IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 11, April 2026
Impact Factor: 8.2

Zerodha Clone: Design and Development of a Responsive Frontend-Based Stock Trading Web Application

Prof. Diksha Fulzele, Mr. Yash Waghmare, Mr. Pratik Shiradkar
Dept. Computer Science & Engineering,
Tulsiramji Gaikwad Patil College of Engineering and Technology, Nagpur, Maharashtra, India.
dikshafulzele73@gmail.com, yashwaghmare053@gmail.com, pratikshiradkar17@gmail.com

Abstract: *This paper presents a detailed study and implementation of a Zerodha clone focusing on frontend technologies. The system is designed to replicate real-world trading interfaces with high usability, responsiveness, and performance. The implementation uses HTML, CSS, and JavaScript to develop dynamic components such as dashboards, navigation systems, and data visualization modules. The system demonstrates efficient UI rendering, improved user interaction, and scalability for future backend integration.*

Keywords: Zerodha Clone, Web Application, UI/UX, JavaScript, Responsive Design, Dashboard

I. INTRODUCTION

Digital transformation in financial services has led to the rapid emergence of modern trading platforms that provide users with seamless access to financial markets. These platforms have redefined traditional trading by integrating advanced web technologies, real-time data visualization, and user-friendly interfaces. As a result, investors can now monitor market trends, manage portfolios, and execute trades efficiently through web-based applications. This shift highlights the growing importance of technology-driven solutions in enhancing accessibility and user engagement in financial systems.

With the continuous advancement of digital technologies, platforms such as Zerodha have revolutionized the way users interact with stock markets by offering simple, efficient, and intuitive interfaces. In today's competitive environment, users expect applications that are not only functional but also responsive and visually appealing across multiple devices. Modern frontend development focuses on delivering seamless user experiences through responsive layouts, interactive components, and efficient navigation systems. These features play a crucial role in improving usability and reducing complexity for users.

This project focuses on the development of a Zerodha clone using frontend technologies such as HTML, CSS, and JavaScript. The system aims to replicate key UI components of a trading platform, including dashboards, holdings, and analytical visualizations. Emphasis is placed on responsiveness, performance, and user interaction to ensure a smooth and engaging experience. By implementing modern design principles and interactive elements, the project demonstrates how frontend technologies can be effectively utilized to build scalable and user-centric financial applications

II. RELATED WORK

Existing research highlights the importance of UI/UX in financial applications. Modern platforms use responsive layouts, data visualization, and modular architecture to enhance usability. Technologies such as CSS Flexbox and JavaScript frameworks are widely used.

Existing research in web-based financial applications emphasizes the critical role of user interface (UI) and user experience (UX) in enhancing user engagement, accessibility, and system efficiency. Modern trading platforms such as

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 11, April 2026
Impact Factor: 8.2

Zerodha, Upstox, and Groww have demonstrated that intuitive design and seamless interaction significantly improve user satisfaction and retention.

Studies in frontend development highlight the importance of responsive design techniques, including CSS Flexbox and Grid systems, which enable applications to adapt dynamically across multiple devices such as desktops, tablets, and smartphones. This adaptability ensures consistent performance and usability regardless of screen size, which is essential for financial applications where users require real-time access.

III. SYSTEM ARCHITECTURE AND DESIGN

A. Architecture

The proposed system follows a layered architecture model that separates the application into distinct components, ensuring better scalability, maintainability, and performance. The architecture is divided into three primary layers: the presentation layer (frontend), the application layer (logic handling), and the data layer (backend – conceptual).

The frontend layer is developed using HTML, CSS, and JavaScript, and is responsible for handling all user interactions. It includes components such as the navigation bar, dashboard interface, stock listings, and portfolio visualization. The design focuses on responsiveness and usability, ensuring smooth interaction across multiple devices.

The application layer manages the internal logic of the system. It processes user inputs, handles dynamic content rendering, and controls UI behavior. JavaScript plays a key role in enabling interactivity, event handling, and real-time updates within the interface.

The backend layer (conceptual) is intended to handle data storage, authentication, and business logic. Although the current implementation focuses on frontend development, the system is designed to support integration with backend technologies such as Node.js and MongoDB in future enhancements.

This layered approach ensures loose coupling between components, allowing independent development and easy scalability of the system.

B. Data Flow

The data flow in the system is designed to ensure efficient processing, validation, and presentation of user inputs. The workflow follows a structured sequence that enhances reliability and user experience.

Initially, the user interacts with the interface by entering data or navigating through different modules such as dashboard, holdings, or analytics. The input provided by the user is captured by the frontend components.

Before processing, client-side validation is performed using JavaScript to ensure that the input data meets required conditions such as format correctness and completeness. This reduces errors and improves system efficiency by preventing invalid data from being processed.Once validated, the data is processed within the application layer, where dynamic updates are applied to the interface. For example, portfolio values, stock lists, and graphical representations are updated in real time based on user interaction.

The processed data is then displayed back to the user through dashboards and visual components such as charts and tables. This ensures a continuous feedback loop where users can interact with the system and immediately view results.

The structured data flow enhances system performance, minimizes errors, and ensures a smooth and responsive user experience.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 11, April 2026
Impact Factor: 8.2

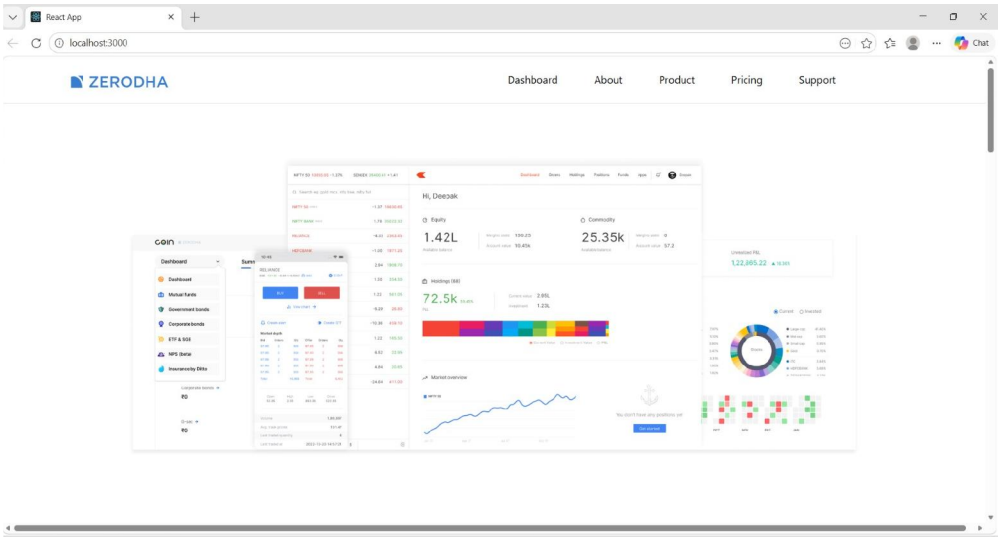

Fig.1 Landing Page

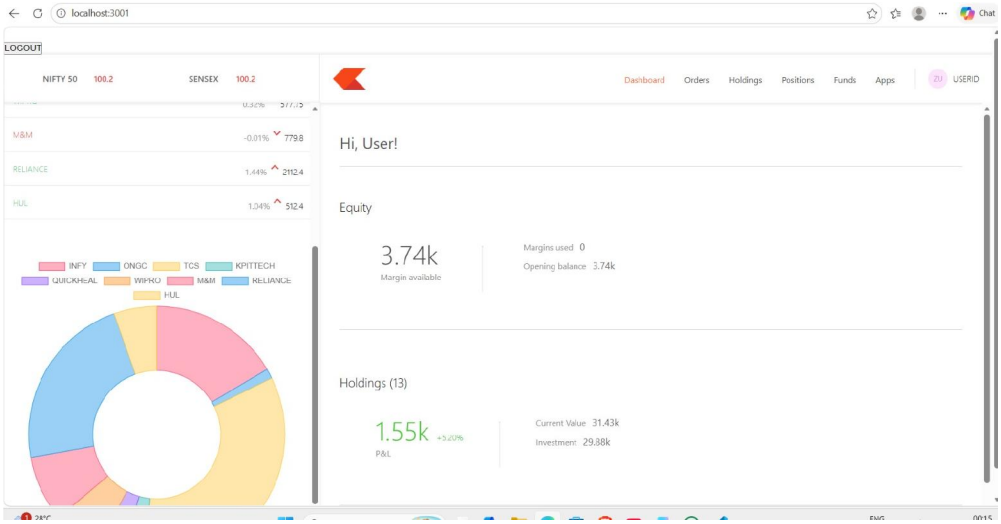

Fig.2 Dashboard

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 11, April 2026
Impact Factor: 8.2

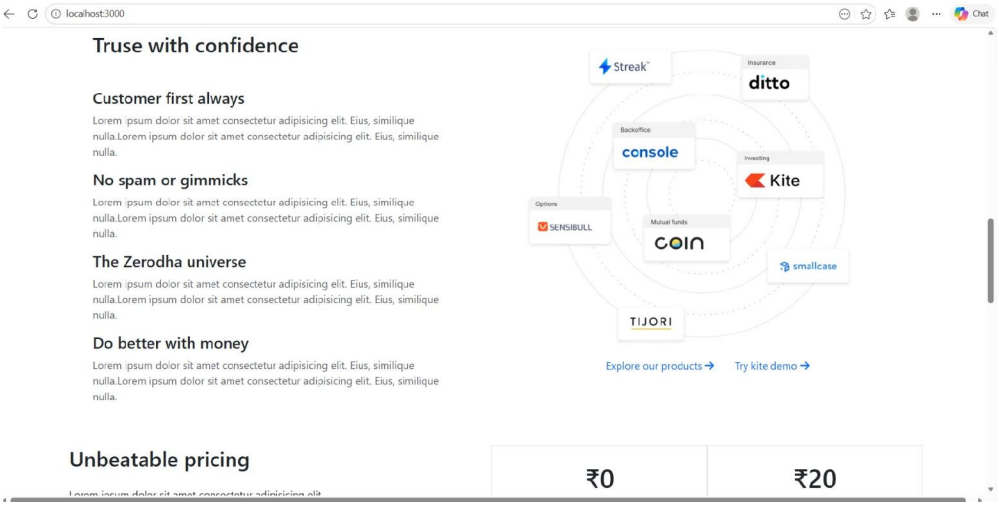

Fig.3 Portfolio Chart

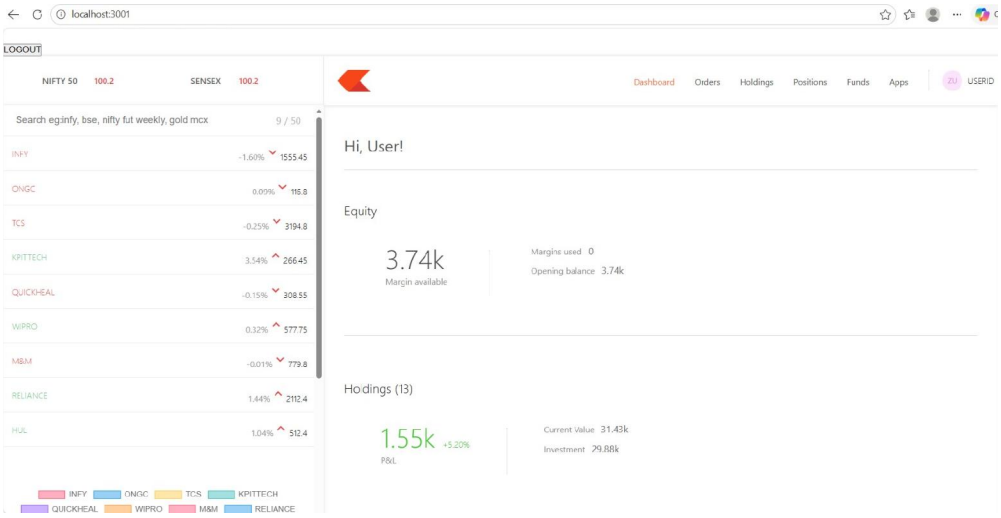

Fig.4 Application UI

IV. IMPLEMENTATION

The implementation of the proposed Zerodha clone is carried out using modern frontend development tools and technologies to ensure efficiency, scalability, and maintainability. The development environment primarily includes Visual Studio Code as the code editor, GitHub for version control and project management, and browser developer tools for debugging and performance analysis.

The frontend of the application is developed using HTML, CSS, and JavaScript, which together form the core structure, styling, and interactivity of the system. HTML is used to design the layout and structure of web pages, while CSS is applied to create visually appealing and responsive designs using techniques such as Flexbox and media queries. JavaScript is used to implement dynamic functionalities, including event handling, DOM manipulation, and client-side validation.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 11, April 2026
Impact Factor: 8.2

V. RESULTS AND DISCUSSION

The developed system demonstrates a highly responsive and user-friendly frontend application that effectively simulates the interface of a real-world stock trading platform. The application performs efficiently across different devices and screen sizes, maintaining consistent design and functionality.

One of the key outcomes of the system is its fast response time, achieved through optimized frontend rendering and efficient JavaScript execution. The use of lightweight components and structured design ensures smooth navigation between different sections of the application.

The interface provides intuitive navigation, allowing users to easily access various modules such as dashboard, holdings, and analytics. This enhances usability and reduces the learning curve for new users.

VI. CONCLUSION

The project successfully demonstrates frontend implementation of a trading platform. Future work includes backend integration and real-time data.

This paper presents the design and implementation of a frontend-based Zerodha clone using modern web technologies. The system successfully replicates key components of a stock trading platform, including navigation, dashboard visualization, and interactive user interface elements.

The project highlights the importance of responsive design, UI/UX principles, and client-side validation in developing efficient web applications. By focusing on frontend development, the system demonstrates how user experience can be enhanced through intuitive design and real-time interaction.

The modular and scalable architecture of the system provides a strong foundation for future development. Potential enhancements include backend integration for real-time data processing, secure user authentication, and advanced analytics features.

In conclusion, the proposed system effectively showcases the capabilities of modern frontend technologies in building scalable and user-friendly financial applications.

ACKNOWLEDGMENT

The author would like to express sincere gratitude to the faculty members and mentors of the Department of Computer Science and Engineering for their continuous guidance and support throughout the development of this project.

Their valuable insights, suggestions, and encouragement played a crucial role in the successful completion of this work.

The author also acknowledges the use of open-source tools and technologies that facilitated efficient development and implementation of the system.

REFERENCES

[1] M. Y. Ivory and M. A. Hearst, “Improving Web Site Design Using Quantitative Measures,” IEEE Internet Computing, 2001. Available: https://people.ischool.berkeley.edu/~hearst/papers/tango-ieee.pdf

[2] E. Marcotte, “Responsive Web Design,” A List Apart, 2010. Available: https://alistapart.com/article/responsive-web-design

[3] Google Developers, “Responsive Web Design Basics,” Available: https://developers.google.com/web/fundamentals/design-and-ux/responsive

[4] MDN Web Docs, “HTML, CSS, and JavaScript Guide,” Available: https://developer.mozilla.org

[5] W3Schools, “Web Development Tutorials,” Available: https://www.w3schools.com

[6] Chart.js Documentation, “Data Visualization in Web Applications,” Available: https://www.chartjs.org

[7] D3.js Documentation, “Data-Driven Documents,” Available: https://d3js.org

[8] Zerodha, “Official Trading Platform Website,” Available: https://zerodha.com

[9] Upstox, “Online Trading Platform,” Available: https://upstox.com

[10] Groww, “Investment Platform Overview,” Available: https://groww.in

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 11, April 2026
Impact Factor: 8.2

[11] Smashing Magazine, "UI/UX Design Principles for Modern Web Applications," Available: https://www.smashingmagazine.com
[12] Nielsen Norman Group, "User Experience Research & Guidelines," Available: https://www.nngroup.com
[13] Mozilla Developer Network, "Web Performance Optimization," Available: https://developer.mozilla.org/en-US/docs/Web/Performance
[14] React Official Documentation, "Building User Interfaces," Available: https://react.dev