**Deccan Education Society’s Fergusson College (Autonomous), Pune**

**Department of Computer Science**

A

Project Report on

***“Auction Platform*”**

In partial fulfillment of Post Graduate course in

M.Sc. Computer Applications-II

(Semester-III)

CSA-620 Advance Software Engineering Practices

SUBMITTED BY

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**Department of Computer Science**

# CERTIFICATE

This is to certify that the project entitled “Auction Platform”

submitted by

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in partial fulfillment of the requirement of the completion of M.Sc. (C.A)-II [Semester-III], has been carried out by them under our guidance satisfactorily during the academic year 2024- 2025.

Place: Pune Date:04/12/24

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**Project Guide:**

**Dr. Kavita Khobragade**

**Examiners Name Sign**

**1.**

**2.**

ACKNOWLEDGEMENT

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**1.Introduction**

# Existing System

eBay

Complexity: The extensive range of features can be overwhelming for new users, making navigation difficult.

High Fees: Seller’s face significant listing and final value fees, which can reduce profitability.

Scams and Fraud: Despite safety measures, fraudulent listings and scams still occur, eroding user trust.

Customer Support: Users often experience challenges in obtaining timely and effective customer service.

Listing Competition: High competition can make it difficult for individual sellers to get visibility. 2. AuctionZip

Limited Online Bidding: Primarily focused on live auctions, which limits participation for remote users.

User Interface: The website can feel outdated and less intuitive compared to modern platforms.

Niche Market: Limited to specific types of auctions (mainly live), reducing overall user base.

3. HiBid

User Experience: Some users find the site confusing or not user-friendly, particularly during the bidding process.

Limited Listings: Focused on certain categories, which may not appeal to a broader audience.

Technical Issues: Reports of site lag during live auctions can frustrate users.

4. Proxibid

High Fees: Both buyers and sellers face substantial fees, which can discourage participation.

Complicated Processes: The registration and bidding processes can be lengthy and complex.

Limited International Reach: Primarily focused on the U.S. market, limiting its global accessibility.

Bidsquare

Niche Focus: Mainly targets art and antiques, which may not appeal to general auction users.

Limited User Base: Smaller compared to giants like eBay, which can result in fewer bids and lower competition for sellers.

Fee Structure: Buyers often face additional fees, which can deter participation.

Scalability: As user numbers grow, platforms may struggle to maintain performance and service quality.

Technical Challenges: Live bidding requires robust technology; any glitches can lead to significant user dissatisfaction.

User Retention: Keeping users engaged after their first auction can be difficult, especially if their experience is less than ideal.

# Need of the System

1. User Trust and Security

Robust Verification Processes: Implement identity verification to build trust among users.

2. Transparency and Fairness

Real-Time Bidding Updates: Utilize real-time bidding features to ensure all users see up-to-date bid information, reducing manipulation risks.

Clear Auction Rules: Provide transparent guidelines regarding bidding processes, fees, and seller responsibilities.

3. User-Friendly Experience

Intuitive Interface: Design a clean, easy-to-navigate interface that simplifies the bidding process for new users.

Comprehensive Tutorials: Offer resources that explain the auction process, helping users feel more comfortable participating.

4. Cost Transparency

Clear Fee Structure: Display all fees upfront (listing, transaction, etc.), ensuring users know the costs involved before participating.

5. Technical Reliability

Responsive Design: Ensure the platform is fully functional across devices (desktop and mobile), allowing users to bid anywhere, anytime.

By addressing these needs, your auction platform not only solves common issues faced by existing systems but also enhances the overall user experience. Emphasizing these solutions will showcase the value of your platform and attract both buyers and sellers looking for a reliable, efficient, and secure auction environment.

# Overview of the Project

The auction platform serves as an online marketplace where users can buy and sell items through a bidding process. It connects buyers and sellers, facilitating the exchange of goods in a competitive environment.

Key Features:

1. User Registration and Profiles:

Users can create accounts, complete profiles, and manage their information.

Different roles (e.g., Auctioneer, Bidder, Super Admin) with specific permissions and functionalities.

1. Auction Listings:

Sellers can create auction listings for items, including descriptions, images, starting bids, and auction duration.

Items can be categorized for easier browsing (e.g., electronics, antiques, collectibles).

1. Bidding Process:

Registered users can place bids on auction items.

Real-time updates on current bids and bid history.

Notifications for users about outbid situations or auction closings.

1. Payment Proof Submission:

Buyers can submit proof of payment after winning an auction.

Status updates on payment proof (e.g., pending, approved, rejected).

Admin Dashboard:

Admins can manage users, auctions, bids, and transactions.

Tools for monitoring site activity, resolving disputes, and generating reports.

# 2. Analysis

* 1. **Feasibility Study**

## 2.1.1 Technical Feasibility

**1. Technology Stack**

**Frontend:**

* **HTML/CSS:**
  + **HTML** provides the structural foundation for web pages, while **CSS** enables styling and layout design.
* **JavaScript Frameworks:**
  + **ReactJS:** A widely-used library for building user interfaces, particularly single-page applications (SPAs). Its component-based architecture promotes reusability and efficient state management. ReactJS's ecosystem includes tools like ReactJS Router for navigation and Redux for state management.

**Backend:**

* **Node.js:** A JavaScript runtime that allows for server-side development. It excels in handling asynchronous events, making it ideal for applications with many concurrent users.
* **Express.js:** A minimal and flexible web application framework for Node.js, Express simplifies the creation of APIs, middleware integration, and routing, allowing for quick and scalable backend development.

**Database:**

* **MongoDB:** A NoSQL database that stores data in a flexible, JSON-like format (BSON). It’s particularly suitable for applications with varying data structures, such as auction items, user profiles, and bid histories. MongoDB’s horizontal scalability makes it easier to manage large datasets as user demand grows.

## Economical Feasibility

**a. Initial Development Costs:**

* Involves creating a user-friendly interface and a robust backend. This includes UI/UX design, frontend and backend development, and quality assurance to ensure functionality and security.
* Domain registration is necessary to establish an online presence. Hosting services will be required to keep the website accessible, with options ranging from shared to cloud hosting depending on traffic and resource needs.
* Essential for promoting the platform and attracting users. This includes digital marketing strategies, content creation, and potential launch promotions to incentivize early sign-ups.

**b. Ongoing Operational Costs:**

* Continuous maintenance is necessary to ensure the platform runs smoothly. This includes bug fixes, updates for new features, and overall performance improvements.
* Establishing a customer support system is crucial for assisting users. This includes hiring support staff and implementing tools for efficient user interaction.

**c. Revenue Model**

* A percentage of each successful sale can be charged to sellers. This aligns the platform’s revenue with successful transactions and encourages effective marketing.
* A fixed fee can be charged for each auction listing. This creates a consistent revenue stream, independent of whether the item sells.

## Operational Feasibility

1. Development Team:

Frontend Developers: Responsible for building and maintaining the user interface, ensuring a responsive and engaging experience. Proficiency in HTML, CSS, and ReactJS is essential.

Backend Developers: Focus on server-side logic, database integration, and API development using Node.js and Express.js. They ensure data security, performance, and scalability.

UI/UX Designers: Design user interfaces and experiences, conducting user research and testing to create intuitive layouts and flows.

2. Operational Workflow

1. User Registration:

Users sign up via an online form, providing necessary information such as name, email, and password. Email verification can be implemented to confirm user identities and prevent fraudulent accounts.

2. Auction Listing:

Registered users can create auction listings by providing item details (title, description, images, starting price, duration).

3. Bidding:

Users can place bids on items during the auction period. The system should automatically update current bid status in real-time, ensuring transparency and engagement. Notifications can be sent to users when they are outbid or when an auction is about to close.

4.Payment Proof Submission:

Buyers can submit proof of payment after winning an auction.

Status updates on proof (e.g., pending, approved, rejected).

Admin Dashboard:

Admins can manage users, auctions, bids, and transactions.

Tools for monitoring site activity, resolving disputes, and generating reports.

# 2.1 Hardware and Software Requirement

## Hardware

* + A Device with a good processor is required to handle the computational tasks efficiently.
  + **RAM**: A minimum of 4GB RAM is necessary to ensure smooth operation of the webpage and webserver.

## Software

* + VS Code: Used for developing the project.
  + **Nodemon Server**: Hosts the web application.
  + MongoDB: Serves as the database system for the project.
  + **HTML, CSS and JavaScript, NodeJS, ReactJS, ExpressJS**: Used for designing the frontend, which is displayed correctly in any modern web browser.
* **Requirement for user**
* Stable internet connection.
* Latest version of any Modern Browser.

# Design

* 1. **Database Table Designing:**
     1. **User:**

|  |  |  |
| --- | --- | --- |
| **Field** | **Data Type** | **Description** |
| UserName | String | User Name |
| Password | String | Password |
| Email | String | Email |
| Address | String | Address |
| Phone | String | Phone |
| ProfileImage\_public\_id | Int | Profile Image public id |
| profileImage\_url | String | Profile Image url |
| paymentMethods\_bankAccountNumber | String | Payment Methods bank Account Number |
| paymentMethods\_bankAccountName | String | Payment Methods bank Account Name |
| paymentMethods\_bankName | String | Payment Methods bank Name |
| paymentMethods\_upi | String | Payment Methods UPI id |
| Role | String | role |
| unpaidCommission | Number | Unpaid Commission |
| auctionsWon | Number | Auctions Won |
| moneySpent | Number | Money Spent |
| createdAt | Date | Created At |

|  |  |  |
| --- | --- | --- |
| **Field** | **Data Type** | **Description** |
| Title | String | title |
| Description | String | description |
| startingBid | Number | Starting Bid |
| Category | String | category |
| currentBid | Number | Current Bid |
| startTime | String | Start Time |
| endTime | String | End Time |
| image\_public\_id | String | Image public id |
| image\_url | String | Image url |
| createdBy |  | Created By |
| highestBidder |  | Highest Bidder |
| commissionCalculated | Boolean | Commission Calculated |
| createdAt | Date | Created At |

* + 1. **Auctions Table:**

|  |  |  |
| --- | --- | --- |
| **Field** | **Data Type** | **Description** |
| user\_id | String | User ID |
| proof\_public\_id | String | Proof |
| proof\_url | String | url |
| uploadedAt | Date | Uploaded date |
| Amount | Number | Amount |
| Comment | String | comment |

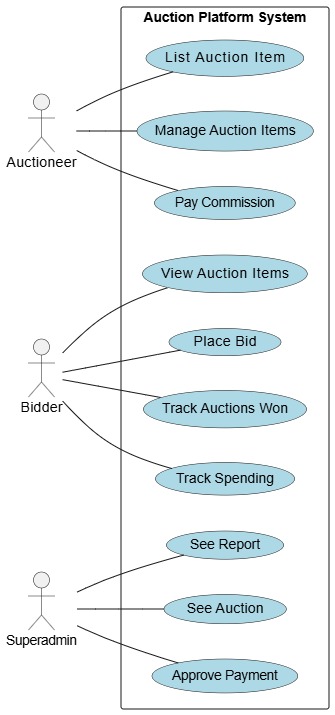
|  |  |  |
| --- | --- | --- |
| **Field** | **Data Type** | **Description** |
| Amount | Number | amount |
| User | string | user |
| createdAt | Date | createdAt |

**3.Commissions Types:**

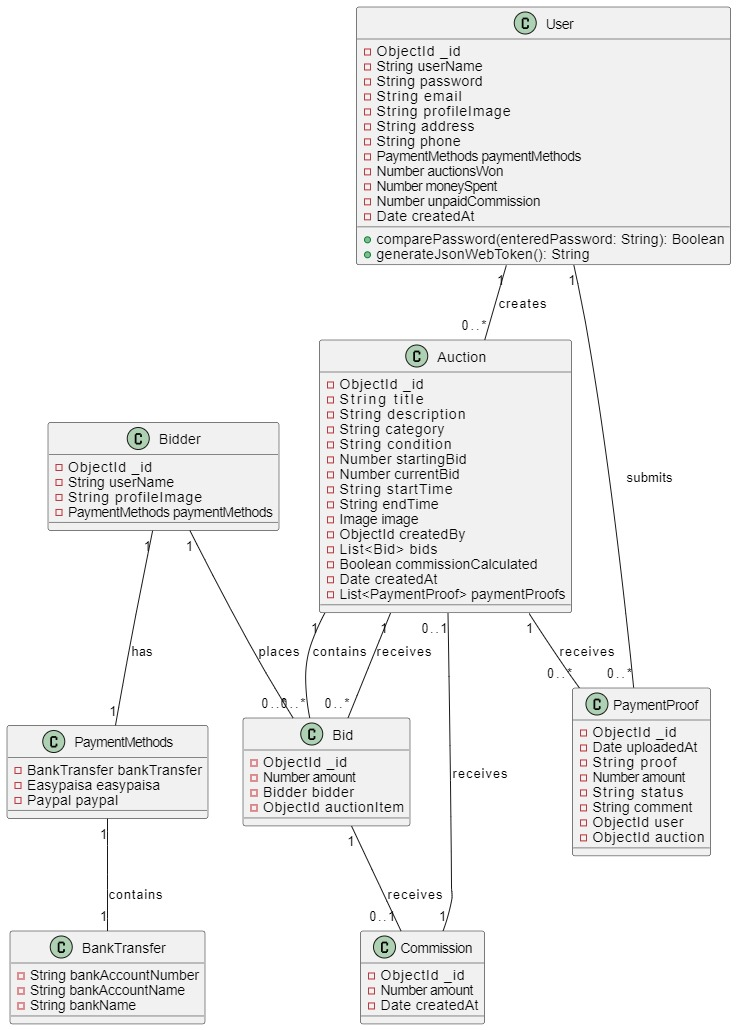
# 4.Payment Proofs

# 4. Diagrams

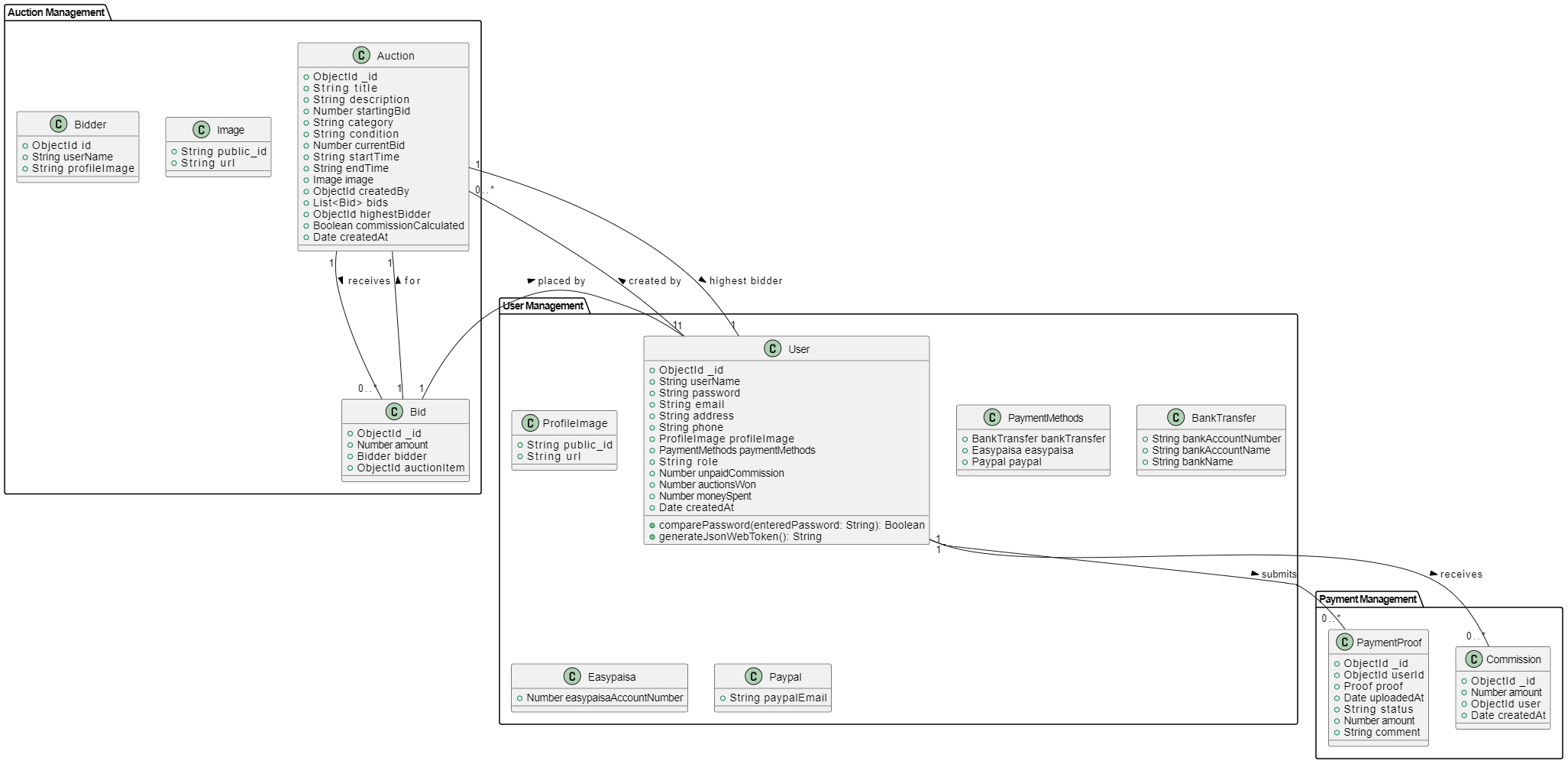
# 1.Use Case Diagram:



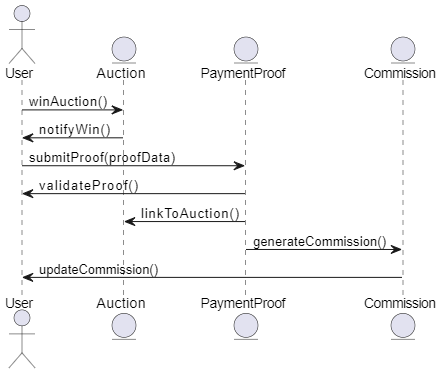
**2.Class Diagram:**



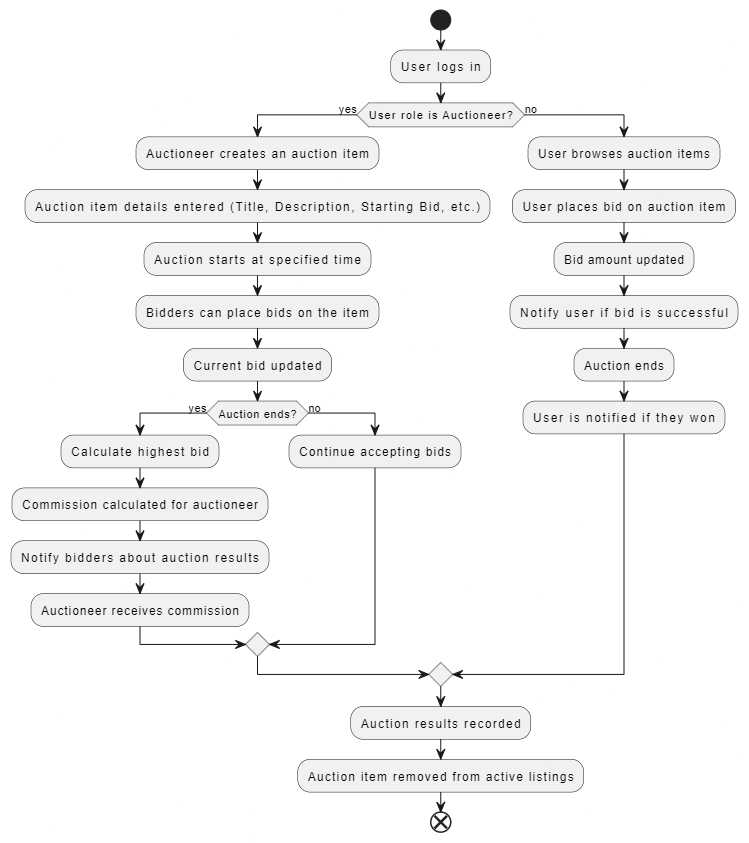
# 3. Package Diagram:



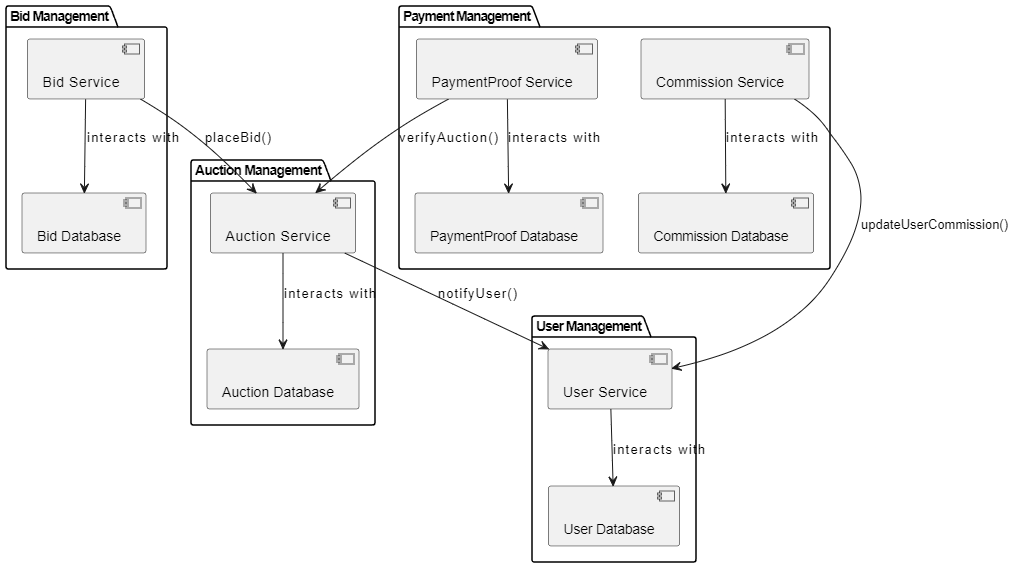
**4. Sequence Diagram:**



# 5. Activity Diagram:



**6. Component Diagram:**

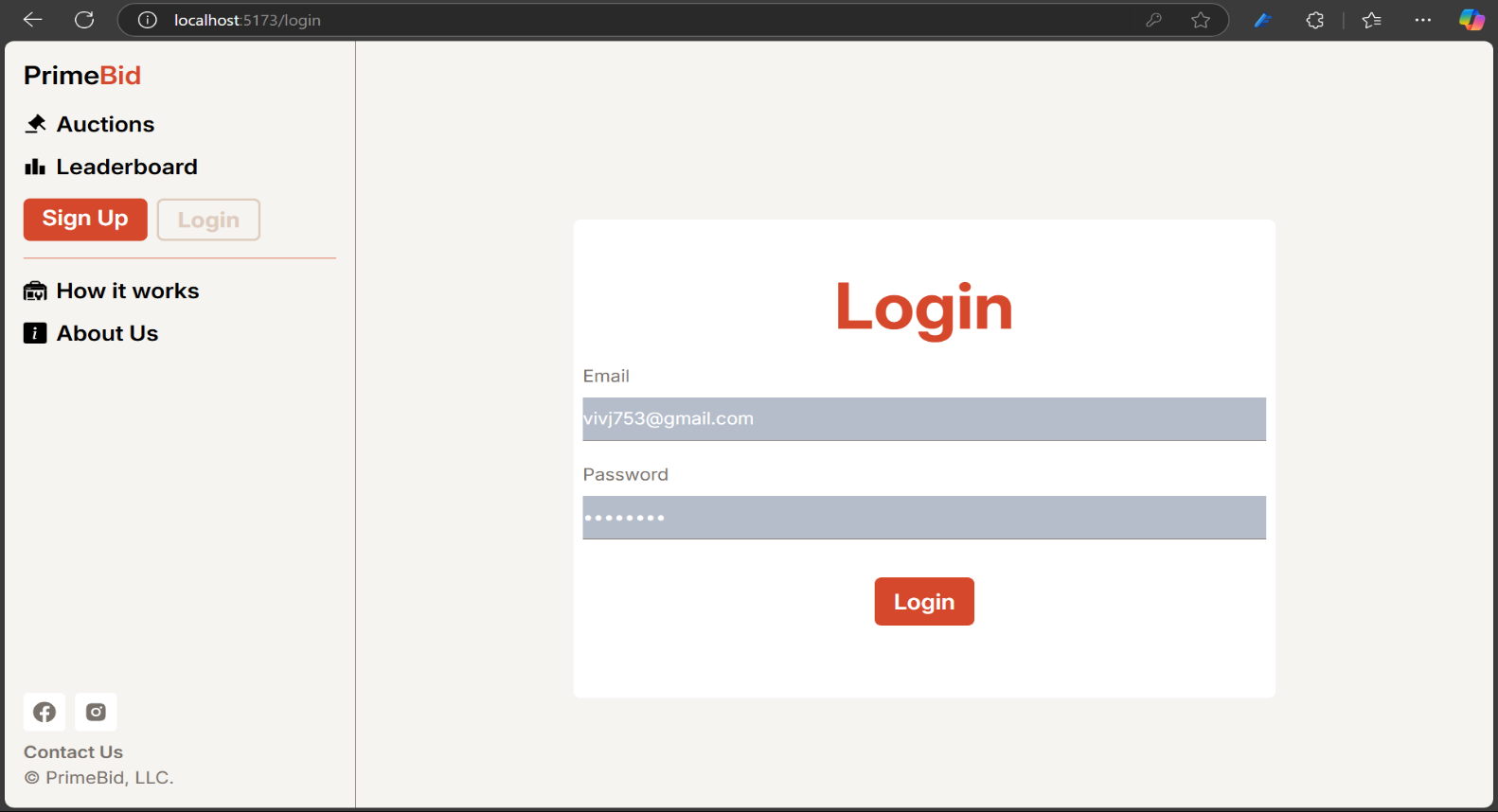
****

# 7.Deployment Diagram:

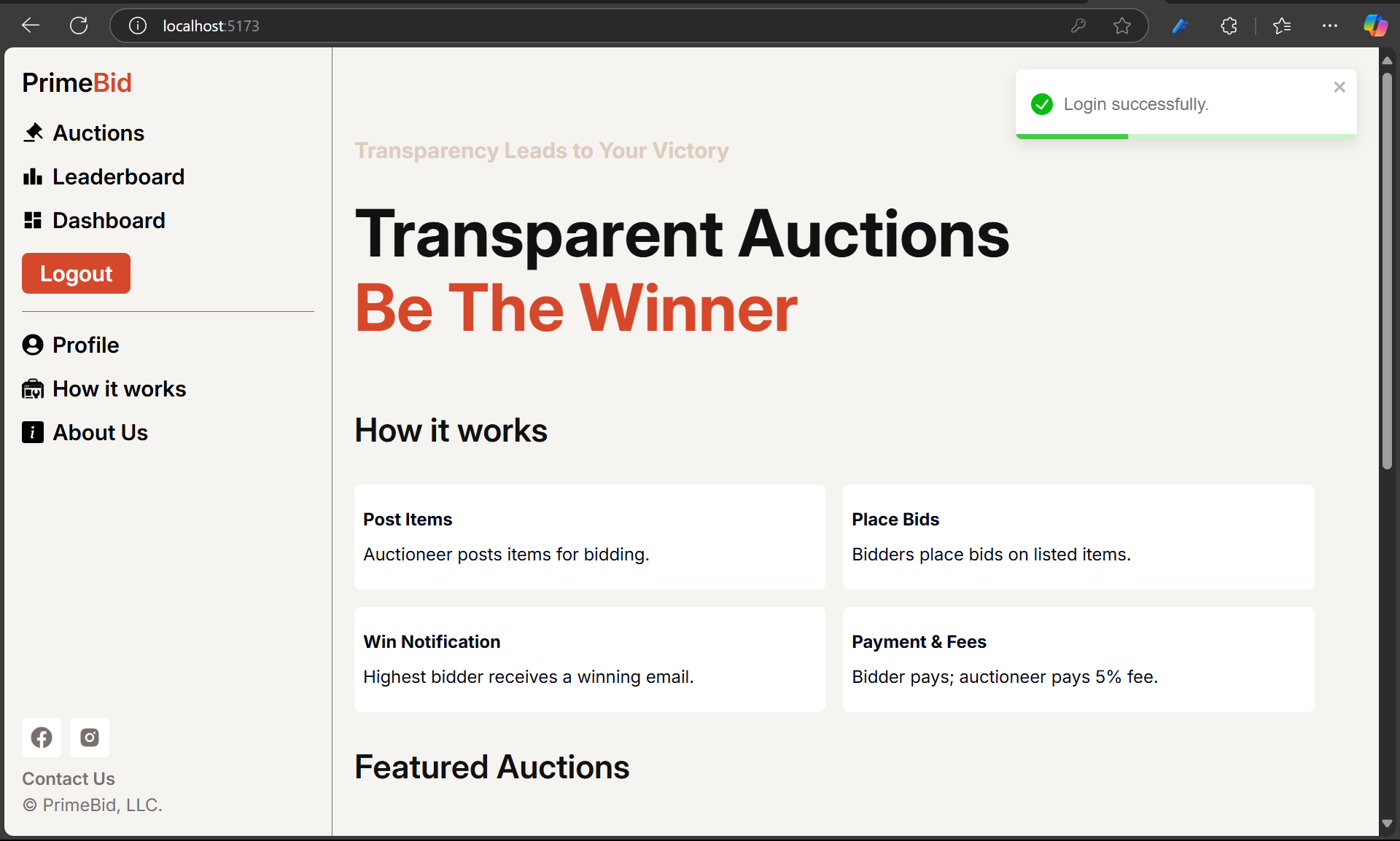
# 

**3.3 Input / Output Screens**

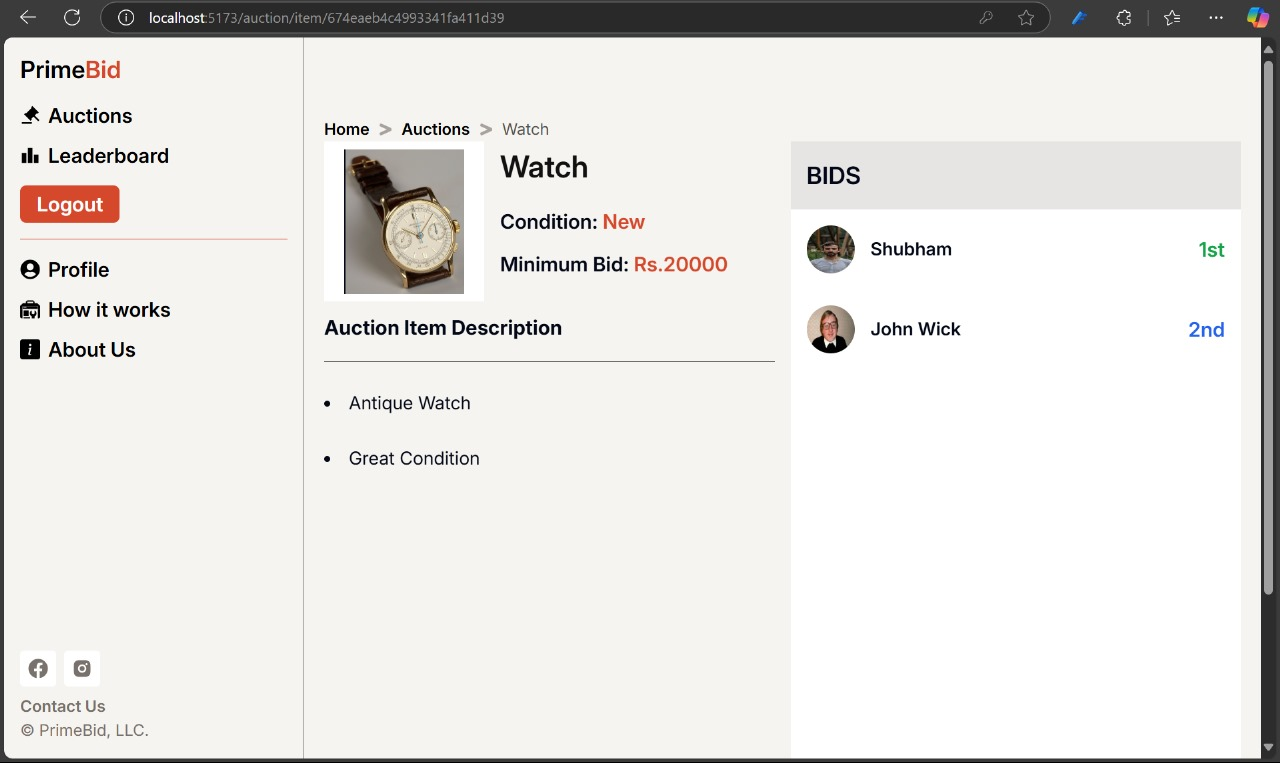
# Login Screen:

****

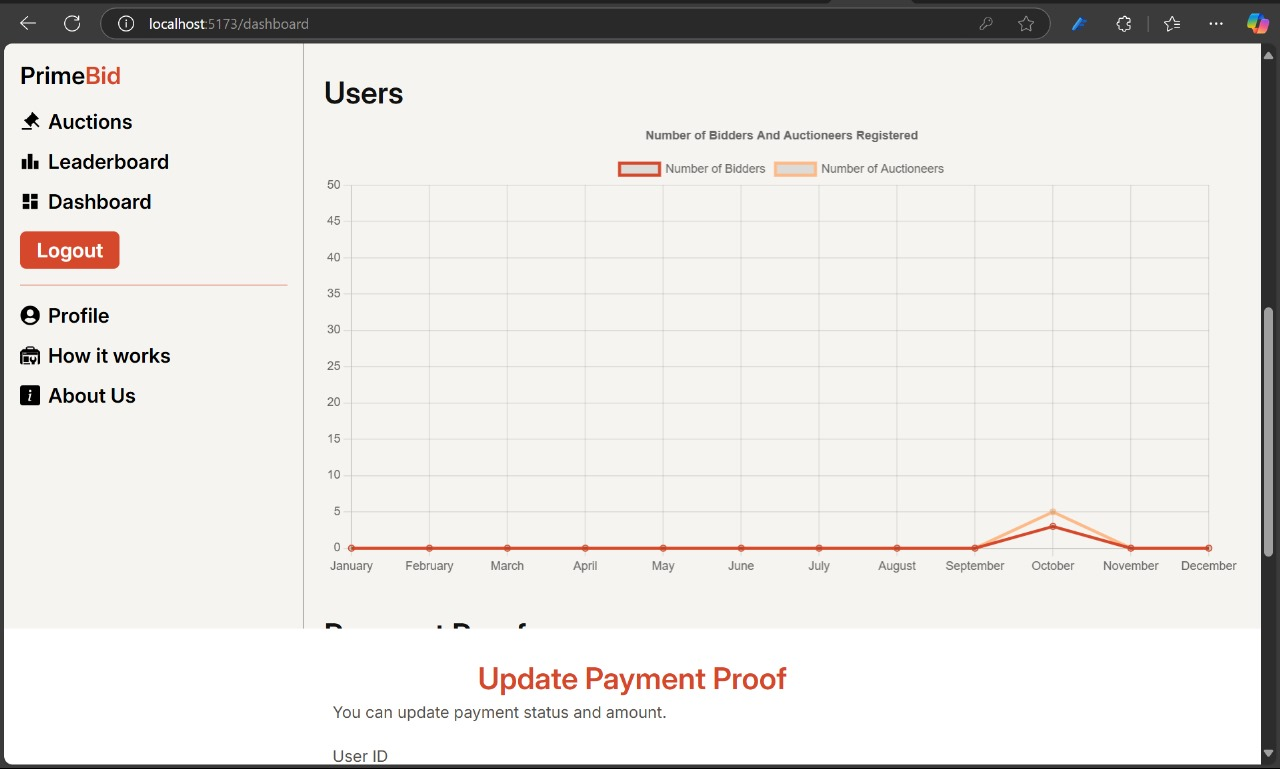
* + 1. **Home Page:**



* + 1. **Biding Page:**



* + 1. **Admin Page**



**4.Testing**

**4.1 Importance of testing:**

Testing is paramount for the success of our Auction website project as it ensures the reliability, functionality, and security of the platform. By rigorously testing various aspects such as user registration, project posting, bidding processes, payment transactions, and communication channels, we can identify and rectify any defects or inconsistencies before deployment. This not only enhances user experience but also instills confidence in stakeholders, mitigates risks, and ultimately contributes to the overall success of the project by delivering a robust and user-friendly platform.

**4.2 Types of testing:**

For our Auction website project, we employ a comprehensive range of testing methodologies to ensure the quality and reliability of the platform. This includes unit testing to verify the functionality of individual components like user registration and project posting, integration testing to validate interactions between different modules such as bidding and payment processing, system testing to evaluate the overall functionality and performance of the website, user acceptance testing (UAT) to gather feedback from real users, performance testing to assess scalability and responsiveness, security testing to identify and mitigate vulnerabilities, regression testing to confirm that recent changes haven't adversely affected existing functionalities, and usability testing to ensure an intuitive and user-friendly experience. By utilizing these diverse testing approaches, we aim to deliver a robust, reliable, and user-centric freelancing platform.

**4.3 Test cases:**

Future enhancements for Auction website could include:

**Test Cases for Auction Platform**

**1. User Authentication**

* **Registration:** Valid details → Account created; Invalid details → Error shown.
* **Login:** Correct credentials → Access granted; Incorrect → Error shown.
* **Logout:** User logs out → Redirect to login page.

**2. Item Listings**

* **Add Item:** Valid details → Item listed; Missing details → Error message.
* **Edit Item:** Modify item details → Changes saved successfully.
* **Delete Item:** Delete an item → Item removed from the listing.

**3. Bidding**

* **Place Bid:** Higher bid → Accepted; Lower bid → Rejected with error.
* **Auto Increment:** Bidder increases max bid → Updated highest bid.
* **Auction Close:** Bids stop after auction ends → Final winner declared.

**4. Notifications**

* **Bid Notification:** Notify users when outbid or won.

**5. Security**

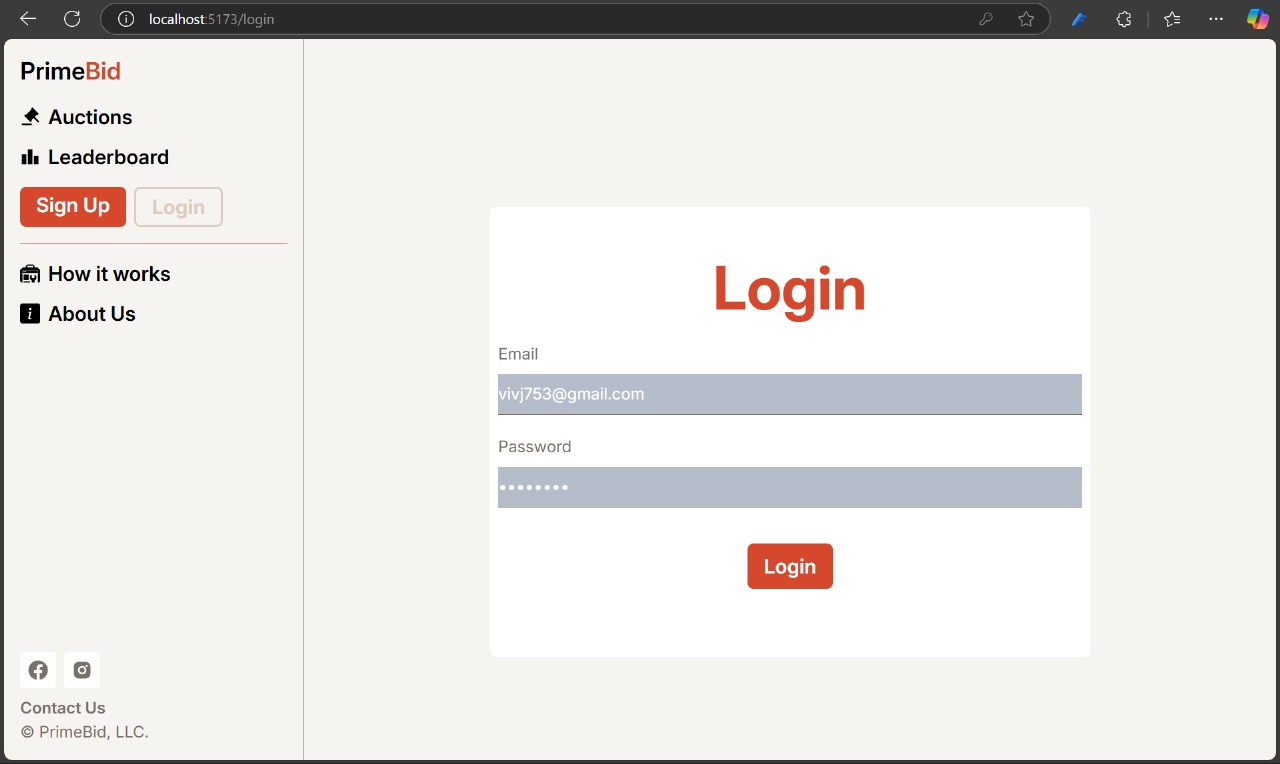
* **SQL Injection:** Malicious input → Input sanitized, no database issues.
* **Unauthorized Access:** Access pages without login → Redirect to login.

**6. Reports**

* **Activity History:** User views their bids and winnings → Correct data shown.
* **Auction Summary:** Admin views auction stats → Data displayed accurately.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Test Scenario | Test Steps | Test Data | Expected Result | Actual Result | Status |
| TC-01 | User Registration - Valid Input | 1. Navigate to registration page.  2. Enter valid details. 3. Click "Register". | Username: user1 Email: user1@example.com Password: P@ssword1 | Account created successfully, and confirmation displayed. | Account created successfully. | Pass |
| TC-02 | User Registration - Invalid Email | 1. Navigate to registration page.  2. Enter invalid email.  3. Click "Register". | Username: user2 Email: invalidEmail Password: P@ss1 | Error message "Invalid email format" displayed. | Invalid email format  displayed. | Pass |
| TC-03 | Add Item - Valid Input | 1. Log in.  2. Navigate to "Add Item".  3. Enter valid details and submit. | Name: Phone Price: $100 Description: New phone | Item successfully added and visible in auction listing. | Item successfully added and visible in auction listing. | Pass |
| TC-04 | Add Item - Missing Fields | 1. Log in.  2. Navigate to "Add Item".  3. Submit with missing name field. | Price: $100 Description: New phone | Error message "Name is required" displayed. | Name is required displayed. | Pass |
| TC-05 | Place Bid - Higher Bid | 1. Log in.  2. Select an auction item. 3. Enter a higher bid and submit. | Current Bid: $100 User Bid: $120 | Bid accepted, user becomes the highest bidder. | Bid accepted | Pass |
| TC-06 | Place Bid - Lower Bid | 1. Log in.  2. Select an auction item. 3. Enter a lower bid and submit. | Current Bid: $100 User Bid: $90 | Error message "Bid must be higher than current bid" displayed. | Bid must be higher than current bid displayed. | Pass |
| TC-07 | Notifications - Auction Won | 1. Auction ends with user3 as highest bidder. | Highest Bidder: user3 | User3 receives notification: "You won the auction!" | Get the notification-You won the auction | Pass |

Sample of passed Test Case

****

**5. Reports:**

The Purposed Auction platform reports cover key areas: sales performance (revenue, items sold, top categories), user engagement (active users, bids, retention), technical performance (uptime, load times, errors), customer satisfaction (feedback, support tickets, disputes), and compliance and risk (fraud, policy violations, payment issues). These reports provide insights into trends, user behaviour, platform health, and risk management, helping to improve operations and user experience.

**6. Drawbacks and limitations:**

**Technical Problems:**

Website downtime, slow page loads, and bugs can disrupt auctions, especially during high-stakes moments, damaging the user experience and trust

**Limited User Accessibility:**

Users in different time zones or those with slow internet connections may have difficulty engaging in real-time auctions, which could limit the potential audience

**Security Concerns:**

Auction websites can be vulnerable to hacking and fraud, especially in financial transactions and personal information storage.

Protection of payment details and user privacy is essential but can be costly and complex

**7. Future enhancement and conclusion:**

 **AI and Machine Learning**: Implement AI for personalized recommendations, fraud detection, and bidding predictions.

 **Blockchain Technology**: Use blockchain for transparent, secure, and tamper-proof transaction records.

 **Augmented Reality (AR)**: Enable users to visualize products in 3D for a better understanding of item quality.

 **Improved Mobile Experience**: Optimize apps for faster navigation, notifications, and a user-friendly interface.

 **Global Expansion**: Introduce multilingual support, regional payment gateways, and international shipping options.

Auction platforms play a vital role in connecting buyers and sellers efficiently, but they face challenges like fraud, technical issues, and market saturation. By adopting advanced technologies, improving transparency, and enhancing user experience, these platforms can evolve into more secure, user-friendly, and globally accessible marketplaces, ensuring long-term growth and trust among users.

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