Prediction of Indian government stakeholder oil stock prices using hyper parameterized LSTM models

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***Abstract*— An investment is capturing money to profit from it. Investing has become a buzzword among middle-class households. People can invest their money in a variety of ways. Land, gold, jewels, cash, mutual funds, and the stock market may all make investments. We all know how volatile the stock market is. But why is it beneficial to middle-class families? For example, a man from a middle-class family may want to buy land, but it may be too expensive. However, it is possible to obtain a share for a pittance. The disparity between investment and result is apparent here. Forecasting is challenging due to the volatility and non-linearity of financial stock markets. Artificial intelligence and increased computing power have enhanced accuracy in stock price prediction programs. In this paper, we consider Bharat Petroleum Corporation Limited (BPCL), Hindustan Petroleum Corporation Limited (HPCL), and Indian Oil Corporation (I.O.C.) to be the government oil corporations with the most significant stake in the Indian petroleum industry. This paper enhances the prediction of effect by combining a hybridized model of Machine Learning with a Data Science model. Machine Learning-based Hyper Parameter Tuning of Neural Network LSTM has been used to estimate the following day closing price for three equity from Indian government oil industries. The open and close stock prices are considered when creating new model input variables. This project's accuracy is around 99 percent.**

Keywords*— *Data Science, LSTM, Neural Network, Recurrent Neural Networks, Stock Prediction

I. INTRODUCTION

We've all heard advertising that mentions "subject to market risk." It's one of those situations when a stroke of luck may turn us into a king[1]. There is no other method to transform a wealthy person into a beggar if it offends someone. The changeover only takes a few hours. Investing may make us rich or impoverished. Given all of this, it's simple to infer that the stock market is one of the most volatile industries[2][3]. Inconceivable growth if the prediction is accurate and an equally outlandish fall if it is not. However, it is worth noting that individuals are investing in this dangerous industry. So, what is causing this? The answer will be more straightforward if presented in-depth and accompanied by an example. There are various ways to invest money. Some people invest their money in real estate, others in assets such as gold, jewels, and so on, while others keep it liquid or invest it in mutual funds[4]. Purchasing real estate or gold is prohibitively costly. And nobody can bear or afford such a cost. Purchasing shares on the stock exchange is far less expensive than purchasing them earlier[5][6][7]. As a result, everyone may invest. It is inexpensive for everyone. So it's easy to see why people invest here. Sail, for example, is one of India's economic cornerstones. Today's stock price for Shipping Corporation is Rs. 128.65 (in Indian currency). As a result, anybody can invest or purchase a share. Everyone can afford it. Appropriate information and perfect counseling are also essential in the case of stock prices, the stock market, and so on. There are several shares available on the market. As a result, information on the shares and their linkages should have been available. With a proper grasp of stock prices, share prices, investment, audits, business portfolios, and so on, one may make sound decisions about where and how much to invest and identify and discover any misbehavior [8][9]. If that information is unavailable, one must study, learn, get expertise, or rely on brokers[10]. However, certain ambiguities or constraints[11][12]. Everyone in today's hurried environment cannot grasp everything[13]. Aside from that, several reports of brokers misinforming their clients to maximize their profits[14]. It demonstrates that such dependence is neither ensured nor safeguarded[15]. To make educated selections regarding investing in the stock market, one must combine knowledge with dependable advice[16]. We live in the digital age, also called the technological age[17]. Digitalization has changed both business and the way people live. So, the stock price predictor should be made digital to make it easier to find, understand, use, and trust. As a result, research has been conducted to produce software to avoid all of the earlier defects while providing an accurate forecast to consumers[18]. In such a case, the end-user does not need to learn anything; they only need to use and decide[19]. The user has to know the technique of usage, not the specifics, as the advised strategy is based on the stock market. In this scenario, the Indian stock markets (specifically in government petroleum shareholders I.O.C. [Indian Oil Corporation], BPCL [Bharat Petroleum Corporation Limited], and HPCL [Hindustan Petroleum Corporation Limited]) are compared[20].Because of the size of the stock market, it has been kept to a minimum. Specialized algorithms can display a figure or graph if software forms the relationship. The main goal is to determine how these two markets and a probability density function are connected. Because of its prominence in the machine learning sectors such as image processing, materials science, data science, IoT,

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