European Economic Letters
ISSN 2323-5233
Vol 15, Issue 3 (2025)
http://eelet.org.uk

Smart Finance- The Involvement of Artificial Intelligence in FinTech

Dr. Pooja. Srivastava, Ragini Dixit, Eti Agarwal

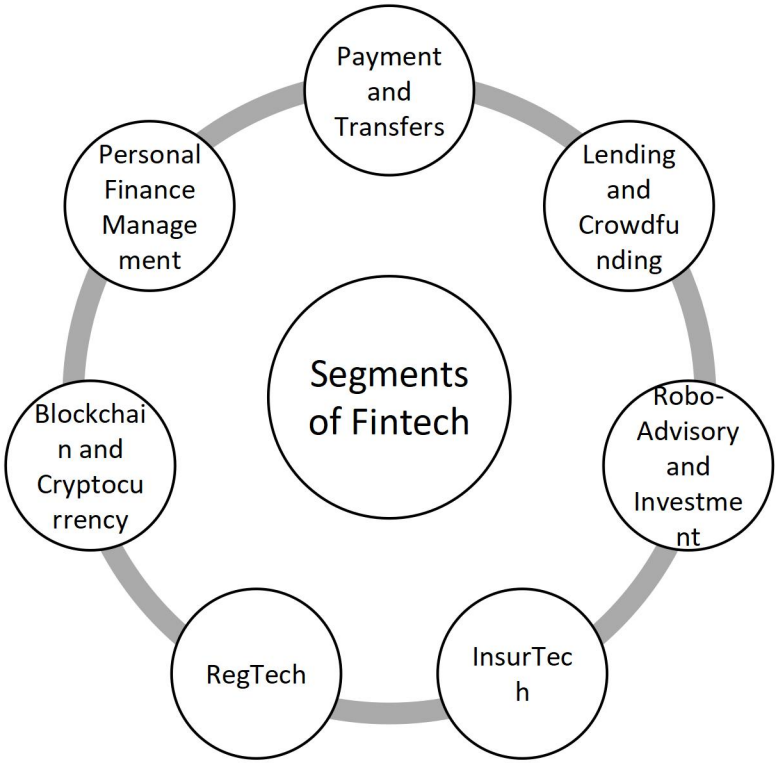
Abstract -
The Financial industry has transformed due to growth of FinTech. It gives hike to new opportunities for better customer experience, investment strategies and risk management. The game-changer behind this revolution is Artificial Intelligence (AI). The research paper analyzes the involvement of Artificial intelligence in financial service industry. The research paper is exploring 3 focal areas of AI in fintech- Algorithm trading, Predictive analytics and robo-advisors for smart investment. The paper includes these technologies, their impact and their implementation in financial industry. This paper Illustrates how AI is changing and re-shaping the future of finance by giving smarter investment opportunities.
Index Terms- Algorithm Trading, Fintech, Predictive Analysis and Robo-advisors.

1. Introduction

1.1 Fintech Industry

Financial Technology, or Fintech in short, is the term used to describe the way in which financial firms utilize technology into their offerings in order to enhance, or automate their operations. It involves an extensive range of tools, apps, and solutions intended to innovate, simplify, or change established financial processes. The term "fintech" includes a number of sectors that use technology to improve customer experiences, lower operating costs, and launch new business models. These sectors include banking, payments, lending, insurance, investing, and personal finance.

Segments of Fintech



1.2 Algorithm Trading

Algorithmic trading, often known as automated trading or algo-trading, is the practice of using computer algorithms to execute trading in financial market quickly and with minimal human interruption. Based on data inputs or market conditions,

these algorithms use preset rules or strategies to determine when and how to buy or sell assets like stocks, bonds, or currencies.
Algorithmic trading's main objective is to execute orders more quickly, at lower trading expenses, and maybe take advantage of market opportunities by instantly analyzing enormous volumes of data. These algorithms are frequently employed in high-frequency trading (HFT), where hundreds of deals can take place in a split second, and they can function with variables like price, volume, timing, and other market conditions.

1.3 Robo-Advisors

It is an automated investment platform which offer portfolio management services and financial advising with minimal human participation. These platforms build and manage an investment portfolio for customers using software and algorithms which take into consideration their risk tolerance, financial objectives, and other individual characteristics.
Robo-advisors usually use an online questionnaire to gather data from their clients, evaluating variables like age, income, risk tolerance, and financial objectives. Based on this information, the robo-advisor develops a customized investment plan, frequently using exchange-traded funds (ETFs) or inexpensive index funds to establish a diversified portfolio.

1.4 Predictive Analysis

Predictive analysis is the process of analyzing historic data and forecasting future patterns or events using statistical methods, machine learning algorithms, and data mining. Finding patterns and connections in data that may help in forecasting and improve decision-making is the primary objective of predictive analysis.

The emergence of artificial intelligence (AI) has played a major role in the recent rapid change of the FinTech sector. Financial services are becoming more data-driven, individualized, and efficient thanks to AI. AI is improving the speed, accuracy, and intelligence of financial operations through applications in predictive analytics, robo-advisors, and algorithmic trading. AI's capacity to analyze large amount of data, spot trends, and predict results is very useful in the financial markets, where risk, time, and strategy are crucial factors.
AI and machine learning (ML) can execute intricate calculations, adjust to new data, and enhance performance over time, they have become extremely useful tools in the financial industry. Simple automation was the first use of AI in banking, but more sophisticated uses soon followed. AI has emerged as a key component of consumer financial services, portfolio management, and algorithmic trading, launching a new era of "smart finance.

2. Literature Review

This literature review examines existing studies on the application of Artificial Intelligence (AI) in the FinTech sector, focusing on three key domains: algorithmic trading, robo-advisors, and predictive analytics. These fields are essential to the growth of "smart finance," which uses AI to improve risk mitigation, optimize financial strategies, and improve investment decision-making.

2.1 Fintech

2.1.1 Development of FinTech

The emergence of early computer-based financial systems in the 1960s and 1970s marked the beginning of FinTech's early advances. But according to Puschmann (2017), the modern FinTech revolution got its start in the early 21st century thanks to developments in mobile and internet access. From early digital banking systems to the emergence of disruptive technologies like blockchain technology, Arner, Barberis, and Buckley (2016) distinguished significant stages in the development of FinTech. The growth of FinTech products, especially mobile payment systems like Apple Pay, PayPal, and Alipay, has been further accelerated by the growing dependence on digital platforms and smartphones (Raghupathi & Raghupathi, 2018). This technological change is closely tied to the increasing trend toward cashless economies.

2.2 Algorithm Trading

2.2.1 Development of Algorithm trading

Algorithmic trading is the implementation of automated, computer-driven algorithms to conduct transactions based on predetermined criteria. Although algorithmic trading has existed since the 1970s, its incorporation with artificial intelligence is a relatively new development. The advent of machine learning (ML) techniques has significantly increased the precision and effectiveness of algorithmic trading strategies, claim Narayan and Sharma (2019). These algorithms, which are frequently quicker than humans, examine past data, spot trends, and forecast future events to guide trade execution in real-time.

2.2.2 The involvement of AI in Algorithm Trading

Algorithmic trading relies heavily on AI to increase prediction accuracy, lower trading costs, and accelerate decision-making. According to Bose and Mehta (2020), deep learning models have improved the capacity to handle vast and complicated datasets that were previously inaccessible using conventional algorithms. Algorithms may learn and adapt from past market data thanks to machine learning techniques including supervised learning, reinforcement learning, and neural networks, which optimize trading tactics. According to Liu and Tan (2021), algorithmic trading using reinforcement learning can help AI agents improve their decision-making over time by allowing them to hone their trading tactics through trial and error.

2.2.3 Disadvantages of Algorithm Trading

Even though AI has many advantages, there are disadvantages to algorithmic trading. Chen and Zhang (2023) draw attention to worries about the possibility of "flash crashes" and market volatility brought on by an excessive dependence on algorithms. Furthermore, data quality is a critical concern. Inaccurate forecasts resulting from poor data quality may compromise the efficacy of AI trading systems.

2.3 Robo-Advisors

2.3.1 Development of Robo-Advisors

Robo-advisors are online services that use AI and algorithms to manage portfolios and offer automated investing advice. The emergence of low-cost investment management technologies in the early 2000s led to an increase in the popularity of robo-advisors, according to Bose and Mehta (2020). In order to build and manage a diversified portfolio, these platforms use artificial intelligence (AI) to evaluate an investor's risk tolerance, financial objectives, and other personal preferences.

2.3.2 The involvement of AI in Robo-Advisory Services

AI improves robo-advisory services by providing tailored investing solutions that can automatically respond to market conditions. According to Kuo and Chiu (2022), robo-advisors can continuously optimize portfolios and automatically rebalance them when market conditions change thanks to machine learning algorithms, frequently at a cheaper cost than traditional financial advisors. AI also makes financial advice more accessible by enabling scalability, which enables services to be provided to a large number of people without the need for extra human resources.

2.3.3 Advantages and Disadvantages

The main advantages of AI-powered robo-advisors are their high level of customization, affordability, and accessibility. AI robo-counselors equalize access to individualized financial planning for people who might not otherwise be able to pay for traditional financial advisors, claim Liu and Tan (2021). But there are drawbacks, like the absence of human intuition, which might influence choices in highly irregular or unpredictable situations. Additionally, because robo-advisors are only as good as the data they use to make recommendations, Narayan and Sharma (2019) draw attention to worries regarding algorithmic bias and data privacy.

2.4 Predictive Analytics

2.4.1 Development of Predictive Analytics

Statistical algorithms and machine learning techniques are used in predictive analytics to evaluate past data and forecast future results. According to Liu and Tan (2021), financial projection benefits greatly from predictive analytics driven by AI. Large datasets can be analyzed by AI models to find hidden patterns and connections that improve market forecasting accuracy.

2.4.2 The involvement of AI in Predictive Analytics

Predictive analytics benefits greatly from AI's capacity to process and evaluate enormous amounts of both structured and unstructured data. Kuo and Chiu (2022) state that one way AI can forecast market movements is through sentiment analysis, which entails examining news articles, social media posts, and other online information. Artificial intelligence (AI) systems can forecast price changes and direct investment choices by analyzing the sentiment surrounding financial assets or events.

2.4.3 Disadvantages of Predictive Analytics

Bose and Mehta (2020) note that overestimation of models is a potential problem, when algorithms become too precisely matched to previous data, making them less successful in projecting future market activity, even though predictive analytics offers powerful capabilities. Furthermore, as Chen and Zhang (2023) point out, the efficacy of AI-based forecasts is limited since external variables like natural disasters or geopolitical events are not always predictable using historical data.

The financial landscape has changed dramatically as a result of the incorporation of AI technology into predictive analytics, robo-advisory services, and algorithmic trading. AI has enhanced risk reduction, individualized investment management, and market productivity. The influence of AI will be determined in large part by ethical and regulatory factors, though, as its

usage grows. According to the literature, artificial intelligence (AI) has the potential to promote FinTech innovation, but its drawbacks and restrictions—such as the dangers of overfitting, data biases, and regulatory oversight—must be carefully considered.

3. Research Objectives

3.1 To study the role of AI algorithms in changing the prospect of trading by making better decision-making and risk management.
3.2 To study the involvement of Robo-advisors in modifying the advisory industry and wealth management.
3.3 To analyze effectiveness of AI and predictive analytics in predicting market trends and investment strategies for better investment decisions.
3.4 To assess the effectiveness of AI for better financial decision-making.

4. Research Methodology

4.1 Nature and Source of data

For the purpose of the study both primary and secondary data will be used to accomplish given objectives.

4.1.1 Primary source of data

For research purpose, the collection of data will be done through self-developed questionnaire.

4.1.2 Secondary Source of Data

For the purpose of research secondary data will be collected from journals, articles and published research papers and various reports published by companies.

4.2 Sample Size

The sample size for the research purpose for primary data is 50 from city of Lucknow.

4.2.1 Sampling Technique

For the purpose of the research convivence sampling technique is used.

4.3 Research Design

The objective of the study to comprehend how AI technologies contribute in the growth of financial service sector. Therefore, I will be conducting descriptive research.

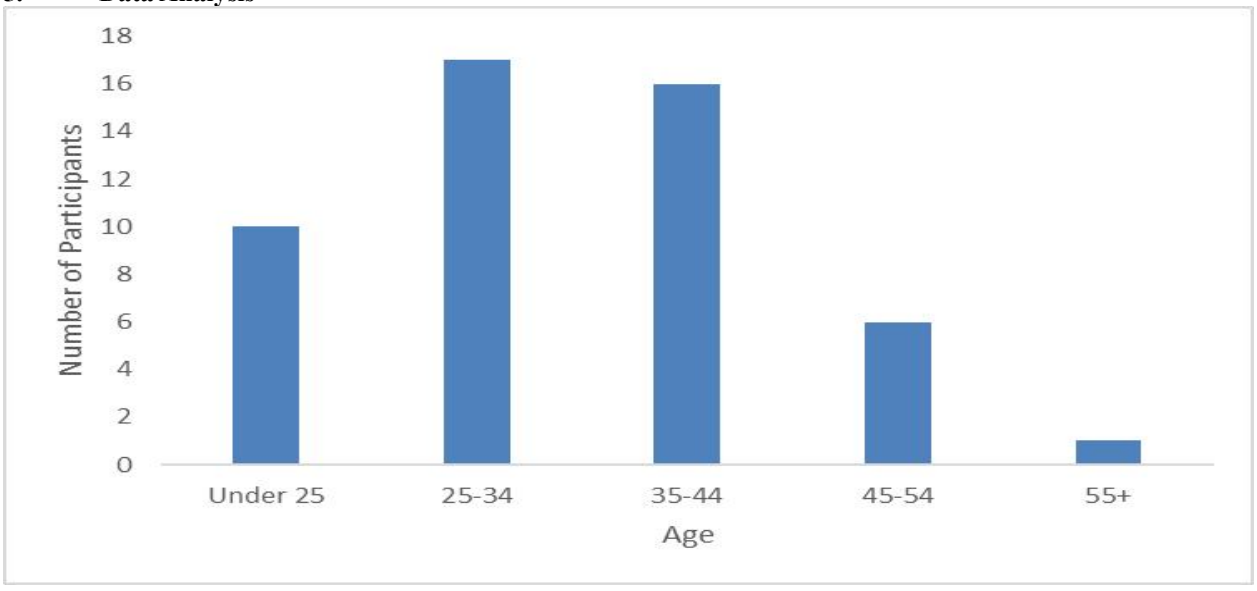
4.4 Data Analysis

Both primary and secondary data is analyzed through graphical and visualization techniques. Main graphical techniques were bar graph, pie chart and line graph.

4.4.1 Research Tool

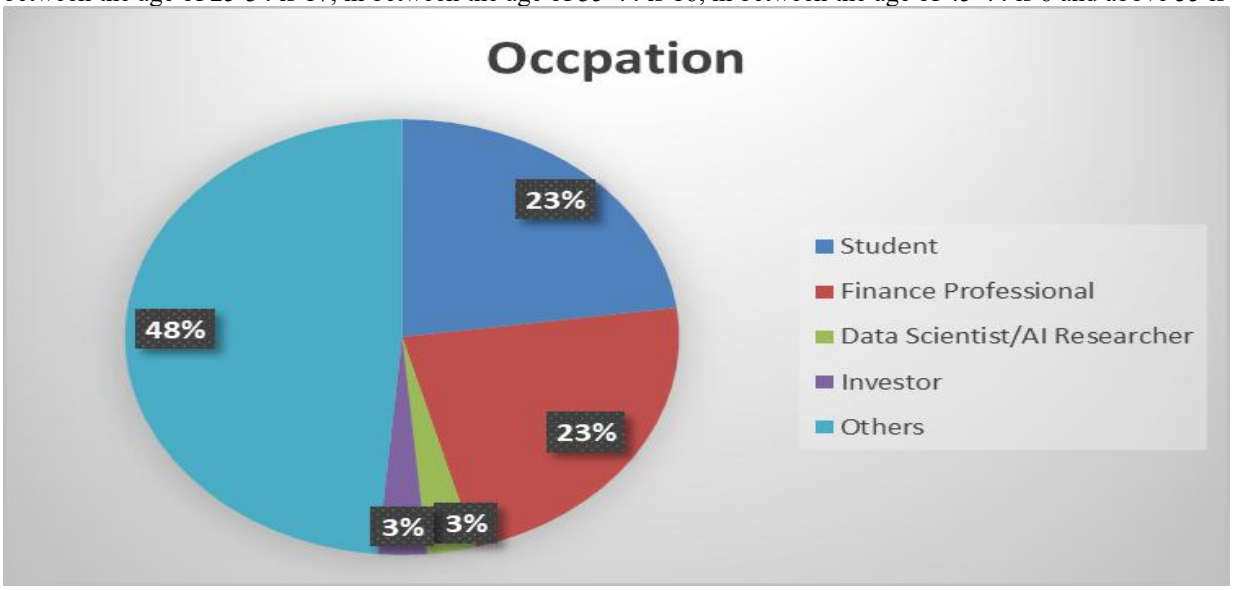
Pie chart and Bar Diagram

5. Data Analysis

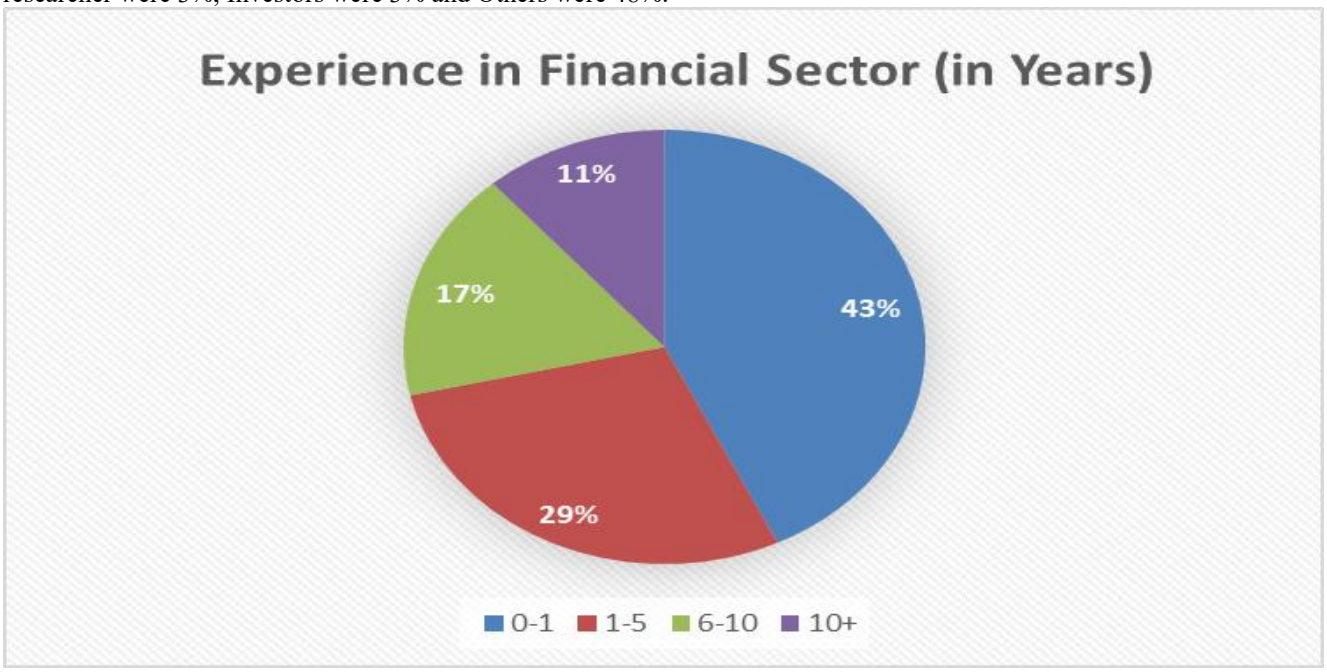


European Economic Letters
ISSN 2323-5233
Vol 15, Issue 3 (2025)
http://eelet.org.uk

The above chart shows age of the participants, Number of Participants under the age of 25 is 10, Number of participants in between the age of 25-34 is 17, in between the age of 35-44 is 16, in between the age of 45-44 is 6 and above 55 is 1.

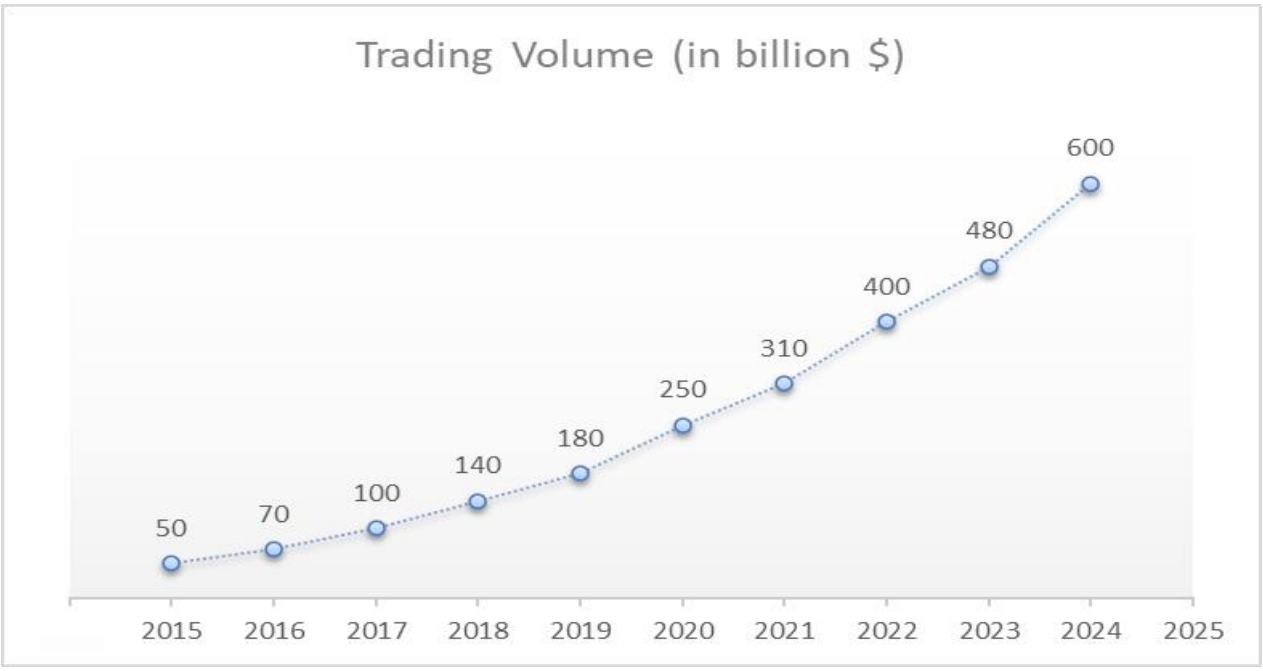


The pie chart shows the occupation of participants. Students were 23%, Finance Professional were 23%, Data Science/AI researcher were 3%, Investors were 3% and Others were 48%.



The pie chart shows the experience of participants in the financial sector. The participants with the experience of 0-1 years were 43%, The participants with the experience of 1-5 years were 29%, The participants with the experience of 6-10 years were 17% and rest 11% were having the experience of 10+ years.

European Economic Letters
ISSN 2323-5233
Vol 15, Issue 3 (2025)
http://eelet.org.uk



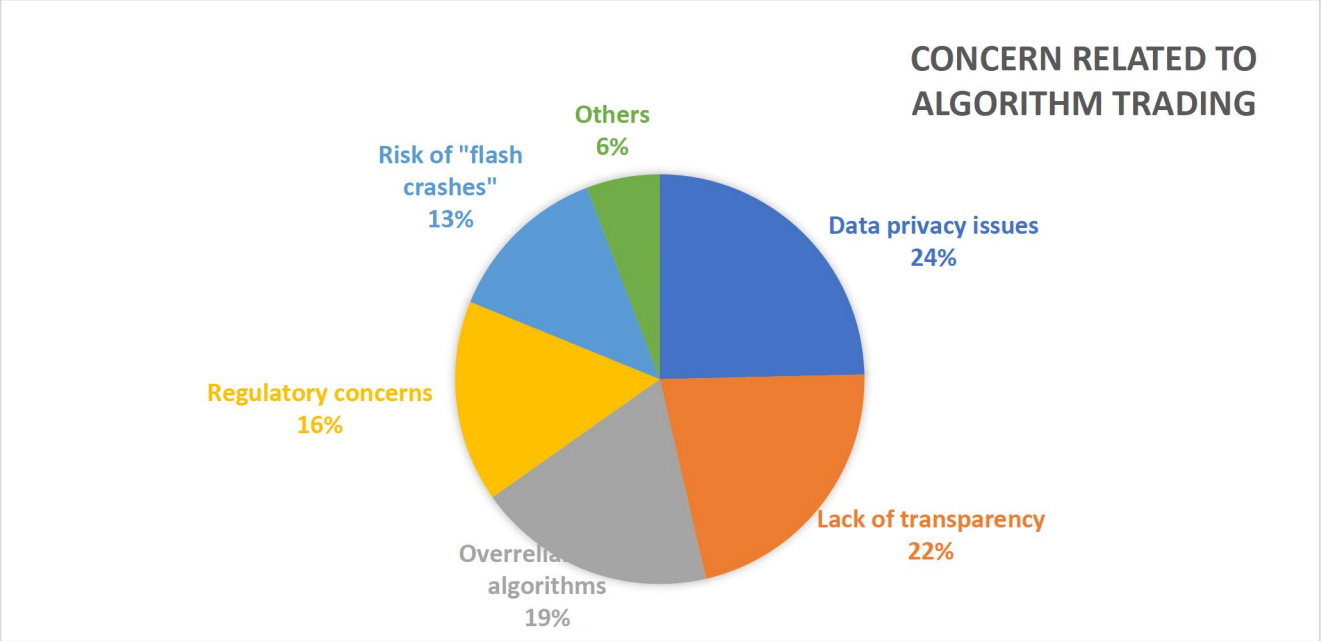
*79+ Amazing Algorithmic Trading Statistics (2025)- Analyzing Alpha

The chart is showing upward growth of AI-Driven trading as the trading volume in 2015 was around 50$ Billion. In Year 2020, The trading volume reaches to 250$ Billion as AI became radically mixed in Hight Frequency Trading, Hedge funds and Automated Trading Systems. In 2025 AI- Driven trading volume grow to $600 Billion, Showing the growth in algorithm trading and risk management systems.

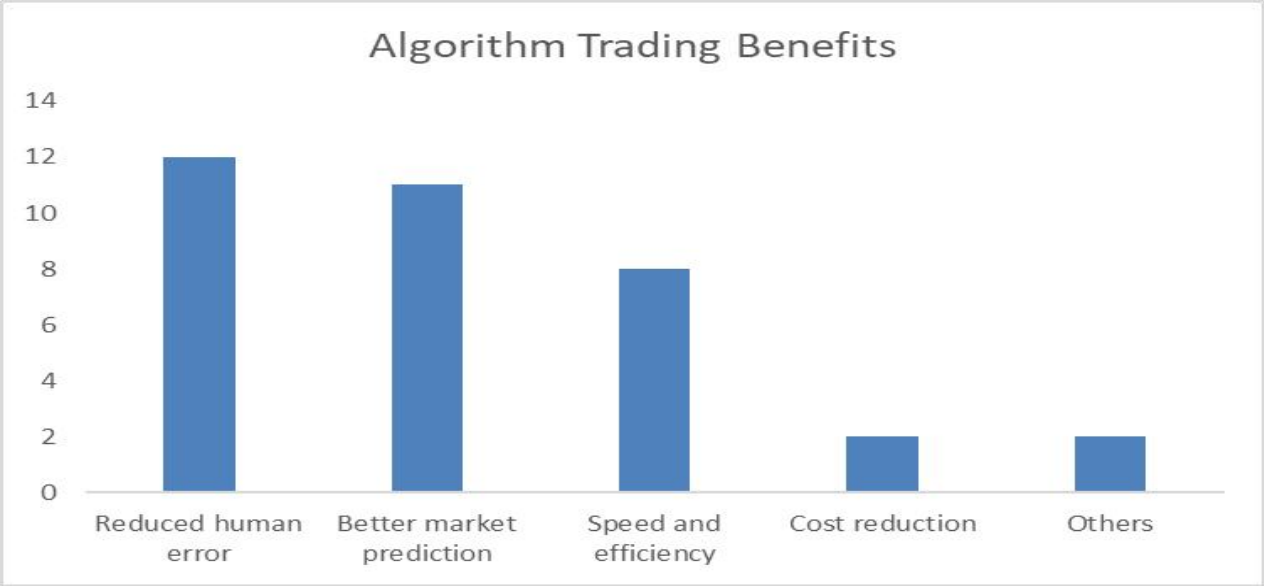
European Economic Letters
ISSN 2323-5233
Vol 15, Issue 3 (2025)
http://eelet.org.uk

[2208.07168] AI for trading strategies

Through this chart, we can analyze that AI trading is showing the growth in upward direction with less fluctuation which reflects the better decision-making and risk management. Whereas, The Traditional trading is showing more fluctuation indicating towards high-risk exposure and uncertain loss. The AI-driven trading gives higher returns with lower amount of risk.

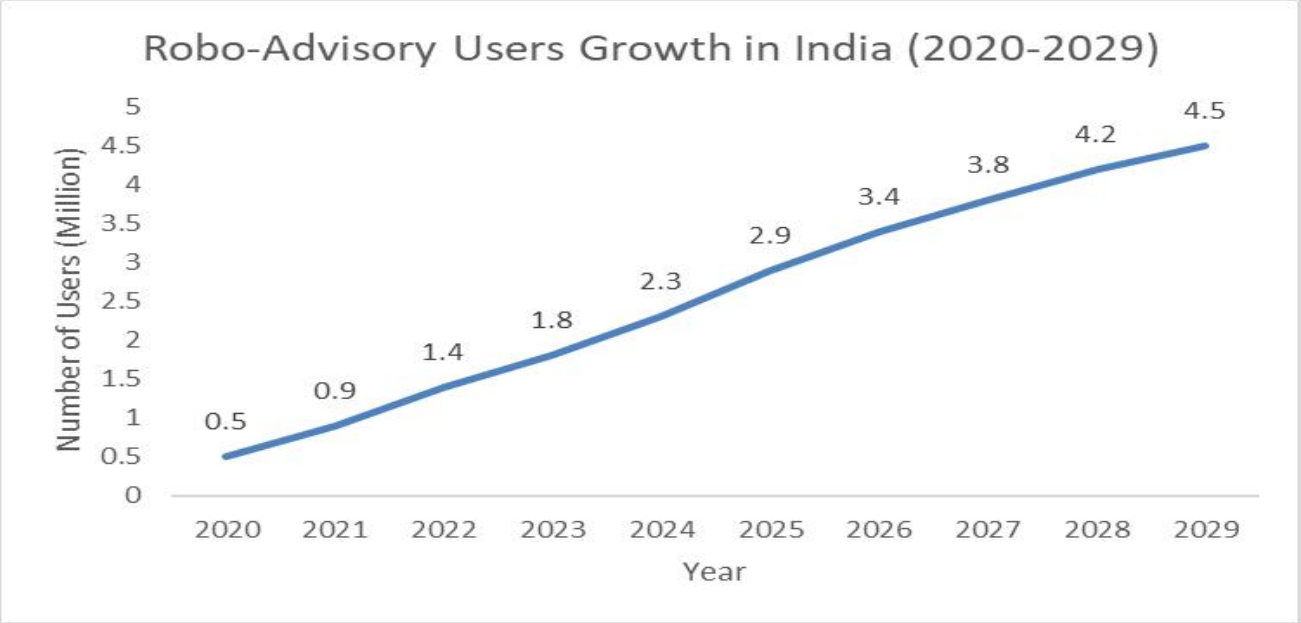


The chart is showing concern related to Algorithm trading. The data privacy is the main concern of participants, Lack of transparency standing at second, followed by Overreliance on algorithm, followed by regulatory concerns, followed by risk of “Flash crashes”, and others.



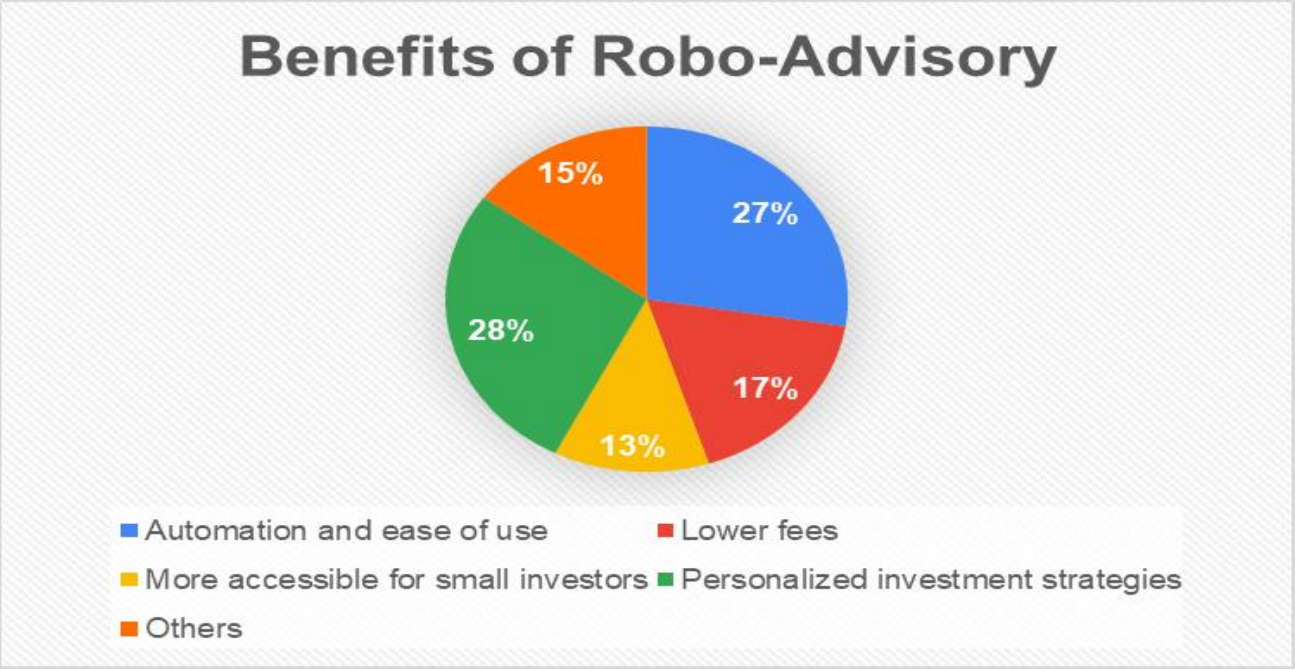
According to chart, Algorithm trading main benefit is reduced human error, then better market prediction, then speed and efficiency, then cost reduction and then others.

European Economic Letters
ISSN 2323-5233
Vol 15, Issue 3 (2025)
http://eelet.org.uk



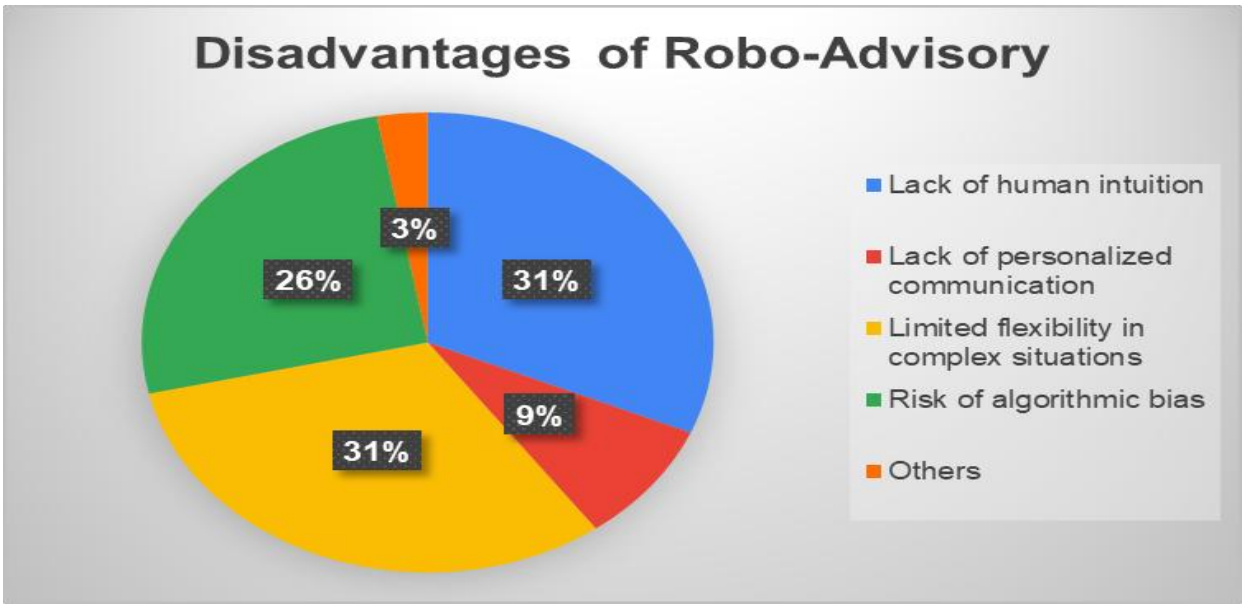
Robo Advisory Market Size, Share & Growth Forecast, 2033

In the chart, Robo-advisory user is growing with stable growth. In 2020, The Robo- advisory service users in India were 0.5 million and it is projected to reach 4.5 million in 2029. In year 2020-2022 there was slow and stable growth, 2023-2026 there will be fast adoption of technology-based investment solutions which will increase the users from 1.8 million to 3.4 million in the year 2023 and 2026 respectively. In year 2027-2029, the Robo-advisory services will become mainstream services.

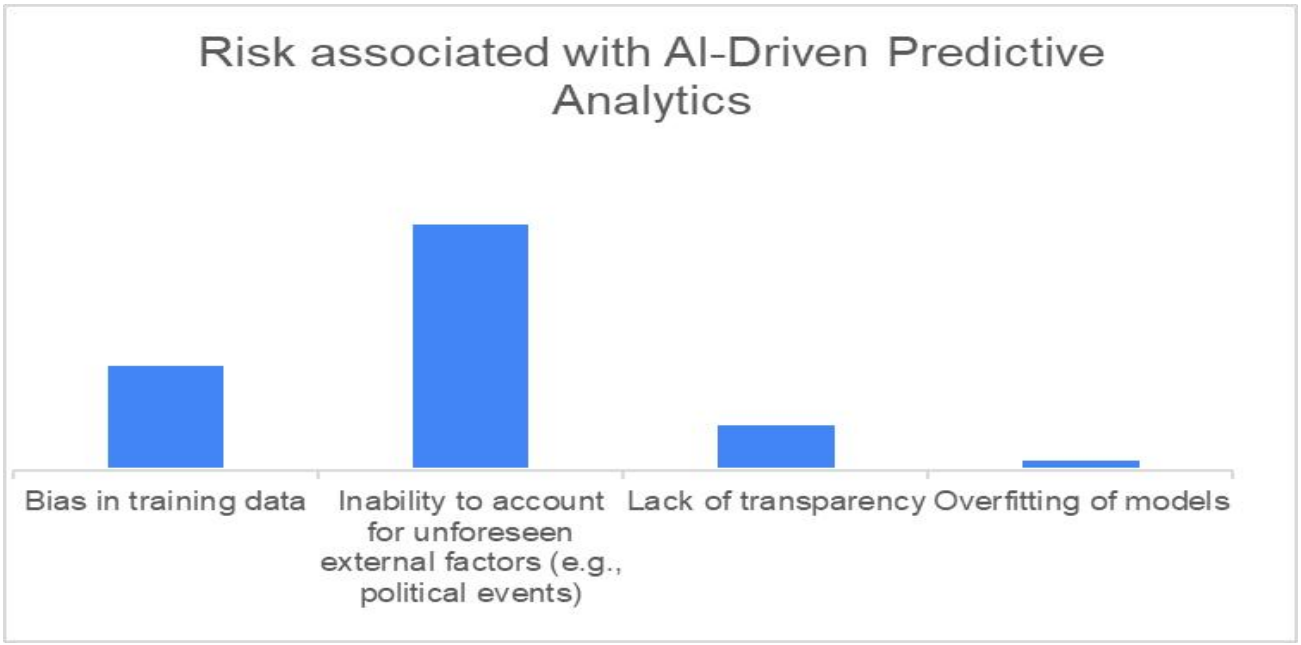


According to chart, Robo-Advisory main benefit is personalized investment strategies, then automation and ease of use, then lower fees, then others and then more accessible for small investors.

European Economic Letters
ISSN 2323-5233
Vol 15, Issue 3 (2025)
http://eelet.org.uk

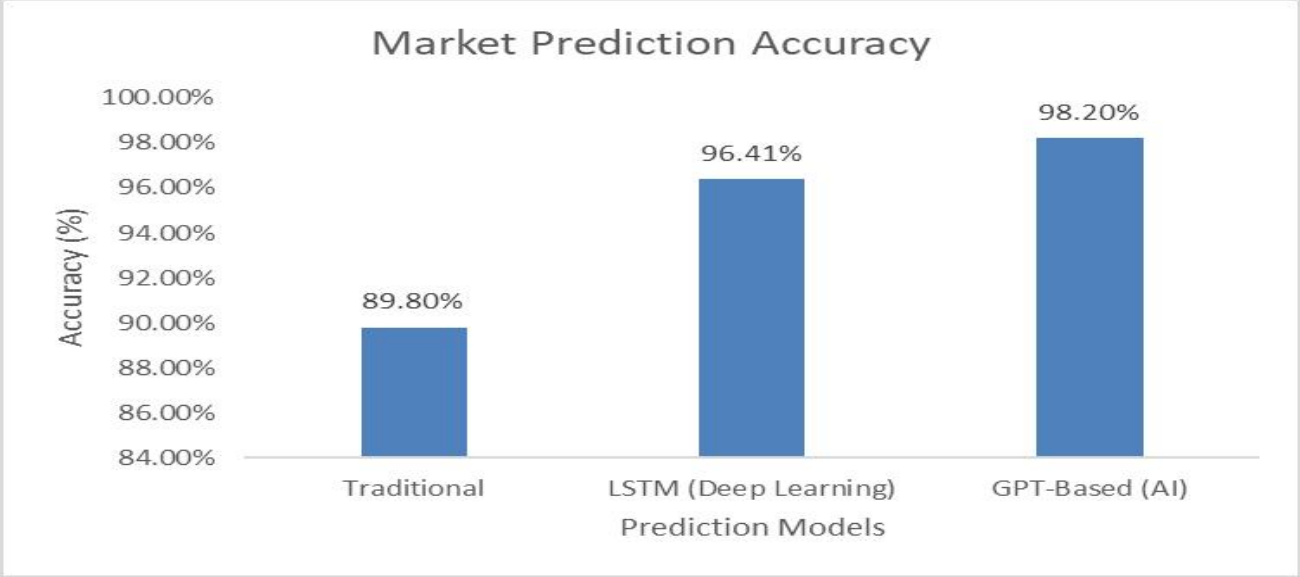


The chart is showing concern related to Robo-Advisory. The lack of human intuition and limited flexibility in complex situations are the main concern of participants, Risk of algorithmic bias standing at second, followed by lack of personalized communication and others.



The chart is showing concern related to AI-Driven Predictive Analytics. The Inability to account for unforeseen external factors is the main concern of participants related to predictive analytics, Bias in training data standing at second, followed by lack of transparency and overfitting of models.

European Economic Letters
ISSN 2323-5233
Vol 15, Issue 3 (2025)
http://eelet.org.uk



A survey on long short-term memory networks for time series prediction - ScienceDirect
The Chart is showing the accuracy of market prediction models. Traditional Model gives 89.80% accuracy. LSTM and GPT-Based prediction models provide 96.41% and 98.20% accuracy respectively.

6. Conclusion

- Artificial intelligence (AI) is revolutionizing trading by improving execution speed, risk management, and decision-making. The following are some crucial elements that demonstrate this change:

○ **Improved Ability to Make Decisions:**

Data Analysis and Pattern Recognition: By analyzing enormous volumes of both historical and current data, artificial intelligence (AI) systems are able to spot sophisticated patterns and trends, empowering traders to base their judgments on insights derived from data.

○ **Enhanced Speed of Execution:**

High-Frequency Trading (HFT): AI-powered high-frequency trading systems take advantage of minor price fluctuations and market liquidity gaps by executing a large number of trades at incredibly fast speeds.

- Artificial intelligence-powered robo-advisors are transforming the wealth management and financial advisory industries by improving investment decision-making, cost effectiveness, individualization, availability, and management of risks. Several important factors are driving the adoption of AI in this industry:

○ **Improved Portfolio Optimization and Decision-Making**

In order to produce accurate and fact-based investment recommendations, AI-driven algorithms examine enormous databases, including market patterns, economic indicators, and investor behavior. By enhancing asset allocation, rebalancing, and tax-loss harvesting, machine learning models increase the effectiveness of investment strategies.

○ **Accessibility and Economic Efficiency**

By automating investment management, robo-advisors lower the cost of financial advising services and increase accessibility to asset management. Robo-advisors make financial management more accessible, while traditional financial advising firms can have high costs and minimum investment requirements.

○ **Customization Using Big Data and AI**

Sophisticated AI algorithms integrate user data to offer individualized investment plans according to timeline, tolerance for

risk, and financial objectives. Through chatbots and AI-powered financial assistants, robo-advisors may provide personalized financial advice thanks to natural language processing (NLP).

- **Better Compliance and Risk Evaluation**

By evaluating current market data and personal financial patterns, AI improves risk profile and suggests appropriate investment plans. In order to ensure compliance with financial rules and minimize human error, robo-advisors integrate regulatory frameworks and compliance technology.

- Predictive analytics and artificial intelligence (AI) are revolutionizing the forecasting of risks, investment opportunities, and market trends, allowing for more intelligent and calculated investment choices. These technologies improve decision-making accuracy, optimize risk management, and offer deeper market insights by utilizing big data, machine learning, and sophisticated algorithms.

- **Better Forecasting of Market Trends**

Large volumes of historical and current market data are analyzed by AI algorithms to find patterns and trends that help investors better predict market moves. Economic trends, industry changes, and stock price swings can all be predicted with the use of techniques like sentiment analysis, deep learning, and reinforcement learning.

- **Finding Investment Possibilities**

AI-driven screening of growth stocks, cheap assets, and promising developing industries is made possible by predictive analytics. Robo-advisors with AI capabilities offer individualized investment plans according to a client's objectives, risk tolerance, and market circumstances.

- **Advanced Risk Mitigation and Management**

In order to maximize portfolio diversification and reduce losses, AI-driven risk assessment models examine volatility, macroeconomic indicators, and past downturns. By warning investors about possible dangers including asset bubbles, market crashes, and geopolitical upheavals, predictive models enable proactive decision-making.

- **Adaptive Strategies and Real-Time Decision-Making**

Real-time data processing by AI-driven trading algorithms allows them to dynamically modify investment strategies in response to market conditions.
Automated portfolio rebalancing maximizes returns while guaranteeing alignment with an investor's financial goals.

7. References

1. Accenture. (2020). The future of fintech: How artificial intelligence is shaping financial services. Accenture. https://www.accenture.com/us-en/insights/financial-services/future-fintech
2. Analyzing Alpha. (n.d.). Algorithmic trading stats. Analyzing Alpha. Retrieved from Analyzing Alpha
3. Auer, R. A., & Claessens, S. (2018). Fintech, digital currency, and the future of banking. International Finance Discussion Papers, 1219. https://doi.org/10.2139/ssrn.3036617
4. Bose, S., & Mehta, R. (2020). Robo-advisory services in the era of AI: A new wave of financial planning. Journal of Financial Innovation, 8(3), 45-60.
5. Chan, E. (2009). Algorithmic trading: Winning strategies and their rationale. Wiley.
6. Chen, H., & Zhang, H. (2023). Regulation of AI in the financial sector: Emerging concerns and frameworks. Journal of Financial Regulation, 10(2), 198-212.
7. Chiu, S., & Li, X. (2020). Artificial intelligence in financial markets: Cutting edge applications for risk management, portfolio optimization, and economics. Wiley Finance.
8. Davey, K. (2014). Algorithmic trading: The play-at-home version. CreateSpace Independent Publishing Platform.
9. Grand View Research. (2023). Robo advisory market size, share & growth report, 2030. Grand View Research. Retrieved from Grand View Research

10. Gomber, P., Kauffman, R. J., Parker, C., & Weber, B. W. (2018). On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. Journal of Management Information Systems, 35(1), 220-265. https://doi.org/10.1080/07421222.2018.1451950
11. He, Z., & Li, Z. (2017). A review on machine learning in finance. International Journal of Machine Learning and Computing, 7(5), 99-105. https://doi.org/10.18178/ijmlc.2017.7.5.646
12. IMARC Group. (2026). Robo advisory market: Global industry trends, share, size, growth, opportunity and forecast 2024-2029. IMARC Group. Retrieved from IMARC Group
13. Jabeen, F., & Khan, R. A. (2021). The role of AI in FinTech: A systematic review and future directions. International Journal of Computer Applications, 174(8), 27-34. https://doi.org/10.5120/ijca2021920533
14. JPMorgan Chase. (2023). AI & machine learning in financial markets. JPMorgan AI Research. https://www.jpmorgan.com
15. Kuo, H., & Chiu, Y. (2022). Artificial intelligence applications in predictive finance: A comprehensive review. Journal of Artificial Intelligence in Finance, 7(1), 32-48.
16. Liu, S., & Tan, L. (2021). Predictive analytics in financial markets: Opportunities and challenges. International Journal of FinTech Studies, 6(4), 90-112.
17. McKinsey & Company. (2018). AI in financial services: Revolutionizing wealth management. McKinsey & Company. https://www.mckinsey.com/industries/financial-services/our-insights
18. Moghar, A., & Hamiche, M. (2020). Stock Market Prediction Using LSTM Recurrent Neural Network. Procedia Computer Science, 170, 1168-1173. https://doi.org/10.1016/j.procs.2020.03.049
19. Narayan, P. K., & Sharma, S. S. (2015). Financial markets and artificial intelligence: A survey. Journal of Computational Finance, 17(2), 1-18. https://doi.org/10.21314/JCF.2015.093
20. Pilla, P., & Mekonen, R. (2025). Forecasting S&P 500 Using LSTM Models. arXiv preprint arXiv:2501.17366. Retrieved from https://arxiv.org/abs/2501.17366
21. PwC. (2017). Global FinTech Report 2017: Redrawing the Lines. PricewaterhouseCoopers (PwC). https://www.pwc.com/gx/en/industries/financial-services/global-fintech-report.html
22. Statista. (2025). Robo-advisors – worldwide | Statista market forecast. Statista. Retrieved from Statista
23. Sultana, A., & Reddy, S. P. (2024). Comparative Analysis of ARIMA and LSTM Models for Stock Price Prediction. 2024 IEEE/ACIS 27th International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing (SNPD), 240-245. https://doi.org/10.1109/SNPD61259.2024.10673919
24. Thomson, A., & Stewart, D. (2020). The future of robo-advisory: AI-powered personal finance. International Journal of Financial Studies, 8(2), 56-70. https://doi.org/10.3390/ijfs8020056
25. Treleaven, P., Galas, M., & Lalchand, V. (2013). Algorithmic trading review. Communications of the ACM, 56(11), 76-85. https://doi.org/10.1145/2500117
26. Van der Aalst, W. M. P., et al. (2020). AI in finance: Transforming the financial industry with AI and data science. Springer. https://doi.org/10.1007/978-3-030-42071-2
27. Xiao, R., Feng, Y., Yan, L., & Ma, Y. (2022). Predict stock prices with ARIMA and LSTM. arXiv preprint arXiv:2209.02407. Retrieved from https://arxiv.org/abs/2209.02407
28. Zohar, O., & Melville, N. (2021). Consumer adoption of robo-advisors: The impact of personality traits and technological understanding. Journal of Financial Planning, 34(7), 50-59.