Stock Market Web Application using MERN Stack

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Abstract— This paper presents the design and development of a stock market web application using the MERN stack. The system provides real-time stock data, portfolio tracking, and trading simulation features. The application enhances user experience through responsive design and efficient data handling. The project demonstrates practical implementation of full-stack development in financial technology.

Keywords— Stock Market, MERN Stack, Web Application, Portfolio Management, FinTech

I. INTRODUCTION

The financial industry has undergone rapid digital transformation with the integration of web technologies. Stock trading, once limited to physical exchanges, is now widely accessible through online platforms. This project focuses on developing a stock market web application that enables users to monitor stock prices and manage investments efficiently.

The main objective is to provide a user-friendly interface that simplifies trading and portfolio management for both beginners and experienced investors.

II. LITERATURE REVIEW

Existing stock market platforms such as Zerodha and Groww have revolutionized online trading. These systems provide real-time data, analytics tools, and user-friendly dashboards. However, building such systems requires strong backend architecture and efficient data handling.

Research shows that MERN stack applications are highly scalable and suitable for real-time applications like stock trading systems.

III. SYSTEM ARCHITECTURE

The system follows a three-layer architecture: presentation layer (ReactJS), application layer (Node.js and Express), and data layer (MongoDB). The frontend communicates with backend APIs to fetch and display real-time data.

External APIs are integrated to provide live stock prices and market indices.

IV. METHODOLOGY

The project follows the Software Development Life Cycle (SDLC) approach, including requirement analysis, system design, development, testing, and deployment.

Frontend development is carried out using ReactJS, while backend services are developed using Node.js. MongoDB is used for database management.

V. IMPLEMENTATION

The system includes several modules such as user authentication, stock listing, portfolio management, watchlist, and transaction history.

Users can buy and sell stocks, track their investments, and analyze market trends using real-time data.

VI. RESULTS AND DISCUSSION

The developed system successfully provides real-time stock updates and efficient portfolio tracking. The application is responsive and performs well across different devices.

Testing results indicate that all major functionalities work correctly, including authentication, transactions, and data updates.

VII. CONCLUSION

This project demonstrates the effective use of MERN stack technologies in building a stock market application. It provides practical insights into full-stack development and financial technology systems.

Future enhancements may include AI-based stock prediction and integration with real trading platforms.

REFERENCES

[1] MERN Stack Documentation
[2] Financial Technology Research Papers
[3] Stock Market API Documentation
[4] SDLC Model References