Garage Master: Project Proposal

Members	
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Project Goal: The primary goal of the "Garage Master" project is to create an online platform that specializes in selling parts and items for car and bike modifications. This platform will allow users to browse, customize, and purchase modification parts with ease, and see a preview of how their vehicles after the modifications will look like. The project aims to provide a seamless and engaging user experience from browsing to checkout, incorporating various design patterns to ensure efficiency and scalability.

End User: The end users are car and bike enthusiasts who are interested in modifying and customizing their vehicles. These users may range from casual hobbyists to serious automotive enthusiasts. They seek a convenient and reliable online platform where they can explore a wide variety of parts, visualize modifications, and purchase items with flexible payment and delivery options. They appreciate user-friendly interfaces and detailed product information to help them make informed decisions.

Functional and Non-functional requirements

Functional requirements: Functional requirements specify the specific behaviors, functions, and features of a system. They describe what the system should do.

1. **User Authentication and Authorization**
   - Users must be able to create accounts and log in using their email and password.
   - Only authenticated users can make purchases.
2. **Product Management**
   - Display car and bike modification items on the homepage.
   - Allow users to switch between car and bike sections.
   - Search functionality for finding specific parts or items.
   - Users can add items to the cart.
   - Users can add items to wish list.
3. **Product preview**
   - Show a preview of how the car/bike will look like after modifications with selected items.
4. **Shopping Cart and Wishlist**
   - Users can add items to their shopping cart and wish list.
   - Display the items in the cart and wish list.
   - Option to send the car/bike to the garage or request home delivery of parts.

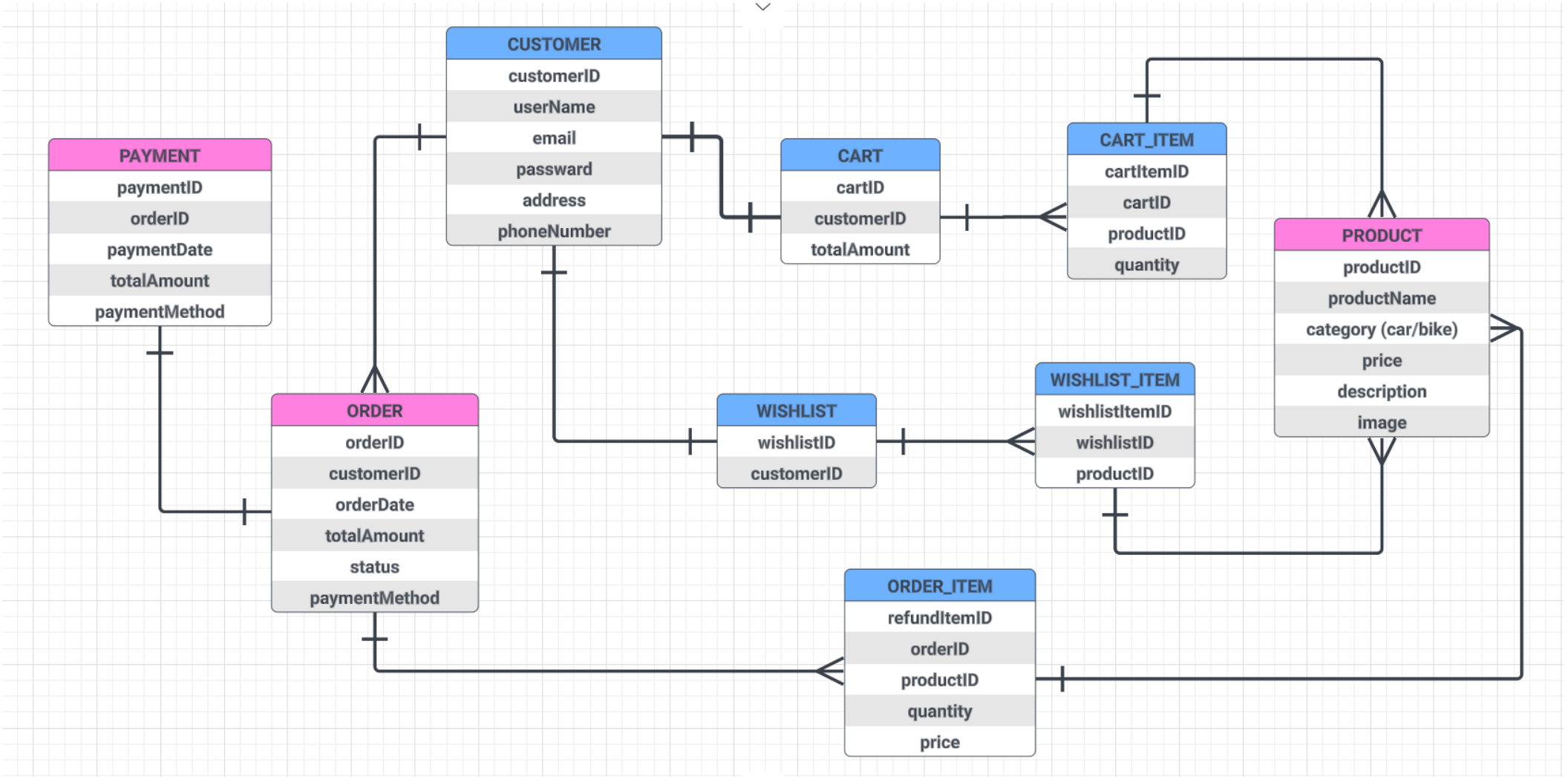
5. **Payment System**
    - Provide different payment options: Cash on Delivery (COD), mobile banking, and card payment etc.
    - Process payments securely and confirm orders.
6. **Order Processing**
    - Allow users to confirm their orders after selecting delivery options and payment methods.
    - Notify users about their order status via email.

Non-functional requirements: Non-functional requirements outline the quality attributes, performance metrics, and constraints of a system. They describe how the system should perform.

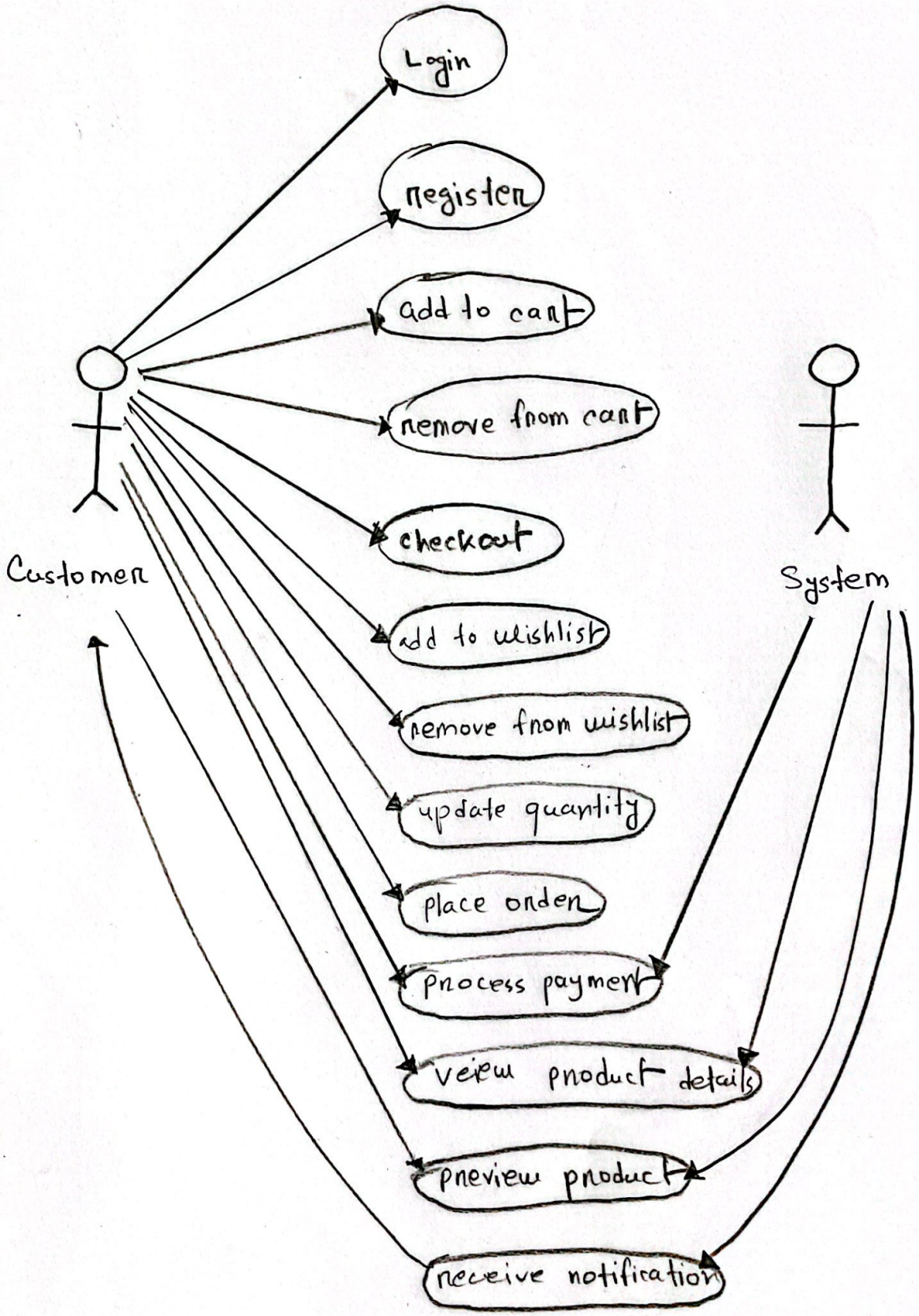
1. **Performance**
    - The website should load within a few seconds.
    - The preview feature should render quickly and accurately.
2. **Reliability**
    - The system should have high availability.
    - Ensure data consistency and handle failures.
3. **Security**
    - Implement strong authentication mechanisms.
    - Secure payment processing using encryption and secure connections (HTTPS).
4. **Usability**
    - The interface should be user friendly and easy to navigate.
    - Provide clear instructions and feedback to users.

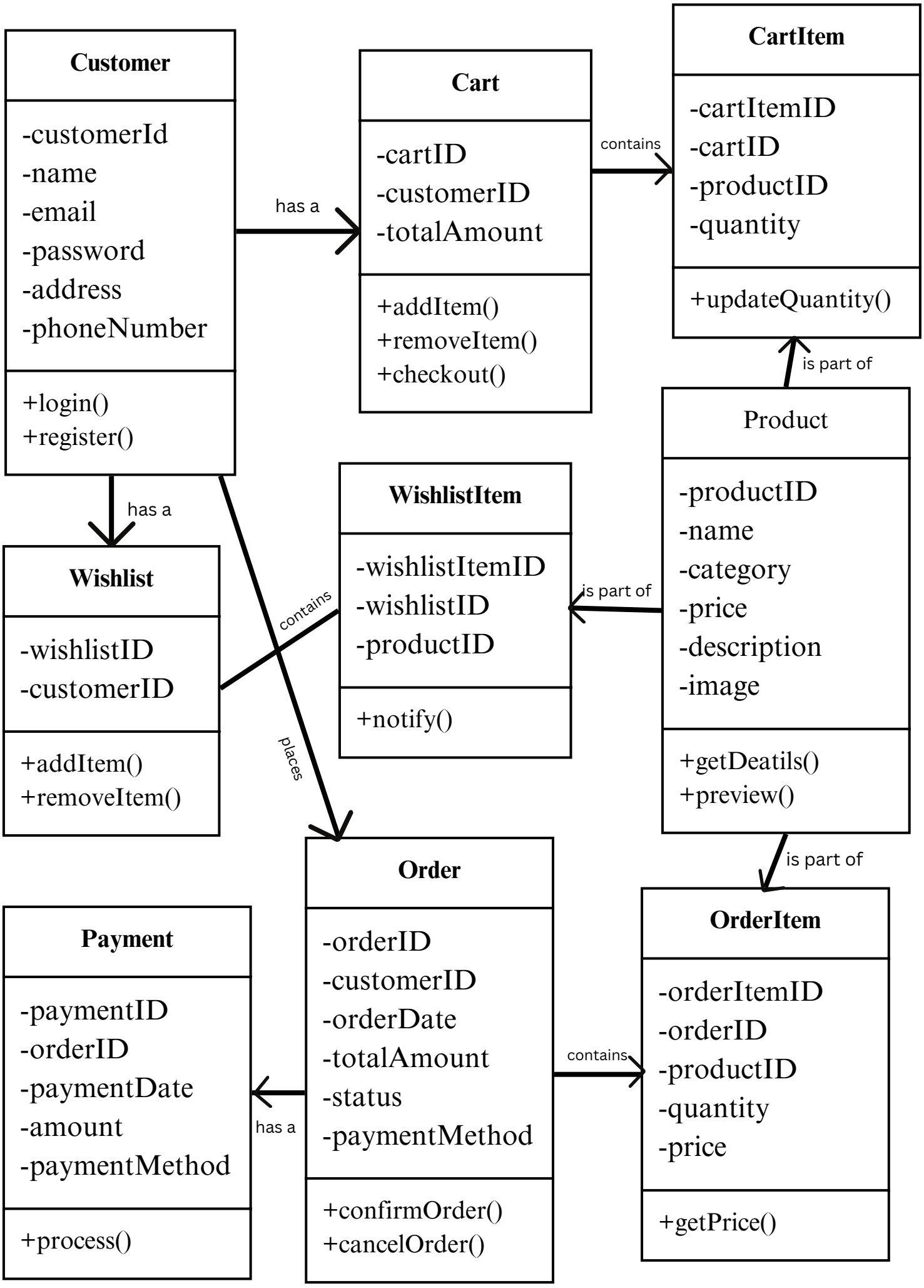
5. **Scalability**
   - The system should handle increasing numbers of users and transactions efficiently.
   - Design for future expansion and additional features.
6. **Maintainability**
   - Use different design patterns (e.g., Strategy, Decorator, Observer) to ensure the system is easy to update and extend.
   - Keep the codebase well-documented and clean.
7. **Portability**
   - Ensure the website is responsive and works well on different devices (desktops, tablets, smartphones).
   - Support major web browsers (Chrome, Safari, Edge).

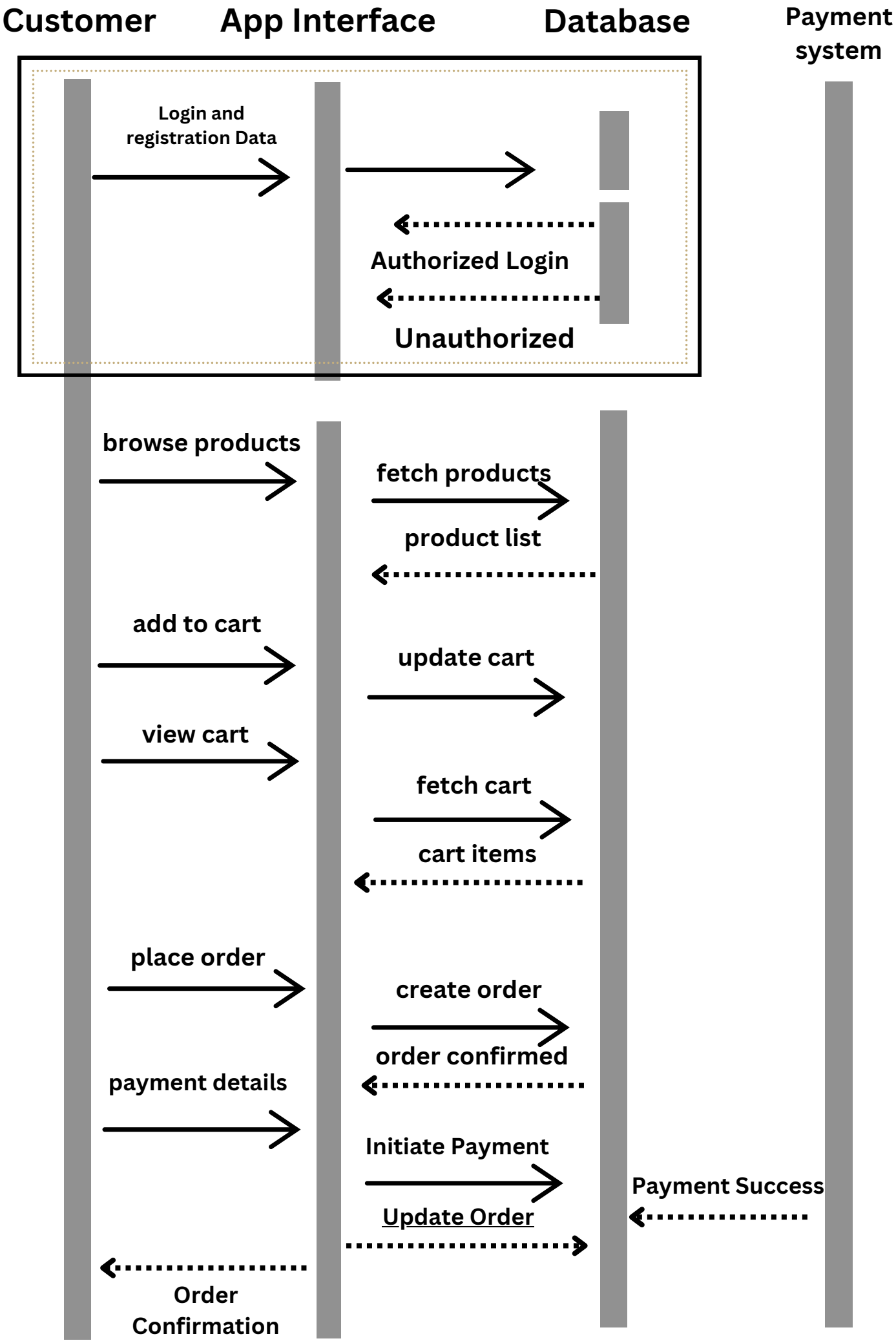
ER Diagram:


CUSTOMER
customerID
userName
email
password
address
phoneNumber
PAYMENT
paymentID
orderID
paymentDate
totalAmount
paymentMethod
CART
cartID
customerID
totalAmount
CART_ITEM
cartItemID
cartID
productID
quantity
PRODUCT
productID
productName
category (car/bike)
price
description
image
ORDER
orderID
customerID
orderDate
totalAmount
status
paymentMethod
WISHLIST
wishlistID
customerID
WISHLIST_ITEM
wishlistItemID
wishlistID
productID
ORDER_ITEM
refundItemID
orderID
productID
quantity
price

USE-CASE DIAGRAM




Customer
-customerId
-name
-email
-password
-address
-phoneNumber
+login()
+register()
has a
Cart
-cartID
-customerID
-totalAmount
+addItem()
+removeItem()
+checkout()
contains
CartItem
-cartItemID
-cartID
-productID
-quantity
+updateQuantity()
is part of
Product
-productID
-name
-category
-price
-description
-image
+getDeatils()
+preview()
has a
Wishlist
-wishlistID
-customerID
+addItem()
+removeItem()
contains
WishlistItem
-wishlistItemID
-wishlistID
-productID
+notify()
is part of
places
Order
-orderID
-customerID
-orderDate
-totalAmount
-status
-paymentMethod
+confirmOrder()
+cancelOrder()
is part of
OrderItem
-orderItemID
-orderID
-productID
-quantity
-price
+getPrice()
contains
has a
Payment
-paymentID
-orderID
-paymentDate
-amount
-paymentMethod
+process()


Customer
App Interface
Database
Payment system
Login and registration Data
Authorized Login
Unauthorized
browse products
fetch products
product list
add to cart
update cart
view cart
fetch cart
cart items
place order
create order
order confirmed
payment details
Initiate Payment
Payment Success
Update Order
Order Confirmation