Anuj Rudra (ar28g22@soton.ac.uk)
Aryan Patel (ap14g22@soton.ac.uk)
Ruichong Peng (rp10g22@soton.ac.uk)
Jincheng Guo (jg16n22@soton.ac.uk)
XiangWei Low (xwl1n21@soton.ac.uk)

COMP1216. Software Modelling and Design (2022-23)

Group 50: An Online Auction Service

Submission date: 10 March 2023

1 Introduction

Task Allocation:
Managers: Aryan Patel, Ruichong Peng
Designers: Anuj Rudra, XiangWei Low, Jincheng Guo

Task 2: Aryan will be defining the scope of the system, including Goals, Needs, Business Case, Stakeholders, High Level Operational Concepts etc.
Task 3: Anuj and XiangWei will be writing about the possible scenarios related to the system, covering a successful, failed and cancelled Auction.
Task 4: Ruichong and Jincheng will be writing two full use case descriptions.

Anuj Rudra - UML Use Case Diagram
Aryan Patel - UML Class Diagram
Ruichong Peng - UML Activity Diagram
Jincheng Guo - UML Sequence Diagram
XiangWei Low - UML Sequence Diagram, UML State Diagram

Assumptions made:
Figure 2 - The assumption made in this figure is that the user gets given a LoginID automatically When they create an account and this is used to login. The user name is created by the user and is used as a display name on the auctions and shown as their name when they bid.

2 Scope

2.1 Needs

- It is difficult for people to sell, buy and bid for items currently.
- There is no official and secure auctioning site, which provides a secure platform for people to buy and sell their products.

2.2 Goals

- Allows for the user to submit items to be auctioned.
- The system will have several auctions live at the same time.
- Allows users to bid for items that are being auctioned.
- Provides bidders with information about the seller, including buyer reviews from previous auctions and penalty points accumulated.

2.3 Business Case

- The system can take a percentage of a sellers' earnings on a product (commission).
- Advert revenue, sponsorship's from other businesses and promotions together with other businesses.

2.4 Stakeholders

- Buyers (Bidder)
- Seller
- Businesses
- Owner of the service

2.5 High-level Operational Concepts

- A website available for anyone to use.
- Users will create an account and be able to start bidding on auctions, they will also be able to start their own auctions.

2.6 Success Criteria

- Track the number of products auctioned.
- See if the system can manage with a large number of auctions.
- The number of bids placed, products sold and users signed up.
- Positive reviews of the products.
- Taking users' feedback on sellers.

3 Scenarios

3.1 Scenario 1. Successful Auction

1. Alice logs into the online auction service and register as a seller.
2. Alice decides to sell her vintage camera.
3. Alice creates a new auction with the following information:
   - Name of item: Vintage Camera
   - Start Time: 10:00 AM on March 1, 2023
   - End Time: 10:00 AM on March 8, 2023
   - Reserve price: $500
4. The system creates the auction and displays it on the website.
5. Bob, a registered bidder sees the auction and decides to place a bid for $550.
6. The system updates the current highest bid to $550 and displays it on the website.
7. Charlie, another registered bidder, sees the auction and decides to place a bid for $600.
8. The system updates the current highest bid to $600 and displays it on the website.
9. The auction close at 10:00 AM on March 8, 2023.
10. Since the highest bid($600) is greater than the reserve price($500), the auction is successful.
11. The system informs Charlie that they have won the auction and provides payment instructions.
12. Alice ships the vintage camera to Charlie.

3.2 Scenario 2. Failed Auction

1. Alice logs into the online auction service and decides to sell her antique vase.
2. Alice creates a new auction with the following information:
   - Name of item: Antique Vase
   - Start time: 12:00 PM on March 1, 2023
   - End time: 12:00 PM on March 8, 2023
   - Reserve price: $1000
3. The System creates the auction and displays it on the website.
4. Bob, a registered bidder, sees the auction and decides to place a bid for $800.
5. The system updates the current highest bid to $800 and displays it on the website
6. Charlie, another registered bidder, sees the auction and decides to place a bid for $900.
7. The system updates the current highest bid to $900 and displays it on the website.
8. The auction closes at 12:00 PM on March 8, 2023.
9. Since the highest bid ($900) is less than the reserve price ($1000), the auction fails.
10. The system informs Alice that her auction was unsuccessful and that the antique vase has not been sold.
11. Alice decides to keep the antique vase or list it again at a later time.

3.3 Scenario 3. Cancelled Auction

1. Alice logs into the online auction service and decides to sell her painting.
2. Alice creates a new auction with the following information:
   - Name of item: Painting
   - Start time: 9:00 AM on March 1, 2023
   - End time: 9:00 AM on March 8, 2023
   - Reserve price: $2000
3. The system creates the auction and displays it on the website.
4. Bob, a registered bidder, sees the auction and decides to place a bid of $2500.
5. The system updates the current highest bid to $2500 and displays it on the website.
6. Charlie, another registered bidder, sees the auction but decides not to bid.
7. The auction is still open and Alice decides to cancel it due to a change in circumstance.
8. The system informs Bob that the auction has been cancelled and refunds any money he has paid.
9. The system also informs Charlie that the auction has been cancelled and that they can provide feedback on Alice.
10. Alice receives one penalty point for cancelling the auction after a bid has been placed.

4 Use Cases

4.1 Use Case 1. Successful Auction

Use Case 1	Successful auction
Scope	An online auction service
Primary Actor	Seller, Bidders
Stakeholders	Sellers, Bidders, System Owner
Preconditions	Sellers and bidders have registered properly with the required information and the seller has less than 2 penalty points.
Main success scenario:	1. The seller logs into the online auction service. [InvalidLogin] 2. The online auction service checks the seller's identification and penalty points, then the seller decides what item to be in the auction. [PenaltyPoints] 3. The seller then provides the necessary information to the auction seystem, such as the name of the item, the reserve price of the item, start and end time of the auction. 4. The online auction system creates the auction and displays the item on the website for bidding. 5. The timer starts and bidders are now allowed to bid for the item. 6. Bidders start bidding for the item. 7. The system is constantly updating the highest bid and displays it on the website. [SmallerBid] 8. The seller checks the status of the auction and decides to continue with the auction. 9. The timer ends and the auction is then closed. 10. The online auction system then checks whether the highest bid is greater than the reserve price for the item. [InvalidBid] 11. The online auction system then informs the winning bidder and provides the payment information for the bidder. 12. The online auction system informs the seller of who had won the auction and asks for the seller to ship it to the winning bidder. 13. The seller then ships the auctioned item to the winning bidder.
Extensions:	[InvalidBid]: When the highest bid is less than the reserve price of the item, the online auction system informs the seller. [PenaltyPoints]: When the online auction system checks that the seller has more than 2 penalty points, the online auction system denies the seller from creating an auction. [InvalidLogin]: When the seller has registered with invalid information for the item, the online auction system then denies the seller from creating the auction. [SmallerBid]: When a bidder has placed a bid smaller than the highest bid, the online auction system denies the bid entry and informs the bidder to place a higher bid.

4.2 Use Case 2. Failed Auction

Use Case 2	Failed auction
Scope	An online auction system
Primary Actor	Seller, Bidders
Stakeholders	Sellers, Bidders, System Owner
Preconditions	Sellers and bidders have registered properly with the required information.
Main success scenario:	1. The seller logs into the online auction service. [InvalidLogin] 2. The online auction service checks the seller's identification and penalty points, then the seller decides what item to be in the auction. [PenaltyPoints] 3. The seller then provides the necessary information to the auction system, such as the name of the item, the reserve price of the item, start and end time of the auction. 4. The online auction system creates the auction and displays the item on the website for bidding. 5. The timer starts and bidders are now allowed to bid for the item. 6. Bidders start bidding for the item. 7. The system is constantly updating the highest bid and displays it on the website. [SmallerBid] 8. The seller checks the status of the auction and decides to continue with the auction. 9. The timer ends and the auction is then closed. 10. The online auction system then checks whether the highest bid is greater than the reserve price for the item. 11. The online auction system detects the highest bid is less than the reserve price of the item. 12. The online auction system informs the seller that the auction has failed.
Extensions:	[InvalidLogin]: When the seller has registered with invalid information for the item, the online auction system then denies the seller from creating the auction. [PenaltyPoints]: When the online auction system checks that the seller has more than 2 penalty points, the online auction system denies the seller from creating an auction. [SmallerBid]: When a bidder has placed a bid smaller than the highest bid, the online auction system denies the bid entry and informs the bidder to place a higher bid.

5 Use Case Diagram

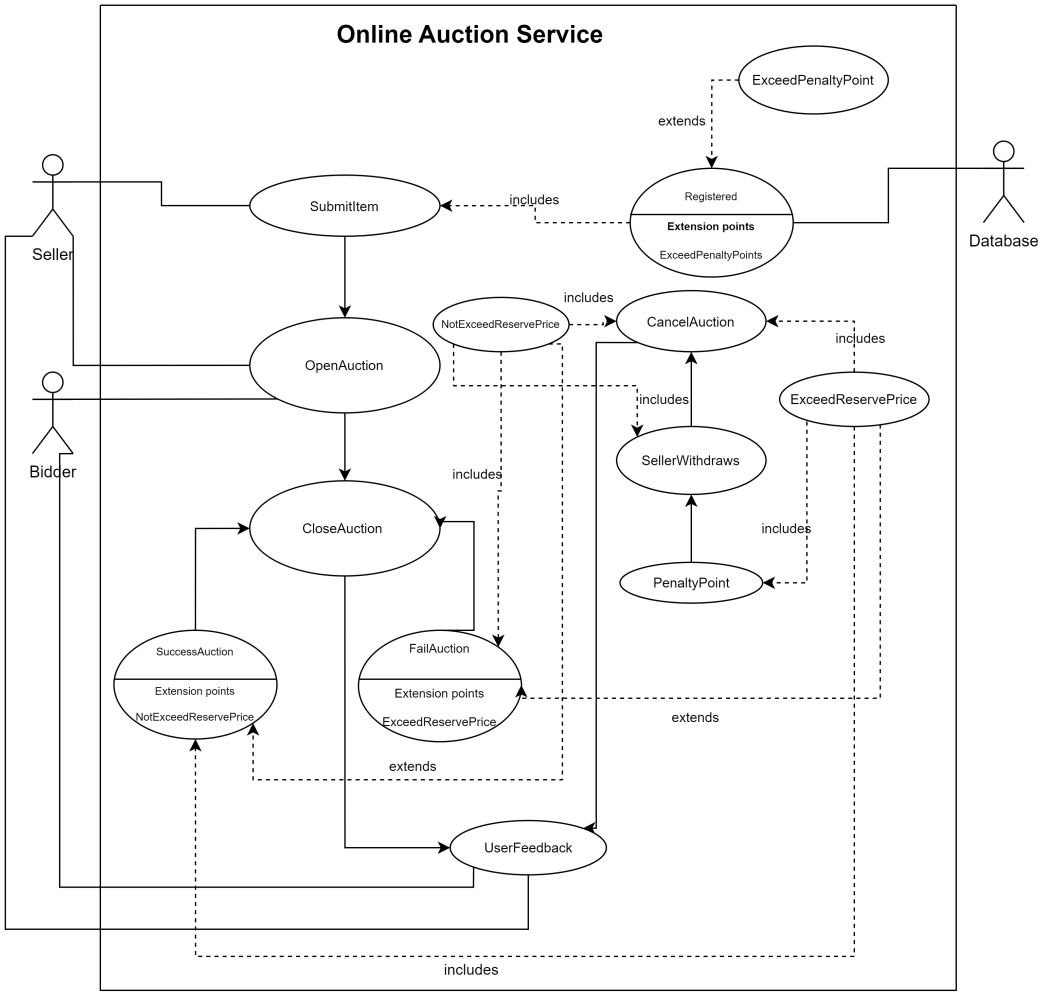

Figure 1: Use Case Diagram

6 Class Diagram

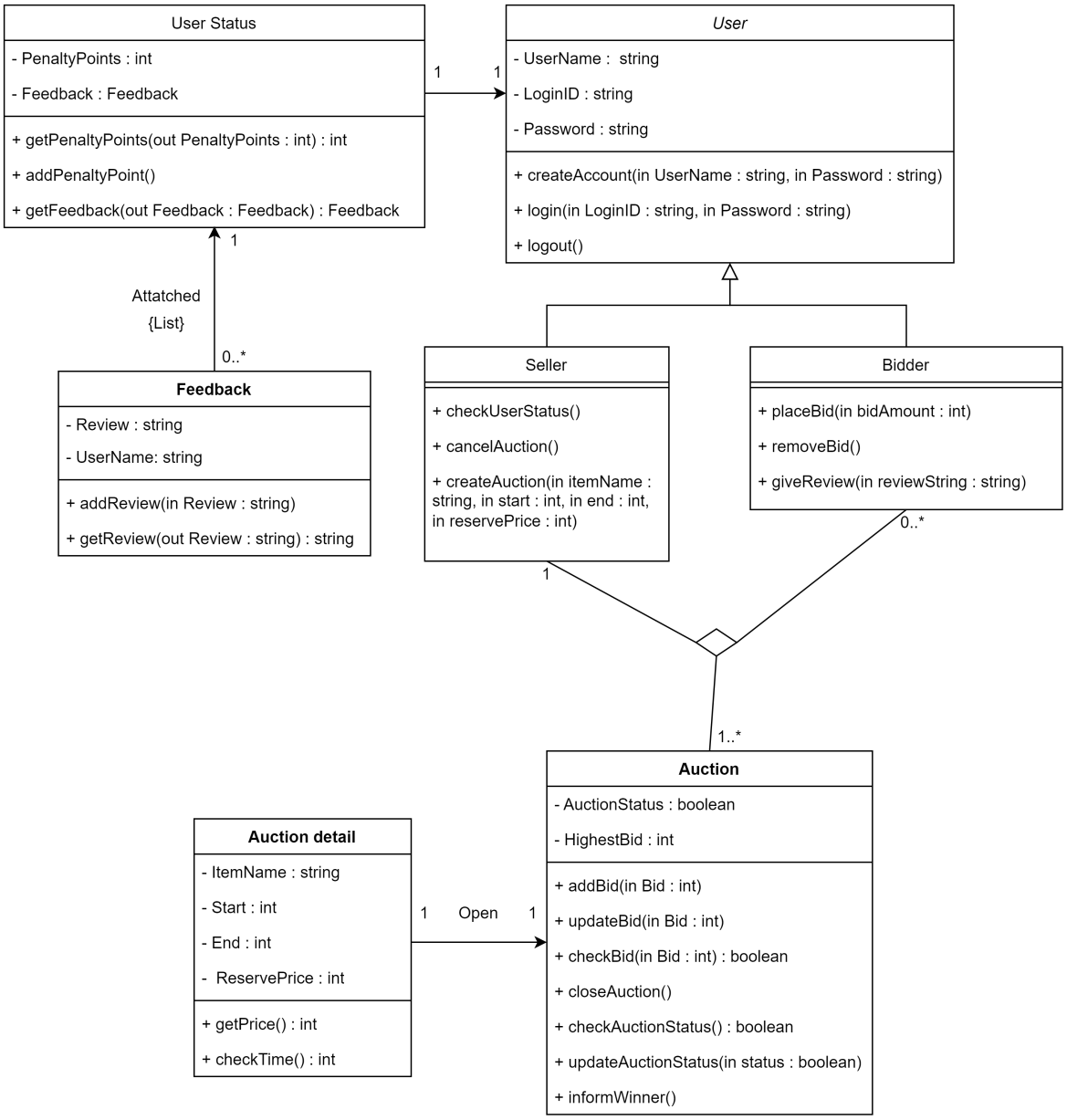

Figure 2: Class Diagram

7 Sequence Diagrams

7.1 Sequence Diagram 1. Successful Auction

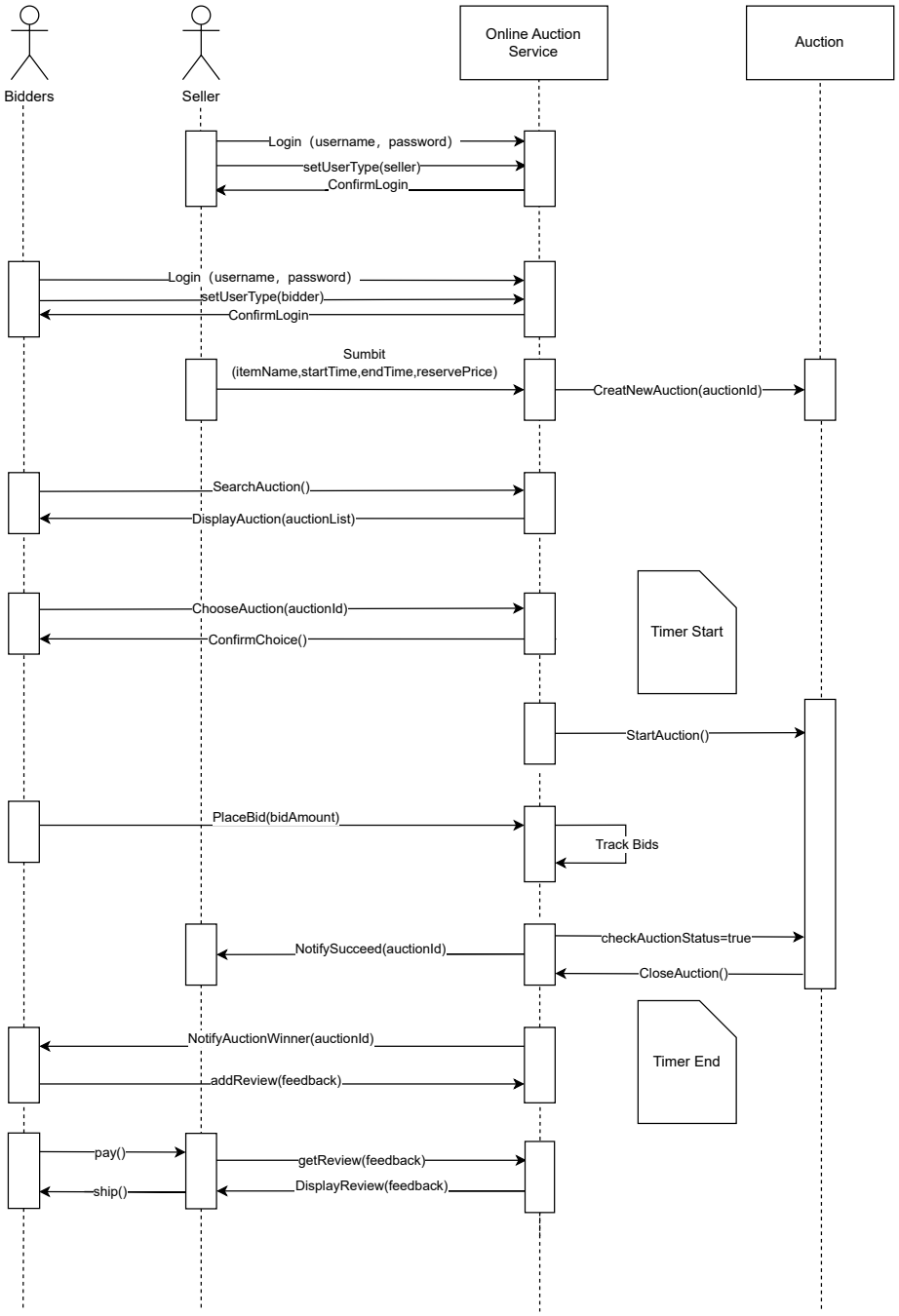

Figure 3: Sequence Diagram 1

7.2 Sequence Diagram 2. Failed Auction

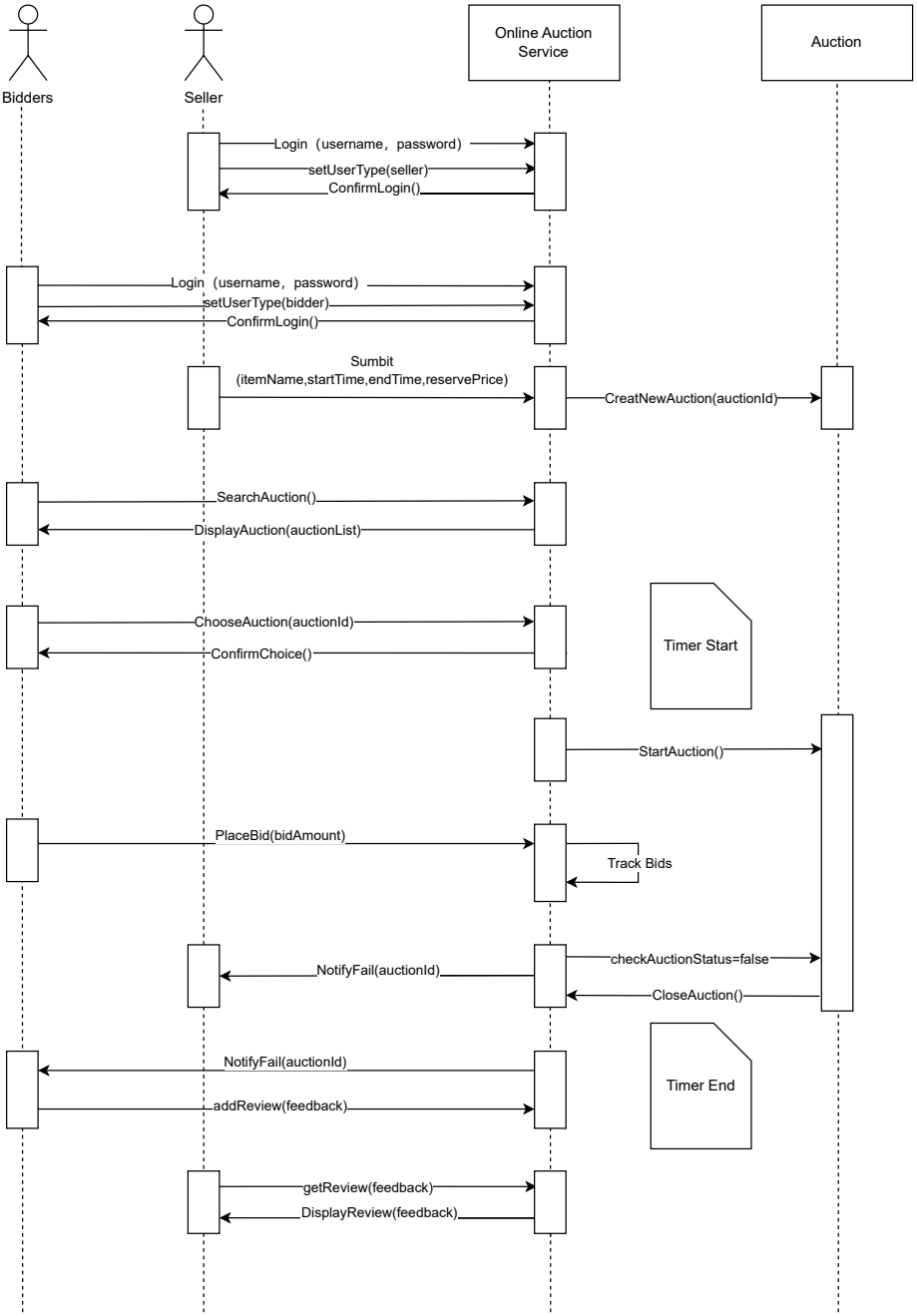

Figure 4: Sequence Diagram 2

8 Activity Diagram

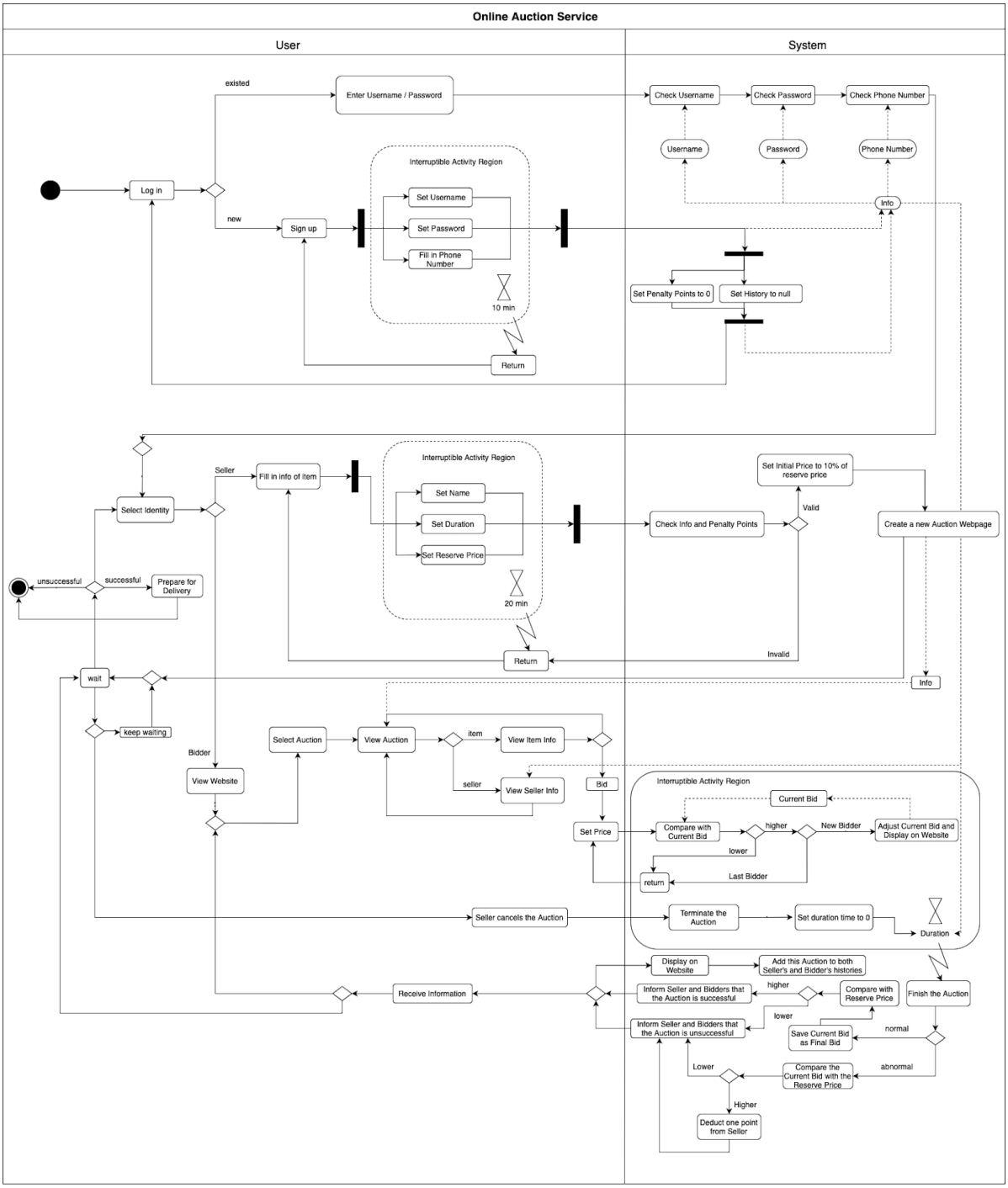

Figure 5: Activity Diagram

9 State Diagram

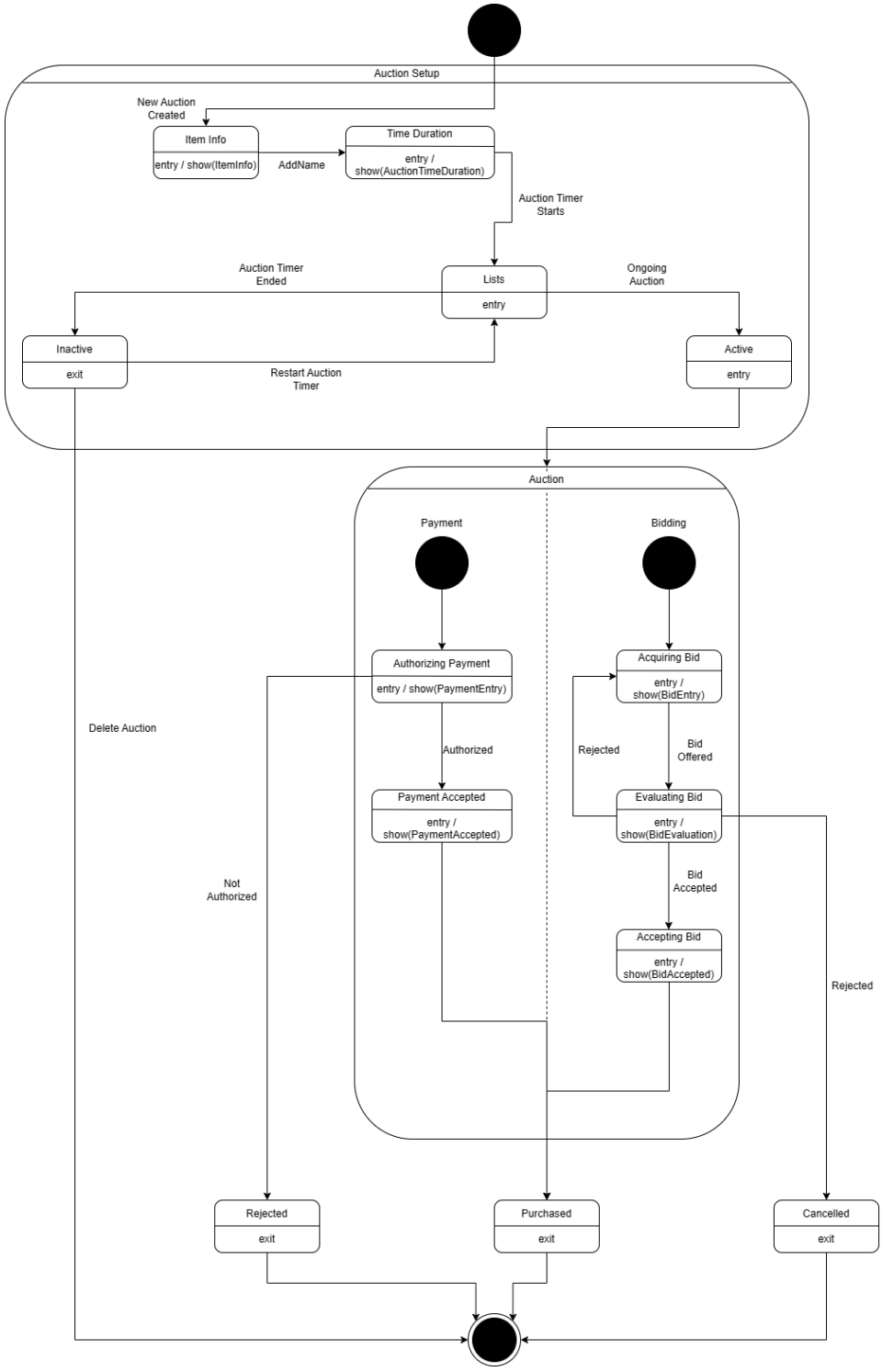

Figure 6: State Diagram