Abstract

The stock market is a complex, non-stationary and chaotic dynamic system. It is a popular investment platform that appeals to a wide variety of masses. While the stock market remains a significant way to earn profit, it is often considered one of the most risky forms of investment due to the underlying nature of the financial domain and a host of various factors that often elude the attention of naïve investors. The stock market is a hostile environment that demands undivided attention to the events that transpire throughout the day along with a certain consideration to the effects of the past and the implications on the future. Hence, many investors, face (or stand a risk) of failure on a daily basis. Therefore, the need of the hour is a Decision Support System (DSS) that takes into account market trends, financial analysis and strategies to identify the best time to purchase stocks and the actual stocks to purchase. This paper highlights the above concerns regarding the volatile stock market and discusses the implementation of a DSS taking into account the modern and sophisticated techniques of Data Analytics like Clustering and forecasting models like Holt-Winters. Also, the DSS uses popular supervised learning algorithm used extensively in machine learning and Artificial Intelligence, the Perceptron. While the data analytics form the initial stage of the DSS, the decision-making
will be aided by the Perceptron, which would consider the results of the aforementioned analysis and various local stock market parameters and a host of statistical concepts. This will culminate in a comprehensive DSS that will assist the potential investors in the most important aspect of success in the stock market i.e. decision-making.

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**Index Terms**

Computer Science  
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**Keywords**

Decision Support System (DSS)  
Data Analytics  
Clustering  
Holt-Winters  
Supervised Learning  
Machine Learning  
Artificial Intelligence  
Perceptron.