

ATradGPT: Leveraging Agentic AI to Enhance Stock Trading Education and Accessibility in Capital Markets

Theekshana Samaradiwakara¹
IronOne Technologies
Sri Lanka
theekshanas@irononetech.com

Narada Wijerathne²
IronOne Technologies
Sri Lanka
naradaw@irononetech.com

Lushanthan Sivaneasharajah²
IronOne Technologies
Sri Lanka
lushanthans@irononetech.com

Hammaad Rizwan²
IronOne Technologies
Sri Lanka
hammaadr@irononetech.com

Keywords—Agentic AI, Retrieval-Augmented Generation, Capital Markets, Investing, Financial Tech

I. INTRODUCTION

Building a good investment portfolio within the Colombo Stock Exchange (CSE) is a complex process with a steep learning curve, often requiring access to real-time information, understanding of market dynamics, and adherence to trading regulations. However, this information and material are not available at a single location, causing inconvenience to users. Furthermore, even if it is accessible, it is often a very demanding task for a single person to process the said material and make informed decisions.

To democratize investing by facilitating access to educational resources and streamlining the trading process, a Conversational Intelligent Investment Advisor has been developed. Leveraging open-source models with the RAG architecture, Agentic workflows and Langchain framework, the intelligent advisor integrates with the ATrad application and guides users through the complete process of investing.

II. LITERATURE REVIEW

Leveraging Agentic AI, particularly with Retrieval-Augmented Generation (RAG), holds significant promise for enhancing stock trading education and accessibility in capital markets. Agentic AI systems offer autonomy and advanced decision-making, suitable for simulating complex stock trading environments [1]. Enhancing Large Language Models (LLMs) with financial knowledge, as explored by IDEA-FinKER and IDEA-FinQA, is crucial for trustworthy AI in financial analysis [2].

RAG improves the accuracy and relevance of LLM responses in finance by integrating external data retrieval, addressing the challenge of domain-specific queries [3] [4]. This approach, used in business chatbots to extract insights from news articles, can be adapted for stock trading education by

providing learners with current market data [3] [4]. The increasing application of AI agents in financial markets, including autonomous trading, indicates the potential for sophisticated educational tools [1] [4].

By combining Agentic AI with financially knowledgeable LLMs and RAG, it is possible to create innovative platforms that offer realistic trading simulations and accessible financial insights, democratizing access to capital market understanding and trading skills [3].

III. MATERIALS AND METHODS

The application has multiple data sources and a multi-model RAG architecture. Data sources include user manuals, educational articles, rules of Colombo Stock Exchange, and oracle databases. Consequently, making the system capable of retrieving relevant information to address user queries, generating SQL queries to fetch real time market data and announcement data from the integrated databases to provide comprehensive answers to user queries.

In order to handle complex user questions such as composite questions and analytical questions, the system routes it to an Agent, which has the ability to call multiple custom tools as well as other chains depending on its reasoning and problem formulation. This adds to the capabilities of the advisor by allowing it to do comparative analysis, technical analysis, and charting.

A collection of open-source model variations is used instead of a single larger model. Each model is picked according to the difficulty and the nature of the task leading to low computational resource consumption without a loss of accuracy.

Experimentation with different data cleaning methods, text splitting methods, vector databases and software architectures were carried out to reduce costs and overhead, enhance the response quality and to ensure accurate and controllable outputs.

IV. RESULTS AND DISCUSSION

ATradGPT was deployed for a controlled group of industry experts from selected stock brokerages who were given investment-related queries to test the system's accuracy and usability. Feedback was collected based on response relevance, ease of understanding, and decision-making support.

The system's responses were manually cross-checked with official Colombo Stock Exchange (CSE) regulations, educational articles, and real-time market data from the integrated databases. This ensured that the retrieved and generated responses aligned with authoritative financial sources.

These findings validate the feasibility of ATradGPT in simplifying stock market education and real-time investment assistance. Future improvements will focus on fine-tuning domain-specific LLMs.

V. CONCLUSION

In conclusion, the ATradGPT project offers a transformative approach to stock trading education and accessibility within the Colombo Stock Exchange. By leveraging Agentic AI and the RAG architecture, the system simplifies complex processes for users, making investing more accessible. Through intelligent query handling, real-time data integration, and tailored educational resources, ATradGPT empowers users to make informed decisions with ease.

Future developments, including model fine-tuning for the capital markets domain and local language adaptations, promise to further enhance the system's effectiveness, ensuring a more personalized and efficient user experience in stock trading education.

REFERENCES

- [1] D. B. Acharya, K. Kuppan, and B. Divya, "Agentic ai: Autonomous intelligence for complex goals—a comprehensive survey," *IEEE Access*, 2025.
- [2] C. Yang, C. Xu, and Y. Qi, "Financial knowledge large language model," *arXiv preprint arXiv:2407.00365*, 2024.
- [3] M. Arslan, H. Ghanem, S. Munawar, and C. Cruz, "A survey on rag with llms," *Procedia computer science*, vol. 246, pp. 3781–3790, 2024.
- [4] M. Arslan, S. Munawar, and C. Cruz, "Business insights using rag-llms: a review and case study," *Journal of Decision Systems*, pp. 1–30, 2024.