

Software Requirement Specifications

Project Name: Online Auction System

1. Introduction

1.1 Purpose

The purpose of this document is to outline the functional and non-functional requirements for an **online auction system**. The system will serve as a digital marketplace for users to buy and sell goods through an auction format from anywhere at any time.

1.2 Scope

The scope of this project includes the development of an online auction platform where users can:

- Register and manage their accounts,
- List items for auction with detailed descriptions,
- Place bids on items in real-time,
- Track auction progress and receive notifications,
- Complete payment transactions,
- Receives user feedbacks,

while ensuring a secure and user-friendly environment.

The project will not cover physical auction events or live auctioneer services.

1.3 Audience

This document is intended for:

- Project Managers: To understand the scope and manage resources.
- Developers: To guide the technical implementation.
- Testers: To create test cases based on requirements.
- Stakeholders: To provide feedback and ensure alignment with business goals.

2. System Overview

The online auction system will consist of a web application accessible via desktops and mobile devices. It will feature user-friendly navigation, support for various item categories, and secure payment processing.

Key Features:

- User registration and profile management.
- Item auction listing and bidding functionality.
- Real-time notifications and updates.
- Admin dashboard for monitoring and reporting.
- User feedback component to get valuable insights.

3. Functional Requirements

3.1 User Registration

- Users must enter a valid email address, username, and password to create an account.
- Passwords must adhere to security guidelines (minimum length, special characters).
- A verification email will be sent to the user's registered email address containing a link to activate the account.
- The system should check for the uniqueness of the username and email address, preventing duplicate accounts.
- The system should provide a mechanism for resending the verification email if the user does not receive it or if it expires.

3.2 User Login

- The system must provide a secure login form that collects the user's username/email and password.
- The login process must validate user credentials against stored data and provide feedback on successful or failed login attempts.
- The system should allow users to recover their password through a "Forgot Password" feature, enabling them to reset their password via a secure link sent to their registered email.
- The system must log authentication events (successful and failed login attempts) for auditing and monitoring purposes.

3.3 Item Listing

- The system must provide a user-friendly interface for registered sellers to create new auction listings, including fields for:
 1. Title (mandatory)
 2. Description (mandatory)
 3. Starting bid amount (mandatory)
 4. Auction end date and time (mandatory)
 5. Category selection (mandatory)
 6. Images uploads (optional, but recommended)
 7. Tags (optional, but recommended)
- The system should validate item details to ensure all required fields are completed and that the starting bid is greater than zero.
- The system should allow sellers to edit or delete their listings before the auction begins and provide confirmation prompts for deletion.
- The system should provide notifications to sellers for important events, such as when they receive bids or when their auction is about to end.
- After an auction end, sellers should be able to view the final bid, winning bidder information, and transaction details.

3.4 Bidding

- Authenticated users can place bids on active auctions.

- Users must be able to view the current highest bid amount and the time remaining for the auction before placing their bids.
- The system should enforce a minimum bid increment (e.g., a percentage or fixed amount) to ensure that bids are placed in reasonable increments.
- Bids must automatically increase up to the maximum amount set by the user in the event of outbidding.
- Notify bidders upon outbid, successful bid or auction ending soon.
- Bidders need to confirm their bids before submission.
- Users must be able to view their bidding history, including details of all bids placed (e.g., item details, bid amounts, and timestamps).
- The system must log all bidding activities, including user IDs, bid amounts, and timestamps, for auditing and monitoring purposes.
- The system may implement maximum bid limits to prevent excessive bidding from a single user, ensuring fairness in the auction process.
- The system must provide real-time updates for bid amounts and auction statuses without requiring page refreshes, enhancing user engagement.
- Users should be able to see live updates of the current highest bid, remaining auction time, and recent bidding activity.

3.5 Auction Management

- The system must provide a user-friendly interface for sellers to create new auctions, including fields for:
 1. Auction title
 2. Item details (description, images, category)
 3. Starting bid amount
 4. Reserve price (optional)
 5. Auction duration (start and end times)
- The system should validate auction details to ensure that all required fields are completed and that the starting bid is greater than zero.
- Sellers must be able to view and manage all their active and past auctions from a dedicated dashboard, including: bid amount, Number of bidders, Auction status (active, ended, sold),
- Users can cancel an auction before it ends, subject to specific rules (e.g., no bids placed).
- The system will display a countdown timer for each auction.
- Users can notify both the winning bidder and the seller
- The system must provide real-time updates on auction activities, including current bids and time remaining, visible to both sellers and bidders.
- Only authenticated users (registered sellers) should be able to create or manage auctions. The system must verify that users are logged in before allowing auction management actions.
- All auction management actions (creation, modification, deletion) must be logged for auditing and accountability.

- The system must automatically close auctions at the specified end time, updating the auction status and notifying the winning bidder and seller.

3.6 Messaging System

- The system will send email notifications for:
 1. Successful registration
 2. Bid status updates (e.g. outbid notification)
 3. Auction ending soon reminders
 4. Shipping information
 5. Transaction related discussions

3.7 Payment Processing

- The system will integrate with a payment gateway (e.g., Stripe, PayPal) for secure transactions.
- Users can view their transaction history, including completed and pending payments.
- The system will send a confirmation email upon successful payment.

3.8 User Feedback and Ratings

- User can leave their feedback and ratings based on their experience.
- Users must be able to submit feedback only once per transaction to prevent spam and ensure fairness.
- The system should notify sellers via email when new feedback is received.
- Only registered and logged-in users should be able to submit feedback to ensure authenticity and accountability.

3.9 Item Search and Filtering

- Users must be able to search for items using keywords relevant to the item title, description, category, price range, or auction end times.
- The search bar should be prominently displayed on the main page and throughout the site for easy access.
- The system should provide suggestions or autocomplete features based on user input to enhance the search experience.
- The search results must display relevant items with essential details such as:
 1. Title
 2. Current bid amount
 3. Auction end time
 4. Seller rating
- The filter options should be easily accessible and presented in a user-friendly sidebar or dropdown menu.
- Users should be able to apply multiple filters simultaneously to narrow down their search results effectively.

3.10 Shipping and Logistic Integration

- Users must be able to enter and save multiple shipping addresses within their account settings for convenience.

- During the checkout process, users should be able to select their saved address or enter a new address.
- Shipping costs should be automatically calculated and displayed during the checkout process based on the user-entered address.
- The system should provide buyers with tracking information once the item has been shipped, allowing them to monitor the shipment's progress.
- Users should receive automated email notifications with tracking updates at various stages (e.g., shipment dispatched, out for delivery).
- A tracking section should be available on the user's account page to view the status of all their orders.

3.11 Admin Dashboard

- Admins must be able to view a list of all registered users, including their account status (active, suspended, etc.).
- Admins should have the ability to edit user details, such as usernames, email addresses, and passwords.
- Admins should have access to user activity logs, showing actions taken by users (e.g., bids placed, items listed).
- Admins must be able to view a list of all active, upcoming, and ended auctions, including details such as item title, current bid amount, and auction status.
- Admins should be able to modify auction details, including extending auction end times, changing starting bids, or cancelling auctions if necessary.
- Admins must be able to view all transactions processed through the platform, including payment status and transaction history.
- The system should notify admins of any failed transactions or suspicious activities requiring investigation.
- Admins must have access to user feedback and ratings for sellers, enabling them to monitor service quality and user satisfaction.
- The admin dashboard must have an intuitive, user-friendly interface with easy navigation to different sections and features.

3.12 Responsive Design

- The layout must be based on a fluid grid system that allows elements to resize proportionally to the screen size.
- All components, including headers, footers, navigation menus, and content areas, should be flexible and adjust to different viewport dimensions.
- The navigation menu must adapt to smaller screens by converting into a collapsible menu (hamburger menu) that expands when clicked.
- All images and media elements (e.g., videos, icons) must be responsive, scaling appropriately to fit within their containing elements.
- The system should implement techniques such as CSS properties (e.g., max-width: 100%) to ensure that images do not overflow their containers and maintain aspect ratios.

3.13 Legal and Security Considerations

- The system must comply with data protection regulations (e.g., GDPR, CCPA) regarding the collection, processing, and storage of personal information.

- Users must be informed about how their data will be used, with clear privacy policies accessible at all times.
- Users should have the ability to access, modify, and delete their personal data from the system.
- All payment transactions must be encrypted using industry-standard protocols (e.g., SSL/TLS) to ensure data security during transmission.
- Users must receive notifications for any payment-related activities, including confirmations, failures, or refunds.
- The system must implement strong user authentication measures during login.
- User roles and permissions must be defined, ensuring that access to sensitive features and data is restricted based on user roles (e.g., admin, seller, buyer).
- The system must log user access and activities for auditing and monitoring purposes.
- The platform must adhere to local, national, and international auction laws, including regulations regarding bidding practices and seller disclosures.
- Sellers must be required to provide accurate descriptions of items, with penalties for misrepresentation outlined in the user agreement.
- The system must present users with a clear user agreement and terms of service during account registration, which must be accepted before using the platform.

3.14 Testing and Quality Assurance

- The system must undergo functional testing to verify that all features work according to specified requirements, including user interactions, auction processes, and payment systems.
- Test cases should cover positive, negative, and edge scenarios to ensure robustness in various conditions.
- A User Acceptance Testing phase must be conducted with real users to validate the system's usability and functionality against business requirements.
- The system must undergo performance testing to assess its responsiveness and stability under varying load conditions, including peak traffic scenarios.
- Security testing must be conducted to identify vulnerabilities and ensure that data protection measures are effective against threats (e.g., SQL injection, cross-site scripting).
- The system should be evaluated for compatibility with different operating systems (e.g., Windows, macOS, iOS, Android).
- A bug tracking system must be implemented to log, categorize, and prioritize defects identified during testing.

4. Non-Functional Requirements

4.1 Performance

- The system should handle up to 1,000 concurrent users.
- Pages should load within 3 seconds under normal load conditions.

4.2 Security

- User data must be encrypted in transit and at rest.
- The system must implement measures against SQL injection and cross-site scripting (XSS).

4.3 Usability

- The user interface must be intuitive, with a clear layout and easy navigation.
- The system should be accessible on various devices, with a responsive design for mobile users.
- Help and support sections must be easily accessible.

4.4 Scalability

- The architecture should allow for the addition of new features and increased user load without significant rework.
- The database must be able to handle increased data volume as the number of users and auctions grows.

5. System Architecture

5.1 Technology Stack

- Frontend: HTML, CSS, JavaScript, ReactJS
- Backend: Python (Django/Django Rest Framework)
- Database: MySQL
- Payment Gateway: Stripe or PayPal

5.2 Deployment

- The application will be hosted on a cloud service (e.g., AWS, Azure) to ensure reliability and scalability.

6. User Roles

6.1 Seller

Capabilities:

- Create and manage account settings.
- List items for auction.
- Manage items.
- View auction history and notifications.

6.1 Buyer

Capabilities:

- Create and manage account settings.
- buy items for auction.
- Place bids on items.
- View auction history and notifications.

6.2 Admin User

Capabilities:

- Manage user accounts (approve, suspend).

- Monitor and manage active auctions.
- Generate reports on system performance and user activity.
- Handle user inquiries and support requests.

7. Glossary

- **Auction:** A public sale in which goods or property are sold to the highest bidder.
- **Bid:** An offer made by a buyer to purchase an item at a specified price.

8. Conclusion

In conclusion, the successful implementation of the Online Auction System hinges on the thorough understanding and adherence to these requirements, paving the way for a platform that not only meets user expectations but also sets a standard for excellence in online auction services.

All stakeholders are encouraged to review these requirements to ensure that the system meets their needs. Future modifications and enhancements will be discussed in subsequent meetings.