IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE IN STOCK MARKET PREDICTION: AN EXPLORATORY STUDY ON INDIAN MARKET

Vertika Goswami, Research Scholar, IIS (Deemed to be University), Jaipur, Rajasthan
Dr. Gargi Sharma, Associate Professor, IIIM, Jaipur

Abstract

The bold expedition of artificial intelligence into the monetary scene has brought about a change in the way financial planning and stock exchange are managed. In other words, AI has proven to be a game-changer in the ever-evolving field of finance, revolutionizing the way investors and financial institutions approach stock market analysis and forecasting. Today, monetary foundations and financial backers don't have to go through hours managing basic/specialized diagram research or settle for speculation solely based on intuition, all things considered they can use artificial intelligence apparatuses to examine the complex landscape of the stock market and further develop the accuracy of expectations.

This paper basically concentrates on how artificial intelligence is used and how it tends to be valuable to use various artificial intelligence tools for stock market predictions. This paper will also focus on some of the pre-existing artificial intelligence tools and techniques that are used by various organizations with the end goal of predicting stock market and how the future trading can be beneficial through AI. In conclusion, it can be argued that the incorporation of AI into the stock markets will benefit both investors and traders. It comes with its fair share of negative aspects in current scenario, but it will be favourable in the long run.

Keywords: Artificial Intelligence, Stock Market, Trading, Prediction

Introduction

Every industry, including capital markets, is dominated by artificial intelligence. Computing first revolutionised in financial trading exchange when it made possible to work out gigantic numbers in a fraction of a second and watch the markets change in the blink of an eye. Today, Artificial Intelligence trading systems are driving the second wave of advances in financial history. Trade and investment were significantly more complex and different before the innovation anyway.

However, being a typical buzzword today, artificial intelligence has been around for a long time. The starting points of artificial intelligence can be traced back to the days of the old-style rationalists. However, recognition of authority can be traced back to the 1950s. The term was coined in 1956 at the Dartmouth Summer Research Project on Artificial Intelligence (DSRPAI) facilitated by John McCarthy and Marvin Minsky. In the 1980s, AI began to gain traction in the financial industry. It was around this time that specialist frameworks emerged – a phenomenal business item in finance. Master frameworks are knowledge frameworks in the light of information – used to predict market shifts and provide new currency plans in the currency business. Financial institutions and the banking industry have gradually started using master frameworks to reduce the risk of human error. It helped with currency exchange, business development, financial analysis, international trade and bank management.

Traditional Methods of Stock Market Prediction

Technical Analysis

A technical analysis is an investigation of verifiable market information, including cost and volume. Specialist investigators expect to use past performance to predict future market behaviour, using expertise in market psychology, financial management, and quantitative research. The two most common types of specialized investigation are chart examples and technical (statistical) markers. The main rule of principle underlying technical analysis is that market costs reflect generally available data that could affect the market. So, there is a compelling reason to look at cash, fundamental or new improvements as they are now rated as a given security. Specialist investigators mostly admit that price move in patterns, and history will generally repeat the same with respect to general psychology on the market.

Fundamental Analysis

The primary point of the basic investigation is to assess the hidden value of the organization. It's basically a way to find out the intrinsic value of an asset and look at things that could affect its future value. This kind of research depends on external opportunities, external impacts, modern patterns and in addition fiscal summaries of the organization. Major investigations can be comprehensively organized into two kinds to be specific; top-down examination and bottom-up approach. Bottom-up analysis, on the other hand, starts with a specific stock and expands to all other factors that affect price, such as the economy and industry. A top-down analysis starts with a broader view of the economy and then narrows it down to an industry and finally to a specific company. As is evident from the types of central inquiry, there is an examination of three factors, namely the economy, the industry and finally the organization. At the singular level, this large number of three variables is broadly analysed to arrive at a choice of business. On the financial front, factors like money related arrangement, modern creation, gross domestic product, expansion and various other monetary factors have collapsed. SCP analysis or Michael Porter's five forces model can be used to conduct industry analysis. The review of the organization is carried out with the help of the investigation of financial records, the control of profit and loss and the control of income.

Efficient Market Hypothesis

"Efficient market Hypothesis basically says that all realized data on venture capital hedges such as stocks are henceforth factored into the cost of those hedges. Accordingly, if accept this to be true, no measure of investigation can provide the financial sponsor an advantage over various financial sponsors," collectively called the market" (Eugene Fama, 1970). The main idea behind hypothesis is that the cost of exchanged resources, such as stocks, now reflects all publicly available data, and assuming one is based in an effective financial planning on publicly available data, one can't beat market. Stock returns are difficult to estimate because old data is now consolidated in the cost of the stock and new data is by definition unpredictable or arbitrary. Efficient market theory disassociates itself from both fundamental and technical analysis; similarly, it runs counter to this whole idea of involving artificial intelligence for predicting stock market forecasting.

Contemporary Approaches for Forecasting Stock Market Using Artificial Intelligence

Artificial intelligence has advanced and disrupted the financial sector over the past few years.

Artificial intelligence has given the universe of money a better approach to meet the needs and wants of clients who, in this changing age, demand smarter, more responsive, more efficient and safer ways to spend, set aside and put away cash. Computer reasoning can be named as the ultimate fate of the stock market. The use of robot-traders, AI, the exploration of large amounts of information, all this is focused with greater precision and efficiency. Applying artificial intelligence to the stock trading will not only help traders, financial backers in making better and efficient decisions, it will also help in expanding the base of financial backers.

Machine Learning and Stock Market

Stock market anticipation has been a critical area of research in AI. Artificial intelligence calculations such as relapse, classifier and support vector machine (SVM) help predict stock market. Machine learning is everywhere, from "OK Google" to complicated medical diagnoses and procedures. Artificial intelligence can be characterized as the ability of computers to learn new things on their own with the help of information, previous encounters and perceptions. The more information the computer processes, the better the choices and goals will be. Rod market estimation is not what it used to be 10 years ago, there are a huge number of variables that lead to a change in financial exchanges and it is expected that there are many elements to think about when predicting a stock trading. In other words, due to the chaotic structure and unpredictability of stock markets, it is sometimes extremely difficult to predict a particular trend or pattern. An algorithm will be able to identify a pattern in the chaos and predict how it will affect the future if all available data is fed into it.

Big Data and Stock Market

"Big data" refers to vast amounts of data, both structured and unstructured, that are challenging to analyze using traditional methods due to their size. According to Gartner's definition from around 2001, big data encompasses information with a larger variety, increasing volume, and high velocity. This data can be gathered from diverse sources such as online entertainment. Decision-making relies on the availability of data; the more data accessible, the more informed decisions can be made. This concept is also fundamental to artificial intelligence, where machines make better decisions with more data. The stock market is inherently volatile, constantly fluctuating and inundated with continuous streams of data. This data encompasses various information sources, including social media platforms like Facebook and Twitter, and can be in various formats like text or images. These data collections, often collected in massive volumes, could range from petabytes to exabytes or even zettabytes. Traditional databases struggle to handle such immense datasets. Big data offers the opportunity to delve into the significant information generated from publications to social media posts. This information is crucial due to the unpredictable nature of stock trading and its propensity for change.

Artificial Intelligence Tools

- **Greenkey Technologies:** Acknowledgment of discourse usage, combined with common improvements in language work, saves marketers time by allowing them to filter notes, market information, and constantly move organizations.

- **Trading Technologies:** They have artificial intelligence that recognizes the complex interchange design for huge scale. They use artificial intelligence innovations with great information

processing power.

- **TechRadar:** It offers two supports, discussion channel management, and an exchange-ready framework. The algo used is known as break-even calculation and is adopted to limit the exchange risk by tracking trading sectors and tracking the strength of help and hindrance.

- **Trade Ideas:** An independent market scanner that provides the financial backer with a constant exchange of valuable open doors. They created an exchange framework called "Holly" and a computer-based news bot.

- **Kavout:** It uses artificial intelligence to suggest daily top stocks and does so with the help of exemplary innovation and a cost estimation engine. It also models portfolios that have been improved using computer intelligence calculations.

- **Auquan:** By enabling data scientists from all backgrounds to create algorithmic trading strategies, this particular platform makes trading accessible to all. Clients can thus earn aids of data scientist.

- **Equbot:** Innovation in collaboration with IBM combines computer intelligence with a functioning information exchange business. It collects information from various sources, for example, news articles, web entertainment posts, budget summaries, and so on, and organizes the interaction of speculation.

Literature Review

Patel et al (2021) in the paper expressed that artificial intelligence gradually advanced into each field and worked in those fields. Artificial intelligence has been implemented by various monetary institutions in various creative ways to reap benefits such as time saving, cost reduction and value addition. This document describes how artificial intelligence is used in finance, for example, in identifying extortion, improving and expanding security, client-side client authentication, and so on. Currently, there are also specific burdens, for example, it is tedious and somewhat expensive.

Sadia et al (2019) through his paper, audited the use or arbitrary forest, SVM (Support Vector machines) on datasets and the results it produces. It expresses that the strategies of any timberland and backing vector machine are not fully utilized. The creators of this document presented a more accurate and credible strategy to more accurately predict the development of the financial market. After directing the research and examination of various information and verifiable information, the creators had the ability to assume that the irregular forest is the most reasonable and incredible resource for the two dealers and financial backers.

Mittal A. & Goel, A. (2012) Using data collected from Twitter, this paper attempted to establish the correlation between "Public Sentiment" and "Market Sentiment". They collected a lot of information (tweets) and tried to capture the public's state of mind using basic common language control strategies. The dataset used for this survey only contains tweets from the English-speaking population; as a result, the population size is small. Nevertheless, they were able to get the connection that the state of mind of individuals affects the choice of speculation.

Chopra, R., & Sharma, G. D. (2021) started this paper by describing the way an organization acquires reserves primarily through financial exchanges and predicting stock exchanges is a

problematic and fascinating enterprise. There are many variables involved in influencing inventory costs. With the help of this paper, they tried to support a framework that will predict the cost of shares by linking it to the past performance of the shares, using the information provided by yahoo finance.

According to Mokhtari et al (2021) the stock exchange is among the main areas in money and determining the financial exchange is one of the most difficult tasks due to the capacity of the financial exchanges to be so impetuous. This paper focuses on stock market prediction using AI. Python was used as a programming language to perform financial exchange prediction; the AI procedure used is called SVM (Support Vector Machine). The information used to do this was collected from various global monetary business sectors and the model produced had the ability to produce higher models.

Miah et al (2015) expressed the importance of artificial neural networks and their share in the expectation of financial exchange due to their ability to manage dubious and missing information that changes in extremely short time intervals. The basic point of this survey is to measure the warehouse costs of organizations with the help of effective brain network models. There are various techniques such as hereditary computing, but the reason for choosing artificial neural networks is the capacity and ability to handle non-linear, confusing and unusual behaviour of securities exchange.

Shaban et al (2024) through this paper, it attempts to give a picture and idea of the dynamic layout of a company's share, and the similar will be achieved by implementing a framework that takes data, for example, news articles and notable stock costs, and examines them to predict the future. storage costs. The writer attempts to focus on the effect of newspaper articles on stock prices; an expectation model was plotted considering the association between stock costs and news articles. The general idea behind this is to provide a clear ability to the financial backer at this time of the site.

Research Methodology

The purpose of this article is to highlight the use of Artificial Intelligence stock market forecasting. It features how the involvement of Artificial Intelligence can be beneficial in the realm of securities exchange anticipation, and how beneficial various advancements in artificial intelligence can be. The present review is subjective in nature and is a contextual analysis to provide the user with background information and thoughts regarding the given point. It uses secondary information that has been collected from various sources such as newspapers, books and websites.

Research Objectives

- To focus on the utilization of artificial intelligence in predicting Stock Exchange trends.
- To explore the impact of artificial intelligence on investors in the financial realm.
- To examine the effectiveness of specific artificial intelligence technologies and tools deployed in this context.

Analysis & Interpretation

Artificial Intelligence subverted the monetary realm. The field of finance was one of the first to adopt artificial intelligence, unlike various businesses. Artificial intelligence has a horde of uses in the field of money. Implementation of Artificial Intelligence on stock exchanges comes with its fair share of advantages and disadvantages;

Advantages

- It takes into account ongoing research and observation of financial exchange.

- A significant advantage of artificial intelligence in the field of exchange will be that it can reason about patterns that cannot be imagined by a human.

- Confirmation of this example should be possible similarly faster than a human advisor.

- Bold decisions made by artificial intelligence will be accurate, unbiased and decisive, different from those made by human advice.

- Artificial Intelligence can help plan for potential problems.

- Artificial intelligence is also useful in the back-end of money exchange, eg in IT, handling money information and reducing the work associated with evaluation and consistency.

Disadvantages

- A significant disadvantage of the reception of artificial intelligence is the lack of capabilities, eg the availability of specialized personnel with the training and skills expected to facilitate the innovation.

- Another disadvantage is cost. Artificial intelligence is not modest, the cost of acquiring and executing massive scale comes with costs.

- Protection becomes a central theme in implementing artificial intelligence innovations.

- More electronicization, more occupational accidents, more labour migration.

Artificial Intelligence Changing the Investment Habits Today

A ton of financial firms are vigorously implementing advancements, for example, massive information, artificial intelligence, computer reasoning, chatbots, online entertainment, and so on. Gone are the days when a financial backer would stay glued to their televisions and go through countless proposals from business firms to get an idea of how to put in and what to contribute to. These days, visiting bots record questions from financial backers and the business is generally completed through portable applications. These businesses are introducing the latest problematic advancements to attract educated millennials, with higher discretionary cash flow and generally watch fast money. Firms like Edelweiss Protections, HDFC Protections and Karvyetc introduced the idea of 'conversational money management' with the help of talk bots, these bots allow to put resources into shared reserves, check portfolio, view common property and stock offering and so on. Over time, new advancements such as Voice assistant (ARYA-HDFC protection) will become more indispensable and allow to put resources in stock using voice commands.

Trading firms have not limited themselves to chatbots, but are also using advancements such as AI and large-scale information research to perform predictive research to identify purchasing tendencies and acquire new clients. For example; in the event that the financial backer constantly monitors the price of a particular share, they will receive brief information whenever there is a sharp development in costs. Firms send aggregate data/rough stock investigation with verifiable data of interest, investigation with different stocks at different limits and so on to enable the financial sponsor to make a brilliant decision. Information research is used to recognize the revenue of the financial

sponsor by breaking down various interesting data. Information research can also be used to recognize various lethargic clients and increase correspondence with them. Edelweiss exchange protection has sent the TX3 phase, which provides fast exchange and logical layouts, allowing clients to break down market information and find out their exchanges in one place.

Future of Trading through Artificial Intelligence

In a study conducted by a Swiss stock exchange where brokers were given some insight into the impact AI will have on the exchange, around 66% of traders agree that it will offer more open doors for the exchange. As shown in the 5th order, two out of three acknowledged that it will lower the general cost of exchange, but there are actually some who acknowledge that man-made consciousness will cause a more unpredictable economic situation. Developments in the space of artificial reasoning will allow business to prove more powerful and actually willing to bear future dangers and difficulties (Tony Shaw, Protections and trades at SIX). Various exchanges are looking at ways to integrate this into their environment to provide benefits to clients, including exchange and subsequent trading. Many salespeople recognized that computerized reasoning would help reduce shift time and have various functional benefits, but some (6%) believed that reducing shift hours would increase shift costs.

If you want to be a bully in the stock market, you need to watch the news consistently and constantly check the stock market. This is where advances like artificial reasoning, big data and artificial intelligence really come into their own. These can be modified and executed in a way that provides advice to financial backers after examining each of the relevant information. Some can be modified to sense designs and dissect these patterns to allow for ongoing hazard evaluations to ensure consistency. In addition, artificial consciousness helps reverse the exchange of money; organizations use computational reasoning to determine IT-related problems. For the manipulation of monetary information and further to limit the work related to the consistency check and various instructions. Computer reasoning can similarly accommodate programmed documentation when certain errands, exchanges, and exercises occur, which can be really beneficial in businesses that are strongly managed and businesses for example banking, exchange, and finance fall into this classification.

According to KPMG's "Transformative Change" report, approximately 60% of asset supervisors recognize that artificial intelligence will influence their approach to business management. Be that as it may, this number is not simply limited to 60% as stated by KPMG, several bosses do not take into account part of the current purposes of artificial reasoning and artificial intelligence. According to a similar report, many businesses have begun to invest in these improvements, and many agree that it will improve the way they work and be beneficial in the long run.

Conclusion

Innovations such as Algorithmic Exchange or Mechanized Exchange have been involved by many organizations and many retails financial sponsors for a very long time. In any case, this is not the main artificial intelligence that can be used to predict stock markets. The way artificial intelligence has disrupted various fields, it won't be long before computer reasoning completely takes over the stock market (monetary singularity). The introduction of artificial intelligence into the stock market is

certainly accompanied by its upsides, as machines are able to make much faster and better decisions than human traders. This will also be useful in attracting additional new financial backers for the share exchange. The stage we're in, AI comes with its fair share of drawbacks, for example security, framework crashes, and so on. As a result, before AI is fully implemented, a biological system with fake authentication innovation should be created to guarantee financial backers that they will have cash and information. In any case, as mentioned, computational reasoning is certainly not another innovation, it has been close and various organizations have implemented it to some extent. The results are encouraging and just demonstrate that engaging artificial intelligence to predict stock markets is what's in store.

Future Scope and Recommendation

Artificial intelligence as an innovation is constantly evolving and evolving at a very fast rate. When it is done, it will constantly learn and develop to make better decisions. Human-engineered reasoning has the ability to completely transform business; many money market members have invested in computer intelligence innovations to work on jobs and correspondence. At a unique level, this large number of different computational reasoning innovations, for example, chatbots, AI, and so on, have room for development. These upgrades can be made to modernize their exposure and further develop their independent direction. Advances can be incorporated and performed together for better and more precise direction. For every advantage computerized reasoning has in the arms trade, cost effectiveness is not one of its strong suits. The primary focus from now on is to ensure practical implementation on a wider scale.

To upgrade this overview, a review can be conducted to understand the level of awareness of funders and the view of the funder, or a unique change in the event that artificial brain power completely replaces the human component. A review can be done to understand how coordinating these innovations or any two advancements together can help two funders and organizations. Altogether, the basic thought processes should be a lure to more viable public spending and security, as a result it should be possible to explore the available resources in which this Artificial Intelligence ecosystem can be implemented better and smarter.

References

- Chen, L., Qiao, Z., Wang, M., Wang, C., Du, R., & Stanley, H. E. (2018). Which artificial intelligence algorithm better predicts the Indian stock market?. IEEE Access, 6, 48625-48633.

- Chopra, R., & Sharma, G. D. (2021). Application of artificial intelligence in stock market forecasting: a critique, review, and research agenda. Journal of risk and financial management, 14(11), 526.

- Fazal, M. I., Patel, M. E., Tye, J., & Gupta, Y. (2018). The past, present and future role of artificial intelligence in imaging. European journal of radiology, 105, 246-250.

- Gonzales, R. M. D., & Hargreaves, C. A. (2022). How can we use artificial intelligence for stock recommendation and risk management? A proposed decision support system. International Journal of Information Management Data Insights, 2(2), 100130.

- Hi'ovská, K., & Koncz, P. (2012). Application of Artificial Intelligence and Data Mining Techniques to Financial Markets. Economic Studies & Analyses/Acta VSFS, 6(1).

- Miah, M. B. A., Hossain, M. Z., Hossain, M. A., & Islam, M. M. (2015). Price prediction of stock market using hybrid model of artificial intelligence. International Journal of Computer Applications, 111(3).

- Mittal, A., & Goel, A. (2012). Stock prediction using twitter sentiment analysis. Standford University, CS229 (2011 http://cs229. stanford. edu/proj2011/GoelMittal-Stock Market Prediction Using Twitter Sentiment Analysis. pdf), 15, 2352.

- Mokhtari, S., Yen, K. K., & Liu, J. (2021). Effectiveness of artificial intelligence in stock market prediction based on machine learning. arXiv preprint arXiv:2107.01031.

- Nair, B. B., & Mohandas, V. P. (2015). Artificial intelligence applications in financial forecasting–a survey and some empirical results. Intelligent Decision Technologies, 9(2), 99-140.

- Patel, U. K., Anwar, A., Saleem, S., Malik, P., Rasul, B., Patel, K., ... & Arumaithurai, K. (2021). Artificial intelligence as an emerging technology in the current care of neurological disorders. Journal of neurology, 268, 1623-1642.

- Sadia, K. H., Sharma, A., Paul, A., Padhi, S., & Sanyal, S. (2019). Stock market prediction using machine learning algorithms. Int. J. Eng. Adv. Technol, 8(4), 25-31.

- Shaban, W. M., Ashraf, E., & Slama, A. E. (2024). SMP-DL: a novel stock market prediction approach based on deep learning for effective trend forecasting. Neural Computing and Applications, 36(4), 1849-1873.

- Srivastava, A., & Sengupta, I. (2017). Predicting stock market: An approach with artificial intelligence. Management, 13(2), 73-77.

- Zavadskaya, A. (2017). Artificial intelligence in finance: Forecasting stock market returns using artificial neural networks.