TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
PULCHOWK CAMPUS

A
CASE STUDY
ON
eAuction

SUBMITTED BY

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SUBMITTED TO

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Table of Contents

Lab 1: Functional Requirements and Non-Functional requirements

Analysis

1. **Identifying the stakeholders and their requirements:** This includes identifying the users of the system (e.g. buyers, sellers, auction administrators), as well as any other parties that may be impacted by the system (e.g. regulatory bodies, payment processors).
2. **Gathering requirements**: This step involves collecting requirements from the stakeholders through various methods such as interviews, surveys, and workshops.
3. **Organizing and documenting requirements:** The requirements collected in the previous step are organized and documented in a clear and concise manner, often using a tool such as a requirements traceability matrix.
4. **Prioritizing and validating requirements:** The requirements are prioritized based on their importance and feasibility, and then validated with the stakeholders to ensure they are complete, consistent, and realistic.
5. **Creating a requirements specification:** A requirements specification document is created that summarizes all of the requirements and serves as the basis for the design and development of the online auction system.

Functional requirements:

1. **User registration and login:** Allows users to create an account and log in to the system.
2. **Item listing and bidding:** Allows sellers to list items for auction and buyers to place bids on those items.
3. **Bidding and auction management:** Allows auction administrators to manage the bidding process, such as setting starting prices, reserve prices, and auction end times.
4. **Payment processing:** Allows the system to process payments from buyers and disburse funds to sellers.
5. **Feedback and ratings:** Allows users to leave feedback and ratings for other users.
6. **Search and filtering:** Allows users to search for items and filter results by various criteria such as price, location, or item category.
7. **Communication**: Allows users to communicate with one another, for example through a messaging system or a chat feature.
8. **Notifications**: Allows users to receive notifications about events such as outbid notifications, auction end notifications, and payment notifications.

Non-functional requirements:

1. **Performance**: The system should be able to handle a high volume of

concurrent users and transactions without experiencing significant lag or downtime.

2. **Scalability:** The system should be able to handle an increasing number of users and transactions as the user base grows.
3. **Security:** The system should protect user data and transactions from unauthorized access and protect against common security threats such as SQL injection and cross-site scripting.
4. **Usability:** The system should be easy to use and navigate, with a clear and intuitive user interface.
5. **Accessibility:** The system should be accessible to users with disabilities and comply with relevant accessibility standards.
6. **Reliability**: The system should be reliable and available to users with minimal downtime.
7. **Compliance:** The system should comply with relevant laws and regulations such as the General Data Protection Regulation (GDPR) and Payment Card Industry Data Security Standards (PCI DSS)
8. **Supportability:** The system should be easy to maintain and support with minimal downtime.

Lab 2: Use Case Modeling

UC1: Create an auction

Scope: eAuction application

Level: user goal

Primary Actor: InventoryIncharge

Stakeholders and Interests:

- InventoryIncharge: Wants accurate, fast entry, and no payment errors, as cash drawer short- ages are deducted from his/her salary.
- Bidder: Wants sales commissions updated.
- InventoryAdmin: Wants purchase and fast service with minimal effort. Wants easily visible display of entered items and prices. Wants proof of purchase to support returns.
- NoticeBoard: Wants to send notices about auction to national daily paper, to bidders and to home page.

Preconditions: InventoryIncharge is identified and authenticated.
Postconditions:The auction is signed by InventoryAdmin and NoticeBoard boardcasts this notice.

Main Success Scenario:

1. InventoryIncharge finds by items are needed to sell.

2. InventoryIncharge reports to InventoryAdmin, a meeting is held, and a valuation team is provided to calculate the minimum starting price.

3. InventoryIncharge creats auction entering title, description, portable document format(PDF) of notice, youtube video link(if any) , minimum starting price, location, type of auction.

Extensions :

3a. InventoryIncharge may select one of these options:
    1. Save
        1. So that changes can be made later.
    2. Confirm
        1. Auction is finally broadcasted.

Special Requirements:

- Pluggable business rules to be insertable at steps 1,2, and 3.

Technology and Data Variations List:

3a. Auction location (latitude, longitude) may be taken via a responsive program.
Frequency of Occurrence: Could be once in a week.

Open Issues:

- What customization is needed for different government agencies?

UC2: View an auction

Scope: eAuction application

Level: user goal

Primary Actor: Bidder, InventoryIncharge

Stakeholders and Interests:

- Bidder: Wants detail about auction
- InventoryIncharge: Wants option to edit if not confirmed.

Preconditions: InventoryIncharge is identified and authenticated.
Postconditions:The auction is signed by InventoryAdmin and NoticeBoard broadcasts this notice.

Main Success Scenario:

1. Bidder sees notice in notice page, when clicked is redirected to detail page.

2. InventoryIncharge can visit through dashboard, or through notice page.

Frequency of Occurrence: Could be continuous.

Open Issues:

- How can we detail page to different stakeholders in convenient user interface(UI)?

UC3: Submit a bid

Scope: eAuction application

Level: user goal

Primary Actor: Bidder

Stakeholders and Interests:

– Bidder: Wants bidding form. Wants to see other bidders bid if auction is of type open auction. Wants to edit the bid amount.

Preconditions: Bidder is identified and authenticated.
Postconditions: The final bid is recorded by the system.

Main Success Scenario:

1. Bidder visits the detail page.
2. Bidder informs system that bail amount is deposited.
3. Bidder selects bid option.
4. Bidder fills in bid form.
5. Bidder submits the form

Extensions :

2a. The bidder may not have actually deposited money.
1. Confirm through financial services provider and ask bidder to enter valid transaction details.

4a. The bidder may submit less amount than current highest.

1. Open auction
    1. Bidder is notified about minimum amount to quote.

0. Close Auction:
    1. No need to check bid amount

Frequency of Occurrence: Could be continuous.

Open Issues:

– Using Django for real time bidding details okay?

UC4: Close a auction

Scope: eAuction application

Level: user goal

Primary Actor: SuperAdminA, SuperAdminB, SuperAdminC, Bidder

Stakeholders and Interests:

– SuperAdminA, superAdminB,SuperAdminC- Wants to enter their one time password(OTP) when auction (closed auction) expires. Then only the bidding result is shown.
-Bidder: Wants to see the bidding result.

Preconditions:Auction is expired.
Postconditions: Everyone sees the bidding result.

Main Success Scenario:

1. SuperAdminA, SuperAdminB, SuperAdminC visits the auction detail page and enter their password.
2. Bidding results are made public.

Frequency of Occurrence: Could be once a week.

Special Requirements:

– One Time Password for related admins, for each auction.

Technology and Data Variations List:

3a.Admin logging may be organization dependent(2 admins, 3 admins).

UC5: Complete an auction

Scope: eAuction application

Level: user goal

Primary Actor: BidWinner, InventoryIncharge

Stakeholders and Interests:

– BidWinner-Wants to complete the purchase by depositing the remaining amount. Wants to confirm shipping of the bought product.
– InventoryIncharge: Wants to confirm the item has been shipped.

Preconditions:Auction is awarded.

Main Success Scenario:

1. BidWinner pays the remaining amount.
2. InventoryIncharge confirms the product is shipped.
3. BidWinner confirms the product is received.

Extensions:

*1a No bidder may take participation.

1. Plan for re-opening of the auction.

*1b. BidWinner may not pay within 7 days of auction closing and may not take the product.

1. The deposited bid amount of that BidWinner is taken.
2. Next highest Bidder is awarded and notified to pay within 7 days.

Frequency of Occurrence: Could be once a week.

Technology and Data Variations List:

1a.Payment confirmation checking could be organization dependent.

1b. The re-opening policy could be pluggable to the system.

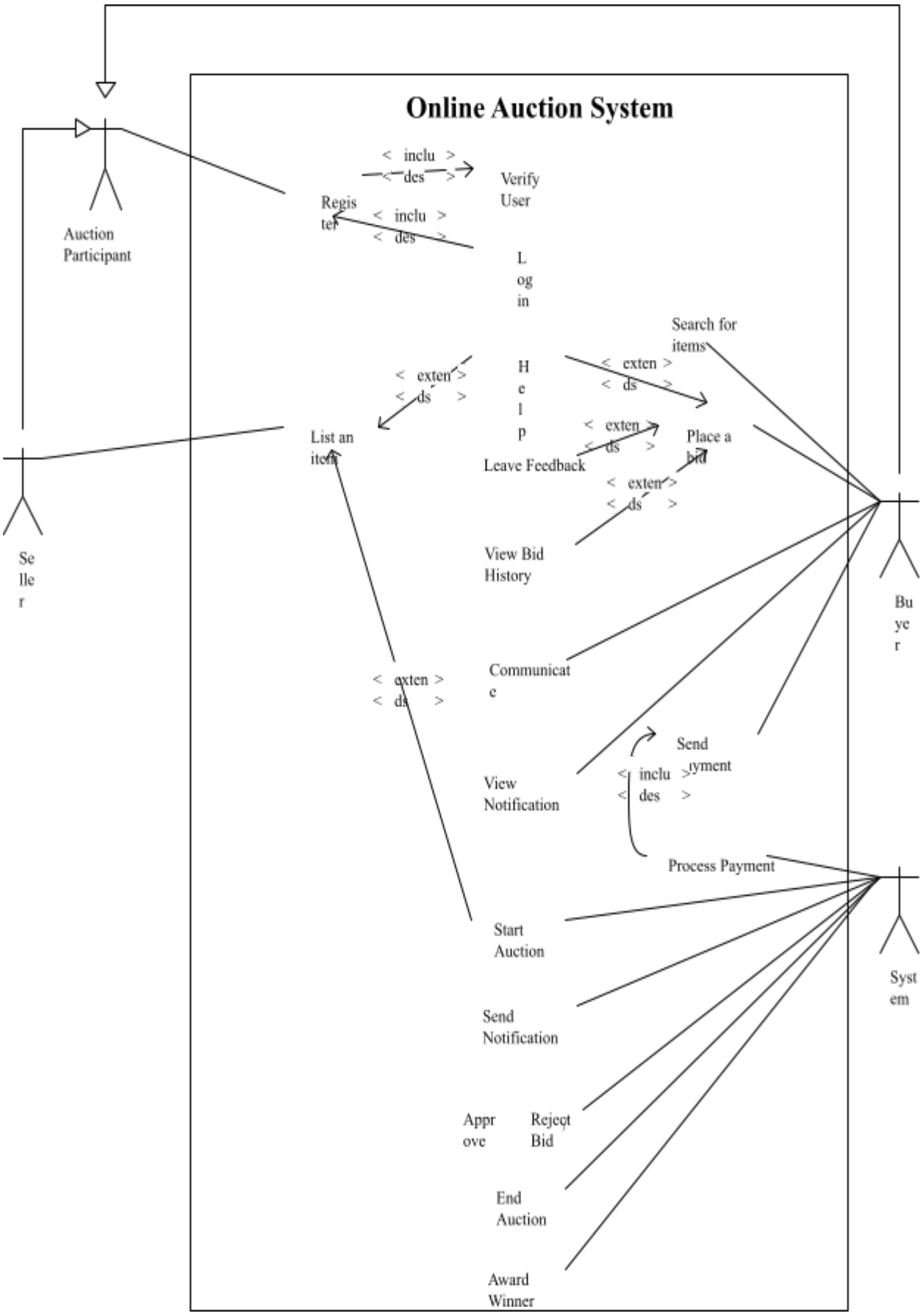
Use Case Diagram

Actors:

- Buyer: A person who places bids on items in the auction.
- Seller: A person who lists items for auction.
- Auction Administrator: A person who manages the auction process, such as setting start and end times, and approving or rejecting bids.

Use cases:

1. **Register and login**: Allows a buyer or seller to create an account and log in to the system.
2. **List an item:** Allows a seller to list an item for auction.
3. **Search for items:** Allows a buyer to search for items and filter results by various criteria.
4. **Place a bid:** Allows a buyer to place a bid on an item.
5. **Approve/Reject bid:** Allows an auction administrator to approve or reject a bid on an item.
6. **Set start and end times:** Allows an auction administrator to set the start and end times for an auction.
7. **Process payment**: Allows the system to process payment from a buyer and disburse funds to a seller.
8. **Leave feedback:** Allows a buyer or seller to leave feedback for another user.
9. **Communicate:** Allows a buyer and seller to communicate with one another through a messaging system or chat feature.
10. **Receive notifications:** Allows users to receive notifications about events such as outbid notifications, auction end notifications, and payment notifications.


Online Auction System
Auction Participant
Seller
Buyer
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Verify User
Regis ter
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< des >
L og in
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View Bid History
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Send ayment
View Notification
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Process Payment
Start Auction
Send Notification
Appr ove
Reject Bid
End Auction
Award Winner

Lab 3: Activity Diagram

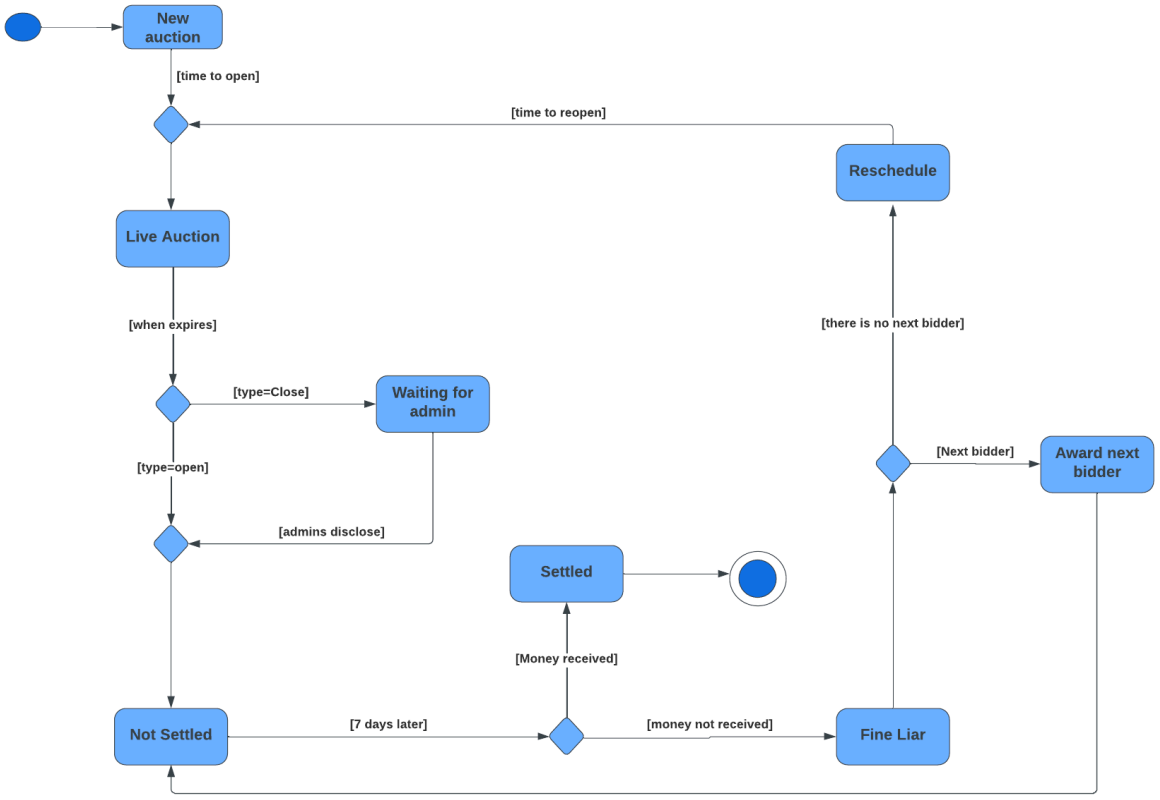


Fig: Acitivity Diagram of Auction Management

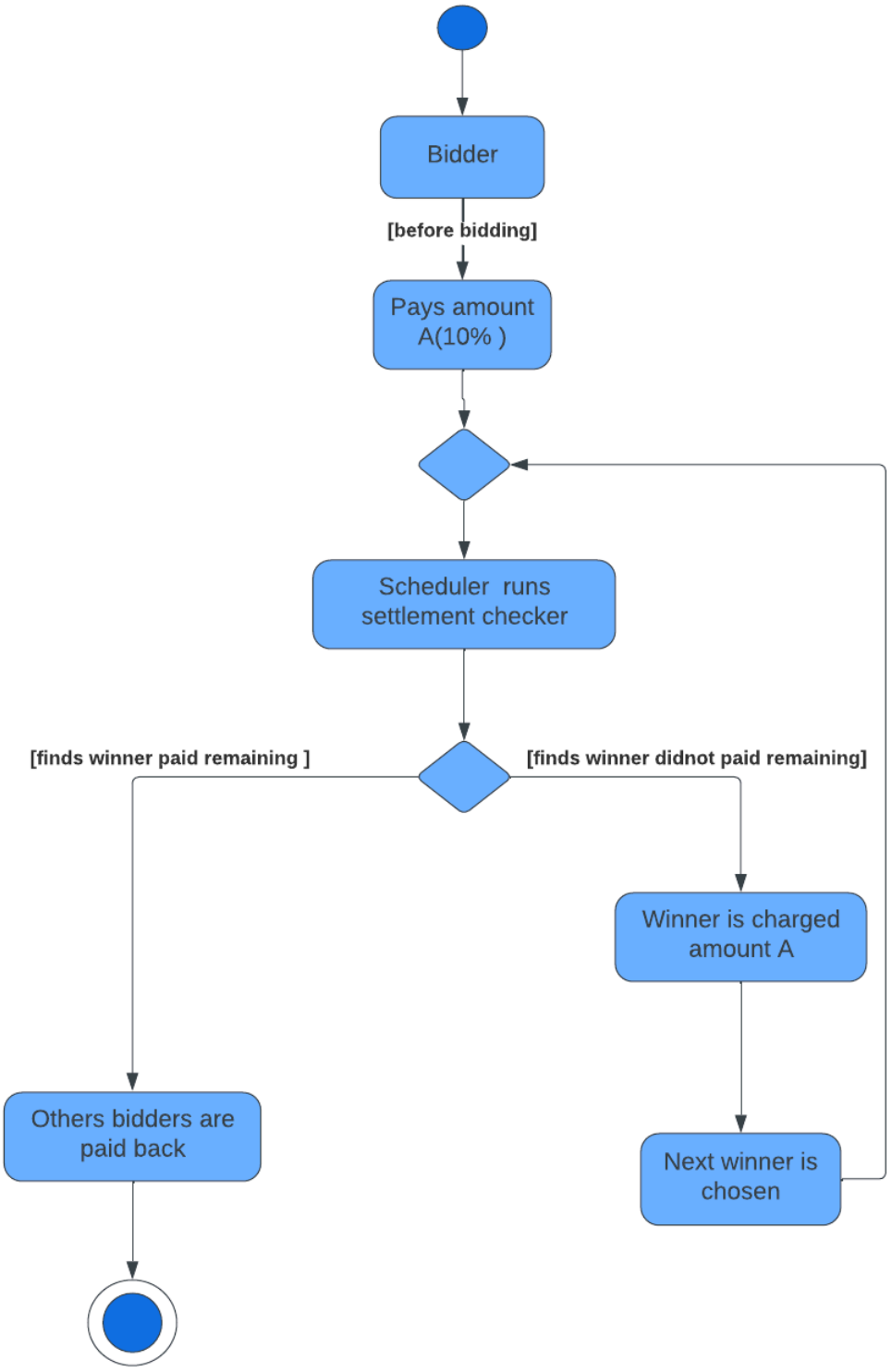


Fig: Acitivity Diagram of Bidding process

Lab 4: Sequence Diagram

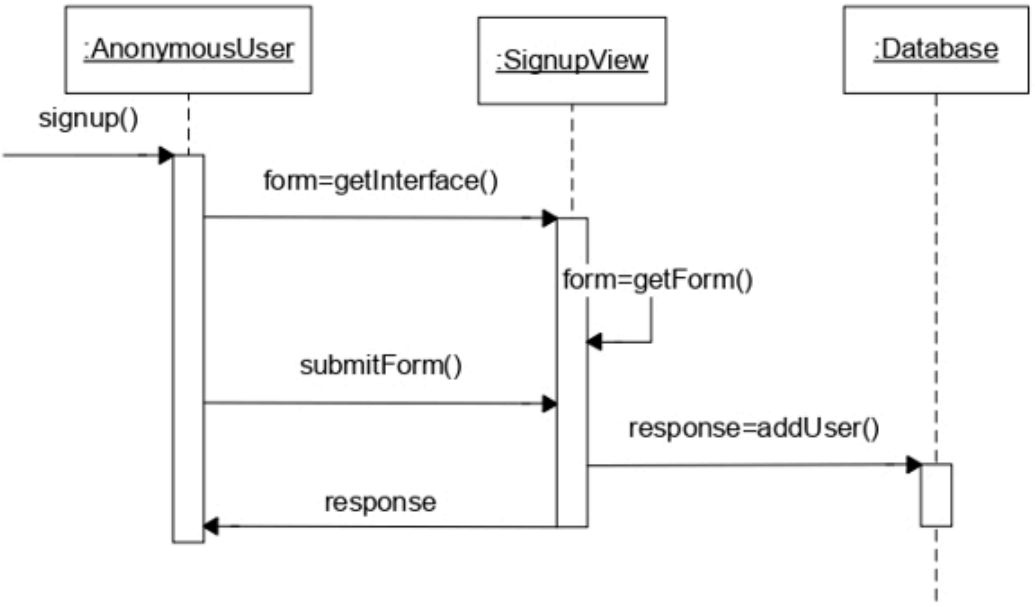


Fig: Sequence Diagram of Signup process

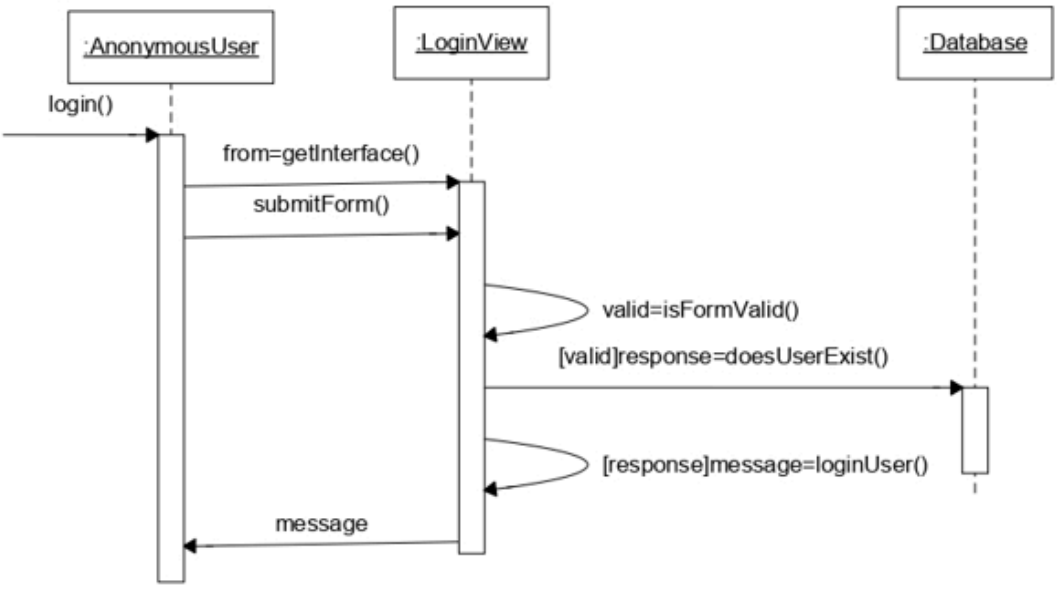


Fig: Sequence Diagram of Login process

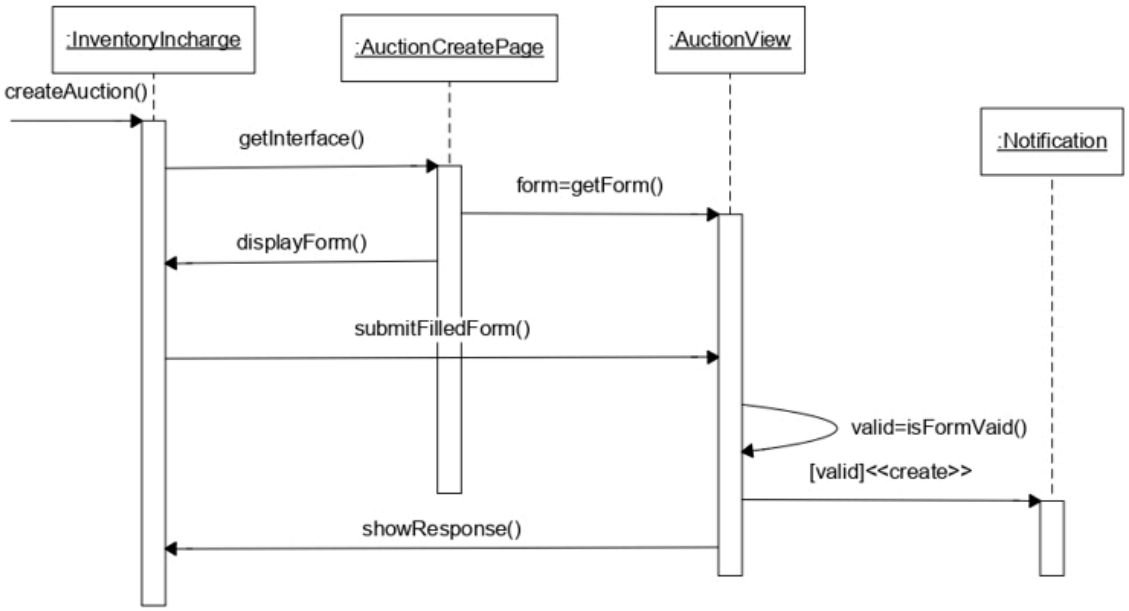


Fig: Sequence Diagram of auction creation process

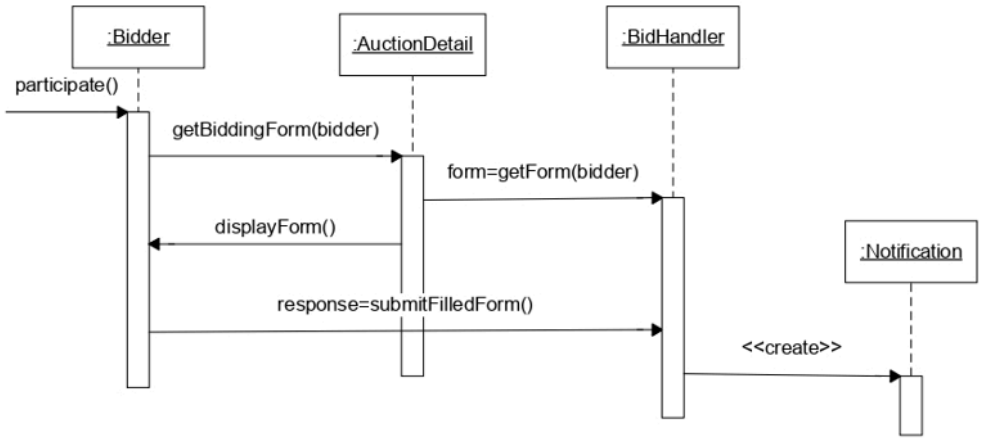
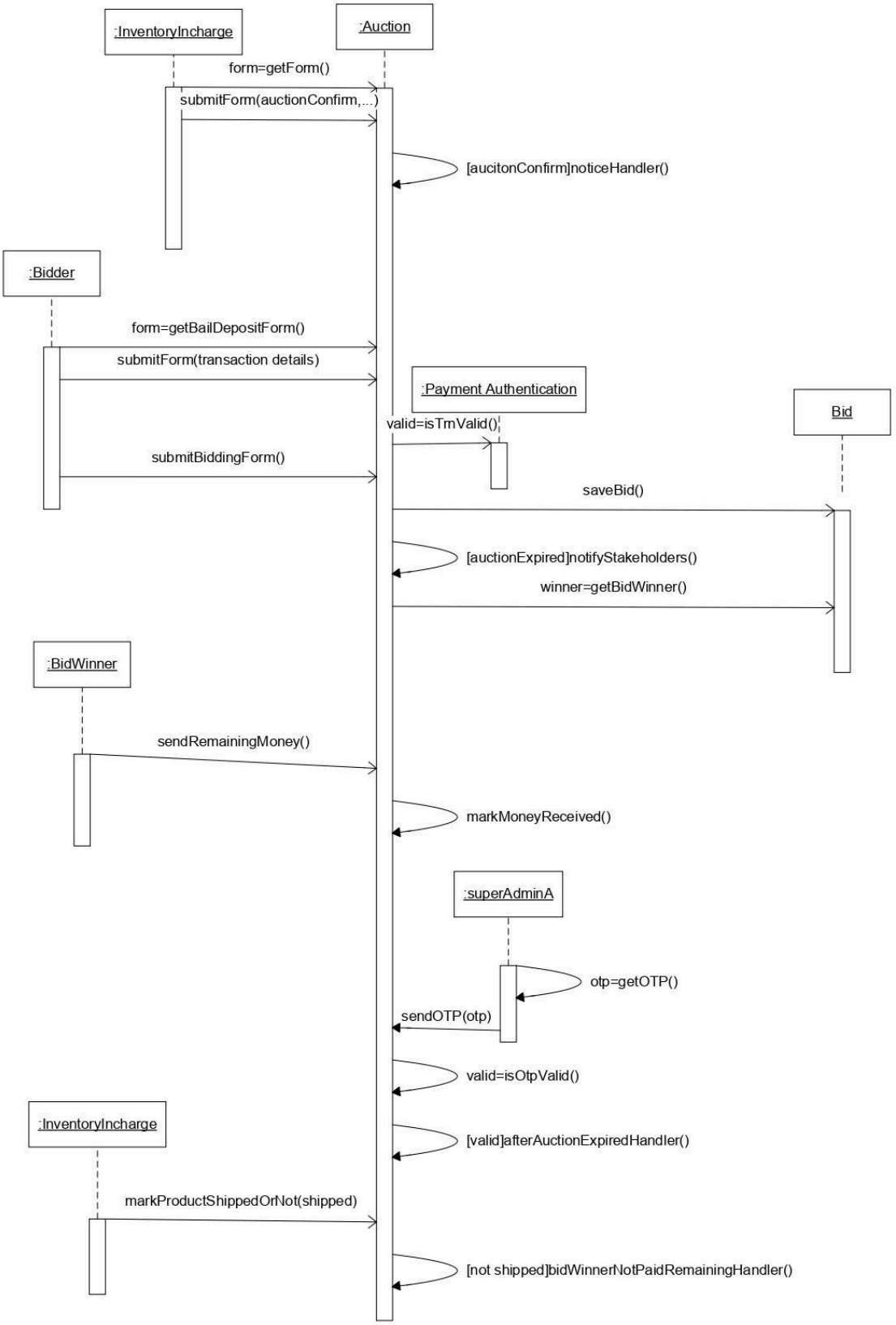


Fig: Sequence Diagram of live auction detail page and bidding managemnt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:Auction
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:Bidder
form=getBailDepositForm()
submitForm(transaction details)
:Payment Authentication
Bid
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submitBiddingForm()
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winner=getBidWinner()
:BidWinner
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markMoneyReceived()
:superAdminA
otp=getOTP()
sendOTP(otp)
valid=isOtpValid()
:InventoryIncharge
[valid]afterAuctionExpiredHandler()
markProductShippedOrNot(shipped)
[not shipped]bidWinnerNotPaidRemainingHandler()

Lab5: Class Diagram