed the researcher's attention for many years is forecasting stock returns. Investors in the stock market have been attempting to discover an answer to estimate the stock trends in order to decide the better timing to buy or sell or hold a share. Forecasting the stock trends have been done both on qualitative analysis and quantitative analysis. There are many statistical models available for forecasting stock trends and choosing an appropriate model for a particular forecasting application depends on the format of the data.

Proposed Study :- In this work we propose a prediction model for the time series stock market data. This model will automate the process of change of stock price indices based on technical analysis and provides assistance for financial specialists to choose the better timing for purchasing and selling stocks. Data mining techniques are used to develop the prediction model and R programming language is used for visualization of results.

Implementation And Architecture Diagrams

IMPLEMENTATION STEPS



Use Case Diagram

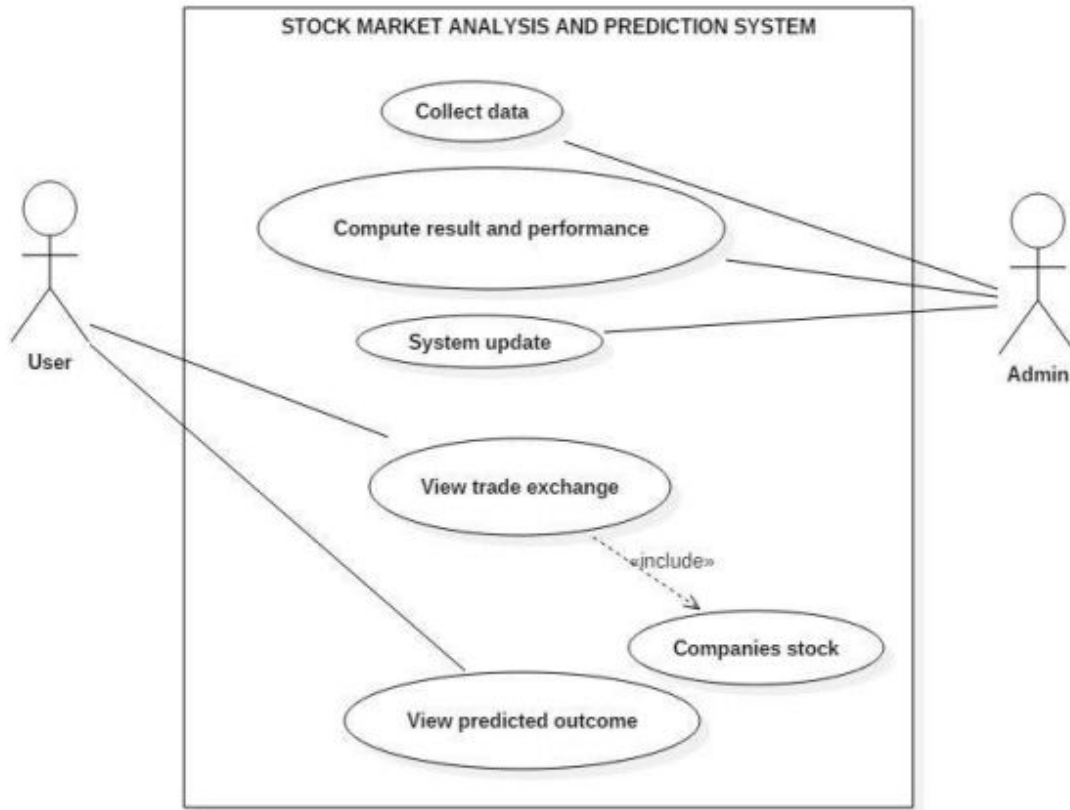


Figure 4.1: Use Case Diagram for the system

Use case index

Use case ID	Use case name	Primary actor	scope	complexity	priority
1	Collect data	admin	in	high	1
2	Compute result and prepare	admin	in	high	1
3	System update	admin	in	high	1
4	View trade exchange	user	in	medium	2
5	Company stock	user	in	medium	2
6	View predicted outcome	user	in	high	1

Use case description:

Use case ID:1

Use case name: Collect data

Description: Every required data will be available in Nepal stock exchange. Admin will be able to collect the data for the system.

Use case ID:2

Use case name: Compute result and performance

Description: Prediction result will be handled and generated by admin. The system will be built, through which the result of prediction and system performance will be analyzed.

Use case ID: 3

Use case name: System update

Description: With the change of market and technology regular update of system is required. Beside there the predicted result of stock exchange and their actual price will be updated by admin on a regular basis.

Use case ID: 4

Use case name: View traded exchange

Description: Company trading which is held at NEPSE can be viewed by users.

Use Case ID: 5

Use Case Name: Company Stock

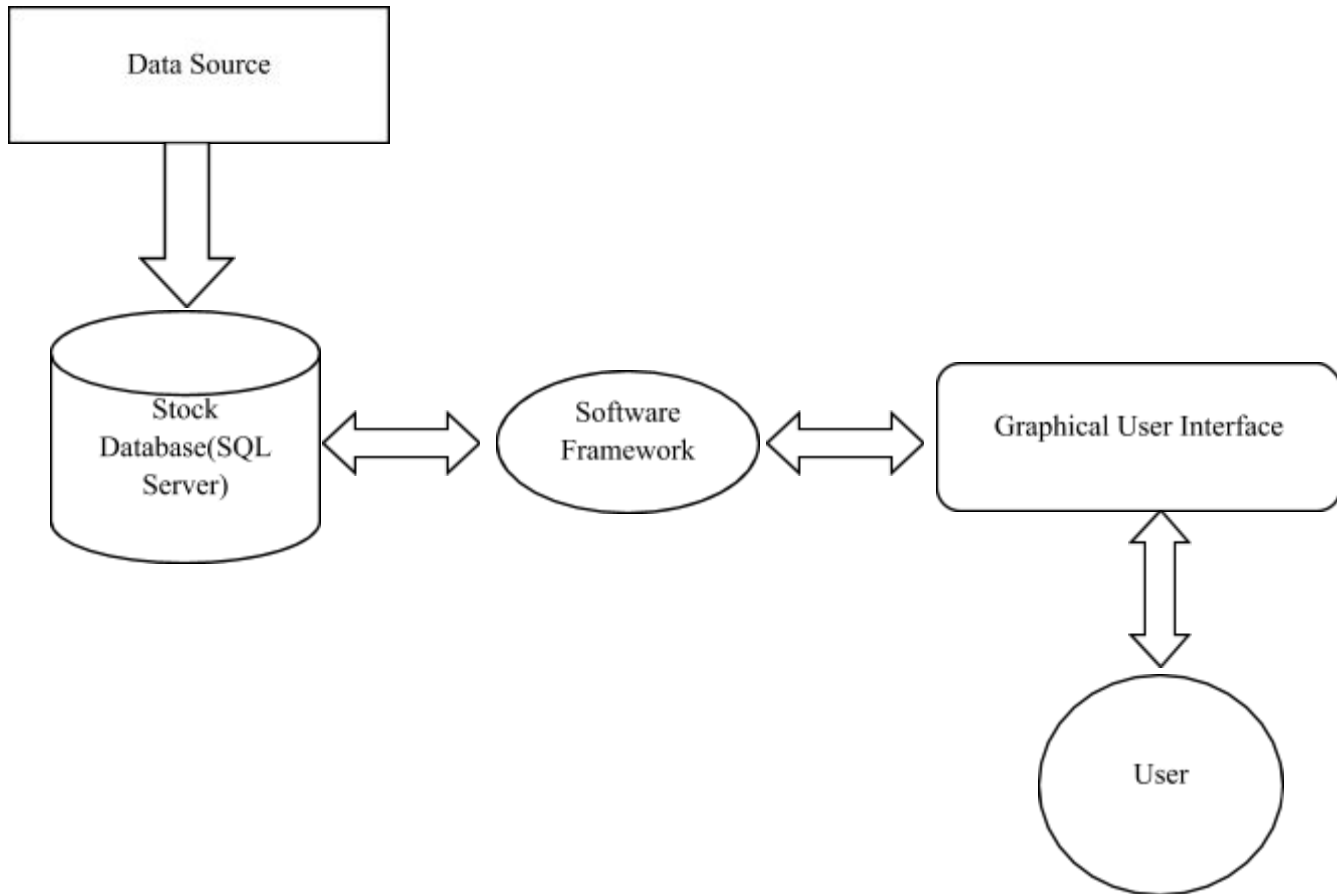
Description: It is an extended feature of view traded exchange. This includes the stock value of a particular company.

Use Case ID: 6

Use Case Name: View predicted outcome

Description: This use case is most important in the whole project. The key feature of this project is to predict the stock value of hydropower companies. Thus, this will be available in the user interface and the viewer can observe them.

SYSTEM FLOW DIAGRAM



Output Snapshots

SHAR**E**
bazaar

Portfolio Tracing Analysis Market Sign out

Reliance

Current market scenario

SYMBOL: RELIANCE
Current Price: Rs 733.95
Change: -8.05
Percentage: -1.02%
TradeTime Jun 7, 3:30PM GMT+5:30

Graph

Zoom 1m 3m 6m YTD 1y All From Jan 2, 2012 To Jun 3, 2013

Sensex falls for second day; weak rupee stirs worries
Friday June 7, 2013

RELIANCE JIO INFOCOMM AND RELIANCE COMMUNICATIONS SIGN COMPREHENSIVE AGREEMENT FOR SHARING OF TOWERS INFRASTRUCTURE RELIANCE JIO INFOCOMM TO UTILISE UP TO 45,000 SITES FROM RCOM'S EXISTING NATIONWIDE NETWORK FOR ACCELERATED ROLL-OUT OF ITS

Friday June 7, 2013

[at noodls] - RELIANCE JIO INFOCOMM AND RELIANCE COMMUNICATIONS SIGN COMPREHENSIVE AGREEMENT FOR SHARING OF TOWERS INFRASTRUCTURE RELIANCE JIO INFOCOMM TO UTILISE UP TO 45,000 SITES FROM RCOM'S EXISTING NATIONWIDE NETWORK ...

Ambani brothers in \$2.1 bln telecom tower sharing pact
Friday June 7, 2013

India's Ambani brothers in \$2.1 bln telecom tower sharing pact
Friday June 7, 2013

SYMBOL: ACC

Current Price: Rs.1,207.55

Change: -0.75

Percentage:-0.06%

TradeTime Jun 7, 3:30PM GMT+5:30

Buy

Acc

Get Current Value

Buy:

Number of stocks

Current Value

Total price

10

×

1207.55

=

12075.5

Buy!

Trade

Buy or sell stocks.

Your buying power is
186347.16

Sell

View the company whose stocks you want to sell:

Asianpaint

Get Current Value

Sell:

Number of stocks

12

×

Current Value

4578

=

Total price

54936

Sell!

Rankings

Where you stand amongst other users.

10 records per page

User ID	Name	Amount	Email ID
21	Rohit	500000.0	sharma@gmail.com
22	Shikar	500000.0	dhawan@yahoo.com
23	Rahul	500000.0	dravid@aol.com
24	Lalit	500000.0	mccii@gmail.com
25	Sidhartha	500000.0	sid@yahoo.com
26	David	500000.0	lloyd@microsoft.com
27	Nasser	500000.0	hussain@facebook.com

Stock prediction for today.

10 records per page

Name	Predicted value	Rise/Fall
JindalSteel	364.2023516010594	▲
JUBILANT	1212.4777281687127	▲
LT	1503.359328544947	▲
MM	45.71601465253247	▼
HANIALOON	150.1155256642329	▼
RELANCE	797.5904924908775	▼
RFNIKA	22.392004317069887	▲
TataSteel	303.9677302192034	▲
WIPRO	335.78521214944635	▲

CONCLUSION

In this paper we have studied different methodologies for Stock Market Prediction which will help the investor make the correct decision to buy or sell the stocks. Each method is having some limitations and some disadvantages. The limitations can be overcome by selecting suitable prediction techniques for specific domains. In future one can combine the two methods and get proper results and output. We made an attempt to evaluate different methods of forecasting the stock market trends by which any investor can find the best method by which they can predict the stock market much more accurately than previously done methods. Based on the technical analysis using historical time series stock market data data mining techniques. The experimental results obtained demonstrated the potential of the ARIMA model to predict the stock price indices on a short-term basis. This could guide the investors in the stock market to make profitable investment decisions whether to buy/sell/hold a share. With the results obtained, the ARIMA model can compete reasonably well with emerging forecasting techniques in short-term prediction. Here we examined and applied a multilayer perceptron model by using the Neural Networks Predict tool. The results from analysis shows that Neural Networks Predict offer the ability to predict the stock prices more accurately than the other existing tools and techniques. The accuracy of the predicted output values that lie within 20% of their corresponding target output value. By using this tool one can have the ability to forecast the stock price of NSE more accurately. This analysis can be used to reduce the error percentage in predicting the future stock prices. It increases the chances for the investors to predict the prices more accurately by reducing the error percentage and hence increase their profit in share markets. Utilizing neural network models together with other forecasting tools and techniques can be considered yet another valuable advancement in the age of technology.

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