# Quickbid: Real-Time Auction

Rishab Ramesh Nair
*Dept. of CSE*
*Amrita Vishwa Vidyapeetham*
Bengaluru, India
bl.en.u4aie23126@bl.students.amrita.edu

Ayush John Daniel
*Dept. of CSE*
*Amrita Vishwa Vidyapeetham*
Bengaluru, India
bl.en.u4aie23150@bl.students.amrita.edu

Hari Haran K
*Dept. of CSE*
*Amrita Vishwa Vidyapeetham*
Bengaluru, India
bl.en.u4aie23126@bl.students.amrita.edu

*Abstract*—This project proposes an online auction platform designed to simplify the auction process for both sellers and buyers. Sellers can add, edit, and remove auction items, configure starting bids, reserve prices, and set auction durations, while tracking auction results. Buyers can browse and filter listings, register on the platform, place bids, and review bidding history. The system utilizes WebSockets to enable updates for bidding activities, ensuring users receive notifications of outbid events or auction closures. Email notifications further enhance user engagement by keeping participants informed of key actions. The platform is built to provide a consistent experience across both desktop and mobile devices. Overall, this project aims to deliver an interactive and efficient solution for conducting online auctions, emphasizing usability and real-time functionality.

*Index Terms*—Online Auction Platform, Real-time Bidding, WebSockets, Auction Management, User Notifications, Cross-platform Usability

## I. INTRODUCTION

The rise of e-commerce has transformed the way goods and services are exchanged, with online auction platforms playing a significant role in enabling transparent and competitive transactions. Traditional auctions often face challenges such as limited accessibility, lack of real-time updates, and reduced user engagement. To address these issues, modern auction systems integrate interactive technologies that ensure both sellers and buyers can seamlessly participate from any location.

This project introduces an online auction platform that emphasizes usability, interactivity, and real-time functionality. The system allows sellers to efficiently manage auction items by setting starting bids, reserve prices, and auction durations, while providing buyers with features such as item browsing, filtering, and bidding history review. Real-time updates are facilitated through WebSockets, ensuring immediate feedback on bidding activities, while email notifications further enhance user engagement by keeping participants informed about critical events such as outbids or auction closures. Designed for both desktop and mobile devices, the platform delivers a consistent and engaging user experience, making it a reliable solution for conducting online auctions in today's digital landscape.

## II. LITERATURE SURVEY

[1] discusses the current challenges in creating online auction platforms. It aims to remove the usual issues of price negotiation and item advertising through digital solutions. The authors outline a clear approach that highlights user experience and efficient auction processes. The research shows how important it is to design intuitive interfaces and use automated bidding systems in today's auction platforms. The study offers useful insights into current methods for developing effective online auction systems that serve both individual sellers and buyers.

[2] offers a modern method for building secure, lot-based online auction systems using current web technologies. The authors focus on developing strong security measures to tackle today's cybersecurity threats in online auction settings. The paper highlights the need for multi-layered authentication systems and real-time fraud detection. The study shows how modern web frameworks can help create strong, scalable auction platforms that keep high security standards while ensuring a smooth user experience.

[3] looks at how auction methods can work in distributed computing environments, especially for resource allocation in edge computing networks. The authors suggest a repeated auction model that improves resource distribution based on current load conditions and user needs. The research presents new bidding strategies that take into account computing limits and network delays. This work provides useful insights into how auction concepts can be applied to modern distributed systems and real-time resource management.

[4] examines recent advancements in real-time bidding systems, focusing on optimization methods and machine learning techniques for automated bidding. The authors review different bid optimization strategies that have come up in recent years, such as reinforcement learning and deep neural networks. The paper addresses challenges in real-time auction settings, including latency issues and dynamic pricing methods. The research gives valuable insights into the technical setup needed for fast, automated auction systems.

[5] offers a modern analysis of online auction management systems as web-based applications, highlighting the growing importance of electronic marketplace features. The authors focus on the design aspects of creating scalable auction platforms that can support increasing user traffic and transaction volumes. The research stresses the need for responsive web design and compatibility across different platforms in today's auction systems. The study gives practical advice for implementing auction platforms that meet current user expectations

for performance and accessibility.

[6] describe the development of a comprehensive e-commerce and auction platform built on the MERN stack, integrating features such as real-time bidding, secure user authentication, product management, and payment processing. The system supports multiple user roles including buyers, sellers, and administrators, with functionalities tailored to enhance user engagement, security, and scalability. Emphasizing real-time communication and seamless user experience, the platform aims to revolutionize online shopping and auction activities, with potential future enhancements involving AI and machine learning integrations.

[7] explore the development of scalable online auction platforms utilizing the MERN stack, focusing on features such as real-time bidding, secure payments, user authentication, and high scalability to accommodate large user bases. They compare various auction models, including traditional English and Dutch auctions, as well as penny auctions, highlighting their respective features and applications. Additionally, the research emphasizes the implementation of private bidding, real-time updates, and the integration of machine learning for personalized recommendations, aiming to enhance user experience, efficiency, and fairness in digital auction environments.

[8] details the development of an online auction system implemented in Java, featuring a user-friendly graphical interface, database integration with MySQL, multi-threading for real-time bidding, socket communication for data transfer, and event listeners for user interactions. It supports functionalities such as user login, item management by administrators, automatic finalization of bids, and display of auction results, aiming to enhance efficiency, broaden market access, and ensure a secure, accessible platform for online auctions. The references included cover key topics in neural networks, machine learning, and image recognition, discussing error propagation, support vector machines, neural network generalization improvements, and license plate recognition techniques.

[9] collectively detail a comprehensive web development project focused on enhancing an auction platform built with React, TypeScript, Node.js, and PostgreSQL. Key improvements included custom dropdown components, multilingual notifications, and features like auction scraping and leasing forms, all aimed at improving user experience, scalability, and maintainability. The project also emphasizes modern development practices such as containerization with Docker, cloud deployment, and efficient state management, while addressing technical challenges like version mismatches and cross-platform compatibility to ensure robust, scalable solutions.

[10] details the development of an online auction platform built with a full-stack approach, incorporating features such as user registration, product listings with images and details, real-time bidding, notifications, and secure transaction processes. The platform aims to foster a fair, transparent, and engaging environment for buyers and sellers by utilizing technologies like Express.js and Node.js, with future plans to integrate AI and blockchain for enhanced functionality. The paper explores the system's functionalities, user behavior, trust factors, technological challenges, and potential future enhancements to improve online auction experiences.

[11] provide an in-depth overview of web development and database management, focusing on technologies such as HTML5, CSS, JavaScript, PHP, Laravel, and MySQL. They detail how relational databases organize data with tables, keys, and SQL queries, and explain how Laravel's MVC architecture facilitates efficient web application development through models, views, and controllers. The development process of a modular auction system for Lotto24 is described, highlighting features like real-time bidding, user management, and system integration, all built using Laravel and modern web practices. Additionally, the documents emphasize project management tools, agile methodologies, and best practices for creating scalable, user-friendly websites and systems.

[12] provides a comprehensive overview of developing a marketing web application tailored for car inspection companies, utilizing modern full-stack technologies such as React, Node.js, Express, and PostgreSQL, all deployed on Azure cloud services. It covers system analysis, design, and deployment processes, emphasizing requirements gathering, database normalization, UML modeling, and security practices like OAuth 2.0 with Azure AD B2C. Additionally, the documents detail the implementation of a print editor with layered PDF templates, CI/CD pipelines with Azure Pipelines, and the integration of various Azure services for high availability, storage, and monitoring, highlighting best practices in software engineering, testing, and system architecture.

[13] provide a comprehensive overview of modern web development and cloud computing, focusing on architecture design, technology stacks, and cloud platform services, particularly on Google Cloud Platform (GCP). They detail the development process of scalable, maintainable web applications using frameworks like React, TypeScript, and Python, emphasizing modular architecture, serverless deployment, and robust testing practices. Additionally, they explore cloud service models, database design, and real-time messaging, illustrating how these components come together to build secure, efficient online platforms such as auction systems with integrated payment solutions.

[14] describes SmartBid, an online real-time auction platform developed using the MERN stack to enhance consumer-to-consumer trading in Finland. It addresses the limitations of fixed-price platforms by enabling dynamic bidding, real-time updates, and secure transactions, with features like user authentication, notifications, and item management. The system is designed to be scalable, transparent, and user-friendly, incorporating modern web technologies such as WebSockets for live bid updates and MongoDB for data integrity. Future improvements include AI-driven suggestions, auto-bidding, and integrated payment options, aiming to increase user engagement, trust, and market competitiveness within Finland's digital marketplace.

## CONCLUSION

The recent studies show a move toward more advanced online auction platforms that use technologies like machine learning, blockchain security, and real-time optimization algorithms. Current research focuses on the need for mobile responsiveness, improved security measures, and automated bidding systems. These studies highlight how online auction systems have evolved from basic bidding platforms to complex, smart systems that use modern web technologies and distributed computing principles.

## REFERENCES

[1] Design And Implementation of online Auction System (2022) - https://www.researchgate.net/publication/363608818_Design_And_Implementation_of_online_Auction_System

[2] Advanced and Secure Online Web-Based Auction System (2022) - https://www.researchgate.net/publication/360297639_Advanced_and_Secure_Online_Web-Based_Auction_System

[3] A Repeated Auction Model for Load-Aware Dynamic Resource Allocation in Multi-Access Edge Computing (2024) - https://arxiv.org/html/2402.04399

[4] A Survey on Bid Optimization in Real-Time Bidding Display Advertising (TKDD, 2023) - Available through GitHub RTB Papers Collection: https://github.com/wnzhang/rtb-papers

[5] Online Auction System (2021) - https://www.researchgate.net/publication/353521317_Online_Auction_System

[6] Budhe, Mrs Pragati. "E-commerce With Auction–Web Application Using MERN Technology." *SSGM Journal of Science and Engineering 1, no. 1 (2023): 136-141.*

[7] V. SivaKumar, J. A. Celin, M. S. S. Ram, S. N. Mohaideen Ibrahim. S, V. K. Kumar. I and M. M. Afzal, "A Scalable Auction Platform Using MERN," *2025 International Conference on Advanced Computing Technologies (ICoACT)*

[8] B. Li and Y. Cheng, "Auction system based on Java language," *2020 International Conference on Advance in Ambient Computing and Intelligence (ICAACI)*

[9] Bui, Ngoc. "Improving user experience and functionality for auction application." (2022).

[10] Prasad, Krishna. "AUCTION BIDDING PLATFORM FOR BUYING AND SELLING GOODS USING FULL STACK."

[11] Seppälä, Lauri. "Developing an Auction Module for Online Gaming Service." (2017).

[12] Suero Martínez, Héctor Gabriel. "Design & Development of a Full-stack ERP Marketing Web App." (2022).

[13] Singh, Kunwar Pratap, and Arvind Kumar. "BidNexus." (2023).

[14] Wadumesthrige, Kanishka Madushani. "SmartBid: online bidding system." (2025).