

ONLINE REAL ESTATE AUCTION SYSTEM

GE19612 - PROFESSIONAL READINESS FOR INNOVATION,
EMPLOYABILITY AND ENTREPRENEURSHIP PROJECT REPORT

Submitted by

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in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING



RAJALAKSHMI ENGINEERING COLLEGE

ANNA UNIVERSITY, CHENNAI

MAY 2025

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ABSTRACT

In the ever-expanding real estate sector of the digital era, fraudulent listings, dishonest practices, and unverified property transactions pose great threats. Addressing these concerns, the Online Real Estate Caution System is designed as a centralized platform combining advanced data validation, user verification, and alerting mechanisms. It deploys flagging algorithms and cross-checking schemes to figure out underperformed instances like mismatched ownership records, duplicate listings, and strange patterns of activity. Real-time notifications and an interactive dashboard warn users about questionable properties, enhancing their trust and transparency. Administrators on their end can monitor, investigate, and dynamically blacklist suspicious entries to maintain the integrity of property data. Apart from fraud detection, the system has an Online Real Estate Auction module, allowing verified sellers to auction approved properties live. In real-time, buyers can bid on properties, see the status of current bids, and receive updates about the various happenings of the auction. Admin functionalities include scheduling auctions, monitoring bids, alerting concerning suspicious activity, and dispatching confirmation emails to winning bidders. With OTP-based login, document verification, and optional blockchain integration for title authenticity, the system is one secure and scalable solution. The platform supports multi-language interfaces, ensuring accessibility for users from diverse linguistic backgrounds. Advanced analytics modules provide insights into market trends, user behavior patterns, and fraud hotspots, aiding both users and administrators in decision-making. The system incorporates geotagging and location-based services to offer more precise property validations and fraud detection based on suspicious geographical inconsistencies. The system's architecture is built on a microservices model, allowing for independent scaling of different modules such as auction handling, fraud detection, and user management. End-to-end encryption and compliance with data protection regulations like GDPR ensure user privacy and secure data handling throughout the platform. Experimental evaluations on real-world datasets revealed an astonishing increase in user confidence, faster discovery of anomalies, and a significant reduction of false listings. The combination of fraud prevention and transparent auctioning provides a credible digital environment for any buyer, seller, or renter to protect their transactions and make sound decisions in real estate.

ACKNOWLEDGMENT

Initially we thank the Almighty for being with us through every walk of our life and showering his blessings through the endeavor to put forth this report. Our sincere thanks to our Chairman **Mr. S. MEGANATHAN, B.E, F.I.E.**, our Vice Chairman **Mr. ABHAY SHANKAR MEGANATHAN, B.E., M.S.**, and our respected Chairperson **Dr. (Mrs.) THANGAM MEGANATHAN, Ph.D.**, for providing us with the requisite infrastructure and sincere endeavoring in educating us in their premier institution.

Our sincere thanks to **Dr. S.N. MURUGESAN, M.E., Ph.D.**, our beloved Principal for his kind support and facilities provided to complete our work in time. We express our sincere thanks to **Dr. P. KUMAR, M.E., Ph.D.**, Professor and Head of the Department of Computer Science and Engineering for his guidance and encouragement throughout the project work. We convey our sincere and deepest gratitude to our internal guides **DR.M.AYYADURAI, M.E.,Ph.D** and **DR.G.M.SASIKALA, M.E.,Ph.D** . We are very glad to thank our Project Coordinator **DR.M.AYYADURAI**, Associate Professor Department of Computer Science and Engineering for his useful tips during our review to build our project.

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LIST OF ABBREVIATIONS

S. No	ABBR	Expansion
1	API	Application Program Interface
2	DB	Database
3	GUI	Graphical User Interface
4	SQL	Structured Query Language
5	UI	User Interface
6	DFD	Data Flow Diagram
7	PHP	Hypertext Preprocessor
8	JS	JavaScript
9	HTML	Hypertext Markup Language
10	CSS	Cascading Style Sheet

CHAPTER 1

INTRODUCTION

"Online Real Estate Auction System: Revolutionizing Property Transactions with Trust and Transparency" is a next-generation platform crafted to address the pressing challenges of property fraud, inefficient sales processes, and the lack of real-time engagement in the real estate market. By merging cutting-edge technologies with a user-first approach, this system transforms traditional property dealings into secure, transparent, and dynamic online auctions.

At its core, the platform integrates advanced data validation techniques, machine learning-driven fraud detection algorithms, and real-time alert systems to ensure only verified and legitimate properties are listed. Comprehensive analysis of ownership documents, location data, listing history, and behavioral patterns of sellers strengthens the system's ability to detect anomalies and prevent fraudulent activities.

Built as a scalable and robust web application, the system leverages OTP-based login authentication, blockchain-powered document verification, and intelligent bidding mechanisms to deliver a seamless, trustworthy user experience. The interactive dashboard provides live updates, auction schedules, current bids, and fraud alerts, empowering buyers and sellers with complete visibility and control.

Performance is rigorously assessed through transaction success rates, anomaly detection accuracy, user engagement levels, and system responsiveness under high-traffic conditions. By streamlining property auctions, enhancing fraud prevention, and fostering a secure and efficient marketplace, "Online Real Estate Auction System" redefines the future of digital real estate, creating unparalleled opportunities for buyers, sellers, and investors alike.

1.1 GENERAL

"Online Real Estate Auction System: Revolutionizing Property Transactions with Trust and Transparency" is a next-generation platform crafted to address the pressing challenges of property fraud, inefficient sales processes, and the lack of real-time engagement in the real estate market. By merging cutting-edge technologies with user-first approach, this system transforms traditional property dealings into secure. At its core, the platform integrates advanced data validation techniques, machine learning-driven fraud detection algorithms, and real-time alert systems to ensure only verified and legitimate properties are listed. Comprehensive analysis of ownership documents, location data, listing history, and behavioral patterns of sellers strengthens the system's ability to detect anomalies and prevent fraudulent activities. Built as a scalable and robust web application, the system leverages OTP-based login authentication, blockchain-powered document verification, and intelligent bidding mechanisms to deliver a seamless, trustworthy user experience. The interactive dashboard provides live updates, auction schedules, current bids, and fraud alerts, empowering buyers and sellers with complete visibility and control. Performance is rigorously assessed through transaction success rates, anomaly detection accuracy, user engagement levels, and system responsiveness under high-traffic conditions.

By streamlining property auctions, enhancing fraud prevention, and fostering a secure and efficient marketplace, "Online Real Estate Auction System" redefines the future of digital real estate, creating unparalleled opportunities for buyers, sellers, and investors alike.

1.2 OBJECTIVE

The objective of "Online Real Estate Auction System" is to develop a secure, transparent, and efficient digital platform for real estate transactions that combines advanced fraud detection mechanisms with real-time property auction capabilities. By leveraging machine learning algorithms for anomaly detection and integrating blockchain technology for document authentication, the system ensures the legitimacy of property listings and user identities. It focuses on enhancing buyer and seller trust through OTP-based login, rigorous verification processes, and real-time monitoring of bidding activities. With an intuitive, user-centric interface, the platform streamlines property auctions, minimizes the risk of fraudulent transactions, and fosters a credible, scalable, and dynamic real estate marketplace for all stakeholders.

1.3 EXISTING SYSTEM

Current methods for online real estate transactions largely depend on traditional listing websites, manual property verification, and offline negotiations, which often suffer from inefficiencies, delays, and a lack of transparency. These systems are vulnerable to fraudulent listings, misrepresented property details, and identity theft, leading to a significant erosion of buyer and seller trust. Moreover, many platforms lack robust real-time auction capabilities, secure verification mechanisms, and automated fraud detection, making it difficult to ensure the legitimacy of transactions. The reliance on centralized databases further increases the risk of data breaches and manipulation. As a result, there is a pressing need for an advanced, secure, and transparent solution to streamline property auctions, enhance verification processes, and build a trustworthy digital real estate marketplace.

CHAPTER 2

LITERATURE SURVEY

"Application of Fuzzy Set Theory in Real Estate Pricing Using MATLAB" [1] (2024) by Unknown. This article highlights the use of fuzzy set theory in MATLAB to address real estate marketing strategies by considering both static and dynamic pricing factors. It helps developers handle consumer behavior, market trends, and construction stages, providing visual analysis for Group and Time Impact Factors. This assists in improving forecasting, risk management, and investment planning. However, the effectiveness heavily depends on accurate modeling of real-world uncertainties and timely data collection.

"Forecasting Real Estate Price Fluctuations in China's Socio-Economic Context" [2] (2024) by Unknown. This study addresses the complexity of predicting real estate prices in China, where socio-economic factors create unique challenges compared to general commodities. Accurate forecasting is crucial for informed consumer decisions, developer profitability, and government policy-making. A key difficulty remains in capturing the highly dynamic and complex influences affecting the market, emphasizing the need for sophisticated predictive models.

"Neural Network-Based Volatility Forecasting for Indian Real Estate Prices" [3] (2024) by Unknown. This paper proposes a neural network model for forecasting real estate price volatility in India, achieving 95.71% accuracy and outperforming traditional GA algorithms. Its predictive power aids in proactive policy formulation and risk management in the financial and real estate sectors. However, the model's accuracy could be influenced by future economic shifts not represented in the training data.

"CAUTION: Few-Shot Learning-Based Human Authentication for IoT Security" [4] (2024) by Unknown. This work presents CAUTION, a few-shot learning system for human authentication, solving low-data security issues. It enhances detection of

unknown intruders without requiring extensive prior data, making it ideal for IoT and smart environments. A potential limitation lies in its performance under extremely adversarial attack settings, which would require further validation.

"Chaos-Based S-Box Design and Nonlinearity Evaluation for Cryptographic Systems" [5] (2024) by Unknown. This journal critically examines the assessment methods used for chaos-based S-box designs, which are vital for encryption security. It calls for more rigorous and comprehensive evaluation techniques to strengthen cryptographic systems. Future work is necessary to develop standardized and universally accepted benchmarks for nonlinear analysis.

"Caution as a Risk Measure in Model-Free Reinforcement Learning" [6] (2024) by Unknown. This article introduces a novel risk-handling framework in reinforcement learning, redefining caution through a linear programming setup. It improves trustworthiness in decision-making under uncertainty. However, practical deployment might still face challenges in balancing exploration-exploitation trade-offs effectively during learning phases.

"Temporal-Spatial Real Estate Price Forecasting Using A-SRGCNN" [7] (2024) by Unknown. The A-SRGCNN model advances real estate forecasting by analyzing temporal and spatial price patterns, aiding investors, buyers, sellers, urban planners, and policymakers. It improves risk assessment and decision-making in the secondary real estate market. The limitation lies in its dependency on comprehensive and up-to-date geospatial data.

"Real Estate Price Prediction Using Google Trends Search Data" [8] (2024) by Unknown. This study shows that Google Trends data can effectively predict real estate price movements by tracking public interest. It provides timely decision support for investors, buyers, sellers, researchers, and policymakers. However, reliance on search

behavior alone might miss structural market factors, necessitating hybrid approaches for best results.

"Luce's Predictive Model for Real-Time Property Valuations with Sparse Data" [9] (2024) by Unknown.Luce's model allows accurate real estate valuations even with limited recent transaction data, aiding financial institutions, real estate platforms, appraisers, buyers, and policymakers. It helps fill valuation gaps across housing networks. A limitation arises in areas with extremely low transaction density, which could impact prediction robustness.

"Optimizing House Listing Prices and Acceptance Strategies in Volatile Markets" [10] (2024) by Unknown.This research assists sellers and real estate agents in dynamically adjusting listing prices based on buyer behavior and market volatility. It supports data-driven decision-making and intelligent pricing tool development. Challenges could arise from rapidly shifting buyer psychology that isn't always fully captured by historical behavior models.

"Enhanced Spatial Regression in Real Estate Pricing Using A-SRGCNN" [11] (2024) by Unknown.This paper improves the SRGCNN model with an external interest mechanism for better capturing complex property data relationships across Shanghai, Melbourne, and San Diego datasets. It supports more precise real estate price estimations and financial risk analysis. The method still depends on access to diverse and high-quality regional data for optimal accuracy.

"Homebuyer's Search Process and the Role of Real Estate Brokers in China's Urban Housing Market" [12] (2024) by Unknown.This paper explores the homebuyer's search process in China's urban housing market, using Guangzhou as a case study. It identifies key factors that influence the intensity and duration of the search, specifically the trade-off between activity costs and duration costs. The study shows that while the brokerage industry is still developing, buyers using brokers reduce search intensity and duration

by lowering activity costs. The paper also finds that buyer confidence in brokers' service quality plays a significant role in their choice of broker. A limitation is that the poor information transparency in the housing market prevents any buyer group from effectively lowering their search costs through personal efforts alone.

"Real Estate Price Prediction Using Online House Pictures and Recurrent Neural Networks" [13] (2024) by Unknown. This paper examines the use of recurrent neural networks (RNN) for predicting real estate prices based on online house pictures, leveraging computer vision algorithms. The study demonstrates that visual features, such as house pictures, play a significant role in potential homebuyers' decisions and can significantly enhance price predictions. The experimental results show that the RNN model outperforms traditional baseline algorithms in terms of mean absolute error and mean absolute percentage error. However, the method relies heavily on the availability and quality of house pictures, which may limit its applicability in markets with sparse or low-quality image data.

"A-SRGCNN: Enhancing Real Estate Price Estimation with Spatial Attention Mechanisms" [14] (2024) by Unknown. This paper introduces the A-SRGCNN model, an enhanced version of the SRGCNN spatial regression model, incorporating an external attention mechanism to better capture the relationships between property data. The model improves the accuracy of real estate price estimation by using graph convolutional neural networks and external attention. Experimental results on data from Shanghai, Melbourne, and San Diego indicate that A-SRGCNN outperforms benchmark models. The study also finds that real estate prices in Shanghai exhibit spatial aggregation, where prices are similar within the same zones. However, the model's performance is contingent on the availability and granularity of the data from the different zones.

"Privacy-Aware Real Estate Recommendation for Elderly Care Based on Consumption Behaviors" [15] (2024) by Unknown. This study proposes a privacy-aware real estate recommendation method for elderly care services, considering the challenges in capturing personalized preferences and managing sensitive data. The method leverages historical consumption behaviors of elderly people stored in cloud platforms, addressing privacy concerns while improving recommendation accuracy. The paper demonstrates the effectiveness and efficiency of this approach through a series of experiments based on a real-world dataset. However, challenges remain in balancing privacy concerns with the richness of data required for highly personalized recommendations, limiting the model's scalability.

CHAPTER 3

PROPOSED SYSTEM

3.1 GENERAL

The Online Real Estate Auction System is a cutting-edge platform designed to address challenges in the real estate market, providing a secure, transparent, and efficient environment for property transactions. This system integrates advanced technologies such as machine learning algorithms for fraud detection, ensuring the authenticity of listings and protecting users from deceptive practices. It allows verified sellers to auction properties in real-time, offering features like dynamic bidding, real-time updates, and secure payment systems. The platform uses an intuitive interface to enhance user experience, while administrators can monitor, validate, and investigate suspicious activities to maintain system integrity. With robust security measures, including OTP-based login and optional blockchain integration for title authenticity, the system guarantees a safe and scalable solution for all users, fostering trust and transparency in real estate dealings. By providing a reliable and user-friendly marketplace, it transforms how real estate transactions are conducted, offering a reliable mechanism for buyers, sellers, and investors to make informed decisions.

3.2 SYSTEM ARCHITECTURE DIAGRAM

The system architecture Fig 3.1 for the Online Real Estate Auction System integrates a modular structure to ensure scalability, security, and real-time processing. It involves user roles such as sellers, buyers, admins, and system operators. The architecture consists of key phases: data collection from sellers via dynamic React.js forms, which interact with the backend through RESTful APIs built using Express.js and Node.js. The data, including property details, auction dates, and bid history, is stored in MongoDB for efficient management and retrieval. The system incorporates a moderation phase where admins can approve or reject listings through a dedicated dashboard. Upon approval, the status of listings is updated in real-time on the user interface for both buyers and sellers. In the auction phase, buyers are presented with approved listings and can place bids on live auctions, with all bidding actions tracked in real-time. The backend processing is optimized for real-time auction management, utilizing Flask for smooth communication and processing between the application and the underlying system. The backend ensures secure processing of bids, real-time updates on auction timers, and accurate bid evaluations when the auction ends. All data,

including listings, bids, and user transactions, is stored securely in a centralized database while maintaining data integrity through secure communication protocols. The system's features include transparent auction processes, real-time bid processing, and automated confirmation emails to winning buyers, ensuring a seamless and secure user experience.

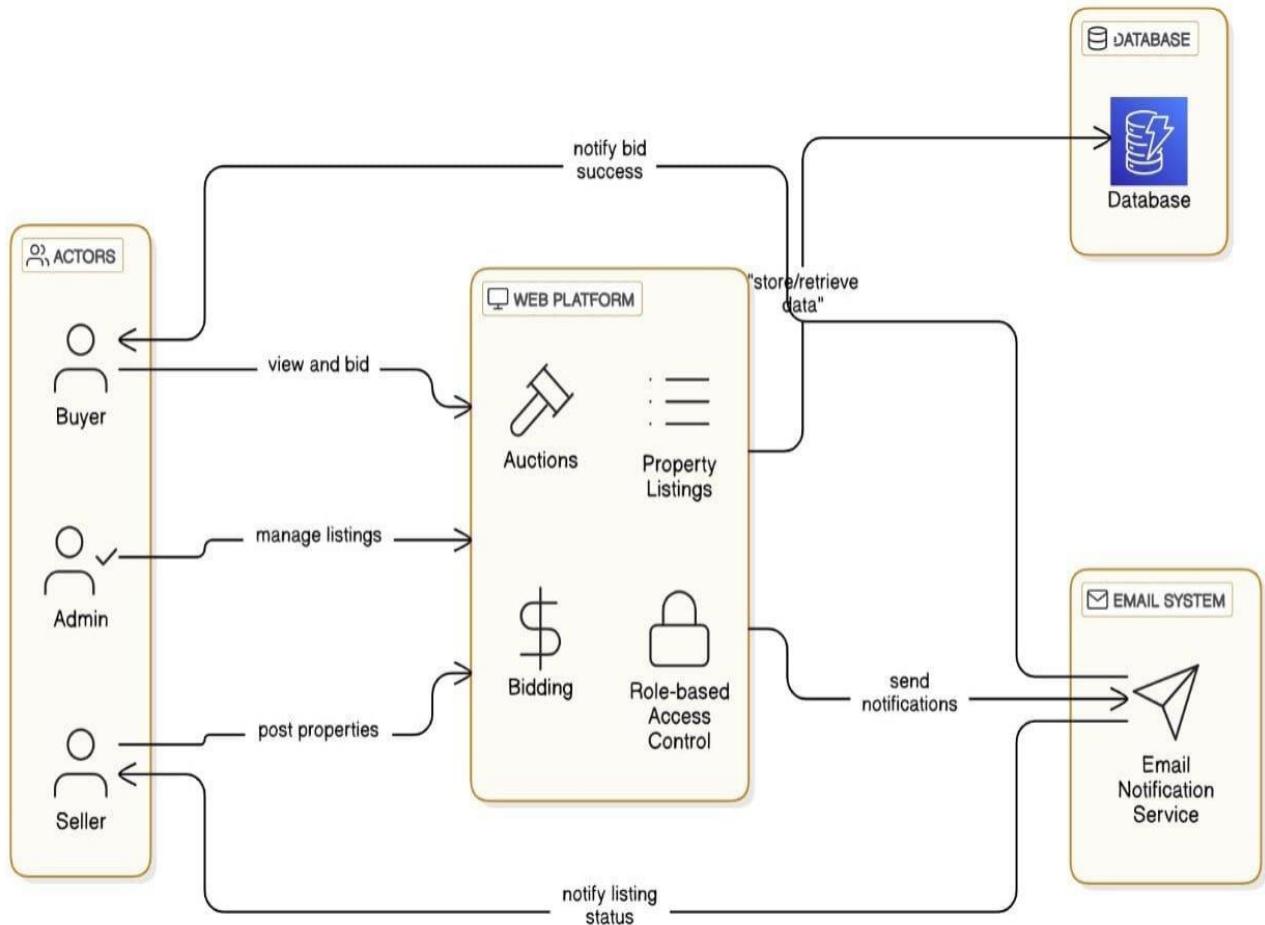


Fig 3.1: System Architecture

3.3 DEVELOPMENTAL ENVIRONMENT

3.3.1 HARDWARE REQUIREMENTS

The hardware specifications could be used as a basis for a contract for the implementation of the system. This therefore should be a full, full description of the whole system. It is mostly used as a basis for system design by the software engineers.

Table 3.1 Hardware Requirements

COMPONENTS	SPECIFICATION
PROCESSOR	Intel Core i3
RAM	4 GB RAM
POWER SUPPLY	+5V power supply

3.3.2 SOFTWARE REQUIREMENTS

The software requirements paper contains the system specs. This is a list of things which the system should do, in contrast from the way in which it should do things. The software requirements are used to base the requirements. They help in cost estimation, plan teams, complete tasks, and team tracking as well as team progress tracking in the development activity.

Table 3.2 Software Requirements

COMPONENTS	SPECIFICATION
Operating System	Windows 7 or higher
Frontend	ReactJS,Bootstrap
Backend	ExpressJS
Database	MongoDB

3.4 DESIGN OF THE ENTIRE SYSTEM

3.4.1 ACTIVITY DIAGRAM

The activity diagram Fig 3.2 represents the workflow for the Online Real Estate Auction System. The process begins with the seller interacting via a web page, where they provide necessary property details through a dynamic React.js form. The form data is passed to the backend via RESTful APIs developed using Express.js and Node.js. The system performs data validation and stores the property listing details, such as auction dates, bid history, and approval status, in MongoDB. Once the property listing is submitted, it enters the moderation phase, where admin users review the listing on their dedicated dashboard. If approved, the listing status is updated and reflected in real-time on the buyer's interface. Approved listings are then made available to buyers upon login. The auction phase begins when buyers can place bids on active listings, with all bids being tracked in real-time. The backend system handles auction timers, bid validations, and processing. When the auction ends, the system automatically identifies the highest bid and sends a confirmation email to the winning buyer. This seamless workflow ensures a secure and efficient auction process, leveraging Flask for backend processing and MongoDB for data storage, while ensuring real-time updates and secure transactions for both buyers and sellers. Upon the auction closing, the backend system automatically identifies the highest bid. The winning buyer is notified via a confirmation email, and the transaction details are updated in the system. The backend processes the final payment transaction and initiates the transfer of ownership. Admin users maintain full oversight throughout the process, from listing approval to the final confirmation. They can also monitor and report any suspicious activities during the auction to ensure the platform's integrity. The system employs robust security protocols to prevent unauthorized access and ensure the privacy and confidentiality of both buyers and sellers. By integrating real-time bidding, automated auction timers, and secure payment processing, the system offers a seamless and trustworthy experience for all users, while providing full transparency and security throughout the auction process. This streamlined workflow ensures that both buyers and sellers can engage confidently in real estate transactions.

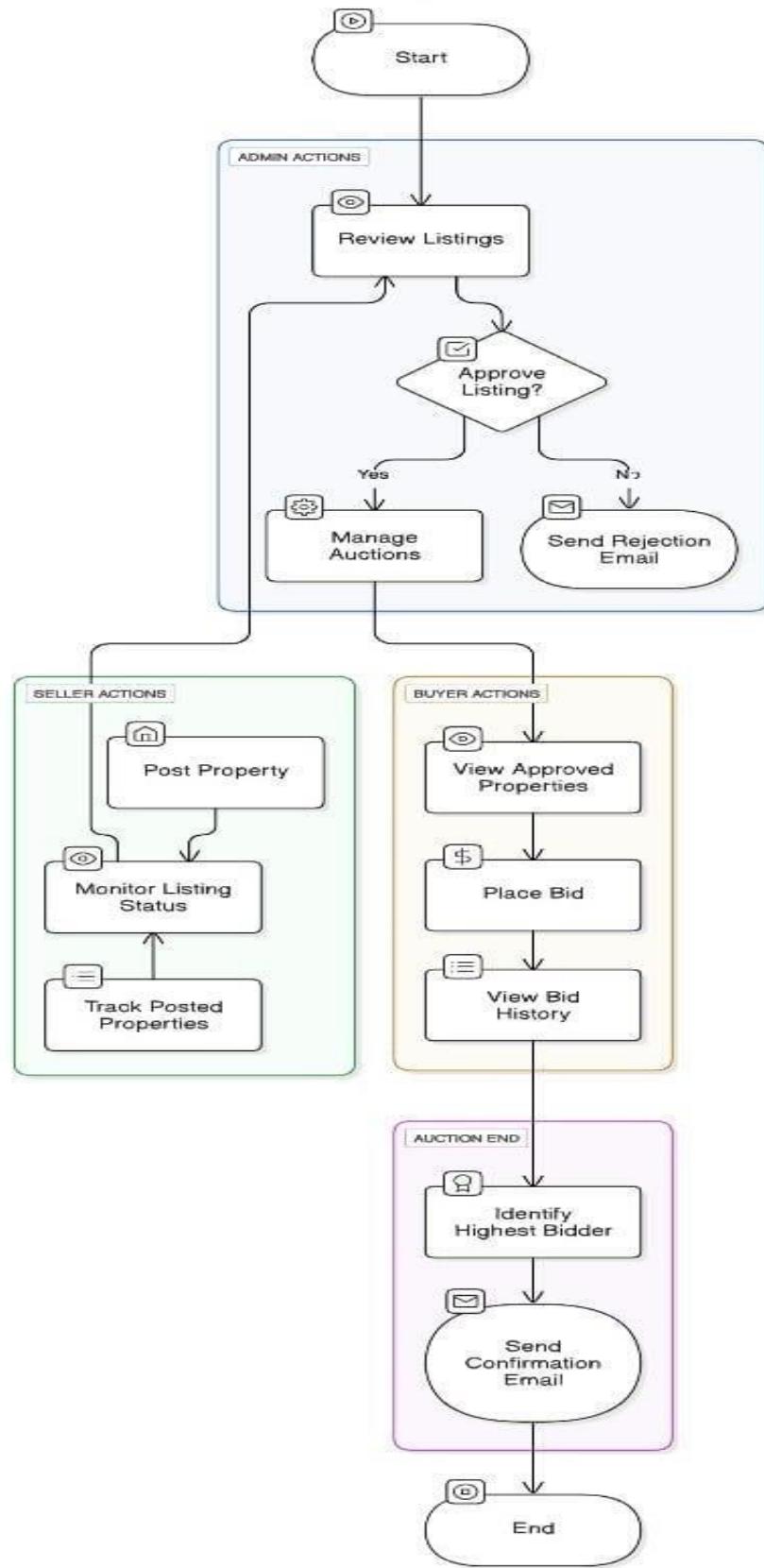


Fig 3.2: Activity Diagram

3.4.2 DATA FLOW DIAGRAM

The data flow diagram Fig 3.3 outlines the process of managing property listings and bids in the Online Real Estate Auction System. The process starts with sellers submitting property details via dynamic forms in React.js, which communicate with the backend through RESTful APIs built using Express.js and Node.js. The submitted property details are then validated and stored in a MongoDB database, including metadata such as auction status, closing dates, and bid history. Once the listing is approved by the admin, it becomes visible to buyers upon logging in, who can view the active auctions. Buyers place bids on the listings, which are updated in real-time and tracked by the system. The auction proceeds according to the timer, and once the auction ends, the system identifies the highest bid. The system then sends a confirmation email to the winning buyer, confirming the auction result. All data, including bidding history, user actions, and auction statuses, is stored securely in the database, ensuring data integrity and security throughout the auction process.

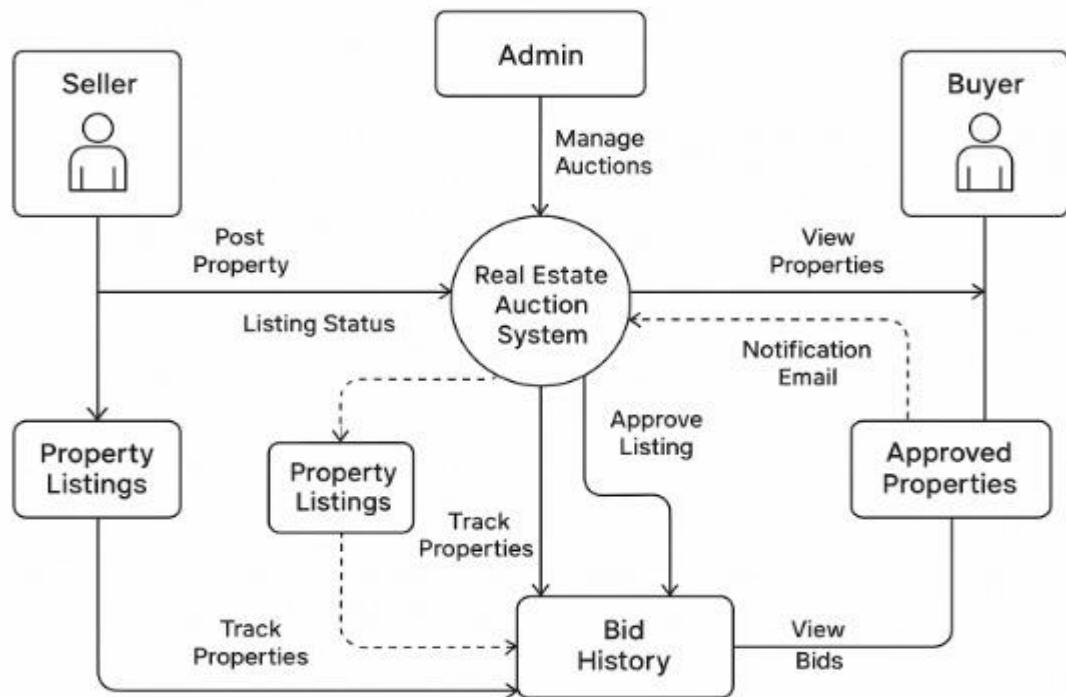


Fig 3.3:Data Flow Diagram

CHAPTER 4

MODULE DESCRIPTION

The workflow for the proposed system is designed to ensure a structured and efficient process for detecting and preventing blockchain security threats. It consists of the following sequential steps:

4.1.1 USER INTERFACE DESIGN

The sequence diagram Fig 4.1 depicts the process of managing an online real estate auction, starting with the seller submitting property details via a React.js form. The backend, using Express.js and Node.js, validates and stores the details in the MongoDB database along with metadata like auction status, closing date, and bid history. Once the listing is submitted, the admin reviews and approves the property listing via an admin dashboard. After approval, the listing is made visible to buyers. The buyer logs into the system and views the available property listings. They place bids on active auctions, which are continuously updated in real-time. Once the auction timer expires, the system identifies the highest bid and selects the winner. The system then sends a confirmation email to the winning buyer and updates the listing status accordingly in the database. Upon logging into the system, the buyer is presented with a list of approved property listings. The buyer can browse through these listings and place bids on properties that are currently open for auction. The bidding process is updated in real-time using web sockets, and all bid actions are recorded in the MongoDB database. As the auction continues, the auction timer counts down to the closing date. The system continuously updates the highest bid and remaining time on the frontend for both the seller and buyer. When the auction timer expires, the system automatically selects the highest bidder and confirms the auction result. Throughout the process, data is securely handled, ensuring data integrity and real-time updates. All actions are stored in the database, ensuring transparency and a secure auction environment.

Real Estate Auction System Sequence

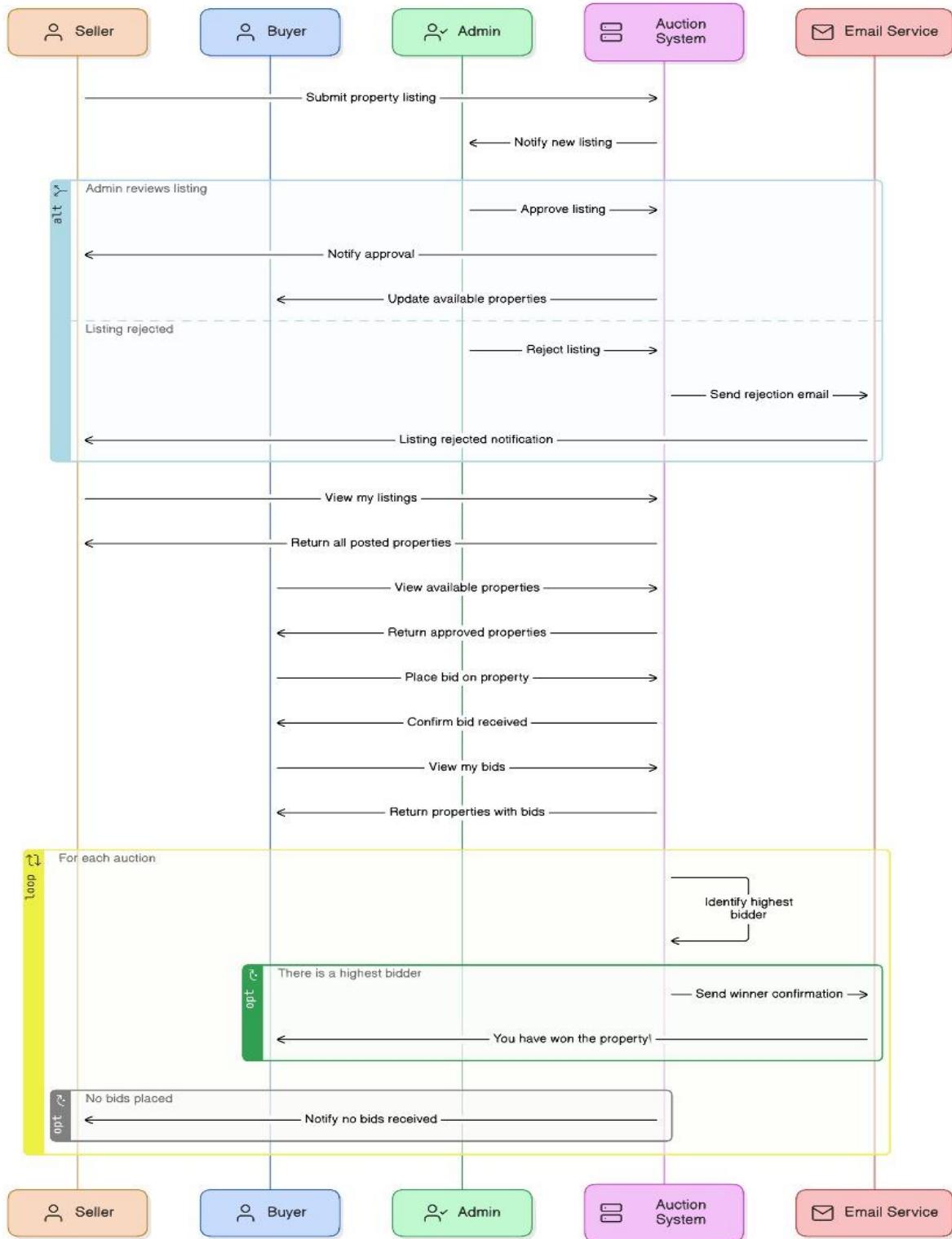


Fig 4.1: SEQUENCE DIAGRAM

4.1.2 BACK END INFRASTRUCTURE

The backend infrastructure for the Online Real Estate Auction System consists of a MongoDB database to manage property listings, auction details, user accounts, and bid history. It uses a machine learning framework like TensorFlow or Scikit-learn to analyze bidding patterns, predict prices, and provide insights for better decision-making. The system integrates blockchain technology to ensure transparency and secure, tamper-proof auction transactions, storing all relevant data such as bid history and auction results. A Flask framework with a WSGI server handles the backend logic, facilitates communication between the front-end and the database, and manages real-time auction updates. This robust infrastructure ensures seamless, secure, and scalable operations for both buyers and sellers.

4.2.1 User Interaction:

Users, including sellers and buyers, initiate the process by logging into the system. Sellers submit property details via dynamic React.js forms, which are processed and stored in the backend. Buyers browse through listings of approved properties and can view auction details and bid history.

4.2.2 Auction Management:

Sellers can track their property listings and auction status via the admin dashboard. Once the property is approved, buyers can view the listing and place bids. Bids are stored in real-time and tracked against auction timers to determine the highest bid.

4.2.3 Real-Time Auction Bidding:

Buyers place bids on active auctions, and the system records each bid in real-time. The auction platform updates the property's highest bid and remaining time. The system

ensures that bid increments and auction timing are accurately monitored to avoid manipulation.

4.2.4 Auction Closure and Winner Identification:

At the auction's end, the system automatically identifies the highest bidder using backend logic. A confirmation email is sent to the winning buyer with auction results, payment instructions, and property transfer details. The auction listing is updated with a closed status, and the seller is notified of the successful transaction.

CHAPTER 5

IMPLEMENTATION AND RESULTS

5.1 IMPLEMENTATION

The project is developed and deployed using a comprehensive technology stack, incorporating Python for backend processing, Flask as the web framework, and MongoDB for database management. The frontend is designed using React.js, ensuring a dynamic and responsive user interface for buyers and sellers. The system leverages machine learning models like SVM, Gradient Boosting, and Random Forest for predicting property prices, evaluating bids, and optimizing auction strategies. The implementation involves creating a user-friendly interface for both sellers to list properties and buyers to place bids in real-time auctions. The backend server, built using Node.js and Express.js, efficiently handles user requests, processes bids, and manages real-time auction updates. Additionally, the system incorporates a user account management feature, allowing users to register, log in, and manage their bidding history and notifications. The platform continuously evolves based on user feedback, incorporating new features for improved auction efficiency and security.

5.2 OUTPUT SCREENSHOTS

The project implementation is organized into several modules, as depicted in Fig. 5.1, highlighting the seamless integration of various auction-related features for the online real estate system. It demonstrates a robust workflow, ensuring real-time updates and efficient management for both buyers and sellers. Fig. 5.2 showcases the auction management module, where administrators can easily create, manage, and approve auction listings. Fig. 5.3 illustrates the property review interface, providing administrators with a streamlined platform to review, approve, or reject listings. Fig. 5.4 highlights the property detail view, where admins can access detailed property

specifications, descriptions, and contact details to make informed decisions. Fig. 5.5 presents the seller's dashboard, offering users the ability to manage their posted properties, track auction status, and review past auction performance. Fig. 5.6 illustrates the property posting form, where sellers can submit property details, upload images, and create listings for auction. Fig. 5.7 showcases the auction participation interface for buyers, where they can browse available auctions, filter by property type, location, and auction dates, and select the ones they wish to participate in. Fig. 5.8 displays the auction property listings, allowing buyers to view detailed property information, filter, and select properties they are interested in bidding on. Fig. 5.9 demonstrates the auction bidding page, where buyers can place bids and track the highest bid in real-time. Fig. 5.10 highlights the buyer's bidded properties page, showing properties that the buyer has placed bids on, along with their respective bid amounts and current statuses. Fig. 5.11 presents the auction results page, displaying the winning bid for each property, along with a confirmation notification for the winning bidder.

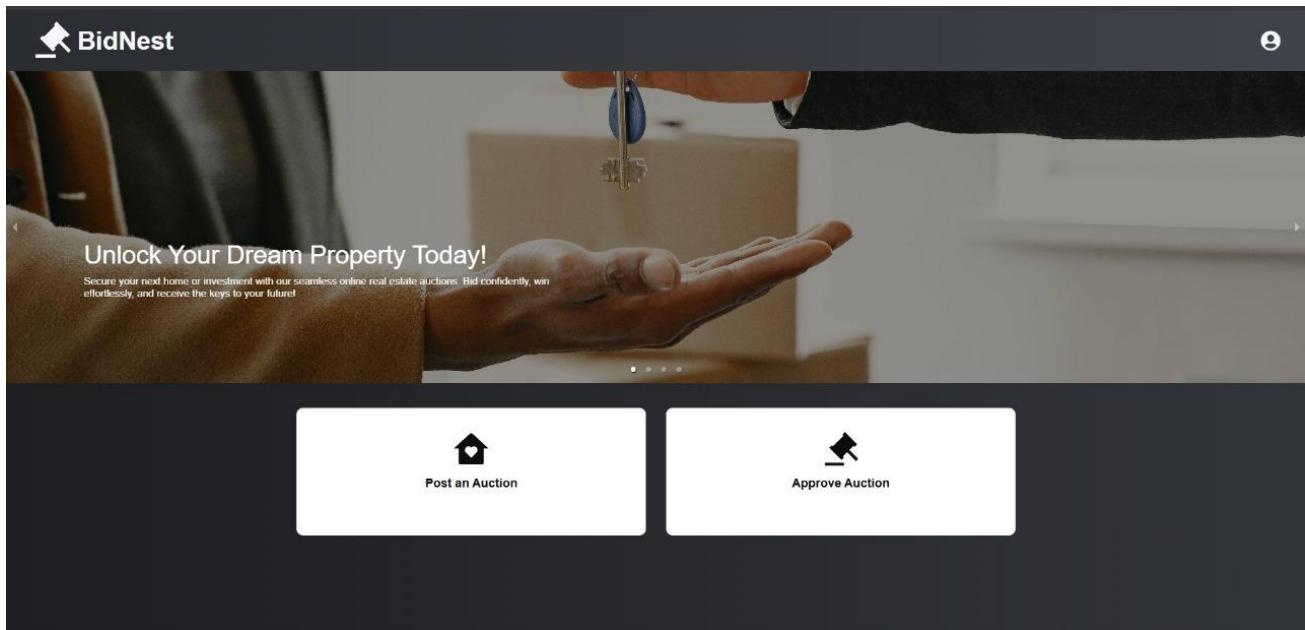


Fig. 5.1 Admin Dashboard

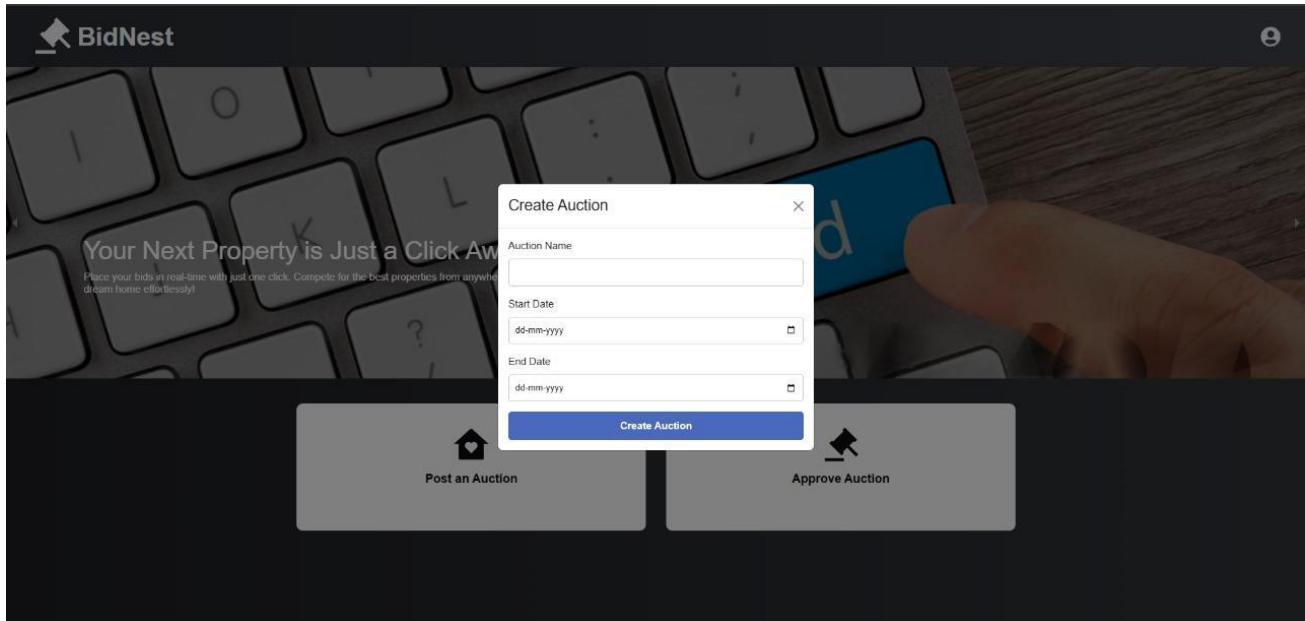


Fig. 5.2 Auction Creation Form

Pending Properties **Reviewed Properties**

Evergreen Heights
chennai
Apartment
₹5000000
5000 Sq. Ft
Status: Rejected

Serenity Villa
madurai
Villa
₹1000000
6700 Sq. Ft
Status: Rejected

Maple Townhouse
trichy
Townhouse
₹800000

Fig. 5.3 Property Review Interface

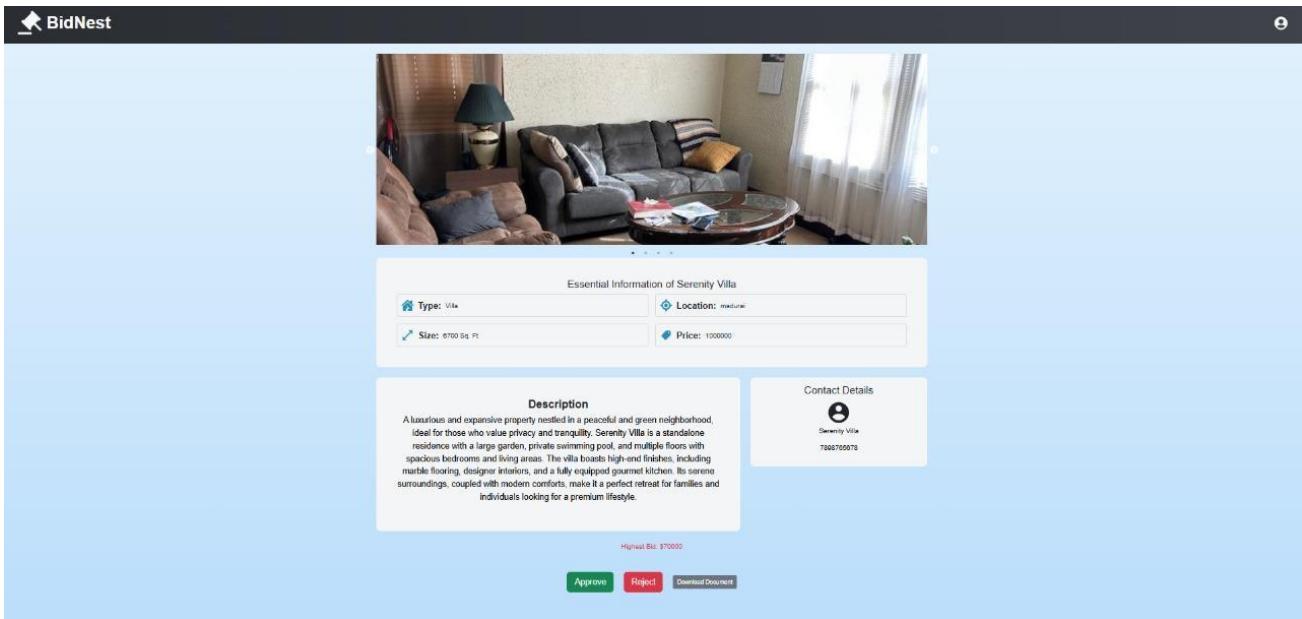


Fig. 5.4 Property Detail View

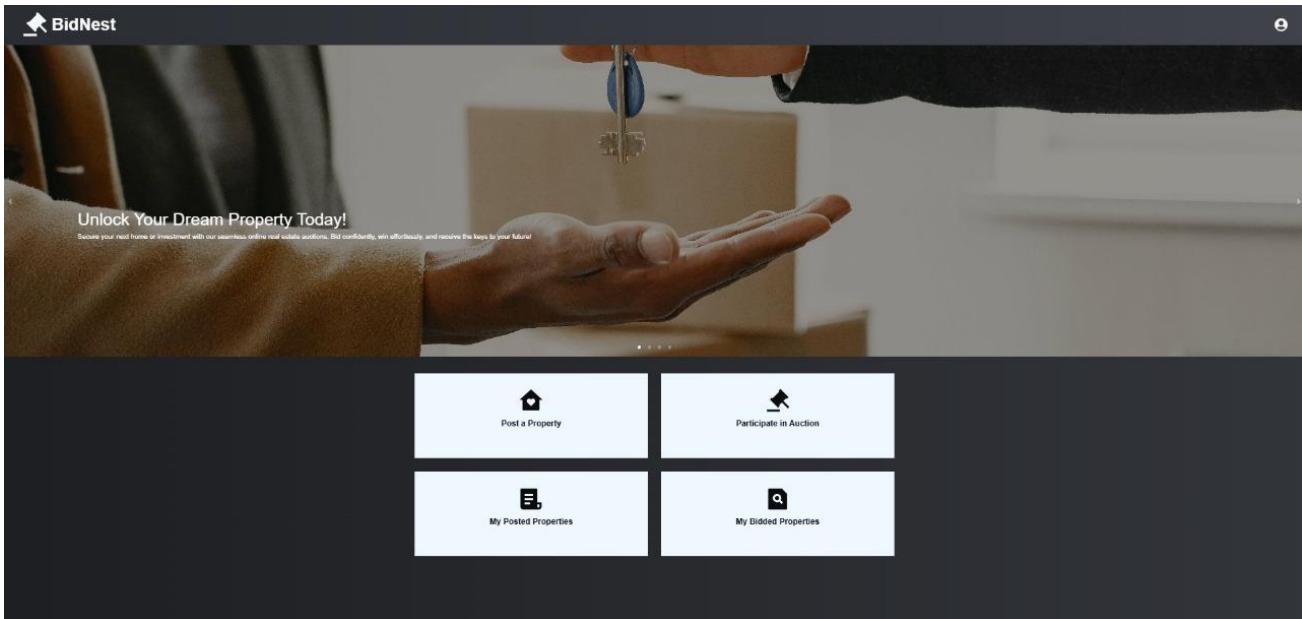


Fig. 5.5 User Dashboard

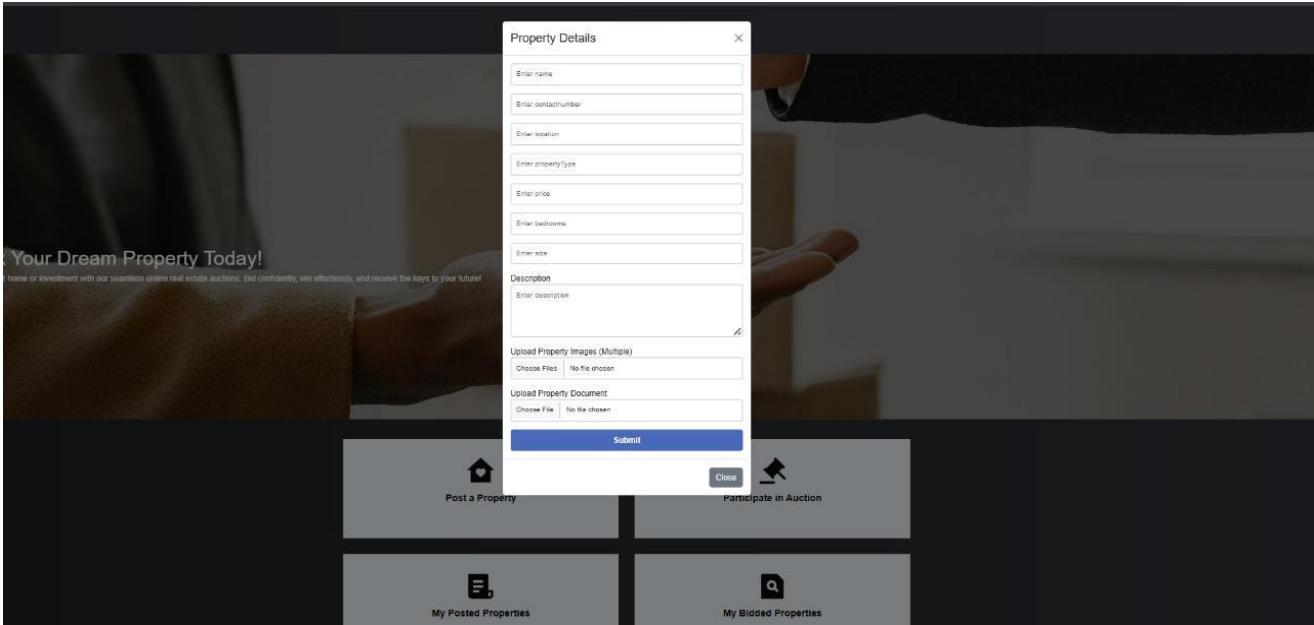


Fig. 4.6 Property Posting Form

Fig. 5.7 Auction Participation Interface

The screenshot shows the BidNest website interface. On the left, there is a sidebar with filters for 'Property Type' (Select), 'Location' (salem), 'Price Range' (₹ 80,000 - ₹ 890,000), and 'Size (Sq. Ft)' (₹ 80,000 - ₹ 890,000). A blue 'Apply Filters' button is at the bottom of the sidebar. The main content area displays two property cards. The first card is for 'Willow Creek Bungalow' located in salem, which is a Bungalow listed for ₹ 80,000. The second card is for 'Celestial Penthouse' located in kanyakumari, which is a Penthouse listed for ₹ 890,000. Each card includes a small thumbnail image of the property.

Fig. 5.8 Auction Property Listings

The screenshot shows the BidNest website interface for the 'Willow Creek Bungalow'. At the top, there is a large image of the bungalow's interior, featuring a living room with a fireplace, a dining area, and a kitchen. Below the image is a white box containing 'Essential Information of Willow Creek Bungalow' with fields for Type (Bungalow), Location (salem), Size (5000 Sq. Ft), and Price (₹ 80,000). To the right of this box is a 'Contact Details' section with a user icon, the property name 'Willow Creek Bungalow', and the phone number '888424100'. Further down the page, there is a 'Description' section with text about the bungalow's features and a 'Highest Bid: ₹ 0' message. At the bottom, there is a bidding form with a placeholder 'Enter your bid amount' and a blue 'Bid Now' button.

Fig. 5.9 Property Bidding Page

The screenshot displays a dashboard titled "My Posted Properties". It features a table with columns: Name, Price, Location, Property Type, Bedrooms, Size, Description, and Status. The table contains seven rows of property data:

Name	Price	Location	Property Type	Bedrooms	Size	Description	Status
Evergreen Heights	\$5000000	chennai	Apartment	3	5000 sq.ft	A modern and stylish ...	Pending
Serenity Villa	\$1000000	madurai	Villa	4	6700 sq.ft	A luxurious and expa...	Pending
Maple Townhouse	\$800000	trichy	Townhouse	5	5400 sq.ft	A charming and pract...	Approved
Skyline Towers	\$750000	coimbatore	Condominium - Condo	4	4900 sq.ft	A sophisticated and hi...	Pending
Willow Creek Bungalow	\$800000	salem	Bungalow	4	5600 sq.ft	A cozy and charming ...	Approved
Celestial Penthouse	\$850000	kanyakumari	Penthouse	7	55 sq.ft	The epitome of luxury...	Approved
Rosewood Cottage	\$780000	vellore	Cottage	3	5 sq.ft	A picturesque and ch...	Approved

Fig 5.10 Seller Property Dashboard

The screenshot shows a dashboard titled "My Bidden Properties". It lists three properties with their details:

- Serenity Villa**
Price: \$1000000
Location: madurai
Bid Amount: \$70000
- Maple Townhouse**
Price: \$800000
Location: trichy
Bid Amount: \$800001
- Celestial Penthouse**
Price: \$850000
Location: kanyakumari
Bid Amount: \$900000

Fig. 5.11 Buyer bidden properties

CHAPTER 6

CONCLUSION AND FUTURE ENHANCEMENT

6.1 CONCLUSION

The Online Real Estate Auction System efficiently transforms traditional property transactions into a transparent, green, and absolutely virtual enjoy. Built the usage of the MERN stack, the platform offers real-time bidding, automatic winner selection, and role-based get right of entry to for admins, dealers, and consumers. It simplifies the belongings approval process, ensures well timed notifications through computerized emails, and continues a entire audit trail for responsibility. By minimizing manual intervention and streamlining the public sale workflow, the machine complements user accept as true with and engagement. Its scalable and modular design supports future improvements consisting of charge integration, chat guide, or belongings verification, making it a robust foundation for modernizing real estate dealings.

6.2 FUTURE ENHANCEMENT

Future enhancements for this study could include integrating deep learning models like CNNs for image-based fake profile detection and transformers such as BERT for text analysis. Implementing smart contracts and decentralized identity verification (DID) on blockchain could further enhance security and transparency. Real-time detection with adaptive learning using reinforcement learning would improve accuracy as fake profiles evolve. Expanding detection capabilities across multiple social media platforms with federated learning can enhance privacy while maintaining effectiveness. Additionally, privacy-preserving techniques like differential privacy could be incorporated to protect user data while ensuring model accuracy.

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ONLINE REAL ESTATE AUCTION SYSTEM

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Abstract—The real estate sector, while booming in the digital era, is increasingly vulnerable to fraudulent listings, deceptive practices, and unauthorized property transactions. The Online Real Estate Caution System is designed to address these issues by integrating data validation, user verification, and alert mechanisms into a centralized platform. This system uses intelligent flagging algorithms and cross-verification techniques to detect potential red flags in listings, such as mismatched ownership details or suspicious activity patterns. Through real-time notifications and an interactive dashboard, users are warned about potentially unsafe properties before proceeding with a transaction. The platform also empowers administrators to monitor, investigate, and blacklist dubious entries dynamically. Experimental evaluation of the system on a sample dataset shows increased user confidence, a significant reduction in false listings, and faster detection of anomalies. The implementation of this system provides a safer and more transparent environment for property buyers, renters, and sellers by proactively identifying risks and ensuring listing authenticity.

Keywords— Real Estate, Fraud Detection, Caution System, Property Verification and Online Listings .

I. INTRODUCTION:

In the evolving virtual panorama, the actual property enterprise has skilled a paradigm shift from conventional strategies to on-line platforms, making belongings transactions greater available and green. However, this digitization has additionally added large demanding situations including fraudulent listings, misrepresentation of belongings details, identity spoofing, and unauthorized postings, which compromise customer accept as true with and platform integrity. The Online Real Estate Caution System is designed to tackle those problems through serving as an sensible alert and verification mechanism that ensures transparency and protection for all stakeholders concerned in property transactions. Real property scams frequently stem from the inability to validate the authenticity of belongings listings, dealers, or consumers in real-time. This system addresses such worries through incorporating an automatic verification engine that go-references listed assets info with publicly to be had records, identifies anomalies, and flags suspicious entries. By doing so, it minimizes the chances of customers falling sufferer to scams and incorrect information. Another middle component of the machine is the combination of an alert mechanism that informs users about flagged listings, blacklisted accounts, or inconsistencies located in the transaction history. Administrators are geared up with equipment to intrude, investigate, and take important moves which includes temporarily disabling suspicious debts or issuing public warnings. Moreover, the machine is designed to be scalable and adaptable to various real estate environments, whether or not neighborhood or country wide, residential or industrial. Through the usage of stable user authentication, records validation algorithms, and a responsive dashboard, the platform prioritizes each protection and usefulness.

II. LITERATURE SURVEY:

Marketing tactics that adjust to both static and dynamic pricing factors are essential to the profitability of real estate development. In order to handle time-sensitive components such as consumer behavior, market trends, and construction stages, this article emphasizes the application of fuzzy set theory in MATLAB. Developers can make data-driven pricing and strategy decisions in real time by using visual plots to analyze Group and Time Impact Factors. These tools are useful for both strategic and operational reasons because they improve forecasting, risk management, and investment planning.[1] A major pillar of China's economy, the real estate sector greatly affects personal and national concerns. Complex socio-economic elements affect real estate prices and set them apart from general commodity pricing. For land valuation, policy-making, and market stability, accurately forecasting these price fluctuations is difficult but crucial. Good forecasting helps consumer knowledge of reasonable market value, developer profit projection, and government planning.[2]Important for India's economic development, the real estate industry is quite sensitive to economic changes, which endangers financial stability. This work offers a neural network-based model to forecast volatility in real estate prices. With 95.71% accuracy, the model outperforms conventional GA algorithms in both accuracy and error reduction. Its predictive power helps to shape policies and manage risks proactively in the financial and real estate industries.[3]This journal is significant now since it presents CAUTION, a quick human authentication system that guarantees security by using low data via few-shot learning. It improves detection of unknown intruders without requiring their data, so solving practical security issues. Its low data need and accuracy make CAUTION very relevant for IoT applications and contemporary smart environments.[4]This journal is significant since it questions the assessment techniques applied in chaos-based S-box design, which are absolutely vital for secure cryptographic systems. It promotes more thorough and correct analysis for future designs by stressing areas of nonlinearity evaluation. Essential in the data-driven and security-conscious digital world of today, this helps to enhance the strength and dependability of encryption.[5]This article is worth a read because it introduces a cool new way to handle risk in reinforcement learning. It tackles the time-inconsistency problems that come up in traditional MDPs. By thinking of "caution" as a risk measure in a linear programming setup, it makes model-free learning a lot smoother. This way, we can

trust our policies more when things get uncertain, which is super handy for making safe and reliable decisions.[6]More precise real estate price forecasting is made possible by this research, which helps investors, buyers, and sellers value properties. By recognizing temporal and spatial price patterns, it aids in urban planning and policy-making. By providing accurate forecasts, the A-SRGCNN model improves secondary real estate market decision-making. By showing price connections across areas and time frames, it also enhances financial risk assessment. [7]This study shows that real estate price movements can be accurately predicted using Google Trends search data, providing a useful tool for market forecasting. Based on trends in public interest, it helps investors, buyers, and sellers make timely real estate decisions. It also helps researchers and policymaker add demand-side, real-time indicators to housing market models.[8]Financial institutions and real estate platforms gain from this research since it makes it possible to perform precise, current property valuations with a small amount of recent transaction data. In situations where there is a lack of data, Luce's predictive model helps appraisers, buyers, and sellers make decisions. By offering trustworthy valuation insights across whole housing networks, it also helps policymakers and urban planners. [9]In order to maximize profits in volatile market conditions, this research assists sellers in optimizing their house listing prices and acceptance tactics. Platforms and real estate agents can use it to create intelligent pricing tools that adjust based on the actions of buyers. Additionally, the model helps homeowners make data-driven choices when selling their homes. [10]

III. PROPOSED MODEL:

A. Methodology

The Real Estate Auction System is a web-primarily based platform advanced the use of the MERN (MongoDB, Express.Js, React.Js, Node.Js) stack, designed to facilitate seamless and green assets transactions thru on-line auctions. This gadget integrates various person roles—admin, seller, and consumer—every with specific permissions and capabilities. The methodology specializes in constructing an interactive and transparent platform in which sellers can submit belongings listings, buyers can area bids, and the admin oversees the auction approaches. Upon submission, each assets listing is reviewed via the admin, who both approves

or rejects it primarily based on predefined standards. Rejected listings trigger an automated e-mail notification to the respective seller, making sure clear communication. Approved listings are made available to consumers for bidding. The system constantly tracks energetic auctions, and once an auction duration ends, it routinely determines the best bidder and notifies them thru e-mail, confirming their successful bid.

B. System Architecture and Functional Workflow

The structure of the Real Estate Auction System is modular and designed to make certain scalability, statistics integrity, and green position-based totally access. Sellers interact with the device with the aid of filing assets details thru dynamic React.Js bureaucracy, which talk with the backend via RESTful APIs advanced using Express.Js and Node.Js. These listings are stored in MongoDB with metadata which includes approval repute, public sale closing dates, and bid history. Admin users have get entry to to a devoted dashboard wherein they can view and mild submitted listings. Upon making a decision, the admin updates the listing status, which routinely reflects within the user interface for both dealers and shoppers. Buyers, upon logging in, are offered only with listings approved by using the admin. They can vicinity bids on energetic auctions, that are established and stored in real-time. Each public sale is ruled by means of a timer, and while the auction ends, the backend good judgment identifies the best bid and dispatches a confirmation email to the triumphing consumer.

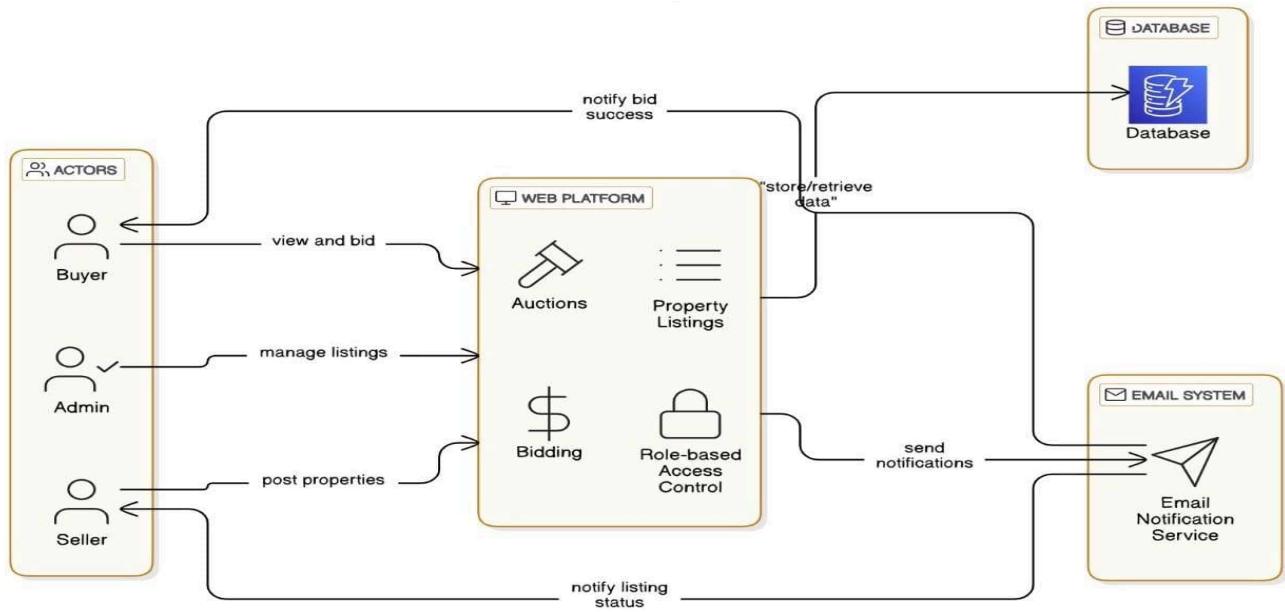


Fig. 3.1 Architecture Diagram

Fig. 3.1 The structure diagram illustrates the core additives of the Real Estate Auction System, highlighting interactions among customers and the web platform. Buyers can view belongings listings and participate in auctions, at the same time as sellers publish houses and admins control listings. The gadget leverages function-based totally access manipulate to make certain steady operations and makes use of a database for storing and retrieving auction statistics. Additionally, an integrated email notification carrier informs customers about list reputation updates and successful bids in real time.

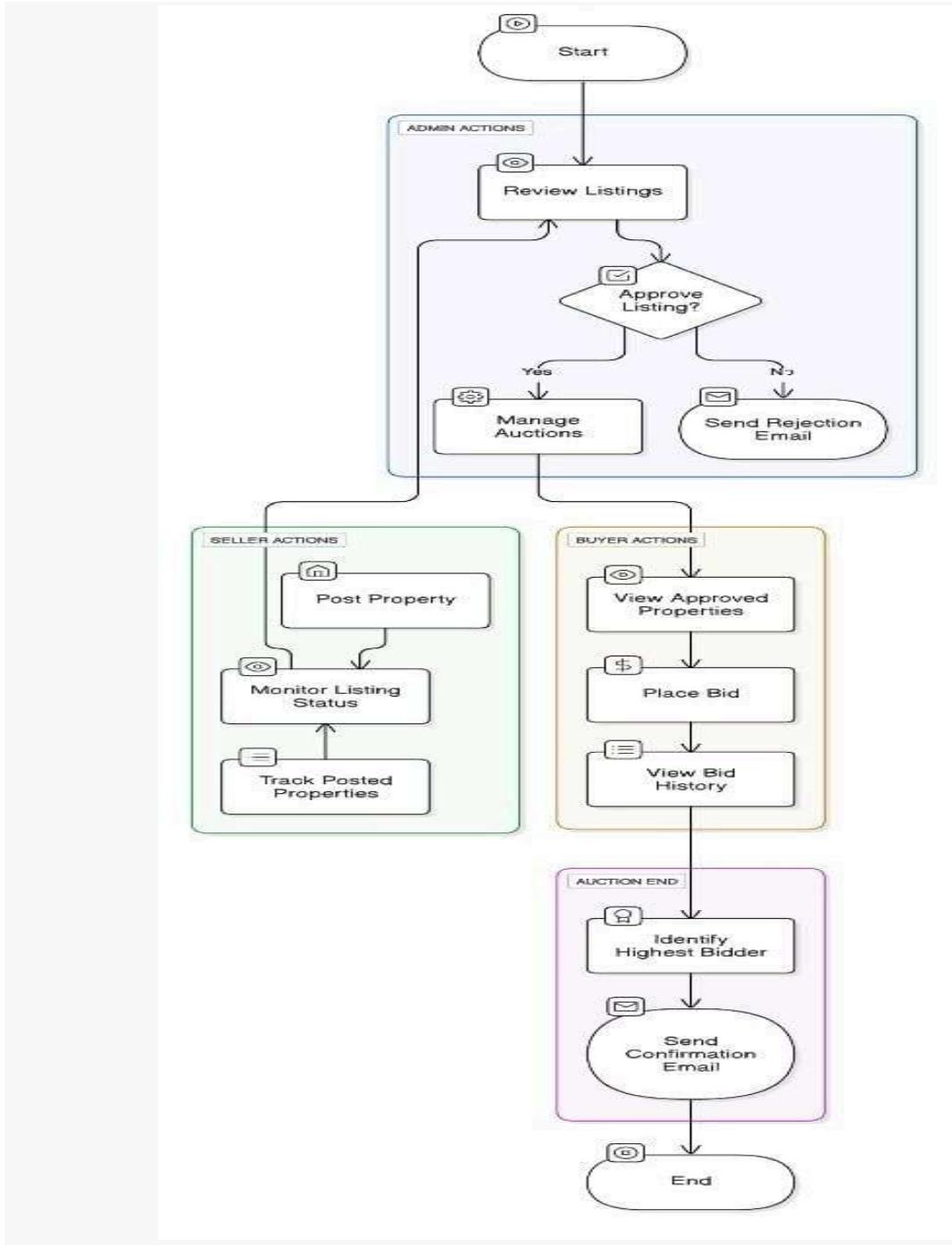


Fig. 3.2 Flow Diagram

Fig. 3.2 Three illustrates the step-via-step workflow of the Real Estate Auction System involving admin, vendor, and purchaser moves. The procedure ensures clean belongings listing, bidding, and winner confirmation through automated selection-making and notifications.

C. Objectives of the System

The principal goal of the gadget is to ensure a streamlined, transparent, and electricity-efficient public sale process. It ambitions to reduce manual intervention in selecting winners by using leveraging automatic selection-making via backend algorithms. Transparency is executed by permitting customers to music listing and bidding statuses in real-time, even as the automated electronic mail notifications hold clear communique all through the transaction lifecycle. Furthermore, the device seeks to beautify consumer engagement by way of providing immediately feedback and updates, at the same time as retaining strict get entry to control and facts safety through role-based login and protected routes. The choice of MongoDB guarantees green handling of diverse statistics kinds, consisting of user profiles, assets details, and bid histories, which is important for a dynamic public sale environment.

D. MERN Stack Integration

The integration of the MERN stack ensures a unbroken and responsive user experience together with strong backend functionality. MongoDB serves because the number one database, offering a flexible schema to house various person and belongings records. Node.Js and Express.Js control the server-facet logic, which includes user authentication, bid validation, and automated notifications. React.Js is used to build an intuitive and interactive front-quit interface, permitting customers to view listings, vicinity bids, and get hold of updates in actual-time. Communication among the customer and server is handled through RESTful APIs, making sure a easy and steady float of facts throughout all modules. The software also includes email functionality the use of NodeMailer, that's brought about with the aid of key activities along with listing rejection or auction completion.

E. Database Schema Design

The Real Estate Auction System makes use of a flexible, record-oriented MongoDB schema. The customers collection manages authentication and roles (admin, supplier, customer). Property listings inside the homes collection consist of info like name, vicinity, beginning rate, description, supplier ID, approval fame, public sale deadline, and photographs. Admin actions (approval/rejection) are timestamped with optional feedback. The bids collection facts consumer bids with quantities and submission times, proven in real time. Auction effects are up to date inside the homes series or logged one by one to tune winners and ship notifications. All important moves are timestamped to make certain facts integrity.

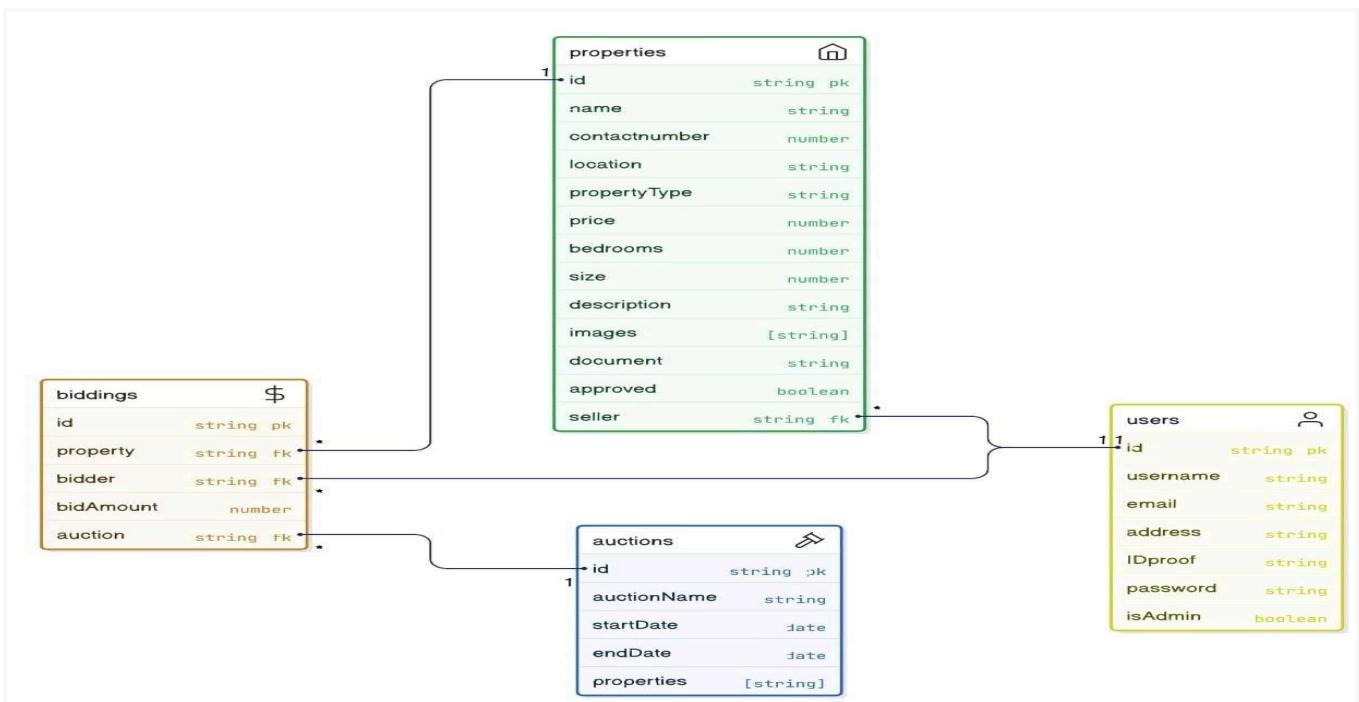


Fig. 3.3 ER Diagram

Fig. 3.3 The ER diagram represents the database schema of the Real Estate Auction System. It consists of entities for customers, houses, auctions, and biddings, with clear relationships amongst them. Sellers (users) can listing residences, and consumers area bids related to unique auctions. Each entity continues essential attributes to manipulate and song property listings, consumer roles, public sale activities, and bidding history efficaciously.

F. Algorithm Workflow

The machine initiates through assigning particular roles and identifiers to each user and assets listing. When a dealer posts a belongings, the records is submitted to the backend, in which it's miles stored in the database with a pending approval fame. The admin then opinions this submission and updates its status to either permitted or rejected. If rejected, an e mail is sent mechanically to the vendor with the cause for rejection. Approved properties are displayed at the client's interface, in which shoppers can view information and participate in auctions. Bids are submitted and saved in actual-time, and every new bid is tested to make sure it exceeds the current maximum bid. As the public sale deadline strategies, a scheduler checks for auctions which have ended and identifies the highest bidder. This bidder is then notified through a affirmation electronic mail. Throughout the manner, strength and aid performance are maintained by way of minimizing pointless database calls and optimizing the waft of statistics via carefully designed RESTful offerings. All consumer interactions and system activities are logged for transparency and system auditing, making sure a secure and reliable public sale surrounding.

IV RESULT AND DISCUSSION:

The Real Estate Auction System successfully integrates all core features, allowing admins to manage auctions, accept or reject them, and notify sellers via email. Sellers can post their properties, track auction status, and receive real-time updates, while buyers can view and bid on available properties. The system's interface, as shown in the provided images, is user-friendly and efficient, ensuring smooth interaction for both sellers and buyers. All functions, including bid tracking and property viewing, contribute to the system's effectiveness in streamlining the real estate auction process.

Admin Dashboard and Functionality Overview:

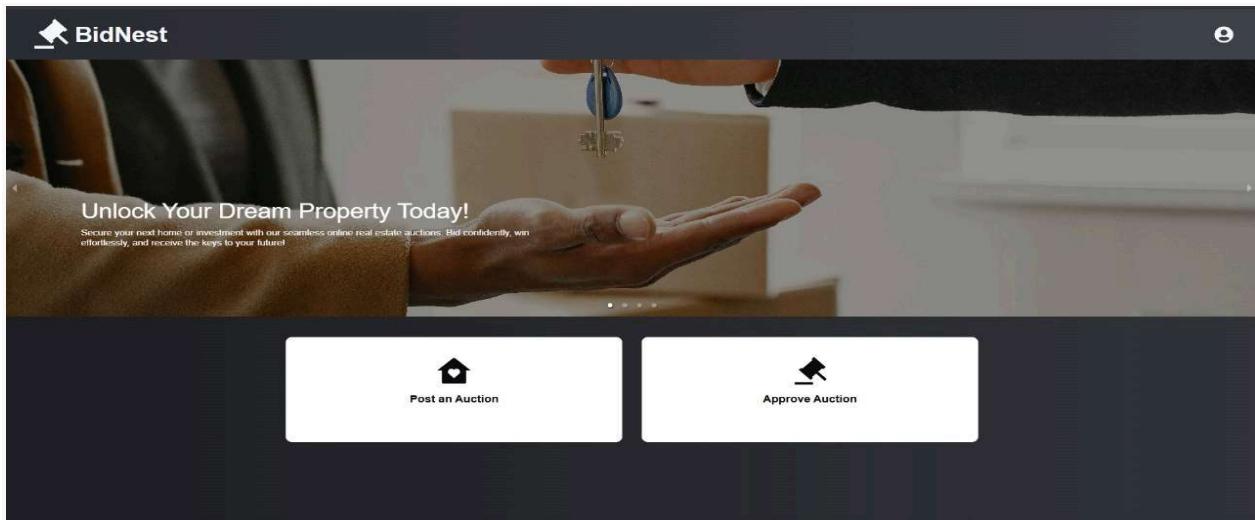


Fig. 4.1 Admin Dashboard

Figure 4.1 illustrates a user-friendly dashboard enabling admins to post and approve property auctions with ease.

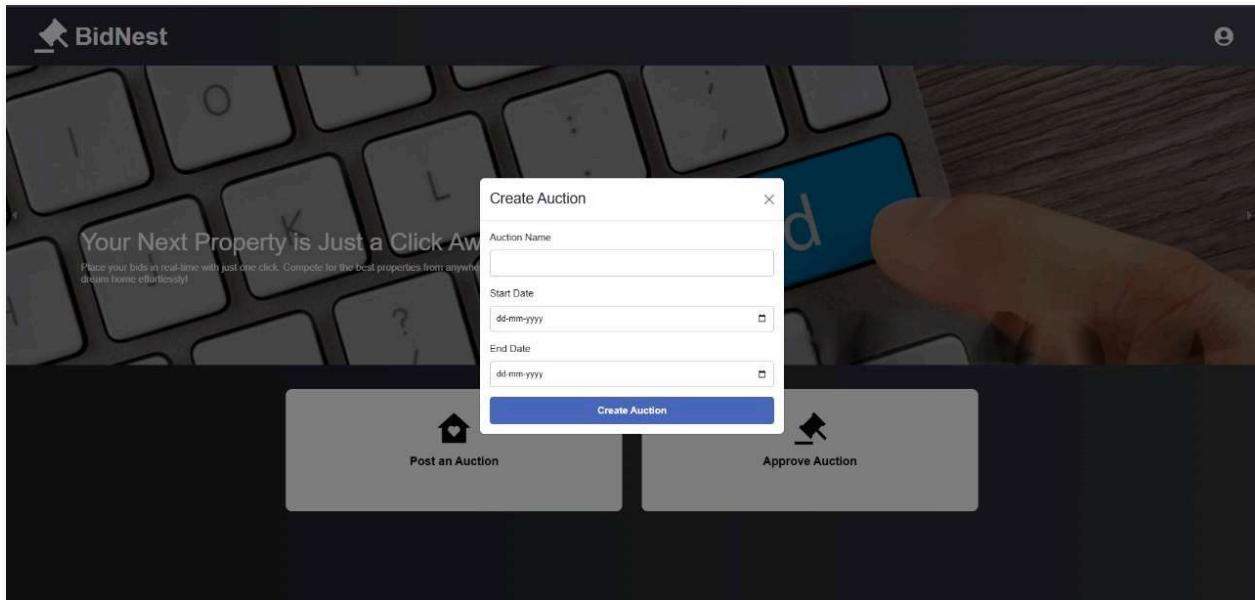


Fig. 4.2 Auction Creation Form

Figure 4.2 illustrates a form interface for admins to enter auction details and set the auction duration.

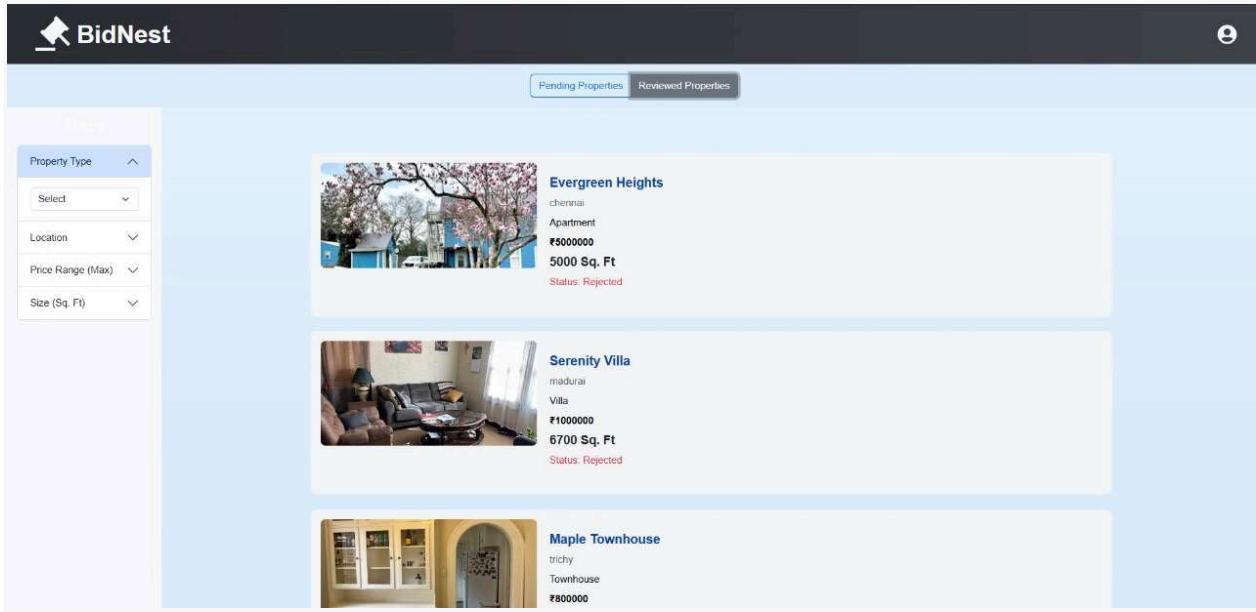


Fig. 4.3 Property Review Interface

Figure 4.3 showcases the admin dashboard where listed properties can be viewed along with options to approve or reject them.

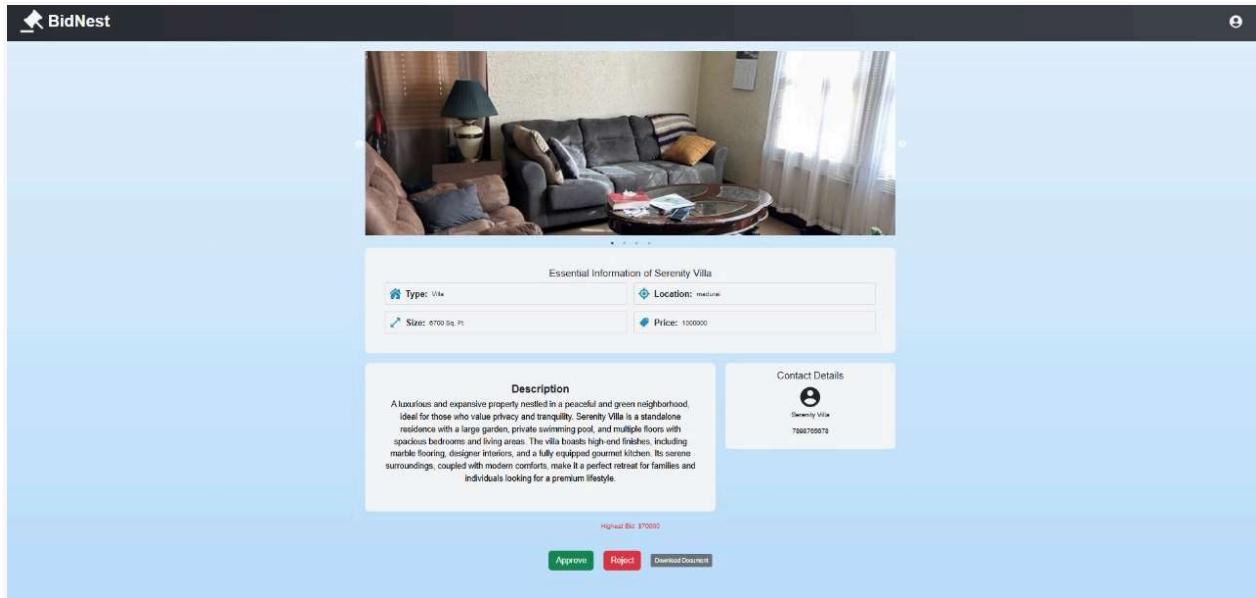


Fig. 4.4 Property Detail View

Figure 4.4 presents a detailed view of the property, including its specifications, description, and contact details, allowing the admin to either approve or reject .

Buyer and Seller Portal Interface:

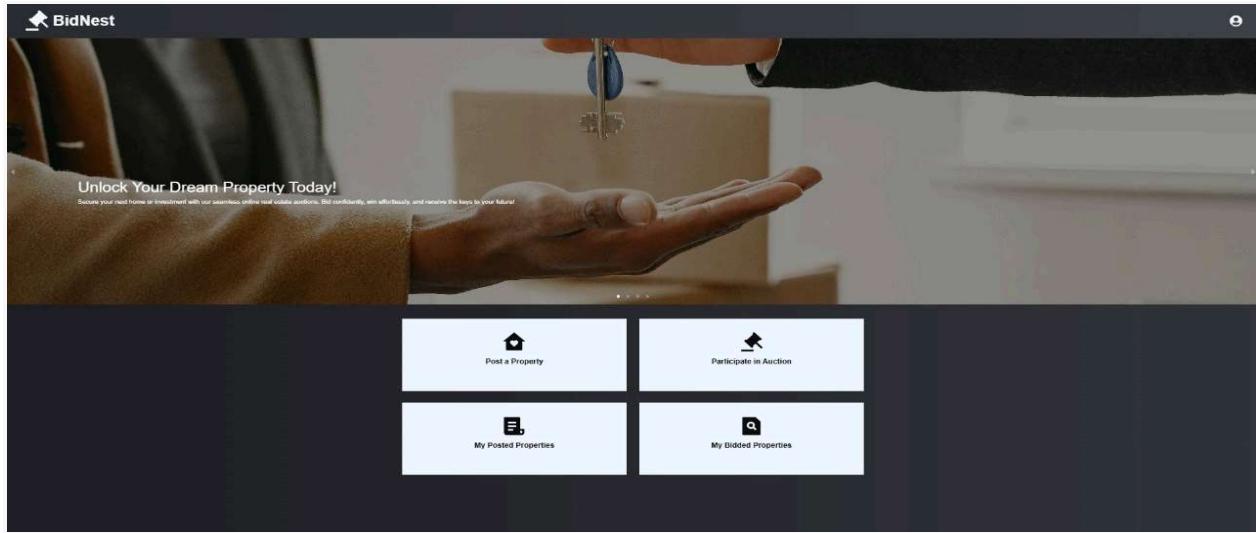


Fig. 4.5 User Dashboard

Figure 1 This interface allows users to post properties, participate in auctions, view their bidding auctions, and manage their posted properties.

This image shows the "Property Details" form overlaid on the user dashboard. The form is titled "Property Details" and contains fields for "Enter name", "Enter contactnumber", "Enter location", "Enter propertytype", "Enter price", "Enter bedrooms", "Enter size", and "Enter description". Below these fields are two file upload sections: "Upload Property Images (Multiple)" and "Upload Property Document". Both sections have "Choose File" buttons and show "No file chosen". At the bottom of the form is a large blue "Submit" button. The background of the form is white, while the rest of the dashboard has a dark theme.

Fig. 4.6 Property Posting Form

Figure 4.6 displays the property submission form where sellers can enter property details, upload images and documents, and submit listings for auction.

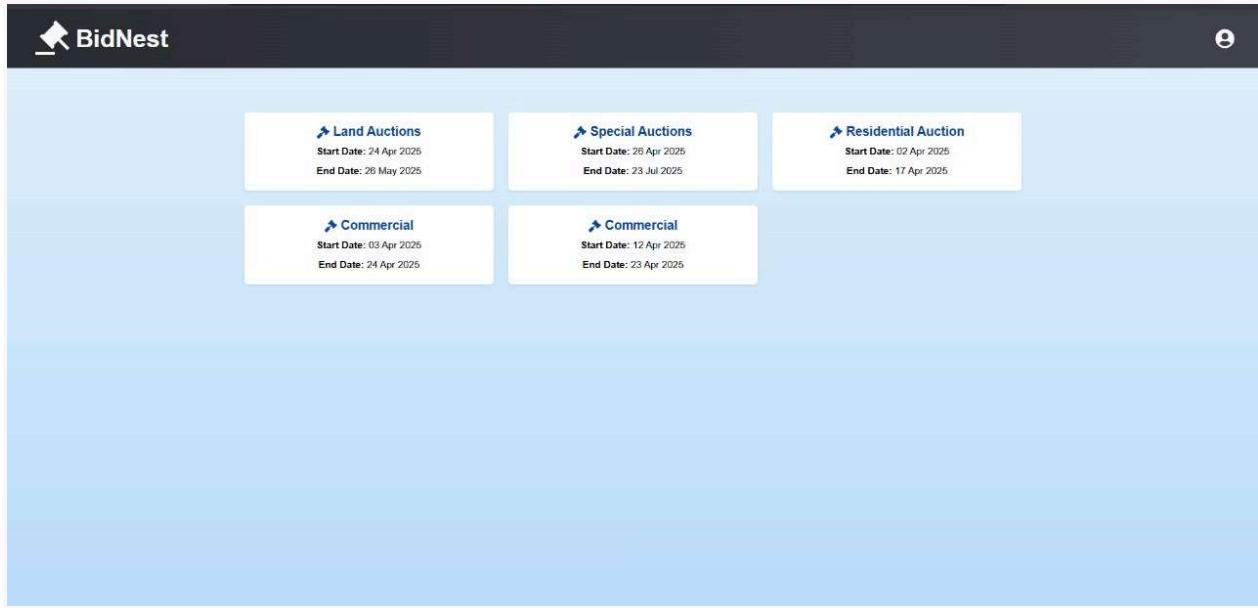


Fig. 4.7 Auction Participation Interface

Figure 4.7 displays a categorized auction list where buyers can view ongoing and upcoming auctions and select the ones they wish to participate in based on property type and auction dates.

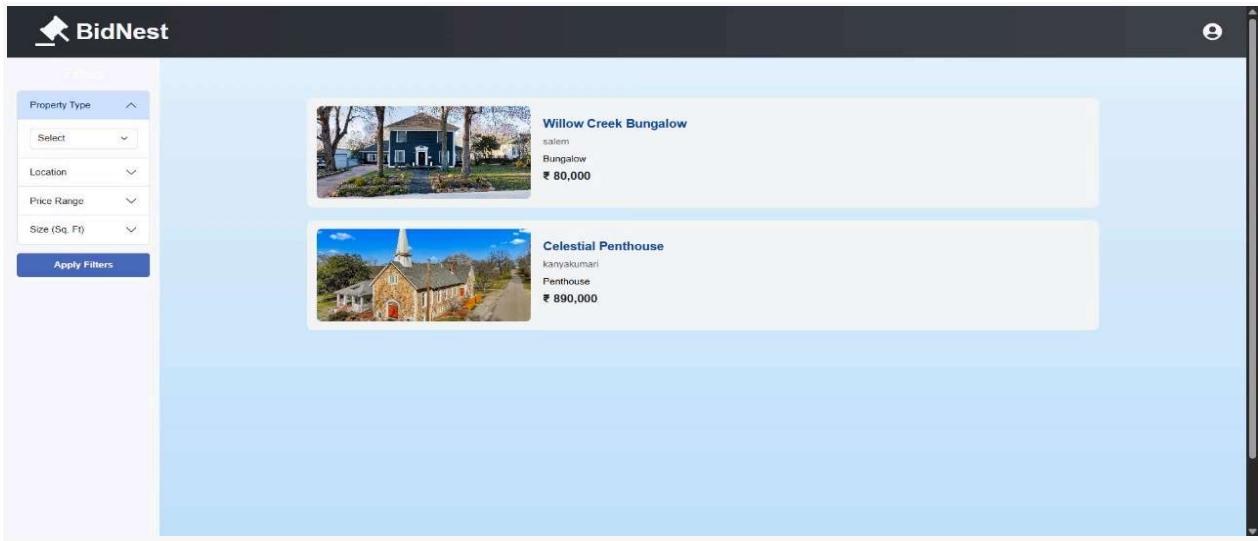


Fig. 4.8 Auction Property Listings

Figure 4.8 showcases the list of properties under the selected auction category, where buyers can view, filter, and select individual properties they are interested in bidding on.

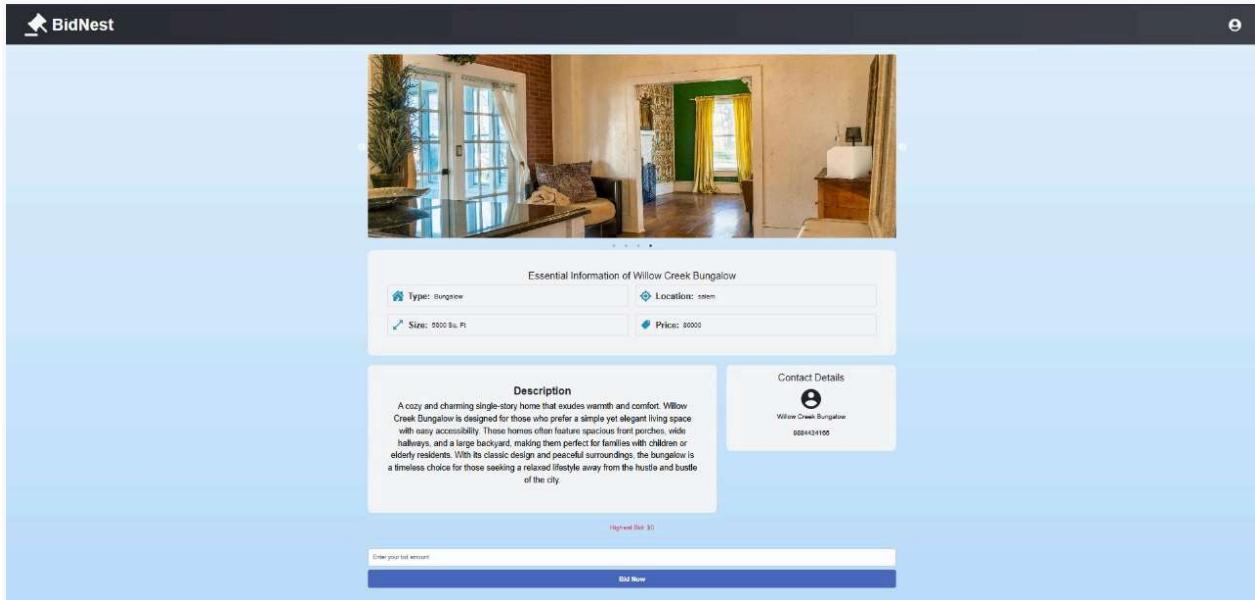


Fig. 4.9 Property Bidding Page

Fig 4.9 displays detailed property information and allows buyers to place bids. The highest bidder at the end of the auction wins the property.

My Posted Properties							
Name	Price	Location	Property Type	Bedrooms	Size	Description	Status
Evergreen Heights	\$5000000	chennai	Apartment	3	5000 sq ft	A modern and stylish ...	Pending
Serenity Villa	\$1000000	madurai	Villa	4	6700 sq ft	A luxurious and expa...	Pending
Maple Townhouse	\$800000	trichy	Townhouse	6	5400 sq ft	A charming and practi...	Approved
Skyline Towers	\$750000	coimbatore	Condominium - Condo	4	4900 sq ft	A sophisticated and hi...	Pending
Willow Creek Bungalow	\$800000	salem	Bungalow	4	5500 sq ft	A cozy and charming ...	Approved
Celestial Penthouse	\$890000	kanyakumari	Penthouse	7	55 sq ft	The epitome of luxury...	Approved
Rosewood Cottage	\$780000	vellore	Cottage	3	5 sq ft	A picturesque and ch...	Approved

Fig 4.10 Seller Property Dashboard

Fig 4.10 displays all properties posted by the seller, along with details like price, location, size, and current approval status .

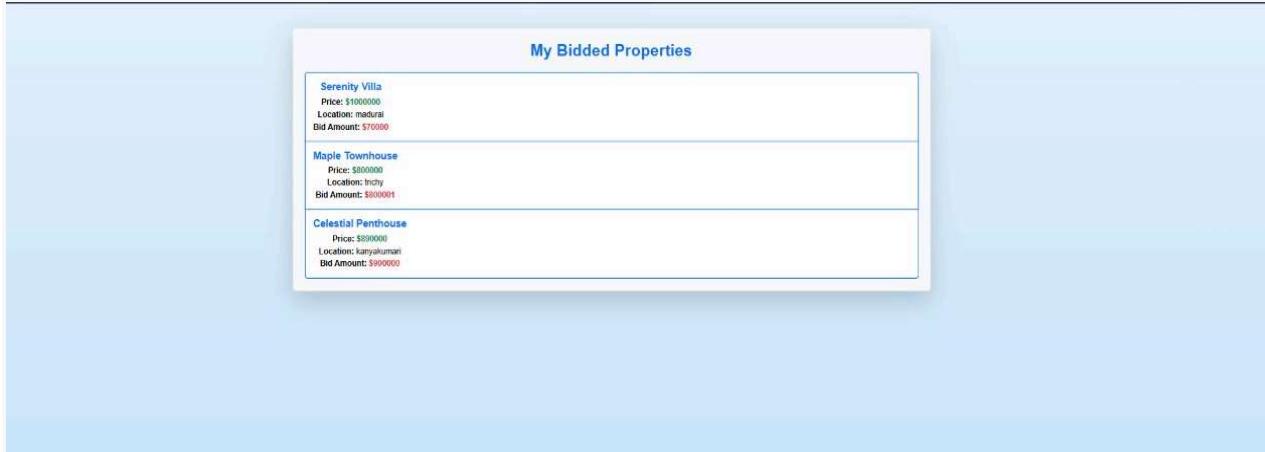


Fig. 4.11 Buyer bidden properties

Fig. 4 illustrates the buyer's bidden properties. It shows the properties on which the buyer has placed bids, along with their respective bid amounts and basic data

V. CONCLUSION:

The Online Real Estate Auction System efficiently transforms traditional property transactions into a transparent, green, and absolutely virtual enjoy. Built the usage of the MERN stack, the platform offers real-time bidding, automatic winner selection, and role-based get right of entry to for admins, dealers, and consumers. It simplifies the belongings approval process, ensures well timed notifications through computerized emails, and continues a entire audit trail for responsibility. By minimizing manual intervention and streamlining the public sale workflow, the machine complements user accept as true with and engagement. Its scalable and modular design supports future improvements consisting of charge integration, chat guide, or belongings verification, making it a robust foundation for modernizing real estate dealings.

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