

APPLICATION OF AI IN STOCK MARKET – PROFITABLE AFFAIRS?

**Dr. Shital Vekariya, Assistant Professor, Faculty of Commerce,
The Maharaja Sayajirao University of Baroda.**

**Pranav Sokhadia, TYBBA student, Faculty of Commerce,
The Maharaja Sayajirao University of Baroda.**

ABSTRACT

Among all of humanity's inventions, artificial intelligence is arguably the most sophisticated. And that's ignoring the fact that the subject is still substantially unexplored, meaning that the AI we currently see is simply the tip of the AI iceberg. Even if the truth has been repeatedly revealed and reiterated, it is still difficult to fully understand the probable future implications of artificial intelligence. This is due to AI's revolutionary and evolutionary effects on society, especially at such an early stage of its development.

Several AI available, including:

Reactive Machines

The most primitive versions of AI have extremely few capabilities. It means the capacity of the human mind to react to various stimuli. There is no memory-based functionality on these computers. This means such machines cannot use previously gained experiences to inform their present actions, i.e., these machines do not have the ability to “learn” and “relearn”. These machines could only be used for automatically responding to a limited set of inputs.

Limited Memory

In addition to possessing the characteristics of purely reactive machines, limited memory machines also have the ability to learn from past data and make decisions for the present and the future. All of today's AI systems, including those that employ deep learning, are trained using vast amounts of training data, which they

then store in memory to create a reference model for resolving new problems.

Theory of Mind

The next stage of artificial intelligence is what academics are now working on. By identifying the wants, feelings, beliefs, and thought processes of the entities it is engaging with, an AI at the theory of mind level will be better able to comprehend those creatures.

Self-awareness

The development of AI has reached its conclusion, yet it only exists in theory for now. AI that has evolved to be so similar to the human brain that it has acquired self-awareness is self-explanatorily referred to as self-aware AI. The ultimate goal of all AI research has been and will always be developing this kind of AI, which is decades, if not centuries, away from becoming a reality.

Artificial Narrow Intelligence

Artificial narrow intelligence is used to describe AI systems that can only carry out a single task on their own while possessing human-like abilities. These machines have a very small or restricted set of abilities since they are only capable of performing the tasks for which they have been designed.

Artificial General Intelligence

Artificial general intelligence refers to an AI agent's capacity to think, observe, comprehend, and act exactly like a human being. These

systems will be able to develop numerous abilities on their own.

Artificial Superintelligence

Artificial Superintelligence (AGI) development will likely be the apex of AI research since AGI will become the most powerful forms of intelligence on the planet.

REVIEW OF LITERATURE:

Anshul Mittal, et.al., 2012 with the help of this paper have tried to establish a correlation between “Public Sentiment” and “Market Sentiment” with the help of data collected from twitter. They gathered a lot of data (tweets) and used straightforward natural language processing techniques to try and gauge the sentiments of the general public. The population size is minimal because the dataset used for this study only includes tweets from English-speaking users. Yet, they were able to establish a link showing that people's moods actually influence their investment choices. In the introduction to this study, Rajan Bhav et al., 2020 noted that a company gets money mostly through stock markets and that forecasting stock markets is a challenging and fascinating undertaking. Stock prices are influenced by a wide range of factors. By using the information provided by Yahoo Finance, they have attempted to create a system that will forecast stock prices by linking it to the stock's historical performance.

The significance of artificial neural networks and their function in stock market predictions were highlighted by Smita Agrawal et al. in 2018 because of their capacity to deal with erratic and sparse data that changes over extremely short timescales. This study's primary goal is to use effective neural network models to predict stock values of firms. There

are many techniques, including genetic algorithms, but artificial neural networks were chosen due to their capability and aptitude to deal with the nonlinear, complicated, and unexpected stock market behaviour. The major goal of Indrani Mukherjee et al work .s from 2011 is to analyse the reasons behind the Indian stock market's low involvement and offer solutions for those reasons. Also, research on the general investment habits and involvement of Indians is done, as well as a solution to the issue of low participation. India's stock market is one of the biggest, ranking 8th globally and 4th in Asia as of 2010, with a market capitalisation of US\$1.63 trillion. Yet, the general public's involvement in the Indian stock markets is still dwindling; most Indians choose to invest their money or savings in fixed income instruments.

Stock trading is one of the most significant aspects of finance, according to V Kranthi Sai Reddy, 2018, and predicting the stock market is one of the most challenging undertakings because stock markets can be so unpredictable. This study employs machine learning to forecast the stock market. The task of making stock market predictions has been programmed in Python using a machine learning method known as SVM (Support Vector Machine) (Support Vector Machine). The information used for this was gathered from a number of international financial markets, and the model developed was able to produce higher models.

OBJECTIVES OF THE STUDY:

- 1) To evaluate the use of AI
- 2) To examine the impact of AI on stock market
- 3) To analyse the impact of AI on society

PURPOSE OF THE STUDY:

The stock's open, high, low, close, volume data, cost of various goods related to the stock, and forex (currency) price will be used to predict stock price range, unpredictability, risk, reward, pattern of stocks, examination of stock with other companion stocks, and correlation with global market. To determine the general sentiment of stock market investors, sentiment analysis of news is conducted.

METHODS OF MARKET PREDICTION:

The stock market can be predicted in a variety of ways, which makes it an interesting undertaking to undertake. How they will compare the methodologies will depend on the research:

Fundamental Analysis:

Fundamental analysis' main goal is to examine a company's underlying value. It is a technique for figuring out the intrinsic worth of a firm asset and for examining the variables that could affect the company's value in the future. This study is based on outside factors such as events, influences, and business trends. Top-down and bottom-up fundamental analysis can be broadly divided into two categories.

Unlike bottom-up research, which starts with a specific stock and then expands to include all other aspects like the industry and economy that affect the price, top-down analysis starts with a broad picture of the economy and then narrows it down to the industry before arriving at the specific firm. It is clear from the several sorts of basic analysis that there are analyses of the economy, the industry, and the company.

To make an investment decision, each of these three elements is carefully examined at the individual level. Company analysis is performed with the help of balance sheet analysis, P&L analysis, and Cash flow analysis.

Technical Evaluation:

Share prices are highly volatile; they fluctuate day to day, rising one day and falling the next. But, as time goes on, some clear patterns and tendencies start to emerge. The analyst investigates the share price trend using this specific methodology.

To put it another way, it is a technique for evaluating securities that entails looking at data generated by various market activities, like share price and volume. Technical analysis uses charts and other techniques to predict future behaviour.

Three fundamental premises constitute the basis of technical analysis:

- I) Market prices accurately reflect all information about a stock;
- II) Patterns have a propensity to recur.
- III) Stock prices follow trends.

Moving averages, momentum indicators, and charts can all be employed for technical analysis. The phrase "technical analysis" designates a vast range of approaches, all of which rely on the analysis of past performance to predict future outcomes.

Analytical Views: How The Securities Market May Benefit From AI:**1. Developing Trading Algorithms:**

- i. Using a collection of algorithms to trade in the market is not a new concept. According to a study, algorithmic trading accounts for around 70% of the daily volume traded on the market. The market is following particular patterns and tendencies. These patterns develop as a result of the securities market's high levels of supply and demand. Such wants and supply are produced when many algorithms perform trades simultaneously.
- ii. Knowledge of the financial market, trend analysis, and coding languages like Python,

Java, etc. are essential for this kind of coding and constructing algorithms. It is now impossible for everyone to possess the expertise needed for Algo trading. Even though a person is well-versed in industry and trend information, he might not be well-versed in coding languages. On the other hand, if one is proficient in coding, it is possible that he is unaware of the markets.

iii. The AI now enters the scene. In Algo trading, AI eliminates all human constraints. AI is knowledgeable about the market, trends, languages, and everything else you need.

2. Risk administration:

i. Losses can be decreased through risk management. When the risks outweigh the rewards, losses result. Traders have the potential to profit on the market if risk is effectively handled.

ii. It is the most important, though frequently disregarded, need for profitable trading. When a trader makes considerable earnings but loses them all in just one or two bad deals without using an effective risk management approach, the significance of this becomes clear.

- Determine the risks: The first stage is to determine the risks associated with transactions on the securities market. Market risk, credit risk, liquidity risk, operational risk, and regulatory risk are a few examples of these potential dangers.

- Gather and analyse data: AI can be employed to gather and examine enormous amounts of data in order to spot patterns and trends in consumer and market behaviour. Market information, news feeds, financial reports, and mood from social media are some examples of this data.

- Create predictive models: Using data analysis and AI, predictive models may be created that anticipate the possibility that certain risks will

materialise. These models can aid investors in making well-informed investment decisions.

- Deploy risk management techniques: With AI, risk management strategies that are intended to lessen the impact of risks on investment portfolios can be put into place. These tactics could involve diversification, hedging, and other methods of risk reduction.

- Monitor and adjust: To ensure the best performance, AI may also be used to assess the efficacy of risk management measures and make the necessary adjustments.

- In conclusion, AI may be an effective tool for managing risks in the securities market, assisting investors in identifying hazards, creating predictive models, putting risk management methods into practise, and monitoring and tweaking these tactics to achieve the best results.

3. Portfolio rebalancing:

i. Rebalancing entails realigning a portfolio's asset allocation to either its original target allocation or a new target allocation that takes into account the investor's evolving objectives, risk tolerance, or market conditions.

ii. Rebalancing is crucial because it can assist investors in managing risk and achieving their financial objectives. Investors can make sure their portfolio is in line with their investment goals and risk tolerance by maintaining a consistent allocation.

iii. It is generally recommended to invest no more than 10% of the value of your portfolio in any one asset type. Let's say the portfolio as a whole is worth \$100,000. Right now, no asset should be worth more than 10,000 invested. You must actively monitor the market for this.

iv. With AI, the same is now possible with the least amount of work. See what it is capable of.

v. For instance, if stocks have done well, the portfolio may become underweight in other

asset classes like bonds even while the value of bonds remains constant, as the value of stocks increases. To return the portfolio back to its desired allocation, rebalancing would entail selling some of the stocks and purchasing more bonds. The AI will decide if equities should be sold and money should be put into bonds. AI is able to continuously track market circumstances and send notifications when the portfolio swings outside of predetermined boundaries. Investors may be able to rebalance their portfolios more effectively and promptly as a result, lowering the risk of losses.

vi. Several portfolio rebalancing techniques exist, including calendar-based, percentage-based, and threshold-based approaches.

- Calendar-based rebalancing entails rebalancing on a predictable schedule, like annually or semi-annually.
- Percentage-based rebalancing entails rebalancing the portfolio when it deviates by a specific percentage from the desired allocation.
- Threshold-based rebalancing entails rebalancing when the portfolio veers away from a predetermined threshold level.

AI is capable of analysing social media posts, news articles, and other market sentiment data to ascertain how investors feel about certain stocks. As a result, investors may be better able to see trends and decide whether to rebalance their portfolios.

4. Spotting Patterns and Trends:

i. By analysing vast amounts of market data, including stock prices, trade volumes, and economic indicators, AI can spot trends and patterns in the securities markets.

ii. AI algorithms are capable of analysing time-series data, such as stock prices over an extended period of time, to spot patterns and trends. Investors can use this information to

forecast market trends and make wise investment choices.

iii. AI can group comparable stocks based on attributes like industrial sector, market capitalization, or growth potential using clustering and classification algorithms. By diversifying their portfolios, this can assist investors in locating investment opportunities and risk management.

iv. Deep learning algorithms can be used by AI to find intricate patterns and connections in market data. Deep learning can be used, for instance, to spot trends in financial accounts or establish links between market movements and economic indicators.

ANALYSIS:

Artificial intelligence has changed the finance industry. Comparatively speaking to other sectors and businesses, the finance sector was one of the early adopters of artificial intelligence. There are several uses for artificial intelligence in the financial industry. The use of artificial intelligence in stock markets has both benefits and drawbacks.

Benefits:

- Artificial intelligence will make calculated, accurate, and unbiased investment decisions that are comparable to those made by human advisors.
- Planning for future issues can be made easier with artificial intelligence.
- Artificial intelligence can also be used to improve the back end of financial trading, including IT-related concerns, financial data processing, and labour savings connected to auditing and compliance.
- It makes it possible to analyse and track stock market sentiment in real time.

- The ability of artificial intelligence to consider patterns that are not humanly conceivable will be a major boost in the field of trading.
- When compared to a human advisor, this pattern recognition can be completed more quickly.

The adoption of artificial intelligence is hindered by a lack of technical employees with the necessary knowledge and experience to implement the technology.

Artificial intelligence is not inexpensive; the cost of purchasing it and using it on a big scale adds to its expense and make it highly expensive.

- When artificial intelligence technologies are implemented, privacy becomes one of the main concerns.
- When automation increases, job losses increase and unemployment rates rise.

AI and SEBI:

In order to prevent manipulations, the Securities and Exchange Board of India has opted to utilise the capabilities of artificial intelligence and big data (PTI, The Hindu).

To take advantage of technologies like artificial intelligence, machine learning, big data, etc., SEBI wants to develop a "data lake" initiative. SEBI was able to come to the conclusion that social media posts had been utilised to manipulate the securities market after conducting some study and closely monitoring social media posts.

It is challenging to detect fraud using common tools and software that solely evaluate price and volume structured data (Ajay Tyagi, Chairman SEBI). This technology will be used by SEBI to examine unstructured data, such as posts on social media. A paradigm shift in the securities market environment may be brought about by technologies like artificial intelligence and

machine learning, according to the SEBI chief. Tools for artificial intelligence and machine learning are already in use in a number of industries, including management of trading funds, supervision, and surveillance.

CONCLUSION:

Several businesses and many retail investors have been using automated trading or algorithmic trading technologies for a long time. Yet, this is not the only instance of AI that may be employed to forecast the stock market. Given how artificial intelligence has impacted other industries, it won't be long until it entirely replaces stock trading (Financial Singularity). Because machines can make choices more quickly and effectively than human traders, incorporating artificial intelligence into stock trading has many advantages.

GOAL AND RECOMMENDATION FOR THE FUTURE:

Technology-wise, artificial intelligence is constantly developing and expanding very quickly. Once put into use, it will continue to grow and learn in order to make wiser decisions. Many participants in the financial market have invested in AI technology to enhance functioning and communication, and it has the potential to radically alter the sector. All of these different artificial intelligence technologies, including chatbots, machine learning, and others, can be improved on a personal level. Some changes might be made to boost their productivity and better their decision-making.

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