SRS DOCUMENTATION

ONLINE AUCTION PORTAL:AUCTORA

AUCTORA

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Software Requirements Specification (SRS)

Online Auction System

1. Introduction

1.1 Purpose

This SRS outlines the design of an Online Auction System aimed at digitizing auction processes via a secure, real-time web platform. It supports multiple auction types, ensures wide accessibility, and offers robust admin and user features.

1.2 Scope

The system includes:

- User registration/login with verification
- Multiple auction categories: Live, New, Antique, Custom
- Real-time bidding, product dashboards
- Buyer/seller panels
- Secure checkout with future payment integration
- Notifications and basic analytics
- Cross-device responsive UI

1.3 Intended Audience

- **Sellers:** Individuals/businesses listing items
- **Buyers:** Participants in auctions
- **Admins:** Managers handling moderation and compliance

1.4 Definitions

- **Live Auction:** Real-time timed bidding
- **Dashboard:** Interface summarizing activities
- **Payment Gateway:** Platform to handle digital payments
- **Responsive UI:** Layout adapting to various screen sizes

1.5 Technologies

- **Language:** Python, Dart
- **Frontend:** Dart
- **Backend:** Python/Dart
- **Database:** Firebase, Supabase
- **Realtime:** Firebase Realtime DB
- **Payment Integration:** Future inclusion

1.6 References

- eBay auction structure
- Flutter, Firebase docs

2. Overall Description

2.1 Product Perspective

A unified mobile/web platform combining various auction types, allowing bidding, item discovery, and user personalization through history-based suggestions.

2.2 Product Functions

- Secure login & registration
- Product listing, bidding, and management
- Dashboards for sellers and buyers
- Notifications and analytics
- Admin tools for oversight

2.3 User Characteristics

- **Buyers:** Comfortable with basic browsing
- **Sellers:** Can manage listings
- **Admins:** Tech-savvy with access privileges

2.4 Constraints

- Requires stable internet
- Live bidding requires low latency
- Dependent on external payment APIs

2.5 Assumptions & Dependencies

- Users have modern devices
- Hosting and legal compliance are ensured

2.6 Functional Partitioning

- User Management
- Auction/Bidding/Product Modules
- Payment/Transaction
- Notification & Reporting

2.7 Use-Case Model

1. User logs in
2. Views dashboard
3. Chooses auction type
4. Views items, places bid
5. Proceeds to checkout if won
6. System sends notifications

2.8 System Architecture (High-Level)

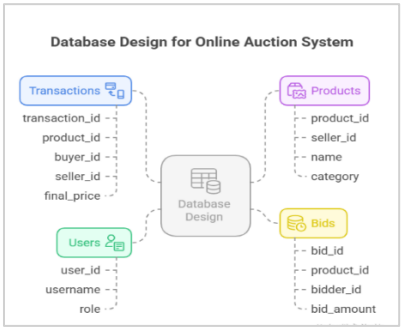
- Web/Mobile UI
- Backend API (Python)
- DB: PostgreSQL/MongoDB
- WebSockets for live updates
- Payment Gateway API

2.9 Database Design (Conceptual)

Tables:

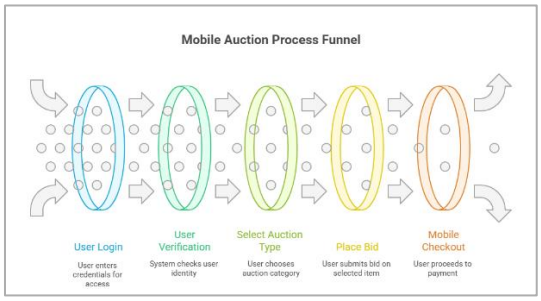
- users:
  - user_id (PK)

    - username
    - UserNumber
    - role (e.g., buyer, seller, admin)
    - verification_status
- products:
    - product_id (PK)
    - seller_id (FK to users)
    - name
    - description
    - category (e.g., Live, New, Antique, Custom)
    - initial_price
    - current_bid
    - bid_increment
    - start_time
    - end_time
    - status (e.g., active, closed, pending)
    - image_urls (array/JSON string)
- bids:
    - bid_id (PK)
    - product_id (FK to products)
    - bidder_id (FK to users)
    - bid_amount
    - timestamp
- transactions:
    - transaction_id (PK)
    - product_id (FK to products)
    - buyer_id (FK to users)
    - seller_id (FK to users)
    - final_price
    - transaction_date
    - payment_status
    - payment_gateway_ref



2.10 Output Design

- Dashboard: Live auctions, bids
- Detail pages: Descriptions, timers
- Checkout: Summary + Payment
- Push notifications



3. Specific Requirements

3.1 Functional Requirements

ID Description

FR1 The mobile app SHALL allow new users to register an account.

FR2 The mobile app SHALL allow registered users to log in securely.

FR3 The system SHALL verify user identities upon registration.

FR4 The mobile app SHALL allow sellers to list products for auction.

FR5 The mobile app SHALL support Live Auctions with real-time bidding.

FR6 The mobile app SHALL support New Product Auctions.

FR7 The mobile app SHALL support Old Antiques Product Auctions.

FR8 The mobile app SHALL allow users to create and manage Custom/Offline Auctions.

FR9 The mobile app SHALL display detailed information for each product.

FR10 The mobile app SHALL allow users to place bids on active auctions.

FR11 The system SHALL update current bid prices in real-time for live auctions.

FR12 The mobile app SHALL provide a secure checkout process for winning bids.

FR13 The system SHALL integrate with a mobile-friendly payment gateway for processing transactions.

FR14 The mobile app SHALL provide seller-specific dashboards.

FR15 The mobile app SHALL provide buyer-specific dashboards.

FR16 The system SHALL provide basic analytics and reporting on auction activities.

FR17 The system SHALL send push notifications for bid updates, auction status, and results.

FR18 The system SHALL allow administrators to manage users and listings.

3.2 Non-Functional Requirements

NFR1: Performance The mobile app SHALL respond to bid placements within 1 second for live auctions.

NFR2: Security The system SHALL encrypt all sensitive user data and financial information.

NFR3: Security The system SHALL protect against common mobile and web vulnerabilities (e.g., insecure data storage, API vulnerabilities).

NFR4: Usability The mobile app UI SHALL be intuitive and easy to navigate for all user types.

NFR5: Usability The mobile app SHALL provide clear feedback on user actions (e.g., successful bid, error messages).

NFR6: Reliability The system SHALL have an uptime of at least 99.5%.

NFR7: Scalability The system SHALL be capable of handling 10,000 concurrent users without significant performance degradation.

3.3 Activity Diagram (Textual Flow)

Start

--> Launch Mobile App

--> User Login Screen

--> User Verification

--> Main Mobile Dashboard (User chooses auction type)

--> IF "Live Auction" THEN

--> Live Auction Screen

--> Place Bid (Real-time)

--> Mobile Checkout

--> Mobile Payment Gateway

--> ELSE IF "New Product Auction" THEN

--> New Product Screen

--> Individual Product Detail Screen (New)

--> Place Bid

--> Mobile Checkout

--> Mobile Payment Gateway

--> ELSE IF "Old Antiques Product Auction" THEN

--> Antiques Product Screen

--> Individual Product Detail Screen (Antiques)

--> Place Bid

--> Mobile Checkout

--> Mobile Payment Gateway

--> ELSE IF "Custom/Offline Auction" THEN

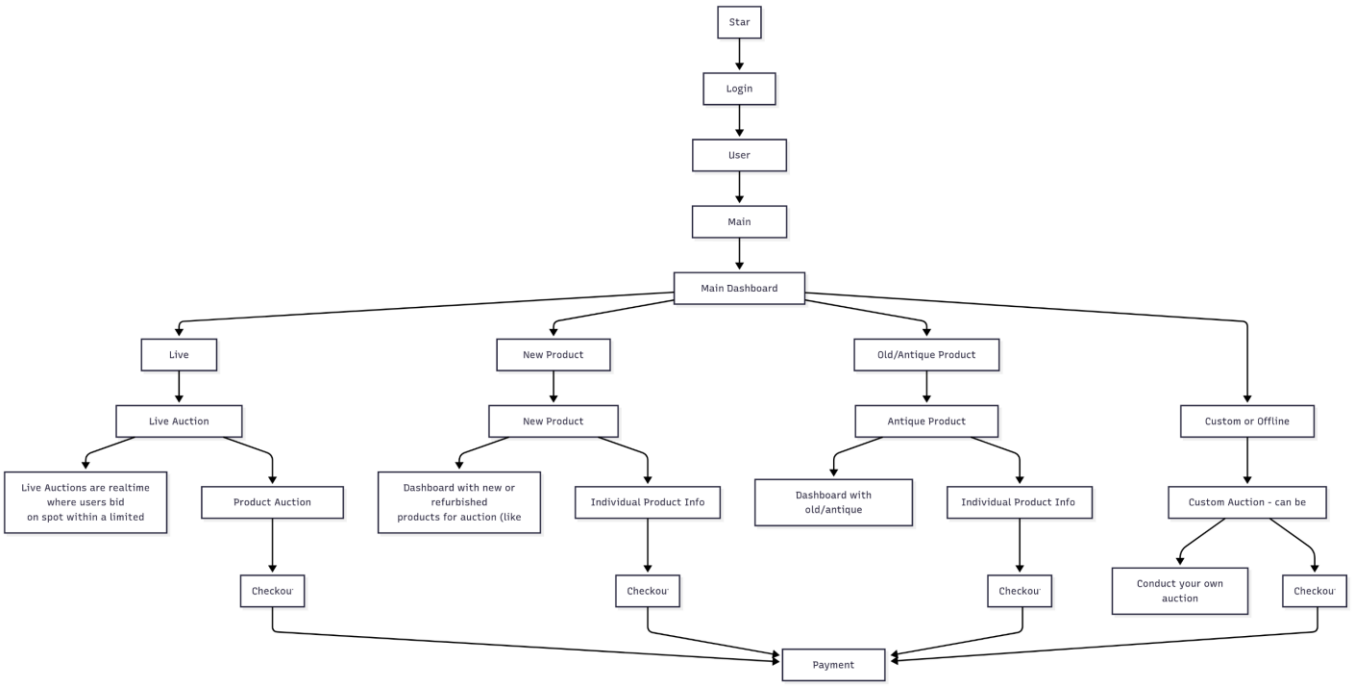
--> Custom Auction Management (Can be conducted offline via app)

--> After Verification (for custom auction creation)

--> Mobile Checkout (if online component)

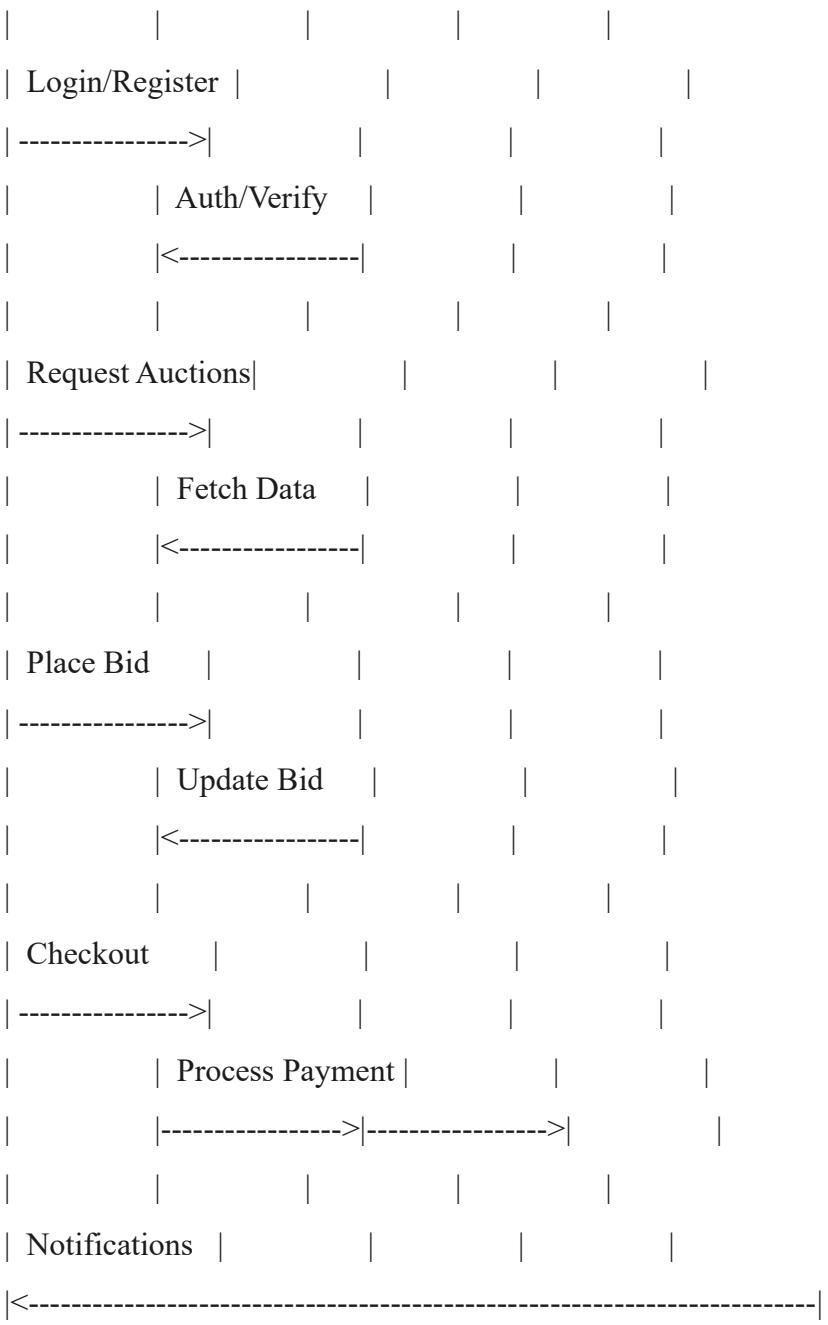
--> Mobile Payment Gateway (if online component)

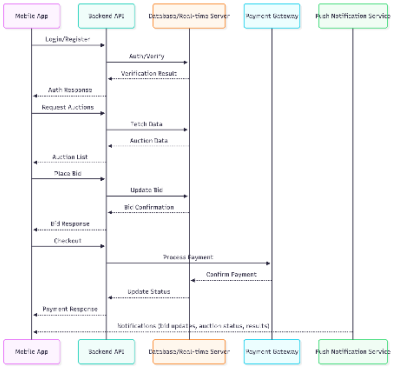
--> End


Star
Login
User
Main
Main Dashboard
Live
Live Auction
Live Auctions are realtime where users bid on spot within a limited
Product Auction
Checkou
New Product
New Product
Dashboard with new or refurbished products for auction (like
Individual Product Info
Checkou
Old/Antique Product
Antique Product
Dashboard with old/antique
Individual Product Info
Checkou
Custom or Offline
Custom Auction - can be
Conduct your own auction
Checkou
Payment

3.4 Sequence Diagram (High-Level)

Mobile App --> Backend API --> Database/Real-time Server --> Payment Gateway --> Push Notification Service





4. External Interface Requirements

4.1 User Interface

- Screens for login, bidding, checkout
- Mobile-optimized dashboards
- Gesture support and push alerts

4.2 Hardware Interface

- Smartphones/tablets
- Camera for image uploads
- Standard backend hosting

4.3 Software Interface

- Mobile OS compatibility (iOS/Android)
- Stripe/PayPal API integration
- WebSockets, Push services

5. Future Enhancements

5. Future Enhancements

- AI-based recommendation system

- Advanced reporting
- Multilingual UI
- Smart contract escrow
- In-app video for live auctions
- Encrypted chat
- AR product preview

6.Cybersecurity Approach

Authentication & Access Control
Passwords are securely hashed, with optional 2FA and timed session expiry to prevent unauthorized access.

Data & API Security
All sensitive data is encrypted (SSL/AES), and APIs are protected using tokens and strict role-based access.

Fraud Prevention
Unusual bidding patterns and IP activity are monitored. Seller identities are verified and actions logged.

Database Protection
The system uses safe queries, regular backups, and restricts database access to trusted sources.

System & Compliance
Firewalls block threats; code is hardened. Real-time logs and audits ensure GDPR and security compliance.

7.Research Gap Analysis

Despite the widespread usage of online auction platforms such as eBay, OLX, and similar systems, several critical limitations and underdeveloped features persist. The proposed Online Auction System is designed to address these gaps through the integration of intelligent algorithms, secure infrastructure, and enhanced mobile functionality. A comparative analysis is presented below:

Area	Existing Platforms	Proposed Enhancement
AI Recommendations	Basic category-based suggestions	Smart, behavior-driven product recommendations based on user history and interactions
Seller Analytics	Limited or basic sales summaries	Advanced dashboards with visual metrics, sales performance insights, and trend tracking
Live Streaming	Rare or only for premium auctions	Built-in live video streaming for all types of auctions within the mobile app
In-App Chat	Often lacks real-time or secure communication	Moderated, encrypted chat functionality between buyers and sellers
AR Item View	Not available	Augmented Reality (AR) preview for antiques and selected product categories
Fraud Detection	Largely manual or reactive response to fraud	AI-driven anomaly detection with real-time flagging and alert systems

8. Acknowledgement & Glossary

8.1 Acknowledgement

We sincerely thank our faculty and project guide for their mentorship and support throughout the development of this project.

8.2 Glossary

- API: Application Programming Interface, a set of defined rules that enable different applications to communicate with each other.
- Frontend: The part of a mobile application that users interact with directly.
- Backend: The server-side of a mobile application, responsible for data storage and processing.
- Database: An organized collection of structured information, or data, typically stored electronically in a computer system.
- Real-time: Occurring immediately or with negligible delay.
- UI: User Interface, the point of interaction and communication between a human and a computer program.
- UX: User Experience, the overall experience of a person using a product or service.
- Flutter: An open-source UI software development kit for building natively compiled applications for mobile, web, and desktop from a single codebase.
- Push Notification: A message that pops up on a mobile device.

9. Summary and Conclusion

This Online Auction System project aims to deliver a robust, user-friendly, and secure mobile application that modernizes the auction experience. By leveraging Flutter and other mobile-centric technologies, it will provide real-time bidding, comprehensive dashboards, and secure transaction capabilities across various auction types, all accessible from a smartphone or tablet. The system is designed with scalability and future enhancements in mind, ensuring it can evolve to meet the growing demands of the digital marketplace. This project will significantly improve the accessibility, efficiency, and transparency of auction processes for both buyers and sellers.

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