

## Project Title: ART GALLERY MANAGEMENT

Group Number: 5

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## 1. Introduction

Art Gallery Management is a system, available as a website for all browsers and also available as an application for Android and iOS. This is a system where artists from all over the world can get an opportunity to showcase their masterpieces. Art enthusiasts from all over will get the chance to see different art pieces from their homes, without physically being in an art gallery. They can make purchases and get home delivery for the art pieces bought. Aside from all these, Art Gallery Management also has the feature of running auctions. Artists can put their art pieces for auction and people can bid for these artworks and buy them by winning the bid.

## 2. Motivation

When we hear about art, we always think about an art gallery or a museum. An art gallery or museum implies physical participation. But it is not always possible for people to physically attend to them in their busy schedules. There is also the new emergence of digital art. An online gallery will create opportunities to overcome the regional boundaries and people from different countries can simultaneously be in the same art gallery and appreciate the art. New artists have little to no chance of showcasing their art due to a lack of space from veteran artists. A virtual art gallery is an answer here. Artists from any part of the world will get to showcase their art on an equal platform with other artists.

## 3. System Request

### 3.1. Project Sponsor:

Laurence des Cars, president-director of the Louvre Museum.

### 3.2. Business Need:

The purpose of this project is for all those art enthusiasts scattered around the world, who want to appreciate art even in their busy schedules, hence building an online platform for bringing them all together. All types of art deals and auctions are done through this website. This creates an entire virtual ecosystem for all types of art genres. Thus, our vast inventory will provide the feelings of an art exhibition, one will get when visiting an art gallery. And finally, our management will ensure all the transactions being made are done fluidly without any hassle.

### 3.3. Business Requirements:

- A well-functioned website and app, that will work on Android, iOS, tablet, PC, etc.
- There will be a home page for showcasing popular arts, and that page will have redirects to the Showcase page which will be a virtual art gallery.
- Guest visitors can view all the arts and browse, but purchasing requires an account login and payment information.
- There will be a bidding system for buying arts.
- Only verified users can bid for an art piece.
- The arts will be categorized and customers can search for different arts based on their artist, title, type of art and year.
- Customers can also search for artists using their name, birthplace, age and style of art.
- Include 24/7 online user support.

- There will be an admin panel, only accessible to admins, which will show the list of art pieces set for showcasing, auction, and those that have been sold, best-selling artists, customers' expenditures etc.
- There will be another panel exclusive to the artists, and their agents, where they can see the bid on their art pieces, arts that have been sold and other information.

### **3.4. Business Value:**

#### **3.4.1. Tangible Value:**

- Having many renowned artists' masterpieces on one website will increase traffic, hence will result in a 35% increase in sales from new customers.
- Introducing premium services would increase sales by 15% among existing customers as buying more is encouraged by giving exclusive rewards and vouchers to the customers.
- Business partners give a 10% discount when their services are used for product delivery.

#### **3.4.2. Intangible Value:**

- Having a virtual platform is what everyone wants in this era of the 4th Industrial Revolution so that people can save their time by browsing through a website or an app to look for the aesthetics they desire.
- Having online auctions will increase customer satisfaction as they can stay anonymous from other customers, this will, in turn, improve customer privacy and security.

### **3.5. Special Issues or Constraints:**

- Buying licenses from artists and copyright owners before showcasing their arts in their gallery.
- Getting government approval and solving mandatory tax issues for inter-country delivery.

- Management will contain a team of art connoisseurs for conducting fraudulent checks on new arts before putting them for showcasing.
- Management will ensure that the art being showcased must not exhibit/prioritize discrimination or any racial slurs.
- For online transactions, authorisation from bank authorities is required.

## 4. Requirements Analysis

### 4.1. Functional Requirements:

1. Gallery View:
  - 1.1. A page that details all of the arts that are offered.
  - 1.2. Both unregistered and registered users have access to the galley.
  - 1.3. An account is required to buy or bid.
  - 1.4. Users can search for specific works of art in the gallery using keywords such as "art piece name," "artist," and so on.
  - 1.5. The genre, art style, artist, and ratings are used to categorize the works of art.
  - 1.6. This page lists the art pieces that are up for auction.
  - 1.7. The current bid on an auctioned piece of art is displayed.
2. Customer Management:
  - 2.1. Users must create a new account with unique credentials such as a username or email address.
  - 2.2. To log in to an existing account, users can use user authentication.
  - 2.3. Bids can be placed on items that are up for auction by users.
  - 2.4. Users can add things they like to their shopping cart.
  - 2.5. Users can pay for their purchases using a variety of methods.
  - 2.6. View previous carts and a list of artworks purchased.
  - 2.7. Customers that spend a certain amount of money will be upgraded to premium status, allowing them to take advantage of exclusive offers and bonuses.
  - 2.8. New auctioned items are notified to premium users.
3. Admin Management:
  - 3.1. Admin has the authority to select and authorize the artworks that will be auctioned.
  - 3.2. Admin may see who is bidding on a given item and how much they are bidding.



- 3.3. If the agent wishes to sell the item, the bidding system will offer potential purchasers the current bid and the amount of time they have to bid.
- 3.4. All of the users' transactions will be in Admin's backlog.
- 4. Artist Management:
  - 4.1. Artists can contribute their work to the gallery.
  - 4.2. Artists can submit their own works to be auctioned.
  - 4.3. Artists have the ability to determine their own prices for their work.
  - 4.4. Artists have the ability to set starting bids.
  - 4.5. Artists may check which of their works have been sold and which have not.
  - 4.6. Artists may see who has purchased their work.
- 5. Payment and Delivery
  - 5.1. Cash on delivery and digital payment options for bKash, Nagad, Rocket, and all credit and debit cards will be available.
  - 5.2. The system will be able to accept orders for deliveries to be made at a specific date and location.
  - 5.3. The borrower will be notified of the current status of their order by the system (being packaged, being shipped, out for delivery etc.).

## 4.2. Non-Functional Requirements:

1. Operational:
  - 1.1. The system should be compatible with computer browsers, Android, and iOS.
  - 1.2. The system must be able to communicate with the database system.
  - 1.3. The system should be able to communicate with bank payment systems, bKash, and other transaction methods.
2. Performance:
  - 2.1. The system should be able to support 2000 users at the same time.
  - 2.2. The system should be able to support 100 artists at once.
  - 2.3. The system should give 50 administrators access to the system at all times.
  - 2.4. Every 10 minutes, the system should check and update the bids on auctioned items.
  - 2.5. The system should be operational 24 hours a day, seven days a week.
3. Security:
  - 3.1. Customers are the only ones who can see their cart.
  - 3.2. Customers are the only ones who can see how much money they have spent in total.
  - 3.3. The delivery address is only visible to delivery management.
  - 3.4. Billing information is only visible to payment management like banks and bKash.
  - 3.5. Personal information about other accounts is encrypted, so the administrative body cannot see it.
  - 3.6. Artists can only see the name and general information of their buyers.
  - 3.7. The system includes essential cyber-attack security.
4. Cultural and Political:
  - 4.1. Personal data is safeguarded in accordance with the Data Protection Act.

- 4.2. The policy is to only display art that has been licensed by the artists.
- 4.3. Before accepting an item from the showcase, make sure it is not a forgery.
- 4.4. The system should be able to distinguish between currencies of different countries.

## 5. Usage Scenario

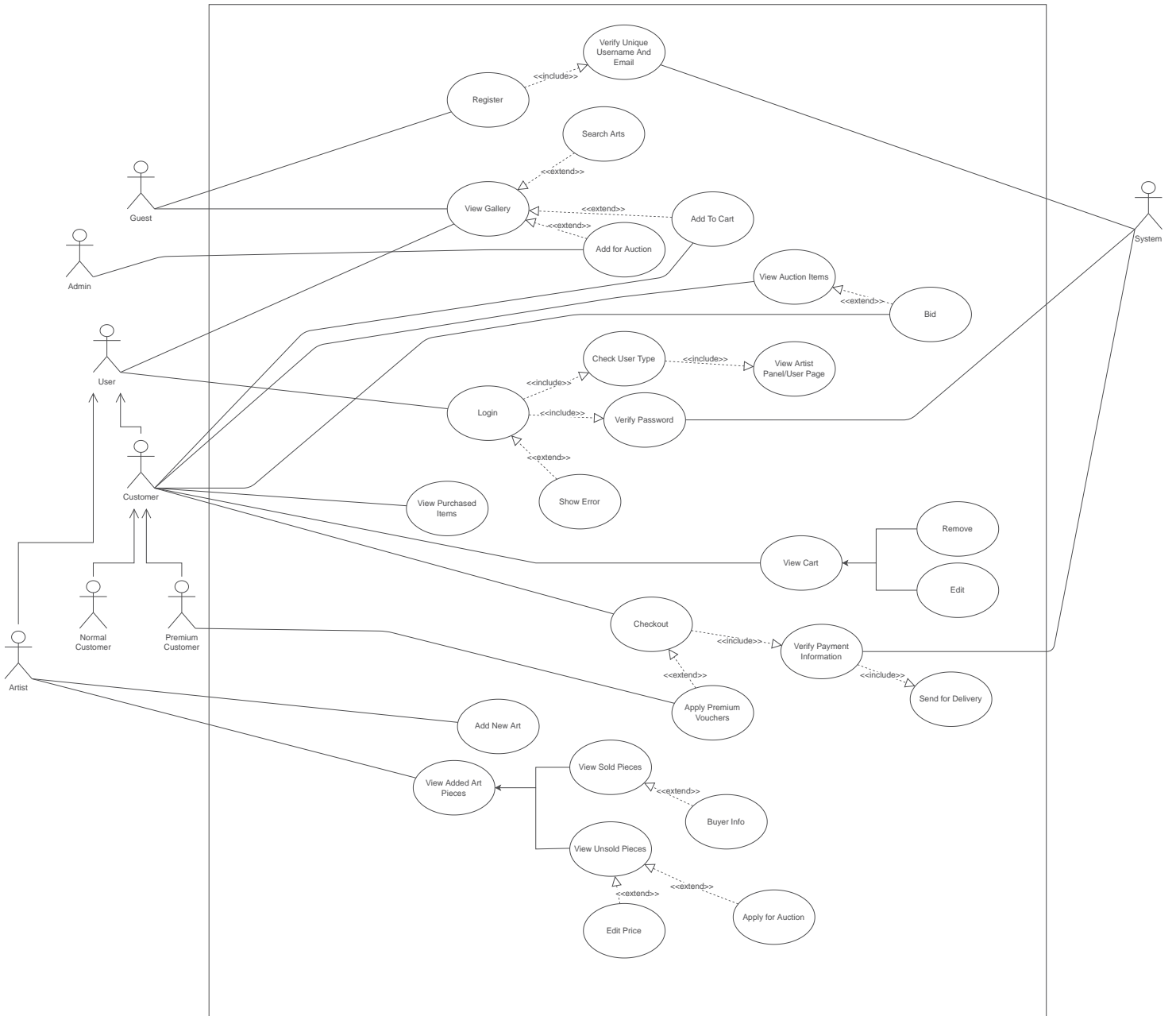
When a customer visits the page, they can browse through the gallery and search for specific artworks. If they want to make a purchase, they must log in or register an account. Their account will be registered with unique username and email address. Once logged in with an account, they can add arts to their cart and proceed to checkout. During checkout, the customers will have to provide their necessary payment information, billing and delivery address, etc. Once all the information is verified, they will be sent for delivery. Customers can also access the auction portal where they can bid for art pieces. If someone else bids over them, the customer will get a notification. If the customer wins a bid, they get notified and are redirected to checkout. Premium customers can apply for vouchers during checkout. When an artist open the page, they can access the artist dashboard where they can see how many art they have, and how many of them have been sold. They can view their own art and can edit the price on them if they are unsold. They can also add new artworks, which goes through a verification process and the system generates all necessary information and showcases it, finally notifying the artist that their art has been added. Artists can also apply their art pieces fro auction, where the request is forwarded to the admin who reviews and approves the art for auction. Once published for auction, the artist will be notified.

## 6. Design Diagrams

### 6.1. Use Case Diagram

Our Use Case Diagram shows Guest, User and Admin as primary actors, while the System is a secondary actor. User is of two types, Artist and Customer. Customer can be a Normal Customer or a Premium Customer. As a guest, someone can view the gallery and search for arts. They do not have an account, so they can also Register. Users can log in. Customers can add art to the cart, view auctioned items and place bids. They can view their purchased items, view and make changes to the cart, and checkout by entering payment information. Premium Customers can apply for vouchers during checkout. The artist can add new art, and view their owned art. Artists can see purchase records of sold artworks, or change the price of unsold artworks. They can also apply one of their art for auction. Admin approves this request and adds to auction. The system is responsible for verification and other tasks.

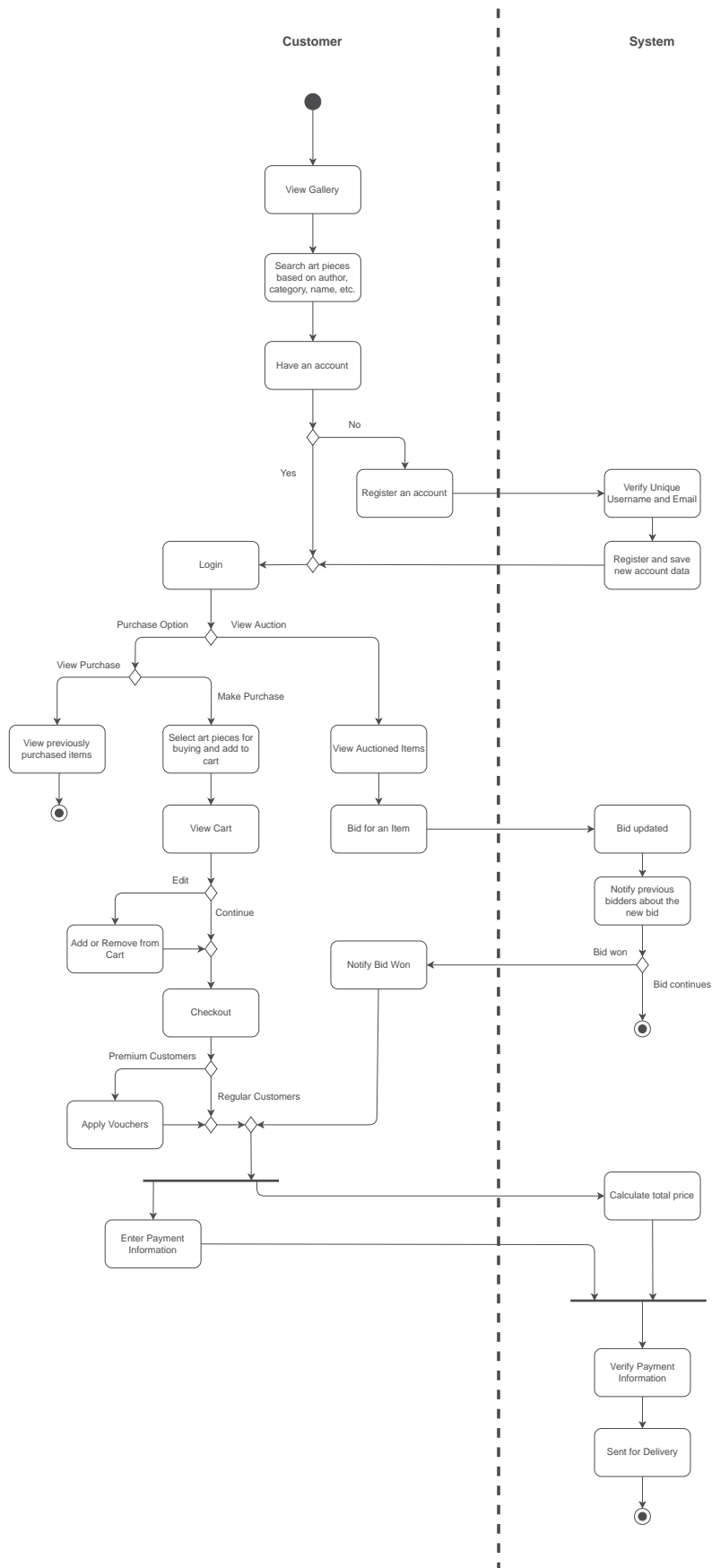
# ART GALLERY MANAGEMENT



## 6.2. Activity Diagram

### Customer Side:

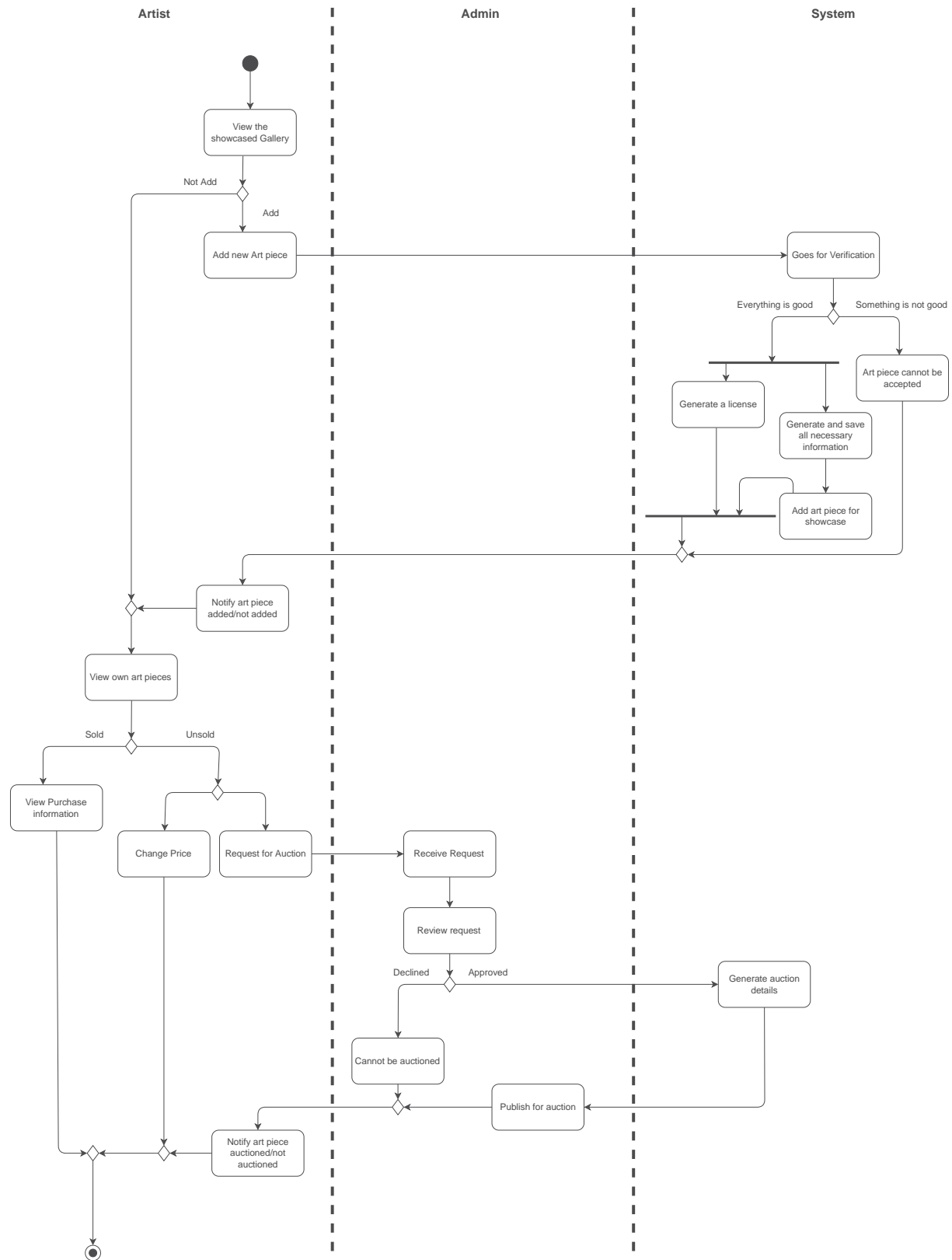
A user will be able to view and search from the available art pieces. To make any purchases, they have to log in using their credentials. New users, without an account, need to register to be able to buy items. The system will check for unique usernames and emails before adding the user's information into the database. Users who already had an account can directly log in. Once logged in, customers can either go to purchase options or auction options. In the purchasing section, they will have the option to view previously bought art pieces or make new purchases. Customers can select an art piece and add it to the cart. Customers can view their cart and chose to edit by removing or adding to the cart or continuing. Then they can checkout. Premium customers, in this stage, can apply for vouchers. In the auction section, customers can view auctioned art pieces and bid on them. The system then updates the bid on that art. Then the system notifies previous bidders that there is a new bid. The system checks the bid status, if the bid is won it notifies the customer, else it does nothing. Finally, in the checkout process, the system calculates the total price, and at the same time, the customer enters their payment information. Once both are done, the payment information is verified and the art is sent for delivery.





### Artist Side:

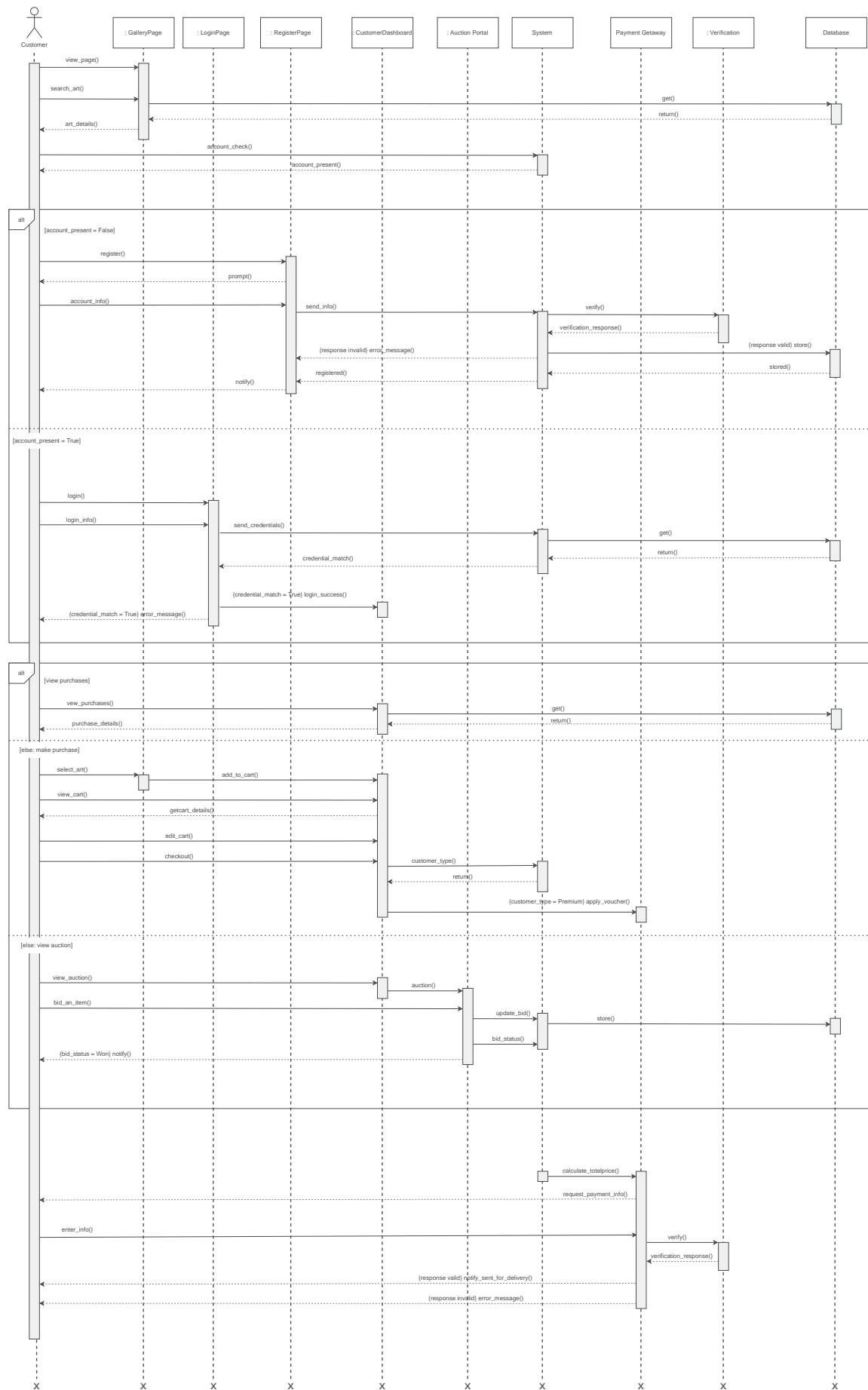
Artist can view the gallery and chose to add or not add new art pieces. If they add, this goes to the System for verification. After verification, if something is not right, the art piece cannot be added and the artist is notified. If verification is successful, a license is generated and at the same time all necessary information is generated and saved and the art piece is added for the showcase. Then the artist is notified. Then the artist can view his own art pieces. From there, for sold art, he can view the purchase information. For unsold art, he can either change the price or apply for an auction. The auction request is sent to the Admin who reviews the request. If declined, the artist cannot be auctioned and the artist is notified. If approved, the system generates auction details and then the admin publishes the art for auction. Then the artist is notified.



### 6.3. Sequence Diagram

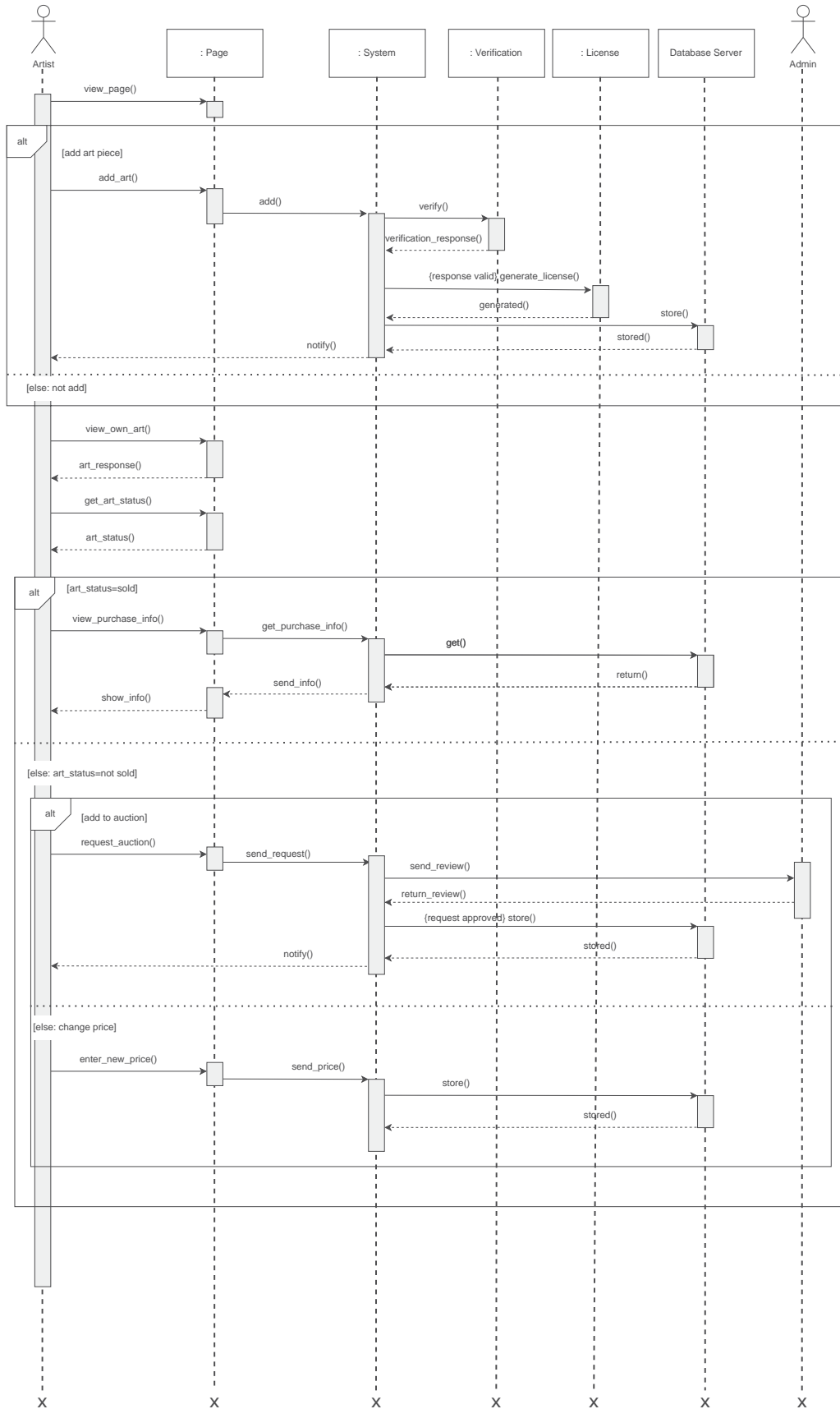
#### Customer Side:

A customer will first open the Gallery Page. They can search for art on the page. The page will get the art details from the database. The customer can check with the system if he has an account or not. If not, the page will show a Register option. The customer can opt to register, which will take them to the Register Page. The register page will ask for information. The customer will enter the information, which will be sent to the System. The system first sends them to Verification. For valid responses, the data is stored in the database and the system sends a registered response to the page. For invalid responses, an error message is sent. The register page then notifies the customer. If an account is present, the customer opens the login page and enters credentials. They are sent to the system which gets data from the database and matches them. If a match is found, login is successful and connects to Customer Dashboard, else an error message. In the customer dashboard, the customer can request to view purchases, which are fetched from the database and displayed. Else the customer can make a purchase, where they select art from the gallery page and adds it to the cart. Then request to view the cart on the customer dashboard. Upon getting the cart details, the customer can make changes to the cart and opt for checkout. Premium customers can verify with the system and apply vouchers in the Payment Gateway. The last option is to view Auction Portal. Customers can place new bids and the bid status gets updated on the database. The auction portal also checks the bid status from the system and notifies if a bid has been won. After all this, the system calculates the total price and sends it to the Payment Gateway which then prompts the customer for payment information. The payment information is verified and either a 'Sent for Delivery' or an 'Error Message' notification is sent based on the verification.



### Artist Side:

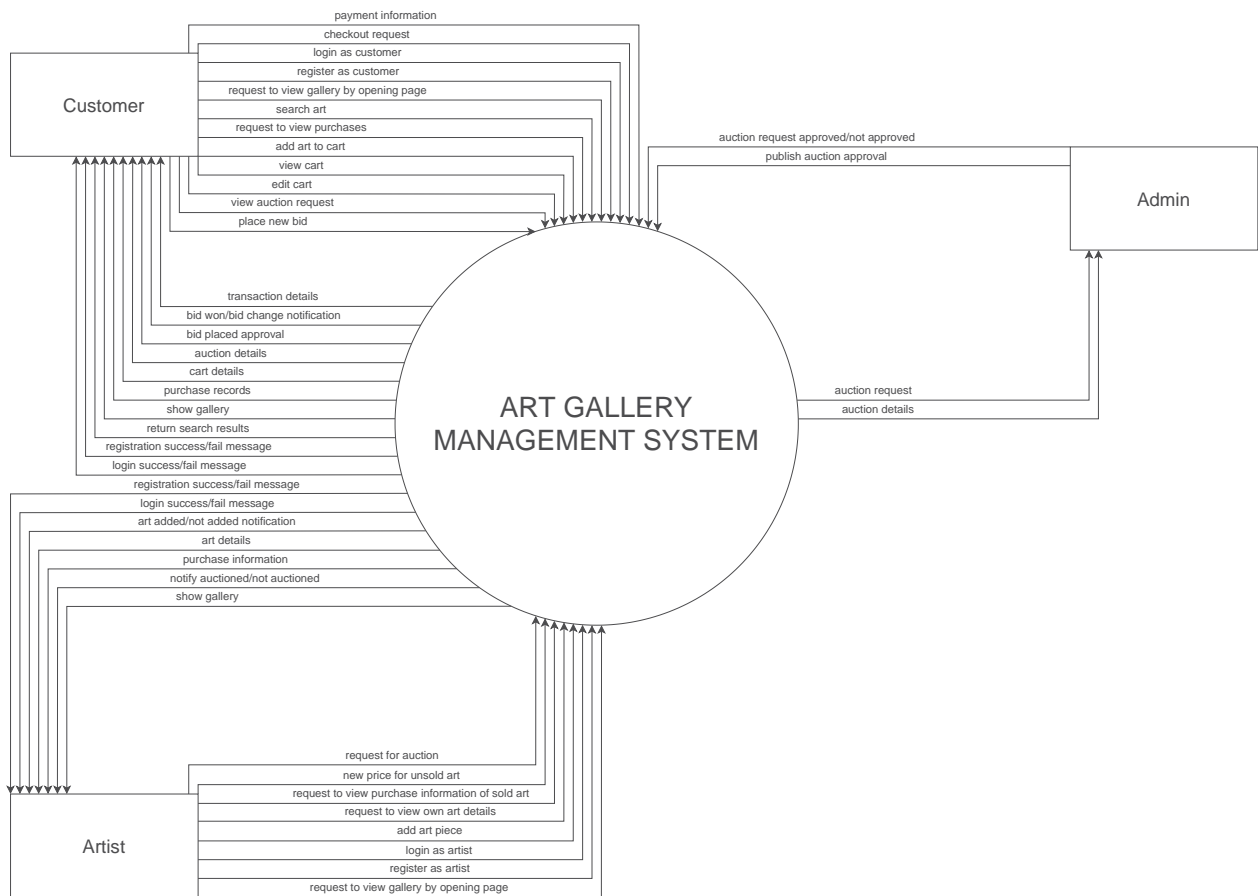
An artist will first open the page. Then they can choose to add a new art piece, or not. If they add, then they will send add art request to the page, and the page will send this request to the system. The system will send it for verification. If the verification response is valid, the system will send a generate license request to License. When generated, the system will store the data in the database, and then notify the artist. Then the artist can view their own art from the page. They can get the art status of sold or unsold, and depending on that they can make two actions. For sold art, the artist can request to view purchase info on the page, the page sends this request to the system. The system will fetch this information from the database and send the information to the artist through the page. For unsold art, the artist has two choices. The artist can add the unsold art for auction. The artist will request for auction, the page will send this request to the system. The system will send the request for review to the Admin. The admin will approve or disapprove the request. If approved, the new auction details will be stored in the database, and the system will notify the artist. Else, they can change the price by entering a new price on the page. The page sends this to the system. The system stores this in the database.



## 6.4. Data Flow Diagram

### Level 0:

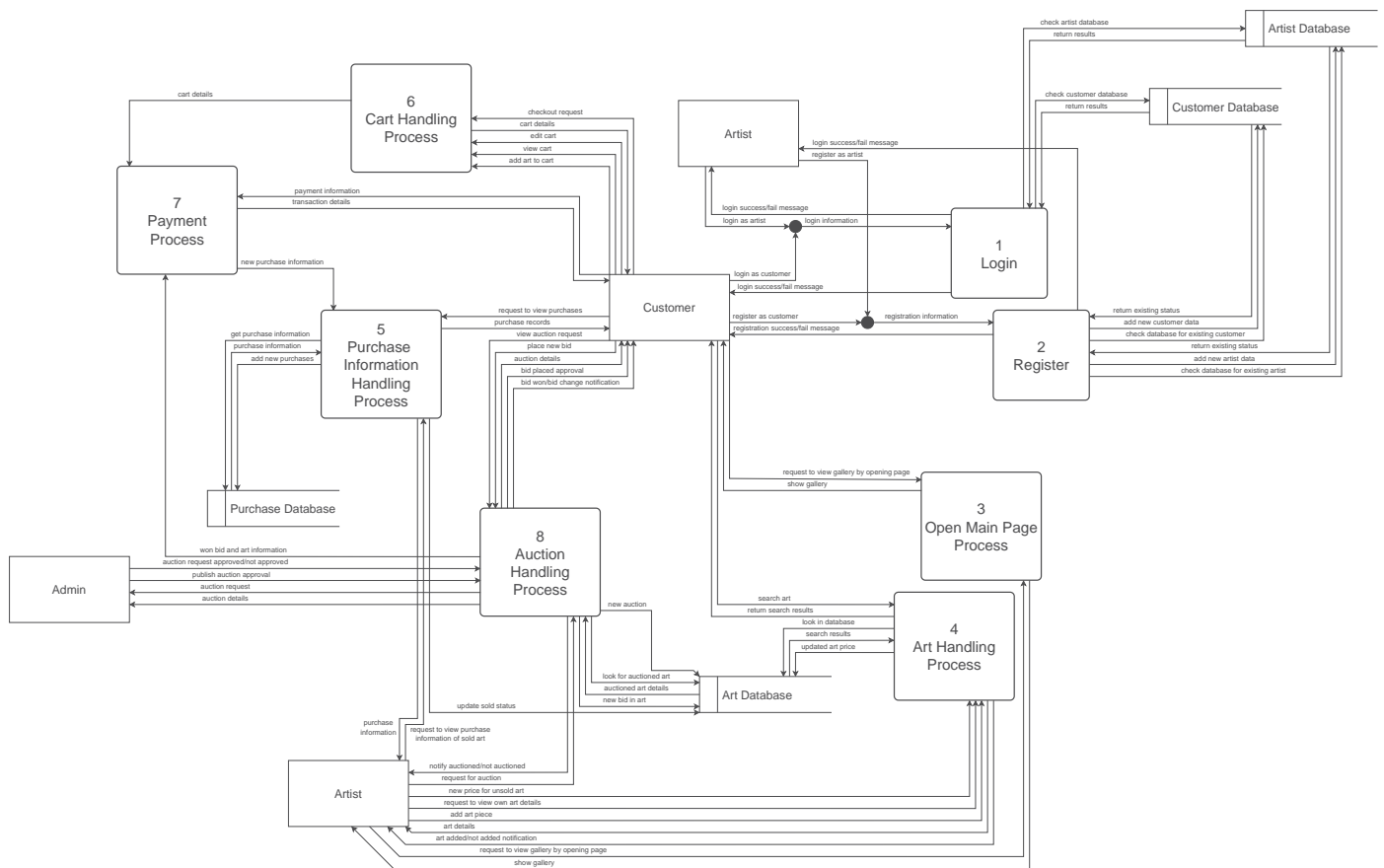
For the context diagram, the Art Gallery Management System is a single process. There are three external entities: Customer, Artist and Admin. Customer will request to view gallery by opening page, and the system will show gallery. Customer search for art, and system will return search results. The customer will login or register as customer, and system will give success or fail message. Customer requests to view purchase and system returns purchase records. Customer can add to cart, and then view cart, the system will return the cart details. Then the customer can edit the cart. Customer can request to view auction and system returns the auction details. Customer can place new bid, and system will return approval. System will notify customer is bid has been won, or bid has been changed. Customer can request checkout, and enter payment information, the system will show the transaction details. Artist can also request to view gallery by opening page, and the system will show gallery. Artist can login or register as artist, and system will give success or fail message. Artist can add new art piece, and system will notify added or not added. Artist can request to view own art details, and system will return art details. Artist can request purchase information of sold art, and system will return purchase information. Artist can set new price for unsold art. Artist can request unsold art for auction. System sends this request to Admin. Admin approves or disapproves the request. If approved, the system generated auction details and sends them to admin. Admin then publishes the auction, and system notifies the artist.





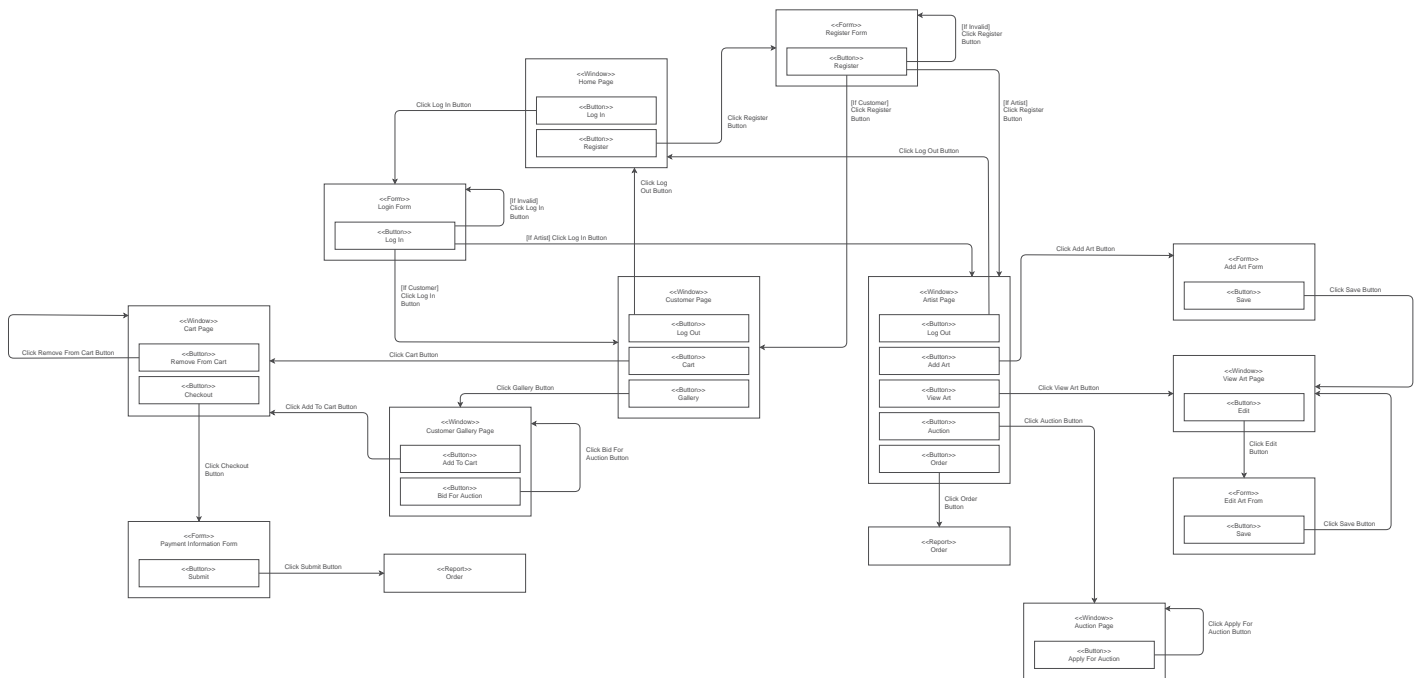
## Level 1:

Level 1 Data Flow Diagram has eight processes. There are three external entities: Customer, Artist and Admin. There are four data stores: Customer Database, Artist Database, Art Database and Purchase Database. Process 1 is Login where it takes information from Artist or Customer, matches with Artist Database or Customer Database and returns fail or success message. Register, Process 1, takes information from Artist or Customer, checks database for existing account and stores the new account in Artist Database or Customer Database. Then it returns fail or success message. Open Main Page Process, Process 3, takes open page requests and returns the page. Art Handling Process, Process 4, deals with art. When asked for art details, either from both Customer or Artist, it searches Art Database and returns results. When artists update price, this process stores the new price in the database. When artists add new art, this process stores the data in the database. Process 5 is Purchase Information Handling Process. When customer or artist requests purchase information, it gets the purchase information from the Purchase Database and returns the results. Customers can add to cart, edit cart, view cart and get cart details using Process 6, Cart Handling Process. Customer sends checkout request and this process sends the cart details to the Payment Process, Process 7. Customer provides the payment information and this process returns the transaction details and sends new purchase information to process 5, which adds new purchases to the Purchase Database and updates sold status in Art Database. Process 8 is Auction Handling Process. Customer requests this process to view auction, and process 8 gets the details from Art Database. Customer places a new bid and this bid is stored in the database. This process checks bid status and notify customers of bid won or bid changed. Artist can request for auction, this request is sent to Admin. Admin approves this request, and process 8 generates details and sends them to admin. Admin then publishes the auction, and process 8 adds new auction to Art Database and notifies the artist.



## 6.5. Windows Navigation Diagram

The first window is the Home Page, which contains the Log In and Register buttons. Log in button takes user to the login form, while register takes them to registration form. After login and registration, if there is some invalid error, it will take them back to the page. If no error, Log In button on log in form and Register button on register page will take to the Customer Page window or Artist Page window depending on the type of user. Customer page has Log Out button which takes customer back to the home page. Cart button takes customer to the Cart page, and Gallery button takes to the Gallery page. In gallery page, customer can bid using Bid For Auction button, it will redirect them back to gallery page. Add To Cart button will add the selected art to cart and take them to the cart page. Remove From Cart will edit the cart and return back to the page. Checkout button will open Payment Information Form. Upon entering payment information, the submit button will open a report containing the Order and transaction details. On the other side, Artist Page also has Log Out button which takes artist back to the home page. View Art button takes them to View Art page that contains all their art. Add Art opens a form and inputs details about new art. Save button in the form redirects to view art page. View Art page has Edit button that opens a form to take new details about the selected art. Save button updates the information and returns to view art page. Auction button on artist page opens an Auction Page where the Apply For Auction button sends a request and the Window returns to auction page. The Order button on artist page opens a report about all the purchases of the artist's art.



## 7. Conclusion

A virtual space that acts as an Art Gallery will bring together a fantastic community of art connoisseurs. It will bring positive outcomes in promoting art throughout the world, and successfully highlight new up and coming artists in the industry. Art Gallery Management aims to find hidden talents throughout the world, and spread their masterpieces to the hands of all the art lovers in the world.