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NSE Stock Price Monitoring System Using LSTM Model

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ABSTRACT: Traditional forecasting methods require assumptions that are uncommon in real life. Therefore, It is challenging to describe nonlinear financial data using statistical methods. In Existing work many researchers attempt to anticipate stock prices using machine learning approaches such as Support Vector Machines (SVM) and Neural Networks. Machine learning's core idea is to use algorithms to parse data, learn from it, and make predictions about new data. Because the SVM shows unique benefits in dealing with limited samples high-dimensional data, and nonlinear situations. The Proposed new model for predicting stock prices is proposed as (MS-SSA-LSTM), which matches the characteristics of multi-source data with LSTM neural networks and uses the Sparrow Search Algorithm. Investors and traders obtain the data of individual stocks they want to invest in and input them into the MS-SSA-LSTM model that automatically outputs a stock price trend chart and forecasts the stock price for the next day.

KEYWORDS: Robotic Process Automation; NSE; Enterprise Resource Management (ERM) software.

I. INTRODUCTION

Robotic process automation (or RPA) is an evolving type of business process automation technology based on the concept of automated robots or AI employees. " A preconfigured software instance that uses business rules and pre-defined operation choreography to complete the autonomous execution of a combination of procedures, operations, transactions and tasks in one or more unrelated software systems to produce a human exception management outcome or service " (IEEE Corporate Advisory Group 2017).

These instances of preconfigured software reproduce the work done by humans and are called robots, or robots of software. In short, RPA robots automate human tasks. Robotic process automation (RPA) uses state of - the-art software systems to manage highly structured, routine and repetitive computer tasks automatically. A robot can take the wheel and get the job done for tasks that are largely driven by rules, schedules, or events. In fact, typical back office staff spend up to 80% of their day on such mundane activities. Such employees fill in paperwork, conduct routine calculations, and process orders all items that are important to customer satisfaction but boring to employees.

The main purpose of implementing Robotic Process Automation (RPA) for NSE (National Stock Exchange) stock monitoring and prediction is to automate repetitive tasks involved in analyzing stock market data, enhancing efficiency, accuracy, and decision-making for investors and traders. By leveraging RPA technology, the system aims to gather real-time market data, perform predictive analytics, and generate actionable insights to facilitate informed investment decisions and optimize trading strategies in the dynamic stock market environment.

II. RELATED WORK

The core objective of the project is to automate the backend office work of monitoring stocks daily. The project uses "Robotic Process Automation" to download the daily stock values from NSE website, feed the data into an Excel Sheet and send it to the required recipient through E-mail. Software for robotic process automation (RPA) is designed to perform basic tasks across applications just like human workers. A process with multiple steps and applications is taught to the software robot, such as taking received forms, sending a receipt note, verifying the completeness of the document, uploading the form in a folder, and updating a spreadsheet with the form name, the date submitted, etc. Like deep learning, with some support from programmers, the software robots used in robotic process automation are programmed by the employees to do the tasks in a specific workflow. The software is not learning on its own or trying

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to adapt new efficiencies or new insights such as tools for enterprise resource management (ERM). RPA acts as a remote worker assistant by clearing up the burdensome, simple tasks that eat up part of the day of each office worker. The architecture developed by us implements a completely independent CMBPC system running on top of Siemens' own enterprise information system which has read-only interaction with the application tier of the enterprise system. Among our key conclusions is that "formalizability" of audit procedures and audit judgment is grossly underestimated. The concept was extracted from the core content of IT Function and Robotic Process Automation from LSE, Robotic Process Automation: Dynamic Roadmap for Successful Implementation from SKEMANN, Robotic Process Automation: The Next Transformation Lever for Shared Services from UMSL and Robotic Process Automation for Auditing. Journal of Emerging Technologies in Accounting from IEEE .A typical company is operating its activities using several and disconnected IT systems. While business process adjustments, these IT structures are not changed frequently due to uncertainty issues of budget, pacing, and implementation. Therefore, the business process does not represent the IT system's defined technical process. Human staff were employed to fill the gap between systems and processes to resolve this technological and organizational debt. Example: A company has made improvements to the Sales process, allowing a compulsory 50 percent advance to validate the product's reservation. This is not yet established in the IT program, however. A human worker will only have to manually check the details of the invoice and payment and process the order if a 50% advance is made. The issue? — Men. A organization would need to hire new employees or prepare existing employees to model the IT system and business process with any improvement in the business process. Both solutions take both time and money. However, with any successful business process shift, recruiting or re-training will also be required.

Additionally, while cost savings and expedience force the implementation to closely follow the existing and approved internal audit program, a certain level of reengineering of audit processes is inevitable due to the necessity to separate formalizable and non-formalizable parts of the program. Our study identifies the management of audit alarms and the prevention of the alarm floods as critical tasks in the CMBPC implementation process. We develop an approach to solving these problems utilizing the hierarchical structure of alarms and the role-based approach to assigning alarm destinations. We also discuss the content of the audit trail of CMBPC.

III. PROPOSED ALGORITHM

A. *Training dataset:*

In this project , to tune up the object detection model for human detection under various low light conditions, a recently released ExDARK dataset is considered which specifically focuses on a low-light environment. In this dataset, 12 different classes of objects are labeled, out of which we fetched data of our desired class for training. This dataset contains different indoor and outdoor low light images; furthermore, the data is subdivided for low light environment into 10 classes ambient, object, strong, twilight, low, weak, screen, window, shadow, and single. Sample images of various indoor-outdoor low-light environments from the database.

The project focuses on the idea of automating one of the backend office work using RPA. The task taken here is to download the Equities Historical Record of the firm from the list of NIFTY50 displayed on the NSE India website daily on a specified time and mail it to the intended recipients who needs to analyze the data daily. The intended recipient or the target person who need to view the Equity record of the top firm from the NIFTY50 list of the NSE India website must do the process manually or must hire someone in the back office to complete the task, which will cost time and hiring charges if he employs someone to finish the process.

B. *Testing datasets:*

A custom dataset is used for the evaluation of the proposed model. The dataset is collected from the market of rawalpindi, Pakistan during the night in the days of COVID-19. Pakistan is one of the most urbanized countries in South Asia with a 3% yearly urban population growth rate. The large population and congested streets make it a riskier place in the growth of COVID-19 and it is very difficult to maintain safety distance in such narrow places. Hence, the monitoring system should need to have high accuracy in terms of the detection and location of the people. Evaluation of the proposed framework in such a highly-populated area will help us to better analyze the performance of the model. Test dataset is the collection of 346 RGB frames. Frames are collected with motionless ToF camera of Samsung galaxy note 10+ installed 4.5 feet above the ground where a 0° regular camera view calibration is adopted. Sample images of low-light conditions from the custom dataset.

The Equities Record of the top firm on the NIFTY50 list is required to analyze the data of the company, make decisions, and plan their next move by other concerned firms that are competitors to top firm on the list. This Equity

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Record of the top firm on the list must be analyzed on the opening time of the stock market daily. Hence it is a manual, repetitive, rule based process where the data are in electronic format and readable. It is also possible to do the manual process using RPA as it is without any adjustment. Using "Robotic Process Automation" a bot is deployed to download the daily Equity stock values of the top firm from the NIFTY50 list of the NSE website, send it to the required recipient through E-mail.

C. *User Interface Automation:*

You or the robot take any direct actions on the program or web page you are automating: tapping, scrolling, keyboard shortcuts etc. Input activities are those that allow you to extract information for further processing from an app and into Studio.

D. *RPA And Implementation Methodology*:

We can deploy virtual workers with robotic automation that mimic human workers. In the case of a process change, a change in some lines of software code is always faster and cheaper than hundreds of employees being retrained. Here are some reasons for the advantage of Robotics Process Automation.

- A human can work 8 hours a day on average, while robots can work 24 hours a day without any fatigue.
- The average human productivity is 60% with few errors compared to the productivity of Robot, which is 100% without errors. Robots handle multiple tasks very well compared to a human being

IV. PSEUDO CODE

Step 1: 'RPA Bot' is triggered.
Step 2: Bot starts the process and the default web browser is started.
Step 3: Google Search Engine is launched. The Search Engine's Text box is searchedfor "NSE Stocks" and the search results are displayed after the "Google Search" button is clicked.
Step 4: The predefined keywords are matched with displayed website names in the search result and the most relevant "https://www.nseindia.com/website is opened in the browser.
Step 5: The Live Market◊ Live Watch ◊ Equity Stock page is opened.
Step 6: The equity page of the firm on the top of the Nifty50 is opened.
Step 7: The Equities Historical data is downloaded and saved in the assigned folder
Step 8: The downloaded file is E-mailed to the assigned recipients through Google mail.
Step 9: The bot checks whether the process is completed or not.
Step 10: The bot is turned off and waits for the next trigger to start the process again.

V. SIMULATION RESULTS

Academic studies predict that RPA is expected to drive a new wave of productivity gains and efficiency improvements on the global labor market, among other technological developments. Although not directly attributable to RPA alone, Oxford University conjectures that by 2035 may have automated up to 35 percent of all employment. Since the days of simplistic screen scraping and simple process management tools first appeared in the 1990s, RPA techniques have evolved significantly. Today, RPA has changed how businesses around the globe approach their business activities, particularly in terms of operational improvement and streamlining. We can't know precisely how automation systems will evolve in years to come, yet we have good evidence that RPA's future is very promising. When RPA prevalence grows and automation experiences a greater degree of adoption in more diverse industries, not only will the full advantages of automation technology be understood, but they will also be leveraged as a crucial competitive advantage in a variety of crowded, growing industries.

The project focuses on the idea of automating one of the backend office work using RPA. The task taken here is to download the Equities Historical Record of the firm from the list of NIFTY50 displayed on the NSE India website daily on a specified time and mail it to the intended recipients who needs to analyze the data daily. The intended recipient or the target person who need to view the Equity record of the top firm from the NIFTY50 list of the NSE India website must do the process manually or must hire someone in the back office to complete the task, which will cost time and hiring charges if he employs someone to finish the process. The Equities Record of the top firm on the NIFTY50 list is required to analyze the data of the company, make decisions, and plan their next move by other concerned firms that are competitors to top firm on the list.

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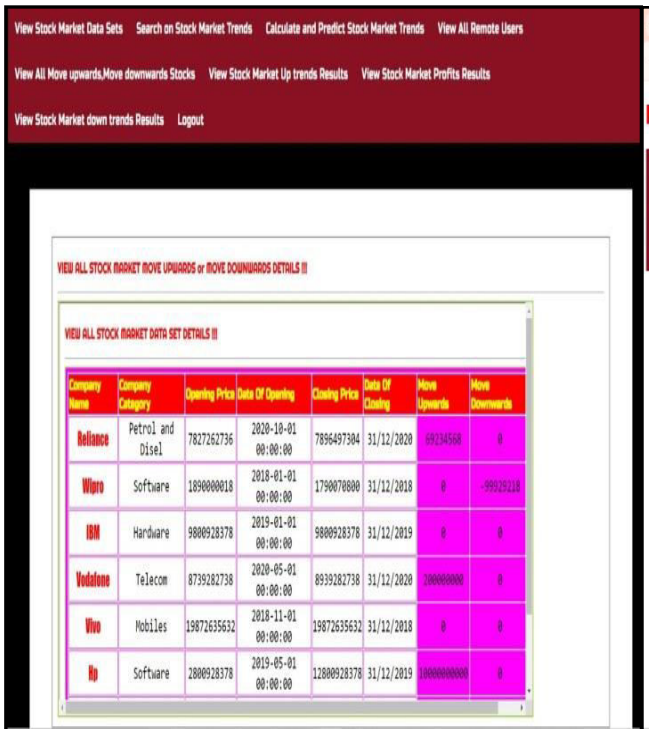

Fig.1. Showing the Data About the Stock Prices

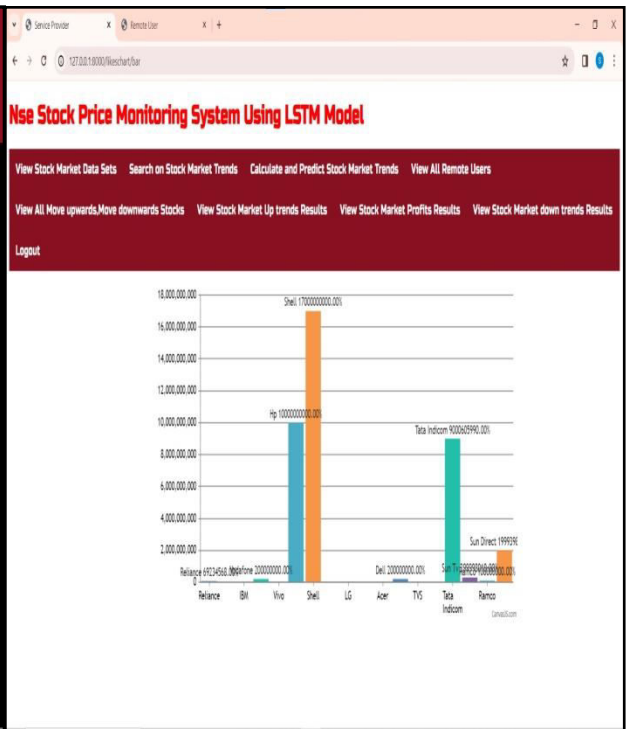

Fig. 2. Predicting the stock results in Bar Chart

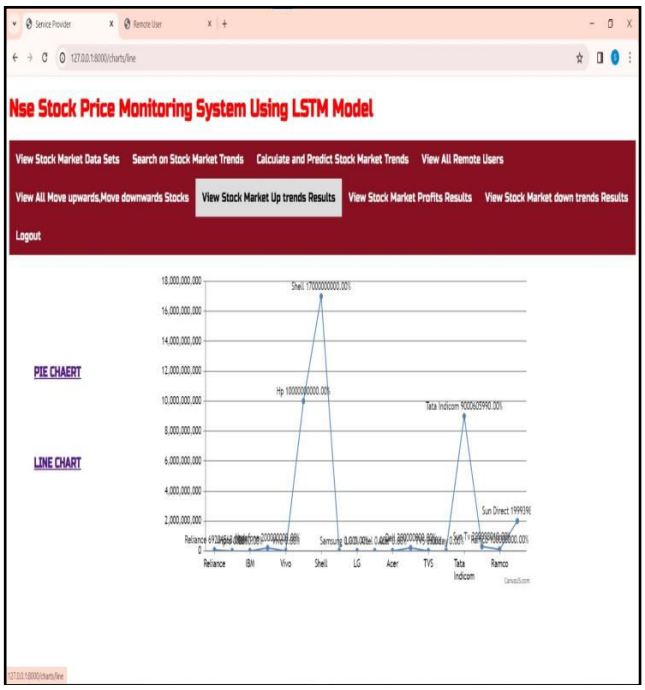

Fig.3.Predicting the results in line chart as Uptrends in market

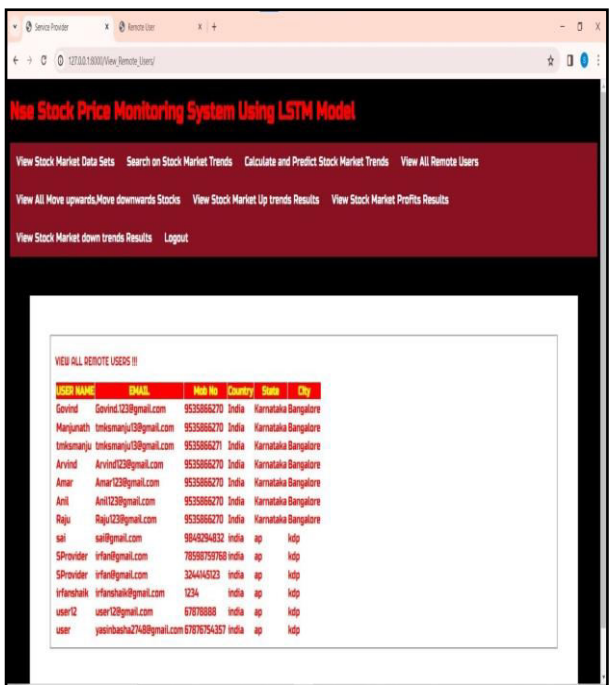

Fig 4.Showing the Registered users

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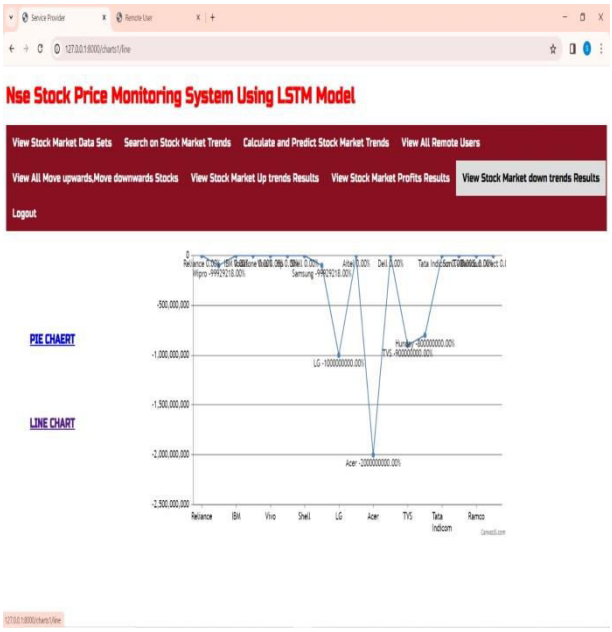

Fig. 5 Predicting the results in line chart as Downtrends in market

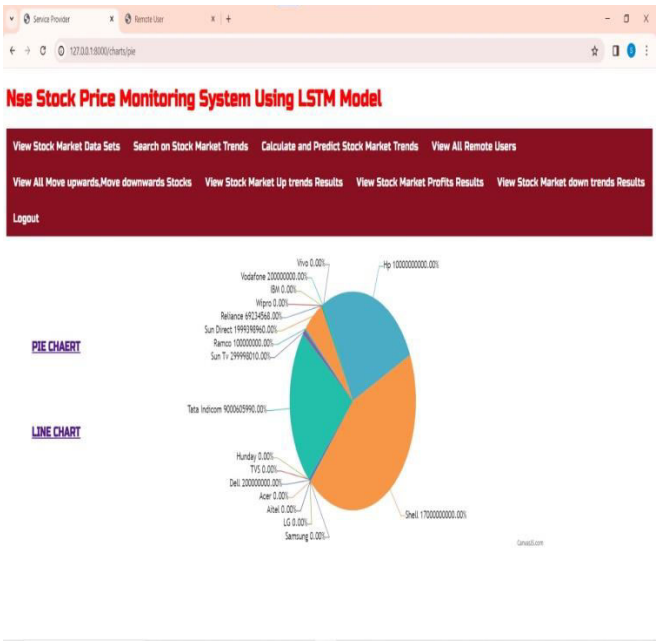

Fig 6 Predicting and Showing the results in Pie chart as

VI. CONCLUSION AND FUTURE WORK

The purpose of this study was the prediction task of stock market movement by machine learning and deep learning algorithms. Four stock market groups, namely diversed financials, petroleum, non-metallic minerals and basic metals, from Tehran stock exchange were chosen, and the dataset was based on ten years of historical records with ten technical features. Also, nine machine learning models (Decision Tree, Random Forest, Ada boost, XG Boost, SVC, Naïve Bayes, KNN, Logistic Regression and ANN) and two deep learning methods (RNN and LSTM) were employed as predictors. We supposed two approaches for input values to models, continuous data and binary data, and we employed three classification metrics for evaluations. Our experimental works showed that there was a significant improvement in the performance of models when they use binary data instead of continuous one. Indeed, deep learning algorithms (RNN and LSTM) were our superior models in both approaches. The maximum number of hops metric. The proposed algorithm provides energy efficient path for data transmission and maximizes the lifetime of entire network. As the performance of the proposed algorithm is analyzed between two metrics in future with some modifications in design considerations the performance of the proposed algorithm can be compared with other energy efficient algorithm. We have used very small network of 5 nodes, as number of nodes increases the complexity will increase. We can increase the number of nodes and analyze the performance.

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