**ABSTRACT**

The Online Auction System is a comprehensive, digital platform designed to facilitate the buying and selling of items through competitive bidding. This system transforms traditional auction processes into an efficient, user-friendly online experience. It incorporates features such as user registration and login, item listing, bidding, and real-time auction updates. Sellers can easily list items for auction, providing detailed descriptions, images, and starting prices. Buyers can browse available items, place bids, and receive notifications about their bid status.

The system includes an admin panel that allows administrators to manage users, monitor auctions, and generate various reports, such as user activity reports, auction statistics, and financial summaries. Key functionalities include the ability to search for items, view bid history, and utilize 'Buy Now' options for immediate purchases.

The primary objective of this system is to streamline the auction process, making it more efficient and accessible, while minimizing human intervention and errors. By leveraging modern web technologies, this system ensures a seamless and engaging experience for all users involved in online auctions.

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# Introduction

## Product perspective

Welcome to the "Online Auction System." This innovative platform revolutionizes the auction process by enabling seamless online bidding and product sales. Vendors can easily list their products for auction, and customers can place competitive bids to purchase them. The main objective of the e-Auction process is to obtain the best value and the highest price for products. Achieving optimal outcomes requires focusing on overall value rather than just price alone. The "Online Auction System" caters to two main user categories: customers and vendors. Vendors can sell their products on the website, and customers can participate in the auctions by placing bids. The product will be sold to the customer who places the highest bid. Users can place multiple bids on various products, ensuring a dynamic and competitive bidding environment.

## Product features

### There are three different users who will be using this product:

* + - * Addministrator who will manage the overall platform.
      * Vendor who will be listing products for auction.
      * Customer who will be placing bids on products.

### The features that are required for the Administrator are:

* + - * Control and manage vendor and customer accounts.
      * Oversee the listing and movement of products and ensure proper documentation.
      * Monitor ongoing auctions to ensure fair play and compliance with platform rules.
      * Search for specific products or users based on various criteria such as name, category, or user details.
      * Generate reports on auction activities, sales, and user engagement.
      * Address and resolve any disputes between vendors and customers.
      * Perform regular maintenance tasks to keep the platform running smoothly.
      * Send notifications and updates to users about their activities and auction statuses.

### The features that are required for the Vendor are:

* + - * Add and manage products for auction with detailed descriptions and images.
      * Set auction parameters such as start time, end time, and minimum bid increments.
      * View and manage bids placed on their products.
      * Access reports on sales and bidding history for their products.
      * Communicate with customers through the platform regarding their products and auctions.
      * Manage their account details, payment information, and transaction history.

### The features that are required for the Customer are:

* + - * View and browse different categories of products available for auction.
      * Place bids on products they are interested in purchasing.
      * Create and manage their account details and personal information.
      * Track their bids and receive notifications about the status of their bids.
      * View their purchase history and transaction details.
      * Search for specific products based on keywords, categories, or vendors.
      * Provide feedback and reviews on products they have purchased.

## Functional Requirement

* Users of this System:
  1. **Administrator**: Manages and oversees the platform or system, handling tasks like user management, content moderation, and system maintenance.
  2. **Vendor (Seller)**: A person or business that offers goods or services for sale on a platform or marketplace.
  3. **Customer (Buyer)**: An individual or entity purchasing goods or services from a vendor or business.
  4. **Guest**: A visitor with limited access, often browsing without full user privileges or registration.

### Administrator

* + - * User Management: The system shall allow the Administrator to create, update, and delete user accounts.
      * Role Assignment: The system shall allow the Administrator to assign roles (buyer, seller, admin) to users.
      * Auction Monitoring: The system shall provide the Administrator with the ability to monitor active, upcoming, and completed auctions.
      * Dispute Resolution**:** The system shall enable the Administrator to intervene and resolve disputes between buyers and sellers.
      * Content Moderation**:** The system shall allow the Administrator to review and approve or reject auction listings before they go live.
      * Policy Enforcement: The system shall enable the Administrator to enforce site policies and rules by banning or suspending users who violate terms of service.
      * Reporting and Analytics: The system shall provide the Administrator with detailed reports and analytics on system usage, auction activities, and financial transactions.
      * System Configuration: The system shall allow the Administrator to configure system settings such as auction duration, bid increments, and notification preferences.
      * Security Management: The system shall enable the Administrator to manage security settings, including setting password policies and enabling/disabling two-factor authentication.
      * Payment Management: The system shall allow the Administrator to oversee and manage payment gateways, transaction fees, and financial reconciliations.
      * Data Backup and Recovery: The system shall allow the Administrator to perform data backups and manage data recovery processes.
      * Communication Management: The system shall enable the Administrator to send messages or notifications to all users or specific user groups.

### Vendor

* + - * Item Listing Creation: The system shall allow sellers to create new auction listings by providing item details, descriptions, images, starting price, and auction duration.
      * Item Listing Management: The system shall allow sellers to edit or delete their auction listings before any bids are placed.
      * Reserve Price Setting: The system shall allow sellers to set a reserve price for their auction listings to ensure the item is not sold below a certain amount.
      * Bid Management: The system shall notify sellers when new bids are placed on their auction listings.
      * Communication with Buyers: The system shall allow sellers to communicate with potential buyers via a messaging system.
      * Payment Processing: The system shall facilitate the processing of payments from buyers to sellers once an auction is completed.
      * Feedback Management: The system shall allow sellers to leave feedback for buyers based on their transaction experience.
      * Upload Images: The seller must be able to upload multiple images for each auction listing to provide visual representation of the item.
      * View Active Auctions: The seller must be able to view a list of their active auctions along with current bids and auction status.
      * Cancel Auction Listings: The seller must have the ability to cancel an active auction listing, provided no bids have been placed.
      * View Sales History: The seller must be able to view a history of their completed sales, including item details, sale price, and buyer information.

### Buyer

* + - * User Registration and Login: Buyers must be able to create an account by providing necessary details and then log in using their credentials.
      * Profile Management: Buyers should be able to view and edit their personal information and account settings.
      * Item Search and Browsing: Buyers must be able to search for items using various filters such as category, price range, auction end time, and keywords.
      * Item Viewing: Buyers should be able to view detailed information about an item, including descriptions, images, seller information, and current highest bid.
      * Automatic Bidding: Buyers should have the option to set a maximum bid amount, allowing the system to automatically place incremental bids on their behalf up to that limit.
      * Auction Monitoring: Buyers should be able to add items to a watchlist to monitor auctions they are interested in.
      * Transaction History: Buyers should be able to view a history of their transactions, including won auctions, payments made, and items received.
      * Communication: Communicate with sellers through messaging or inquiry features to ask questions about items.
      * Account Security**:** Ensure account security through password management and optional two-factor authentication.
      * Viewing Auction History: Access and view past auction activities, including items bid on and won.

### Guest

* + - * View Auction Listings**:** The guest user shall be able to view all available auction listings.
      * Search Auctions: The guest user shall be able to search for auctions using keywords.
      * Sort Auctions: The guest user shall be able to sort auction listings by various parameters such as price, popularity, and end date.
      * View Item Details: The guest user shall be able to view detailed information about a listed item, including descriptions, images, and current bid status.
      * View Seller Information**:** The guest user shall be able to view limited information about the seller, such as their rating and number of auctions conducted.
      * View Auction Rules**:** The guest user shall be able to view the rules and guidelines for participating in auctions.
      * Viewing Auction Calendar: Ability to see upcoming auctions or events without needing to log in.
      * Language and Currency Selection: Options to select preferred language and currency for viewing auction listings.

## Non-Functional Requirement

### Performance:

* + - * Response Time: The system should respond to user interactions (like placing bids or updating listings) within a certain timeframe (e.g., under 1 second).
      * Scalability**:** It should handle increasing numbers of users and transactions without significant degradation in performance.

### Usability**:**

* + - * The user interface should be intuitive and user-friendly, catering to both experienced and novice users.

### Security:

* + - * Data Encryption: All sensitive information (like user credentials, payment details) should be encrypted to prevent unauthorized access.
      * Protection Against Attacks**:** Measures should be implemented to defend against common cyber threats such as DDoS attacks, SQL injection, and cross-site scripting (XSS).

### Monitoring and Reporting:

* + - * Performance Monitoring**:** Monitor system performance metrics such as CPU usage, memory usage, and response times.
      * Reporting**:** Generate reports on auction activities, sales trends, and user behavior for business insights.

## Use case diagram

**Online Auction System**

User and

registration login

profile

management

List viewing

Auction Monitoring

Transaction History

Buyer seller

Payment Processing

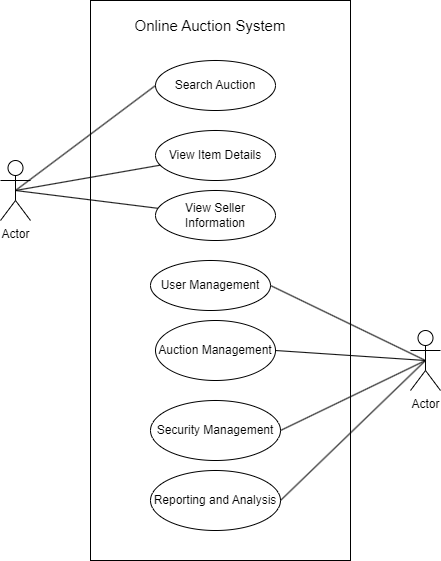
Reserve Price Setting

Communication

With Buyer

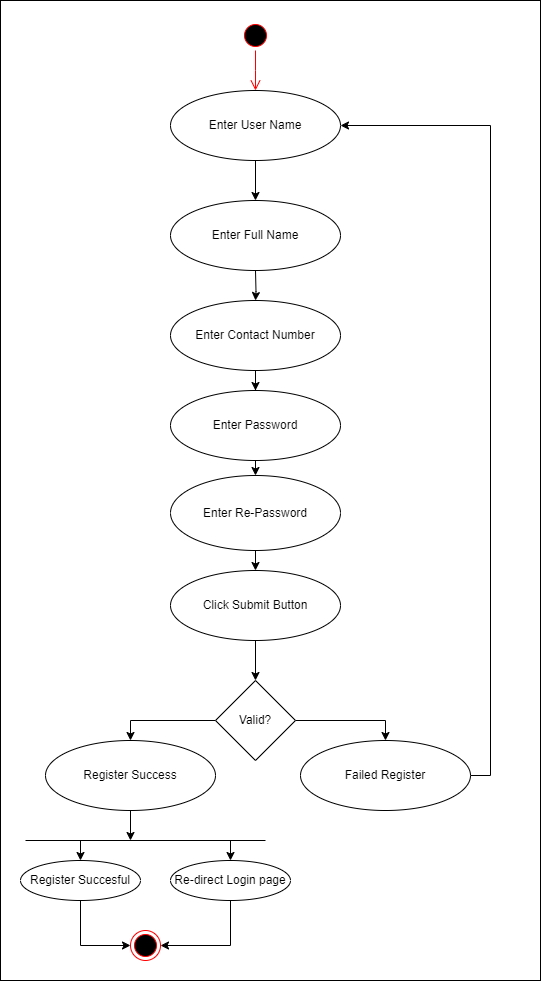
Item Listing

Management

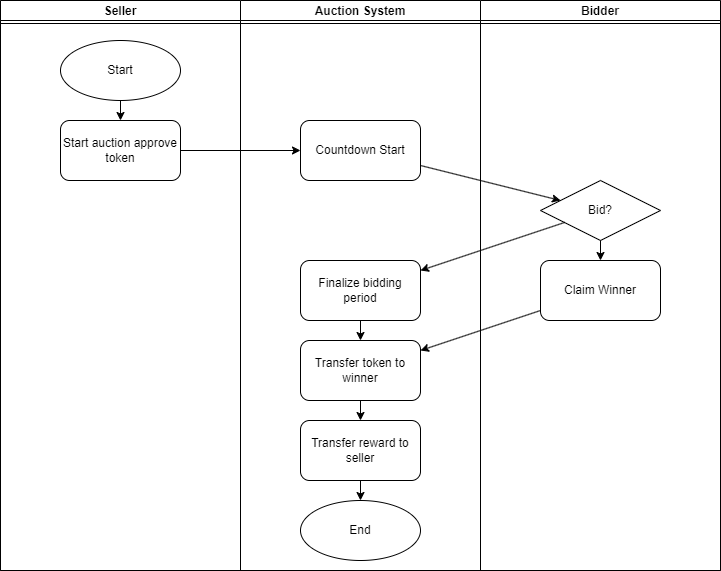


Seller

2.2 Activity diagram

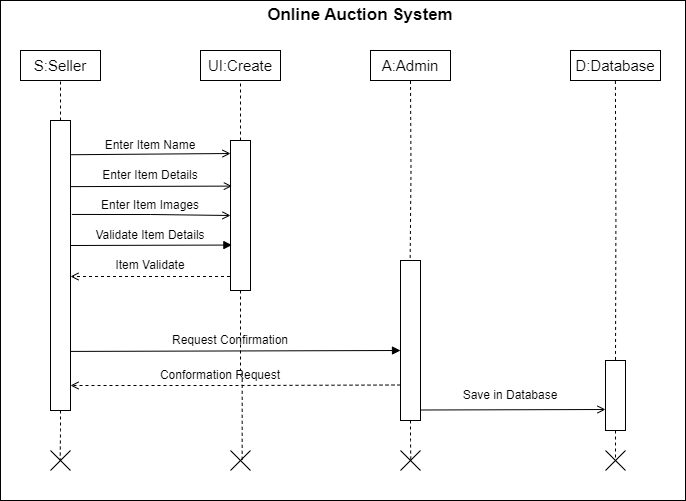


*Figure 2.2-1 Activity diagram for Register*

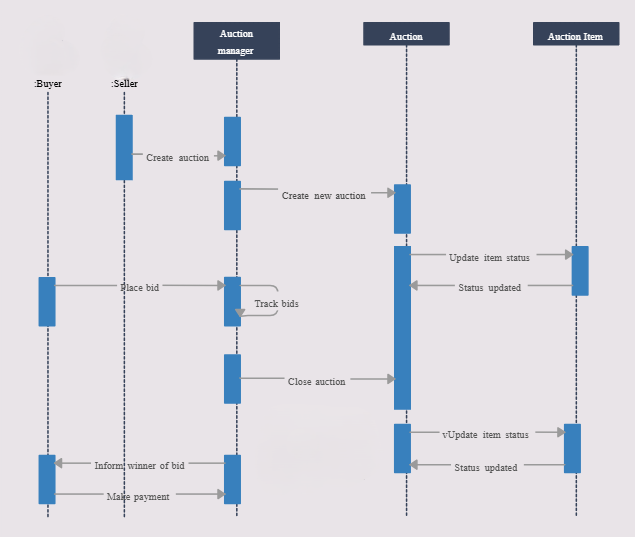


*Figure 2.2-2 Swimlane diagram for Auction Start*

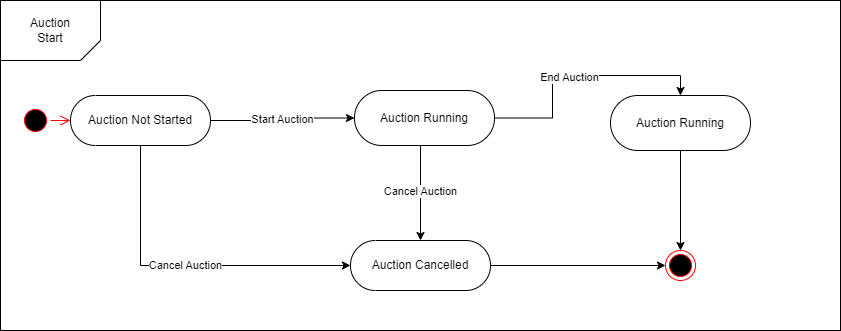
## Sequence diagram



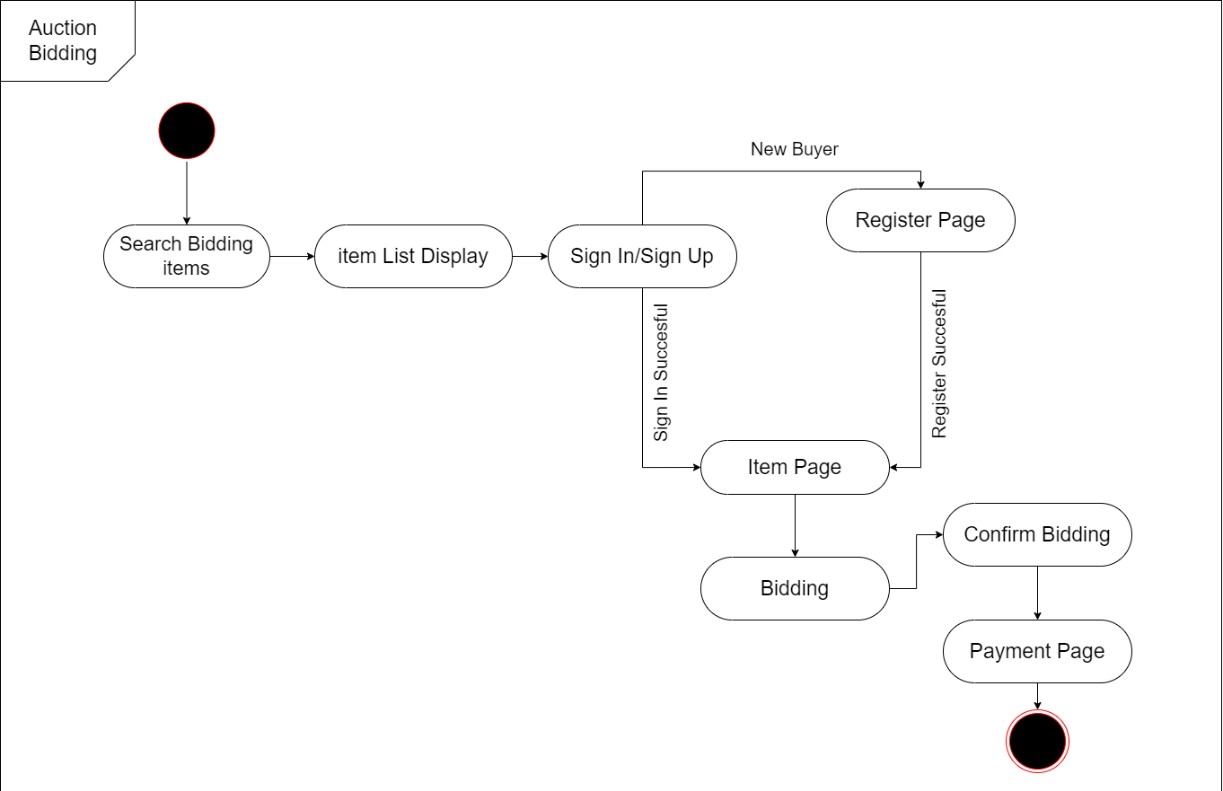
*Figure 2.3-1 Sequence diagram for Create Item*



## State diagram



*Figure 2.4-1 State diagram for Auction Start*



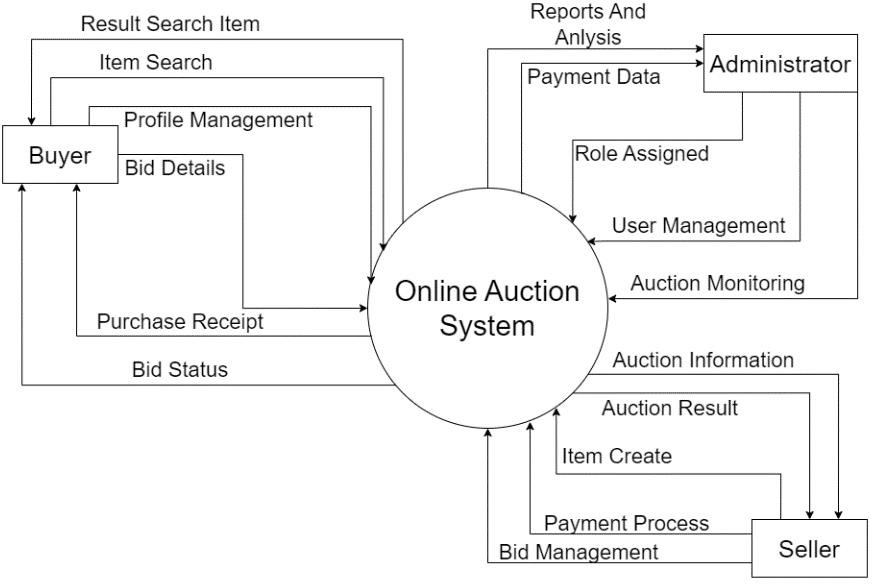
*Figure 2.4-2 State diagram for Auction Bidding*

## Class diagram

*Figure 2.5-1 Class diagram for Online Auction System*

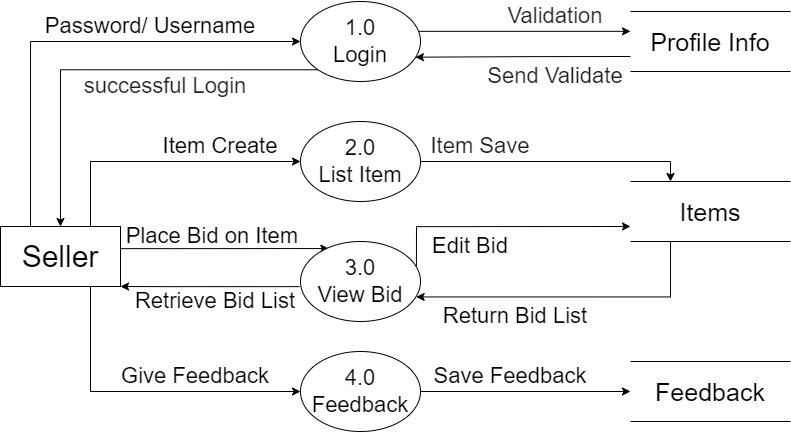
## Data flow diagram

### Context diagram (level-0)



*Figure 2.6-1 Context diagram for Online Auction System*

### DFD Level-1



*Figure 2.6-2 DFD level-1 for Online*