LITERATURE REVIEW
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Detecting trends of stock data is a decision support process. Although the Random Walk Theory claims that price changes are serially independent, traders and certain academicians have observed that there is no efficient market analysis method. The movements of market price are random and not predictable.

The artificial neural networks (ANN) have proved to be efficient in the prediction of future earnings as proved many researchers [1,2,4,26]. The variable to be predicted can be dichotomous realization of the change in earnings per share, adjusted for the drift in the prior earnings changes and the predictor variables used can be identified, in this study. The Multi-Layer Perceptron (MLP)[3,4,5] feed-forward neural network architecture was used, due to its suitability as a classifier and its implementation simplicity on a sequential computer. In contrast with prior applications of ANNs in accounting, and business in general, this study also focused in the selection of an efficient and robust training algorithm. The complexity and the size of the problem, in combination with the scattered nature of pooled accounting data, demanded that a training algorithm should guarantee convergence without oscillations and be relatively fast in order to be used in such a problem [1].

In the development period of study of Neural network, a part from the different types of neural networks studied, Saad, Prokhorov, Wunsch [1988] three different types of Neural networks for low false alarm stock trend predictions. They were Time Delay, Recurrent, Probabilistic Neural networks (TDNN, RNN, PNN). Each of the method has proved better in different respect[24].

Martin Wallance[2008] presented in his study how Neural networks provide forecasts of market prices and actions. These can then form the basis for trading the market in an automated system. A pre-trained network is the natural choice for real-time trading. The implementation of forecasts requires a strategy for dealing with adverse market moves; the question of when to enter or exit the market is also largely determined by forecasts, hence neural networks always have a role in finance[2,3].

Multilayer perceptron (MLP) [3,4,5] neural network model is used to determine & explore the relationship between some variables as independent factors[1,4] & the return of the indices as a dependent element. The volatility of Sensex and Nifty under ANNs is compared with the volatility obtained under GARCH, EGARCH, GJR GARCH & IGARCH models[3]. Here the volatility of Sensex and Nifty under ANN model is compared with the volatility obtained under GARCH, EGARCH, GJR GARCH AND IGARCH models. It is observed that though the volatilities obtained ANN model is less than that of the GARCH, EGARCH, GJR GARCH and IGARCH models.
Two kinds of neural networks, a feed forward multi layer Perceptron (MLP)[1,3] and an Elman recurrent network[5], are used to predict a company's stock value based on its stock share value history. The experimental results show that the application of MLP neural network is more promising in predicting stock value changes rather than Elman recurrent network and linear regression method. However, based on the standard measures that will be presented in the paper we find that the Elman recurrent network and linear regression can predict the direction of the changes of the stock value better than the MLP.

Based on the Neural Network toolbox of MATLAB software, Ma, Wang and Dong [2010] constructed the Single-input Prediction Model (SIPM) and the Multi-input Prediction Model (MIPM) respectively to predict the stock price[6]. The aim of this paper is to compare the accuracy of prediction respectively using the Single-input Prediction Model (SIPM) and Multi-input Prediction Model (MIPM). BP neural network can effectively predict the short-tenn trend of the stock market. With the introduction of self adaptive learning rate method and additional momentum method, the improved BP model has obvious advantages compared to the basic model in the aspects of convergence speed and prediction performance.

Recently, a novel model named procedural neural networks, (PNNs)[7,8,9] was proposed to deal with spatiotemporal data modeling problems, especially for time series with huge data of multi dimension. Different from the traditional multilayer back propagation neural network (BNNs)[5,6], the data in PNN are accumulated along the time axis before or after combining the contribution of the space components[7]. While collecting these data, different components do not have to be sampled simultaneously, but in the same intervals.

Computational complexity cannot be ignored in because of its large size of data when we process the time series issues. The training process of PNN is similar to that of BNN, but the input dimensions of PNN are much lower than those of BNN [7,8]. Moreover, PNN decreases the time for aggregating information from different time segments.

In this way, these time series problems subjected to synchronous sampling in all dimensions can be simulated by PNN. Moreover, the dimensional scale of input for PNN does not increase, while in the recurrent BNN a fix slide time window, which makes the dimensional scale large, is usually chosen to deal with time series data [5]. As a result, the complexity of PNNs is intuitively decreased both in the scale of model and in the time cost of training. Intrinsically, PNN differs from BNN in the way of mathematic mapping[5,6,7,8].

Among different methods, MLFF-Multilayer Feed Forward neural network with back-propagation learning algorithm and GMDH neural network with Genetic algorithm (GA)[10,12,15] learning are used to predict Tehran Price Index (TEPIX) based on the Tehran Stock Exchange
database[11]. This paper uses moving average crossover inputs based on technical analysis rules and the results show the exponential moving average has better result than simple moving average and also the GMDH has better result in the forecasting, power tracking and profitability relative to MLFF neural network.

After completing several simulations for predicting several stocks based on the past historical data using fuzzy neural network[12] with the Back-Propagation learning algorithm, it is conclusive that the average error for simulations using lots of data is smaller than that using less amount of data. That is, the more data for training the neural network, the better prediction it gives. If the training error is low, predicted stock values are close to the real stock values. After completing several simulations for predicting several stocks based on the past historical data using fuzzy neural network with the Back-Propagation learning algorithm, it is conclusive that the average error for simulations using lots of data is smaller than that using less amount of data. That is, the more data for training the neural network, the better prediction it gives. If the training error is low, predicted stock values are close to the real stock values[12].

The use of Support Vector Machines (SVMs) [13, 16] is studied in financial forecasting by comparing it with a multi-layer perceptron trained by the Back Propagation (BP) algorithm. SVMs forecast better than BP based on the criteria of Normalised Mean Square Error (NMSE), Mean Absolute Error (MAE), Directional Symmetry (DS), Correct Up (CP) trend and Correct Down (CD) trend. S&P 500 daily price index is used as the data set. Since there is no structured way to choose the free parameters of SVMs, the generalisation error with respect to the free parameters of SVMs is investigated in this experiment. As illustrated in the experiment, they have little impact on the solution. Analysis of the experimental results demonstrates that it is advantageous to apply SVMs to forecast the financial time series.

The similar work in cash forecasting of a bank branch was implemented in MATLAB by Premchand and Ekta [2006]. Neural networks are used to analyze the system. The system performs better than other systems based on time series. Its performance was also better than one of the available Excel Add-in for forecasting “Alyuda Forecaster XL 2.3”. This system can be scaled for all branches of a bank in an area by incorporating historical data from these branches. Such a system will help the bank for proper and efficient cash management.

Hidden Markov models (HMM) approach is also for forecasting stock price for interrelated markets [19,20,21]. HMM is applied to forecast some of the airlines stock [19]. HMMs have been extensively used for pattern recognition and classification problems because of its proven suitability for modeling dynamic systems. However, using HMM for predicting future events is not straightforward. Here only one HMM that is trained on the past dataset of the chosen airlines. The
trained HMM is used to search for the variable of interest behavioural data pattern from the past dataset. By interpolating the neighbouring values of these datasets forecasts are prepared. The results obtained using HMM are encouraging [21,22].

Survey of existing literature reveals that there are different types of ANN models used for predicting the stock market. Many researchers noted that slight parameter changed causes major variations in the behaviour of the network. So there is no theory which could be guideline for finding best network topology. Recently, Pratap and Ambika [2011] proposed trigonometric functional link artificial neural network (FLANN) model employs standard least mean square (LMS) algorithm with search-then-converge scheduling. The network could effectively calculate learning rate parameter that changes with time and may require less experiments to train the model. Here FLANN is used for long term as well as short term stock market prediction [25].

This covers up to a large extent, the study done on prediction of stock market using artificial neural network. Still there is further scope for the work which is presently being done in this field.