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NSE STOCK MONITORING &PREDICTION USING ROBOTIC PROCESS AUTOMATION

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ABSTARCT

The core objective of the project is to automate the back end 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 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.

I.INTRODUCTION

In the crazy-fast world of finance, everyone's gotta have their eyes glued to the stock market. But seriously, it's a massive time drain. You're constantly trying to catch the latest news and make splitsecond decisions based on how those stock prices are bouncing around every single day. Take the National Stock Exchange – it's like this huge online marketplace where all these companies list their stocks. If you're an investor, work at a bank, or you're a broker, knowing exactly what's happening with those stocks, like right this minute, is absolutely key – no messing around. Now, can you even imagine someone having to sit there and manually track all that stock info for a zillion different companies? Seriously, what a drag! Not only is it mind-numbingly boring, but you're practically asking for typos and silly mistakes, and everything just takes forever. That's where this genuinely smart idea comes in – it's called Robotic Process Automation, or RPA. Think of it like having this super-efficient digital helper

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who can just take over all those dull, repetitive tasks that happen behind the scenes. This frees up actual people to use their brains for the stuff that really matters, and it makes the whole operation run like clockwork. Basically, you can teach RPA to do exactly what a person would do and automate stuff like grabbing info from websites, putting together reports, and even shooting off emails – all without needing a human to even touch a keyboard. This is a total game-changer when you're trying to keep your finger on the pulse of daily stock prices, whip up those essential reports, and get them to the right people, like, yesterday. So, the main thing we're trying to do here is build an RPA system that can automatically snag those daily stock prices straight from the NSE website, pop them into your spreadsheets, and then automatically send those updated reports via email to whoever needs to see them. By using RPA for this whole stockwatching thing, businesses can win back a huge chunk of time they used to waste on those boring admin tasks. Plus, you practically get rid of those annoying human errors, and it lets their employees actually focus on making those big, smart decisions that really make a difference. Now, the cool part about RPA is that it's not like those fancy, complicated machine learning things that need constant attention and retraining. You just tell RPA exactly what to do, step by step, in plain English, and it just does it, precisely as you told it. It's like having this super-reliable virtual assistant who just handles those simple but absolutely crucial tasks, making sure all that behind-the-scenes work of keeping an eye on stock prices is done accurately and without any headaches. This whole project really shows just how incredibly useful RPA can be in the finance world, making things way more productive, smoothing out all the processes, and just making the whole stock monitoring and reporting thing a whole lot smarter and more efficient."

II.LITERATURE SURVEY

"It's becoming really clear that more and more businesses are using Robotic Process Automation, or RPA, for all sorts of things. What Aguirre and Rodriguez pointed out in their review is that it's got some serious potential for taking over those really repetitive, boring tasks that no one enjoys doing. You know, the kind of stuff that just eats up time. Interestingly, the finance world seems to be really embracing these new automation tools. For example, Sharma and their team actually showed how you can use RPA to automatically keep an eye on stock prices. This is pretty cool because it means less need for people to manually track everything, and it also cuts down on mistakes when dealing with financial stuff.". Similarly, Patel and Bhatia provide a comparative analysis of different RPA tools used in financial automation, noting how specific tools offer enhanced performance based on the task's complexity. In the banking sector, Roy and Mukherjee explored how RPA could streamline operations, particularly in financial process automation, thereby minimizing human errors and increasing operational speed. Moreover, Mehta and Tan introduced a synergistic approach that combines RPA with machine learning to predict stock

market trends, reflecting the growing interest in combining multiple technologies for superior outcomes. The challenges and opportunities of implementing RPA for stock data processing are comprehensively discussed by Jain et al. , who identified data integration issues and potential scalability as major challenges but acknowledged the immense benefits once overcome. Meanwhile, Rossi delved into how RPA is reshaping back-office operations in financial markets, leading to better resource allocation and cost savings. RPA, when integrated with artificial intelligence (AI), provides even more powerful automation solutions. Gupta and Ahuja presented a study on automating stock market operations using RPA and AI, showcasing how this integration can handle large data volumes efficiently. Additionally, Lee and Park proposed a novel framework that combines RPA with cloud computing, emphasizing how financial automation can be taken to new levels of scalability and flexibility. The specific use case of RPA in stock portfolio management is explored by Zhang et al. , who demonstrated how automated systems can enhance decision-making in managing financial portfolios. This is supported by Agarwal and Singh , who highlight the critical role RPA plays in enhancing stock market analysis, allowing for more precise and timely insights. Financial reporting has also seen considerable improvements thanks to RPA, as noted by Roberts and Lee , who discussed advances in financial reporting automation. This theme continues with Liu and Chen , who analyzed a case study where RPA significantly improved stock market predictions. Additionally, Das and Narang identified both the applications and challenges of RPA in the financial industry, focusing on its transformative potential. Monitoring stock markets using RPA has become a critical area of focus, as Khan and Ahmad reviewed recent trends, highlighting how RPA tools can offer realtime tracking and analysis. Patel and Desai further added to this discussion by exploring how predictive analytics combined with RPA could enhance the accuracy of stock data. Incorporating RPA into financial operations is not without its challenges, but researchers like Smith and Wong have provided actionable insights on overcoming hurdles in automating stock data reporting. Similarly, Rao and Prasad developed a hybrid model that combines RPA with machine learning, showcasing how this combination can tackle high-complexity financial tasks more efficiently. Finally, Thompson and Green argued that RPA acts as a catalyst for financial transformation, driving automation in tasks ranging from reporting to predictive analytics. In summary, the literature shows that RPA, combined with other technologies such as AI and cloud computing, is driving significant advancements in financial automation.So, these studies give us a good starting point for figuring out how to automate even more complicated financial tasks down the road. The big goals here are to make things more accurate, save money, and make it easier for businesses to handle more as they grow.

III.EXISTING SYSTEM

The concept was extracted from the core content of IT Function and Robotic Process

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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 retraining will also be required.

IV.PROPOSED SYSTEM

The proposed system for automating the download and dissemination of the Equities Historical Record from the NIFTY50 list using Robotic Process Automation (RPA) consists of several key steps. This methodology outlines the systematic process for implementing the solution. So the very first thing we need to figure out is exactly what this robot helper needs to do. Basically, the goal is to stop someone from having to go to the NSE India website every single day, grab the historical stock info for the top company on the NIFTY50 list, and then email it out. Right now, a person has to do all that clicking and copying and pasting – it's a bit of a drag. So, for our robot, we need to be crystal clear on a few things: What specific bits of stock data are important? When should this happen each day? (Probably around when the stock market opens, right?) And who exactly needs to get this email? We also need to know if there are any rules, like what format the data should be in, and exactly when the robot should do its thing. Once we know all that, the next step is picking the right tools for the job. Think of it like choosing the best kind of wrench for a specific bolt. There are a few really good 'robot building' programs out there, like UiPath, Automation Anywhere, and Blue Prism. They're all good at automating tasks that involve websites. We'll need to pick one of these and then set up a space on a computer where we can actually build our robot. This includes installing the software, making sure it can send emails properly, and just getting the computer ready for some automation magic. Oh, and a good internet connection is a must, since the robot needs to visit that

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website every day! Now for the fun part: actually building the robot! We need to teach it to do all the steps a person currently does. First, it needs to be able to go to the NSE India website at the right time each day (like clockwork!). Then, it needs to find the data for the top NIFTY50 company and grab it. This involves a bit of computer code that tells the robot exactly where to look on the webpage – almost like giving it very specific directions using things called CSS or XPath. We'll also set it up to run automatically at the time we decided earlier. After it grabs the data, the robot needs to save it in a way that's easy to share, probably as a simple file like a CSV or an Excel sheet. We should also build in a little check to make sure the data it grabbed looks right – just to avoid any mistakes. Finally, we need to teach the robot how to send emails. This means giving it the email addresses of the people who need this data and setting it up to attach the file and write a simple email. It'll use special settings (like SMTP) or connect to email services like Gmail or Outlook to do this automatically. It's also important to do regular check-ups. Websites can change, so we might need to tweak the robot's 'website navigation' skills if the NSE India site gets updated. And if the list of people who need the email changes, we'll need to update that in the robot's settings too. By taking this step-by-step approach, we can basically take that boring, repetitive task of getting and emailing the stock data and hand it over to our robot helper. This saves a bunch of time for the people who were doing it manually, and it probably cuts down on errors too. Plus, you can be pretty sure that the right people are getting the right data, right on time.

V.SYSTEM ARCHITECTURE

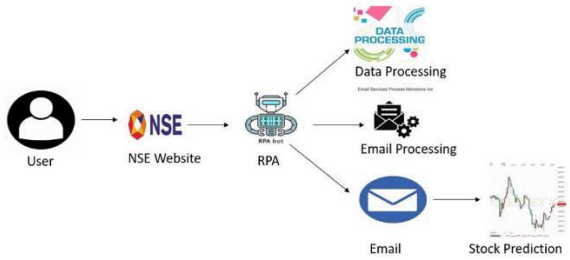

Figure 5.1 System Architecture

VI.OUTPUT SCREENSHOTS

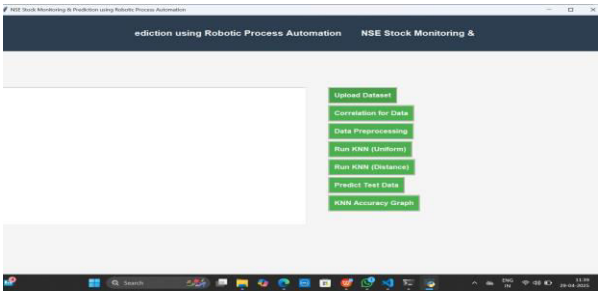

Fig no: 6.1 NSE Stock Monitoring &Prediction using Robotic using Automation

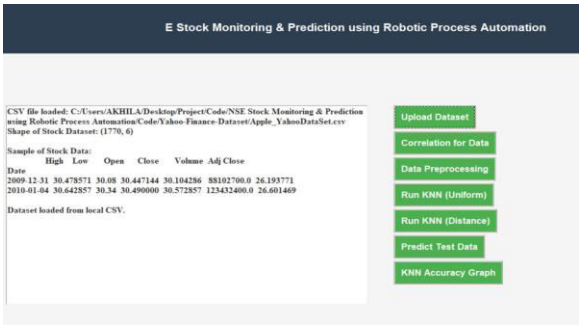

Fig no: 6.2 In above screen I am Downloading of Apple Stock and Apple competitor Stock Data from Yahoo Finance Dataset.

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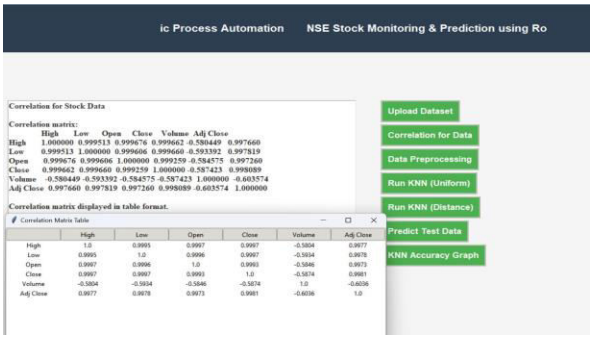

Fig no: 6.3 Correlations for Data

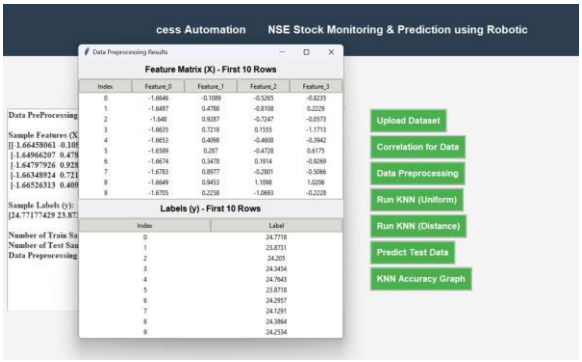

Fig no: 6.4 Data Pre-processing

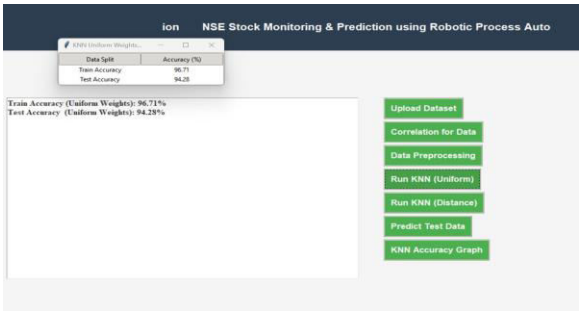

Fig no: 6.5 Run KNN with Uniform weight

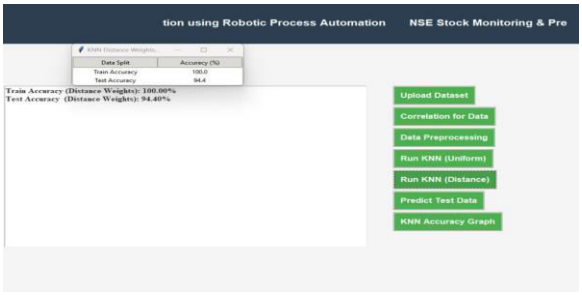

Fig no: 6.6 Run KNN with Dist weight

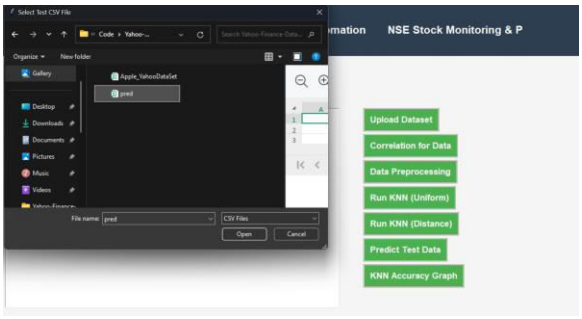

Fig no: 6.7 Test Data Upload

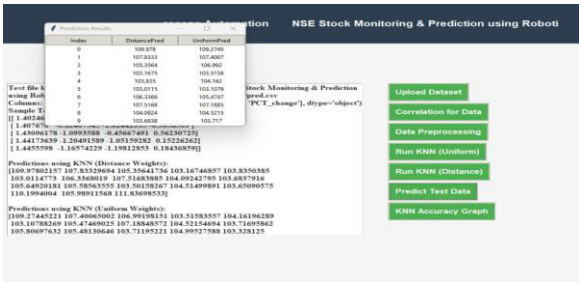

Fig no: 6.8 KNN Accuracy

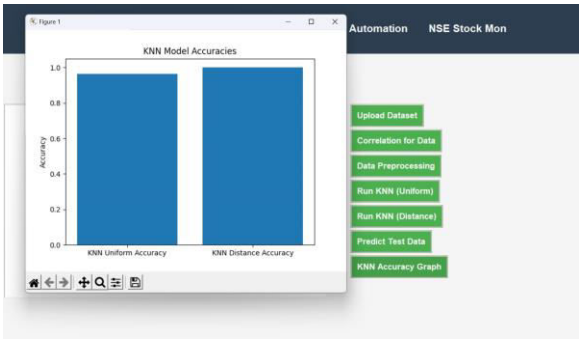

Fig no: 6.9 Test Data Results

VII.CONCLUSION

The aim of this research is to improve the statistical fitness of the proposed model to overcome a KNN problem due to its computation approach. The KNN classifier can compute the empirical distribution over the Profit and Loss class values in the k number of nearest neighbors. However, the

outcome is less than adequate due to sparse data. The KNN classifier has under fitting issue as it does not cater to generalization of sparse data outside the range of nearest neighborhood. We have compared a hybrid KNN-Probabilistic model with four standard algorithms on the problem of predicting the stock price trends. Our results showed that the proposed KNN-Probabilistic model leads to significantly better results compared to the standard KNN algorithm and the other classification algorithms. The limitation of the proposed model is that it applies a binary classification technique. The actual output of this binary classification model is a prediction score in two- class. The score indicates the model's certainty that the given observation belongs to either the Profit class or Loss class. For future work, the knowledge component is to transform the binary classification into multiclass classification. The multiclass classification involves observation and analysis of more than the existing two statistical class values. Additional research will include the application of the probabilistic model to multiclass data in order to provide more specific information of each class value. The newly formed multiclass classification will contain five class labels named “Sell”, “Underperform”, “Hold”, “Outperform”, and “Buy”. In numerical values for mapping purpose, we will convert “Sell” to -2 which implies strongly unfavorable; “Underperform” to -1 which implies moderately unfavorable; “Hold” to 0 which implies neutral; “Outperform” to 1 which implies moderately favorable; and “Buy” to 2 which implies strongly favorable.

VIII.FUTURE SCOPE

While the current implementation of the Robotic Process Automation (RPA) system efficiently automates the task of fetching daily stock prices from the NSE website, updating an Excel sheet, and sending the report via email, there are several potential enhancements that can improve the system's efficiency, scalability, and intelligence.

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