

BidNexus-online auction system

A.Hima Bindu¹, Mandali Samyuktha², Gurram Yashaswini³, Dubbaka Ujwala⁴

¹Assistant Professor in Department of Computer Science and Engineering,

^{2, 3, 4}Students from department of Computer Science and Engineering, Bhoj Reddy Engineering College for Women

ABSTRACT

In the digital commerce era, online auction platforms have emerged as powerful tools for dynamic pricing and competitive purchasing. This paper presents BidNexus, a comprehensive online auction system that bridges the gap between sellers and buyers through a secure, real-time bidding environment. The system is structured into three key modules—Seller, Buyer, and Admin—each providing role-specific functionalities. Sellers can list products by uploading images, videos, and 360-degree views, and set custom auction schedules. Buyers receive timely notifications through email and WhatsApp, including alerts one day before and at the start of auctions they have subscribed to. Live bidding ensures fair competition, and a leaderboard highlights the top 10 highest bidders based on bidding activity. Post-auction, winners receive email confirmations along with secure payment gateway links, from which the platform deducts a 5% commission. Admins play a critical governance role, handling user behavior and resolving disputes, including blocking fraudulent or non-compliant users. The platform is tailored for the Indian market, with full support for INR transactions and strict exclusion of electronic and machine-based products. BidNexus ensures a transparent, engaging, and trustworthy auction experience for all stakeholders.

I. INTRODUCTION

With the proliferation of e-commerce and online marketplaces, demand for transparent, real-time,

and user-driven auction platforms has increased. Not only do online auctions enable dynamic pricing, but they also support competitive buying environments where buyers directly interact with sellers. Conventional auction systems usually do not possess features like real-time notifications, media-rich listings, and severe moderation, which are critical in today's user base. BidNexus – Online Auction System is created to solve these issues by providing a systematic and interactive system with three main user roles: Seller, Buyer, and Admin. Sellers can list products by setting initial prices and conducting auctions with exact dates and times. Buyers can view listed products, register for auctions, and engage in live bidding sessions. Live updates and reminders are provided via email and WhatsApp to keep the users well informed and interested. The platform integrates other features including a leaderboard for awarding the best bidders, secure payment gateways to facilitate transactions, and an administrative module for monitoring user activity and ensuring platform integrity. A commission of 5% is taken on each successful transaction to cover costs. Remarkably, BidNexus also implements product category restrictions, in this case specifically excluding electronics and machinery, in order to preserve quality and trust. Designed for the Indian market, the system accommodates Indian Rupee (INR) transactions and focuses on transparency, fairness, and user responsibility. This paper describes the system architecture, key functionalities, implementation plan, and the impact it seeks to generate in the changing digital auction landscape.

II. LITERATURE SURVEY

This work, "Design and Implementation of an Online Auction Platform with Real-Time Features," would certainly offer an interesting dimension into the application of role-based systems and real-time updates in e-commerce environments. It shows the ability of modular web systems—comprised of Buyer, Seller, and Admin layers—to manage complex auction interactions effectively. Its methodology—user authentication, auction scheduling, and real-time messaging—coincides with the objectives of your project. It will help design a scalable web application for real-time bidding scenarios. This will entail adopting similar modular architectures and real-time push notification strategies; hence, your project will benefit from proven techniques for enhancing usability and responsiveness in competitive bidding environments. [1]

A previous research review on multi-channel communication in auction platforms would consist of a wide range of approaches to increase user engagement via email and SMS integration. However, integration of WhatsApp as a primary notification channel remains underexplored. This sets the stage for your own work by demonstrating the novelty of combining both traditional (email) and modern (WhatsApp) communications to improve user awareness and auction participation. These insights help shape a more responsive auction experience. [2]

Real-time bidding systems have shown significant promise, especially when integrated with event-driven architectures such as Socket.IO or WebSockets. These approaches support live updates without manual refreshing and are crucial for time-sensitive activities like auctions. Earlier platforms, such as those discussed by K. Sharma *et al.* (2021), implemented real-time dashboards but lacked features like auction reminders or leaderboard analytics. Your platform enhances these models by offering personalized alerts, a real-time leaderboard for top bidders, and integrated post-auction communication, including payment gateway redirection and success confirmation. [3]

The importance of admin moderation and dispute resolution in auction systems was highlighted in the study "Trust-Based Online Auctions" by Ahmed & Das (2020). It addressed fraudulent seller behavior and proposed user-blocking mechanisms but did not include provisions for buyers failing to complete payments. Your system addresses this by empowering the admin to immediately block buyers who default, thus maintaining system credibility. The addition of damage-report features also enhances buyer protection. [4]

A survey of previous works reveals a growing tendency to use leaderboards and gamification elements to increase user engagement in auction environments. This technique, while popular in gaming platforms, is still underutilized in auction systems. Your project collects this idea by using bidding frequency and bid amounts to rank users and display the top 10 highest bidders. This serves as both a motivation mechanism and an analytics tool for understanding user behavior. [5]

III. PROPOSED METHODOLOGY

1) Front-end Technologies

- React.js – For building a dynamic and component-based user interface for buyers, sellers, and admins.
- HTML – Provides the structural layout of the application pages.
- CSS (with frameworks like Tailwind or Bootstrap) – Enhances visual styling and ensures responsive design across devices.
- JavaScript (ES6+) – Used to add interactivity and real-time functionalities on the client side.
- Socket.io (Client-Side) – Enables real-time bid updates to users via WebSocket connections.

2) Back-end Technologies

- Node.js – A JavaScript runtime environment for executing server-side logic.
- Express.js – A lightweight web framework for creating RESTful APIs to handle user requests, authentication, bidding logic, etc.
- Socket.io (Server-Side) – Manages real-time two-way communication between the server and all connected clients during live bidding sessions.
- MongoDB – A NoSQL database used to store users, product listings, bids, transactions, and reviews.

3) Development and Execution Tools

- Visual Studio Code – The primary IDE used for coding and debugging the full-stack application.
- MongoDB Atlas – Cloud-based MongoDB database hosting service.
- Postman – Used for testing backend APIs.
- GitHub – For version control and collaboration among team members.
- npm/yarn – Package managers for managing frontend and backend dependencies.
- Chrome Developer Tools – For inspecting elements, debugging front-end issues, and monitoring network activity.

4) Features Implemented

a) Real-time Bidding

- WebSocket Events manage the connection for each auction item.
- When a bid is placed, it's broadcast to all users in real-time using `socket.emit()` and `socket.on()` functions.

b) Email Notifications

- Integrated using NodeMailer.
- Emails are sent to the highest bidder and seller after the auction ends, containing bid details, product info, and payment instructions.

c) Admin Controls

- Admin has access to:
 - Approve/reject sellers and products.
 - View transactions and calculate commission (5% per sale).
 - Ban/unban users and monitor system activities.

d) Leaderboard

- Displays top-performing users based on:
 - Highest bids placed
 - Most items sold
 - Ratings and reviews

5) Sample Calculation – Commission Logic

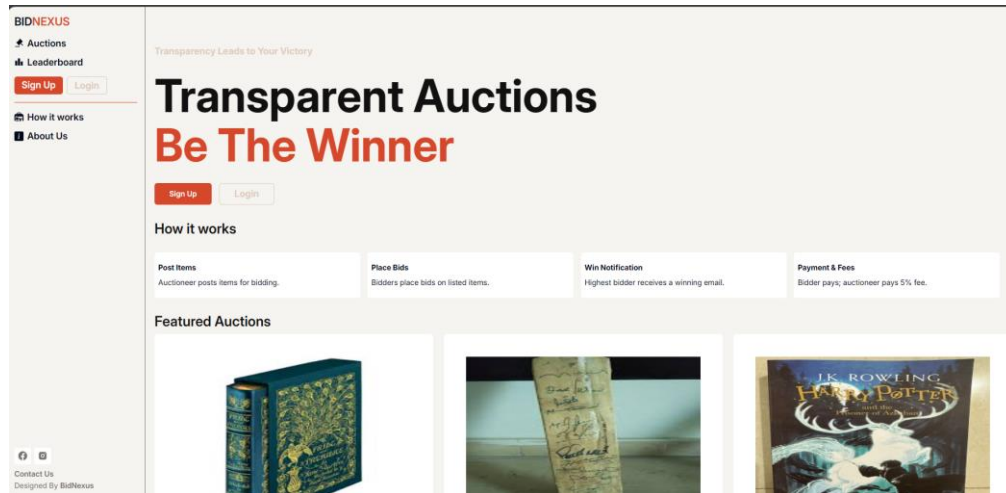
Let's say a product is sold for ₹5,000:

- Commission Rate = 5%
- Commission Amount = ₹5,000 × 0.05 = ₹250

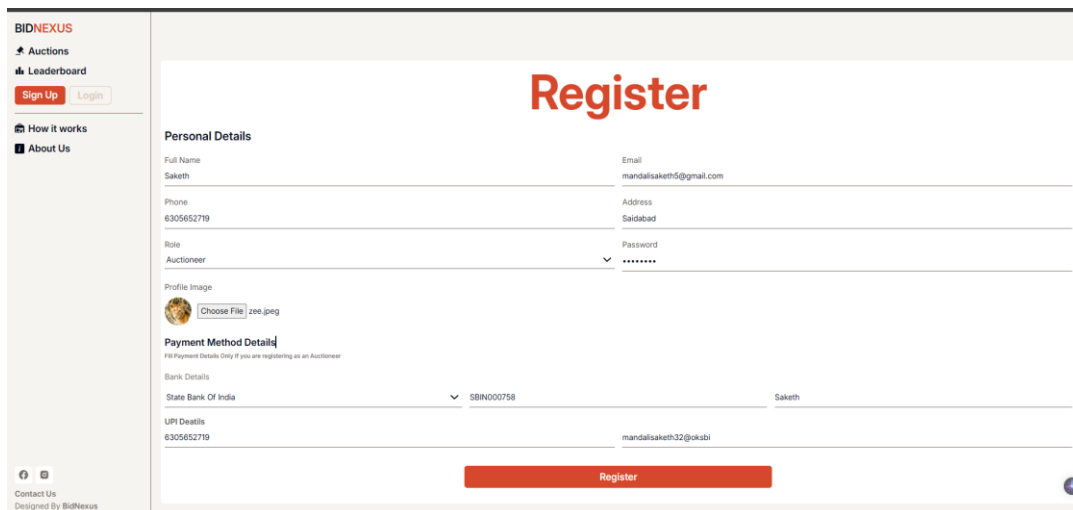
- Seller Receives = ₹5,000 – ₹250 = ₹4,750
- Commission data is stored in the transactions collection and shown in admin reports.

IV. RESULTS

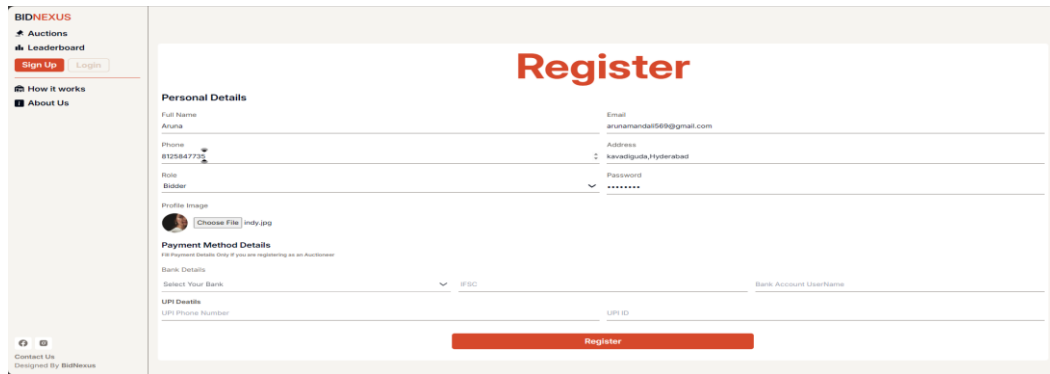
Dashboard



2) Auctioneer register



3) Bidder register



BIDNEXUS

- Auctions
- Leaderboard
- Sign Up
- Login
- How it works
- About Us

Contact Us
Designed By BidNexus


Register

Personal Details

Full Name: _____ Email: anamamandali6@gmail.com

Phone: 8125647775 _____ Address: kavadiquda,Hyderabad

Role: Bidder _____ Password: _____

Profile Image:  [Choose File](#) only.jpg

Payment Method Details

For Payment Details, click if you are registering as an Auctioneer

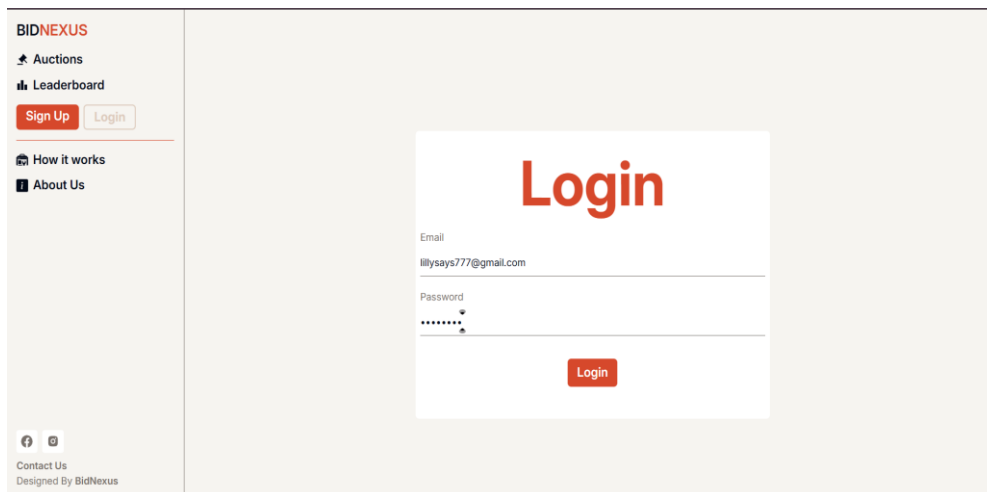
Bank Details: _____ IFSC: _____ Bank Account Username: _____

UPI Details: _____ UPI ID: _____

UPI Phone Number: _____

[Register](#)

4) Login page



BIDNEXUS

- Auctions
- Leaderboard
- Sign Up
- Login
- How it works
- About Us

Contact Us
Designed By BidNexus

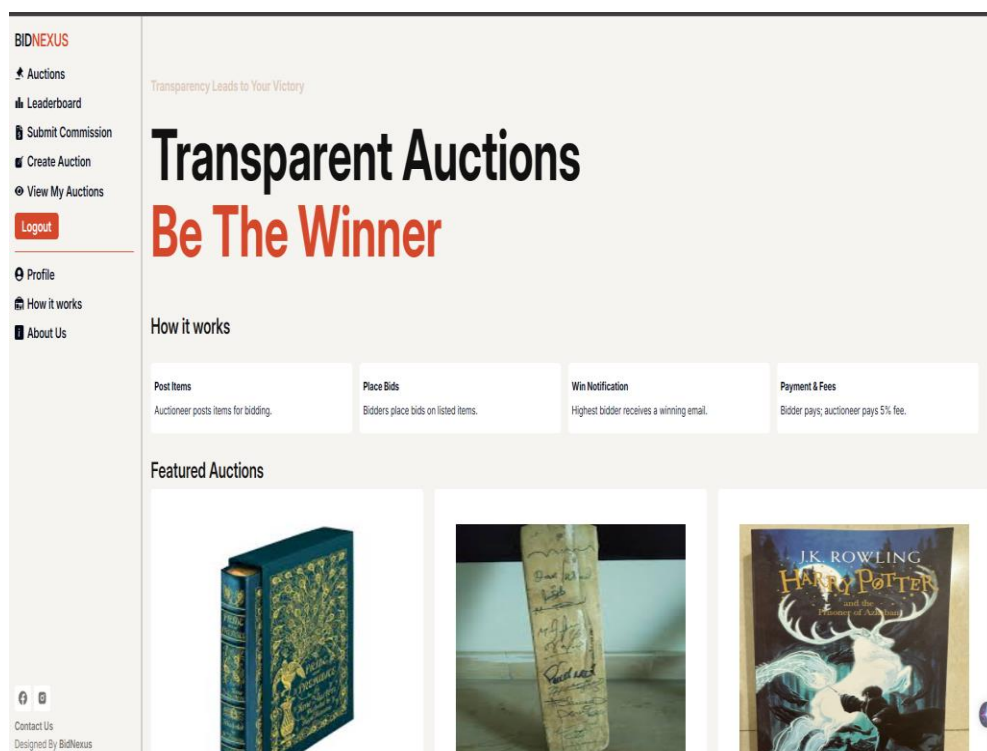
Login

Email: lillysays777@gmail.com

Password: _____

[Login](#)

5) Auctioneer dashboard



BIDNEXUS

- Auctions
- Leaderboard
- Submit Commission
- Create Auction
- View My Auctions
- Logout
- Profile
- How it works
- About Us

Contact Us
Designed By BidNexus

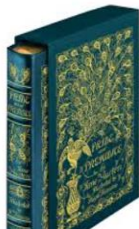


Transparency Leads to Your Victory

Transparent Auctions Be The Winner

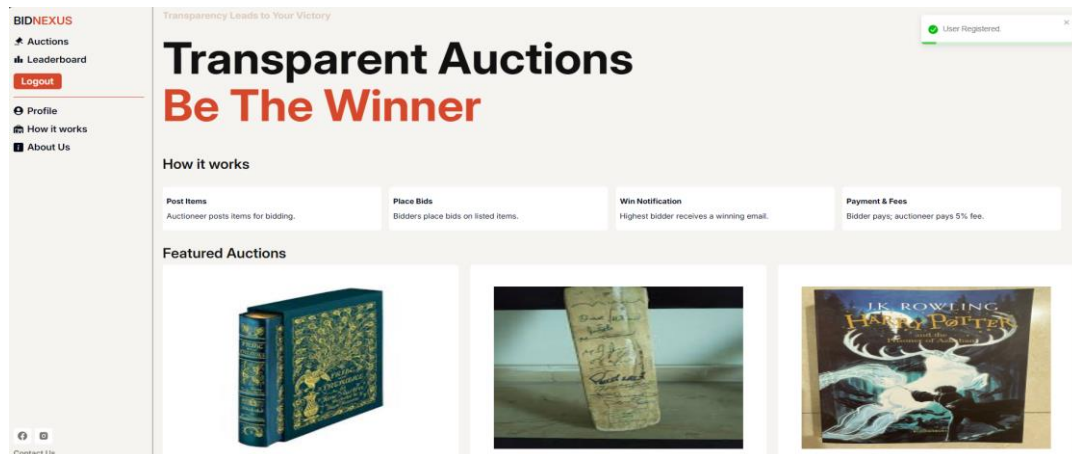
How it works

Post Items	Place Bids	Win Notification	Payment & Fees
Auctioneer posts items for bidding.	Bidders place bids on listed items.	Highest bidder receives a winning email.	Bidder pays, auctioneer pays 5% fee.

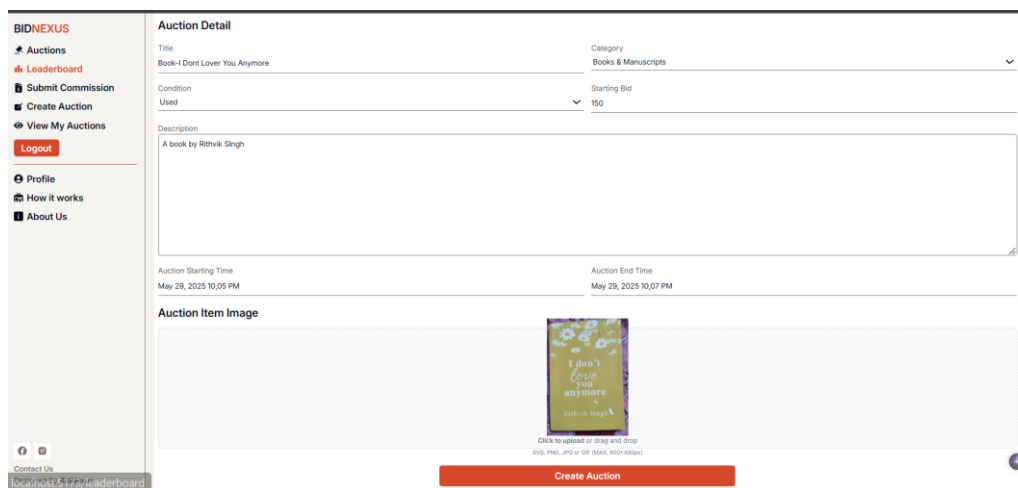
Featured Auctions

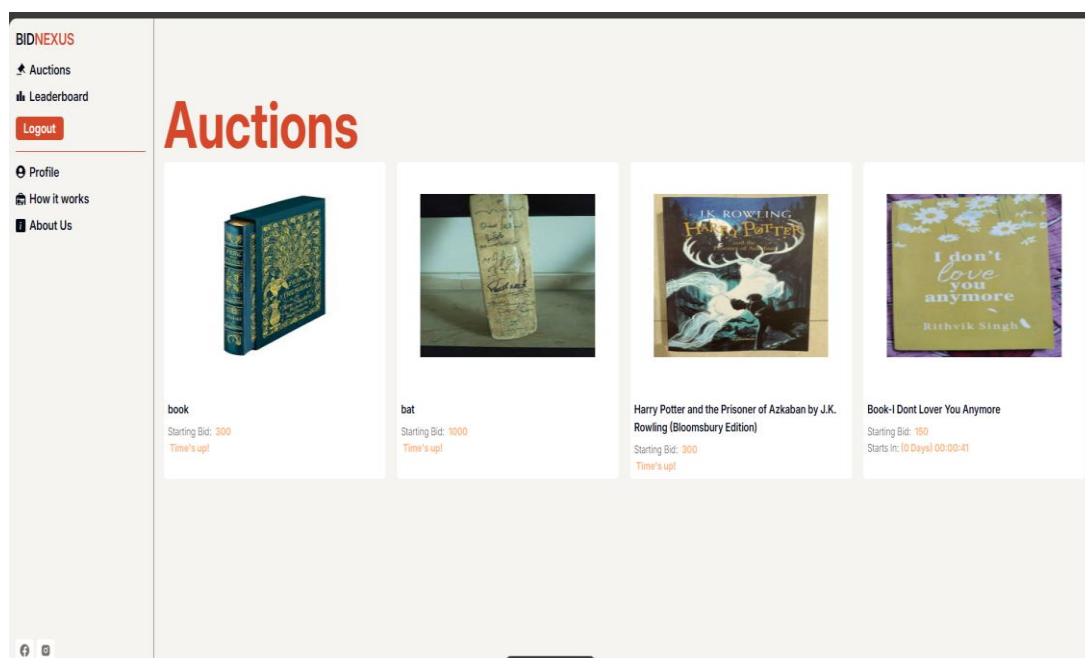
6) Bidder dashboard



7) Creation of auction




8) List of auctions




9) Before auction starts

BIDNEXUS
Auctions
Leaderboard
Logout
Profile
How it works
About Us
Contact Us
Designed By BidNexus



Book-I Dont Lover You Anymore
Condition: **Used**
Minimum Bid: **Rs.150**
Auction Item Description

- A book by Ritvik Singh

BIDS

Auction has not started yet!




10) Bidding time

BIDNEXUS
Auctions
Leaderboard
Submit Commission
Create Auction
View My Auctions
Logout
Profile
How it works
About Us

Home > My Auctions > Book-I Dont Lover You Anymore

Book-I Dont Lover You Anymore
Condition: **Used**
Minimum Bid: **Rs.150**
Auction Item Description


- A book by Ritvik Singh

BIDS


	Aruna	180	1st
	mandali	170	2nd
	Lilly	165	3rd

11) Auction ended

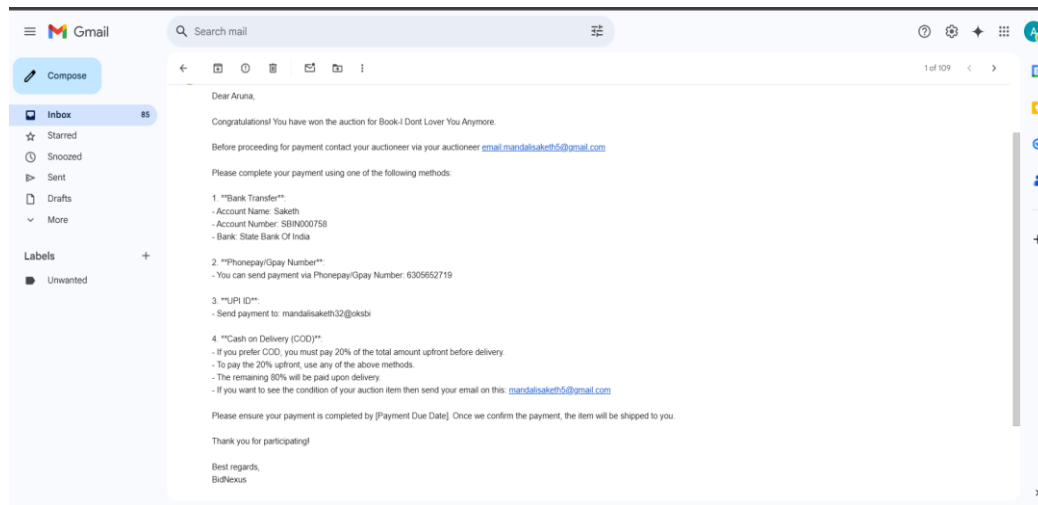
BIDNEXUS
Auctions
Leaderboard
Logout
Profile
How it works
About Us

Home > Auctions > Book-I Dont Lover You Anymore

Book-I Dont Lover You Anymore
Condition: **Used**
Minimum Bid: **Rs.150**
Auction Item Description

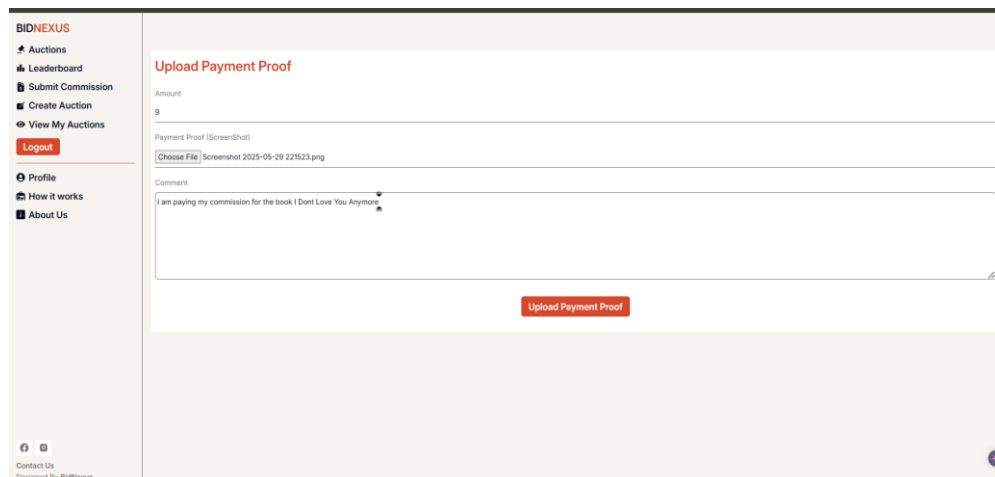
- A book by Ritvik Singh

BIDS

Auction has ended!

12) Mail for winning bidder



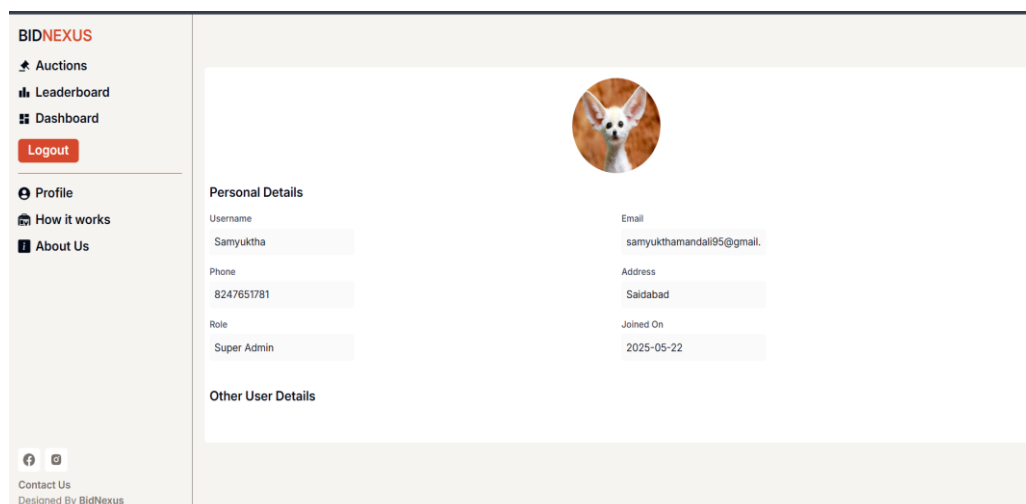
13) Paying commission



The screenshot shows the 'Upload Payment Proof' form in the BidNexus dashboard. The form includes the following fields:

- Amount:** 9
- Payment Proof (Screenshot):** A file upload field with a 'Choose File' button and a screenshot of a payment confirmation.
- Comment:** A text area with the comment: 'I am paying my commission for the book I Dont Love You Anymore'.
- Upload Payment Proof:** A red button to submit the payment proof.

14) Profile of admin



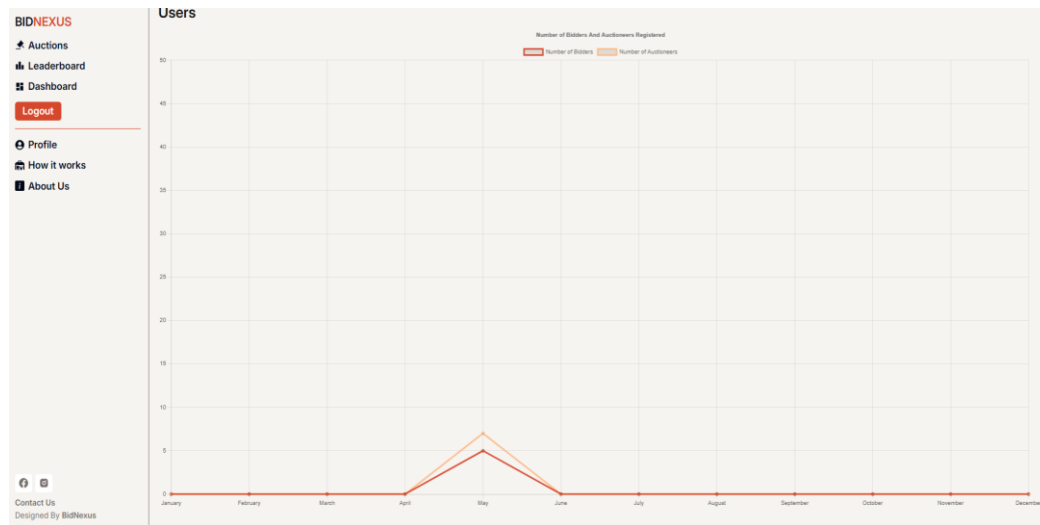
The screenshot shows the 'Profile of admin' page in the BidNexus dashboard. The page displays the following details:

Personal Details

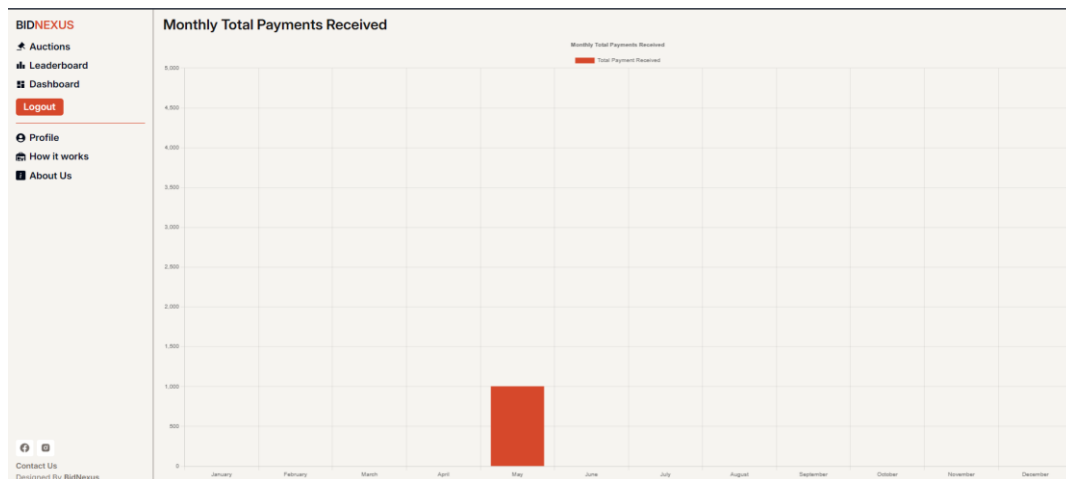
Username	Samyuktha	Email	samyukthamandal95@gmail.
Phone	8247651781	Address	Saidabad
Role	Super Admin	Joined On	2025-05-22

Other User Details

15) Graph of auction bidders



16) Graph of commission



17) Admin dashboard

BIDNEXUS

Auctions

Leaderboard

Dashboard

Logout

Profile

How it works

About Us

Contact Us

Designed By BidNexus

January

February

March

April

May

June

July

August

September

October





November

December

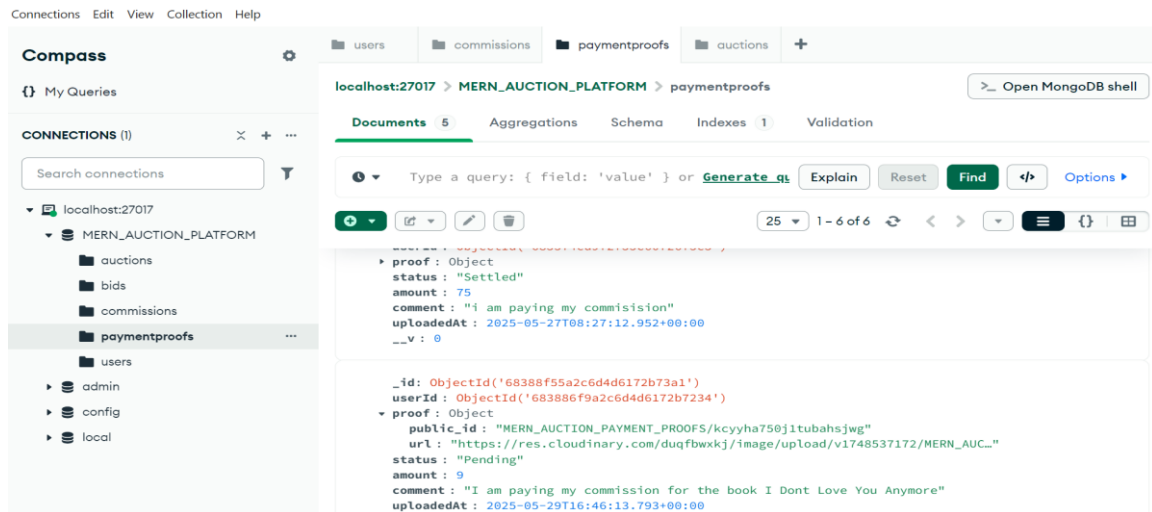
Payment Proofs

User ID	Status	Actions
682ef7b067e0b09e6c98543	Settled	Update Delete
6830b04cca5367e567053c15	Settled	Update Delete
6830b04cca5367e567053c15	Settled	Update Delete
682ef7b067e0b09e6c98543	Settled	Update Delete
683574ed9f2f35c60726f5e3	Settled	Update Delete
683886f9a2c6d4d6172b7234	Settled	Update Delete

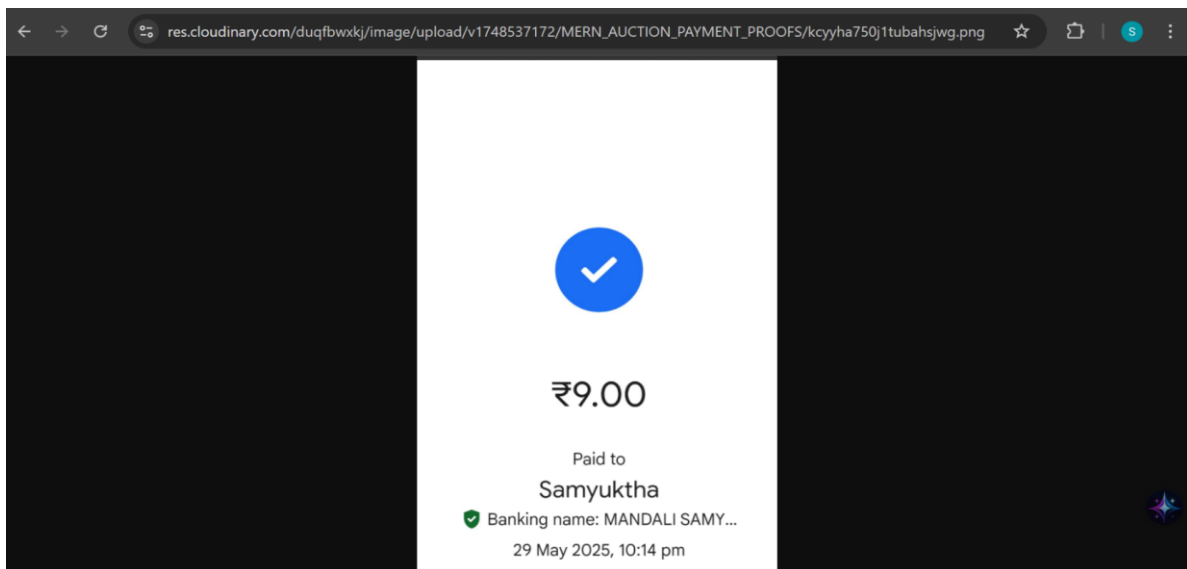
Delete Items From Auction

Image	Title	Actions
	book	View Delete
	bat	View Delete
	Harry Potter and the Prisoner of Azkaban by J.K. Rowling (Bloomsbury Edition)	View Delete
	Book-I Dont Love You Anymore	View Delete

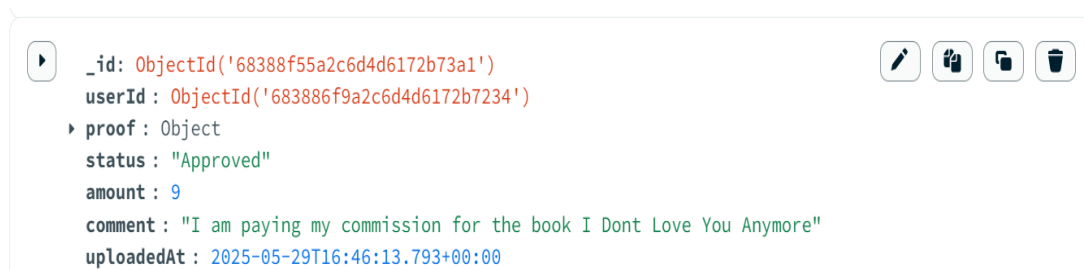
18) Database



19) Proof seen by admin



20) Database payment approve



V. CONCLUSION

Notification Workflow is important for the responsiveness and dependability of the BidNexus – Online Auction System. By incorporating an immediate notification feature, users remain well-informed at all times about critical events like bid changes, auction closing, and payment acceptance. The multi-channel methodology—using Email, SMS/WhatsApp, and In-App notifications—avoids delays by making messages reach users via their favorite communication channels.

This process not only enhances user interaction and decision-making speed in real-time auctions but also adds to the overall transparency and credibility of the platform. Furthermore, by having a disciplined notification log, the system guarantees traceability and assists audit needs. Finally, the notification service significantly enhances the user experience, rendering BidNexus a more interactive, efficient, and reliable online auction site.

REFERENCES

- [1] Bidgoli, H. (2010). The Handbook of Technology Management. Wiley.
- [2] Shinde, P., & Raut, M. (2020). "Online Auction System using Web Technology." International Journal of Research in Engineering, Science and Management, 3(2), 234–238.
- [3] Zhou, Y., & Zhang, X. (2018). "Design and Implementation of a Real-Time Bidding System Based on WebSocket." IEEE Access, 6, 37945–37954.
- [4] Gupta, A., & Jain, R. (2021). "Efficient Notification Service Framework in Web Applications." International Journal of Computer Applications, 183(2), 15–19.
- [5] Google Cloud Documentation. (2024). Cloud Functions and Pub/Sub for Real-Time

Notifications.

- [6] Flask Documentation. (2023). Flask – Web Development with Python.
- [7] Twilio. (2024). Send SMS & WhatsApp Messages.
- [8] Stripe Docs. (2024). Payment Gateway Integration.