



PRICE NEGOTIATOR USING REACT

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Abstract : This research explores the development of a dynamic and responsive e-commerce website leveraging React for the front end and PostgreSQL for back-end database management. The proposed system is designed to cater to diverse business models, including B2B, B2C, and C2C, by enabling users to set and negotiate prices independently of manufacturer-recommended retail prices (MRP). This user-driven pricing model fosters a flexible and interactive marketplace, empowering buyers and sellers to engage in price negotiations directly. The study also delves into the integration of intelligent agent technology to enhance the negotiation process in e-commerce. A state-of-the-art overview of agent-based automated negotiation is provided, focusing on three primary approaches: decision theory, game theory, and negotiation analysis. These methodologies are examined for their potential to optimize negotiation outcomes, improve transparency, and increase efficiency and satisfaction among negotiating parties. By combining modern web development frameworks with advanced negotiation technologies, this research highlights the potential for creating a more adaptive and user-centric e-commerce platform. The findings suggest that such an approach can significantly enhance the negotiation process, offering a scalable and efficient solution for various business models while fostering greater trust and collaboration among users..

I. INTRODUCTION

Price negotiation is an integral part of business operations, affecting both buyers and sellers in various industries. However, traditional negotiation methods are often manual, time-consuming, and prone to inefficiencies. The online shopping experience, while convenient, often lacks the thrill and flexibility of in-person negotiation. The rise of digital tools and web technologies has created opportunities to automate and streamline these processes. React, a popular JavaScript library, offers a robust framework for building interactive and responsive user interfaces, making it an ideal choice for developing a Price Negotiator application. This paper explores the design and implementation of such an application, highlighting its features, benefits, and limitations. An e-commerce website operates as a digital platform that enables users to browse, select, and purchase products or services online. The process begins with users navigating through a well-organized product catalog, where they can search for items using keywords, categories, or filters.

Detailed product pages provide essential information such as descriptions, images, specifications, and pricing to aid decision-making. Users can add desired items to their shopping cart, which displays a summary of selected products and the total cost. The checkout process involves providing shipping information, choosing a preferred payment method, and reviewing the order summary before finalizing the purchase. E-commerce websites today apply various AI techniques to determine the most liked products or most sold products, which are eventually calculated to provide an effortless search for customers shopping on their website. But at times, when the best products are sold at high prices, customers have to compromise on their product. There are also some other problems that customers may face with low-cost products. These problems can be eliminated by giving them an opportunity to negotiate on the products.

II. LITERATURE REVIEW

Previous studies have explored the use of technology in negotiation processes, including the application of artificial intelligence (AI), machine learning (ML), and web-based platforms. However, few studies have focused on using React for building negotiation tools. React's component-based architecture, virtual DOM, and state management capabilities make it a powerful tool for creating dynamic and scalable applications. This research builds on existing knowledge by demonstrating how React can be used to develop a Price Negotiator application that addresses the limitations of traditional negotiation methods.

III. METHODOLOGY

- **Requirement Analysis:** Identified the core features and functionalities required for the application, such as real-time negotiation, user authentication, and price suggestions. Conducted stakeholder interviews and market research to understand user needs and pain points.
- **Wireframing and Prototyping:** Created low-fidelity wireframes and high-fidelity prototypes using tools like Figma to visualize the user interface and gather feedback. Iterated the designs based on user testing and stakeholder input.

- **Component-Based Development:** Leveraged React's component-based architecture to break the application into reusable components (e.g., negotiation chat, price input forms, dashboards). Ensured modularity and reusability to simplify maintenance and future enhancements.
- **Real-Time Implementation:** Integrated WebSocket to enable real-time updates during negotiations, ensuring that both parties could see changes instantly. Optimized the backend to handle multiple concurrent connections efficiently
- **Testing:** Conducted unit testing, integration testing, and user acceptance testing (UAT) to ensure the application met functional and non-functional requirements. Used tools like Jest and React Testing Library for frontend testing and Postman for API testing
- **Deployment:** Deployed the application on AWS using Docker containers for scalability and ease of management. Set up CI/CD pipelines using GitHub Actions to automate the build and deployment process.

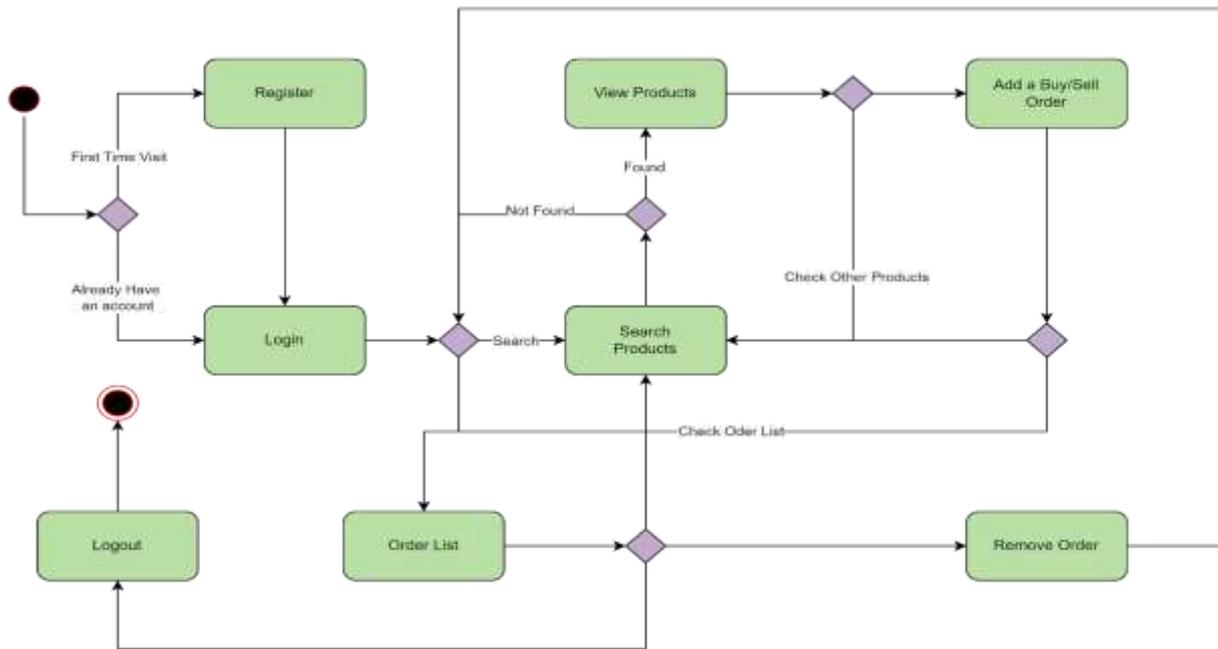


Fig 3.1 State-Transition Diagram

IV. APPLICATION FEATURES

The Price Negotiator application was designed to provide a seamless and efficient negotiation experience for users. Below are the key features of the application:

- **User Authentication and Authorization:** Users can create accounts and log in securely using email and password. The password is hashed and stored securely in the database.
- **Real-Time Negotiation Interface:** A real-time chat interface allows buyers and sellers to communicate and negotiate prices. Messages are delivered instantly using WebSocket. Users can input their proposed prices, and the system allows for counter offers with a history of all offers displayed in the chat. All negotiation data is auto-saved to prevent loss of information in case of accidental disconnections.
- **Price Suggestion Engine:** The application uses a simple AI algorithm (initially rule-based, with plans to integrate machine learning) to provide price suggestions based on historical data, market trends, and user preferences. Users can adjust parameters such as budget, desired profit margin, and urgency to receive tailored suggestions.
- **Interactive Dashboard:** Users can view all ongoing and completed negotiations in a centralized dashboard. The dashboard provides visual analytics, such as negotiation success rates, average time to close deals, and price trends. A detailed log of all past transactions, including final prices and negotiation timelines.
- **Responsive and Intuitive Design:** The application is designed to work seamlessly on both desktop and mobile devices, ensuring a consistent user experience. Users can easily upload documents or images (e.g., product catalogs, and invoices) during negotiations. A dark mode option is available to reduce eye strain and improve usability in low-light environments
- **Notifications and Alerts:** Users receive instant notifications for new messages, counteroffers, and completed negotiations. Automated email reminders are sent for pending negotiations or incomplete actions.
- **Integration with External Tools:** Integrated with a third-party API to support multi-currency negotiations. Users can finalize transactions and make payments directly through the platform using integrated payment gateways like Stripe or PayPal.
- **Admin Panel:** Admins can manage user accounts, roles, and permissions and also monitor ongoing negotiations and intervene if necessary. Comprehensive reports on platform usage, negotiation outcomes, and revenue generated.

V. FUTURE SCOPE

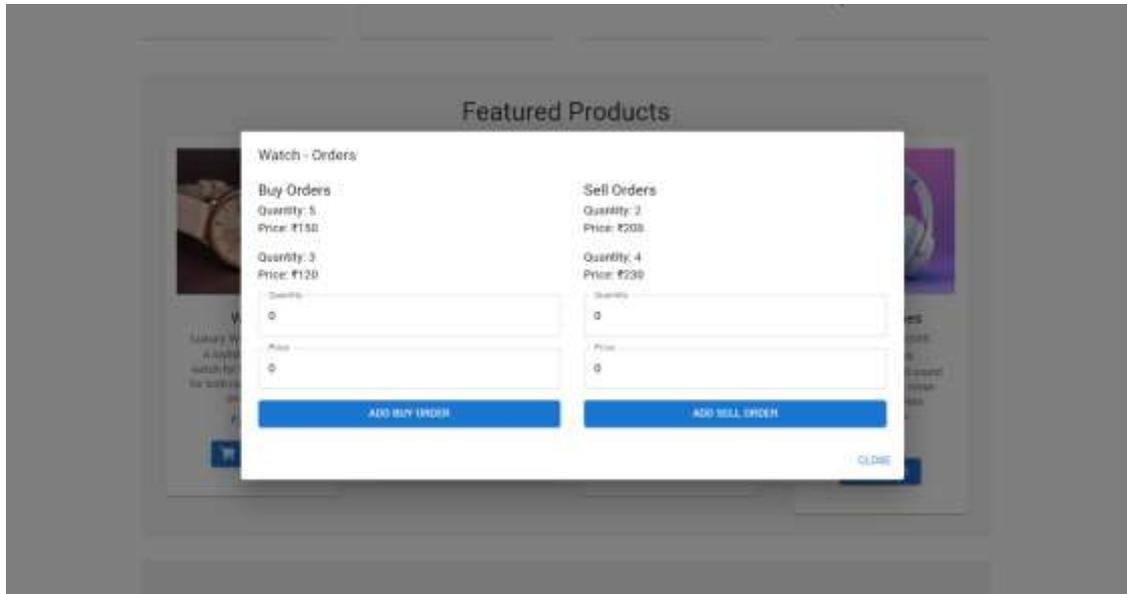
The Price Negotiator application has significant potential for future enhancements, including:

- **AI and Machine Learning Integration:** Incorporating AI-driven algorithms to provide more accurate price suggestions and predictive analytics.
- **Mobile Application Development:** Extending the platform to mobile devices using React Native for a seamless cross-platform experience.
- **Enhanced Security:** Implementing advanced encryption techniques and multi-factor authentication to improve data security

- **Customizable Workflows:** Allowing users to create and customize negotiation workflows to suit their specific needs.
- **Blockchain Integration:** Using blockchain technology to ensure transparency and immutability in negotiation records.

VI. RESULTS AND DISCUSSION

The application was evaluated based on usability, performance, and scalability. User feedback indicated high satisfaction with the intuitive interface and real-time negotiation capabilities. Performance testing revealed that the application could handle moderate user loads efficiently, though scalability improvements are needed for larger datasets. Security testing highlighted the need for enhanced encryption and authentication mechanisms to protect sensitive financial data.



VII. CONCLUSION

The Price Negotiator application developed using React demonstrates the potential of modern web technologies to streamline and optimize price negotiation processes. Its user-friendly interface, real-time capabilities, and dynamic features make it a valuable tool for businesses and individuals alike. However, challenges related to scalability, security, and customization must be addressed to fully realize its potential. Future research and development efforts should focus on integrating advanced technologies such as AI, machine learning, and block chain to enhance the application's functionality and usability. By addressing these limitations, the Price Negotiator application can evolve into a robust and scalable solution for modern negotiation needs.

VIII. ACKNOWLEDGMENT

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