

# LOOMERA #6

SE 305/321 – Software Specification and Design  
Term Project Design Document

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## 1. Introduction

Loomera is a mobile application designed to modernize the sales and communication workflows for our customer. The system addresses the problems that our customer was facing in manual sales tracking and inventory management.

Our project focuses on creating a platform that allows registered customers to browse clothing products, view real-time stock availability and access up-to-date pricing. Beyond a simple catalog, Loomera integrates a direct messaging system to facilitate streamlined communication regarding orders and feedback. The system is comprised of two main components: a mobile application for customers to access product data and communicate with the supplier, and a robust administrative panel that empowers the client to manage inventory, update stock levels, and monitor sales activities efficiently.

## 2. Problem Definition

Our client currently manages communication with customers and product sales manually, which causes inefficiencies and miscommunication. Customers have limited access to product information such as prices, available stock, and new arrivals. Additionally, the client faces difficulties in tracking orders, updating customers about stock status, and maintaining a consistent sales channel. There is a clear need for a digital solution that simplifies customer interaction and centralizes product management.

## 3. Proposed System Design

### 3.1. Requirements

#### 3.1.1. Functional Requirements

1. The system shall allow customers to register for a new account and log in to their existing account.
2. The system must provide a “reset password” feature for the users to renew their passwords.
3. The application must provide search functionality allowing users to find specific products. This should include searching by name or category (e.g., "shirts," "t-shirts").

4. Users must be able to scroll through a catalog of all available clothing products.
5. Users must be able to select a product from the catalog to view its detailed information, including its price and available stock quantity.
6. The system must include a messaging section where a customer can initiate and conduct a conversation with the client for inquiries about orders, feedback, or questions.
7. The system shall allow a registered customer to add products to a shopping cart and complete the checkout process to formally place an order.
8. Customers must be able to view their order history and track the real-time status of their active orders (e.g., 'Processing,' 'Shipped,' 'Delivered'), including logistics information.
9. The system shall provide a login feature for our client to access the admin panel.
10. Our client must be able to add, edit, and remove products from the catalog, including managing their details (name, description), price, and stock quantities, all through the admin panel.
11. Our client must be able to view all incoming customer orders, process them, and update their status (e.g., mark as 'shipped' and provide tracking details).
12. Our client must be able to receive, view, and respond to customer messages within the admin panel.

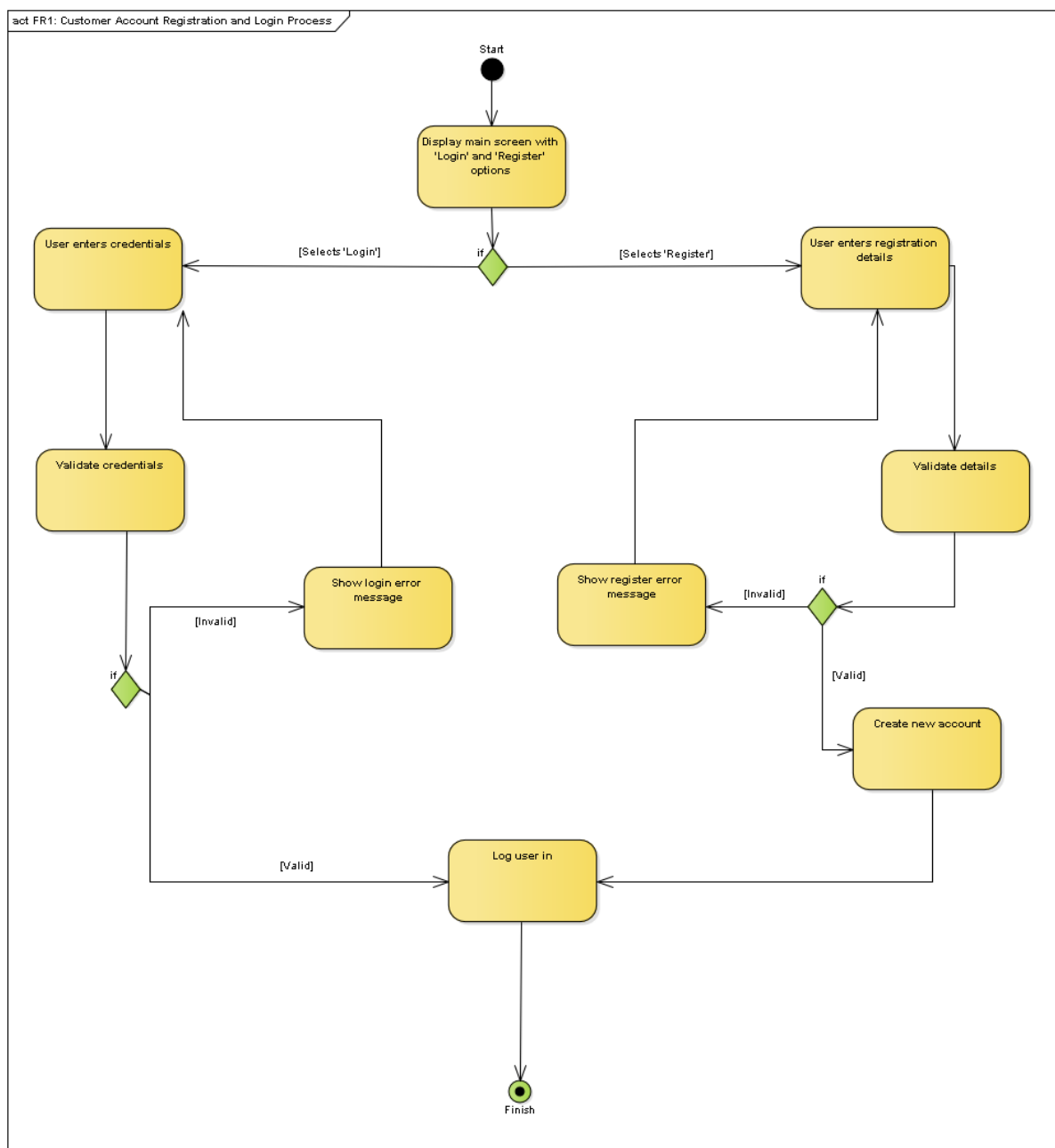
### 3.1.2. Non-Functional Requirements

1. The system must be able to support at least 100 users viewing products simultaneously (the number will be increased when our client has new customers) without any noticeable lag or performance degradation. Page load times for the product catalog should be under 3 seconds.
2. The price and stock information displayed to customers in the app must be updated automatically from the inventory database every 5 to 10 minutes.
3. The system shall limit API requests to ensure system stability and prevent abuse. A single IP address cannot make more than 100 requests per minute to the product catalog API.
4. The mobile application must be fully functional and display correctly on devices running iOS 16+ and Android 13+.

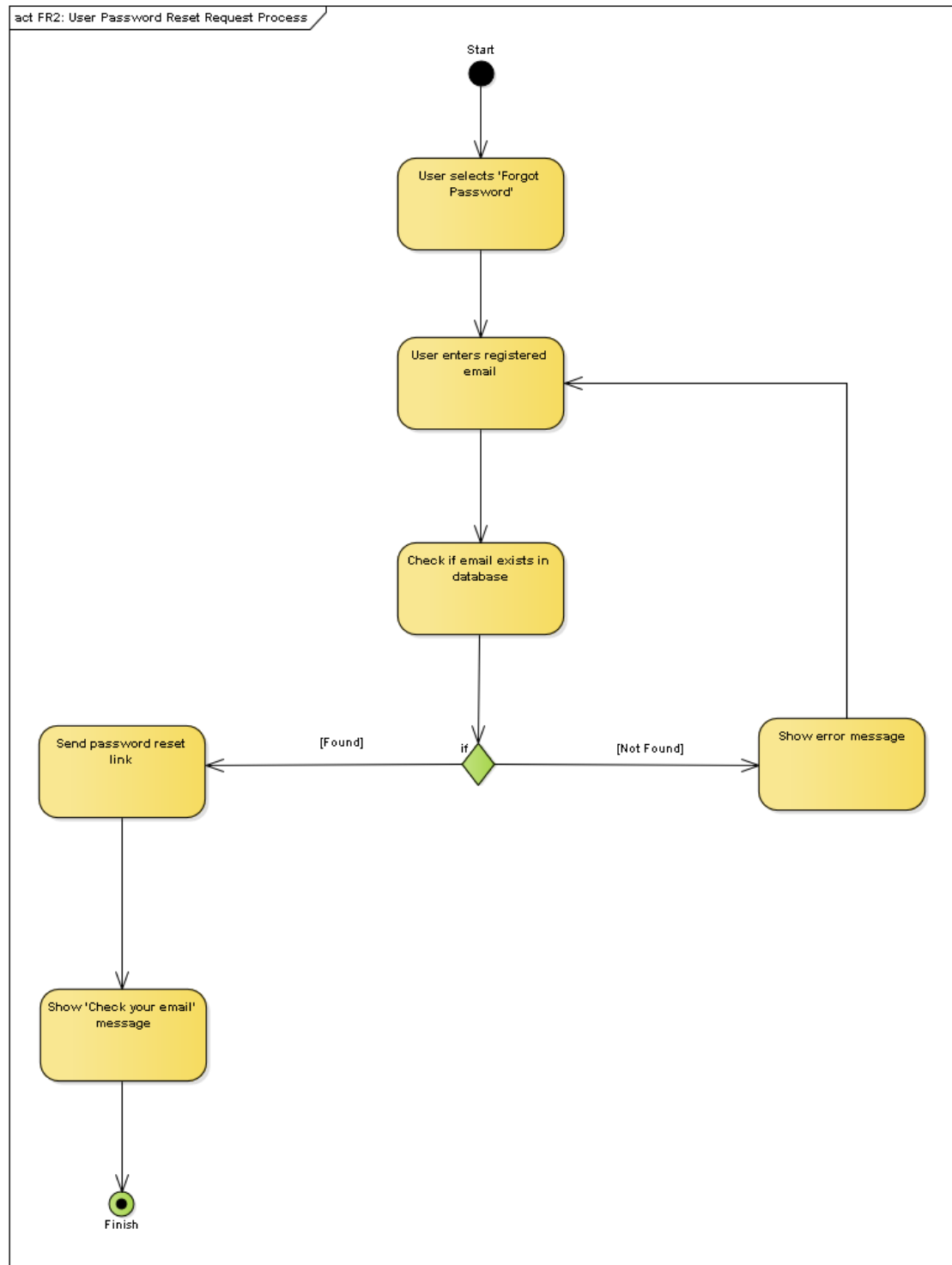
5. The system must deliver new messages from customers to the client's admin panel instantly (e.g., with push notifications) to support our client in achieving an average response time of under 2 hours.

## 3.2. Activity Diagrams

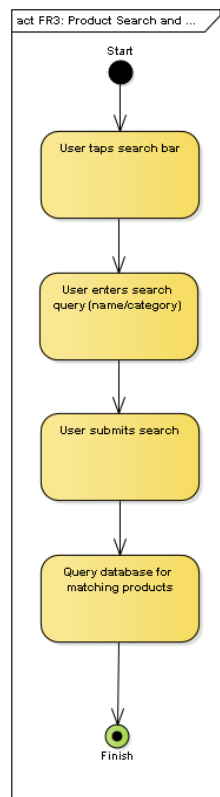
### 3.2.1. Activity Diagram 1: *Customer Account Registration and Login Process*



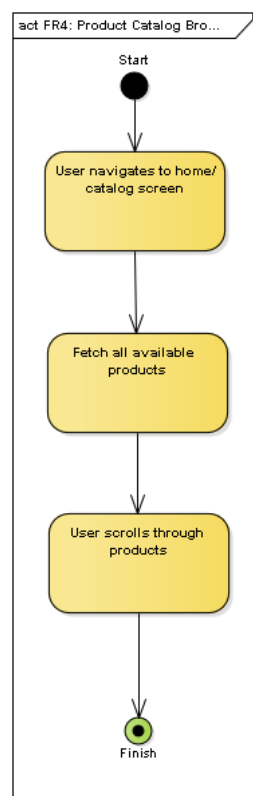
### 3.2.2. Activity Diagram 2: *User Password Reset Request Process*



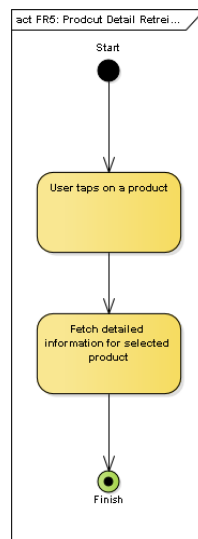
### 3.2.3. Activity Diagram 3: *Product Search and Retrieval Process*



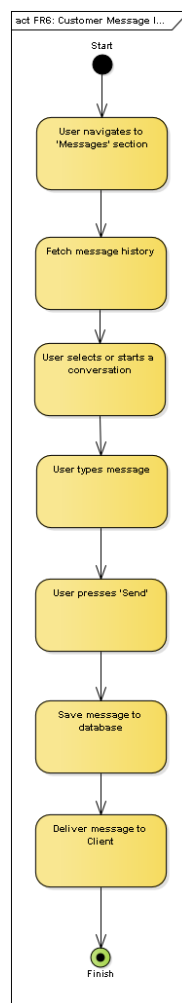
### 3.2.4. Activity Diagram 4: *Product Catalog Browsing Process*



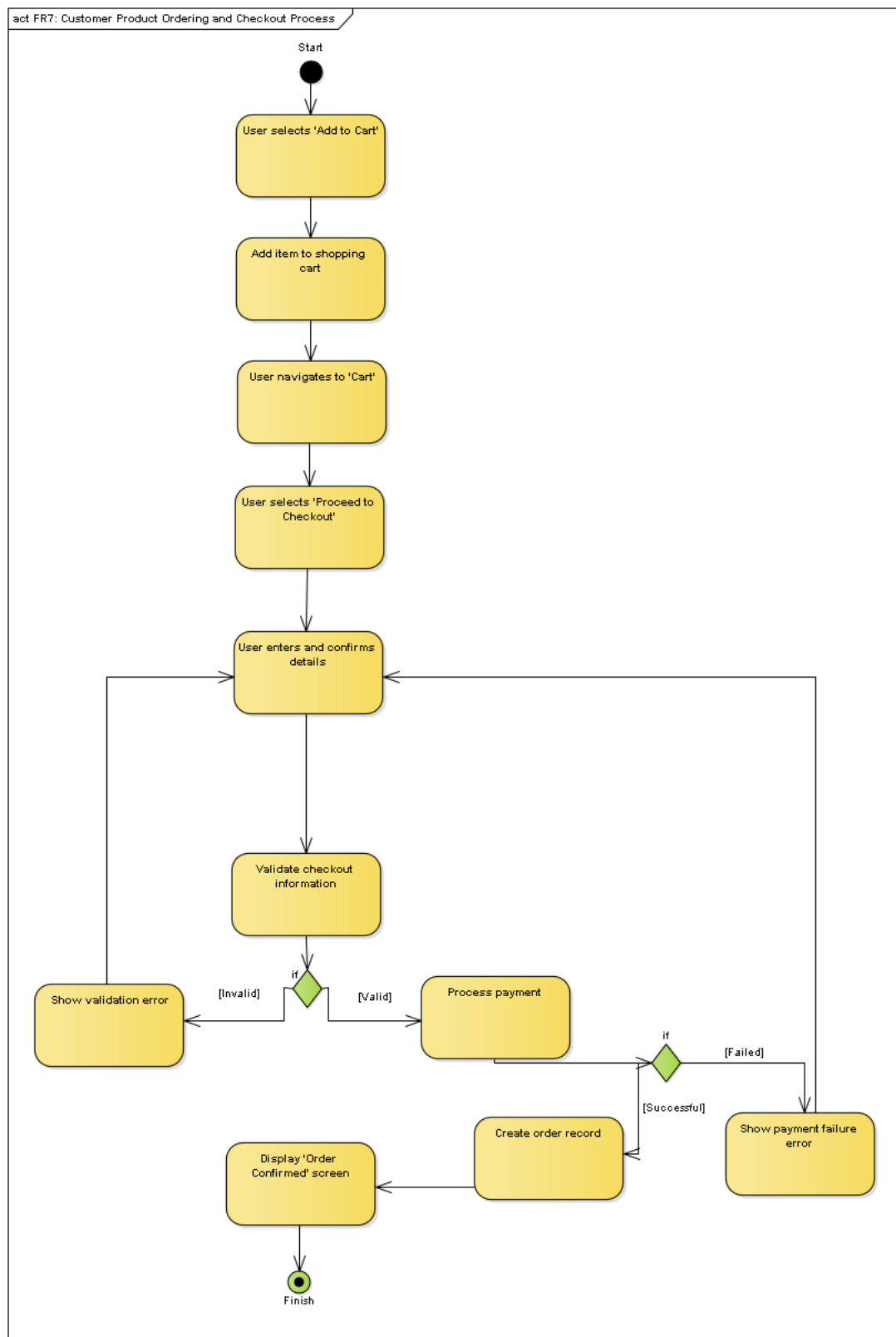
### 3.2.5. Activity Diagram 5: *Product Detail Retrieval Process*



### 3.2.6. Activity Diagram 6: *Customer Message Initiation and Delivery Process*

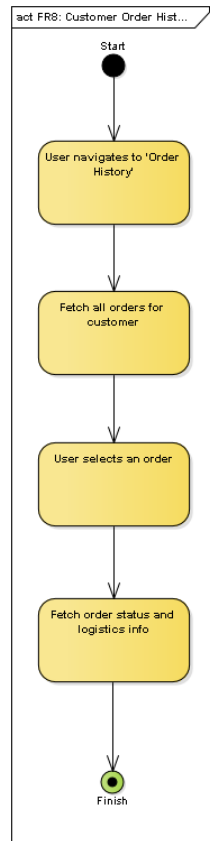


### 3.2.7. Activity Diagram 7: *Customer Product Ordering and Checkout Process*

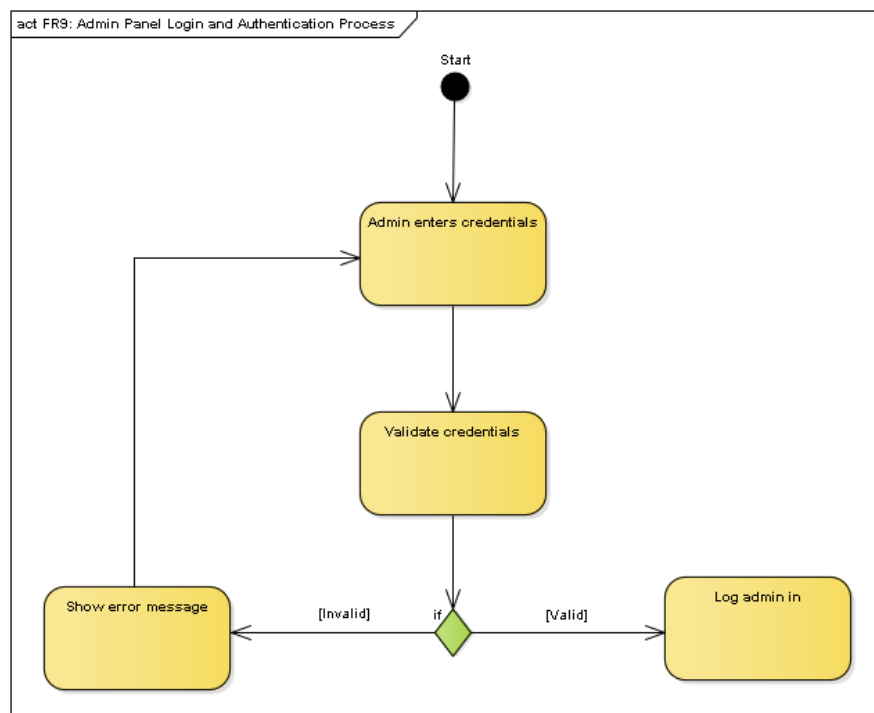




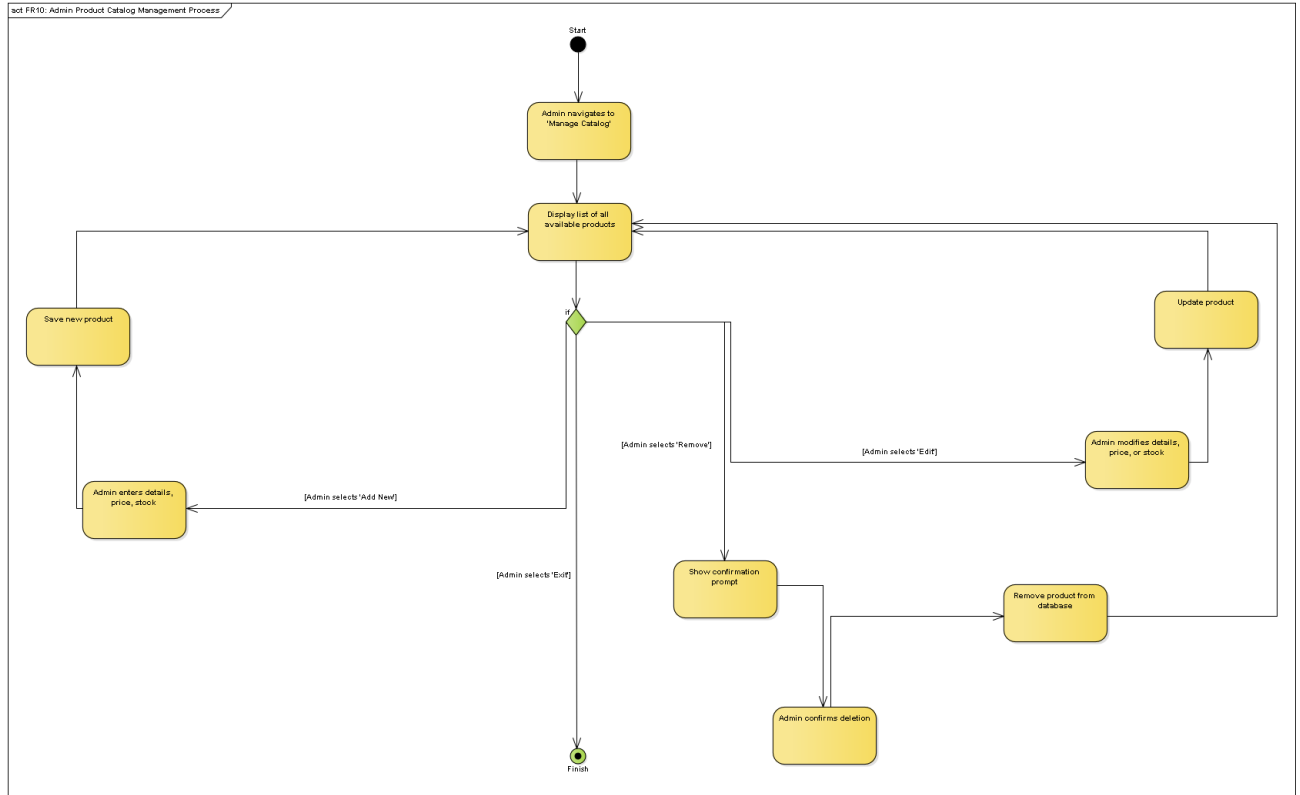
### 3.2.8. Activity Diagram 8: *Customer Order History and Tracking Process*



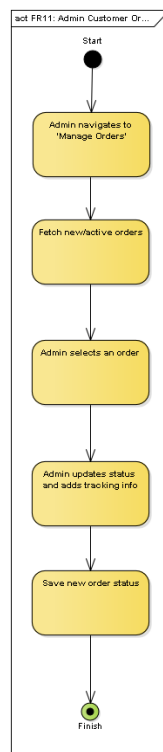
### 3.2.9. Activity Diagram 9: *Admin Panel Login and Authentication Process*



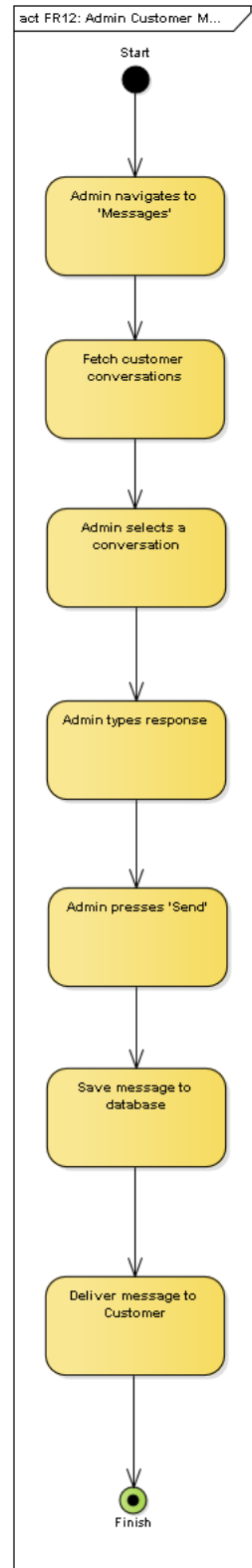
### 3.2.10. Activity Diagram 10: *Admin Product Catalog Management Process*



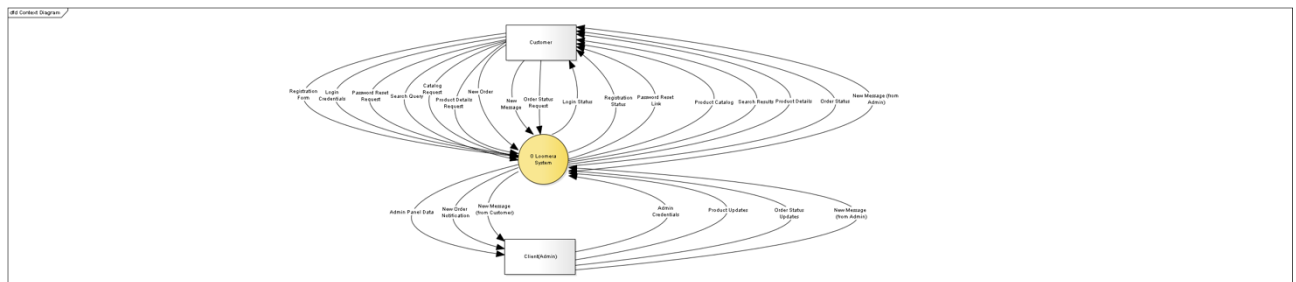
### 3.2.11. Activity Diagram 11: *Admin Customer Order Processing and Status Update*



### 3.2.12. Activity Diagram 12: *Admin Customer Message Response Process*

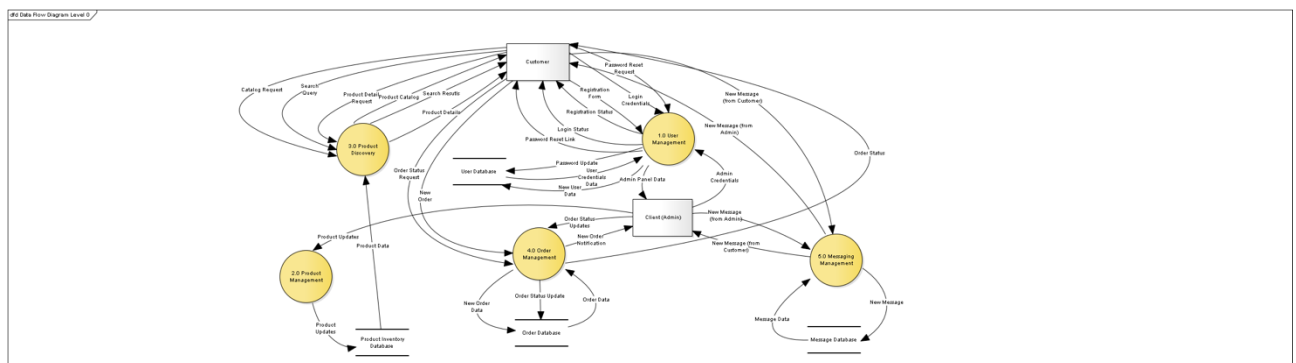


### 3.3. Context Model

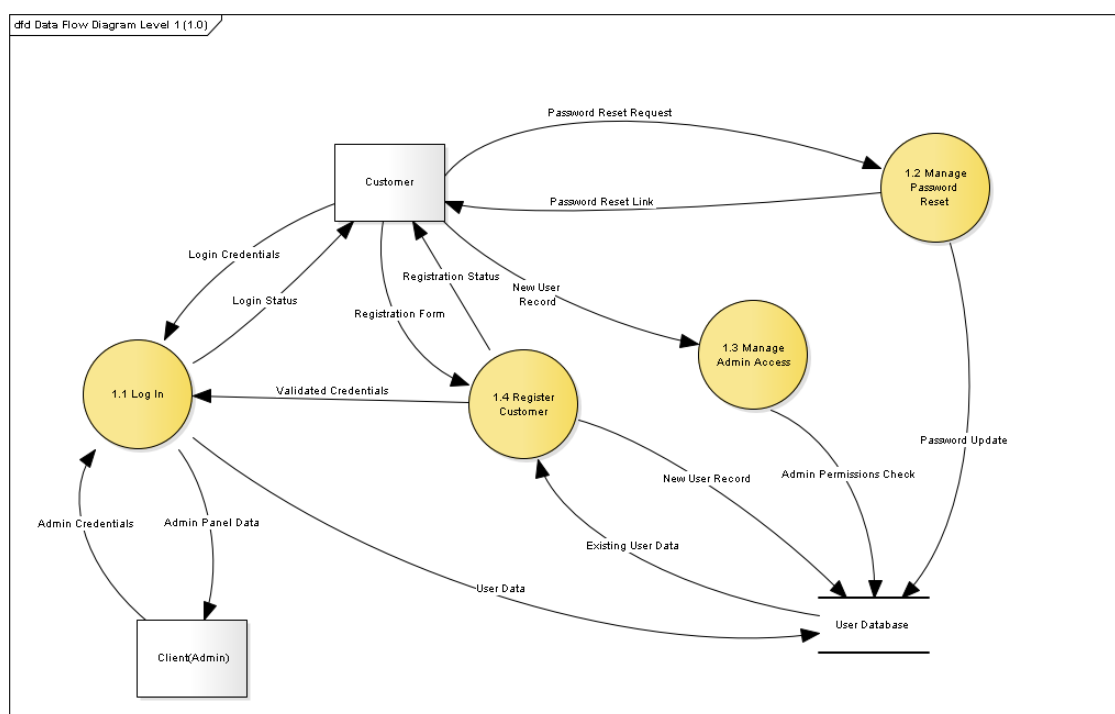


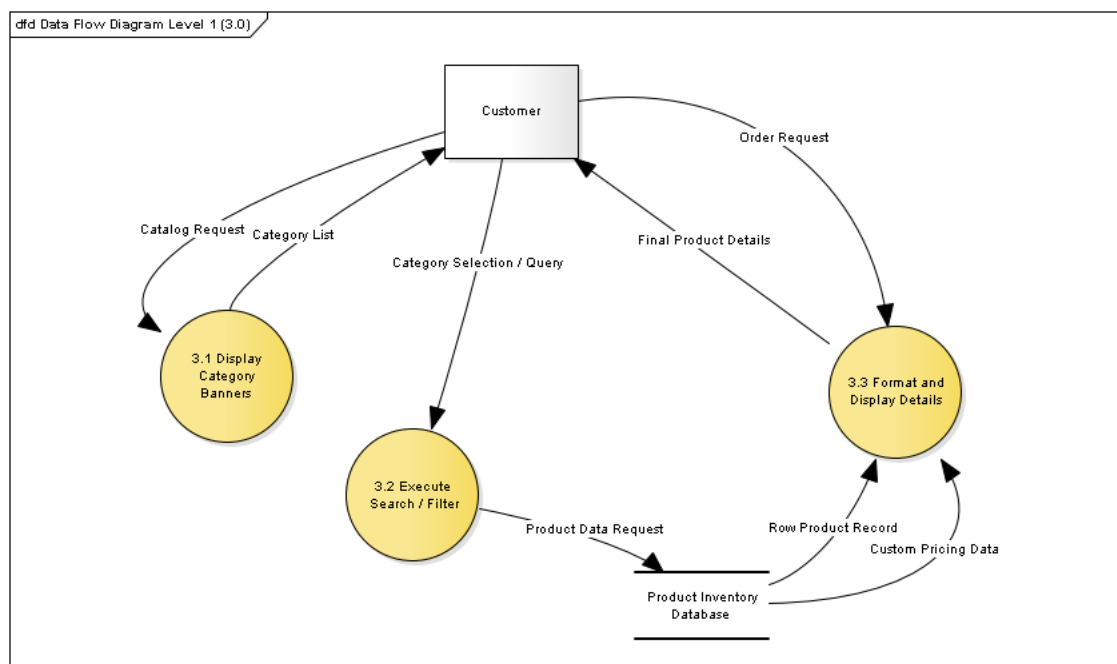
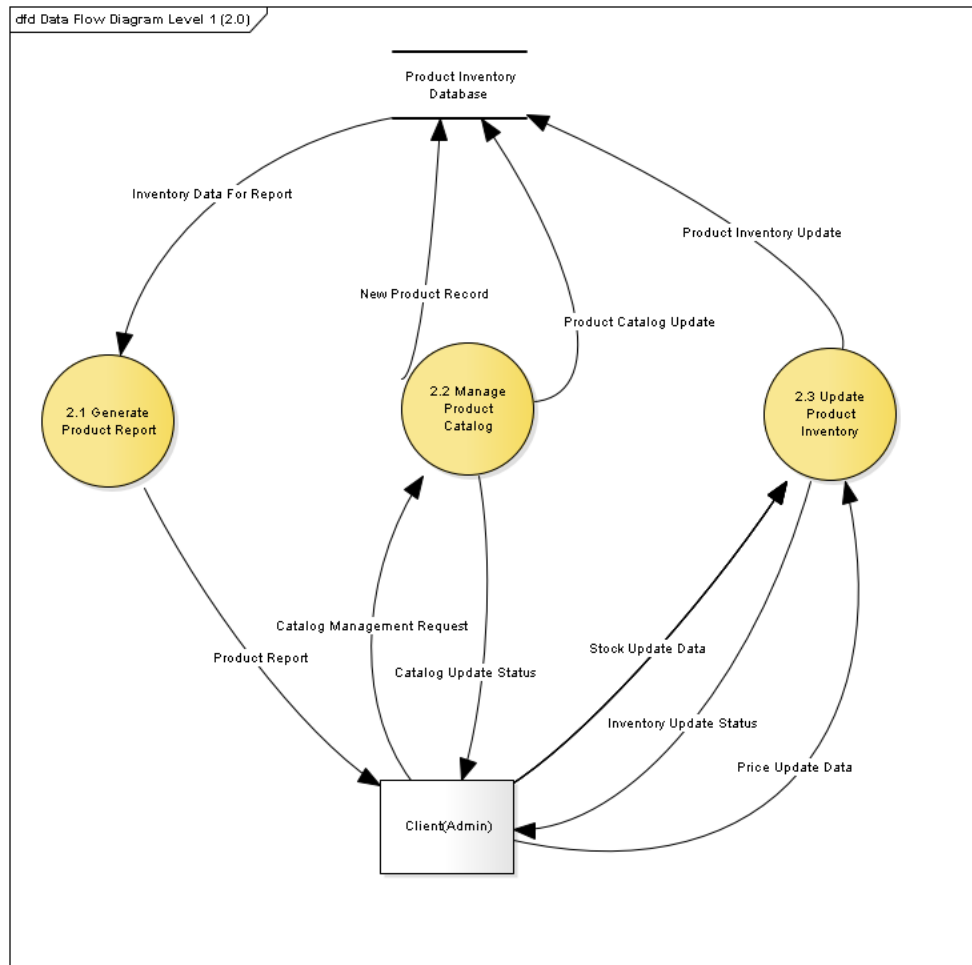
### 3.4. Data Flow Diagrams

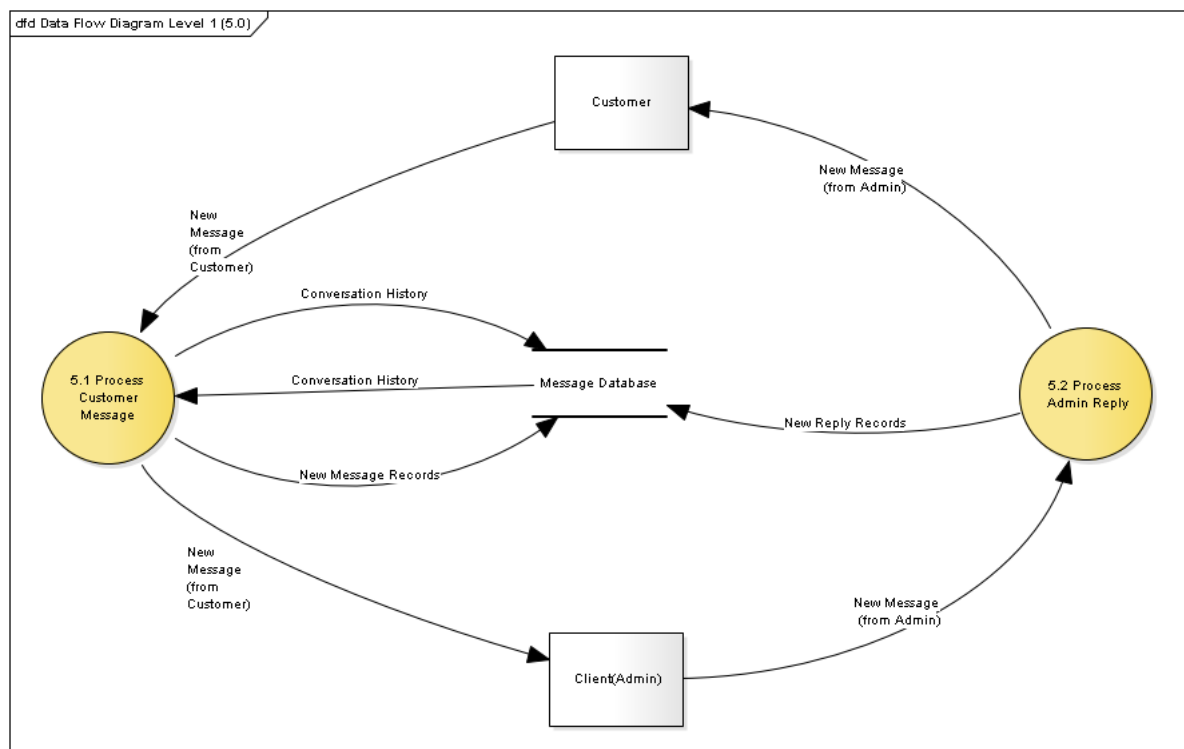
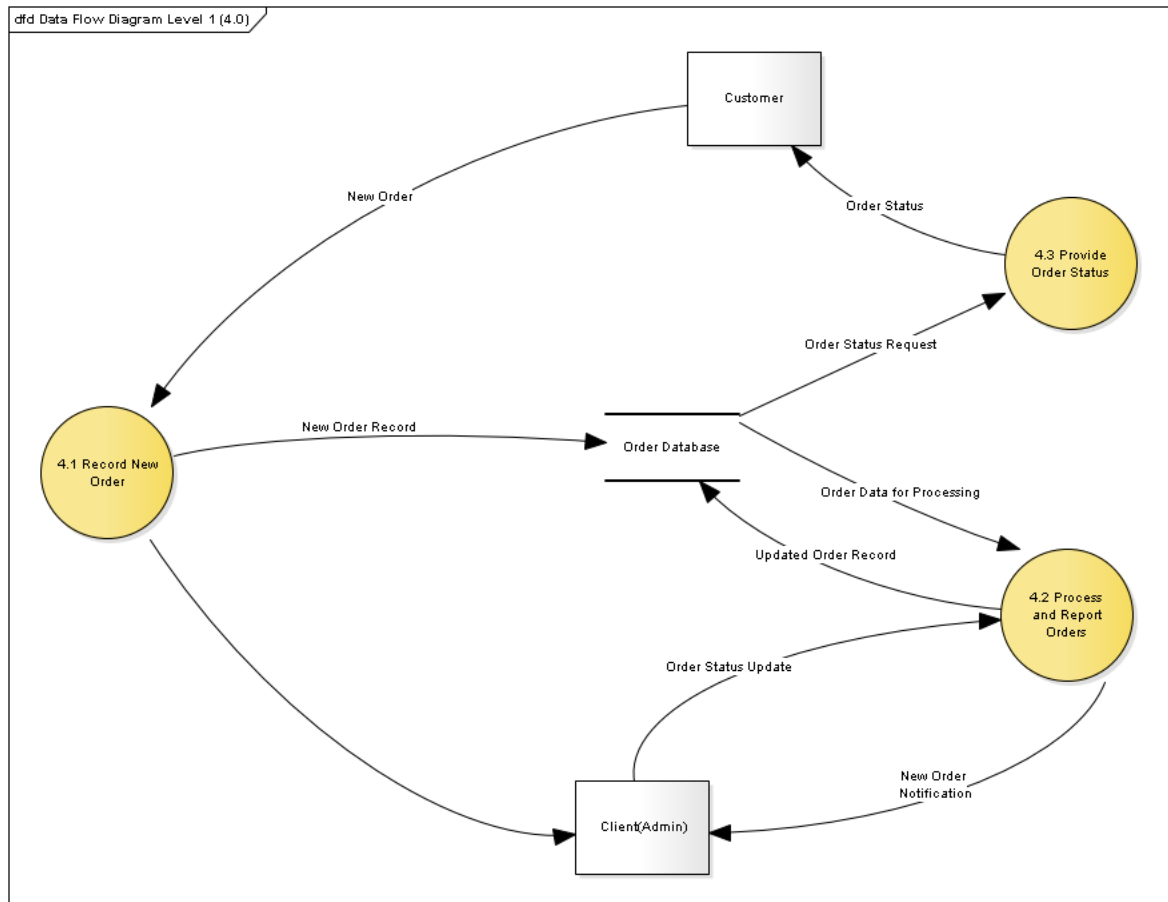
#### 3.4.1. DFD LEVEL 0 Diagram



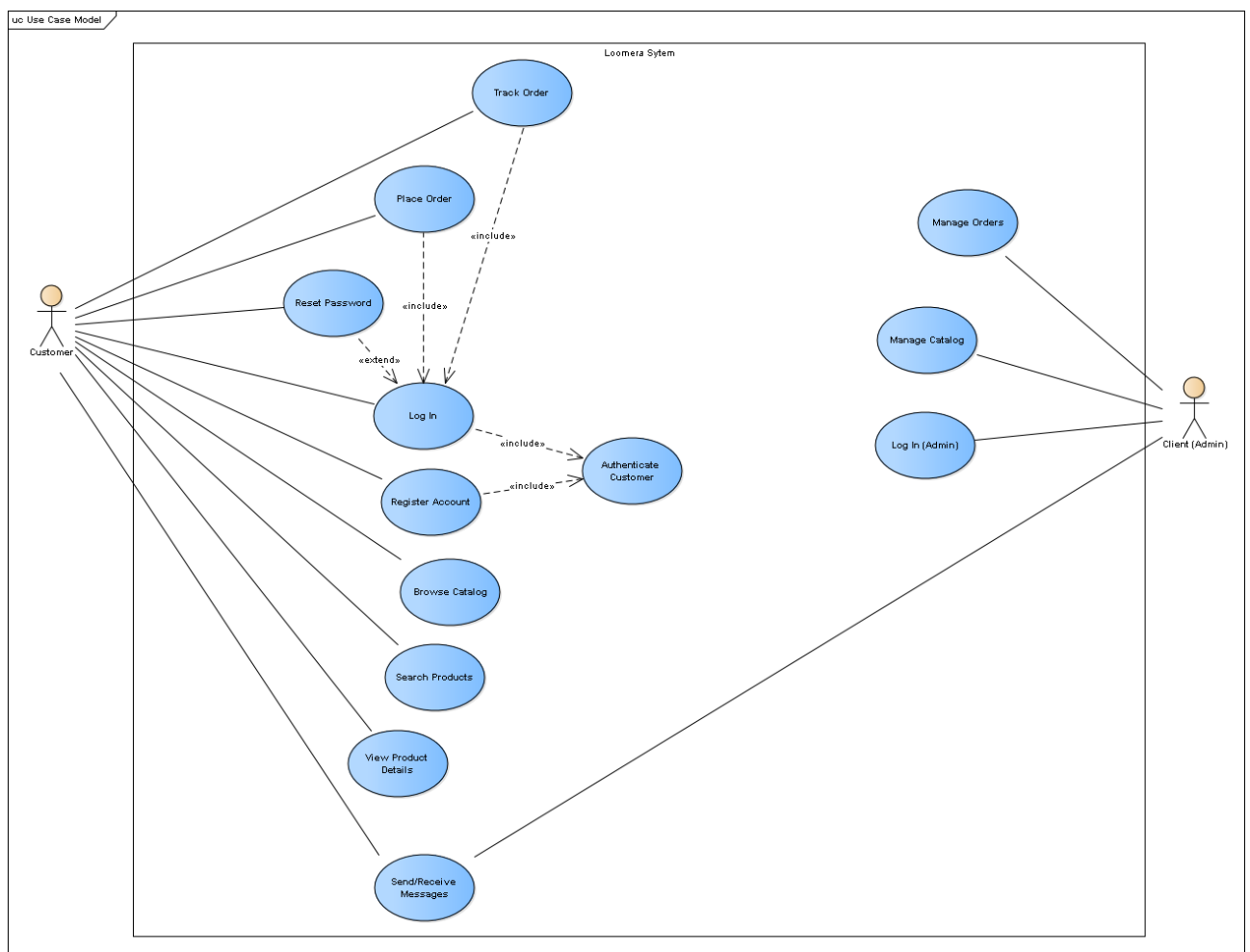
#### 3.4.2. DFD LEVEL 1 Diagrams



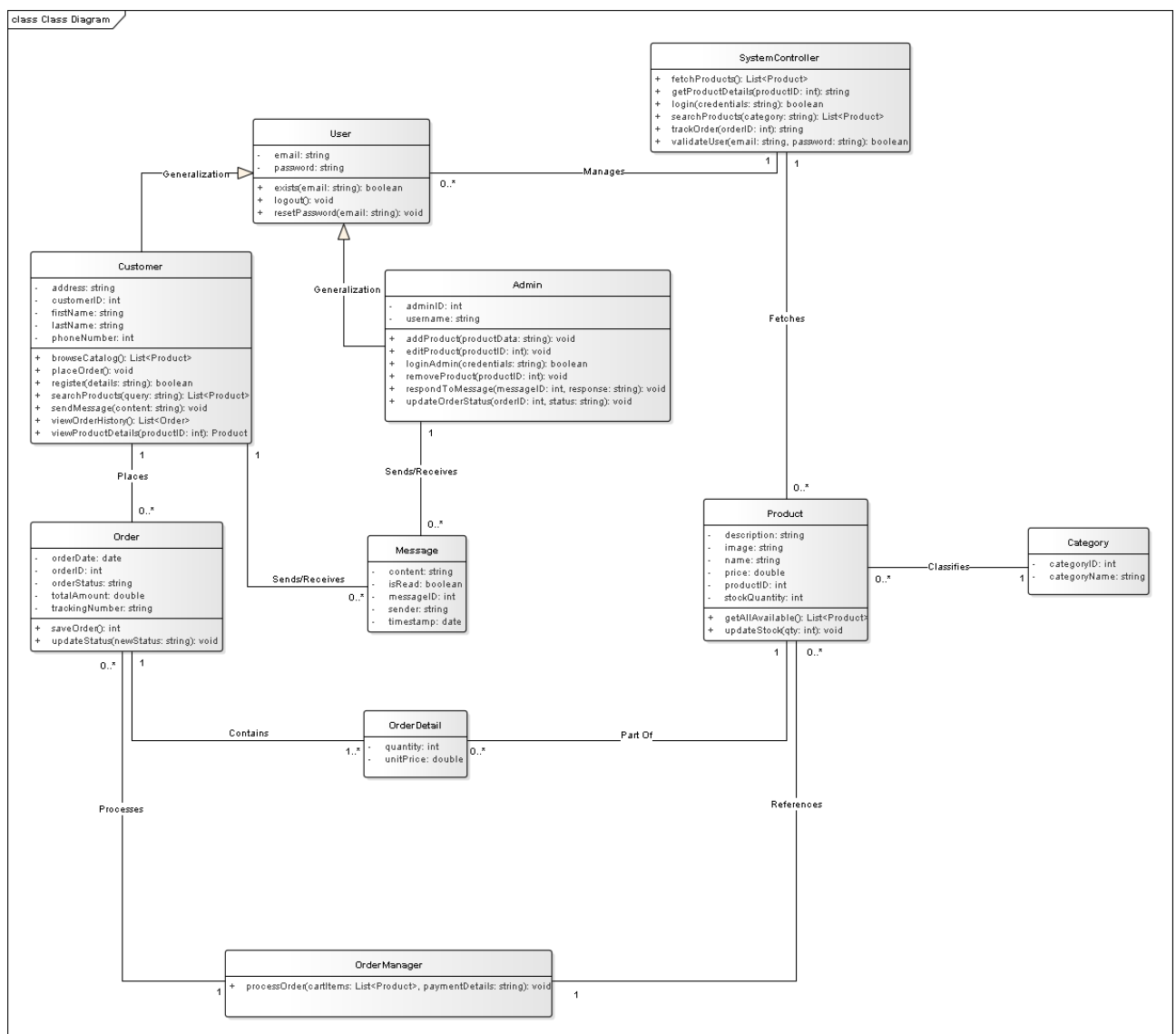




### 3.5. Use Case Diagram

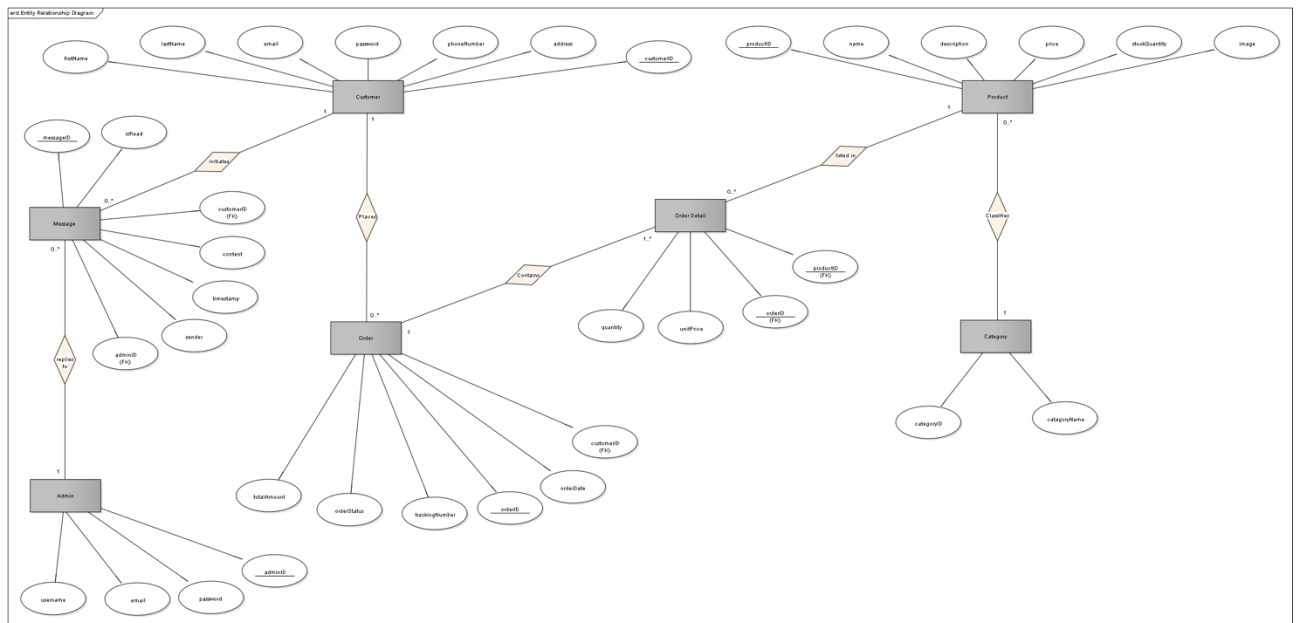


### 3.6. Class Diagram



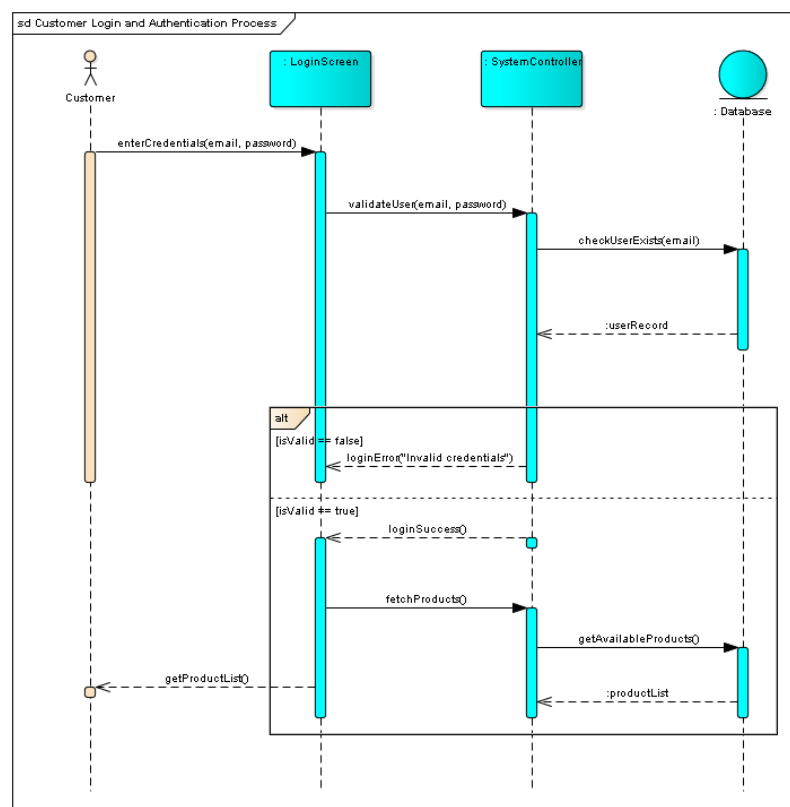


### 3.7. E/R Diagram

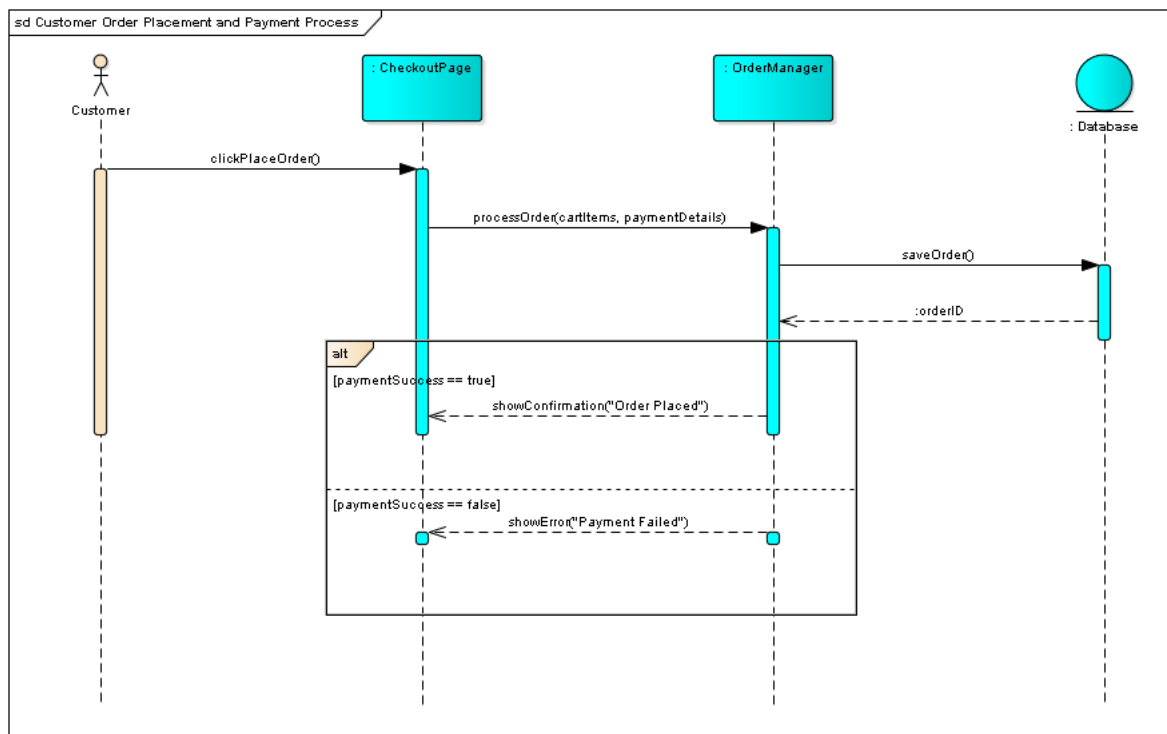


### 3.8. Sequence Diagrams

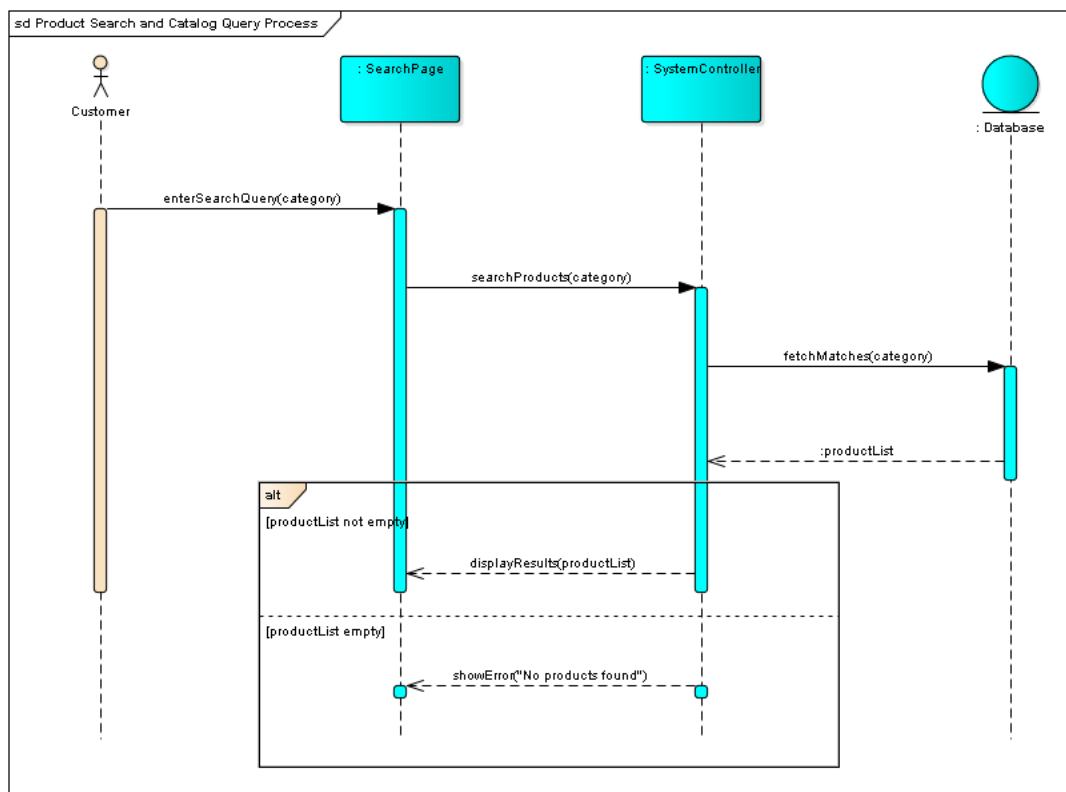
#### 3.8.1. Sequence Diagram 1: *Customer Login and Authentication Process*



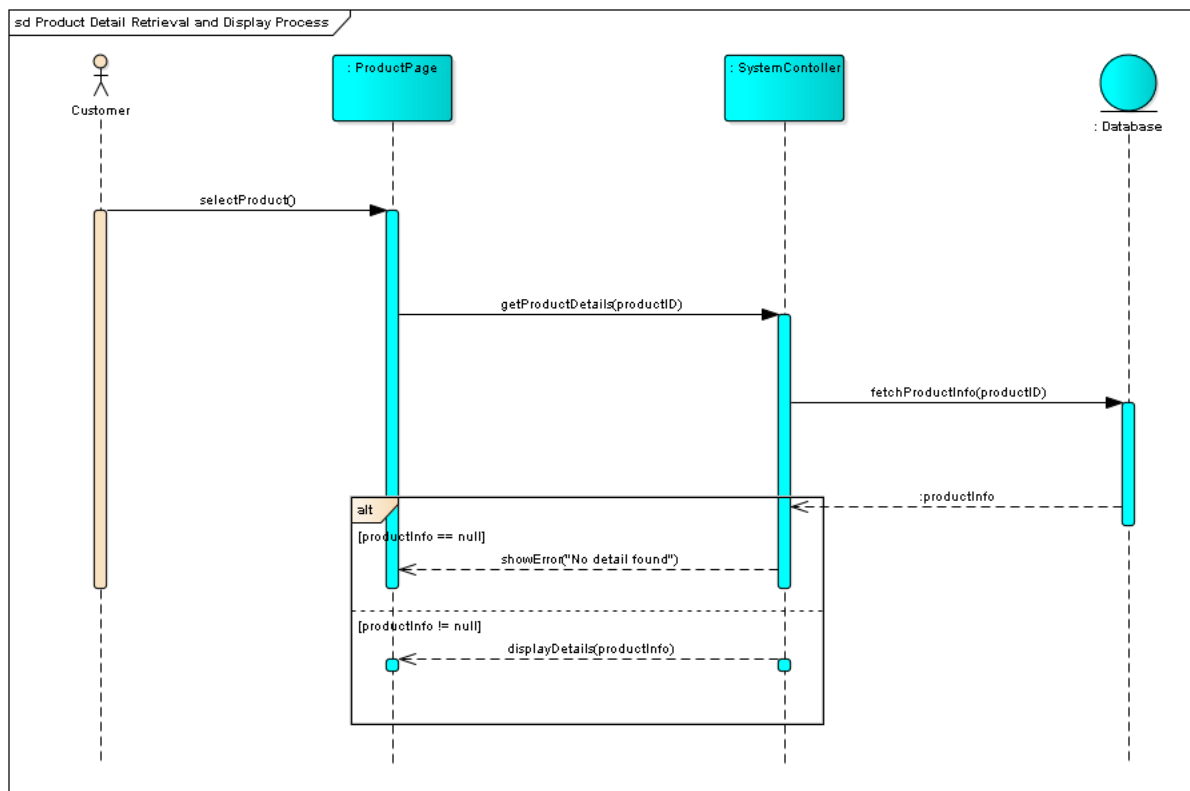
### 3.8.2. Sequence Diagram 2: *Customer Order Placement and Payment Process*



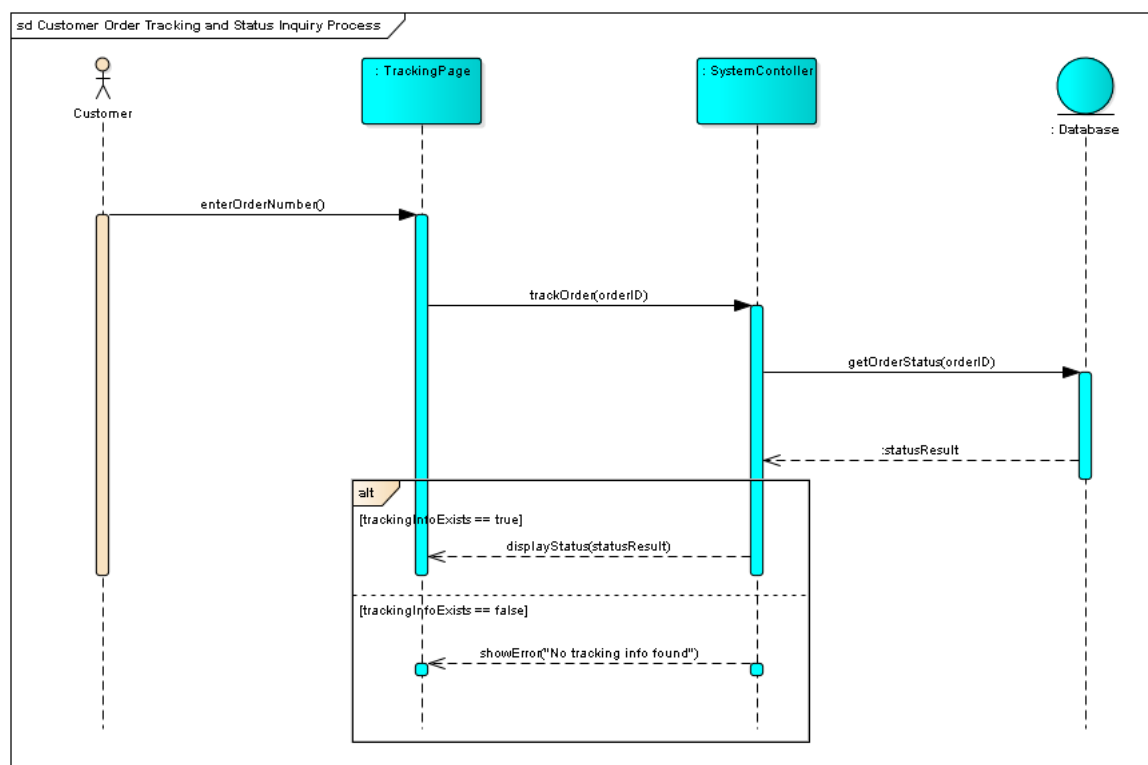
### 3.8.3. Sequence Diagram 3: *Product Search and Catalog Query Process*



### 3.8.4. Sequence Diagram 4: *Product Detail Retrieval and Display Process*

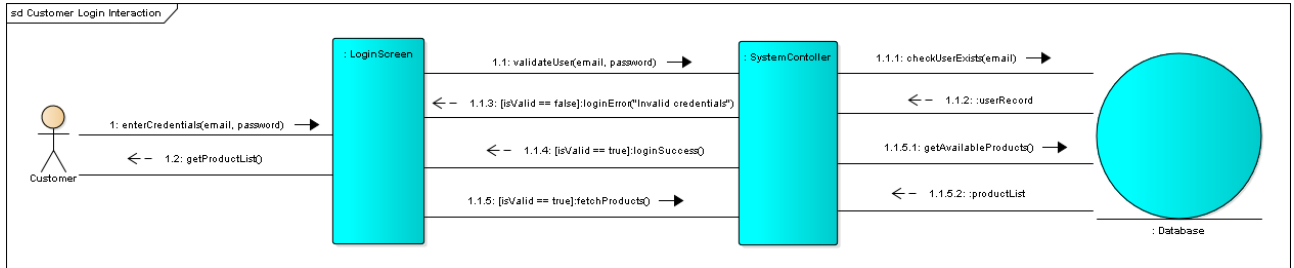


### 3.8.5. Sequence Diagram 5: *Customer Order Tracking and Status Inquiry Process*

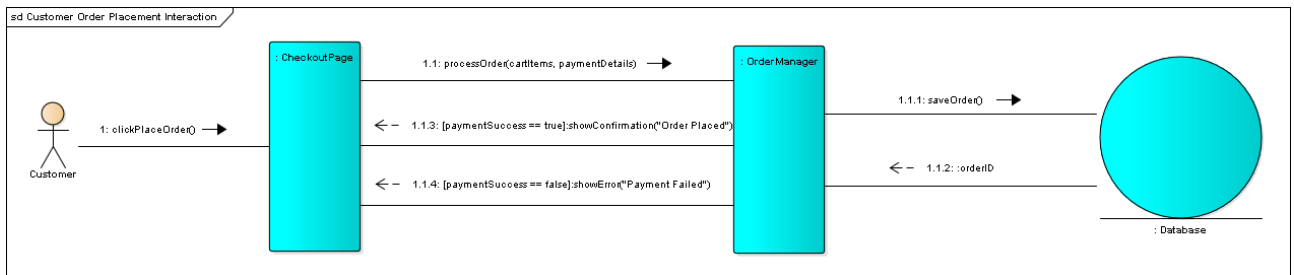


## 3.9. Communication Diagrams

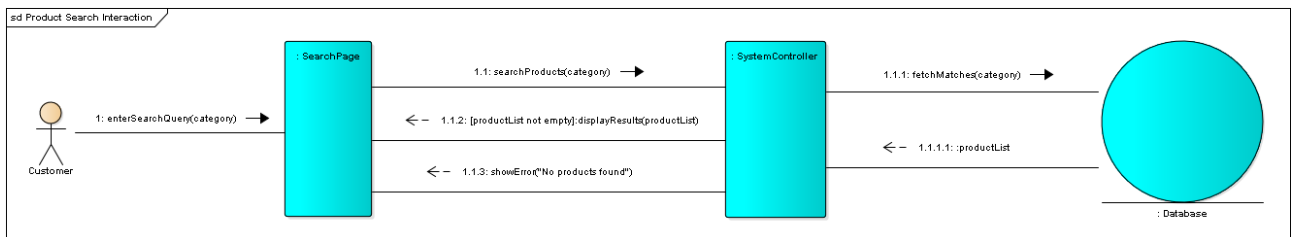
### 3.9.1. Communication Diagram 1: *Customer Login Interaction*



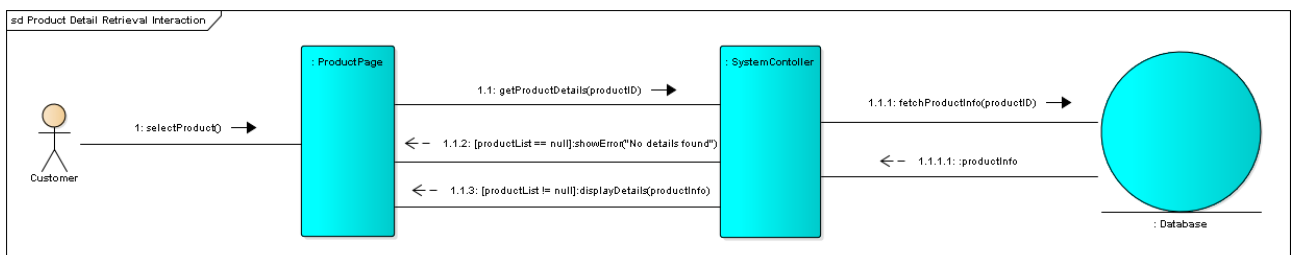
### 3.9.2. Communication Diagram 2: *Customer Order Placement Interaction*



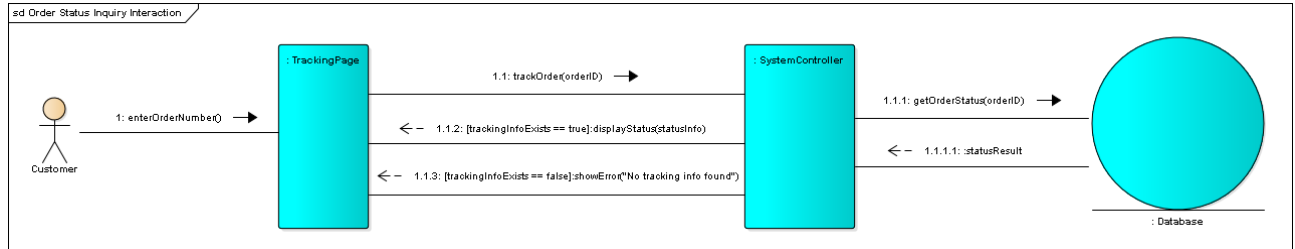
### 3.9.3. Communication Diagram 3: *Product Search Interaction*



### 3.9.4. Communication Diagram 4: *Product Detail Retrieval Interaction*



### 3.9.5. Communication Diagram 5: *Order Status Inquiry Interaction*



## 4. Conclusion

This report has presented a comprehensive software specification and design for our project Loomera that is a mobile application aimed at modernizing sales and communication workflows for our customer. By analyzing the inefficiencies in manual sales tracking, we defined clear functional and non-functional requirements to guide the system's development. Through the creation of detailed UML models, including Activity, Use Case, Context, Data Flow, Entity-Relationship (ER), Class, Sequence, and Communication diagrams, we have established a strong architectural design that ensures data integrity and a seamless user experience for both our customer and his customers. This design document now serves as the foundational guide for the successful implementation and future deployment of the Loomera system.