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Institutional Market Analysis in Stock Market

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Abstract: ***A stock market, equity market, or share market is the aggregation of buyers and sellers of stocks (also called shares), which represent ownership claims on businesses. In stock market analysis we are trying to predict the price of given share or stock The result was achieved at the end of this project was quite impressive as model was able to predict the trend successfully, it was not 100% accurate but considering that model it predicted only on the basis of past data is quite impressive. All these things we are able to do with help of machine learning.***
Keywords: Stock market, financial instrument, trend, machine learning

I. INTRODUCTION

We worked in area of artificial intelligence. AI is the method in which we use certain algorithms and data to provide machines with an ability to think like a human. With the help of artificial intelligence, machines get the power to analyze a problem and make decisions based on the analysis to solve the problem. The sub-field of AI in which we worked is machine learning. Machine learning enables a machine to execute tasks without being explicitly programmed by a person's . As machine learning has its own set of sub-fields, the sub-field of machine learning during which we worked is deep learning. Deep learning is that field of machine learning which enables a machine to mimic the human brain with reference to data processing and making patterns that helps in the process of decision making. Today, the whole world is using deep learning extensively in order to solve problems in a variety of domain. Deep learning is employed to determine which ads must be shown to the user based on their search history in real time. it's used to predict the stock prices based on a variety of factors which is also our area of interest. it's also used to build systems for self-driving cars. it's also used by credit card companies to detect fraud. In fact, deep learning is employed in almost every field that needs to be automated. watching the use cases of deep learning at present day, it appears that deep learning goes to be the backbone of many future technologies. The probable stock exchange prediction target can be the future stock price or the volatility of the prices or market trend. within the prediction there are two types like dummy and a real time prediction which is used in stock market prediction system. In Dummy prediction they need define some set of rules and predict the future price of shares by calculating the average price. within the real time prediction compulsory used internet and saw current price of shares of the company.

II. LITERATURE REVIEW

There are many recent developments in the area of deep learning. we'll be discussing a few them.

1) LSTM (Long Short Term Memory) and GRU (Gated Recurrent Units) are two enhanced RNN models. Despite RNN's being powerful, they're not good at handling long range sequence of data due to the vanishing gradient problem. so as to solve these issues, LSTM and GRU use gate units so as to decide which information is to be kept and which is to be removed from the previous state.
2) LSTM and CNN models are getting used for prediction of DNA protein binding sites in DNA sequence.
3) Recent deep learning based approaches are getting used to remove rain streaks from an input image.

Deep learning may be a sub-field of machine learning that uses algorithms to mimic the working of the human brain in order to process data and creating patterns in the data that further helps in the process of decision making. The key think about case of deep learning is its ability to learn without any human supervision and it can draw from data that is un-labelled. so as to learn, deep learning uses a hierarchical level of ANN (Artificial Neural Networks). In deep learning, neural codes are linked together, almost like the human brain. If the dimensionality of the input file is reduced and used as input in a neural network, information loss may occur. a crucial advantage of deep learning is that it can learn features from the input data itself. However, for RNN neural networks, because the number of network layers continues to increase, the sooner the input data, its influence on the output results are going to be more and more weakened due to the increase in sequence length, which results in the RNN neural network Long-term-memory of information is weak. Hochreiter and Schmidhuber in their 1997 paper "Long Short- Term Memory", they proposed the LSTM neural network for the RNN neural network's inability to unravel the long-order dependence of the time series.

They introduced the "gate" within the LSTM neural network. concept. Yoojeong Song an dJongwoo Lee from Sookmyung Women's University observed that from an outsized set of Input Features only a few actually affect the stock price, they hence studied these input features and wished to work out the ones which can be employed for the best prediction of stock value. The paper proposes three different Artificial Neural Network models which include the utilization of multiple-input features, binary features and technical features to seek out the best approach to achieve the aim. The accuracy of the models was computed and revealed that the model with binary features showed the simplest accuracy and concluded that binary features are lightweight and are most suitable for stock prediction. However, the study has some limitations therein converting the features to binary eliminates some of the relevant information for prediction.

III. METHODOLOGY

In this chapter we are going to discuss how we implemented all the methods for achieving the desired result, the methods which we're visiting discuss are data collection, data pre-processing, model making, tuning the model, predicting the results and forecasting for a specific range of time. For this project we've used the past data of the stock as our factor, we took last 5 years of stock's performance data. the info was collected from yahoo finance's website (https://in.finance.yahoo.com/), it's a trusted site and the data is easily available and can be directly downloaded in .csv format. After downloading the info we cleaned the data i.e., the info contained some null values and if raw data was fed in the model then it could either throw an error or the model wouldn't had trained efficiently. So, the rows containing null values were deleted and data was cleaned. After cleaning the info , the thing we did was pre-processed the info i.e., we took only the closing prices column then split it into two subgroups training data and testing data. Training data contained the info which we were going to use for training our model and the testing data contained the data upon which we were going to test our model. We took 67% of the info as our training data and rest for testing. This data was still not able to be served in the model as our model expected time series data, so we converted the linear data into statistic data. in any case the data pre-processing now we started to make our model, we made the model using tensor-flow library present in python and used LSTM layers for creating the model. After creating the model we trained it on our training model for a specific number of epochs and after that checked the model's accuracy for ensuring it efficiently trained. If the model's performance wasn't up to the mark then we had done some hyperparameter tuning where we tuned some parameters such as number of epochs, number of LSTM layers, number of nodes present within the layers etc. in any case this our model was ready to be predicted, so we fed it with our testing data and predicted whether it yielded satisfying results or not. After the prediction work we then moved on to the forecasting part where the model future forecast performance for the chosen stock.

A. Model Architecture

```
Model: "sequential_1"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
lstm (LSTM)                  (None, 30, 20)            1760
_________________________________________________________________
lstm_1 (LSTM)                (None, 30, 15)            2160
_________________________________________________________________
lstm_2 (LSTM)                (None, 10)                1040
_________________________________________________________________
dense (Dense)                (None, 1)                 11
=================================================================
Total params: 4,971
Trainable params: 4,971
Non-trainable params: 0
```

Fig.3.3.1 Model architecture

B. Block Diagram

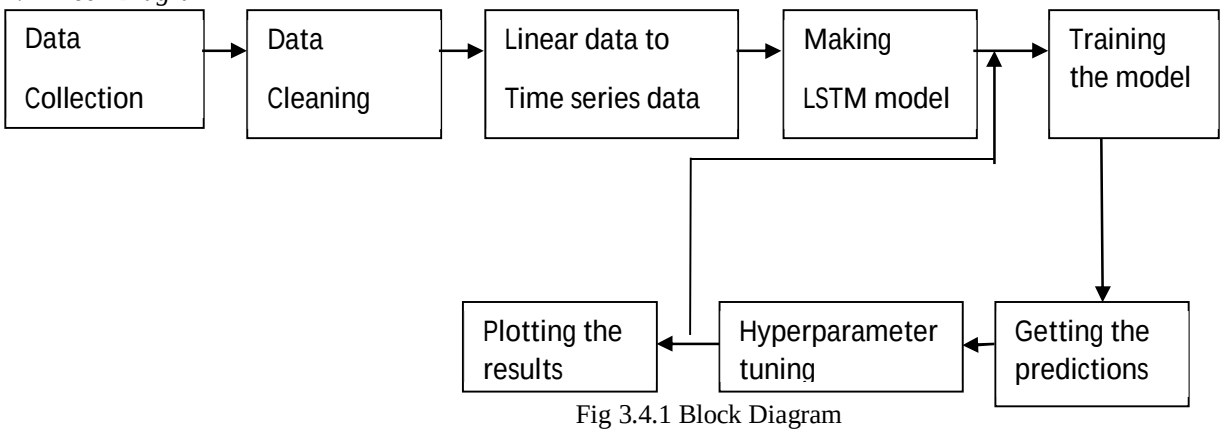

Fig 3.4.1 Block Diagram

IV. CONCLUSION

After completing the project we received quite impressive results of the forecasted price as it showed familiar trend of actual stock market but the backlash was it wasn't precise enough to make practical decisions out of it. The reason for this backlash must be lack of independent factors upon which the model has to be trained. The market sentiments, customers trust for the company, recent deals etc. plays a vital role in predicting the future prices of the stocks and these kind of data were missing in this project. But on the positive side, with only time series data we were successful to scrap some information for future prices of stocks which is very impressive at this stage. Moreover, by completing this project we got much insights from the field of Artificial Intelligence, Stock Market etc. We came to know about many python libraries which were alien to us eg., plotly and streamlit.

V. ACKNOWLEDGEMENT

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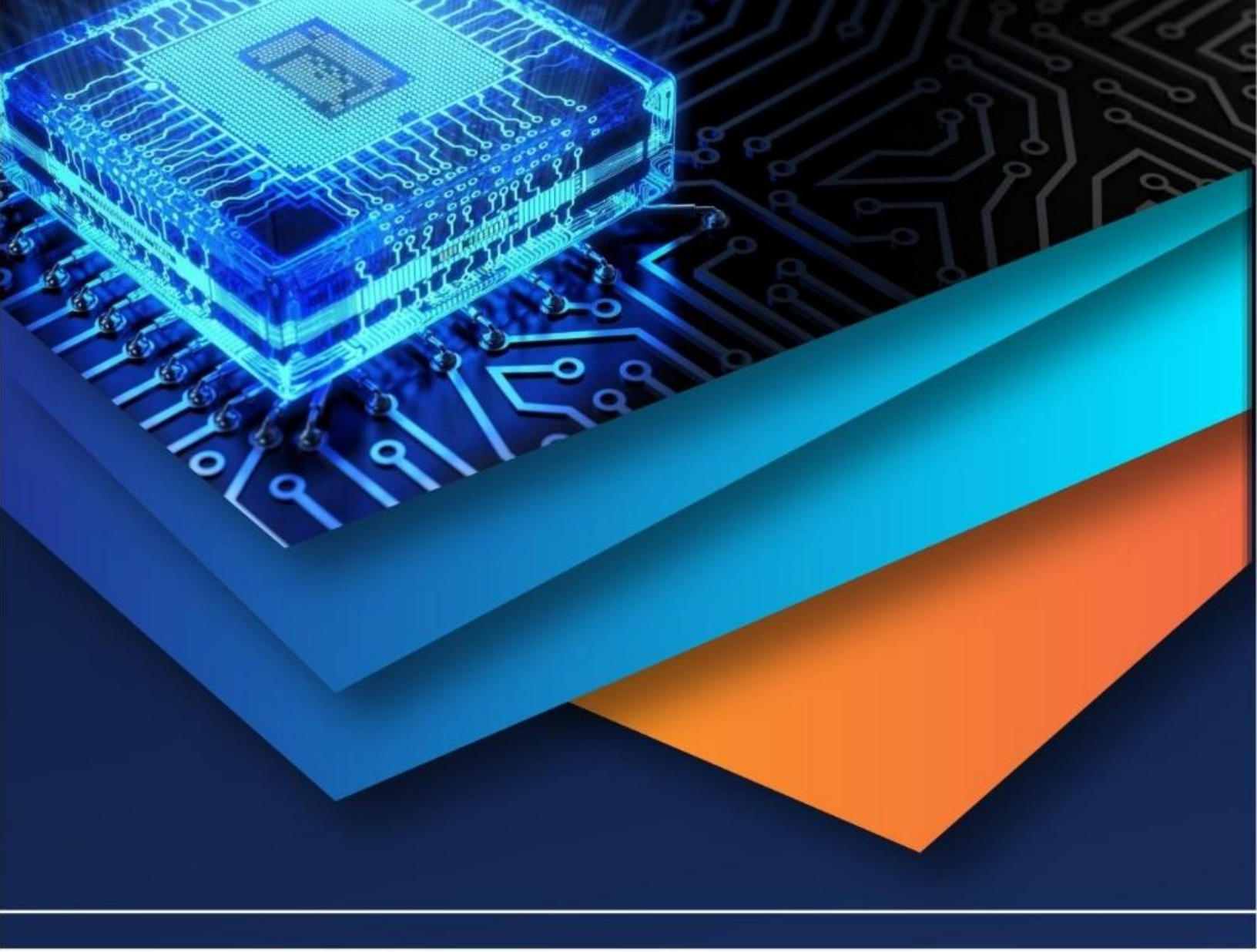

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