Stock Market Prediction Using Artificial Neural Network

Nazish Nazir[1], Mudasirahma Dmutto[2]

[1]RN Engineering & Management College Rohtak, Haryana, India
[2]Department of CSE, Assistant Professor, SSM College of Engineering &Technology, Jammu and Kashmir, India

Abstract— *Nowadays during increasingly developed technology of the World Wide Web and Internet, the data is becoming extremely rich. With the application of data recognition process, the information extracted from data has become the most important part in some areas of society, management field, finance and markets, etc. It is necessary to develop the valid method to understand the knowledge of the data. Whether you are looking for good investments or are into stock trading, stock prediction or forecast plays the most crucial role in determining where to put in the money or which stock to be acquired or sold.*

Keywords— Artificial Neural Network, Stock Market, Forecast Algorithms.

I. INTRODUCTION

An investment theory suggests what parameters one should take into account before placing his (or her) capital on the market. Traditionally the investment community accepts two major theories: the Firm Foundation and the Castles in the Air. Reference to these theories allows us to understand how the market is shaped, or in other words how the investors think and react. It is this sequence of 'thought and reaction' by the investors that defines the capital allocation and thus the level of the market. There is no doubt that the majority of the people related to stock markets is trying to achieve profit. Profit comes by investing in stocks that have a good future (short or long term future). Thus what they are trying to accomplish one way or the other is to predict the future of the market. But what determines this future? The way that people invest their money is the answer; and people invest money based on the information they hold.

The factors that are under discussion on this schema are: the content of the 'Information' component and the way that the 'Investor' reacts when having this info. According to the Firm Foundation theory the market is defined from the reaction of the investors, which is triggered by information that is related with the 'real value' of firms.

Whether you are looking for good investments or are into stock trading, stock prediction or forecast plays the most crucial role in determining where to put in the money or which stock to be acquired or sold. Market trends often reflect the mood of the market and not essentially the status of a company or the true value of the stocks. It is often that stock prices soar based on external factors and it is not uncommon to find stock traders and investors to base their decisions on current affairs and market trends while trying to forecast the stock of any specific company.

The two stock forecasting methods any investor or stock trader must use are the *fundamental Research* and *Stock Forecast Algorithms.*

Fundamental Research is a mandatory method for any investor. The method involves meticulous studying of a company's financial health, the value of assets, debts, cash, revenues, expenses, profitability and plans of development. Fundamental Research is a well rounded stock prediction method for all the data that actually matters are taken into consideration while determining the true value of a stock

Stock Forecast Algorithms are aimed at making the best use of the right time, right price and the right quantity of stocks that must be traded. The Algorithm in place helps a trader to forecast the time at which the price would be the most favourable to either buy or sell a stock. The system predicts absolutely on numbers and has not even remotely affected by popular emotions. Finally, one should not get caught up in the daily trading, and miss out on global trends.

There are several methods that have been developed for the purpose of Stock Prediction Methods such as Fundamental Analysis, Technical Analysis, Data Mining Technology, Internet Based Data Sources of Stock Market Prediction and Application of Complexity Science for Stock Prediction etc. These methods are: Fundamental Analysis, Technical Analysis, Data Mine Technologies etc.

II. INDICATORS FOR STOCK PREDICTION

There are several indicators that are used for the purpose of stock prediction like:

Moving average: The moving average calculates the average of past n values till today. A moving average is commonly used with time series data to smooth short

term noisy data and highlight longer-term trends or cycles.

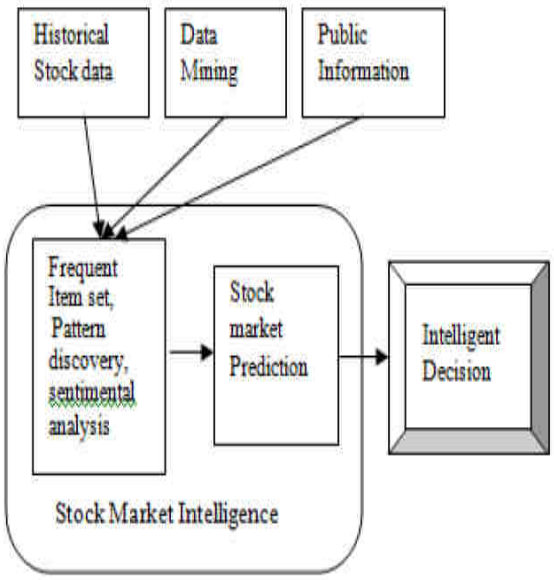
Simple moving average: A simple moving average (SMA) is the un-weighted mean of the previous data; the data can be in n number which is used in financial applications.

Exponential moving average: In EMA we will give more weight age to recent values than historical data. For example we will give more weight age to data of 2015 rather than data of 2014.

Rate of change: The ratio of current price to price n quotes earlier**N** is generally 5 to 10 days. For example we will check here recent data and ups and downs in recent days rather than older days…

Relative Strength Index: Measure the relative size of recent upward trends against the size of downward trends within specified time interval. It will check ups in market prices and downs in market prices.

Process of Stock Prediction:



III. RELATED WORK

Raluca-Mariana tefan [2012] states that there are different methods of data classification. In it we divide data into categories for use them at highest level. Which will provide effectiveness and efficient data?

Ian H. Witten[2013] determines that Text mining is a multidisciplinary field which is involved in information retrieval, text analysis, information extraction, clustering, categorization, database technology, machine learning and data mining.

MAHESH T R et al.[2010] explain thatText mining is a new research area in which we mine knowledge from unstructured text. It means we mine needed text / information using text mining.

Simon Hawkinset al. [2014] concluded that extract information from different written resources. Thus text mining method can be used on various fields like social media, news etc. Outlier detection is used to remove fluctuations from data**.**

Andrea Nemeti a et al. [2015] determine that Stock market prediction is a vast area of research where we can apply text mining techniques for retrieve the text and also use SVM for retrieve numerical data sets and text data. After prediction of stock prices we get collection of data sets which is unstructured.

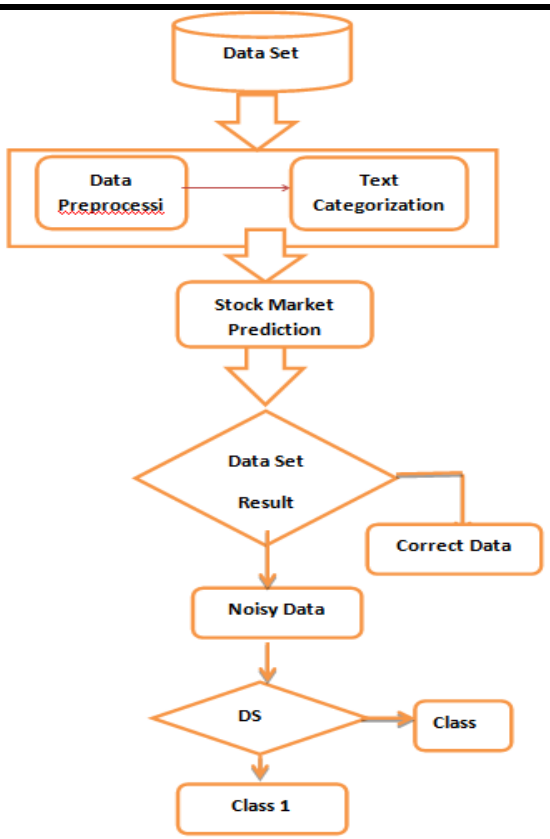
Alberto Arteta Albert1 et al. [2015] gave a conclusion thatusing prediction we can predict future stock prices that they will increase or decrease. If successful prediction of stock then it will be beneficial for future and with stock market prediction profit will also increase. There are moving averages algorithms like SMA,EMA, ROI will be use for stock market prediction.

NilamUpasaniaet al. [2015] explains that we have to make unstructured data into structured data and remove noisy data from data sets. Noisy data can be missing value, duplicated data, etc. Removing of noisy data is also called outlier detection which use different mining methods for detection of noise and then remove it. Forecasting stock market movement direction with support vector machine

IV. OBJECTIVES AND METHODOLOGY OF THE WORK

The objective of the work that is performed involves collection and pre processing the stock market data and applying filters that are moving average, weighted, triangular, exponential on the pre-processed stock market data and further applying neural network to predict performance of stock and to compare the performance of proposed and existing system.

Research methodology:



Facilities used

My proposed work plan for research is as following:-

Data Collection: - Firstly data will collect from companies, news, and social media.

Training data: - All training data of stock market will save in excel sheet using MS_EXCEL.

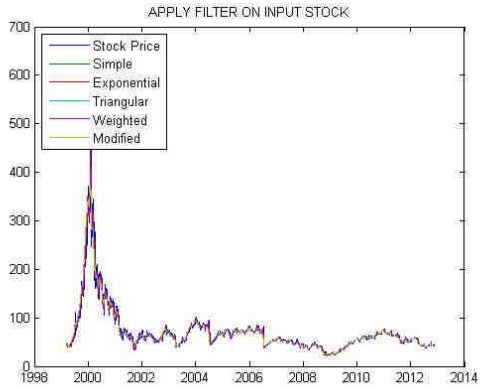
Test data: Test data will from companies and store test data of stock market in excel sheet.

Simulator:- MATLAB r2010a will be useas a simulator for stock market prediction.

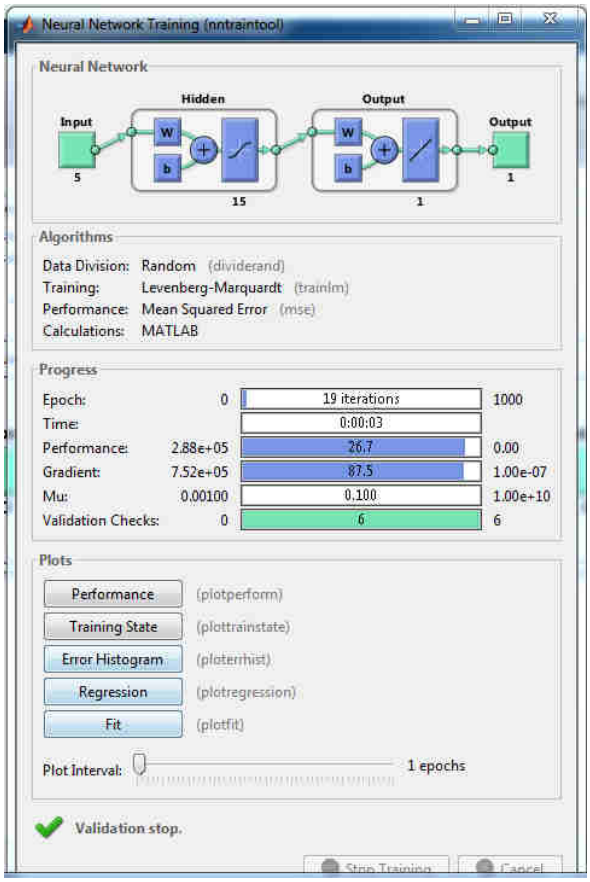
After prediction of stock price our objective is to remove fluctuations from data using moving average algorithms in MATLAB

Results:

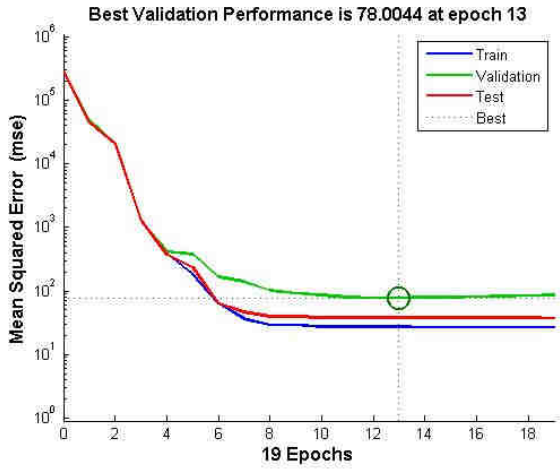
The figure below shows Results if filters applied on the stock data set



The figure below shows the functionality of neural network on the stock data set



The figure below shows the validation performance of dataset using neural network



V. CONCLUSION

The extracted data can be used for applications ranging from market analysis. It decomposes the original stock indexinto the trend terms, the market fluctuation terms, the noise terms and time series with different economicfeatures. Then SVM will use all moving average algorithm to predict stock prices. After prediction of stock prices using all algorithms the result of all algorithm will combine. Then moving average algorithms result will check the duplicate and missing values in data and

remove noisy data. In future we can integrate fuzzy logic in it to smooth out the data and remove the fluctuations.
Thus after prediction we remove the noisy data and also fill the missing values. So the result of prediction will be clean data without any noisy and missing values.

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