

Financial Planning Chatbot

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Abstract—The financial market is volatile and complex, often requiring individuals to make informed decisions quickly. With advancements in artificial intelligence, large language models (LLMs) have emerged as powerful tools for understanding and generating human-like text, enabling the creation of financial planning assistants. This paper presents a financial planning chatbot powered by a LLM, designed to provide personalized financial advice based on user input aimed at assisting users in managing their finances more effectively.

I. INTRODUCTION

The financial market is volatility and complexity present significant challenges for individuals seeking effective financial planning. Leveraging advancements in natural language processing, this report explores a chatbot solution using a large language model (LLM) to provide personalized financial advice. The chatbot adapts to real-time market data, aiming to enhance user engagement and decision-making.

II. GENERAL SYSTEM REPRESENTATION

A general representation of a financial system using an LLM involves several core components: data input, natural language processing, and output generation. The system collects real-time financial data, such as stock prices and economic trends, and processes it through the LLM, which interprets user queries. The model analyzes these inputs, recognizes patterns, and generates personalized financial insights. This system is designed to adapt to changing market conditions, ensuring relevant and context-aware responses. Its architecture ensures scalability and flexibility, allowing it to handle complex financial queries efficiently and accurately.

III. SYSTEM SENSITIVITY ANALYSIS

The financial market is highly sensitive to external factors, such as economic shifts, geopolitical events, and investor sentiment. Market inputs, like stock prices and interest rates, are volatile and unpredictable. LLMs process this dynamic information, adjusting outputs based on changing patterns in real-time data. However, the randomness and frequent fluctuations in market inputs introduce variability in the model's predictions, requiring constant updates to maintain accurate, contextually relevant responses.

IV. SYSTEM COMPLEXITY ANALYSIS

The complexity of the financial market stems from its unpredictable, stock-driven nature and the influence of numerous interconnected variables, such as global economies and investor behavior. LLMs handle this complexity by processing vast amounts of data, recognizing patterns, and generating predictions. However, the market's stochastic elements and rapid shifts increase computational challenges. LLMs must efficiently manage these variations, adapting to complex, multifaceted inputs to provide reliable, real-time analysis while balancing accuracy and processing speed.

V. EMERGENT BEHAVIORS

Emergent behaviors in financial systems arise from the unpredictable interaction of global events, market trends, and investor actions. LLMs, when processing vast financial data, can develop unexpected patterns or behaviors that weren't explicitly programmed. For instance, an LLM may shift its advice toward more conservative strategies during economic instability. These emergent behaviors highlight the system's ability to self-adapt, influenced by real-time data, world events, and complex market conditions, ultimately creating responses that evolve as new inputs or situations arise.

VI. EXPECTED RESULTS

The chatbot is expected to deliver accurate, real-time financial insights tailored to individual user queries. By processing dynamic market data, it will provide relevant advice on budgeting and investment strategies. The system should effectively adapt to changing market conditions while maintaining high responsiveness. Ultimately, the chatbot aims to improve users' financial literacy and empower them in navigating complex financial decisions.

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