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Craftopia

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Graduation Project

Academic Year 2024-2025

Midyear Short Documentation

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Chapter 1: Introduction

    The handmade products market is a vibrant and growing sector, yet many artisans struggle to gain visibility, connect with customers, and

effectively manage their businesses. Additionally, customers face challenges in discovering unique, high-quality handmade products and engaging directly with artisans for personalized requests. To address these gaps, we propose a comprehensive platform designed to empower artisans and enhance the buying experience for customers.

Our platform integrates advanced features such as product customization requests, and direct communication between artisans and buyers. By leveraging modern technologies like an escrow payment system, and auction management, we aim to revolutionize how handmade products are discovered, appreciated, and purchased.

This solution not only bridges the gap between artisans and buyers but also fosters a community-driven marketplace that celebrates creativity and craftsmanship. Through this platform, we aspire to create a sustainable ecosystem where artisans can thrive, and buyers can access unique, personalized products with ease.

Background

In today's digital world, many artisans and creators of handmade products face challenges in reaching customers. They often lack access to platforms that cater to their unique needs, limiting their ability to grow their businesses. At the same time, customers are increasingly interested in authentic, personalized, and ethically made items, creating a demand for handmade products. Our platform aims to solve this problem by providing a space where artisans can showcase their work, connect with customers, and offer customization options. With features like profile management, product listings, sales tracking, and real-time communication, we help artisans expand their reach while maintaining the uniqueness of their craft. For customers, the platform offers a way to discover, customize, and purchase handmade goods, creating a deeper connection with the artisans.

Overall, this initiative bridges the gap between artisans and customers, creating a sustainable and ethical marketplace for handmade goods.

Problem Definition

Handmade products have long been celebrated for their uniqueness and craftsmanship, yet artisans often face challenges in reaching a wide audience and growing their businesses. Many small-scale artists struggle to effectively showcase their products to potential customers, limited by their geographic location, exposure, and lack of a unified platform for managing their sales and product customization. Additionally, customers who appreciate these creative works often face difficulties in discovering new artisans, customizing their orders, and engaging with artisans directly.

Moreover, the absence of a centralized marketplace makes it difficult for customers to compare products, track order status, and communicate with artisans, leading to potential frustrations in the buying process. There is also a growing demand for a seamless and interactive platform that bridges the gap between artisans and customers, providing a user-friendly experience for both groups.

Our Proposed Solution

Craftopia offers a comprehensive solution to these challenges by providing a unified, online platform where artisans can list their handmade products with detailed descriptions and high-quality 3D images,offer customization options and engage directly with customers.The platform also allows artists to track their sales, monitor the performance of their products and receive notifications for custom orders.

For customers, Craftopia enables a seamless experience to browse unique handmade products. They can view detailed artist profiles, track orders in real-time, and easily compare products. The platform also offers an auction feature where customers can bid on exclusive handmade items, further enhancing the discovery of unique products.

Additionally, the system incorporates features such as wishlist management, ratings, product customization, and secure payment methods, all tailored to enhance the buying experience. Craftopia is designed to cater to the needs of both artisans and customers, creating a

vibrant marketplace where creativity is celebrated, and products are accessible to those who appreciate their value.

Project Task Progress and Timeline:

Task	Task Title	Description	Task status
1	Brainstorm	Initial idea generation for the project	Completed
2	Create Project Plan	Structuring the project workflow	Completed
3	Search for Related Work	Researching similar solutions	Completed
4	Study Technologies	Learning relevant technologies	In Progress
5	Define System Requirement	Identifying functional and non-functional requirement	Completed
6	Define System Functionality	Outlining features and user interactions	Completed
7	Define System Architecture	Designing the system structure	Completed
8	Diagrams	Creating UML and system flow diagrams and ERD	Completed
9	Prototype	Developing an initial prototype	In Progress
10	Mid-Year Documentation	Preparing project documentation	Completed

| 11	Final Documentation	Completing the final project Documentation	Planned
12	Set up development environment	Configuring tools and dependencies	In Progress
13	Database Setup	Implementing the database	In Progress
14	Back-End development	Implementing the system logic	Planned
15	Front-End development	Developing the user interface	Planned
16	Unit Testing	Testing individual components	Planned
17	Integration Testing	Ensuring components work together	Planned
18	Bug Fixing	Identifying and resolving issues	Planned
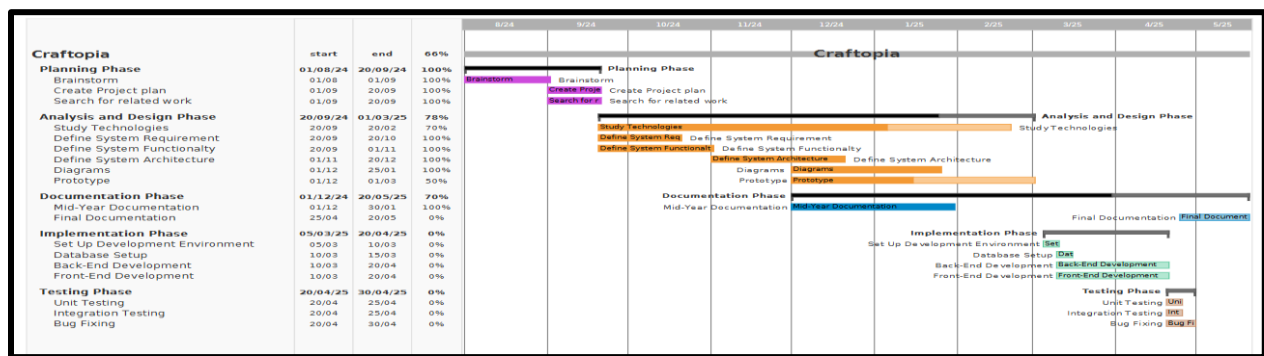
Gantt Chart

Chapter 2: Related Work

Existing Similar Platforms like Etsy, Amazon Handmade, Folksy and Muqbis.

Artist Features

Feature	Craftopia	Amazon Handmade	Etsy	Muqbis	Folksy
Escrow Payment	✓	✗	✗	✗	✗
Request New Category	✓	✗	✗	✗	✗

Admin Features

Feature	Craftopia	Amazon Handmade	Etsy	Muqbis	Folksy
Auction Creation and scheduling	✓	✗	✗	✗	✗

Customer Features

Feature	Craftopia	Amazon Handmade	Etsy	Muqbis	Folksy
Compare Products	✓	✗	✗	✓	✗
Product 3d viewing	✓	✗	✗	✗	✗
Follow Artisans	✓	✗	✓	✗	✓
Customization Requests(receive, accept and decline offers from Artists)	✓	✗	✗	✗	✗
Participate in Auction	✓	✗	✗	✗	✗

Chapter 3: System Analysis

Project Specification

System Architecture
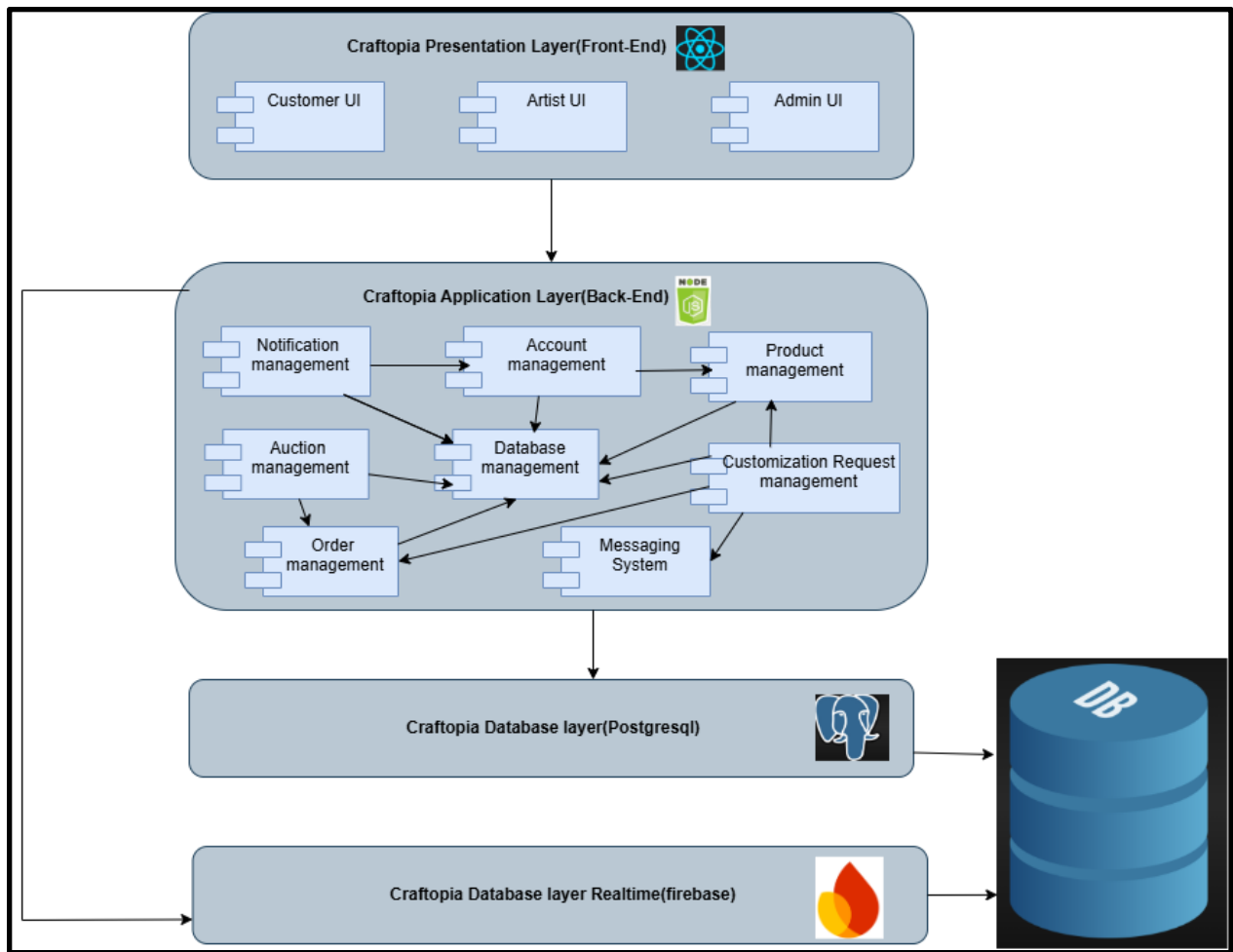
Figure 2: System Architecture

The Technologies that will be used in our project are:

- Front-end (React.js)

- Back-end (Node.js)

- Database (**PostgreSQL** for structured data storage, and a **real-time database** for auction live updates)
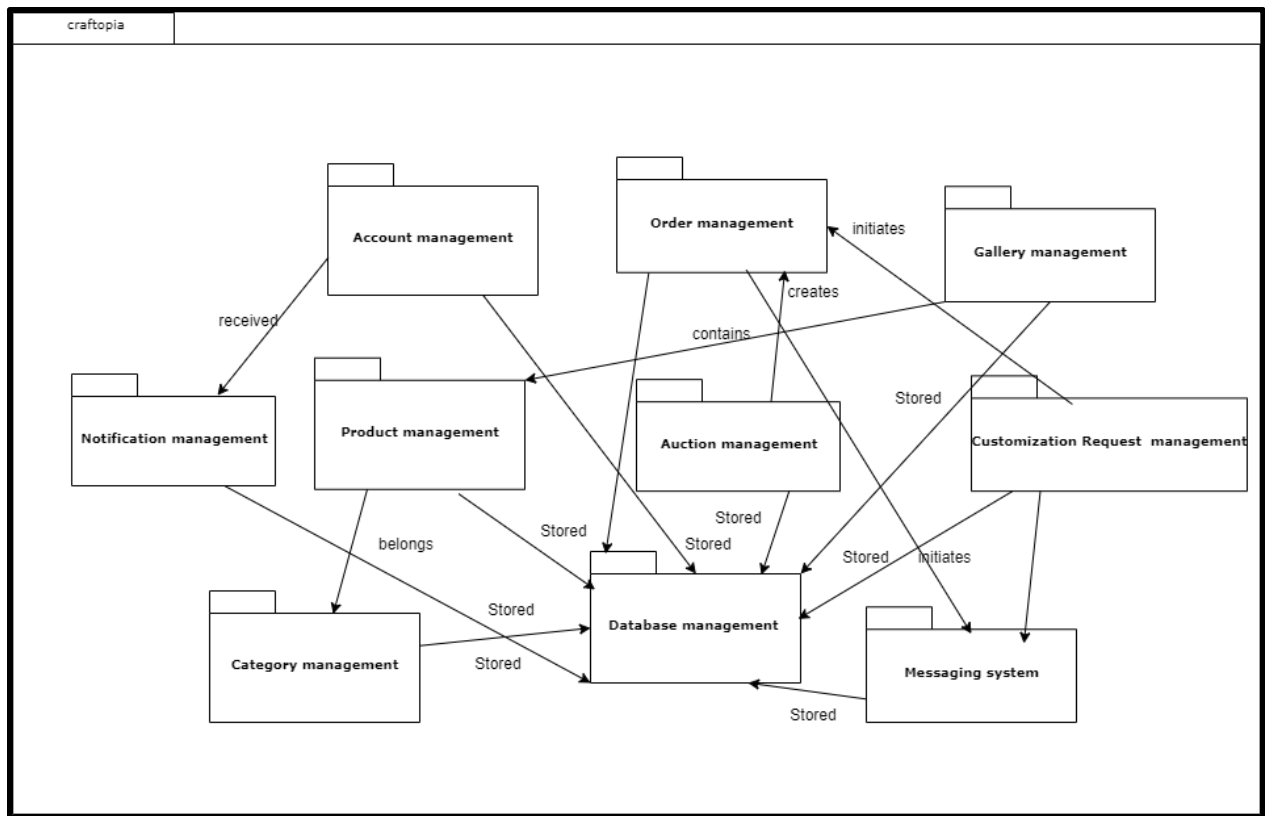
System Decomposition

Figure 3: System Decomposition

Stakeholders

- **Admin:** oversee the operations of the system who accepts or rejects artists requests, manages accounts and orders, schedules auctions and monitors sales and system operations.
- **Artists:** are businesses or individuals who list and sell handmade products on the system who list and manage products and their quantities, manage order fulfillment, set prices and promotions, respond to customers inquiries and contact them if there is a customized product.
- **Customer:** as are the primary users of the system who browse, search for and purchase our handmade products, managing their accounts and orders and providing feedback by rating products and artists.
- **FedEx Corp:** as a partner to control deliveries. Get tracking notifications, provide delivery instructions and watch the order

package's journey in map view so having knowledge when to expect it. Then see picture proof of delivery when it arrives.

- **Escrow Pay:** as a partner to protect our community from fraud. Buying and selling handmade products over our website in the safest and most secure environment to guarantee successful completion of the transactions.

Functional Requirements

Artist Features:

1. Account Management

1.1. Create Profile: Artists should be able to create an account by providing their name, username, and password.

1.2. Artists must be able to verify their email address by entering an OTP sent to their email before completing the registration process.

1.3. Edit Profile: Artists should be able to edit profile details, including name, username, password, and contact information.

1.4. Delete Profile: Artists should be able to permanently delete their account, with a confirmation step to prevent accidental deletions.

1.5. Profile Features:

1.5.1. Profile Picture: Artists should be able to upload a profile picture.

1.5.2. Biography: Artists should be able to write a detailed bio, highlighting their background, skills, and artistic journey.

1.5.3. Profile Video: Artists should be able to upload a video showcasing their craft, providing potential buyers with a more dynamic insight into their artistic process, techniques, and unique offerings.

1.5.4. Gallery / Product Listing:

1.5.4.1. Add Product: Artists should be able to list new products with detailed descriptions, pricing, dimensions, and high-quality images, including 3d viewing.

1.5.4.2. Edit Product: Artists should be able to modify product details, including descriptions, pricing.

1.5.4.3. Delete Product: Artists should be able to remove products from their listings, with a warning for products with pending orders.

2. Product Customization Options

2.1 Artists should be able to offer basic customization options for products directly within the cart.

2.1.1 Customization Fields:

2.1.1.1 Custom Name/Message: Artists should allow customers to add a personalized name or short message to the product, such as engraving or printing.

2.1.1.2 Design Modifications: Artists should provide customers the option to select different colors, sizes, or finishes for their product.

3. Order Fulfilment:

Artists should be able to receive notifications for new orders and custom requests, with clear details on the products and customization options ordered.

4. Sales Tracking:

Artists should have the ability to monitor their sales performance through detailed analytics combining numeric data for precise details and visual charts/graphs for clarity and better insights. This feature would allow them to track various aspects of their sales activity, including the total revenue generated, the number of products sold, Best and Least-selling Products.

5. View Visitors Counter:

Artists should be able to view the number of visitors to their profile or products.

6. Request New Categories:

Artists should be able to request the addition of new product categories to the platform.

Admin Features:

1. User Accounts Management

1.1. Add accounts: The Admin should be able to add admin accounts.

1.2. Remove accounts: The Admin should be able to remove both admin and artist accounts.

1.3. Review Reports: The admin should be able to view reports of inappropriate or abusive content.

2. Product Management

Reject Products: Admins should be able to reject products listed by artists for quality control and compliance.

3. Message Logging

Admins should be able to track messages exchanged between artists and buyers for review in case of disputes or reported behavior.

Customer Features

1. Register/Login

1.1 Customers should be able to create an account by providing their email, mobile number, choosing a username, and setting a password.

1.2 Customers must be able to verify their email address by entering an OTP sent to their email before completing the registration process.

1.3 Customers should be able to log in using their username and password.

1.4 The system should allow customers to reset their password through email or SMS verification.

2. Profile Management

2.1 Customers should be able to update their profile, including name, phone number and password.

2.2 The system should allow customers to update their address for each order request.

3. Browse Products

Customers should be able to browse our handmade products through the page.

4. Place Orders

4.1 Customers should be able to add products to their cart.

4.2 Customers should be able to checkout their selected products in the cart.

5. Order Tracking

5.1 Customers should be able to track their shipped products in real-time.

5.2 Customers should be able to see updates as their order progresses through various stages: Order Placed, Preparing, Out for Delivery, and Delivered.

6. Order History

6.1 Customers should be able to view their order history.

6.2 Customers should be able to reorder previous purchases directly from their order history.

7. Rating products

Customers should be able to rate and write review of products after receiving them.

8. Wishlists

The system should allow customers to add their favorite products to a wishlist for later viewing.

9. Compare Products

Customers should be able to compare product differences, including features, materials, prices, ratings, and reviews, to make informed decisions.

10. View artist profile

10.1 Customers should be able to view a gallery of an artisan.

10.2 Customers should be able to see the sales of a gallery.

10.3 Customers should be able to view the visitor counter for a gallery.

10.4 Customers should be able to view the rating of the artsian.

11. Clear Exchange and Returns Policy

Customers should be able to view the return policy for every product.

12. Report an Account

Customers should be able to report an account of an artist.

13. Search by Artisan

Customers should be able to search for products by their artisan.

14. Follow Artisans

Customers should be able to follow specific artisans they wish to keep up with.

15. Payment:

Customers should be able to pay using Escrow Payment System.

System Requirements:

1.Order Status Notifications

1.1 The customer should be able to receive automatic email updates at key stages of their order

1.2 The system should send email notifications for the following stages:

    1.2.1 Order Placed: Confirmation email with order summary and estimated

    delivery date.

    1.2.2 Order Shipped: Email including tracking information and estimated

    arrival date.

    1.2.3 Order Delivered: Notification confirming successful delivery

2.User Authentication

2.1. The system should send a One-Time Password (OTP) to a customer's and artist's email during account registration for verification.

2.2 OTPs should expire after a defined period to enhance security.

2.3 Users should be able to request a new OTP if they did not receive the initial email.

Auction Management

Customer Features

1. Viewing Bids:

Customers can view the highest current bid.

2. Submitting Bids:

Customers can submit a bid that exceeds the current highest bid.

3. Updating Bids:

Customers can update their existing bid to exceed the current highest bid.

4. Bid Count:

Customers can view the total number of bids submitted for an auction.

5. Auction Timer:

Customers can see the time remaining until the auction ends.

Admins Features

1. Guidelines for Participation:

Admins can establish and communicate clear auction rules to all participants.

2. Creating Auctions:

2.1. Admins can set up auctions by:

2.1.1. Selecting items for bidding.

2.1.2. Defining starting bids, bid increments, and reserve prices.

2.1.3. Specifying auction duration.

3. Managing Auction Listings:

3.1. Admins can ensure auction items are accurately described with:

3.1.1. Detailed descriptions.

3.1.2. High-quality images.

3.1.3. Relevant item details.

4. Scheduling Auctions:

Admins can schedule start and end times for auctions to ensure smooth operation and user engagement.

Artist Features:

1.Requesting an Auction:

1.1 Artists should be able to request an auction for their products, including: Specifying item details (e.g., description, images, and starting bid).

Customization Requests and Offers Features

Customer Features:

1. Customization Requests

1.1. Create a Request: Customers should be able to submit detailed requests for customised products, including specifications, preferred materials, and budget considerations.

1.2. View Artist Responses: Customers should be able to receive and view responses from artists interested in fulfilling their requests.

2. Engage with Artists:

2.1 View Artist Responses: Customers should be able to view offers from artists who have responded to their requests, including price and estimated completion details.

2.2 Accept or Decline Offers: Customers should be able to accept or decline offers from artists based on the customization details and pricing.

2.3 Communicate Directly: Customers should be able to communicate directly with artists to clarify any details or negotiate adjustments before finalizing their order.

Artist Features:

1.Browse Custom Requests:

1.1 Search for Requests: Artists should be able to browse a list of customization requests from customers, with the ability to filter by categories or preferences.

1.2 Select Interesting Requests: Artists should be able to select and view detailed descriptions of customer requests that match their expertise.

2. Submit Custom Price Offers:

2.1 Submit Offer: Artists should be able to submit personalized price offers to customers for specific customization requests, considering the details provided by the customer.

3. Finalize Orders:

3.1 Receive Acceptance: Artists should be notified when a customer accepts their offer, allowing them to proceed with order fulfilment.

3.2 Clarify and Finalize Details: Artists should be able to communicate directly with customers to clarify any remaining details or adjust terms before proceeding with the customization.

Non-functional Requirements

1- Availability

The system must operate 24/7 always always ensuring uninterrupted access and functionality by using multiple servers or instances to prevent single point of failure.

2- Security

User inputs must be validated to prevent SQL Injection, and any attacking attempt by using express validator for input validation.

3-Reliability

All third-party services (e.g., payment gateways, Tracking services providers) must ensure an uptime of at least 99.95%.

4- Performance

End-to-end latency should not exceed 100 milliseconds for real-time interactions (e.g., auction updates or live notifications).

5- Portability

Support responsive design for user interfaces adapting to various screen sizes making it portable across different devices and platforms.

6- Useability

Users should be able to find products or services within 3 clicks.

7- Maintainability

The system should have modular code to facilitate updates and bug fixes.

Use Case Diagram
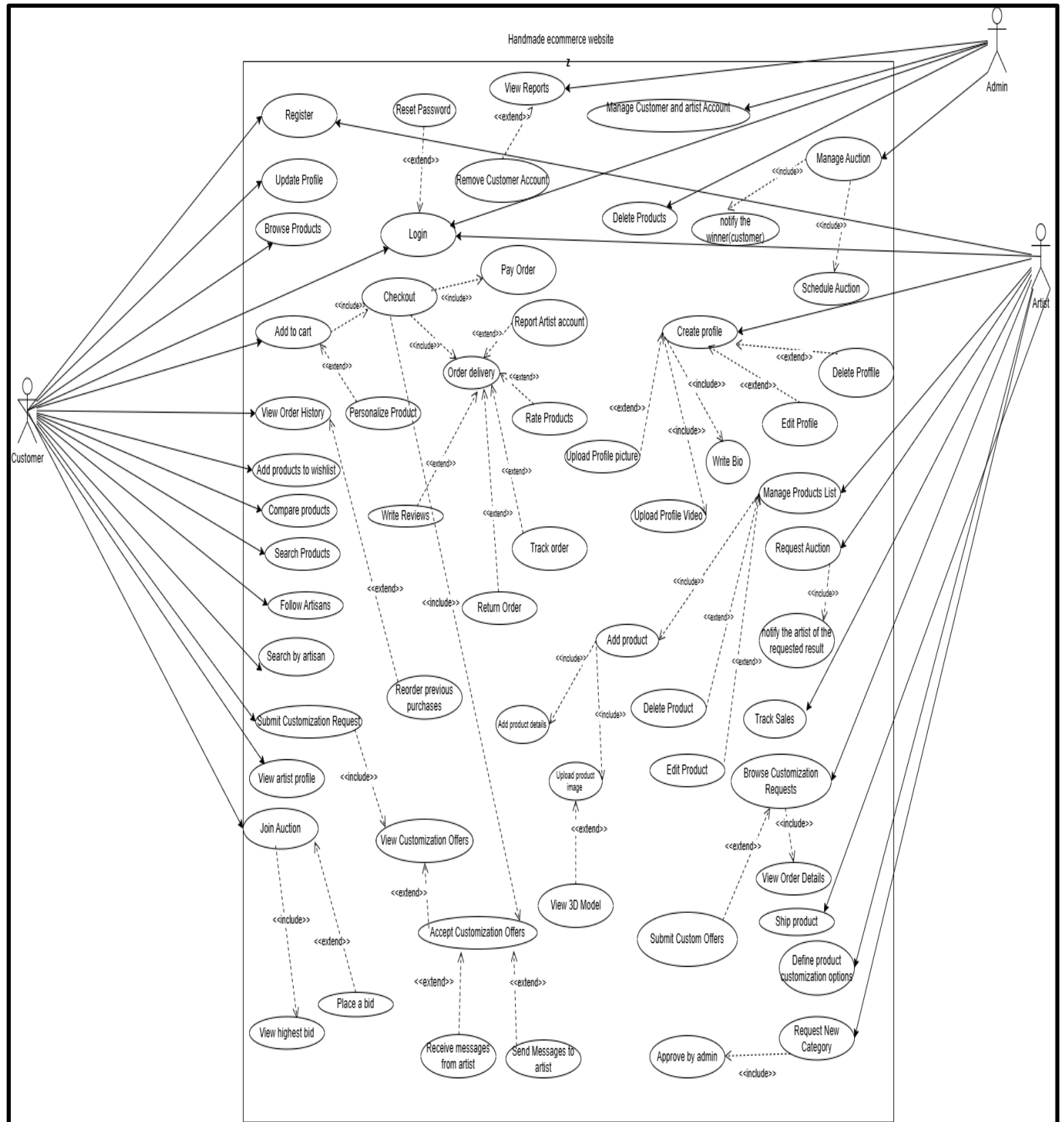
Figure 4: Use Case diagram

Class Diagram

Figure 5: Class diagram 1

1.Account management package
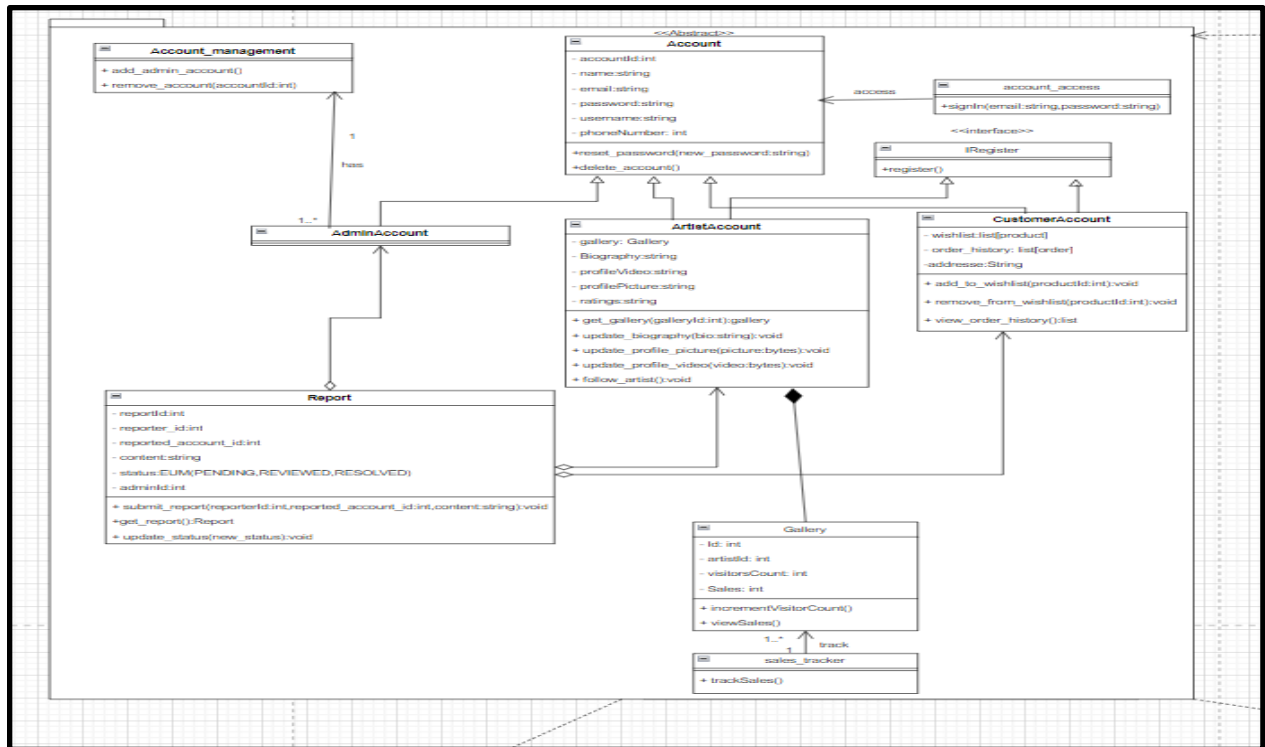
Figure 6: Class diagram 2

2.Order management and Notification management packages
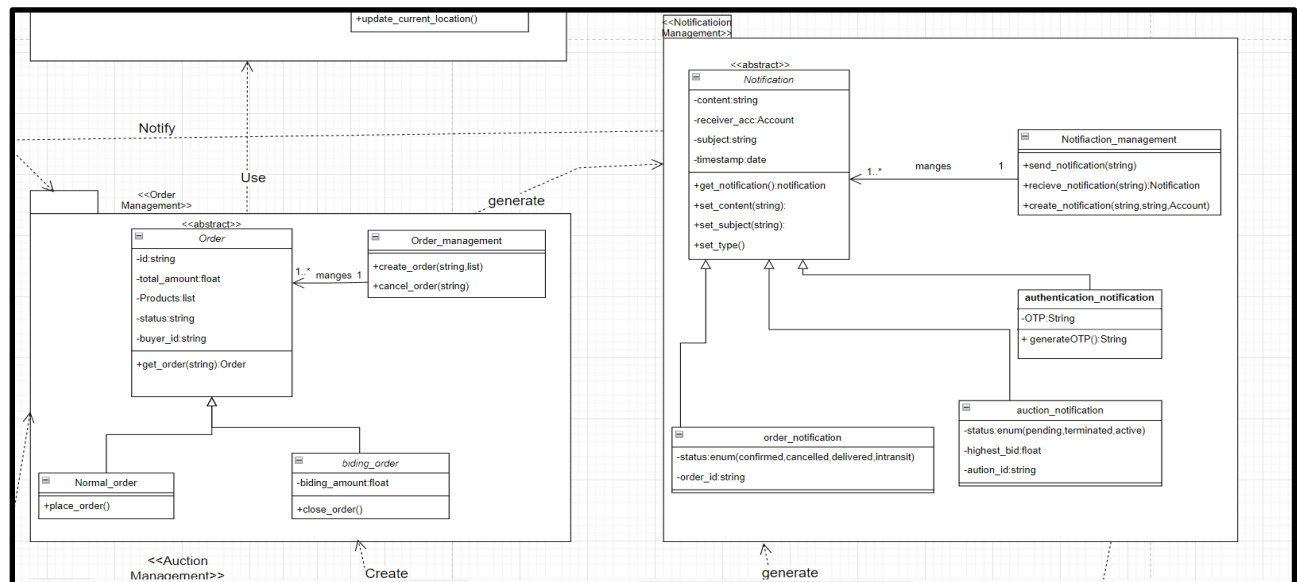
Figure 7: Class diagram 3

3.Product management and Category management packages (applying decorator design pattern)
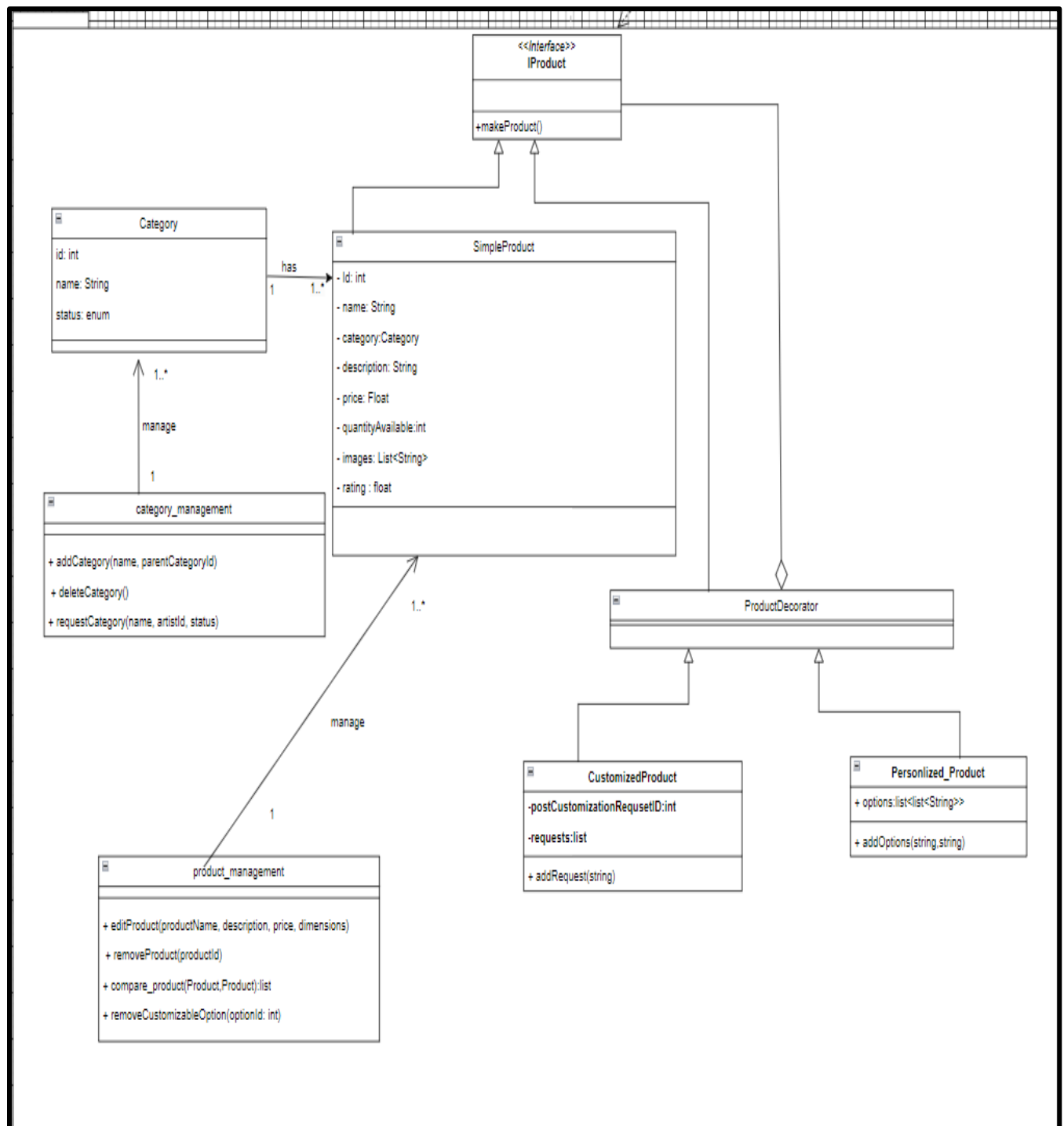
Figure 8: Class diagram 4

4.Auction management package
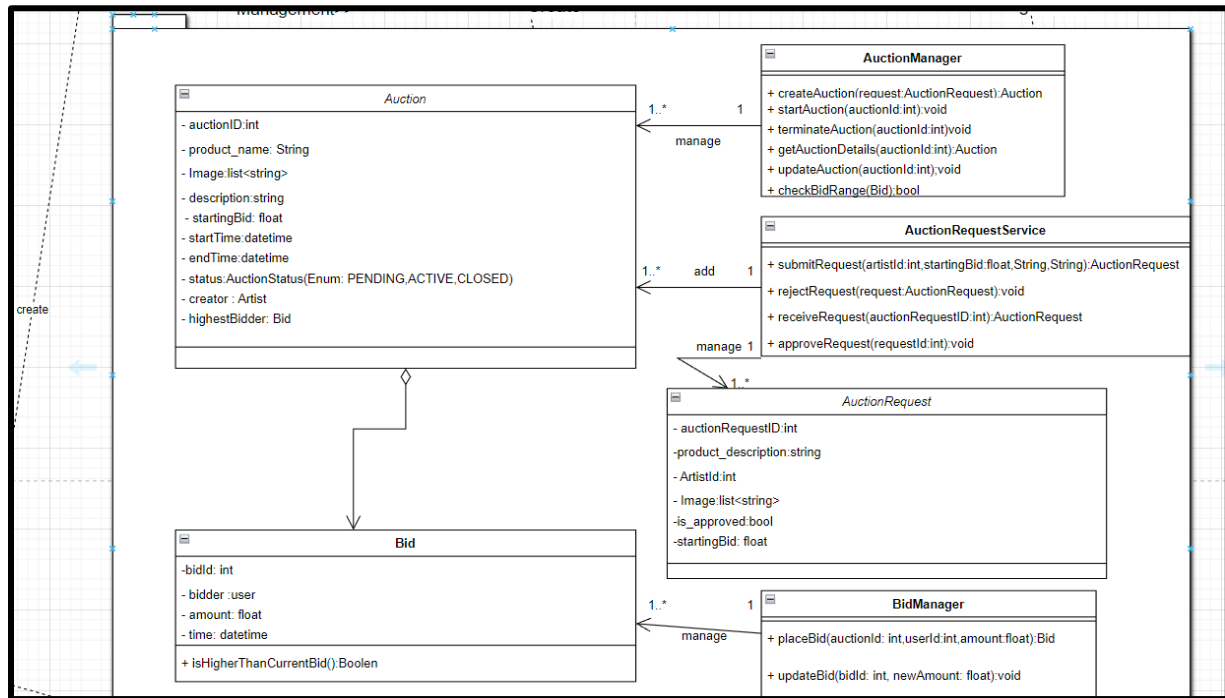
Figure 9: Class diagram 5

5.Customization request management package
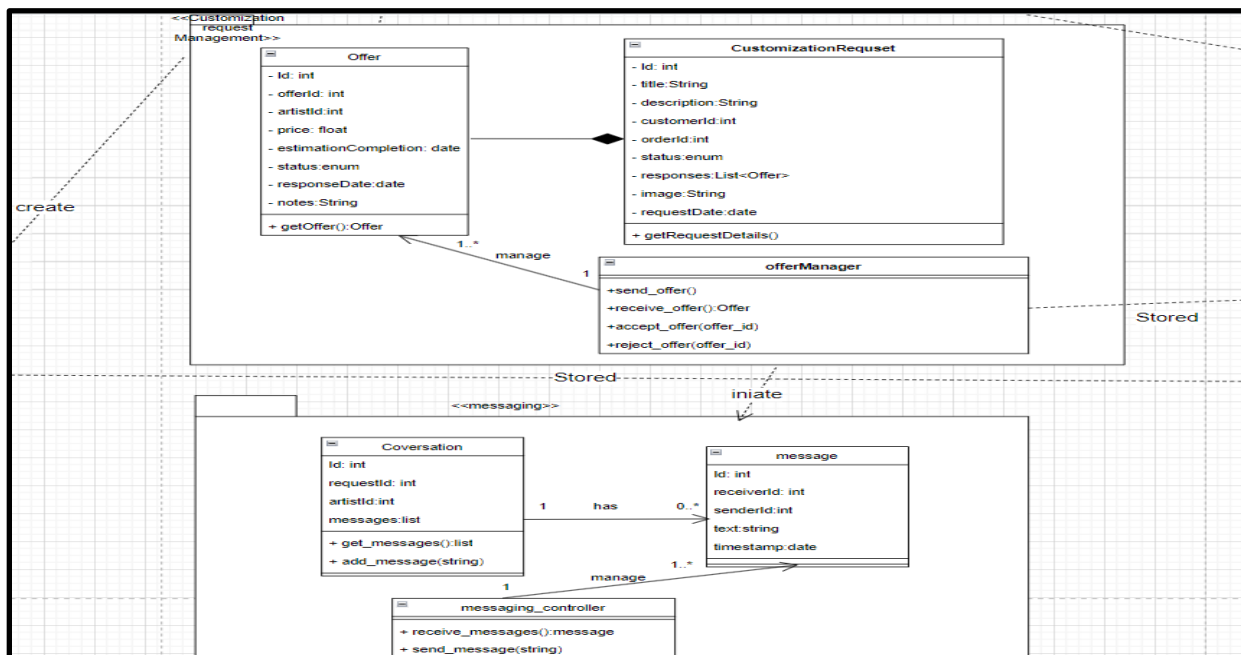
Figure 10: Class diagram 6

6. Third-party (subsystems)
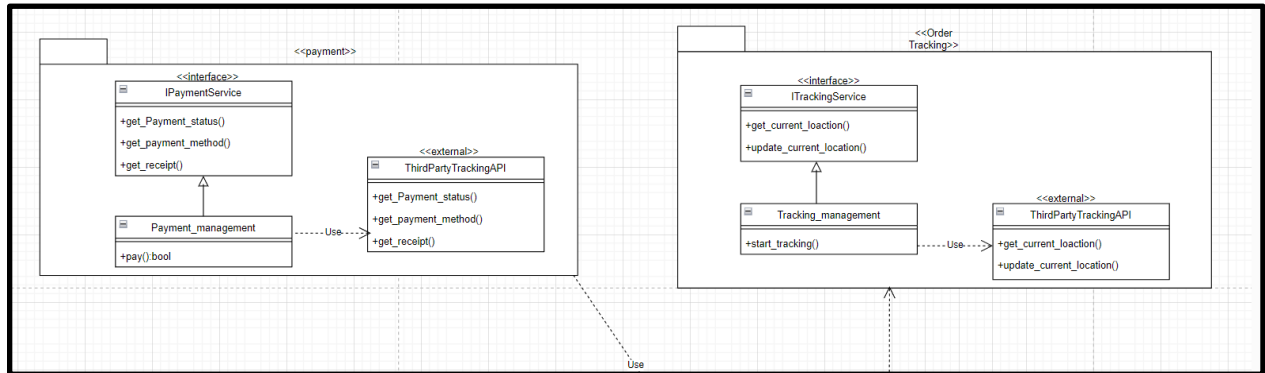
Figure 11: Class diagram 7

7. Database Manager package (applying singleton design pattern)
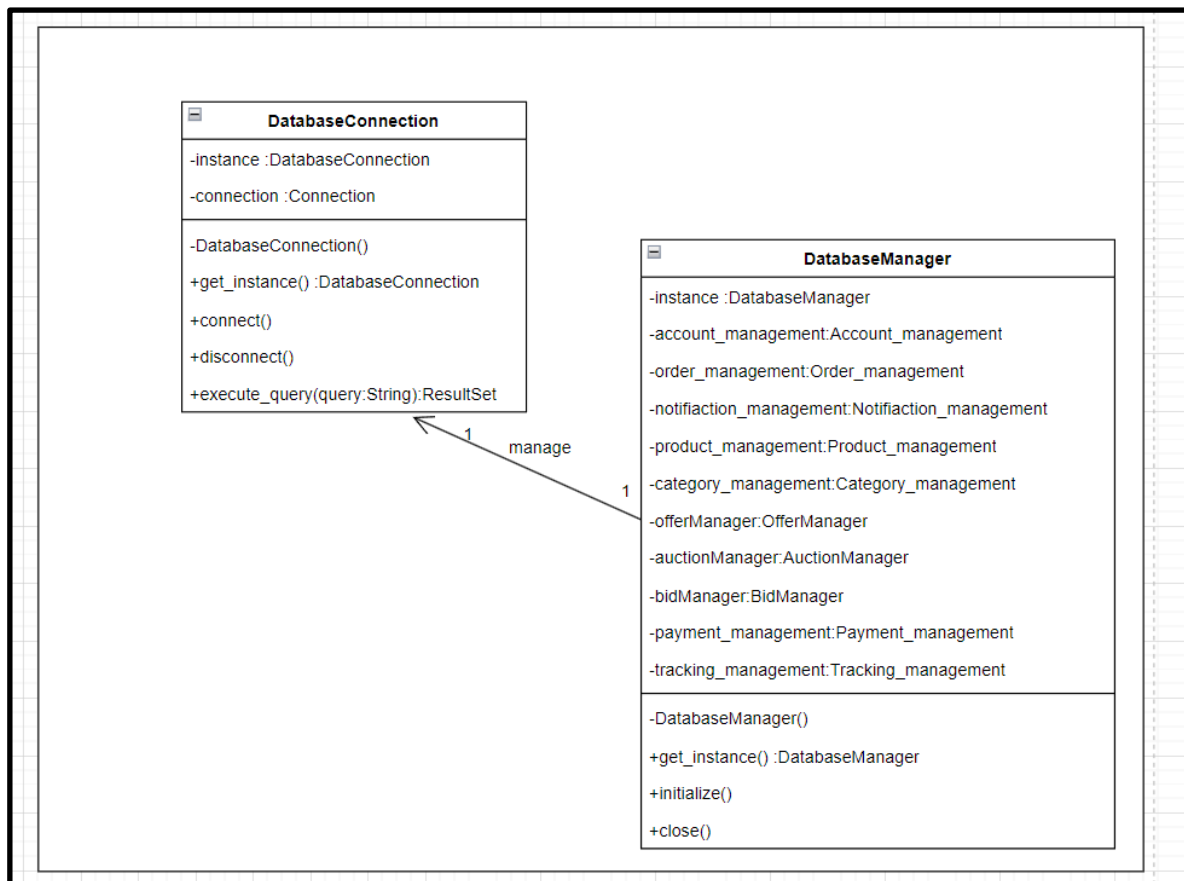
Figure 12: Class diagram 8

Sequence Diagrams

1.Submit offers for Customization Requests
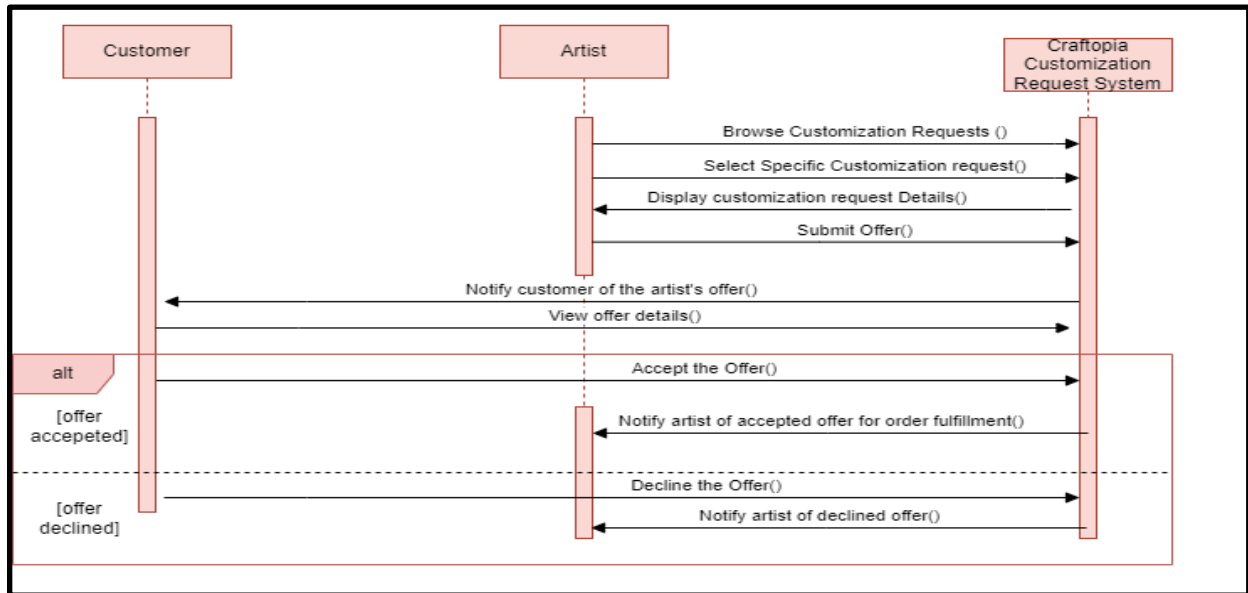
Figure 13: Sequence 1 (Submit offers for Customization Requests)

2. Order Placement
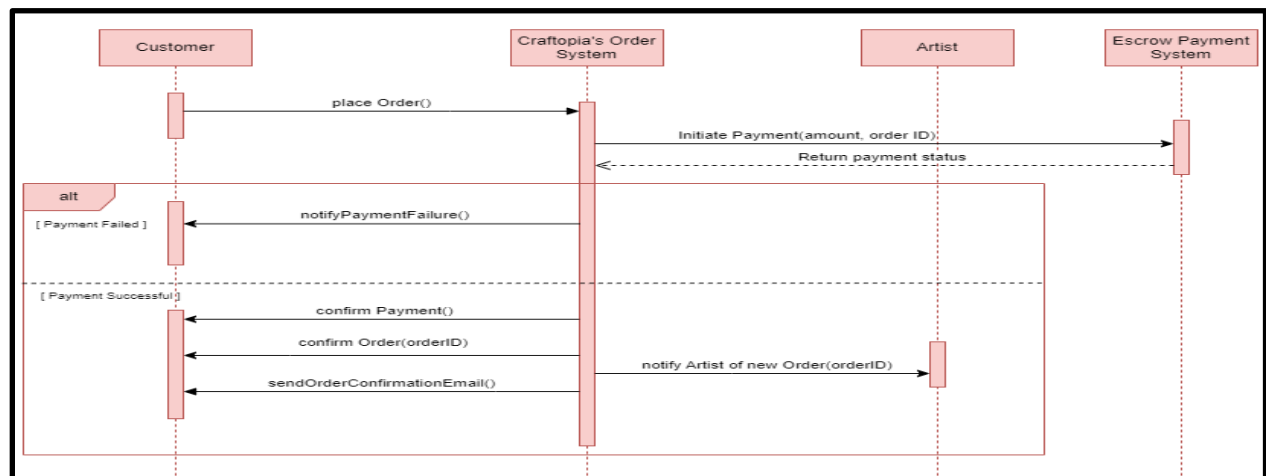
Figure 14: Sequence 2 (Order Placement)

3.Auction Initiation
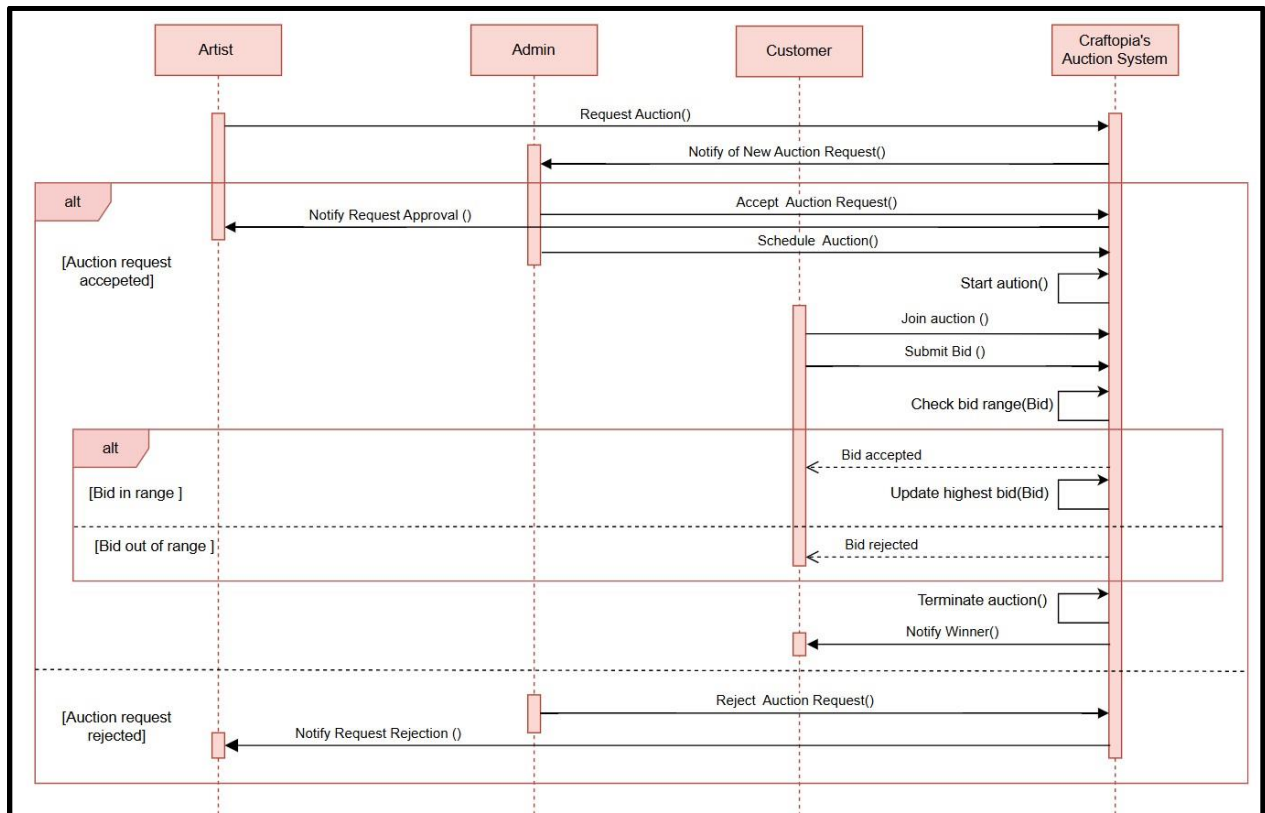
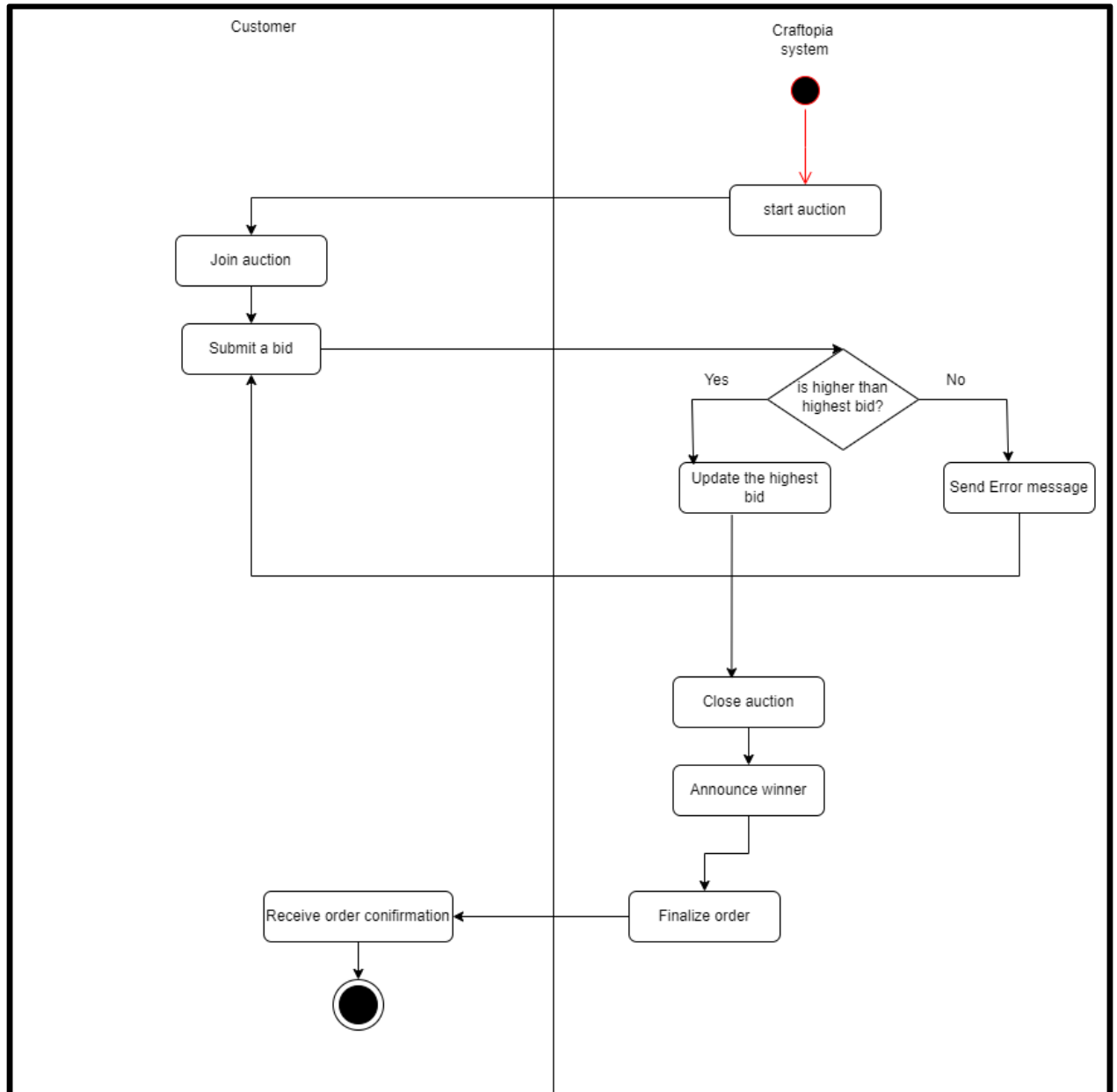

Figure 15: Sequence 3 (Auction Initiation)

Activity Diagrams

1. Auction initiation

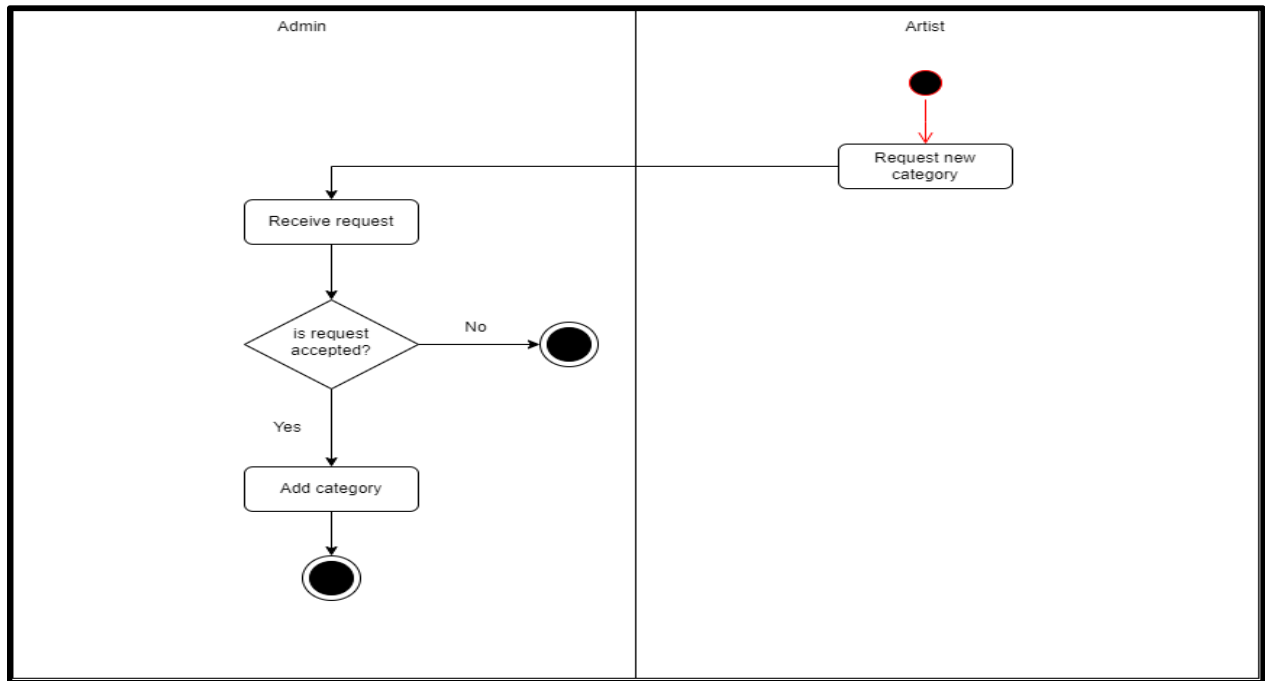**Figure 16: Activity 1 (Auction Initiation)**

2.Request New Category

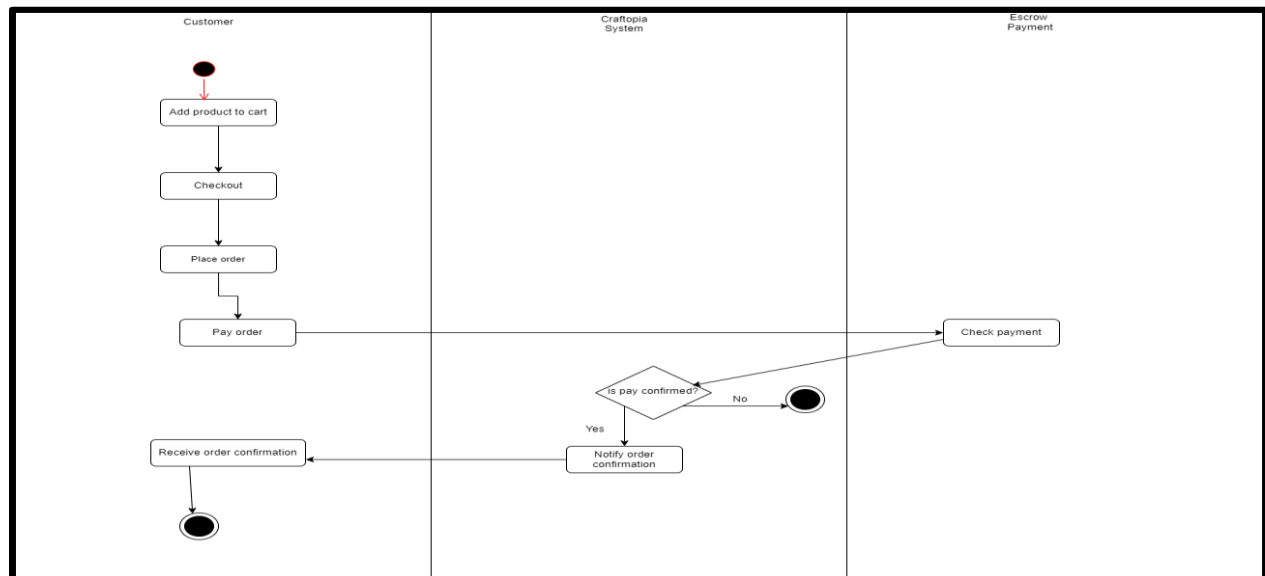**Figure 17: Activity 2 (Category Request)**

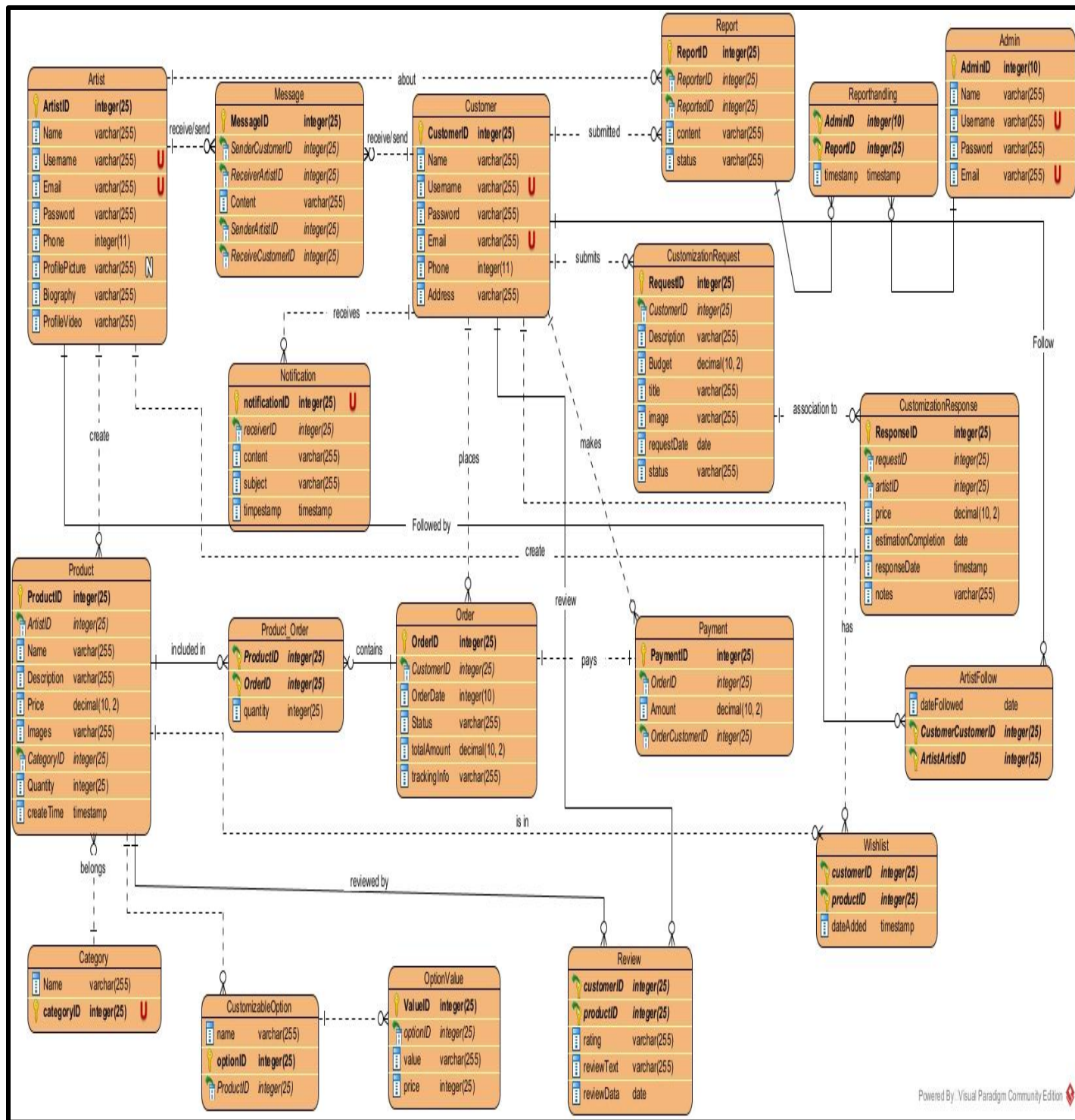## 3. Order Placement

Figure 18: Activity 3 (Order Placement)

ERD Diagram

Figure 19: ERD Diagram

Firebase Realtime Database

Tables:

Auction:

Key: AuctionID

Fields:

productID: integer

artistID: integer

startPrice: decimal

currentBid: Bid

startTime: date

endTime: date

Status: string

Bids:

Key: BidID

Fields:

auctionID: integer

customerID: integer

BidAmount: integer

References

Etsy website: www.etsy.com

Folksy website:www.folksy.com

Amazon Handmade website: www.amazon.ae/handmade

Muqbis website: www.muqbis.com

Escrow Pay: www.escrow.com/pay