Phase III: Software Design and Modeling

Deadline: April 1st, 2024, 23:59

Group Name: Group 5, E-commerce Website

Software Design and Modeling

Software Architecture

1. System Architecture:

Explain how different parts of the system work together. Think of it as describing the big picture of your application - what it does and how it does it.

User Interface: The user Interface will serve as the gateway for all the people interested to see the SkinBliss web application. It presents the visual part of this web application and gives the users the opportunities to see the different sections of the application such as browsing products viewing recommendations, managing their orders, and leaving or seeing reviews.

User Authentication: Is used to secure the access on the specific features and information of each role accounts(user/admin). During the registration process the users fill in their information such as name, surname, email, phone number and password which are securely stored and used later for the log in process.

Product Catalog: The product catalog or categorization makes the most important part of all our web application. This part makes it very easy for the client to search for what he needs. Products are organized based on their function, brand, and reviews, allowing user to browse products based on their preferences and needs.

Personalized Recommendations: As mentioned above we are going to categorise our products based on their function and purpose. Users will select their skin problems and algorithms will analyse this data to generate later the recommended products based on their skin imperfections.

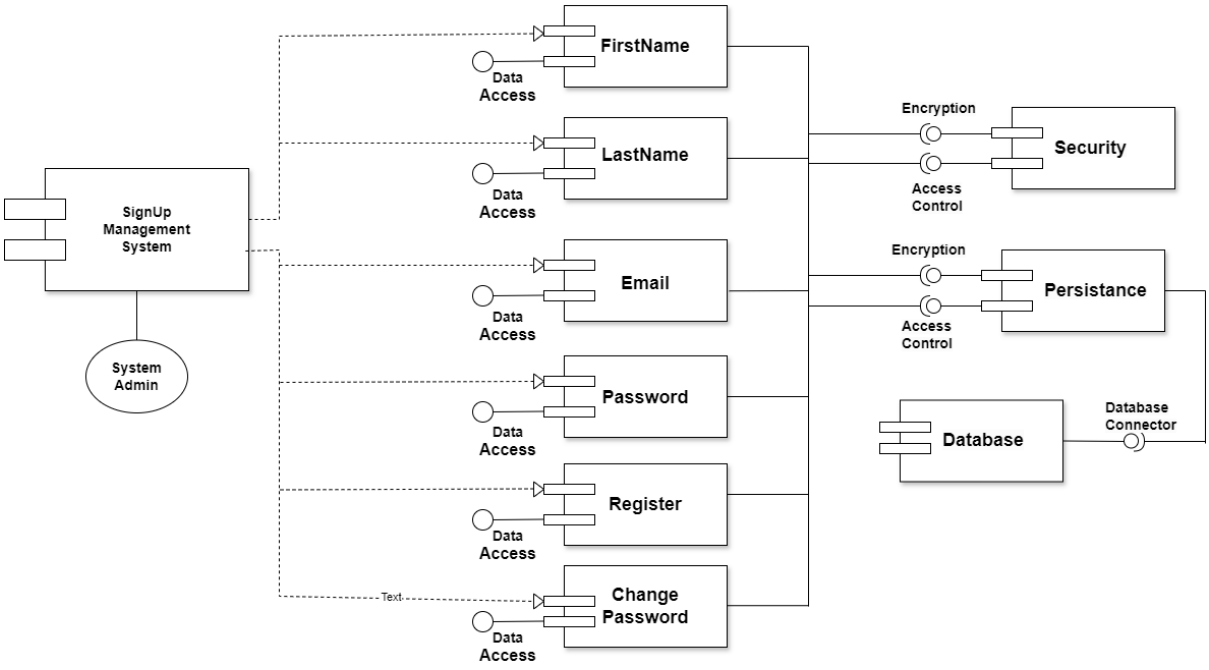
Review Section: SkinBliss includes a review section where users can share their experience and opinion on purchased products. A transparent review section will contribute into the platforms credibility and help the new customers make more informed decisions about the product suitability.

Order Management: This system will be used to enable customers to manage their orders. Users can add products to their cart, remove or change their quantity, review the order details and confirm orders. Once the order will be set, they can check it through the section.

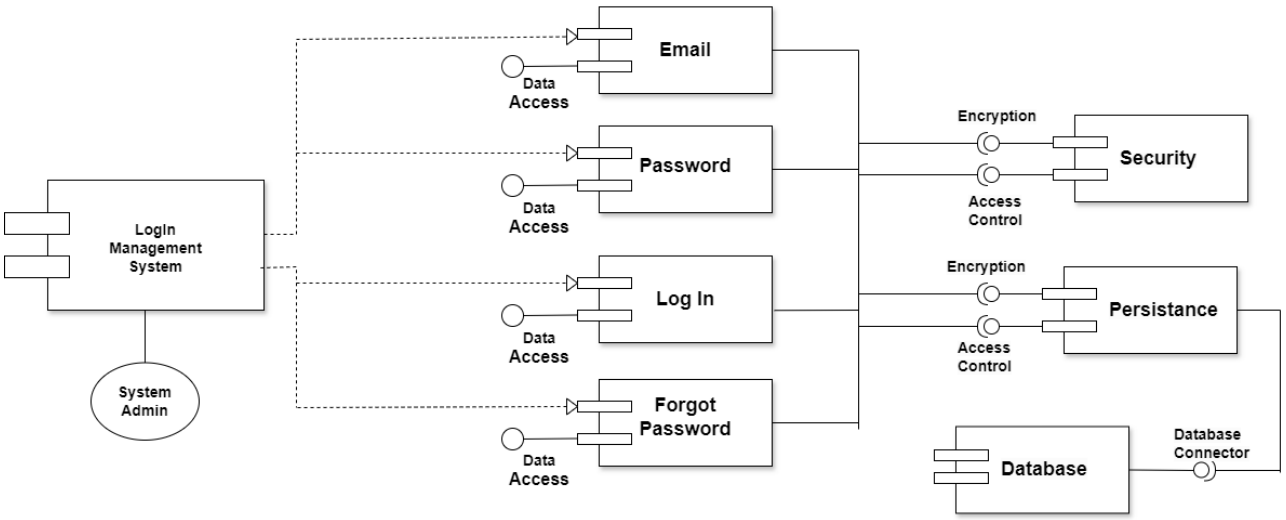
Performance and security: The web application is designed for fast loading times and efficient data recovering, increasing overall responsiveness. As for the security part, it includes security measures such as encryption protocols and secure payment processing, safeguard user data and privacy.

2. Component Diagram:

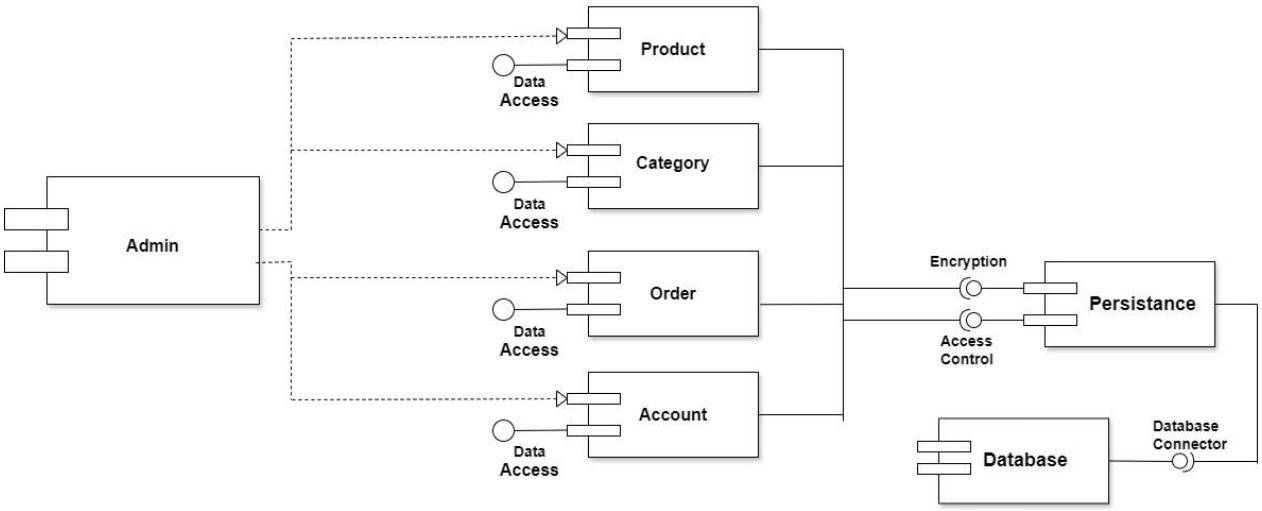
Sign up component diagram

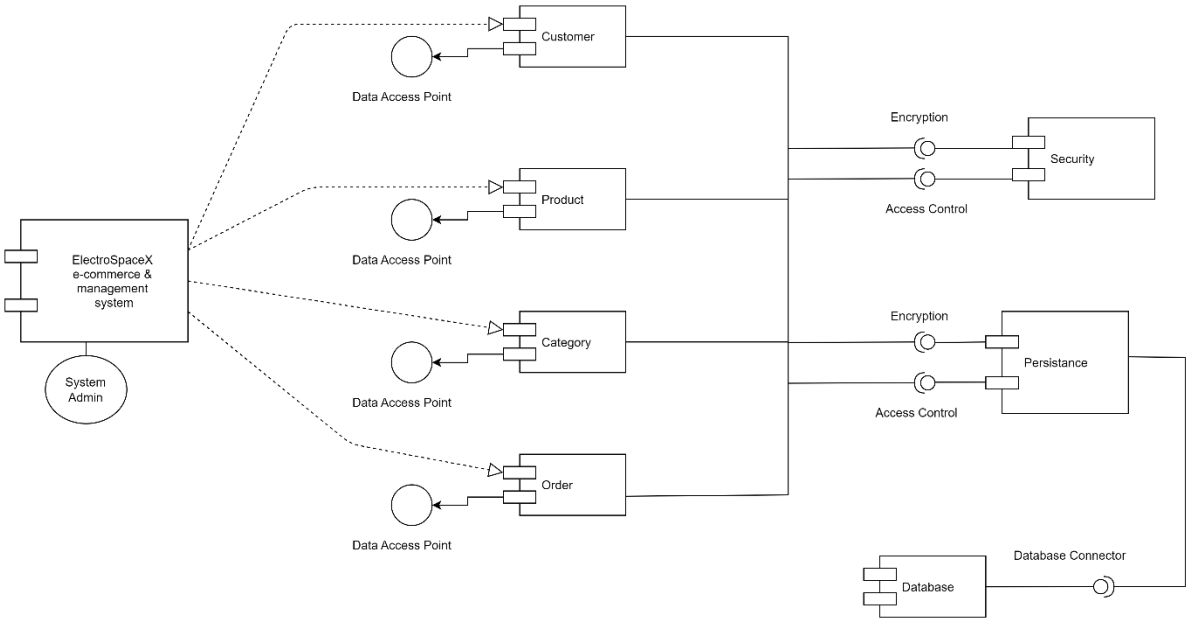


Log In component Diagram

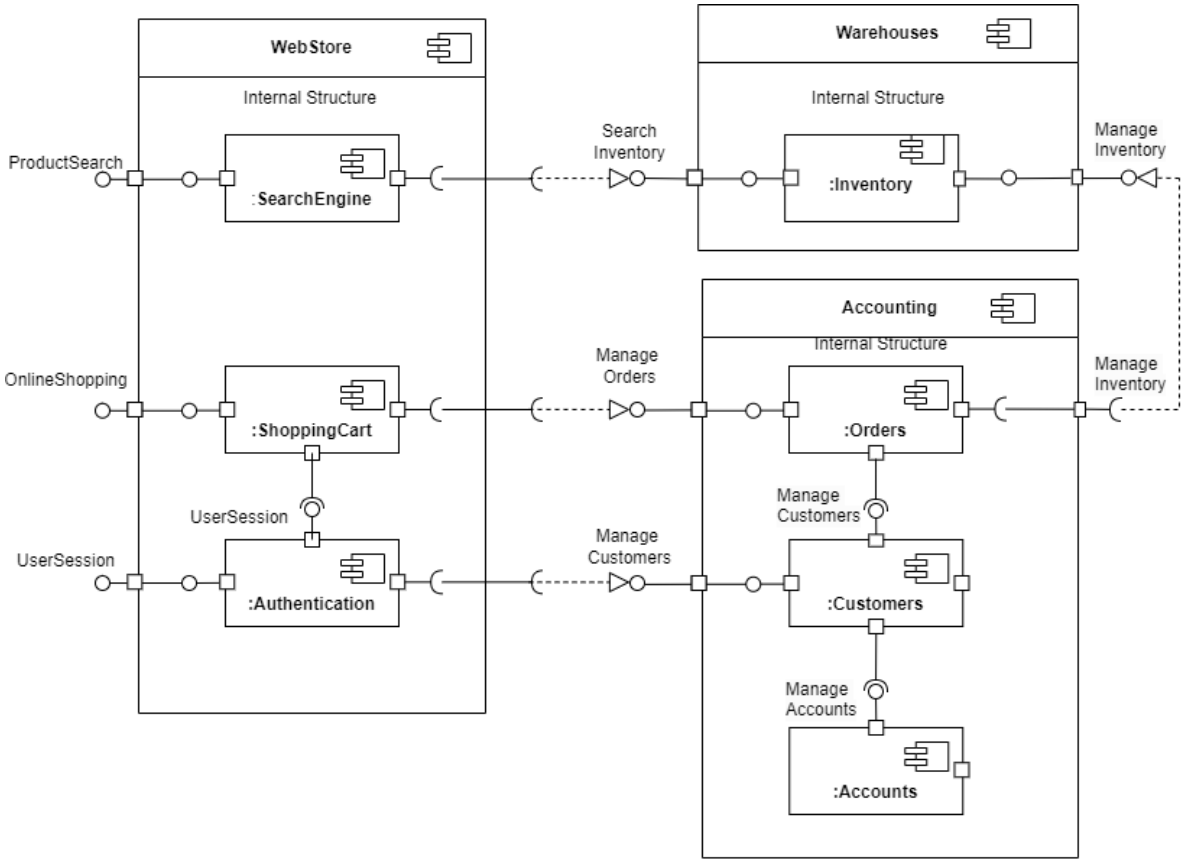


Admin Component Diagram



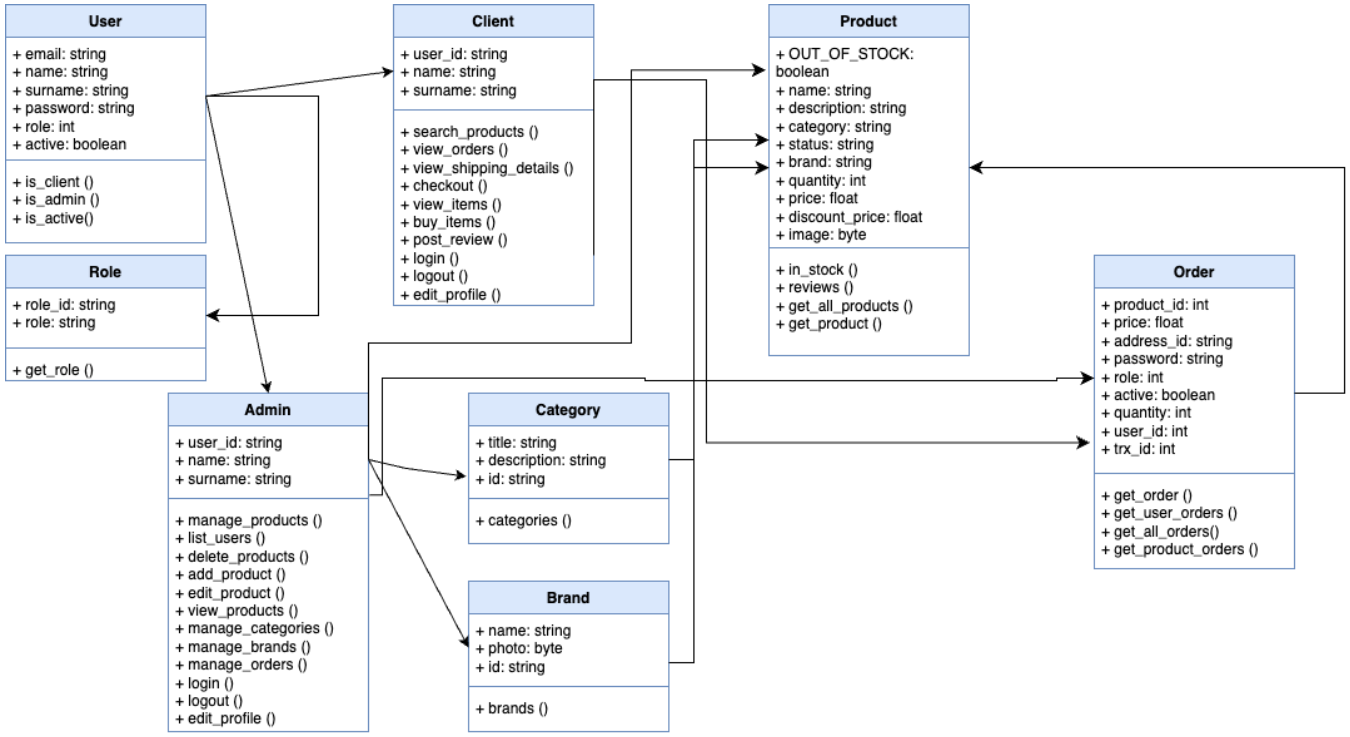


Customer Component Diagram



Detailed Design

3. Class Diagram



The class diagram shows the relationships between several classes including User, Client, Company, Product, Role, Admin, Category, Brand and Order. Here's a breakdown of the connections:

- User:

Has an is_client() function which implies a connection to the Client class.
Has an is_admin() function which implies a connection to the Admin class.

- Client:

Inherits from the User class.

- Admin:

Inherits from the User class.
Has a manage_products() function which implies a connection to the Product class.
Has a manage_categories() function which implies a connection to the Category class.
Has a manage_brands() function which implies a connection to the Brand class.
Has a manage_orders() function which implies a connection to the Order class.
Has a list_users() function which implies a connection to the User class.

- Product:

Connects to the Category class through an unnamed association.
Connects to the Brand class through an unnamed association.
Connects to the Order class through an unnamed association.

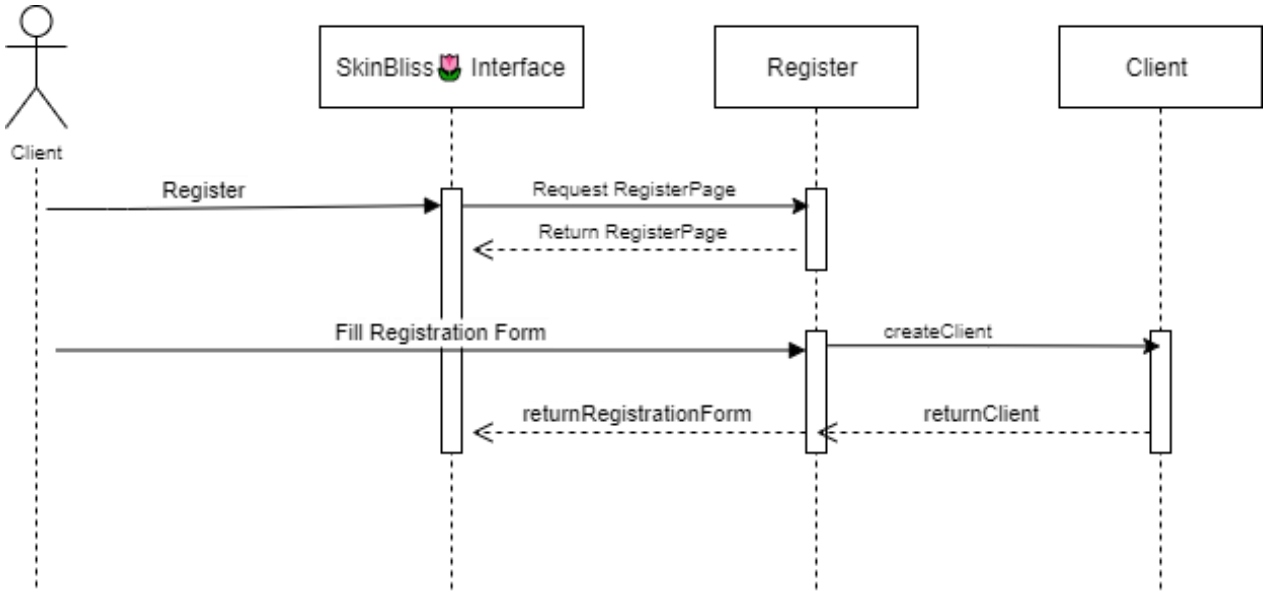
- Order:

Connects to the User class through an unnamed association. Likely this association refers to the client who placed the order.

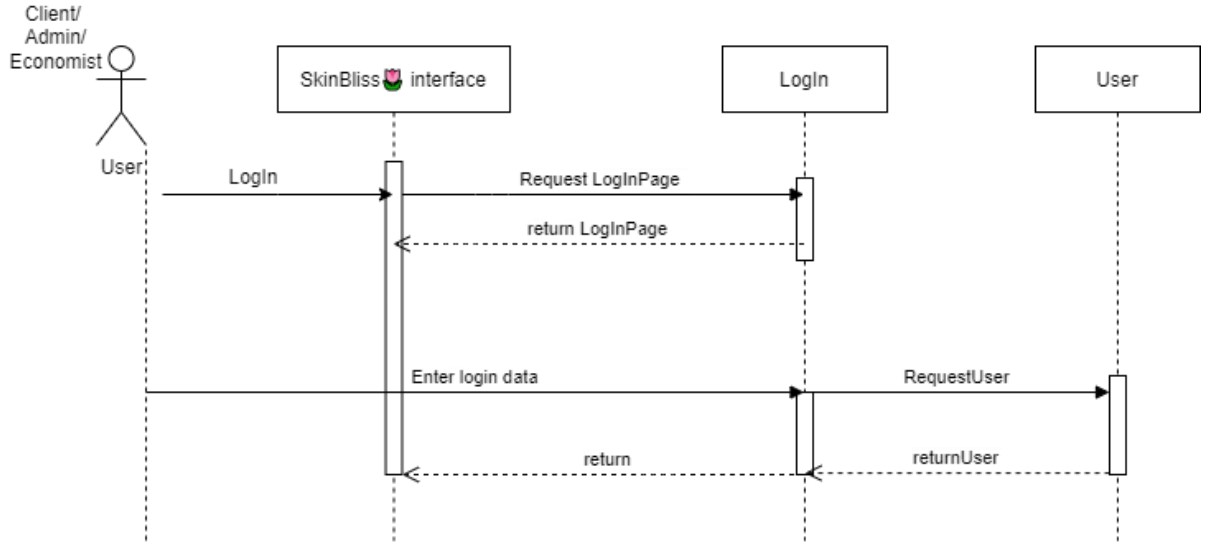
From the above, we can see that the User class is the most general class in the diagram. It has two child classes, Client and Admin. The Admin class has several functions that manage the other classes in the diagram such as products, categories, brands and users.

4.Sequence Diagrams

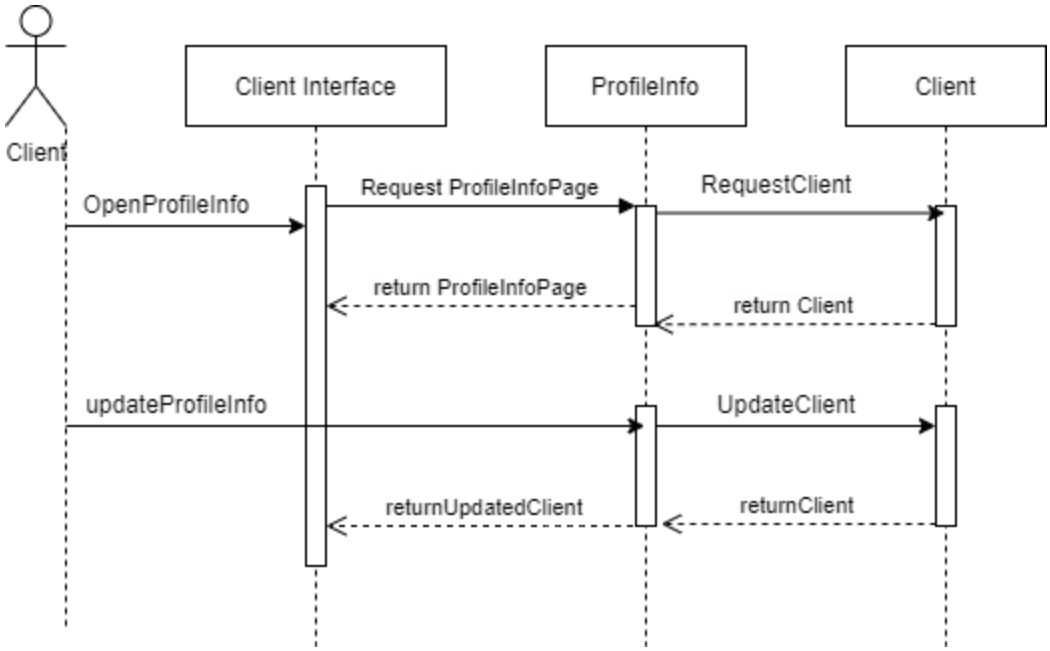
Customer Register Sequence Diagram



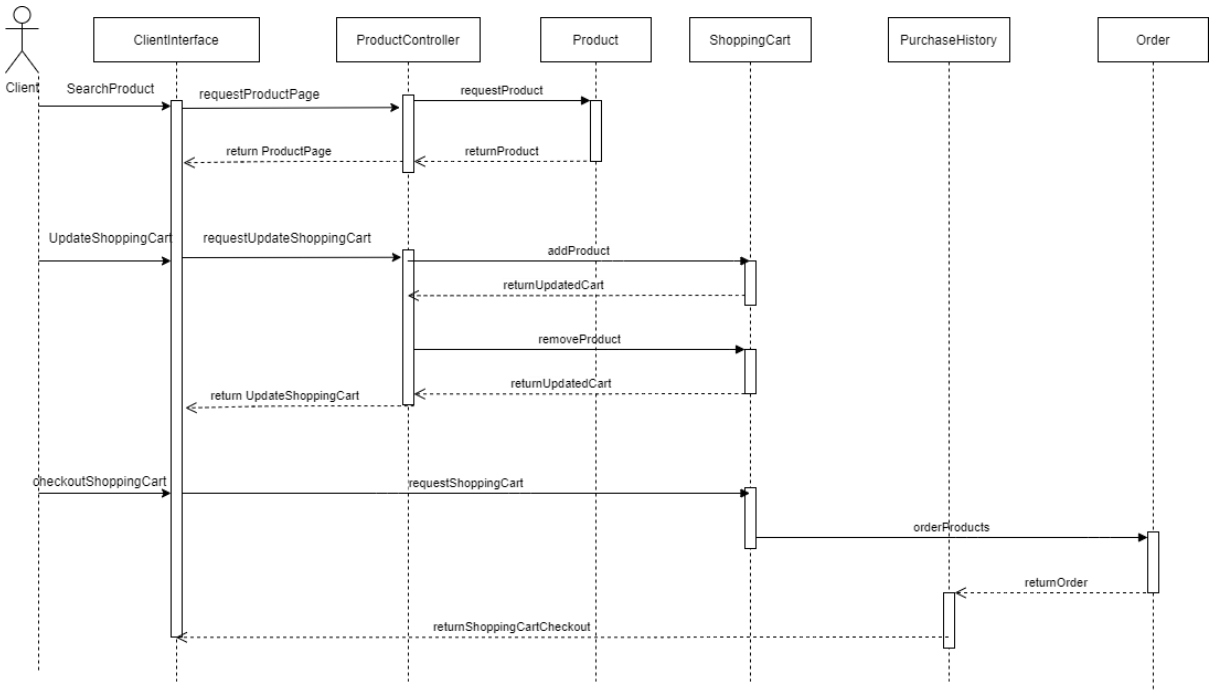
Customer/User LogIn sequence Diagram



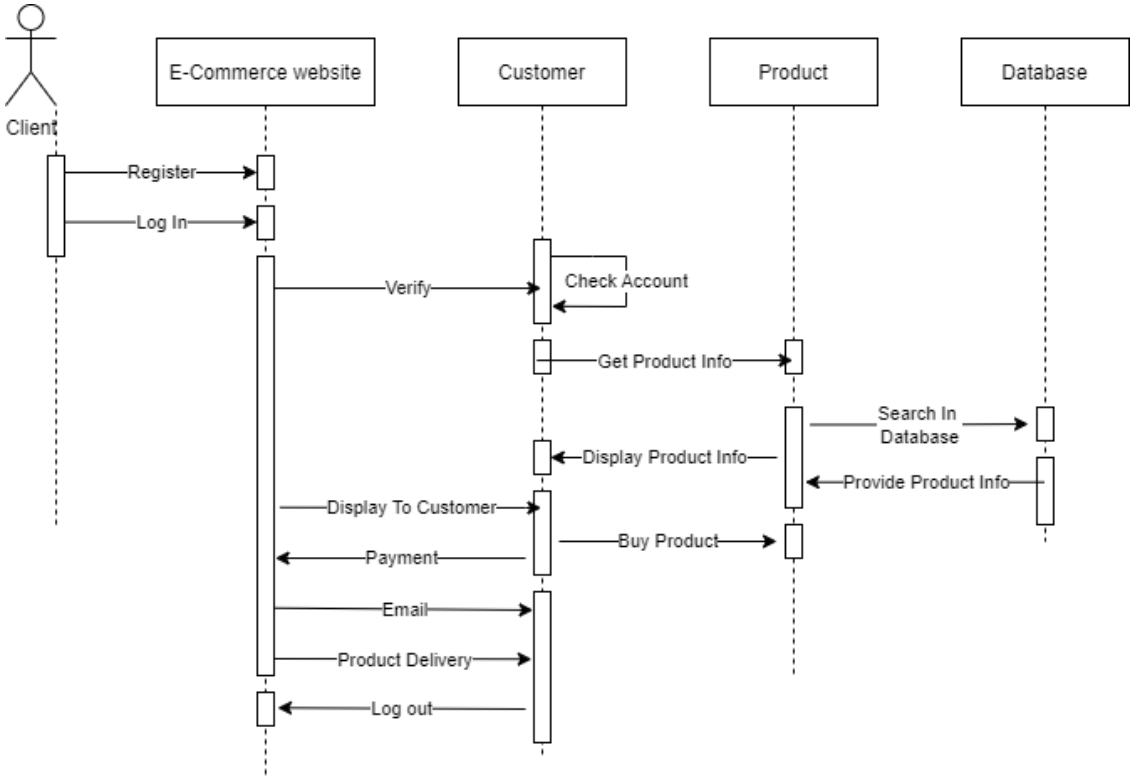
Customer/User Profile Information Sequence Diagram



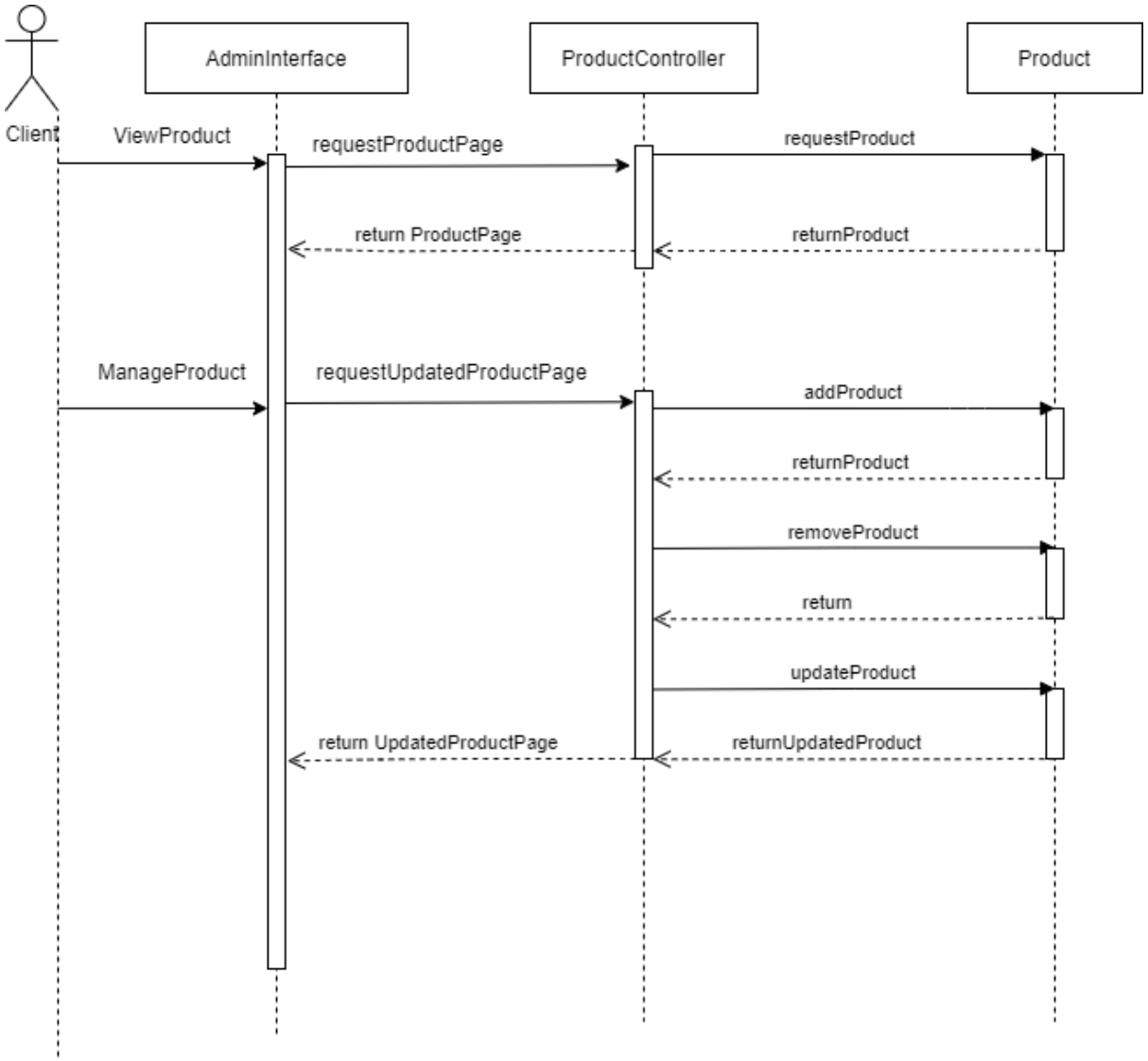
Customer/User Management of Shopping Cart Order Sequence Diagram



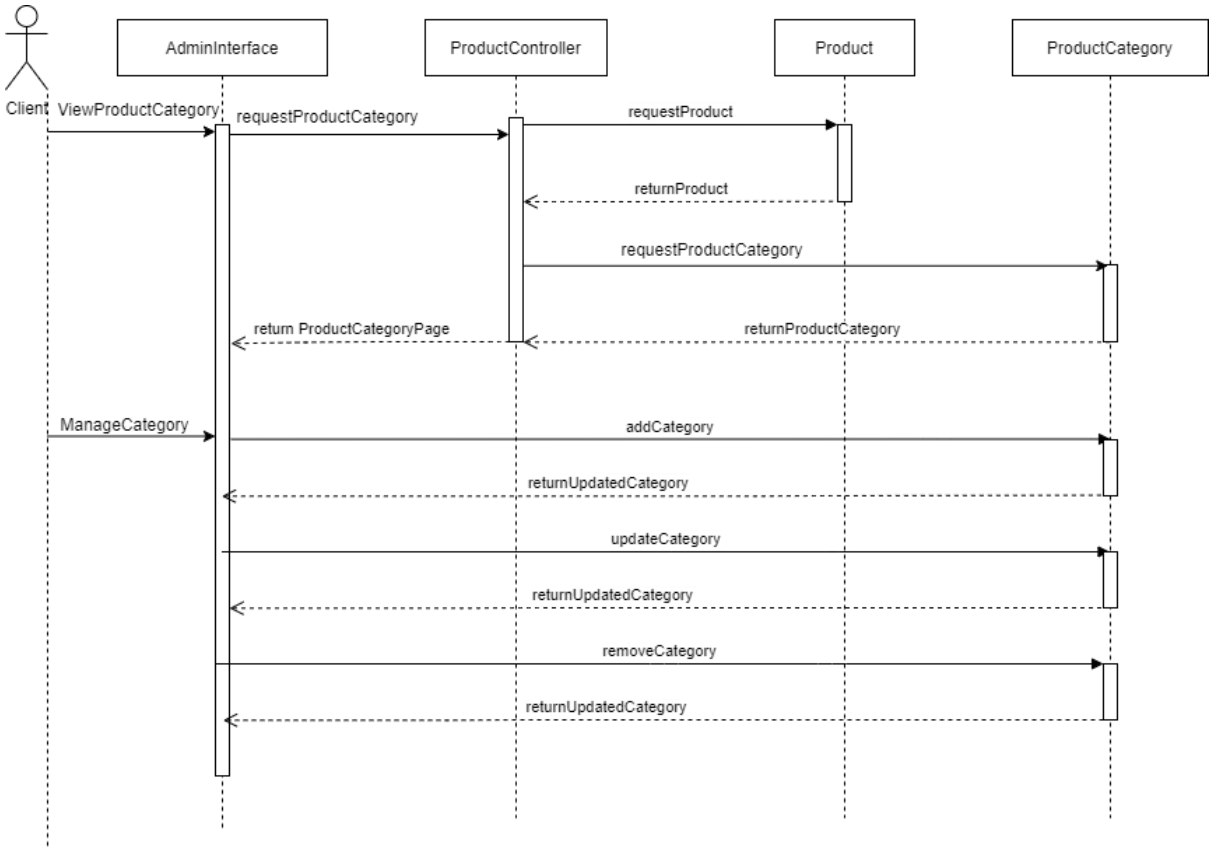
General User Interface Sequence Diagram



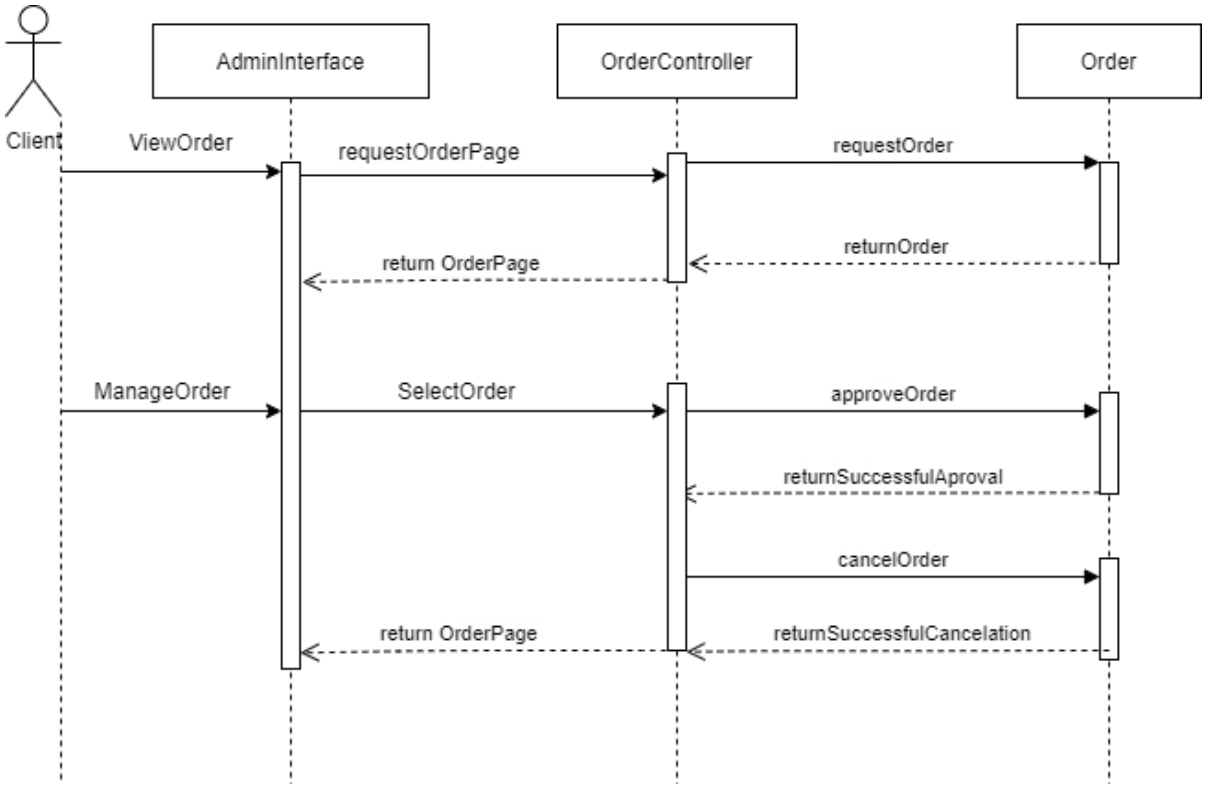
Admin Manage Product Sequence Diagram



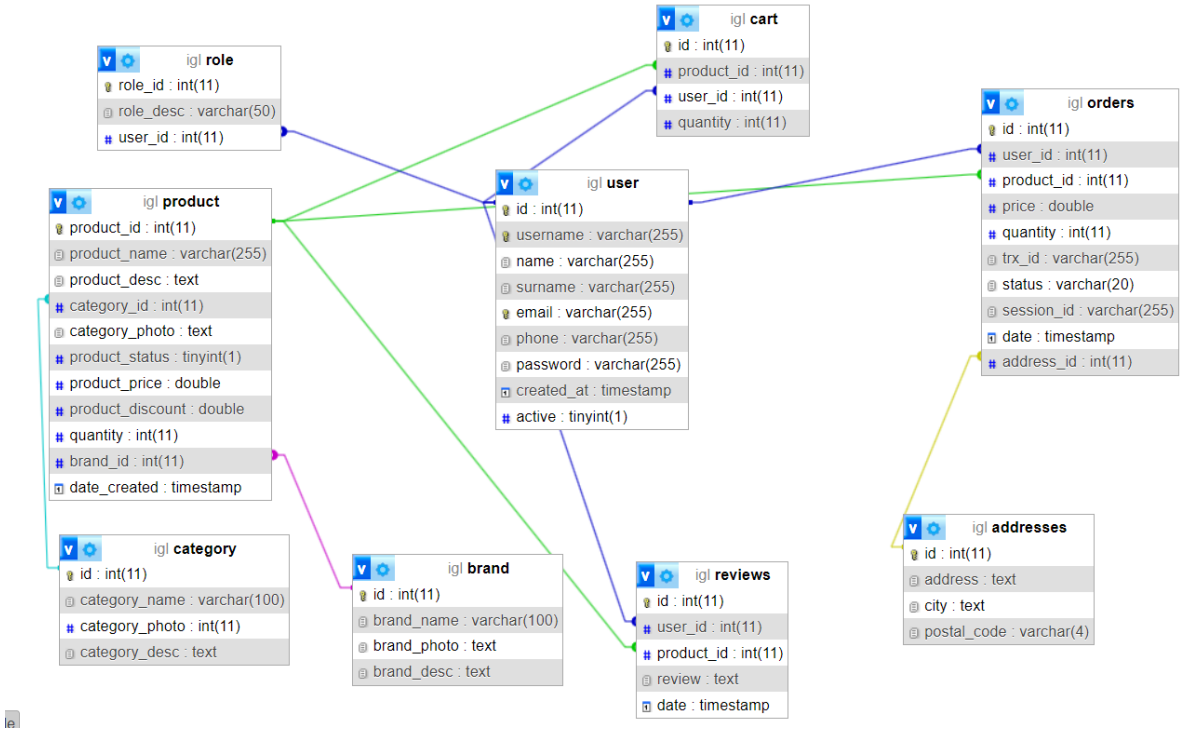
Admin Manage Category Sequence Diagram



Admin Manage Order Sequence Diagram



5.Database Design



- Tables:

1. addresses: Stores addresses with fields for id, address, city, and postal_code.
2. brand: Contains information about product brands including id, brand_name, brand_photo, and brand_desc.
3. cart: Keeps track of user cart items with id, product_id, user_id, and quantity.
4. category: Holds categories of products with id, category_name, category_photo, and category_desc.
5. orders: Tracks orders made by users including id, user_id, product_id, price, quantity, trx_id, status, session_id, date, and address_id.
6. product: Contains information about products available for sale with product_id, product_name, product_desc, category_id, category_photo, product_status, product_price, product_discount, quantity, brand_id, and date_created.
7. reviews: Stores reviews made by users for products with id, user_id, product_id, review, and date.
8. role: Defines user roles with role_id, role_desc, and user_id.
9. user: Stores user data including id, name, surname, email, password, created_at, and active.

- Relationships:

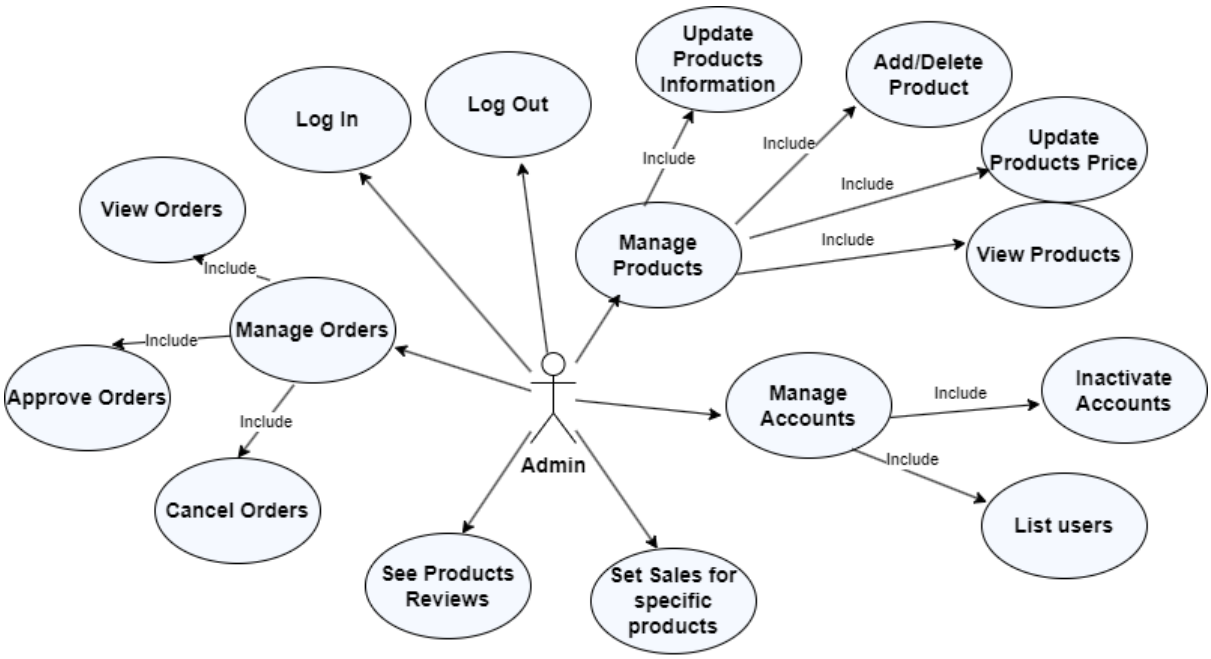
  cart, orders, reviews, tables are associated with the user and product tables via foreign keys (user_id and product_id).
  product table has foreign key relationships with brand and category tables.
  cart, orders tables also have foreign key relationships with the product table.
  orders table is linked with the addresses table for storing shipping addresses.
  role table is associated with the user table to assign roles to users.

- Efficiency:
  Indexes are created on the primary keys and foreign keys of each table to optimize search operations.
  Proper normalization techniques are used to minimize data redundancy and ensure data integrity.
  Constraints are defined to enforce referential integrity between related tables.
  Data types are chosen appropriately to ensure efficient storage and retrieval of data.
  Auto-increment is utilized for primary key fields to ensure uniqueness and ease of data insertion.

Modeling

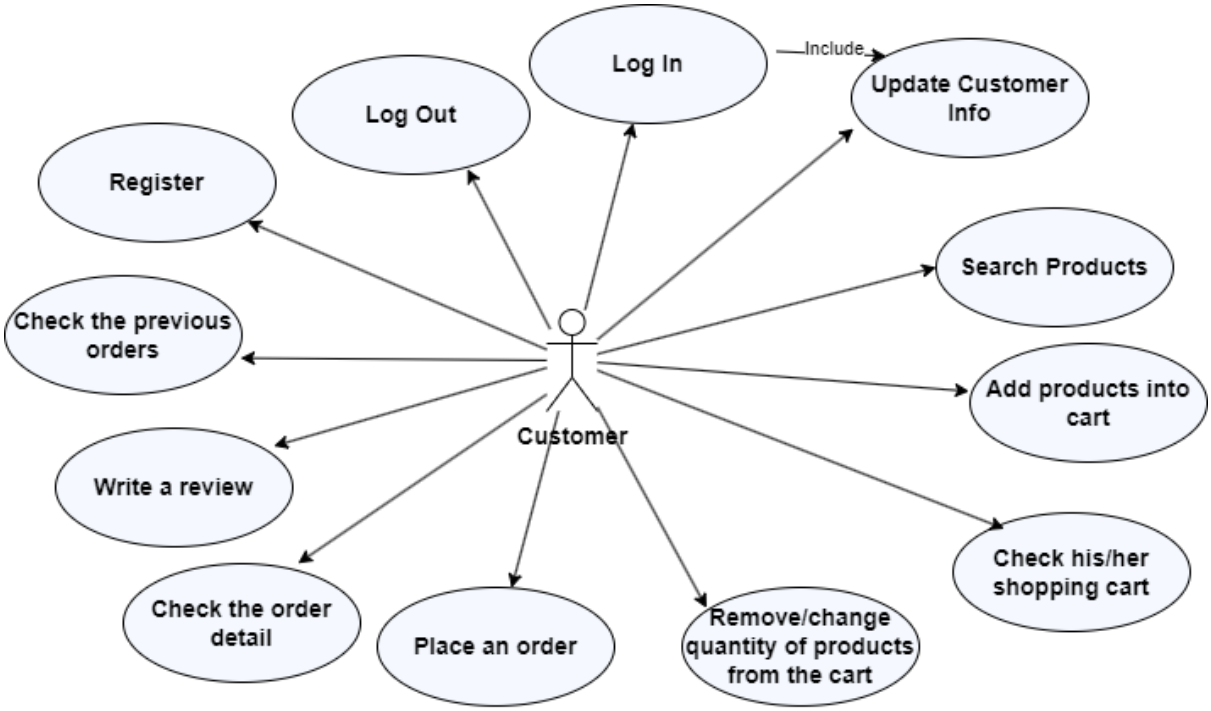
6.Case Diagrams

Admin Case Diagram



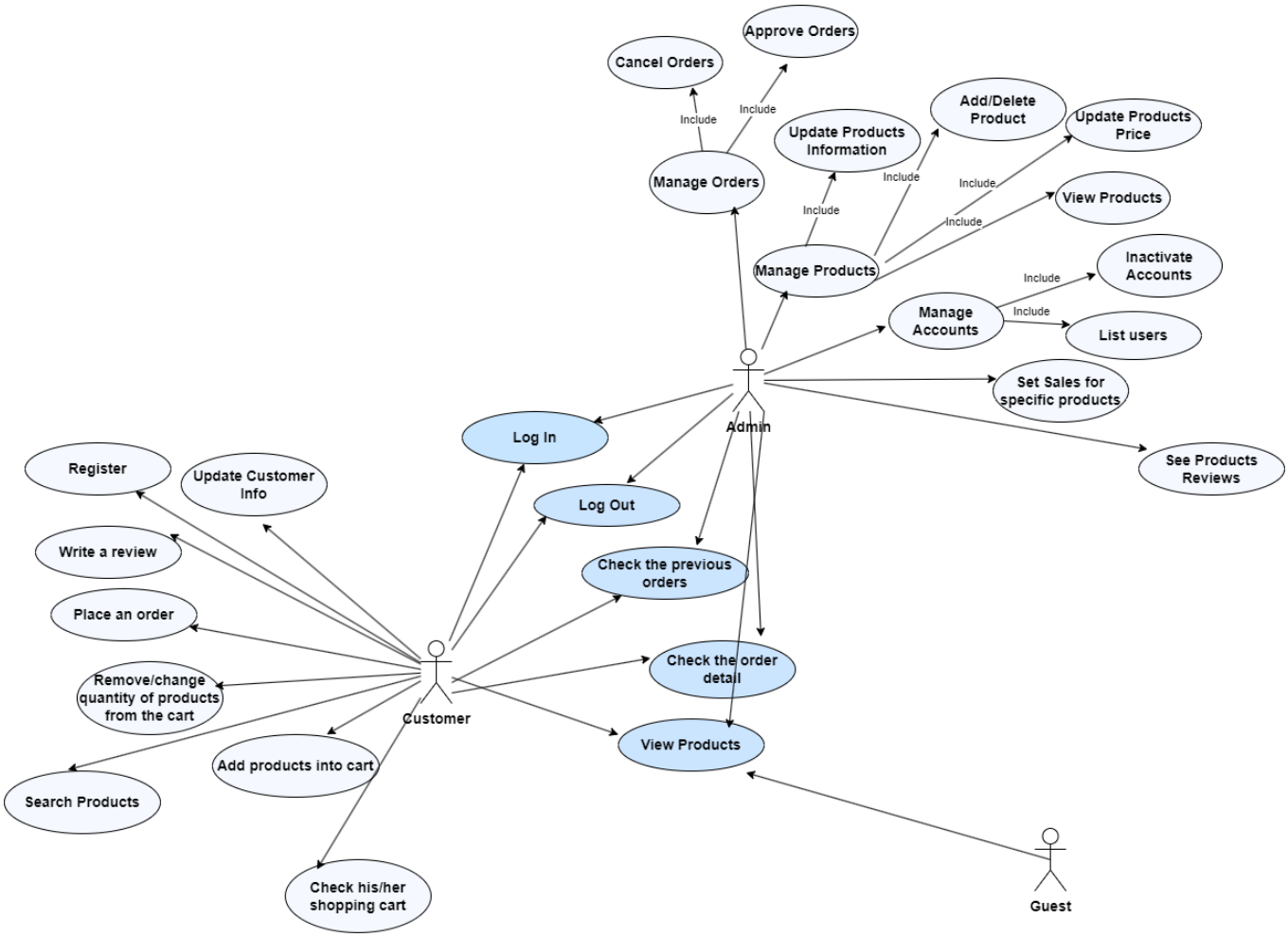
The admin will be the owner of the business and, unlike the user, will enter with the admin role and be able to perform actions that the user cannot. The admin, on the other hand, has the ability to login and log out of the web application, just like the user. Because the admin will be the business owner, it will be able to constantly update products, such as adding or deleting products and changing their prices or information. The admin can manage the accounts registered on the web by listing them and deactivating them as needed. Furthermore, it can manage orders by approving or cancelling them. Finally, he will have the ability to set sales for specific products.

Customer Case Diagram



As we can see, a customer can register in the web application and then constantly log in and out. The user can change its credentials, or the information that was initially entered when registering, such as name, surname, email, phone number, and password. The user will be able to search for products based on the product category or simply by using the search bar. After viewing the products, the user can add them to the cart, and he or she can then constantly check the cart and manage the quantity of products in it. The user can also place an order using the cart's products and then check the order's details, as well as the details of previous orders. After receiving the order, the user can also write a review.

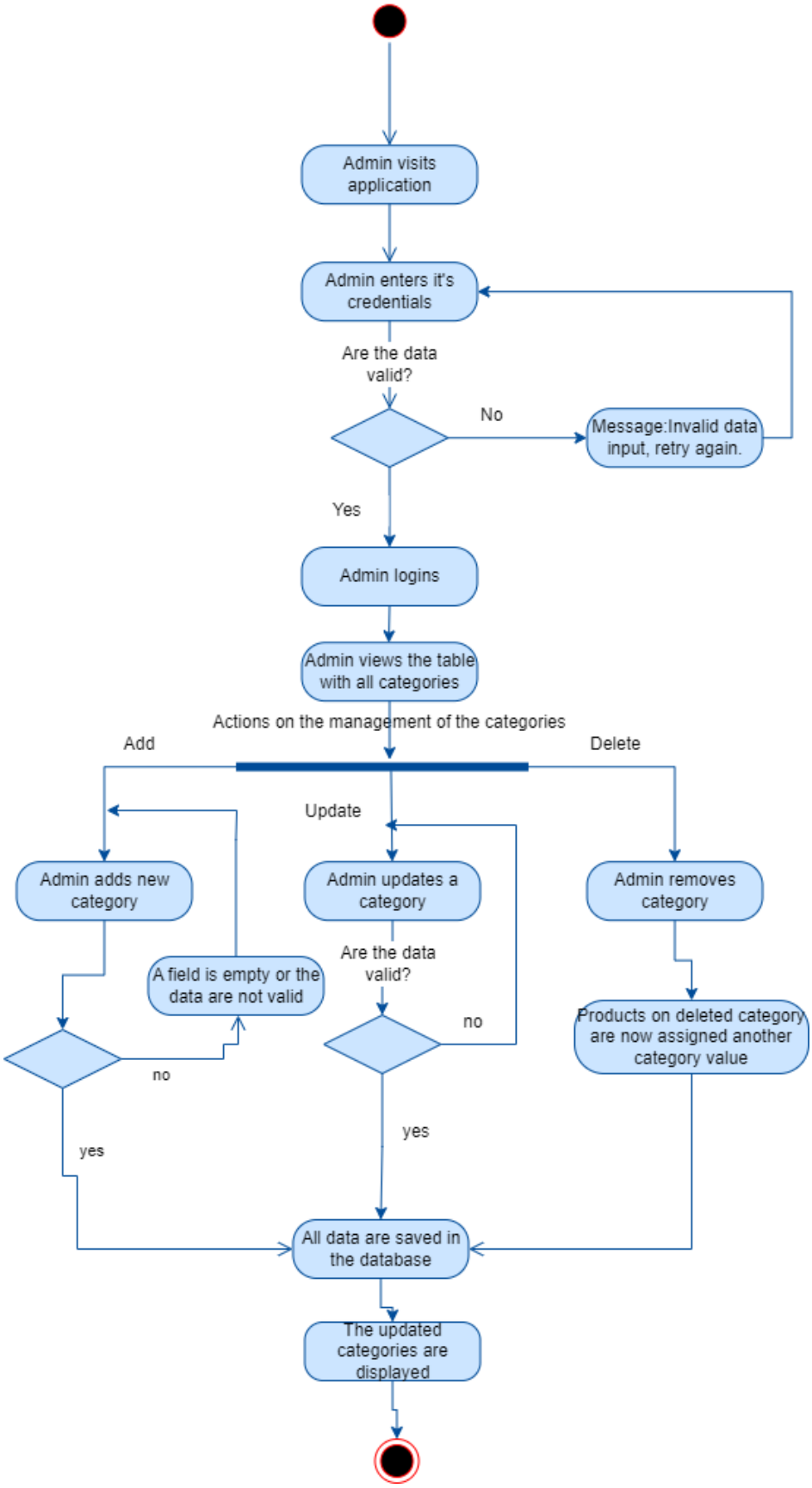
General Case Diagram



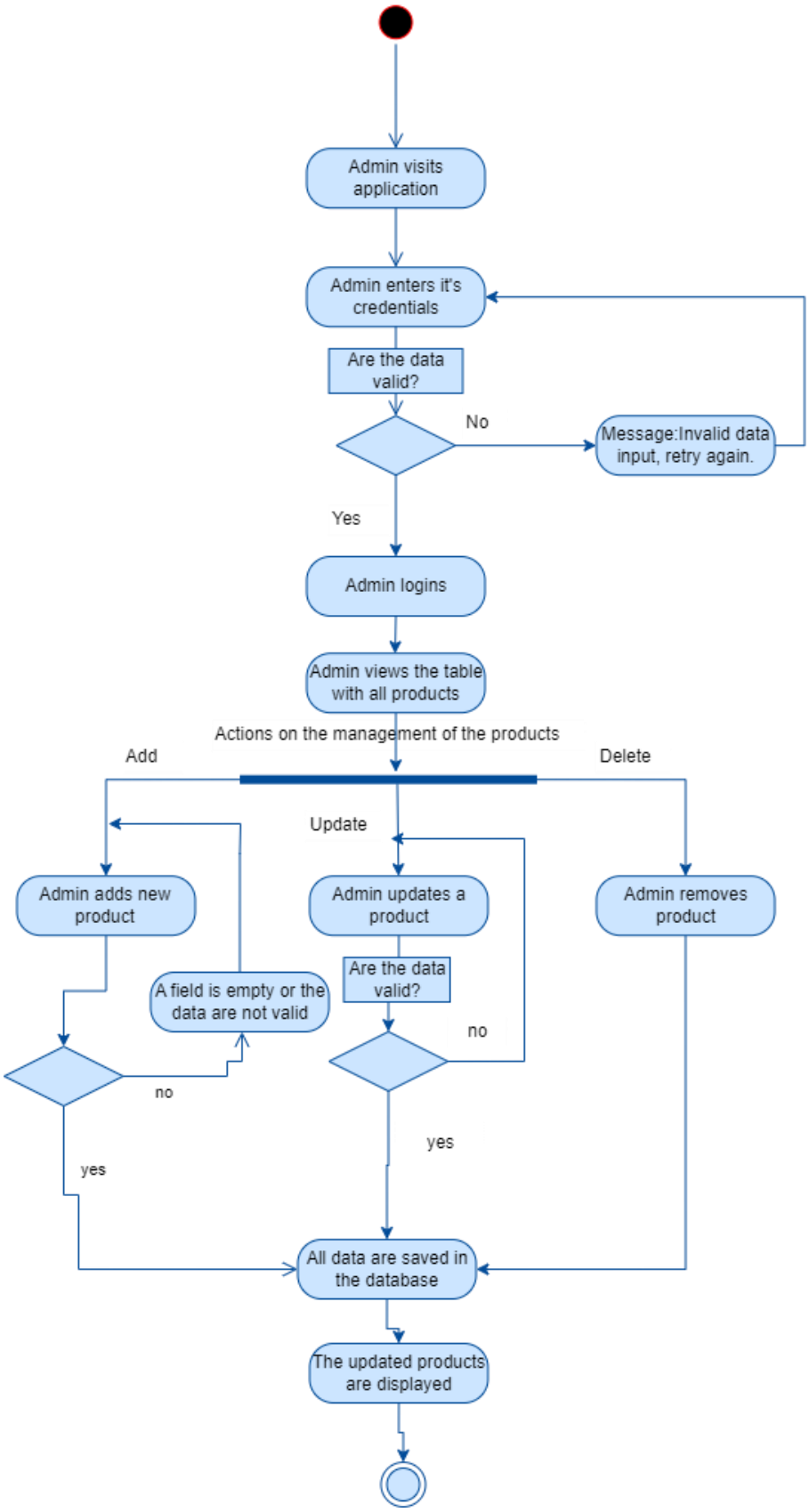
This diagram depicts the same actions as both of the previous ones. The only difference is that it displays actions that are common to both the user and the admin, such as login and log out from the system, viewing products, checking order details, and reviewing previous orders. I have also included the guest case. A guest will be someone who can access the website and view the products without first registering in the web application.

7. Activity Diagram

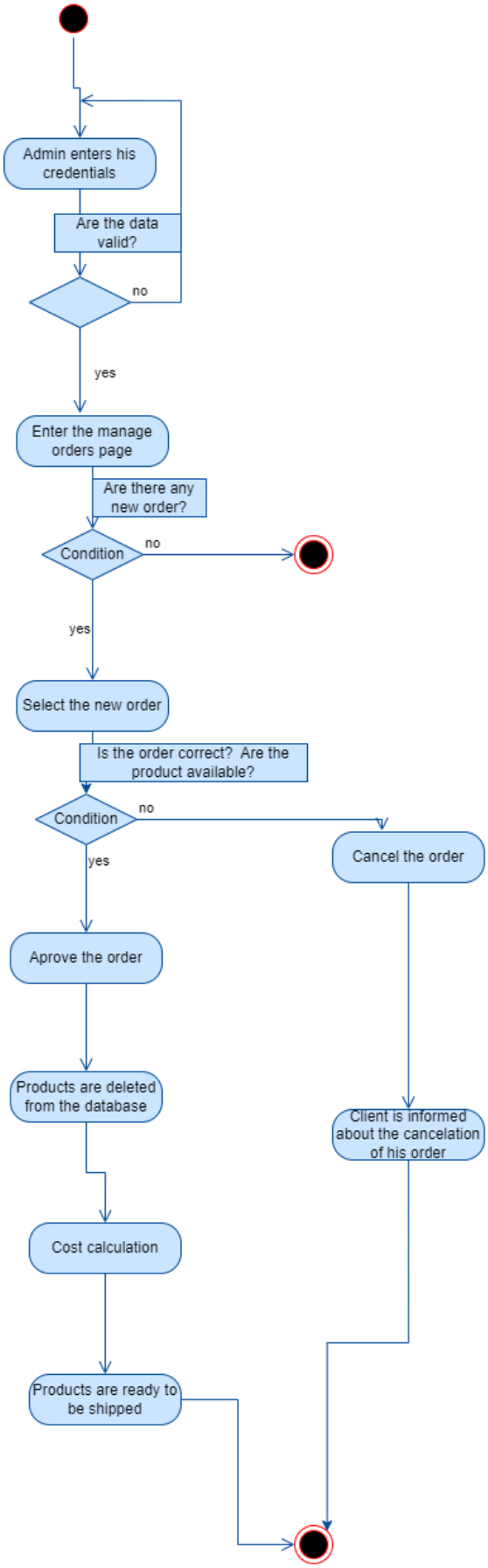
Admin Action on Categories Diagram



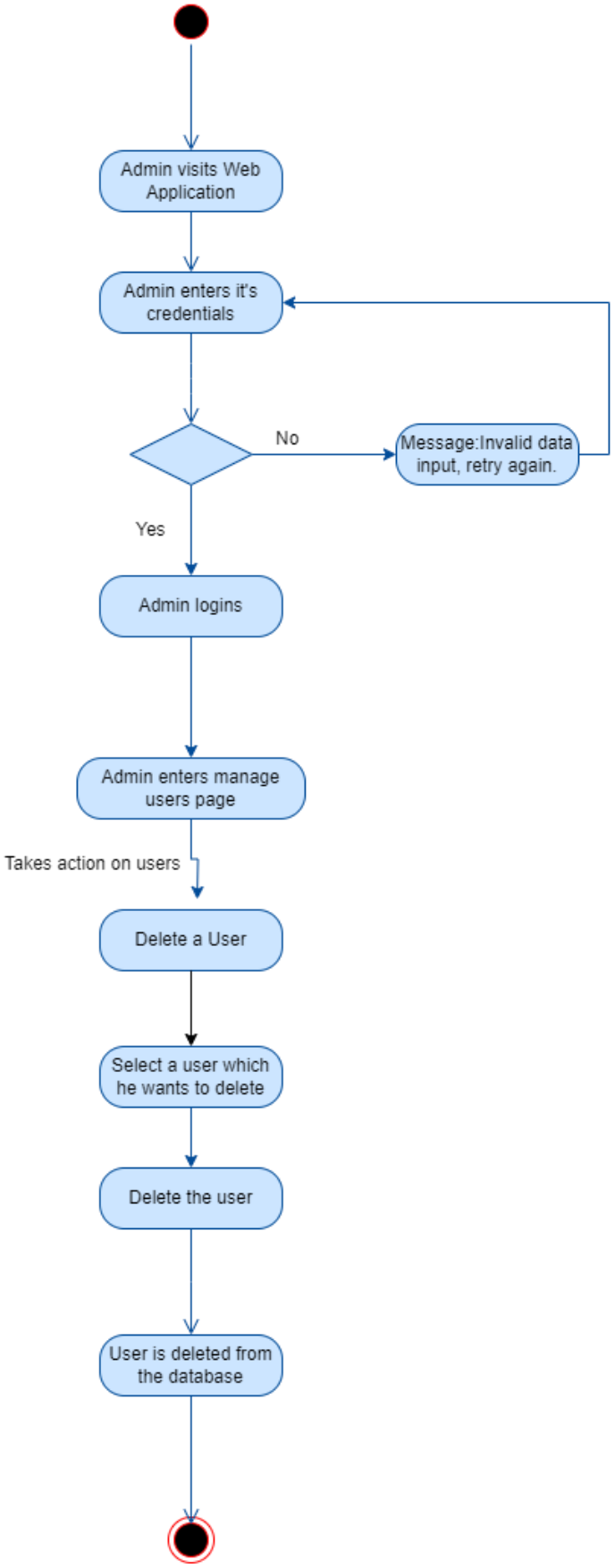
Admin Actions on Products Diagram



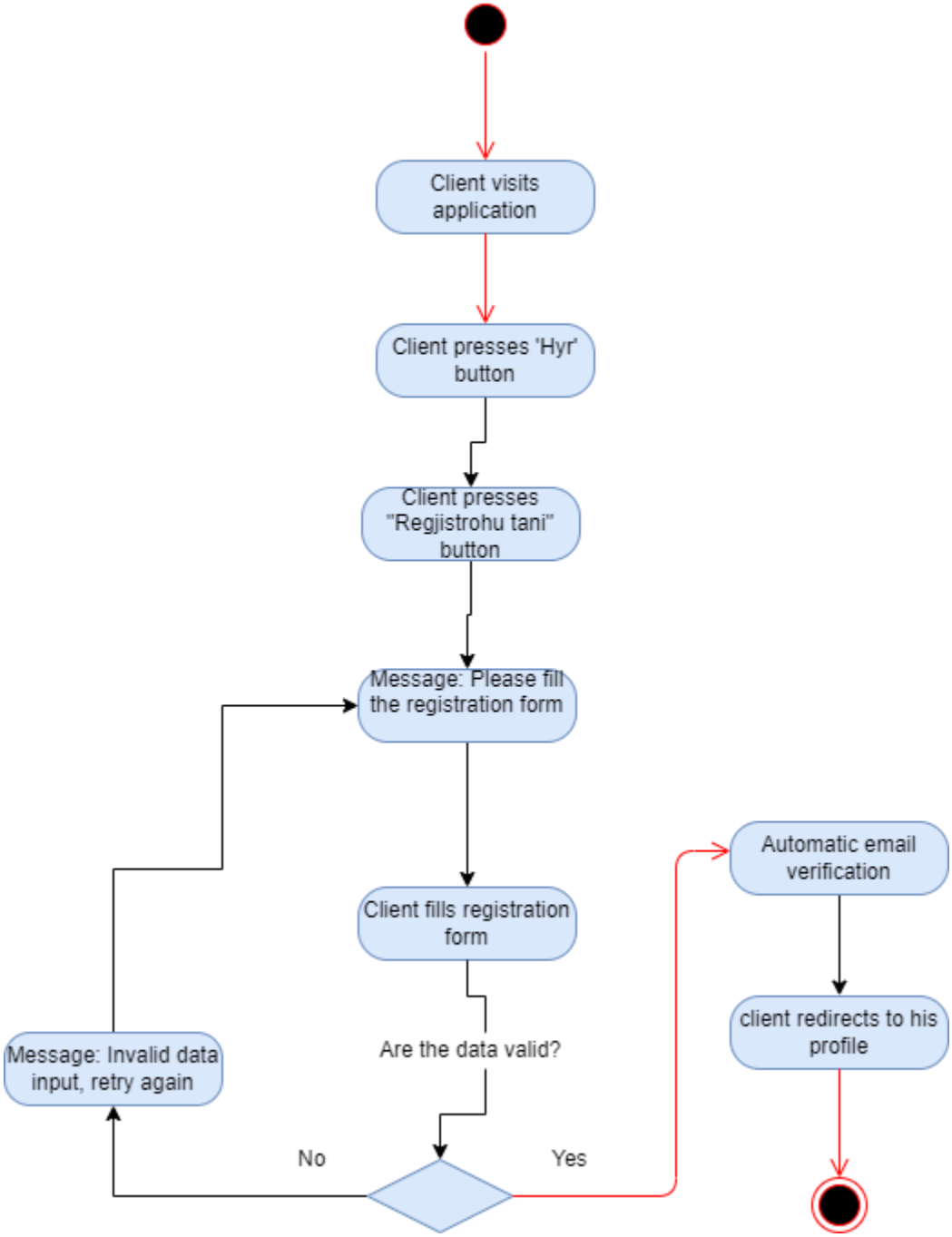
Admin Actions on Order Approval



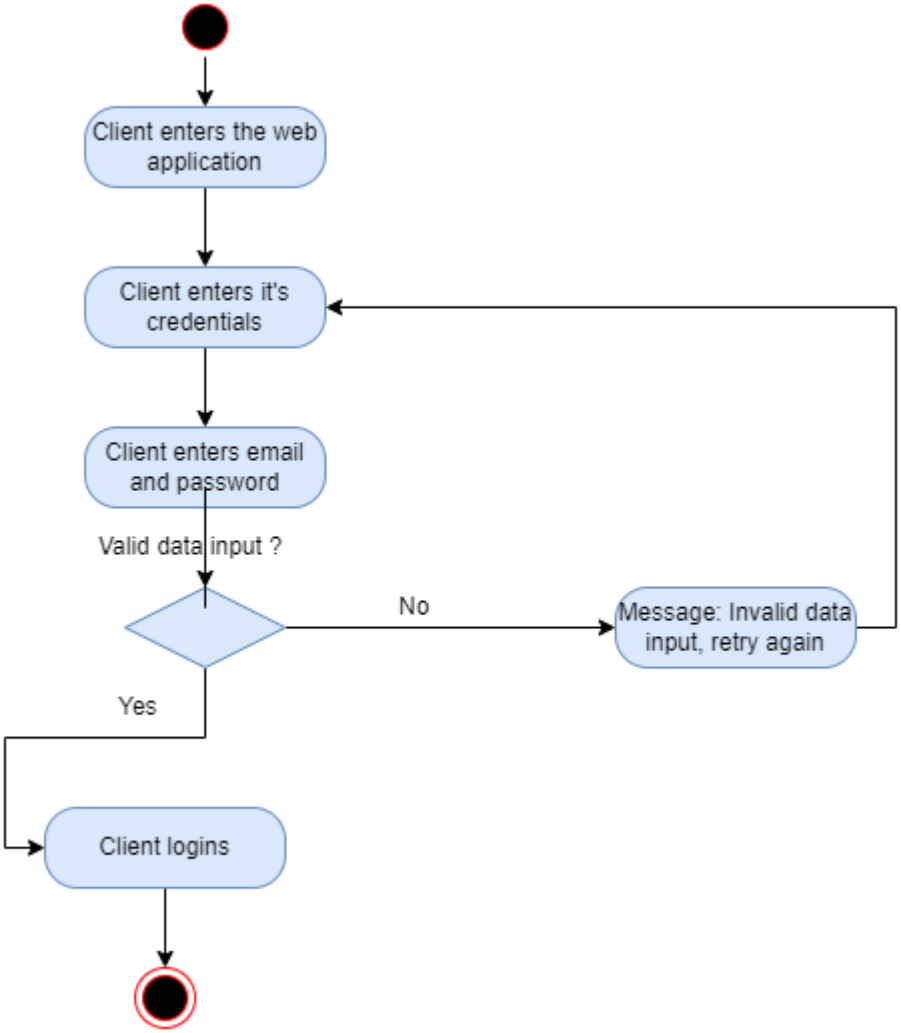
Admin Actions on User Diagram



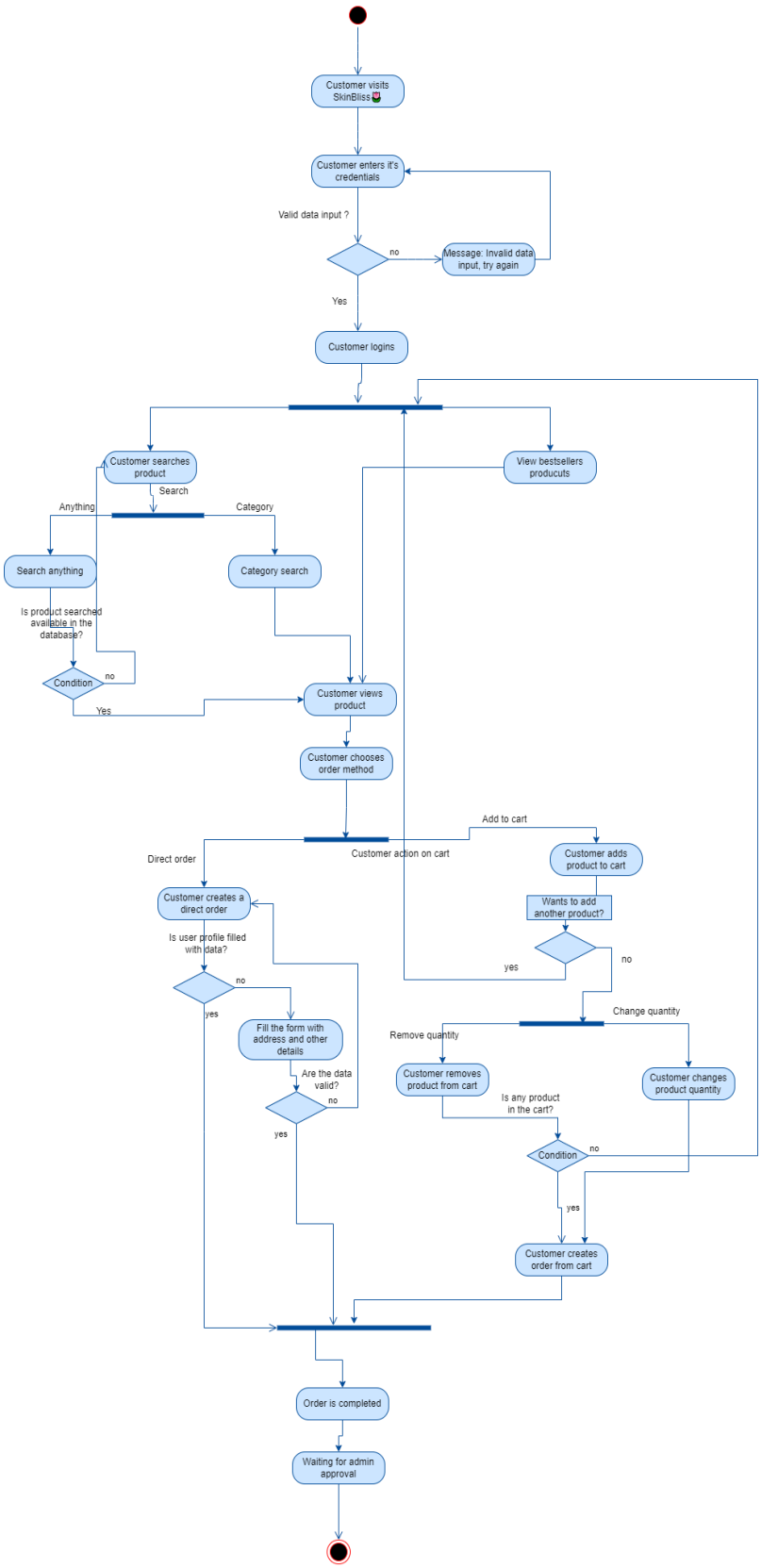
Client SignUp Activity Diagram



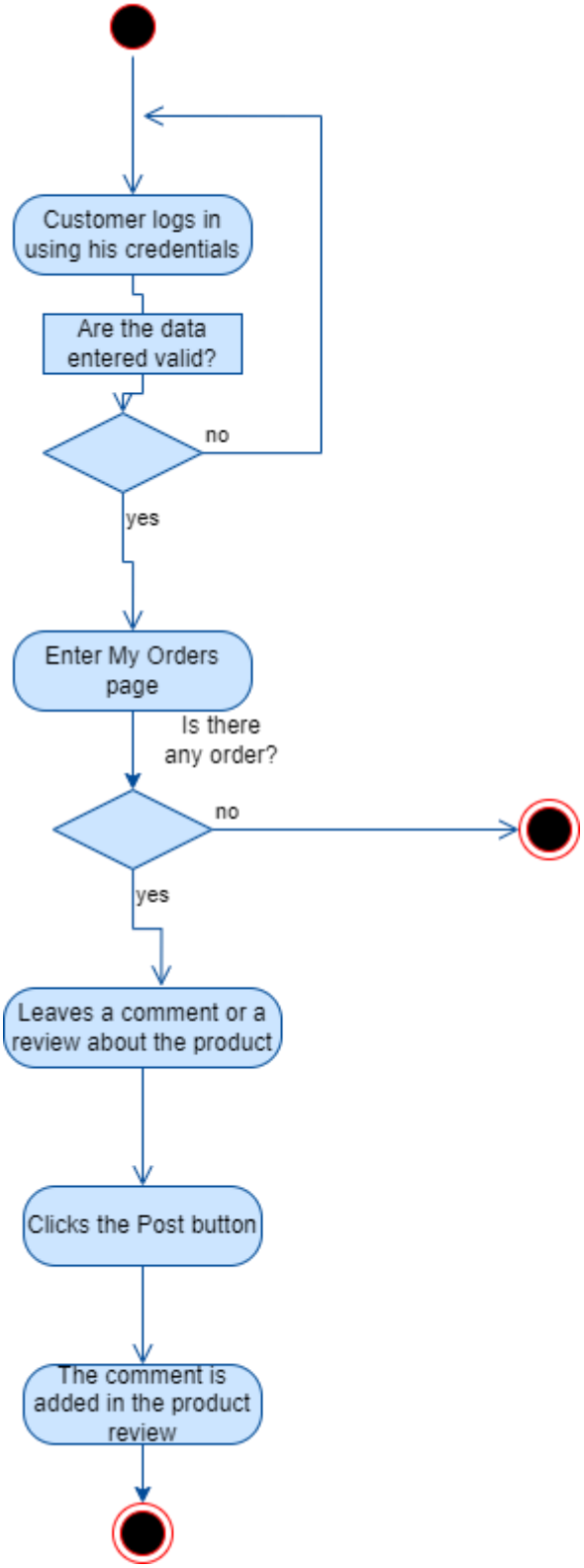
Client LogIn Activity Diagram



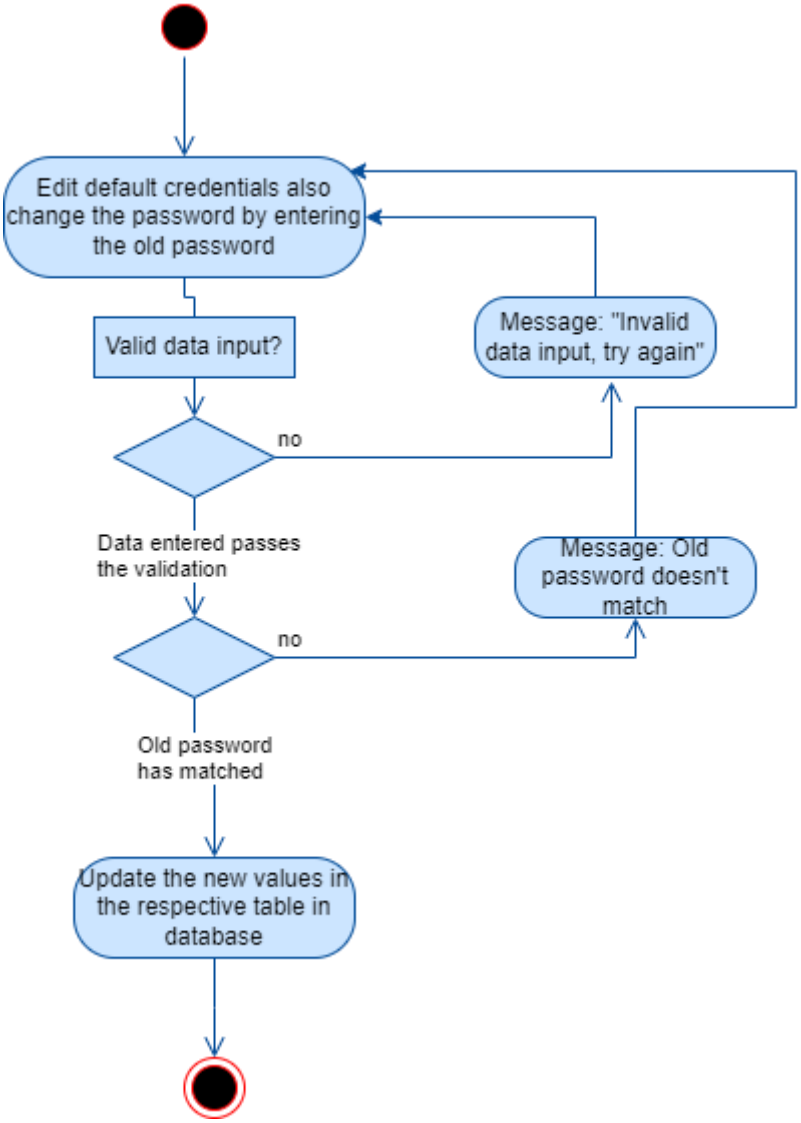
Client order Placement Diagram



Client Leaving Feedback On a Product Diagram

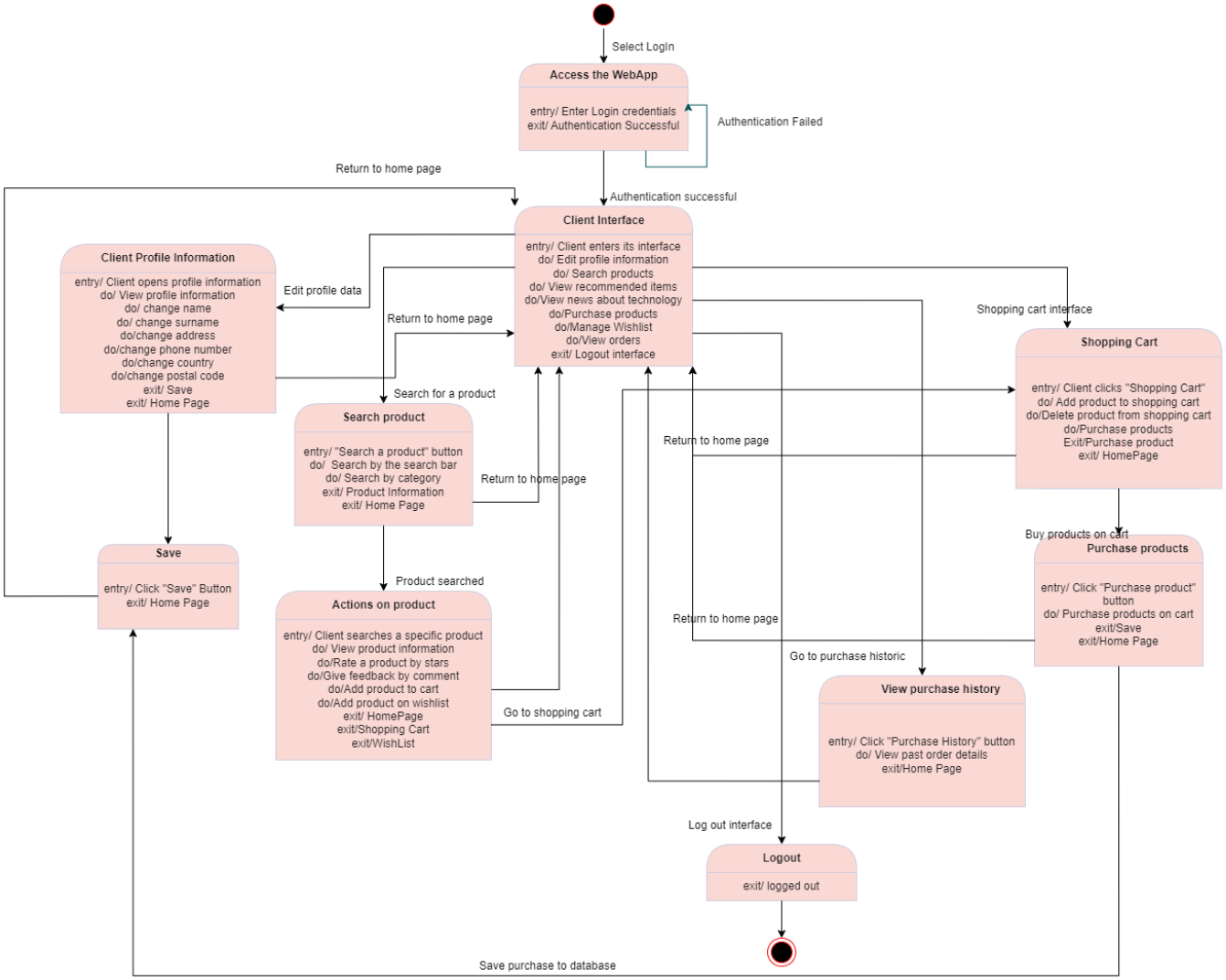


Editing Users Credentials Diagram

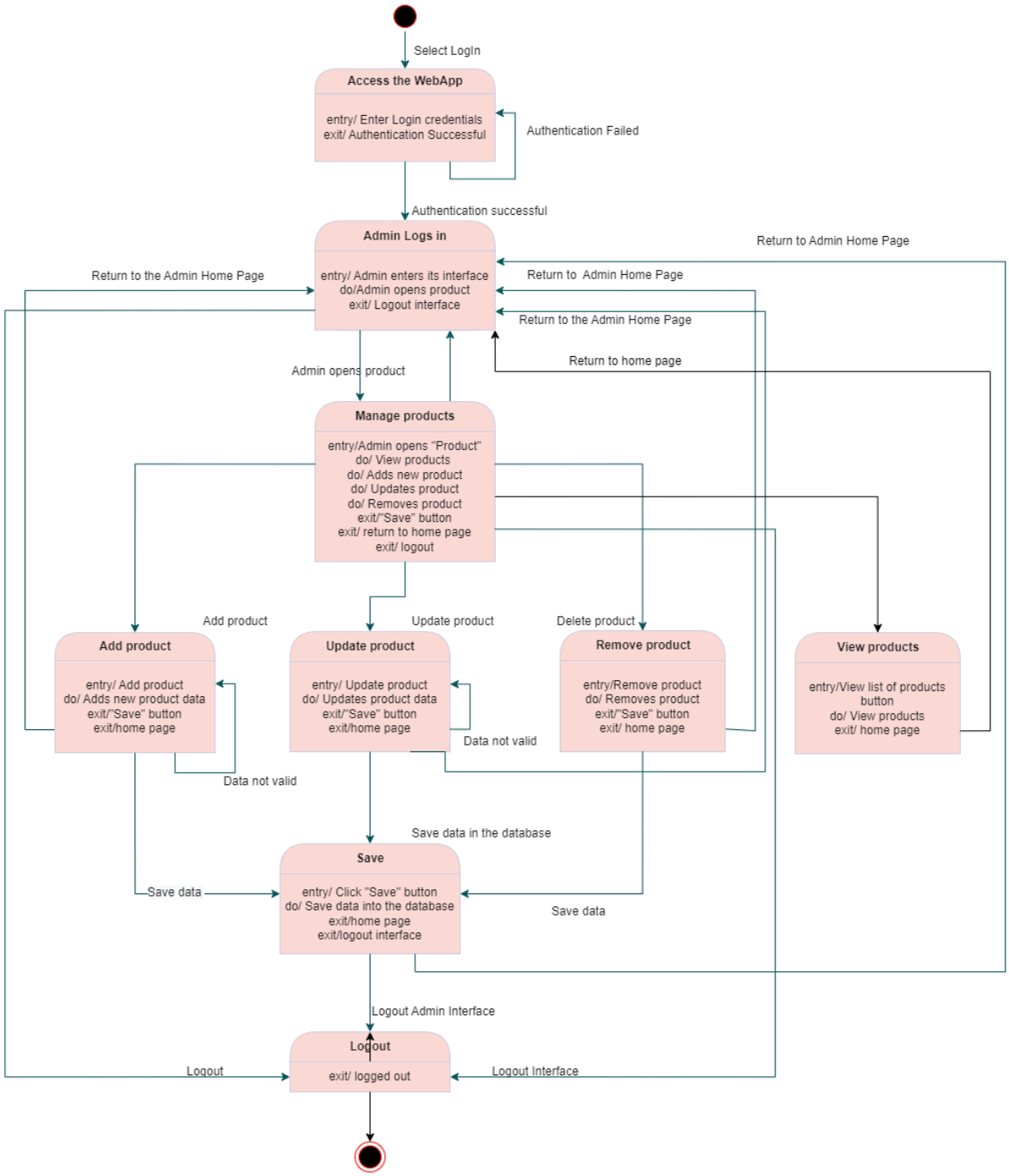


8. State Diagrams

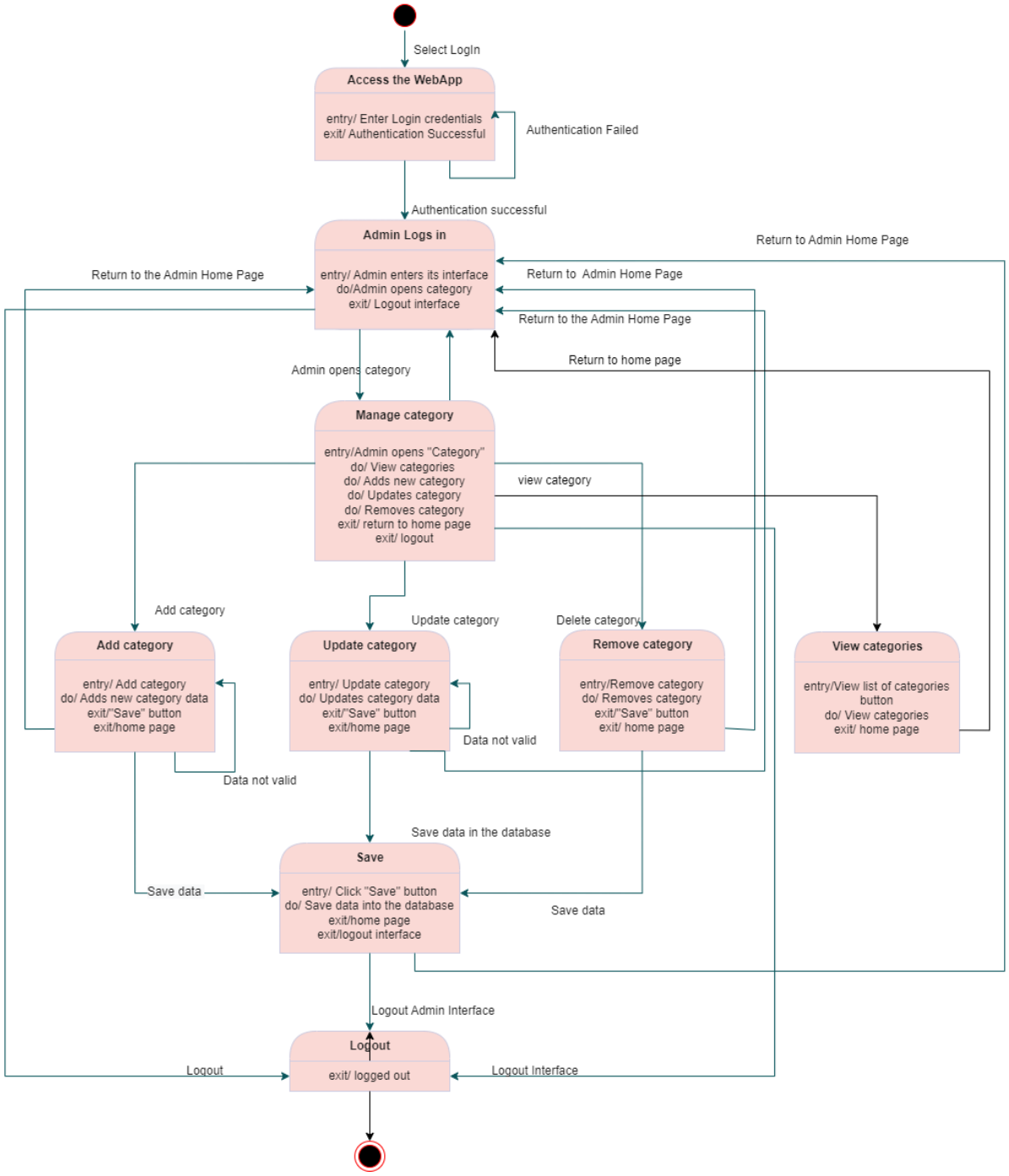
Client Interface State Diagram



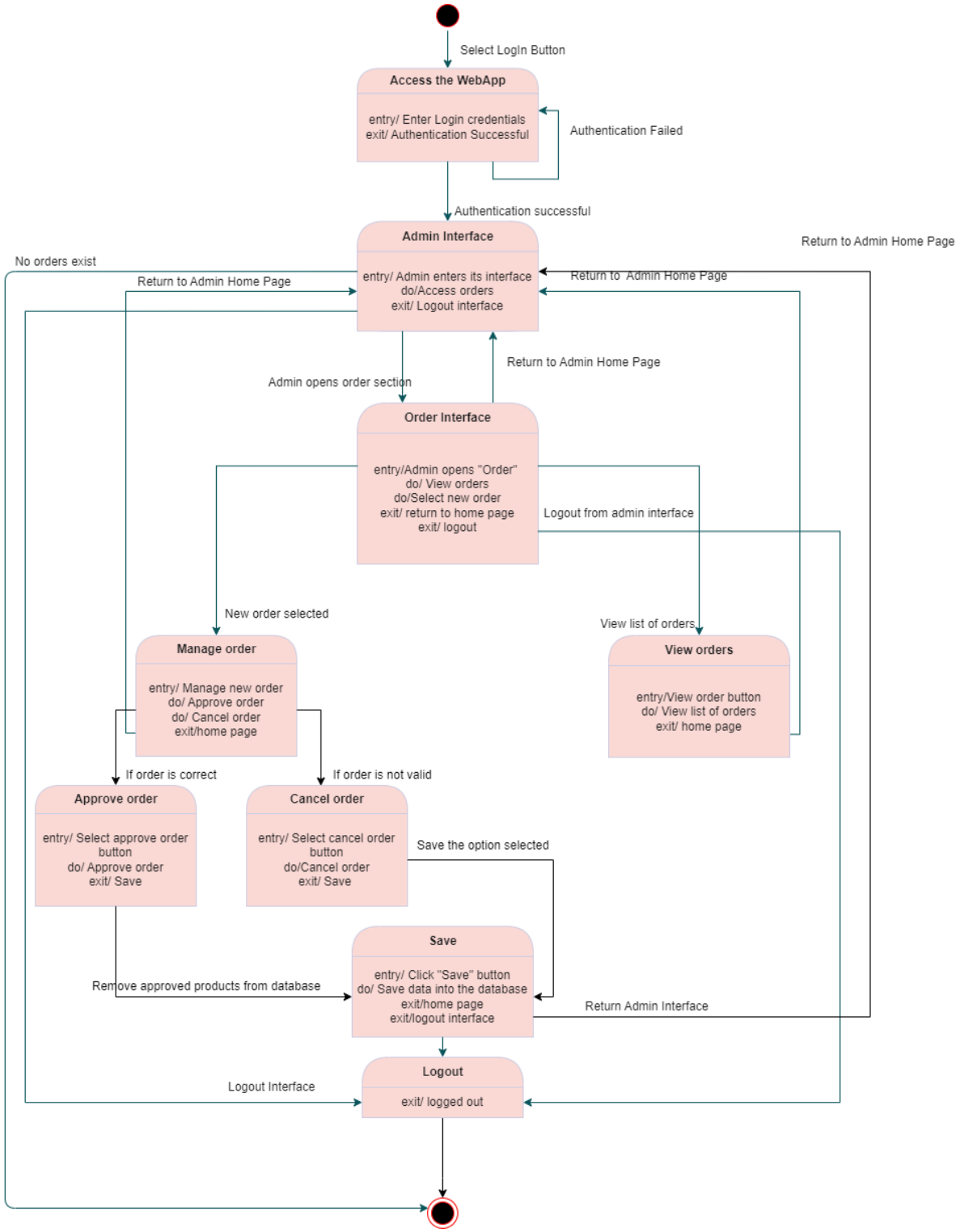
Admin Manage Product State Diagram



Admin Manage Category State Diagram



Admin Manage Order State Diagram



Admin Other Operations State Diagram