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Research Article

Stock Price Prediction Using Datamining With Novel Computing Approach

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Abstract: Foreseeing financial exchange is consistently a difficult work. As an ever increasing number of individuals are associated with exchanging , its consistently an idealistic conduct to predict about the future price. By means of predicting the future stock price, experts and analysts in the stock field can buy or sell accordingly. In order to predict the stock value, financial specialists utilized crucial examination, specialized investigation and innovative investigation. Different strategies, for example, utilizing stock pointers additionally end up being a value a few. Yet, even though there are many techniques available the result of stock prediction is always a random one because of it adhoc nature. The experts in this field can also track the various information channel in order to increase their predicting performance. The previous work consolidates more on the result rather than the methods used. In this paper, we proposed a novel technique which uses the technological methods with that of the technical views and the changing news information's about the stock. We implemented fuzzy rational algorithm with that of the hybrid neural network in conjunction with the k nearest matching points. The optimization techniques used here are the combination of the soft computing methods.

Keywords: Stock Price, Data mining, Soft computing, strategies, fuzzy , neural network

1. Introduction

Financial sector is always unpredictable. This is the sector in which the individuals can do buy or sell to make their monetary profits. The stock exchange unanimously gave permission for the individuals to buy or sell the stock according to their own method of evaluation and assessment. A good trader is one who invests very less amount and acquires a remarkable profit within a time framework. Similarly there are many risk in performing trading continuously because of the volatile market trends. A trader can never expect his stock value to rise frequently. There are regular ups and down in the stock market index with respect to the global changes. There are lot of factors to influence the stock cost. The trader should select the appropriate parameter and should watch it frequently and predicting it by means of unique algorithm. Historical methods are based on the time series l investigation and it seems to be temporary method in predicting the stock price. Technical methods are more depend on novel graphs and equation to fit accordingly to the circumstances. It suffered from the changing global scenarios and hence to keep track of the global environment is very much essential. Also the diagrams and graphs should be implemented clearly. Technological methods are more based on the computer based algorithms with optimisation and high accurate predictable use cases. since news about the stock company play a vital role it is also necessary to keep track of the respective stock company with their growth percentage. communication media plays a important role in scattering the stock news world wide. There are many models available in the stock price prediction. Each model has its own advantage and disadvantage and it is always based on the factors that it will scrutinize and the methodology of its executions. It is found from the previous study that the future price not only evaluated from the ongoing parameters but also from the impact of the governance and the price to earnings ratio. As the market changes randomly from bullish to bearish the need of the market watch with predictive approach is essential. The production and the earnings of the company is essential for the prediction of the future stock price. Hence the developments of the company should be considered and it will be evaluated periodically.

In the past, stock price is well estimated by means of Efficient market hypothesis(EMH).News and sentiment analysis forms a vital role in predicting the stock price. so the combination of historical methods with that of the technical and technological methods prove to be a worth one and the changes in the global scenario should be noted with a value of high priority. The combination of the three techniques interlined to be a single one seems to a accurate and appropriate method. Data mining based Pattern evaluation and comparison seems to be highly innovative method when compared to other strategies.

2. Literature survey

S.Sarode[1] in his research proves that artificial neural network and news analysis together form a decision support system which provides a very good accuracy in predicting the stock price.Shastri and malay[2] incorporated HIVE for predicting both the long term and short term stock prediction. He obtained an accuracy of 91 percent in the method of prediction.In the earlier scenarios ,the authors applied d ANN and SVM for forecast of stock price. The authors concluded that the ANN prototypical was more accurate when compared with SVM prototypical [3].To improve the accuracy of pertinent technical-indicators, a novele study uses hybrid ANN with Genetic Algorithm into the stock market [4].In a major development Xiao Ding[5] introduced a r event-based stock price prediction. In that the author mapped events from news based on Open IE and correlate it with the stock price. The author also introduced both linear and model to correlate phenomenol relationships between events and the stock production.

Author Xi Zhang[6] madea deep learning approach to price prediction using historical data and price movement For estimation, it employs a novel neura network as well as a long memory based network. The system uses knowledge from time series, metrics, and market indexes to feed a three-dimensional CNN for data entry .Acheme David Ijegwa , Vincent Olufunke Rebecca et. al [7] applied strategical relative method , strength measurement, random oscillator and the hybrid balance trade volume for the indicators group to form a fabulous fuzzy innovative and implemented rules to accurably predict the future price.
The author defined a unique membership function that integrates the indicators with the predictive rule.An approach by Zhihao PENG[8]using Cloudera-Hadoop is introduced to analyses the scalability of data to predict the daily prodit and loss of a specific stock in real time based on yahoo finance. M. Tawarish and Dr.K. Satyanarayana[9] in their research produced a good accurate result in predicting the stock price using the genetic algorithm with neural network technique.The combination of genetic algorithm and the neural network proves a effective model to predict the ever changing stock price in Tehran stock market.

3. Proposed method

Data mining methodology is designed to ensure that the data mining effort leads to a stable model that successfully addresses the problem it is designed to solv
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The data mining approach is intended to produce a reliable and efficient data model that can be used to feed the predictive model in the next phase. Various data mining techniques have been used to the process of collected data, organize and analyse the data, interpreting results and upgrading the accuracy of the predictive components. One of the favourites of the data mining techniques is to use the k-nearest neighbourhood algorithm in association withe the decision tree modelling.

The model consists of the following

a)To understand the usage of mining and other techniques in finding the stock prices.

b) organising the collected data and classifying it accordingly.

c) selecting the appropriate technique to build the predictive model.

d)Evaluating the data aganist the known results.

e) implementing the model in the real time stock trading, and performing appropriate buy or sell action.

f) performance of the model can be enhanced by applying the appropriate computational techniques.

The objective of the model is to help the traders to do buy or sell action based on the predictive results to yield more profit. The ultimate decision is taken by the intuitive fuzzy rule .

4. Data Collection

Huge volume of data is collected from the banking sector and especially for the banks such as city union bank, Indian bank and the icici bank.

The various parameters selected are the previous closing price, open price, high value, low value, volume of trading shares, moving average value, earnings per share, price to earnings ratio(P/E). In that the easiest values such as previous day close, current day open, current day min, current day max, current day closing price can be considered. In the given table all the values are compared with the latest previous values.

Attribute	Possible values
Previous close	High, Low , NoChange
Day open	High, Low , NoChange
Day high	High, Low , NoChange
Day low	High, Low , NoChange
Day close	High, Low , NoChange
8 weeks max	High, Low , NoChange
Current trend	High, Low , NoChange

Table 1.0 shows the various attribute values

Data preparation

The datas collected are numeric and continuous in nature and hence it should be converted in to discrete values.

The values are stores as high, low and nochange depends on the comparison with the current and previous values. The following is the sample of the stock data .Table 1 show the numeric values whereas table2 shows the discrete values.

Previous value	**Open value**	**Max value**	**Min value**	**Current close value**
187.5	189	194	185	186
186	192	196	191	193
193	192	199	194	200
200	204	205	201	206

Table 1.1 shows the sample numeric values for a script

Previous value	**Open value**	**Max value**	**Min value**	**Current close value**
High	high	High	low	Low
Low	high	high	low	high
High	low	high	high	high
High	high	high	high	high

Table 1.2 shows the sample discrete values for a script

According to table data, suppose if a script was bought lower than the previous value and if the current close is high then selling the script yields profit, similarly if the script was bought higher than the previous value and if the current close is less then holding the script is a best option.Based on the values of the parameters a decision tree was developed.A decision tree was developed based on the root attribute named open .

The remaining attributes are used to develop the tree. Once the tree was developed, rules for classifying the tree was intiated. The maximum number of attributes used is 5. C4.5 algorithm was used to prune the decision tree. The classification rules depends on the company and hence it various from one company to other.

The following table gives the sample

Script name	No of rules without pruning	No of rules with pruning
CUB	12	5
IND	9	4
SBI	14	8

Table 1.3 shows the applicable methods for various stocks

The following figure gives the sample decision tree for city union bank(CUB)

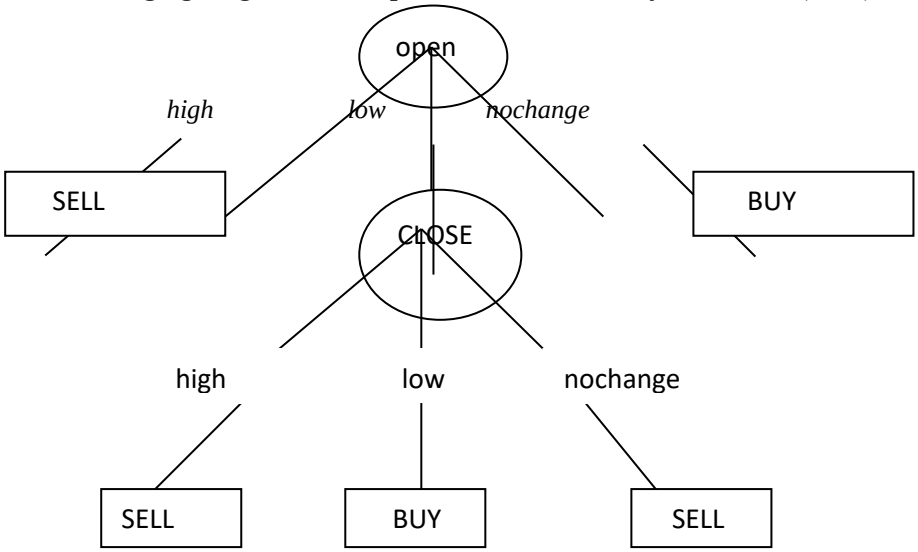

Fig 1.0 Activity chart for stock price prediction

The rules generated from the tree nodes are used as the hidden layer values for a neural network system.

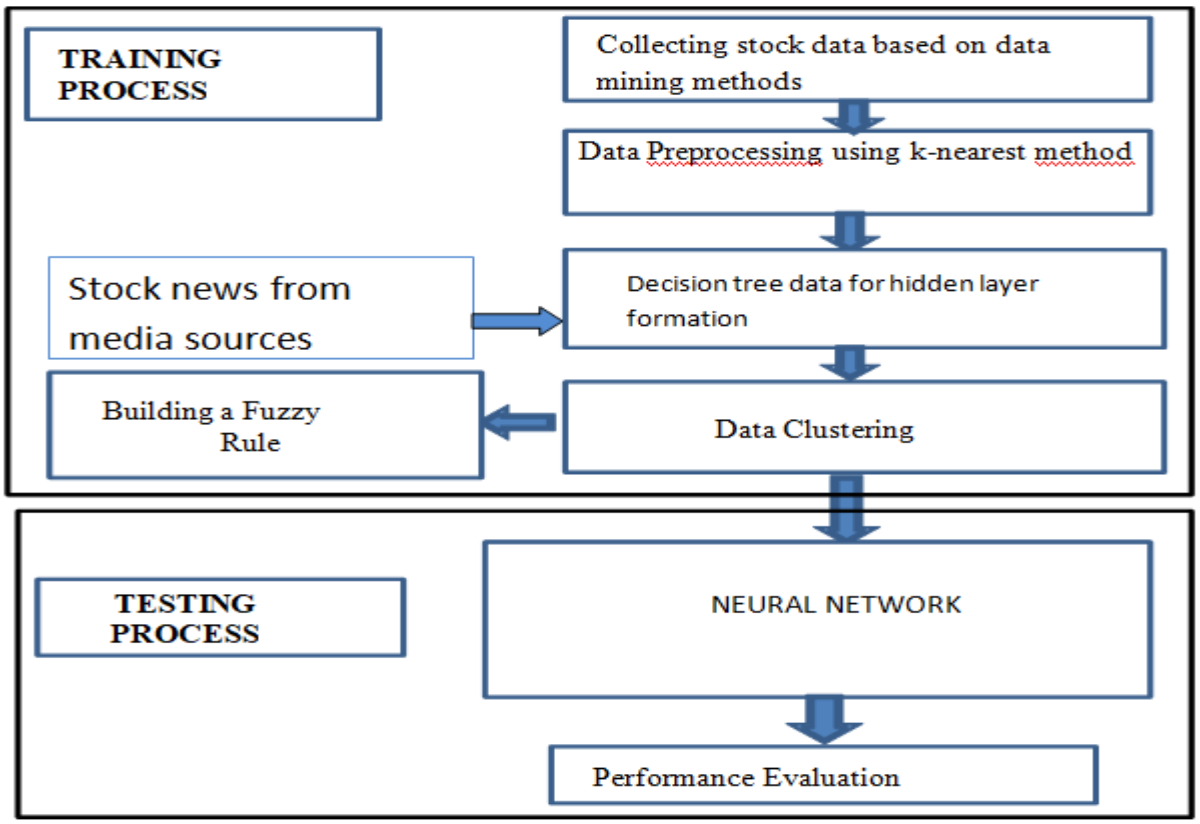

Fig 1.1 Block diagram model for stock price prediction

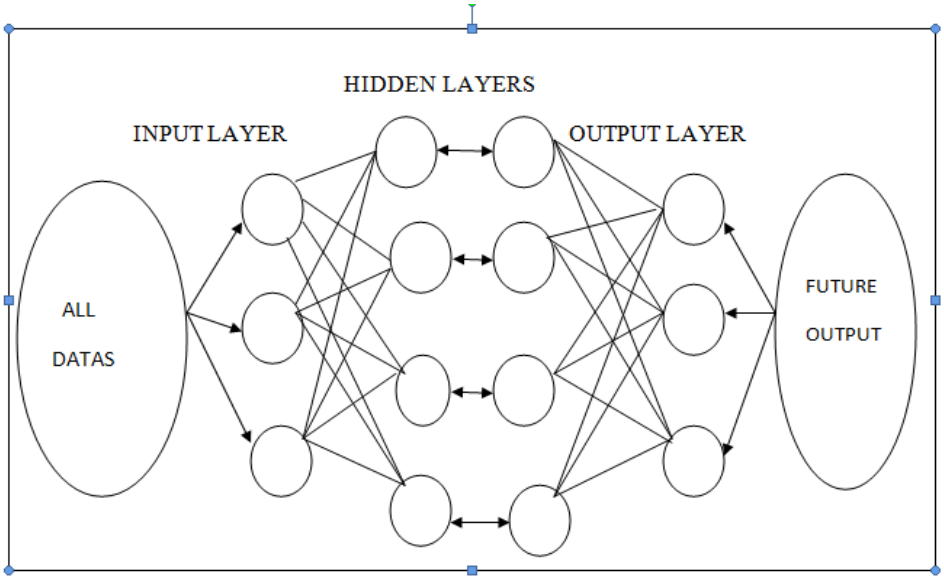

Fig 1.2 Neural network model for stock price prediction

In the above diagram, the hidden layers formed by the rules developed by the decision tree, further the news from the media sources are combined so that a well defined fuzzy rule was developed and it gives the result of the stock price as increase,slight increase, more increase.similarly decrease, slight decrease, more decrease. It also gives the no change value.

5. Result and discussion

The suggested architecture uses KNN and decision tree algorithms to forecast potential stock modifiers using Fuzzy neural networks.The above methodology was executed for banking sector scripts such as ICICI, CUB and the results are tabulated.

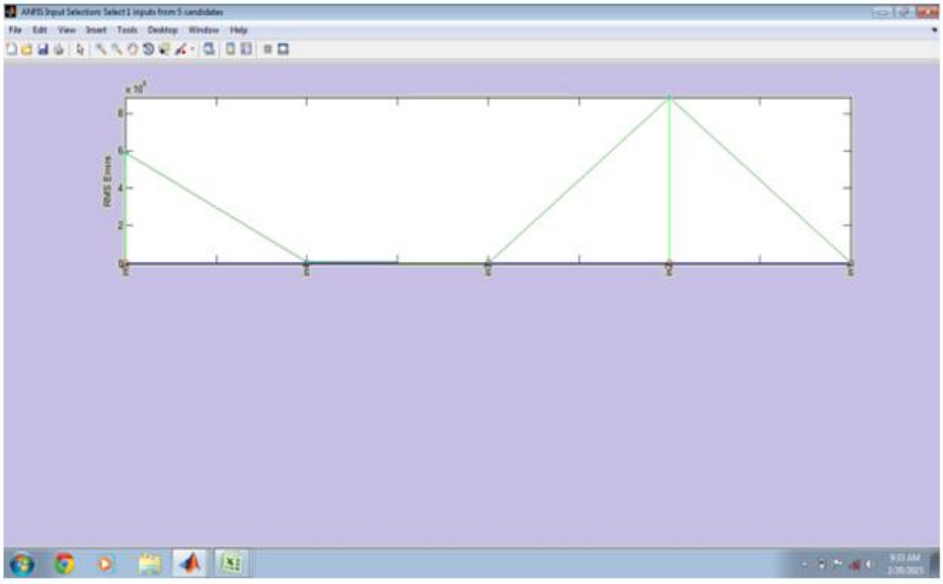

Fig 1.3 shows the training approach phase

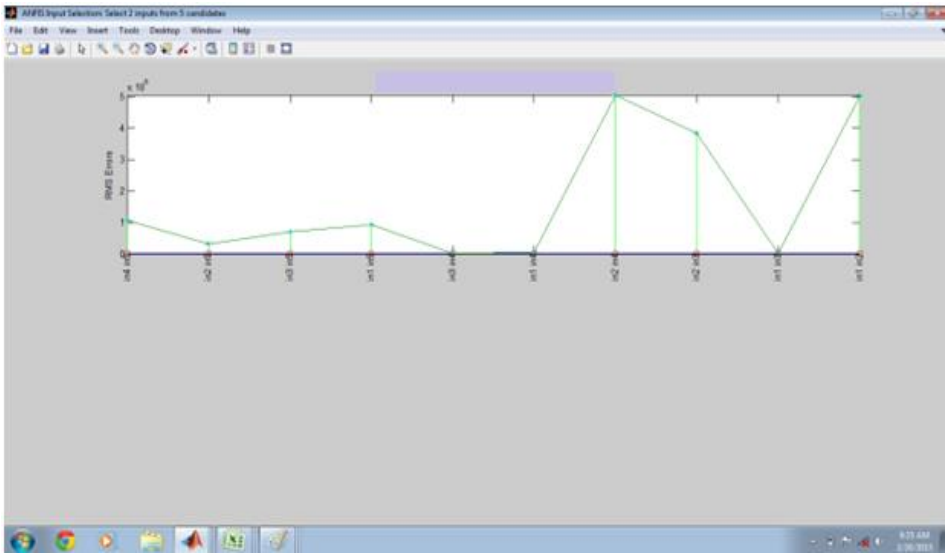

Fig 1.4 shows the testing phase

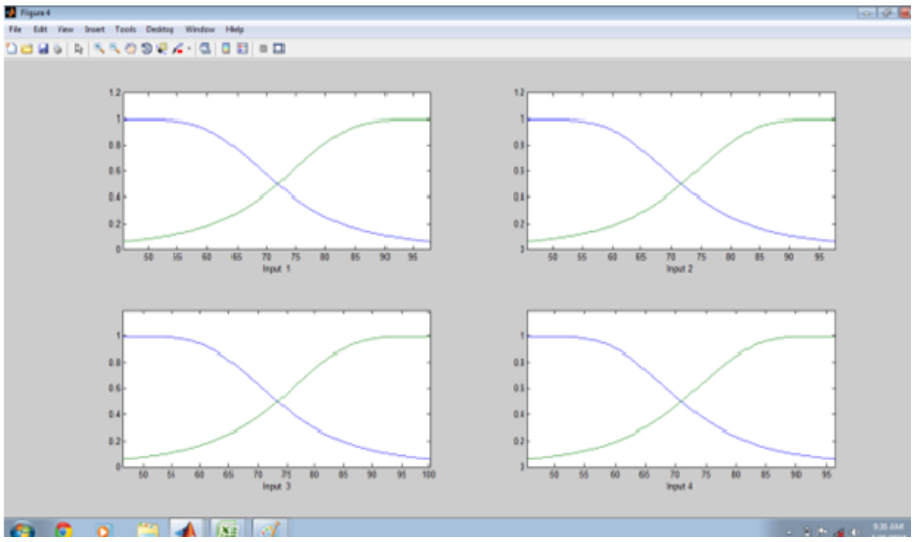

Fig 1.4. shows the fuzzy approach

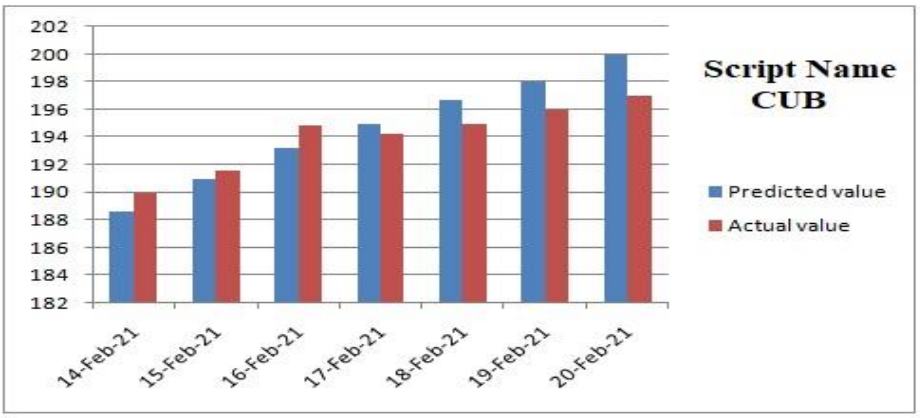

Fig 1.5 shows the comparison of predicted and actual price for CUB

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