

# PROJECT PROPOSAL

## E-AUCTION SYSTEM

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## **CSCI 5308: ADVANCED TOPICS IN SOFTWARE DEVELOPMENT**

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## OVERVIEW

Normally, an auction entails creating a bidding event on goods or services and selling those to the highest or lowest bidder based on the type of bidding. Our bidding is based on a sealed-bid auction.

The characteristics of a sealed-bid auction are below:

- The user gets only ONE chance to submit his/her bidding amount and cannot alter the amount based on competing bids.
- Bid amounts cannot be viewed by other bidders or the seller at the time of auction and the results are declared at the prescribed time set by the seller.

Elements of sealed bidding:

- Prepare event for inviting bids: Invitations include all the details, requirements, and contact details.
- Submission of bids: Bidders submit their final amounts just once.
- Evaluation of bids: The system decides the winner based on seller consent (here, the highest bid).
- Declaration of winner: The system evaluates and declares the winner.

Software workflow summary:

- User registration and login: The user must register as a new user or log in using the credentials to participate in the auction events.
- Selling the goods in the events created by the seller.
- The buyer can view all the items and their details added for auction.
- The buyer must subscribe to an event to submit the bidding amount.
- Buyer and seller both receive emails on various events such as when an item is added by the seller for auction, buyer subscribes for an event, email reminder to the buyer about a registered upcoming auction event, email intimation to the seller and buyer after the system declares a winner for a bidding event.
- Buyers can place bids for the subscribed events.
- The system declares a winner on the highest bid and emails are sent to the buyer and seller.
- If any suspicious or unethical activities are detected, the administrator of the system can block the user from any kind of access to the system.

All the features of the system are briefly discussed below:

## 1. USER REGISTRATION AND LOGIN

### 1.1 Registering a new user

New User first needs to create an account by clicking on the “Register Here” button and then filling up the registration form. In the form, fields marked with an asterisk (\*) are mandatory to be filled.

Welcome to Bidding System!

Register HereLogin

After filling up the registration form, the user needs to click on the “Submit” button.

New User Registration Form

First Name\*Last Name\*

Date of Birth\*

CityState

Country\*

Email Address\*

Password\*

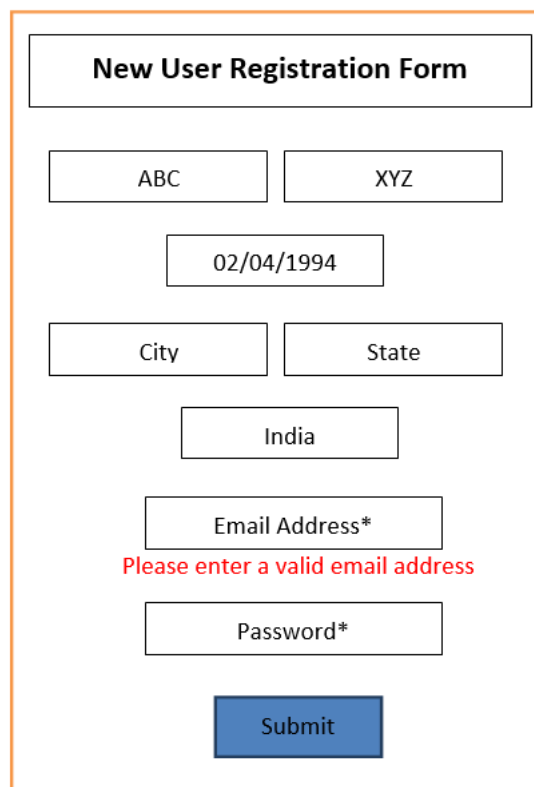
Submit

### Logic:

After the user clicks on submit, all the field values will first be validated against the conditions defined. The conditions for every field are:

- The mandatory fields should not have null values.
- The Date of Birth value will be compared with the system's date and will be considered only if it is more than or equal to 18 years.
- General rules like email address must contain '@', '.' will be used for validation.
- There will be a set of conditions required to be fulfilled for passwords are- it should be of a minimum of 8 characters, should contain at least one Uppercase, one Lowercase, one digit, and one special character (from the given set of characters allowed). Also, the password should not contain the name of the user as a part of it.

After the successful validation, the data entered will get stored in the database. The password will first be hashed using any algorithm like SHA-1, MD5 and then will be stored in the database. If the validation gets failed, then error messages will be displayed corresponding to the field on the form.

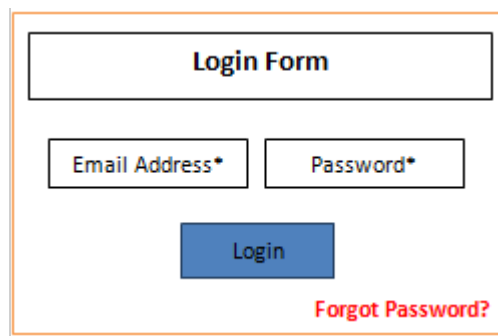


The image shows a 'New User Registration Form' with the following fields and values:

- First Name: ABC
- Last Name: XYZ
- Date of Birth: 02/04/1994
- City: (empty)
- State: (empty)
- Country: India
- Email Address\*: (empty)
- Below Email Address\*: Please enter a valid email address (in red text)
- Password\*: (empty)
- Submit button: (blue)

### 1.2 Logging into the system

Existing Users will have to click on the "Login" button for authentication. Users can enter their Email Address & Password and click on the "Login" button.



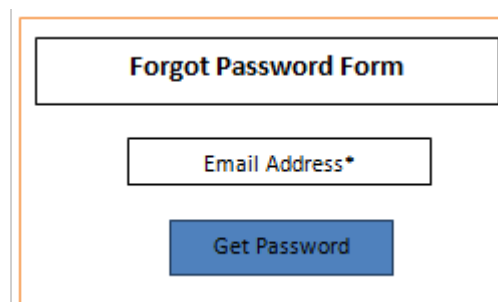
The diagram shows a 'Login Form' with a title bar. Below the title bar are two input fields: 'Email Address\*' and 'Password\*'. Below these fields is a blue 'Login' button. At the bottom right of the form is a red text link that says 'Forgot Password?'.

#### Logic:

After clicking on Login, the system will authenticate the user by validating the Email Address & Password entered. The system will check if these values exist in the database or not. If such values exist, then the user has authenticated successfully otherwise the error message stating, "Email Address and Password is/are incorrect." will be prompted. Also, there will be session management which will start as soon as the user logs in to the system successfully and will timeout after a specified duration. If an inactive/fraudulent user tries to log in, the system will give an error saying "User Blocked".

### 1.3 Forgot Password

There is also a "Forgot Password?" link which the user can click on if he forgets his password and wants to retrieve it. The user would have to enter his Email Address and click on "Get Password".



The diagram shows a 'Forgot Password Form' with a title bar. Below the title bar is a single input field labeled 'Email Address\*'. Below this field is a blue 'Get Password' button.

#### Logic:

After the user clicks on the "Get Password" button, the value i.e., the Email Address entered will be matched with the existing data present in the database. Once a match is found, the Password associated with that matched record will be sent to the user on his/her Email Address. Otherwise, an error message "Email Address not found." will be displayed.

## 2. ITEMS FOR AUCTION

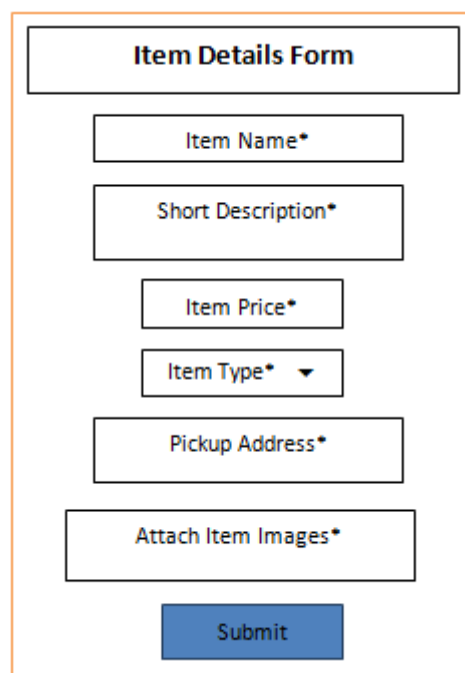
### 2.1. Adding Items for auction

After the user gets logged in successfully and they are on the Sellers tab, they will be able to add the items by filling up the item details form and clicking on the “Submit” button.

#### Logic:

If the user logs in and is on the seller tab, they will be able to add items for auction by clicking on the “Add Items” button. After that, a form will be opened where the seller must fill in the item details. The seller would have to select the category of item from the predefined item types such as Coins, Antiques, Jewellery, and so on. After clicking on submit button, there will be a few validations and all the details of the item will get stored in the database and will also get linked to the user’s account. An ID (which will be auto generated by the system) will be tagged to the item added. There will be a restriction on the number of items a user can add for auction in the system. This number will be managed using a configuration file. The validations that will take place are:

- The item name should not be null
- The item price should not be null
- There should be at least one item image attached
- The pickup address should not be null
- The description should contain at least 100 characters



The diagram illustrates the 'Item Details Form' layout. It is a vertical stack of input fields, each with an asterisk indicating it is required. The fields are: 'Item Name\*', 'Short Description\*', 'Item Price\*', 'Item Type\*' (which is a dropdown menu), 'Pickup Address\*', and 'Attach Item Images\*'. Below these fields is a blue 'Submit' button. The entire form is enclosed in an orange border.

## 2.2 View items added for auction

The seller will be able to view all the items added by them under this option.

### Logic:

When the user is on the seller tab, there will be an option for them to view the items put for auction by them. The system will fetch all the items put by that user from the item details table and display them here as a list. The validation that will be put in place here will include:

- Checking for a valid user id.
- Check if the number of items put up by the user is greater than or equal to 1. If not, the system will give the message “No items to show”.

## 2.3 Edit Item Details

Users will then be able to view and edit the item details.

### Logic:

If the user updates any detail of an item, it will get updated in the database. There will be a few validations in place for this feature. The validations that will take place are:

- The item name should not be null
- The item price should not be null
- There should be at least one item image attached

## 2.4 Delete an item

Users can also delete an item that they have added till now.

### Logic:

When the user is on the seller tab, in the “View items added for auction” window, the user will have an option to select an item and delete it. The delete option will remove that item from the item details database table. If the user deletes an item and an event is created for that item, the system will throw an error saying that the created event should be deleted first and then the item can be deleted.

## 2.5 View all items that the buyer can bid on

When the user logs into their account and is on the buyer tab, they will be able to view a list/grid of all the current items on sale depending upon the item category selected. In



addition to this, there will be another filter called “Recommended Items”. This filter will enable a user to view those categories of items for which he had previously bid for. The information regarding the items on this page would be the name of the item, an image, a concise description along with its price and delivery information. The user would be able to scroll the list and open any item that they are interested in.

Item Name	
Image	Short description of the item
	Price
	Delivery Information

Item Name	
Image	Short description of the item
	Price
	Delivery information

Item Name	
Image	Short description of the item
	Price
	Delivery information

Item Name	
Image	Short description of the item
	Price
	Delivery information

**Logic:**

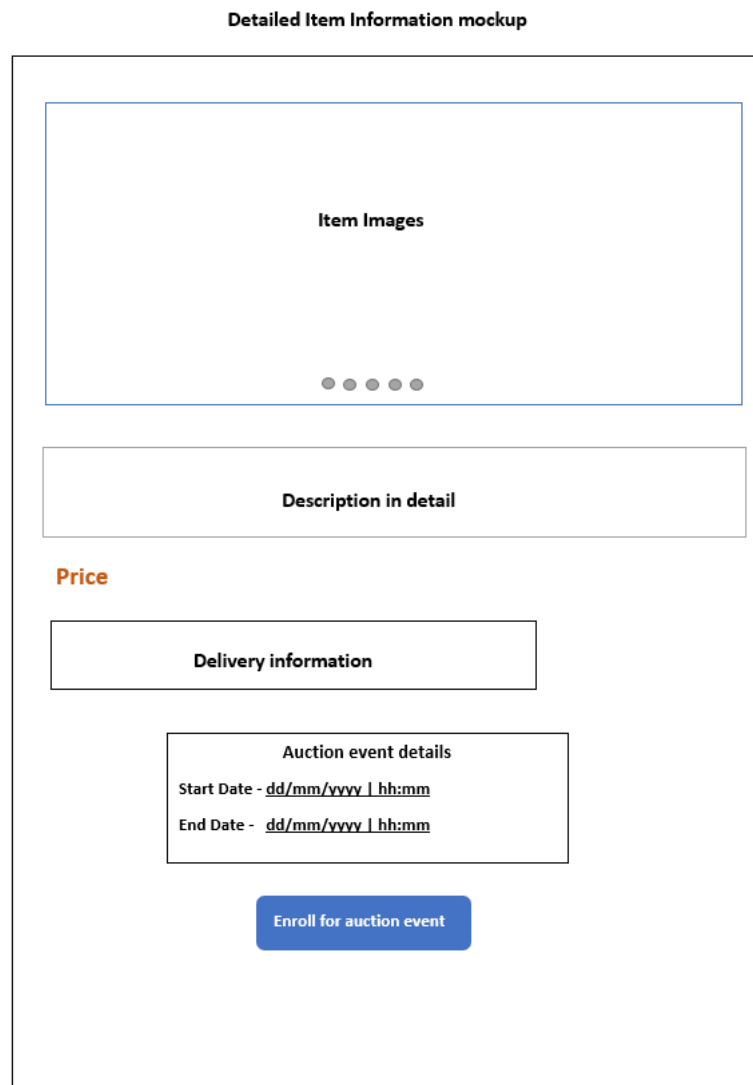
As soon as the user logs in and switches to the buyer tab, there will be a list layout in place which would retrieve data from the item details table for fields mentioned above along with an image and show it in a list format. Below filters will be provided for search:

- i. Item category: Some predefined item category will be present, and a user can select a category to view all items under it.
- ii. Recommendations: When this filter will be selected, then system will check whether the user had previously bid for any item. If yes, then the system will display all the items under the category that he had bid for in the past. If no, then no items will be

returned. In this case, we will display a message “No recommended items present as you have not performed any bidding so far”.

## 2.6 View details of an item

As soon as the buyer clicks on a particular item, they will be able to see detailed information such as how old is the product, a concise description of its condition and some pictures for the user to look at and decide whether they want to place a bid for it or not. The user would also be able to see the number of hits on that item. This feature would help the user to anticipate the competition for that product and place the bid accordingly.



### Logic:

When the user clicks on any list/grid item, they will be redirected to the original item information page where the user will be able to see more details of the product. There would be a **count set up for the number of hits that will be updated on each click** of that button on that product details page and that is how the user will be able to view the number of hits.

### 3. EVENT CREATION

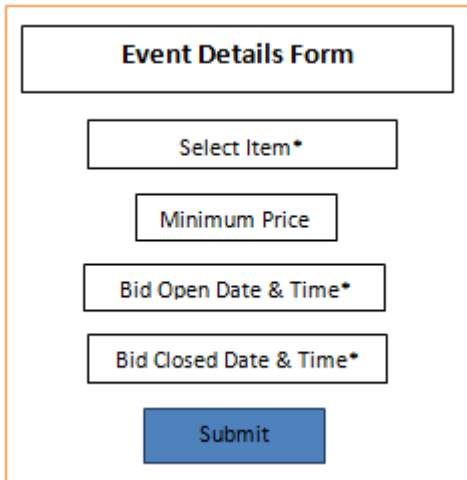
#### 3.1 Creating an Auction Event by the Seller

The seller will be able to create a Bidding Event for a particular item. They will have to fill up the event form and click on submit.

##### Logic:

The user will only be able to create a Bidding event for the items that are linked with their account. Clicking on the “Create Event” button in their profile, they will be redirected to the “create event” form where they will have to fill in the event details. Once the user clicks on submit button, the event details will get stored in the database. Here, the “Minimum Price” field is not mandatory because its default value will be equal to the “Item Price” field value. There will be some validations that will take place once the user clicks on the submit button. The validations that will be put for this are as mentioned below:

- There should be at least one item selected
- There is no event created for the same item
- The bidding opening and closing date and time should not be null and should be a future date



The diagram illustrates the 'Event Details Form' layout. It consists of a title box 'Event Details Form' at the top, followed by five input fields stacked vertically: 'Select Item\*', 'Minimum Price', 'Bid Open Date & Time\*', and 'Bid Closed Date & Time\*'. The asterisk indicates these are required fields. At the bottom of the form is a blue 'Submit' button.

#### 3.2 Cancelling an event

Upon creation of events, the seller will be able to see all the events that they have created. In the created events tab, the seller will have an option to cancel the created event.

**Logic:** For this feature, the seller will have an option to view all the events created by them. In the “view created events” tab, the seller will have an option to cancel the events that they have created. The created events list will appear in which upon selecting an event, the seller will be able to cancel the created event. The subscribed buyers will be notified about the cancellation of the event.

### **3.3 Buyer can enrol for an Auction event**

The item details page would contain an option for the user to enroll for an auction event for the same item. The user would do so by clicking on the ‘Enroll for auction’ button and simply filling their details in the appeared form and clicking on submit button.

**Logic-** If the user is satisfied with the item details, the user will click on the ‘Enroll for auction’ button. This will enroll the buyer for the auction event and the system will send an email confirmation to the buyer notifying the event details. After the buyer clicks on the item to view details, they will be able to verify whether they have already enrolled for the auction event of that item. If the buyer is already enrolled, the “Enroll for auction” button will be greyed out.

### **3.4 The subscribed events tab**

There would be another tab available for the buyer where they will be able to see the list of all upcoming events that they are enrolled for. This is for the buyer’s ease as they will be able to see all their subscribed events on a single page.

**Logic-** When the user switches to the subscribed events tab, they will be redirected to a page where they will be able to see initial display details of the subscribed items along with a disabled bid button. The button will only be enabled when the time matches the event start time provided by the seller.

The subscribed events tab

Item Name	
Image	Short description of the item
	Price
	Delivery Information
	Event information
	Bid

Item Name	
Image	Short description of the item
	Price
	Delivery Information
	Event information
	Bid

Item Name	
Image	Short description of the item
	Price
	Delivery Information
	Event information
	Bid

### **3.5 Buyer can cancel enrolment for an enrolled event**

The buyer will be able to view the list of all the subscribed events in the “subscribed events” tab after they sign in with their credentials. Once the buyer is on this tab, they will be able to select an event and cancel enrolment for the same.

#### **Logic:**

When the buyer clicks on the cancel enrolment button, the selected enrolment will be fetched and deleted from the backend for that buyer.

### **3.6 Past events tab**

The user will be able to see all the events that they have created as a seller or has enrolled for as a buyer in the past using this feature.

#### **Logic:**

When the user clicks on the past events tab, they will be redirected to a page where they will have an option to select if they want to see events created by them or the events they have bid on in the past. The past events will be fetched from the database as the user table at the backend will have information about all the events that the user has enrolled for or created. The system will check if there is any data to display. If not, then “No events to show” will be displayed as a message.

### **3.7 The upcoming events tab**

The user will also be able to see the upcoming events that are created by them or that they can participate in.

#### **Logic:**

When the user will click on the “upcoming events” tab, they will get an option to view the upcoming events that they have created or view the upcoming events they have enrolled for. For this task, the events created by that user which have a start date greater than the current date will be fetched from the enrolled events table and put into a list view for the user to see.

## **4. BUYER AND SELLER EMAILS**

### **4.1 Seller adding an item for auction**

When the seller adds an item for auction, they will receive an email confirmation notifying them that their item has been added successfully and is visible to the users.

### **4.2 Buyer subscribing to an event**

When the buyer subscribes to an event, after clicking on the submit button, they will receive an auto-generated email stating that they have successfully registered for a particular event along with the event details in the mail body.

### **4.3 Invoice of the won items to the buyer**

When the system picks up the highest bidder, an auto-generated email will be triggered stating the items won by the buyer along with their details and an invoice.

### **4.4 Alerts for upcoming events to the buyer**

Post registering for an event the buyer will receive email reminders for upcoming events. The alerts will be generated a day before the event stating the start and end time of bidding and the item on auction.

### **4.5 Password recovery email**

If the user clicks on the forget password button on their login page, they will receive an email that will contain their original password in it.

### **4.6 Auction event cancellation notification email**

If the seller cancels an auction event, an email notification will be sent to all the buyers who had enrolled for that event. Since there can be several buyers who would have enrolled for an event, this email notification will be sent to such buyers in an asynchronous mode (in the background). Therefore, the seller's screen will not be blocked while cancelling an event until all emails are sent.

From: sampada0295@gmail.com

To: User@gmail.com;

 Cc & Bcc

Item successfully put up for sale

Dear user,

Your item has successfully been put up for auction and it will be visible to other users now.  
Please find the details of the item mentioned below:

Item Name

Image

Description

Thank you!

Team \_\_\_\_\_

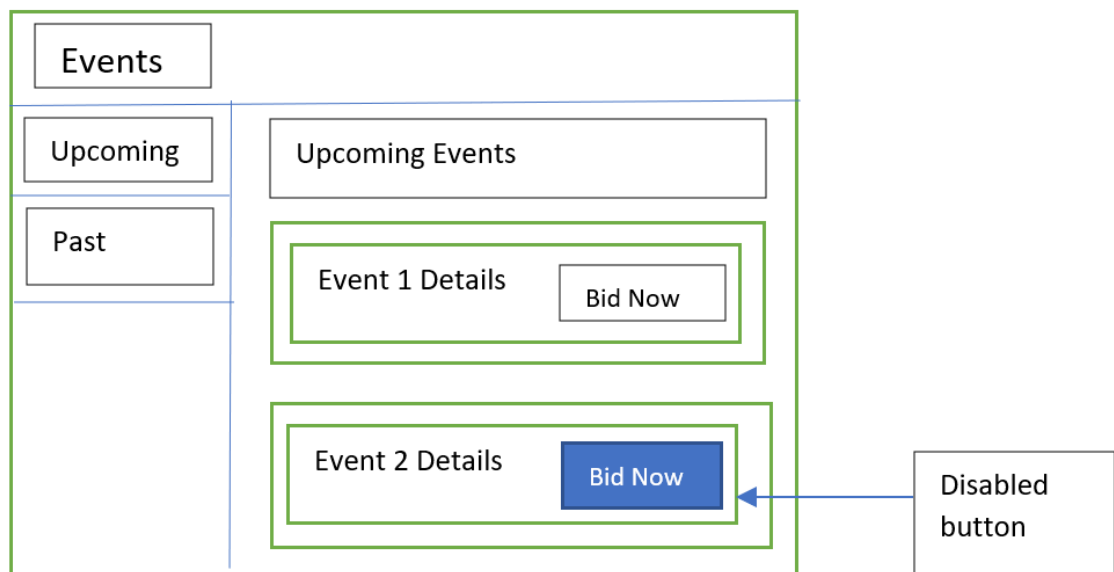


## 5. BIDDING

The bidding feature facilitates a buyer to place a single bid for an auction event that he has enrolled in. After the bidding event is completed, the system will select the winner using the sealed bidding strategy. Below are various tasks that are performed by the buyer and system related to the bidding feature:

### 5.1 Placing bid for an auction event

A buyer will be able to place a bid for the events that he has enrolled in. This can be done by navigating to the “Events” menu to view the “Upcoming” events. To bid for an event, buyers can use the “Bid Now” button corresponding to that event which will be only enabled when the bidding time set by the Buyer has started. This button will remain disabled before and after the specified bidding time.



#### Logic:

The buyer will be able to click on “Bid Now” when the bidding time has started which will redirect the buyer to the below page where he can enter the bidding amount, add some optional comments and press “Place Bid”. On the UI, the system validates whether the entered bid amount is greater or equal to the minimum bid amount set by the seller.

If the amount is valid and greater or equal to the threshold set by the seller, then the backend system will validate whether:

- The buyer has already placed a bid for this event.
- The bid has been placed within the bidding period (between the start and end time of bidding)

If the above validations pass, then the bid will be placed successfully, and the “Bid placed successfully” message will be displayed on the screen. Below are the error messages that will be displayed in case of validation failures:

- “Bidding time has elapsed” if the buyer hits “Bid Now” after the bidding period is over.
- “Bid already placed for this event” if the buyer has already placed a bid for this event.

## 5.2 Selecting winner for an auction event

After a bidding event is completed, the system will select the winner whose bidding amount is the highest amongst all bidders. An email will be sent to the winning buyer with the details of the event and the amount that they are liable to pay to the seller. Also, an email will be sent to the seller as well notifying them about the item that has been sold at auction along with the contact details of the buyer. Currently, the system will not be handling or recording any payments between the buying and selling parties.

### Logic:

The e-Auction system will start processing all bids corresponding to an auction event at the time specified by the seller while creating the auction event. This information will be stored in the database to process all bids at the specified time. Internally, the system will leverage daemon threads from Java multithreading that will be running in the background to check

whether there are any completed auction events whose bids need to be processed at the given time. If the system finds that the “Bid Open Time” for an event has reached, it will verify whether the event was completed using the bid end time. Thereafter, the highest bidder will be selected, and their profile will be verified. Profile verification includes that the buyer’s status in the system is that of an active user and that their profile is not marked as “fraud”. If the profile of the selected winner turns out to be inactive or fraudulent, then the next highest bidder will be selected, and the same profile check will be applied. An email will be sent to the selected winner for the notification and along with the invoice of the item.

## 6. FRAUD MANAGEMENT

### 6.1 View all the users in the system.

- The administrator has access to all user profiles from the user detail table. Admin can find the user by typing the email address in the search tab and can view all the active users in the active user tab and inactive user profiles in the inactive user tab. Furthermore, the admin can select the profile for further actions.

List of Users

abc@xyz.com

Q

Show active	Show inactive	All	
Name	Email/Username	Status	
User1	User1@gmail.com	• Logged in	
User2	User2@gmail.com	• Logged in	
User3	User3@gmail.com	• Logged out	

Select

**Fig.** List of users and searching user with the of email.

### 6.2 Mark user as a Fraud

- By clicking on the user profile and pressing the 'Select' button, the admin is taken to the new tab named 'User Profile' where it has all the details of the user like 'Username', 'Email', and 'User groups and permissions given to the user like 'Create event', 'Pay/receive money', and 'Participate in the event'.
- On the lower tab, there are options like 'Delete', 'Mark as Fraud', and 'Back'.
- If the User has been found doing suspicious activities, Admin has the privilege to mark it as fraudulent and this removes all the permissions to the user.

User Profile

Details & Permissions

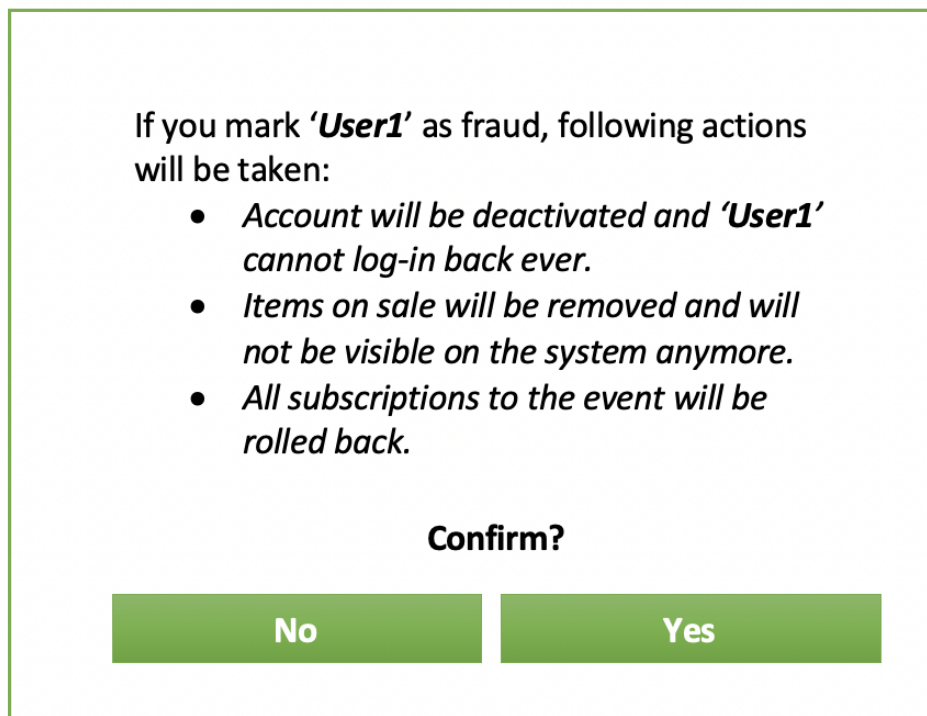
First Name:	User1
Last Name:	User1
DOB:	MM/DD/YYYY
City:	Halifax
State:	Nova Scotia
Country:	Canada
Email/Username:	<a href="mailto:User1@gmail.com">User1@gmail.com</a>
Status:	Logged in
Last Session:	

Mark as Fraud

Back

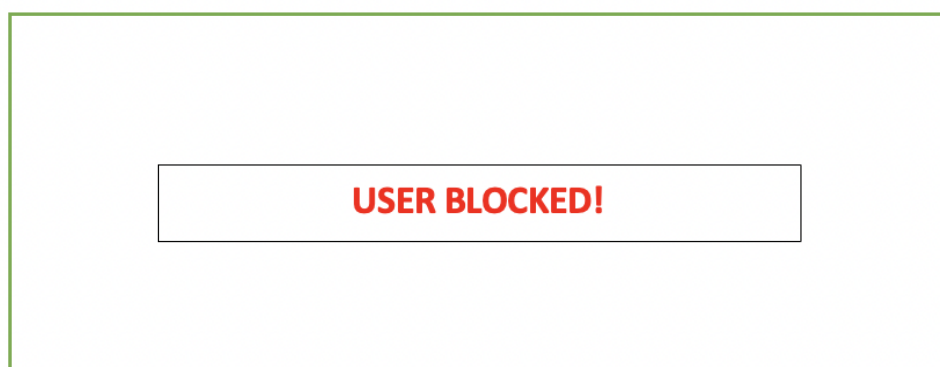
**Fig.** User details and **'Mark as Fraud'** window.

- After the admin confirms the action by selecting the 'Yes' button, the system notifies the admin with another pop-up in bullet points that 'User1' will be affected by your action in the following ways:
  - i. The account will be deactivated and when tries user log-in, it will show an error message: 'Blocked Account'.
  - ii. All the items on sale put up by users will no longer be visible to the other users.
  - iii. All the enrollments or subscriptions will be automatically rolled back.



**Fig.** Another pop-up confirms with admin of the consequences of 'Mark as Fraud' action.

- Now when 'User1' tries to log in back into the account, the error '**User Blocked!**' will be displayed and the user is denied logging in to the system.



**Fig.** User sees a '**USER BLOCKED!**' pop-up after User1 tries logging in.

- After blocking the '**User1'** the user will be visible under the '**Inactive'** tab in the admin dashboard with the details of the user in it.

List of Users

abc@xyz.com

🔍

Show active	Show inactive	All	
Name	Email/Username	Status	
User1	User1@gmail.com	• Blocked	
User67	User67@gmail.com	• Blocked	
User101	User101@gmail.com	• Blocked	

**Fig. 'User1' is now under the inactive users tab.**

- When the other users try to access the subscribed events of '**User1**' after being blocked, the events will be marked as cancelled.

The subscribed events tab

Item Name

Image

*The item is no longer available to bid.*

**Fig. Item posted by the 'User1' will no longer be visible or available to bid.**

- The system will mark all items as "Inactive" that were added by the fraudulent seller. Such items will not be fetched by the system whenever a Seller tries to view items that he wishes to purchase through auction.



## PROJECT PLAN

Sprint	Sprint Start	Sprint End	Work Completion
1	21-Oct	04-Nov	25%
2	05-Nov	18-Nov	25%
3	19-Nov	02-Dec	25%

### Sprint-wise task planning:

#### Sprint 1

1. USER REGISTRATION AND LOGIN
2. ITEMS FOR AUCTION

#### Sprint 2

3. EVENT CREATION
4. ITEMS FOR AUCTION

#### Sprint 3

5. BIDDING
6. FRAUD MANAGEMENT