Inf2C Software Engineering 2018-19 Coursework 1

Billy Byiringiro s1794094

Alan Savio Paul s1768177

Requirements Engineering

1. Stakeholders

- Buyers: Members of the public who want to make a bid and buy lots from the Auld Reekie Auction House. They want to browse through the catalogue and note interest about their interest and the system will notify them about the status of their bid and be able to follow up.
- Sellers: Members of the public who want to sell their lots through the Auld Reekie platform. They will work with auction staff to enter the details about their lots and the auction staff will enter the description and the reserve price of a particular item.
- Auction House Staff: Employees of the Auld Reekie House. They use the app to enter descriptions of lots, including their low, high estimates, and reserve prices. They act the platform administrators.
- Auctioneer: Employees of the Auld Reekie House. They are the ones to decide when to end the auctions when bids have stopped soaring, and they do it with a tap of a hammer on a block in the system.
- The Auld Reekie Auction House: The owner of the Auld Reekie House platform. It wants a platform to digitize their services to allow the sales process to go smoothly and reach more people.
- System provider: it involves in the developing, and releasing the system. In addition, it is also in charge of managing other technical related issues such as database, maintenance, updating, security, and performance. It also works with bank servers to collect payments from buyers, pay sellers and the auction house, and deduct other costs for its service in app development and maintaining working of the system.

2. The system state

1. Catalogue: The catalogue will have details of all the lots. Users can browse through this to select the lot they want to bid in. The catalogue will have details of the lot including category and location in the premise (for buyers who are physically present)
2. Authentication state: As the system users include buyers(or general public members), sellers, staff, and auctioneers. The system will have different authorization privilege state: for what each user can do.
   - System administrator privilege: This privilege that will be owned by either one the app provider or the auction house staff to allow to monitor the states of the system and give privileges to new staff and auctioneers.
   - Staff privileges: staff are the only one who can enter a new lot and edit it, the auctioneers are the only ones who can end auctions and give the seller the privilege to use extra information on their items.
   - Auctioneers privileges: The auctioneers will be authorized view the lots and decided to start on close auctions on them.
   - Sellers privileges: sellers can view the reserve price and other extra information on the item marked as their own.
   - Ordinary user privilege: is the initial privilege given to anyone who registers on the system which is to note an interest and bid on items.
3. The auction house system is quiescent as it can have many various modes depending on a type of user using it and his/her privilege in the system. Among those states include: Browsing through the catalogue, Bidding, Closing a bid, registering and logging in the system, entering new lots, editing a lot, changing user privilege (when hiring new staff members or auctioneers), among many others.

4. Lot status:
   - Not-yet-in-auction: at this state, the item is added in the system but the user can't start bidding on them until the auctioneers start an auction on them. However, the user can note interest on them so that they will get notified when the auction starts.
   - In-auction: this state will allow users to start bidding on a lot and get a notification when others user bid on the same lot
   - Auction-ended: users will mark an end of an auction on a particular item and show the hammer price and whether it was sold when the hammer price was higher than the reserve price
5. Noted Lots (lots' basket): a subset of the catalogue on lots a particular user has noted.

6. User Profile: User will be able to see his personal and bank details entered and can edit and see the history of his bids or items sold, highlighting ones he had won and other details he is privileged to see.
7. Login/Logout state: The system will keep the session when user login so that he can be able to note interests without registering, edit his details, and view his history.
8. Display state: this entails what display to the users depending on the privileges and position they hold in the system.

3. Use Cases

1. Register Buyer or Seller

   Primary Actor: Buyer or Seller

   Support actor: The auction house system

   Summary: A system user tap/click a register button and add his personal details and bank details and is added in the system will the privilege to note interest on items and bid on them when auctions start.

   Precondition: The buyer or seller r is not logged in.

   Trigger: The user clicks the register button to register.

   Success Guarantee: User is added in the system and can able to see his profile page with the information the system hold on him. And the user is given the privilege to note interest and start bidding on lots for which auction has started

   Minimal Guarantee: The user is informed of his or her status in the system, whether he or she is registered on not.

   Main Success Scenario:

   1. The user clicks the register button to register.

   2. The user enters his personal and bank details

   3. The system gives buyer or seller privileges to the user.

   4. The user is registered and can see his or her profile page

   Extensions:

   1. If the user is already registered, notify him and direct him to the login page

2. At any step between 1-2 user can cancel the registering and the system switches to the catalogue page
Notes:

2. Note Interest in Lot
   Primary actor: Buyer
   Supporting actor:
   Description: The user picks a lot they are interested in and notes their interest and the lot will be added to their lots basket.
   Precondition: The buyer is registered and logged in.
   Trigger: The buyer clicks the Note Interest button
   Guarantee: a lot is added to the user's basket and the user is able to get notification related to that lot.
   Main Success Scenario:
   The user notes his interest in a lot by clicking on a star next to the lot name. The user then receives notification when the auction starts and when other users make a bid.

3. Close Lot Auction
   Primary actor: Auctioneer
   Supporting actors: The auction house system, bank servers
   Summary: The auctioneer will decide to close a particular auction when bids have stopped rising and the system will be able to collect the payment from buyers, pays the seller, and other costs.
   Precondition: A lot is in pending auction status
   Trigger: auctioneer click close auction button
   Guarantee: The system closes the auction for all users and takes payment from the highest bidder and notify all bidders and all people who have noted the rest that an auction has ended and the hammer price.

Main Success Scenario:

1. An auctioneer clicks close auction button
2. If the hammer price is above the reserved, the system communicates with other external bank server API's to take the payment
3. The system notify everyone who noted the interest in or has bid the lot that the auction has ended with a particular hammer price that won.
4. The system deposit a correct portion of the money to the seller's bank account and
5. The system notifies, in particular, the buyer and seller about the lot.

Extensions:

1. At step 2, if the hammer price is below the reserve price, the system should jump go to the next step but skip step 4 and go to step 5 to notify the seller and buyer about the outcome of the auction and ask the seller if he or she would like another the current hammer price or want to return the lot.
2. At step 4, when bank taking payment from buyer fails, the system should notify the user about the failure from bank server and ask the buyer either to provide correct bank details given or use other methods of payment.

Stakeholders & Interests:

Notes:

4. Bid on Lot
   Primary actor: Buyer
   Summary: system
   Description: The user will either be able to make a bid on lots in an auction and the system will notify all the user who had bid or noted interest on a particular lot.

5. Add Lot in the system
   Primary actor: Staff
   Supporting actor: Seller
   Description: The staff will work will the seller to add a new item to the system. Description, pictures, and reserve price will be added in the system, and the staff have to connect a particular lot with the owner(seller) given that the seller is in the system. If he or she is not in the system, registering will be required first.

6. Make Payment
   Primary actor: The auction house system
   Supporting actor: bank servers API's
   Description: The auction house system will work with other banks through API's to take and deposit payments between buyers and sellers. And in case of any error, the system should notify the user in respect to that payments,

7. Notifying users
   **Primary actor:** The auction house system
   Description: The system should be able to monitor each auction and other activities and notify users in concern of that.

8. Deleting/updating Lot
   Primary actor: Staff
   Description: Staff should also be able to edit description and pictures of the lots in the system depending on sellers' interest or if there is a mistake in it.

4. Use Case Diagram
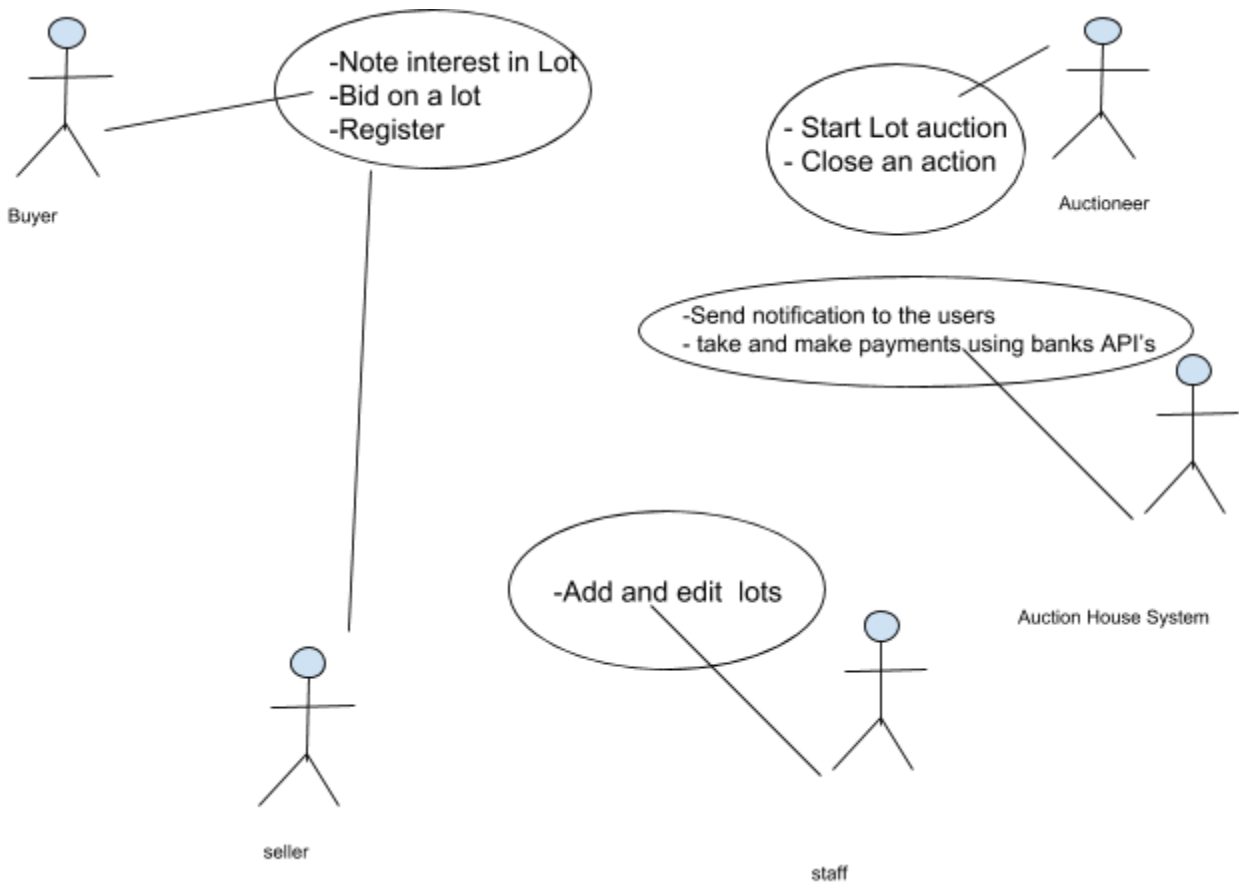
Note: we thought that sellers can also be buyers as the system have their personal and bank details.

5. Non-functional requirements

1. **Maintainability:**
   - ➢ The system should be easy to extend when adding new features in the future.
   - ➢ The system should have a testing environment to make sure that all functions work correctly, and simulate all functions performed by various users.

2. **Security**
   - ➢ The system should follow the General Data Protection Regulation (GDPR) that the data is owned by the user and should not be shared by other third parties, and the user should have the ability to delete or change it whenever he or she wants to.
   - ➢ As the whole system is based on communicating to external users and institutions(banks serves) the security should be given special attention by updating libraries regularity and find vulnerabilities in the system and fixing them.

➢ Back up should also be performed on daily basis to make sure no user data or other data about auctions is lost.

3. **Usability**
    ➢ The user experience(UX) should be user-friendly and straightforward to new users, avoiding unnecessary information and graphics displayed to them. And Staff should make sure that the description written on a particular item is concise and informative.
    ➢ Help centre should be accessible either by email or phone all the time to help users in case of any issues come up.
    ➢ The search should have a good filter so that user will land on lots they want easily and with help of machine learning the system their interest to optimize their search results

4. **Performance**
    ➢ The system should be fast for both on and off-site users to be able to get updates about how the bids are changing instantly nearly real-time.
    ➢ It should allow people to bids after the bidding has closed and has to be fair about who won a particular lot.
    ➢ The system should be responsive to serve users using all kind of devices. Eg. a user using a mobile phone should have the same experience as a user using a computer to access the system.

5. **Reliability**
    - The system should be able to respond to the users correctly after the operation has been committed. The system should not tell a user that they registered while their registration has failed or not saved in the database yet, and it shouldn't make any payment, and only notify the user about it.

6. Non-functional Ambiguities, Subtleties, Incompleteness

1. Will the sellers' privileges be same as buyers' as the system hold the same kinds of information about them or will they use the same way of registering into the system? And do auctioneers, staff, and system using the same registering method as other users of the system?
2. How are the privileges provided and who provides them?
3. What happens for the buyer who won a bid his payment doesn't go through and doesn't provide other bank details, is the lot given to the next highest bidder whose bid is above the reserve price?

4. Can two buyers bid at the same time, how does the system manages that case?
5. Does the system communicate with only bank servers through payment or it uses another payment method such as Paypal? And do user need to pay only via online or they can pay by cash when they are on the site?
6. What happens to a lot that has been sold, are its details deleted from the system, as it is no longer needed?
7. What criteria do auctioneers base on when closing an auction?