



NATIONAL UNIVERSITY OF MODERN LANGUAGES

Software Design and Architecture Final Project

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PROGRAM: BSSE (4th Semester)

COURSE: SOFTWARE DESIGN AND ARCHITECTURE

SUBMITTED TO: Sir Anas Bilal

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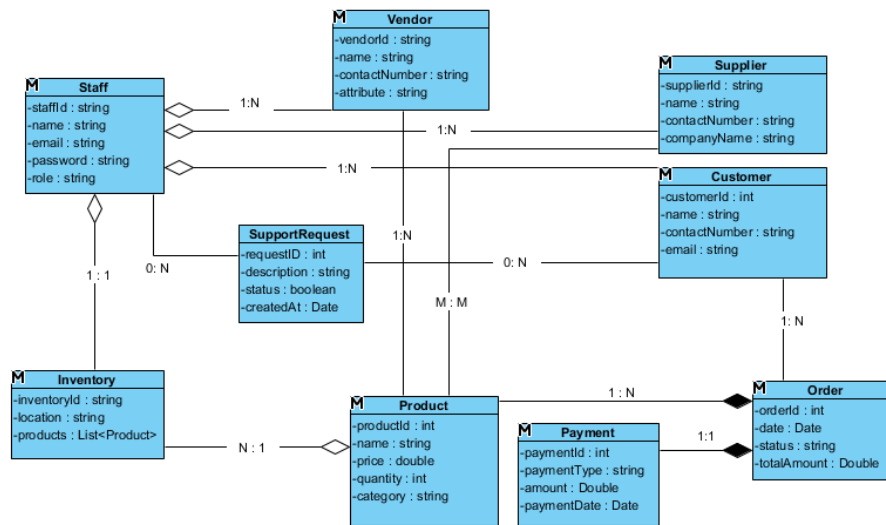
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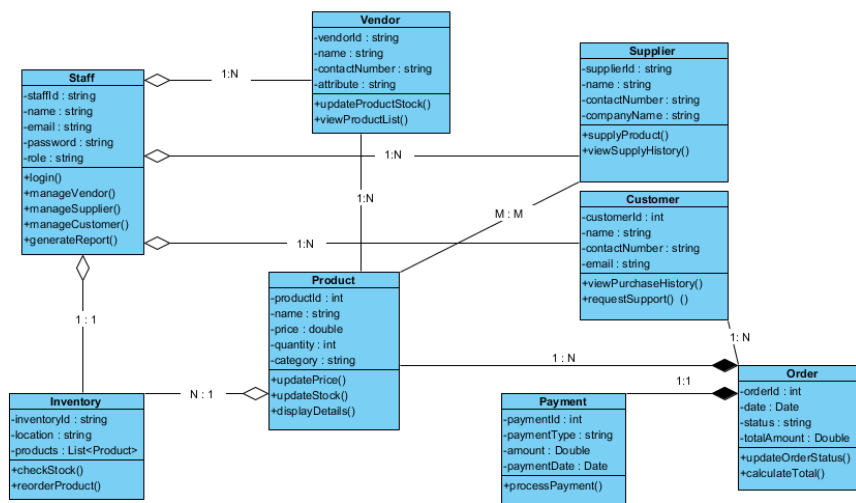
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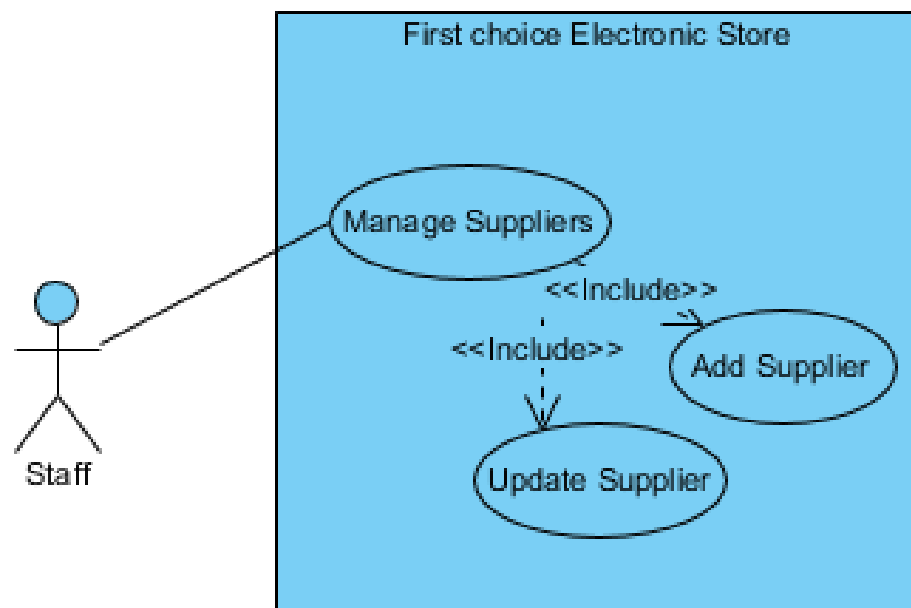
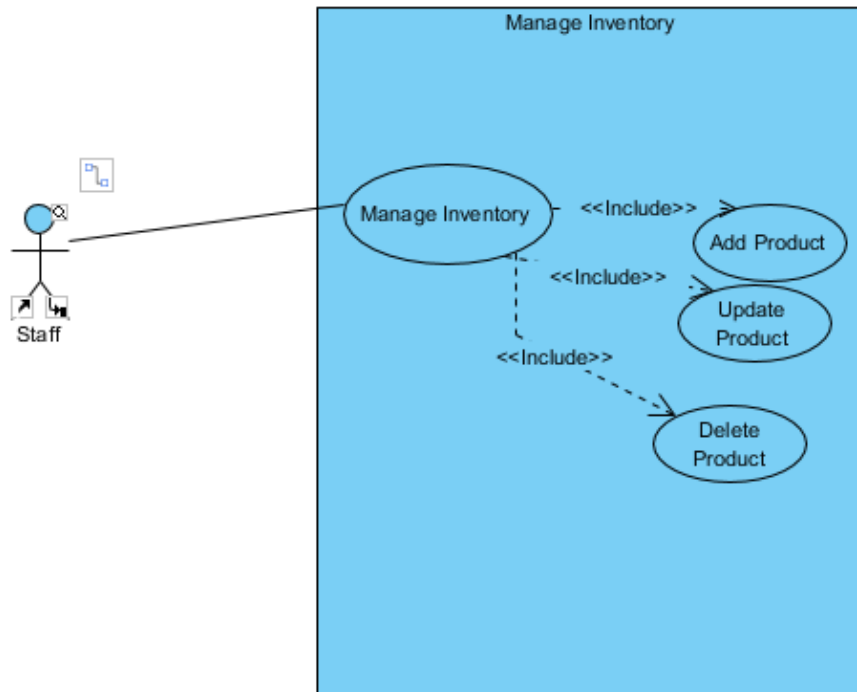
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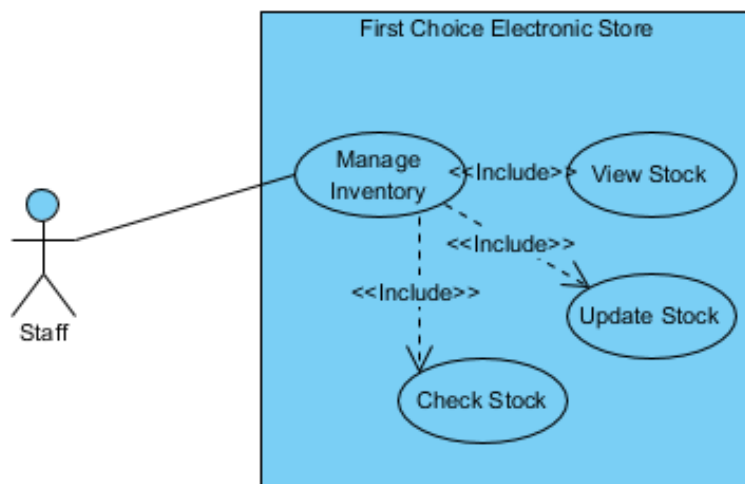
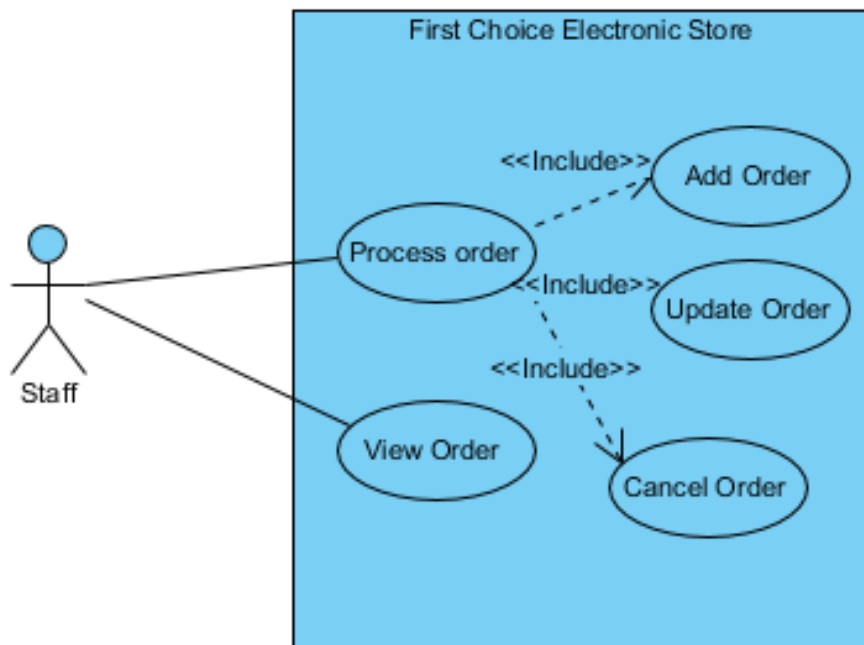


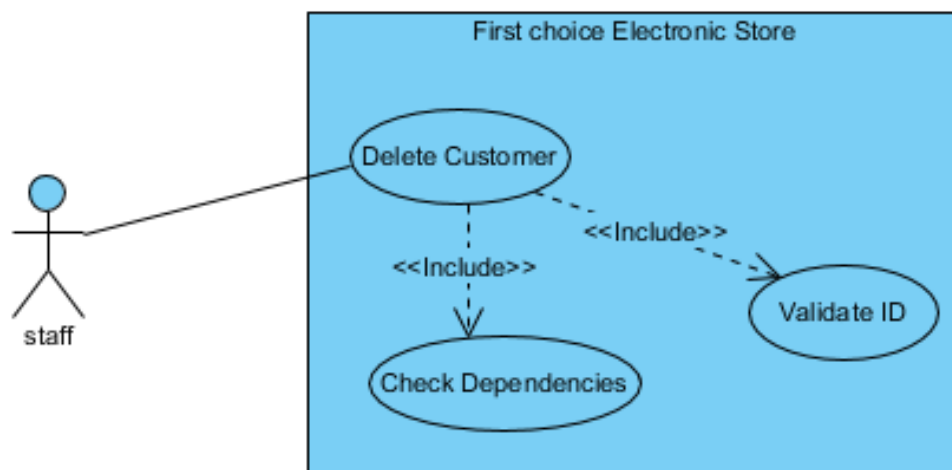
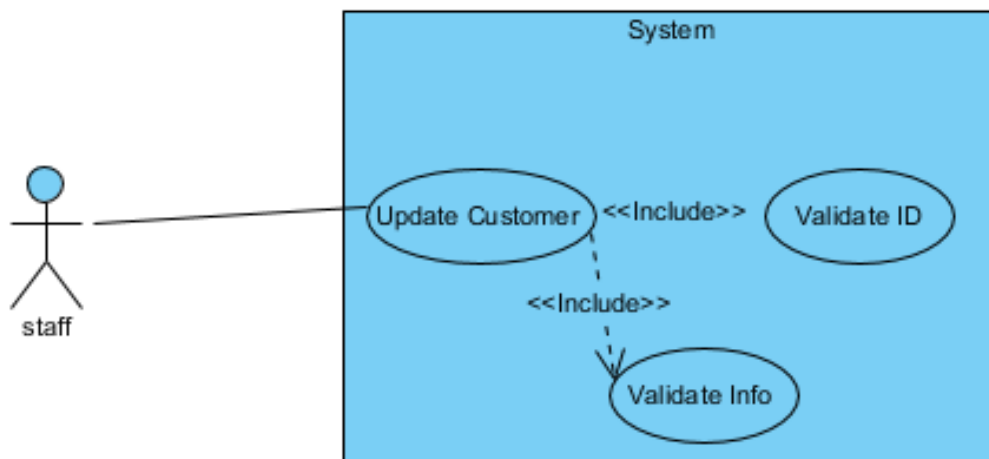
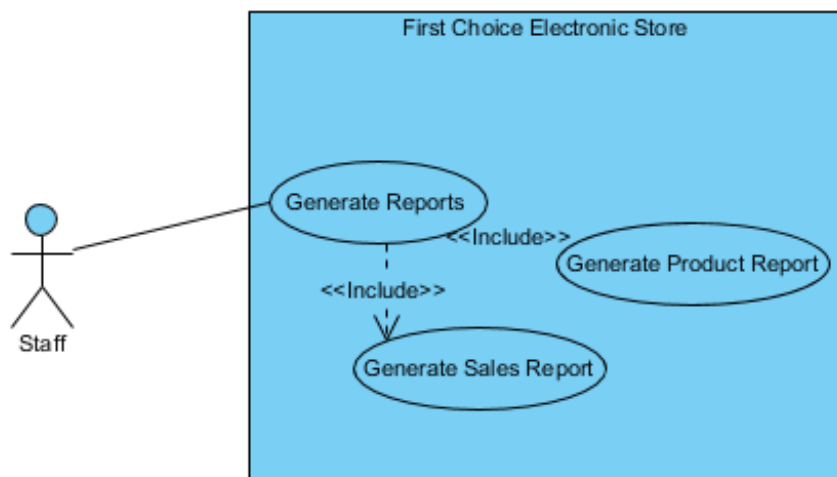
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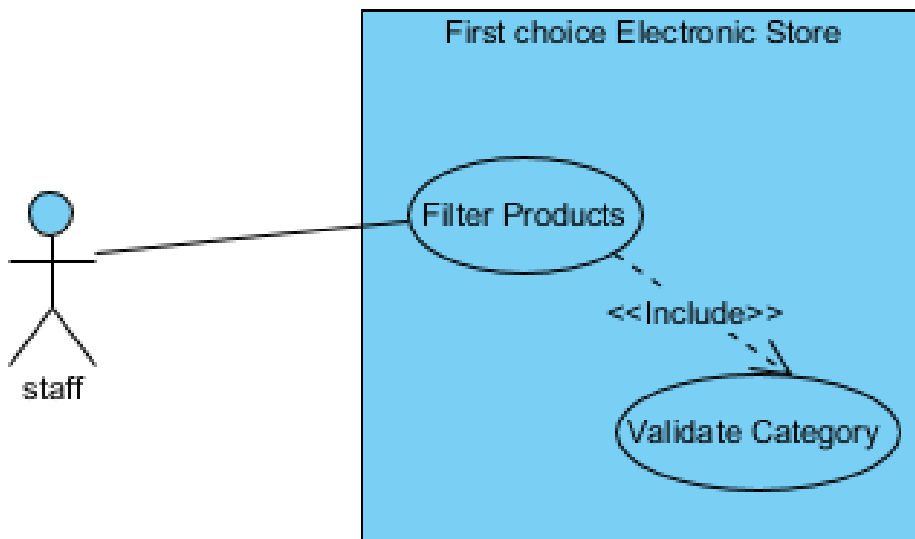
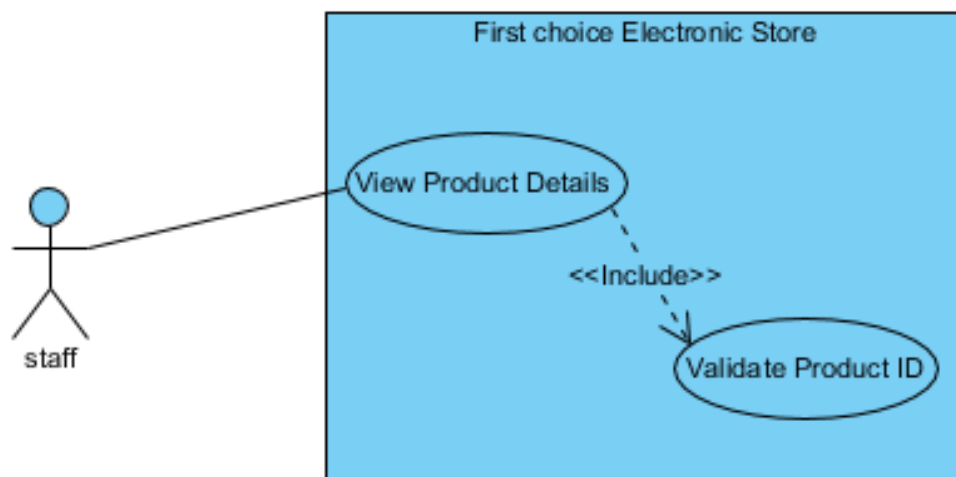
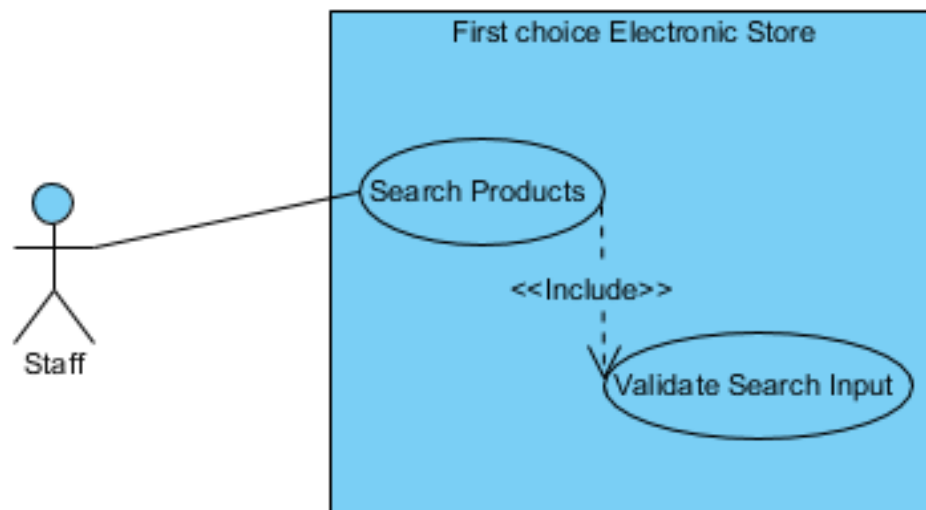


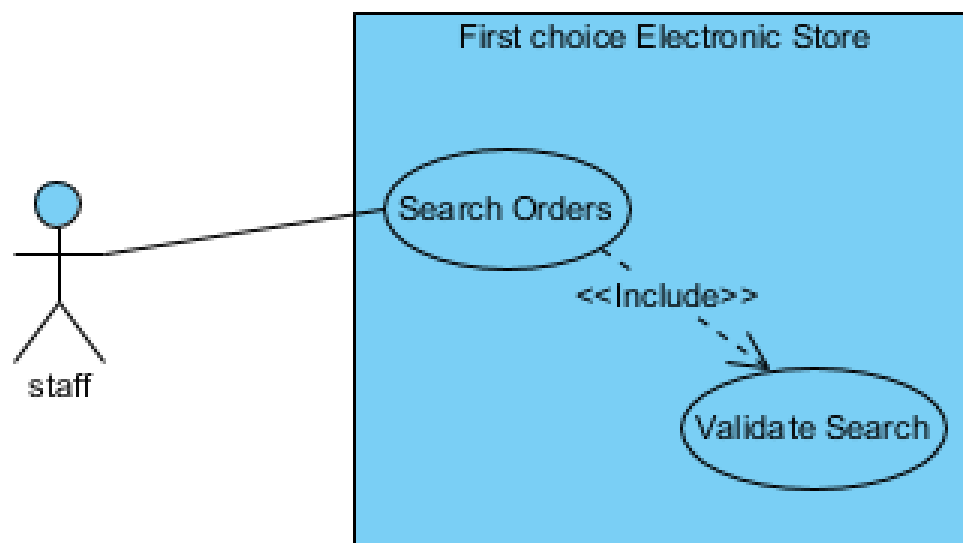
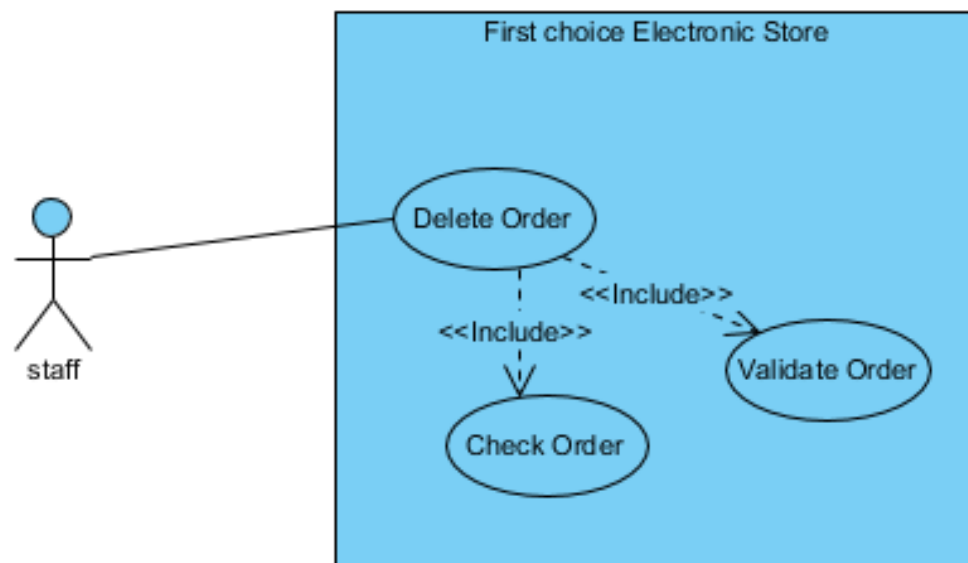
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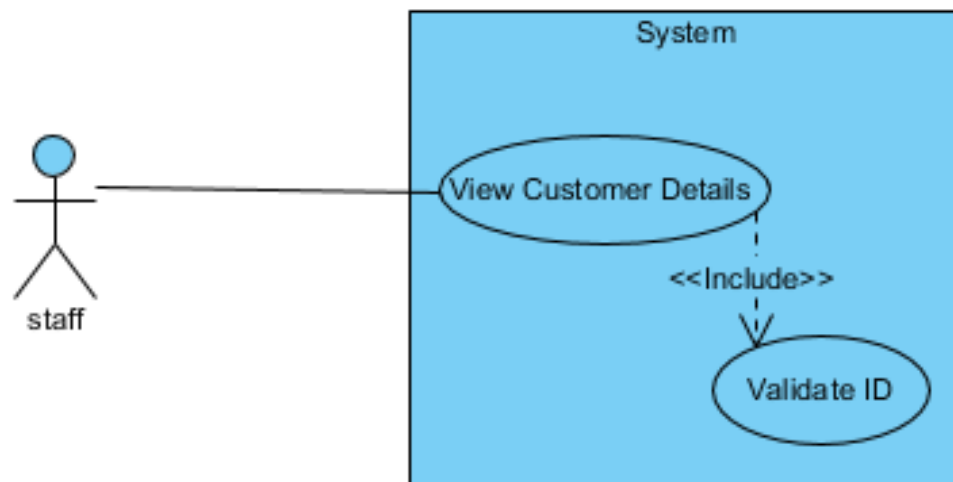
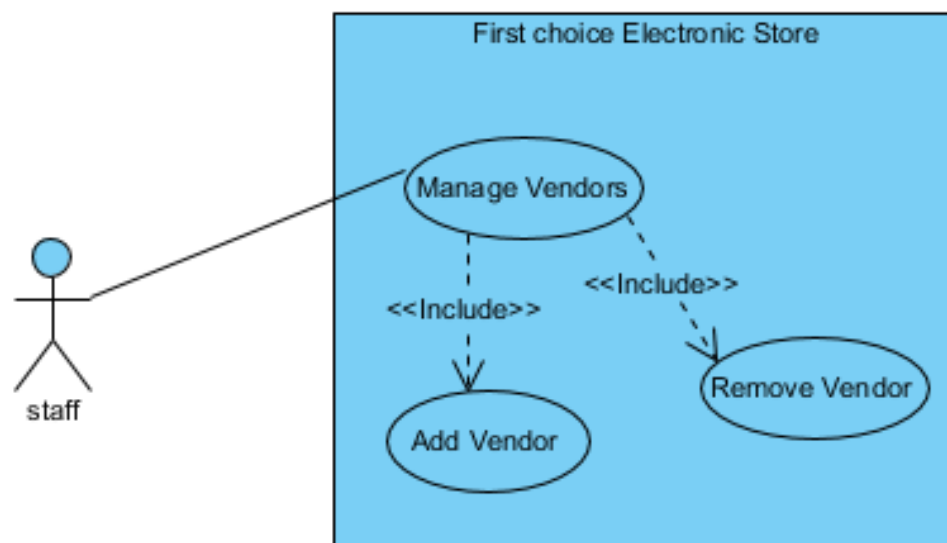


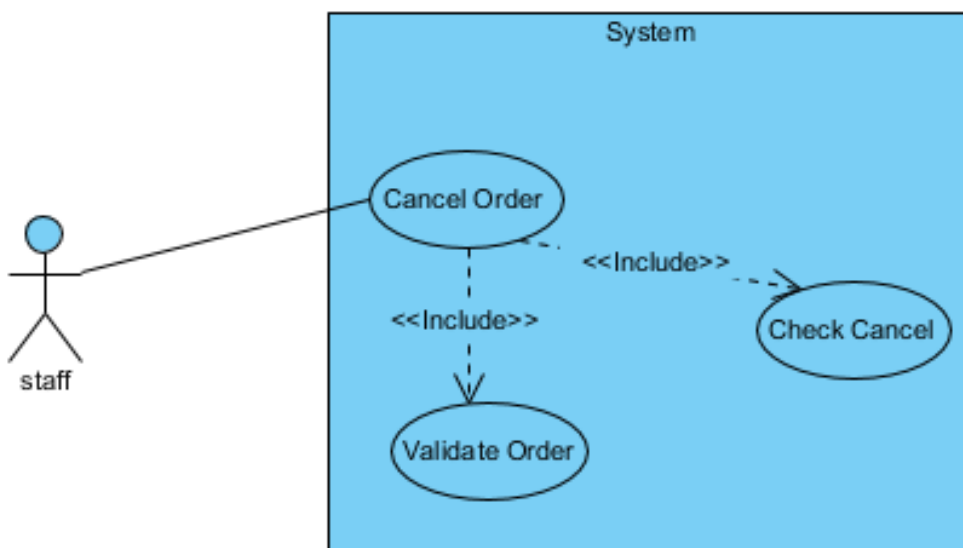
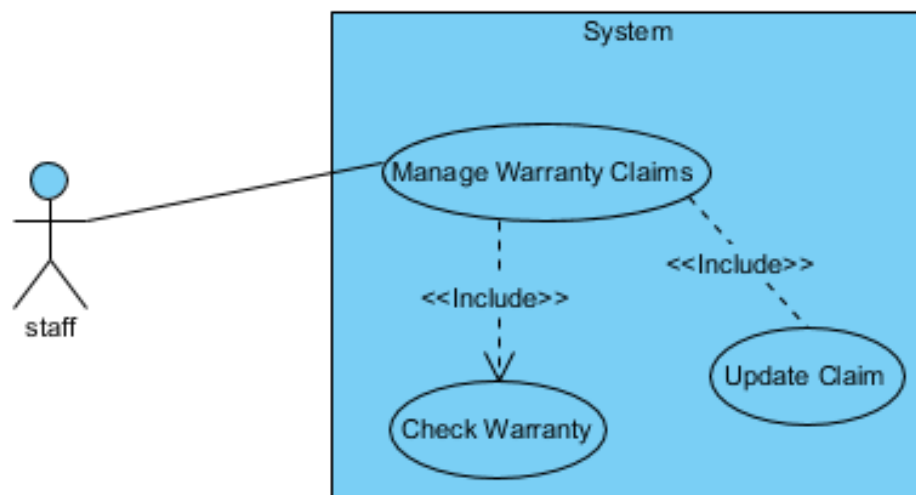


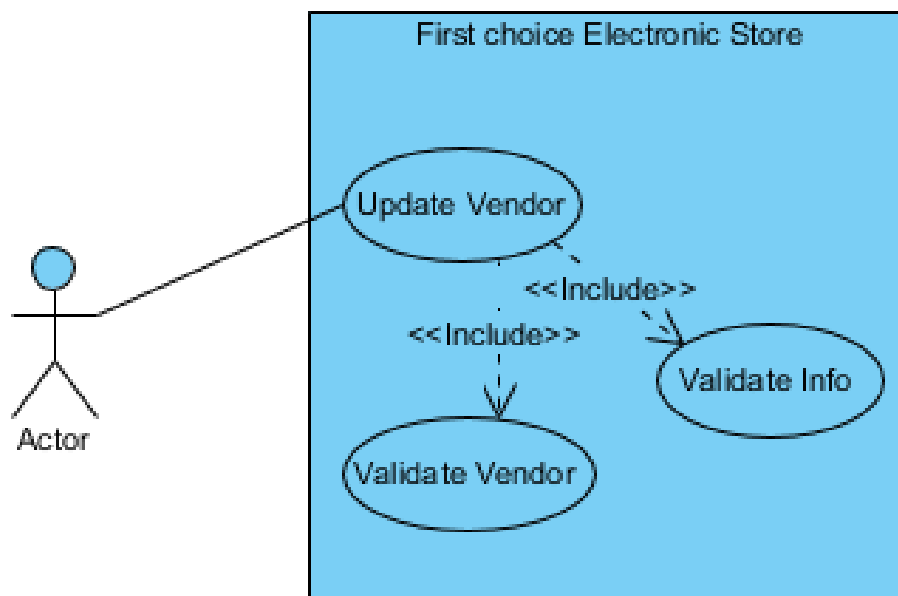
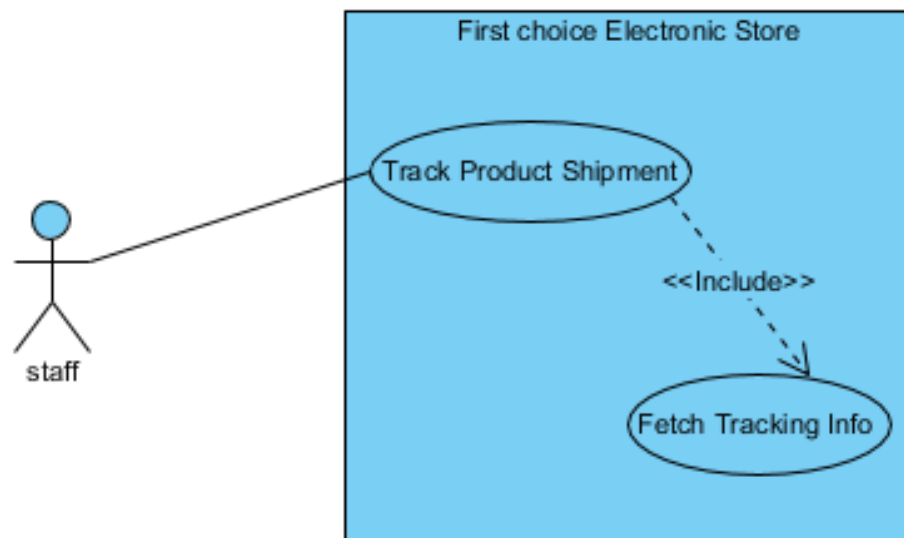




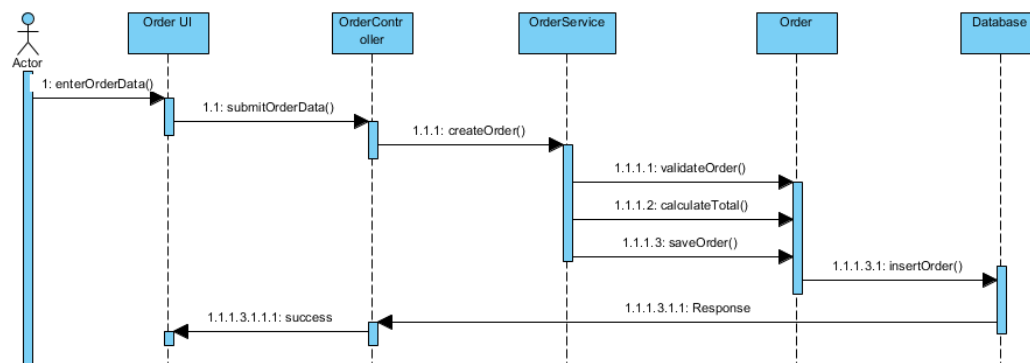
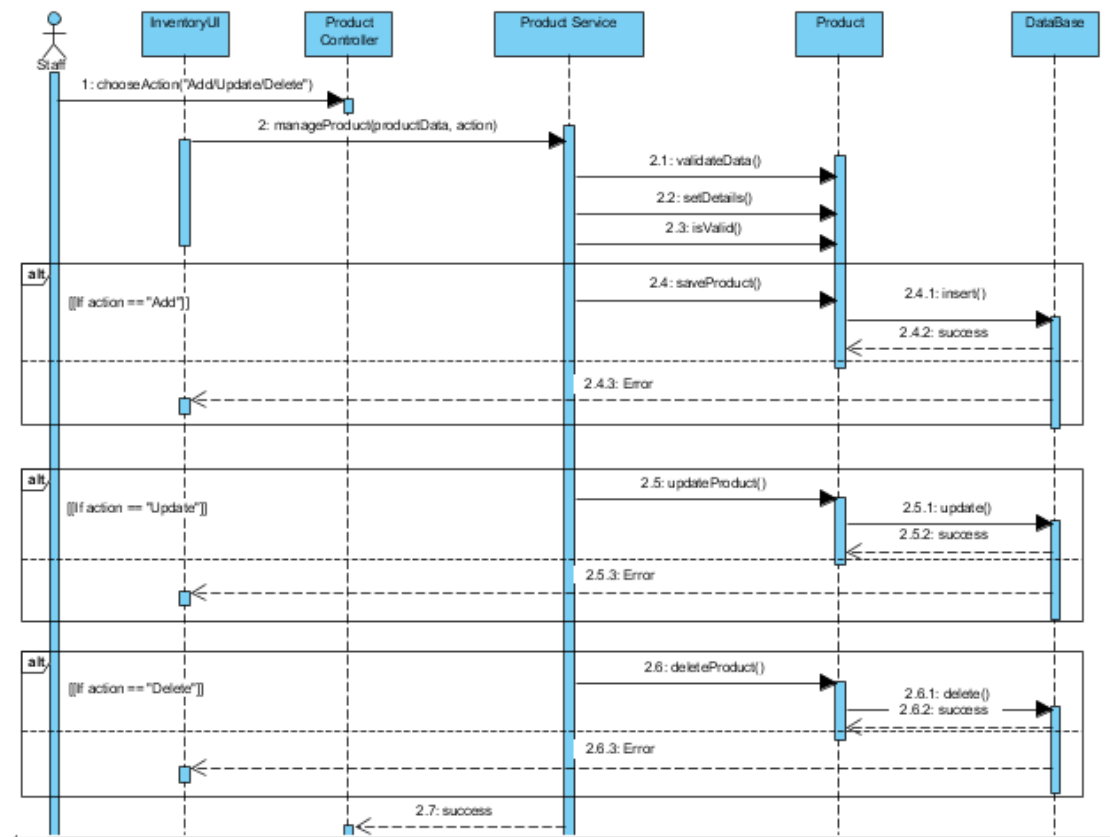


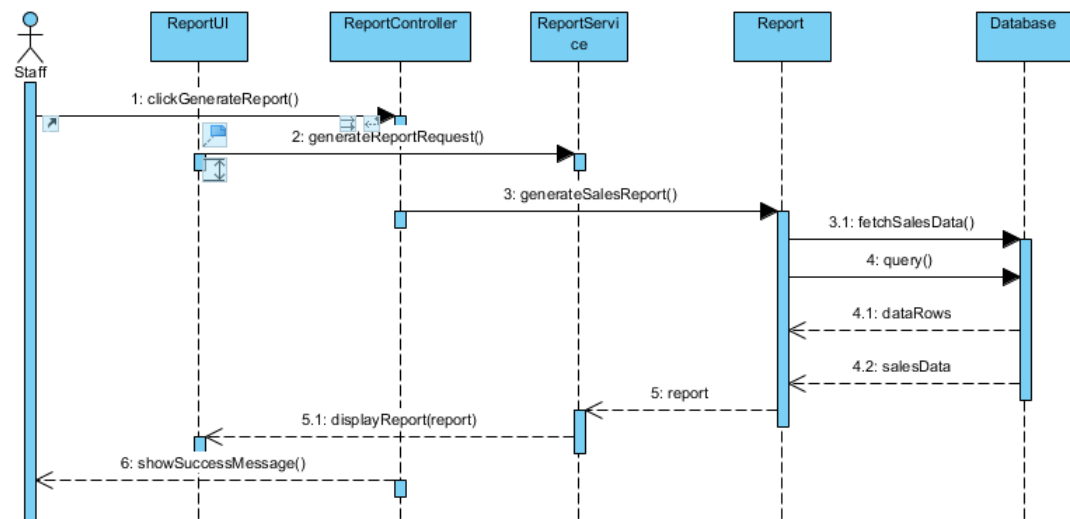
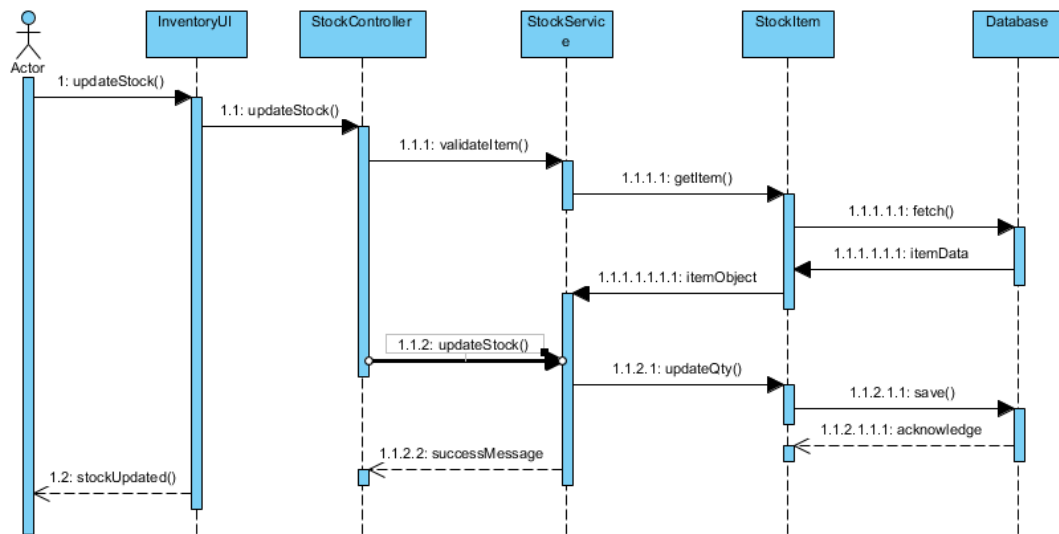
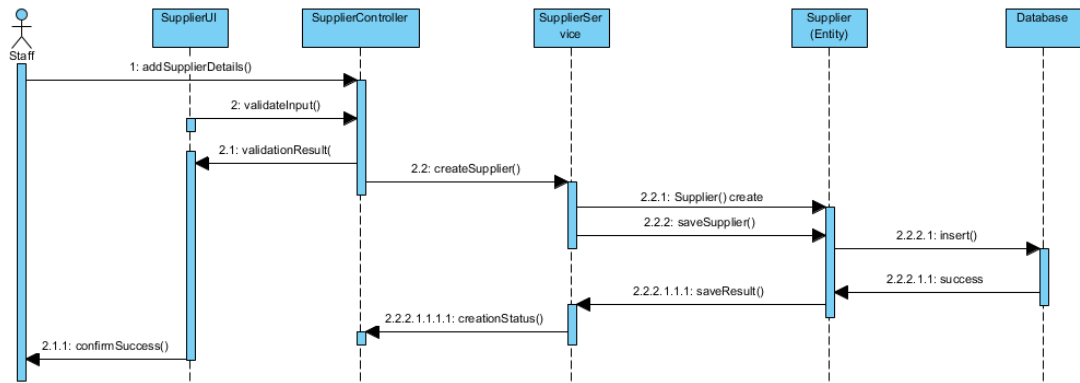


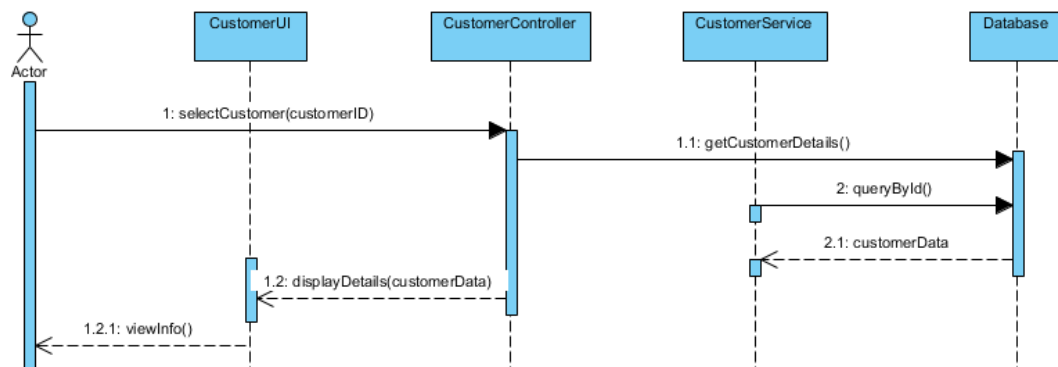
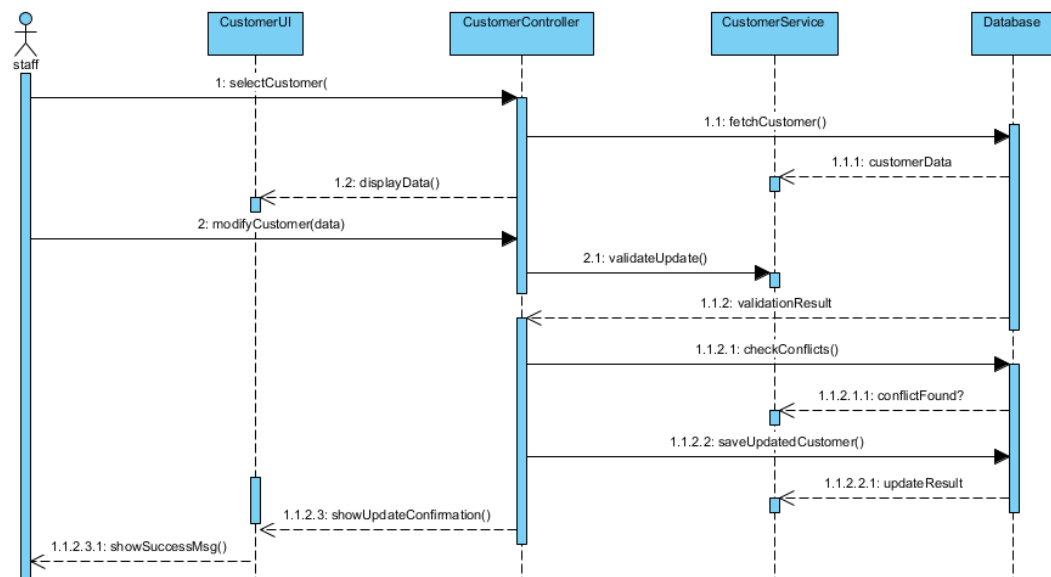
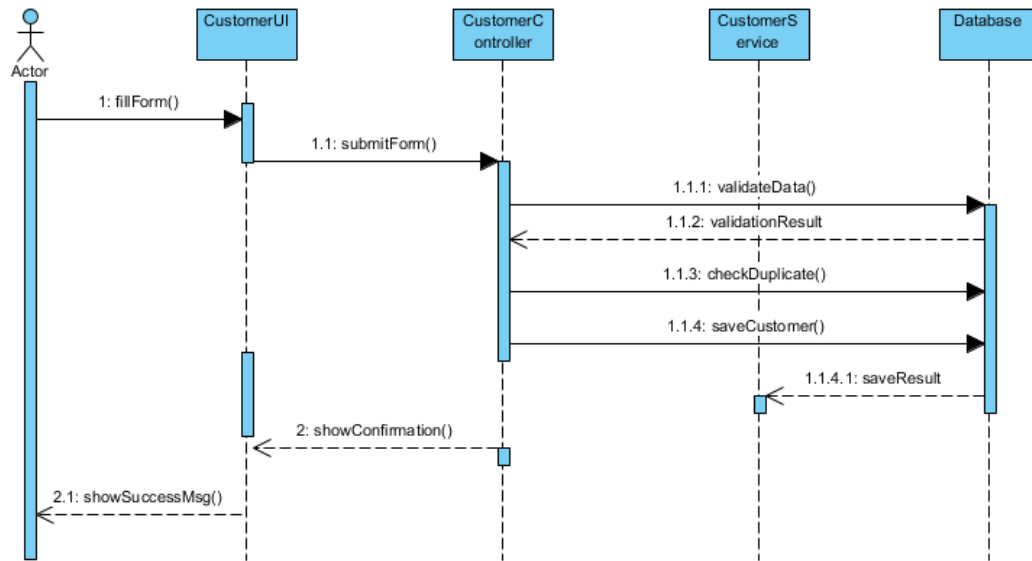


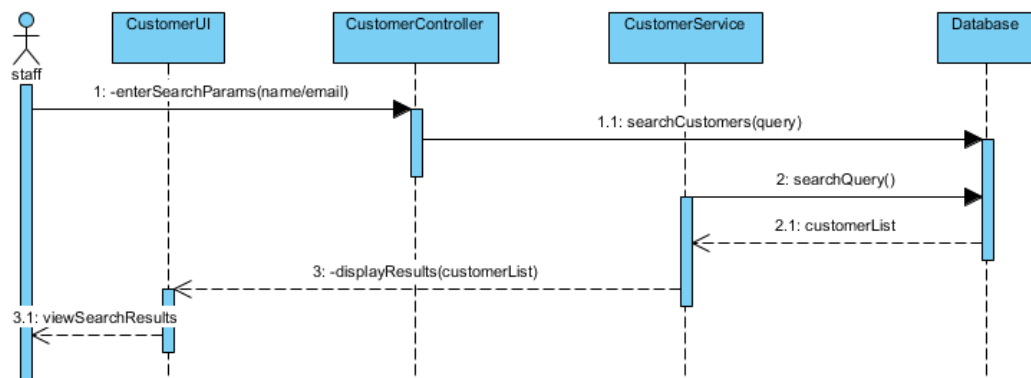
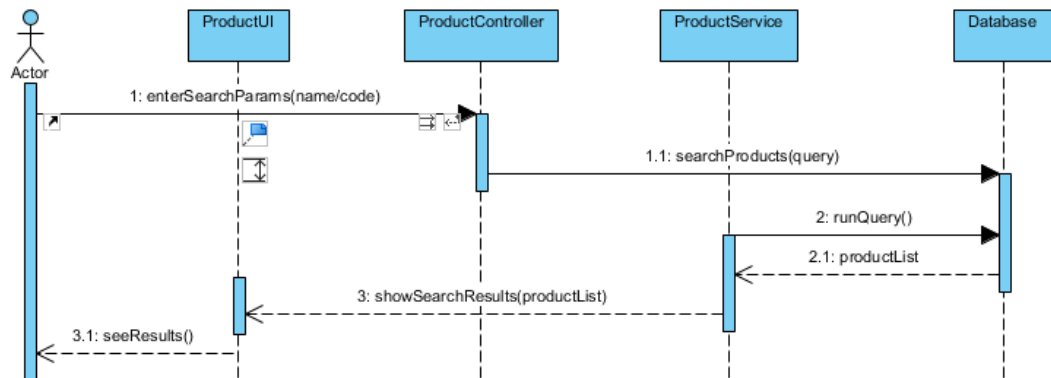
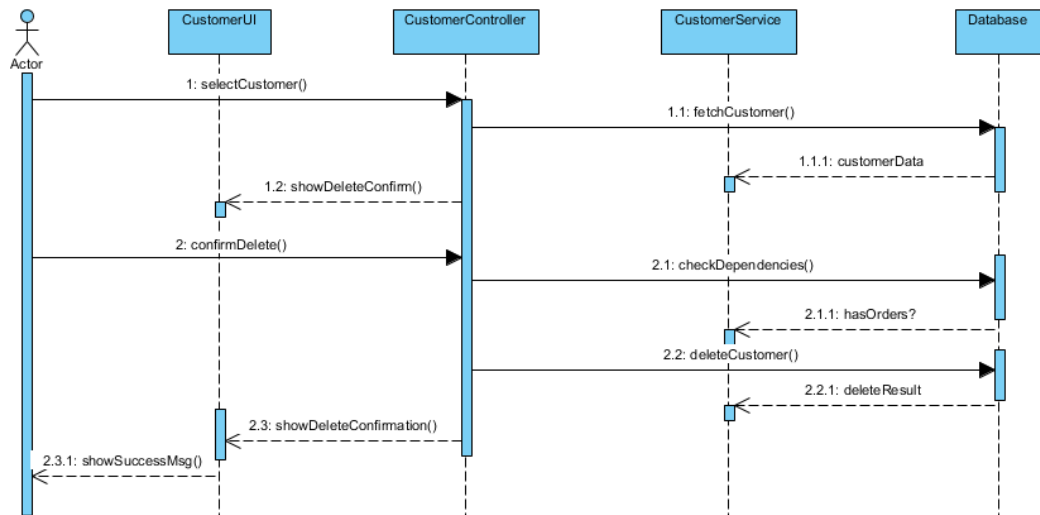


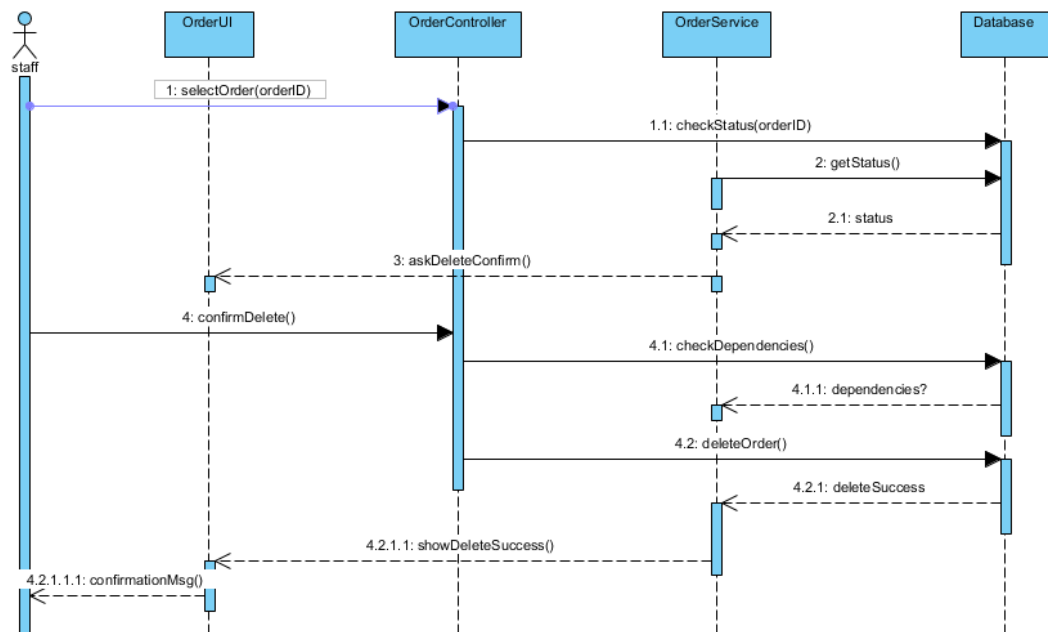
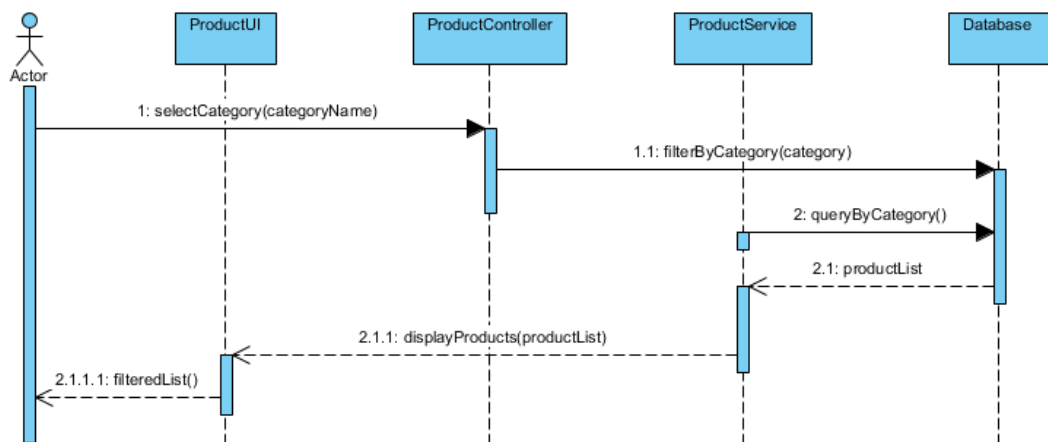
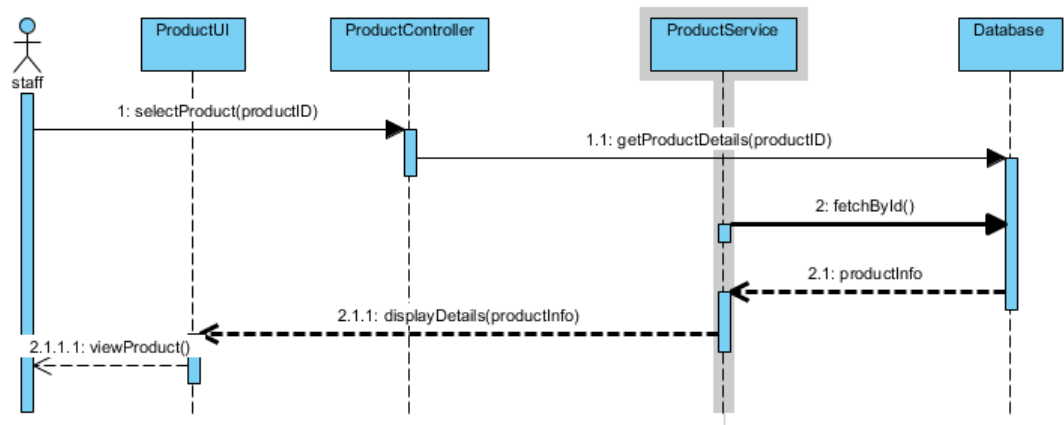
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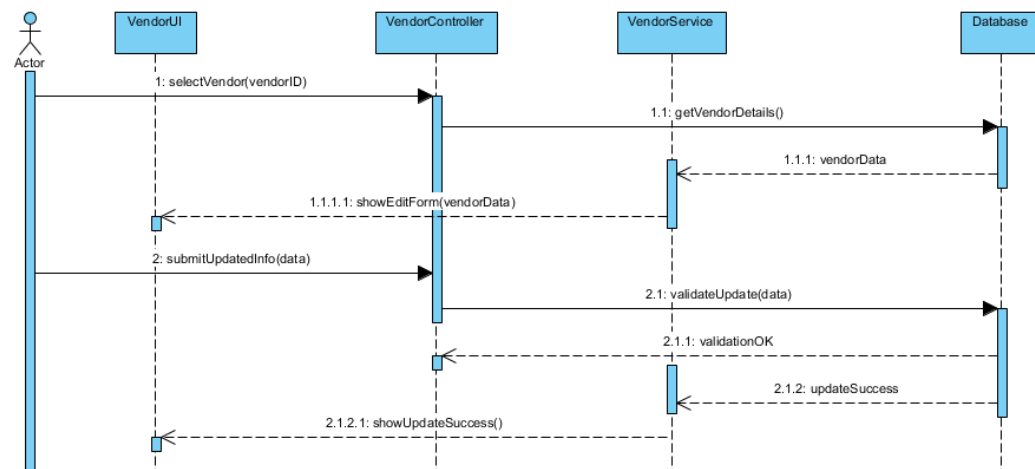
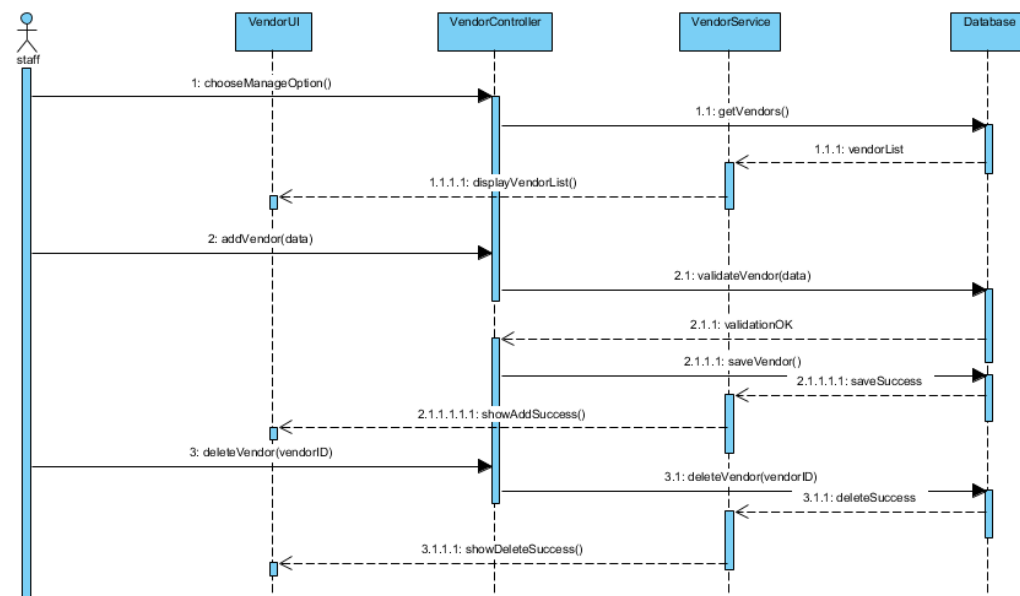
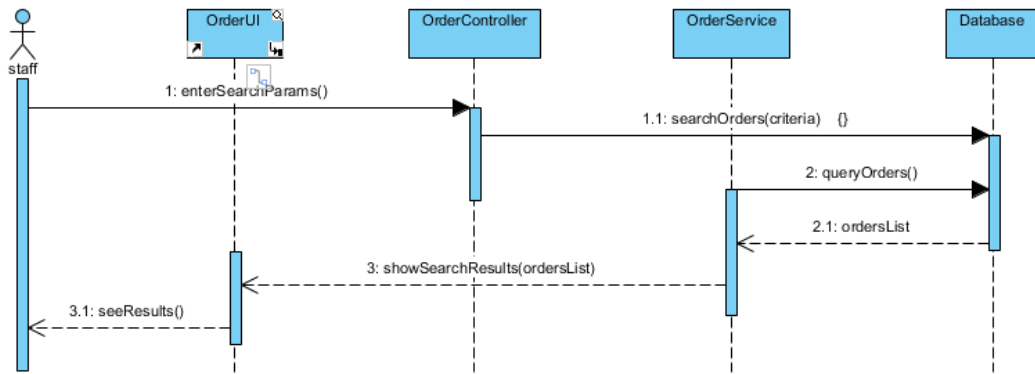


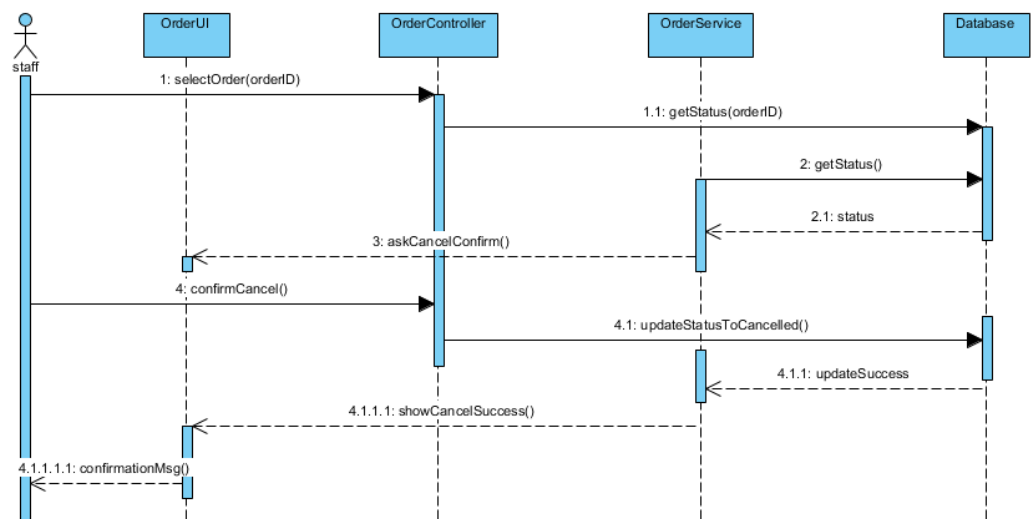
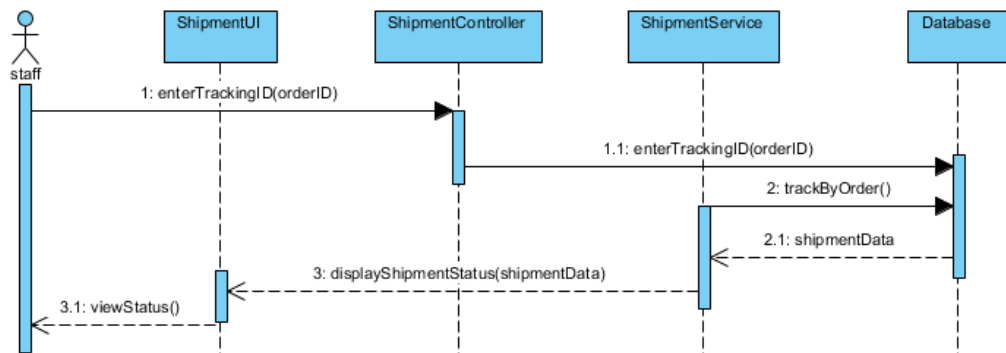
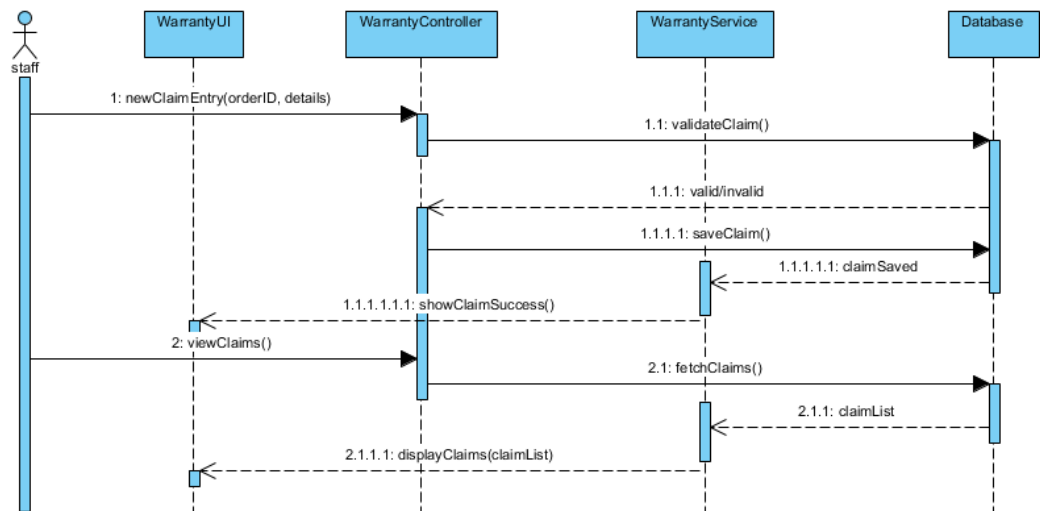






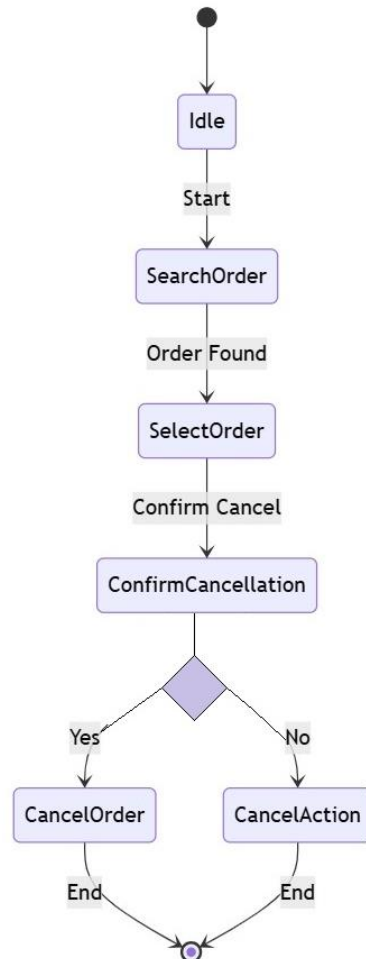


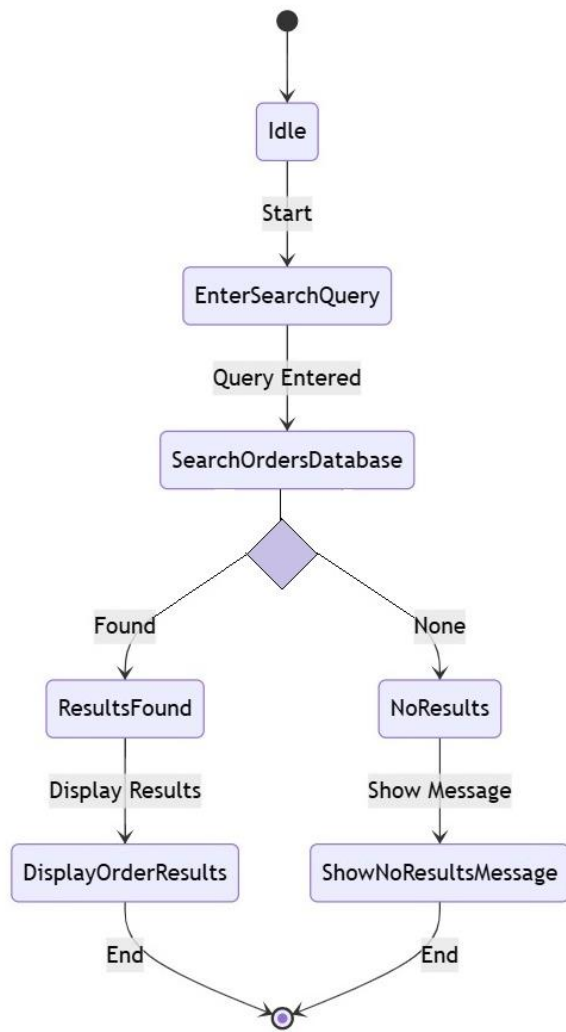


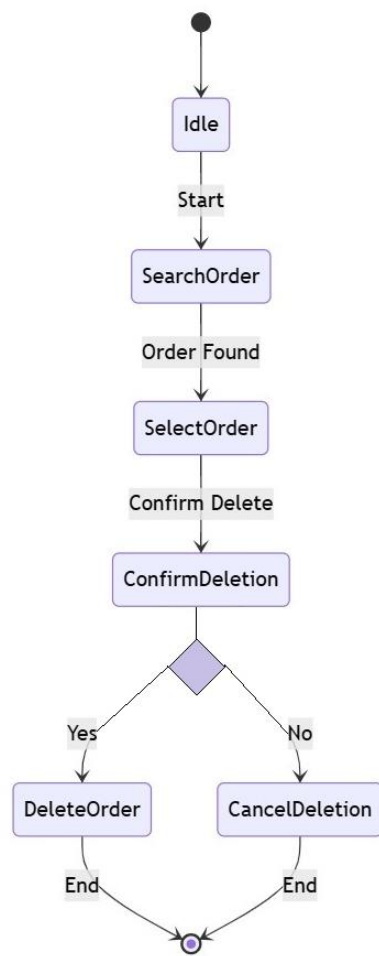


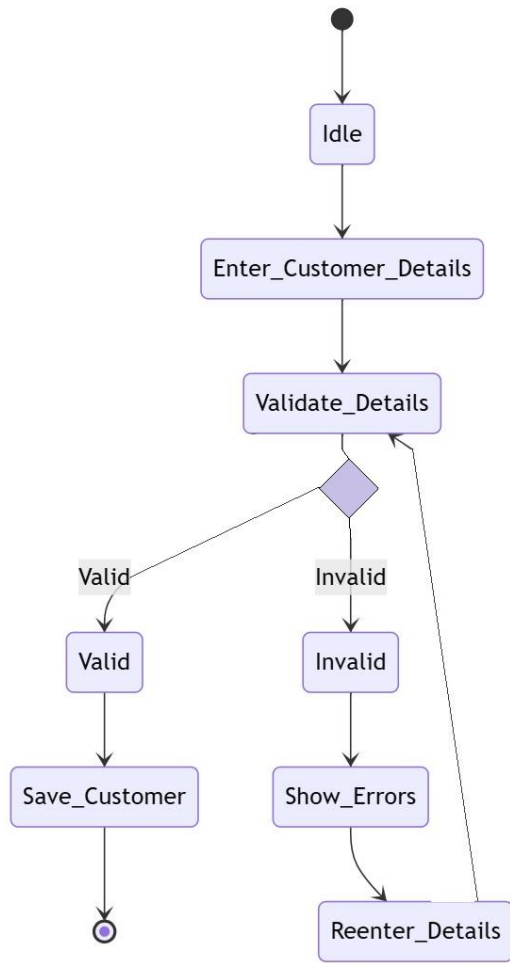
6. State Machine Diagrams

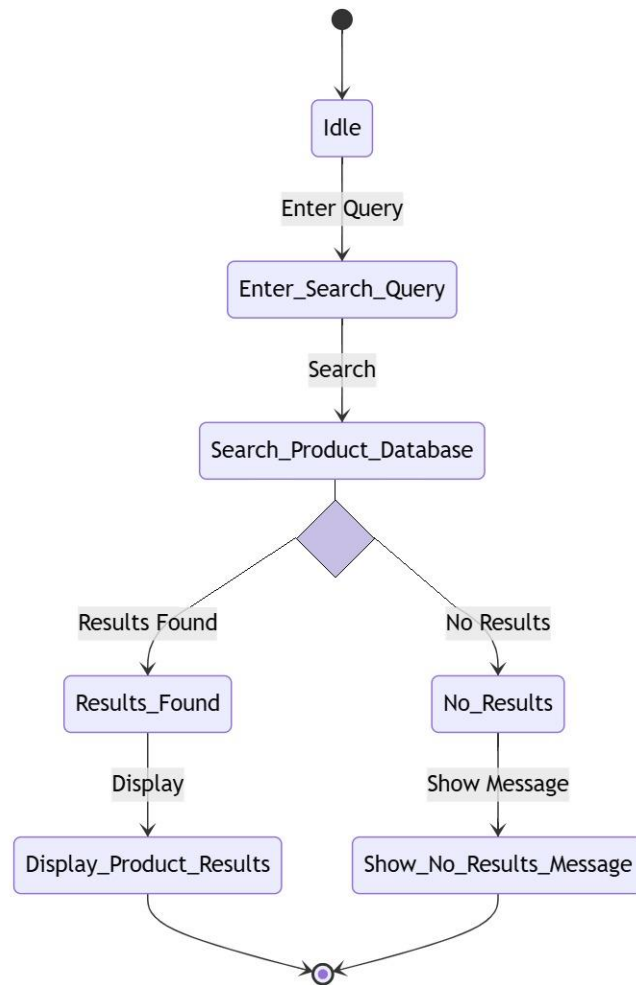
Add your screenshots or diagrams for '6. State Machine Diagrams' here.

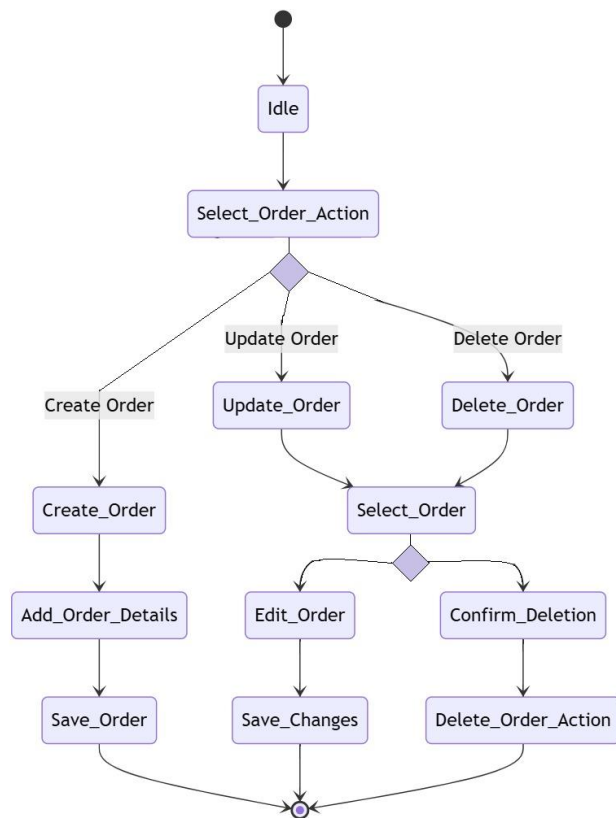
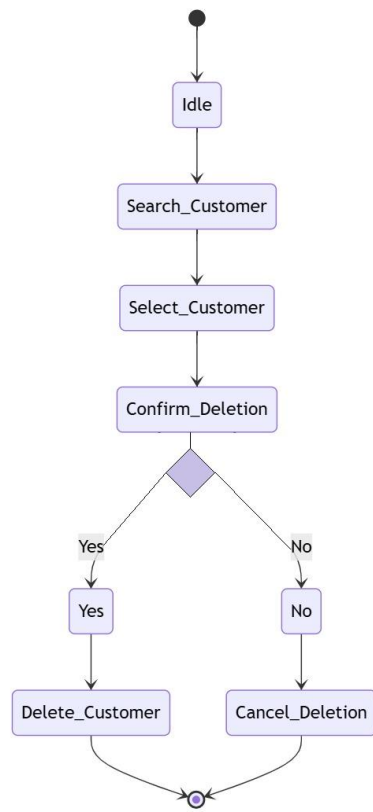


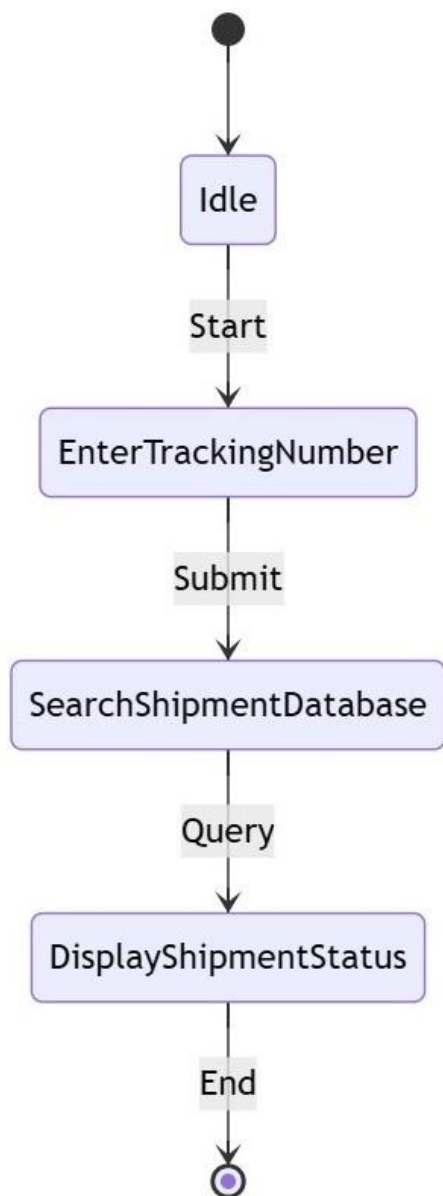


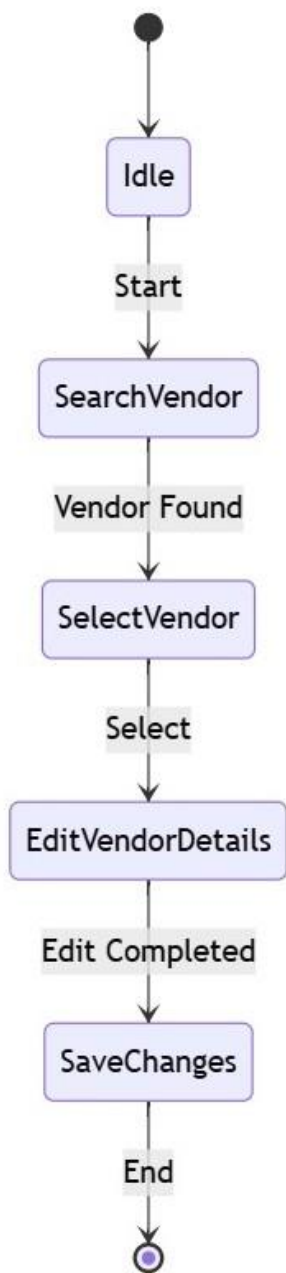


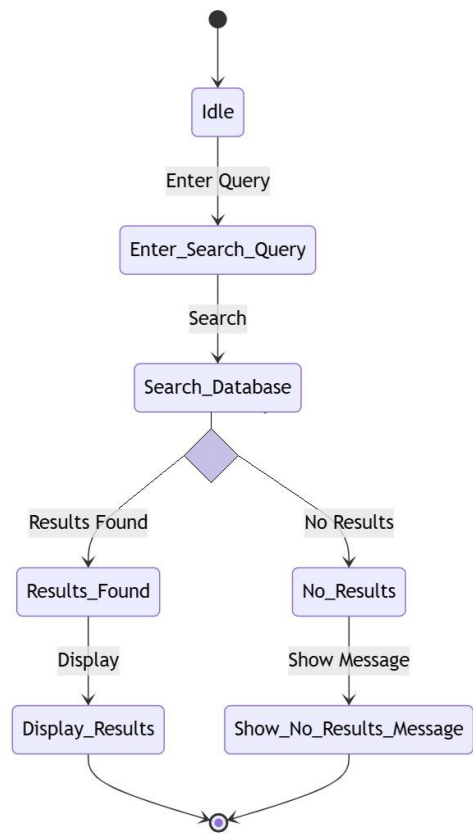


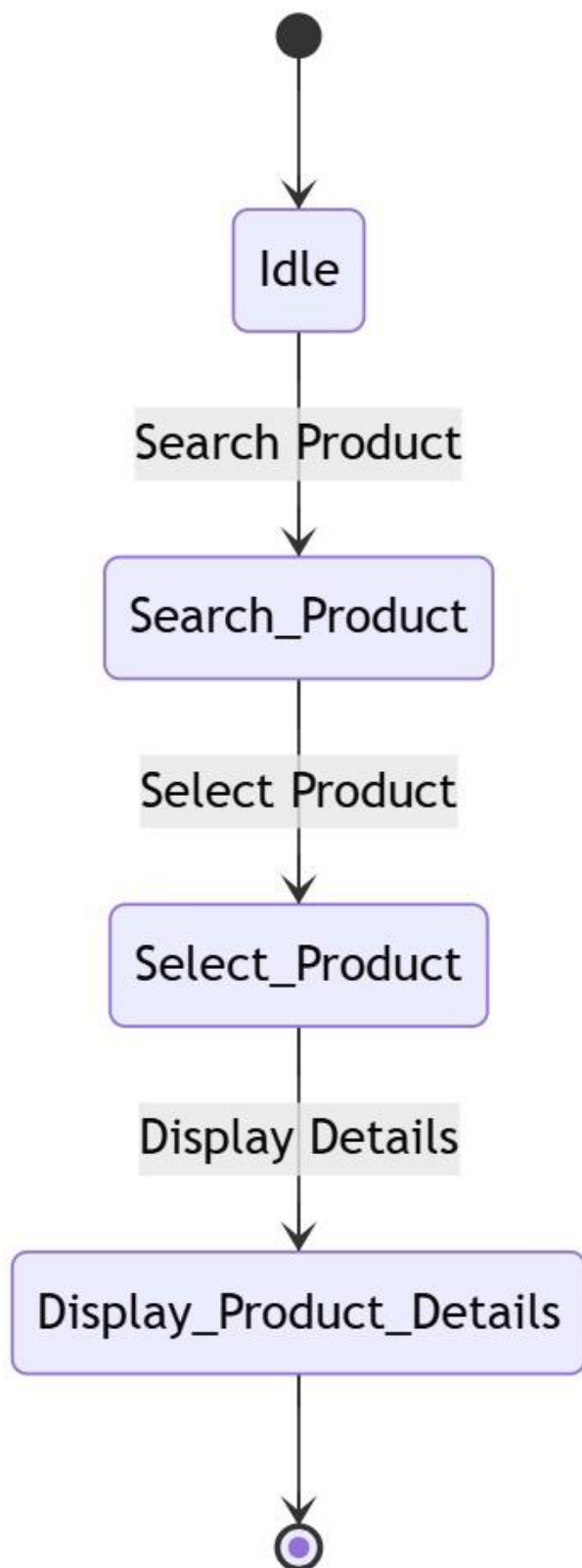


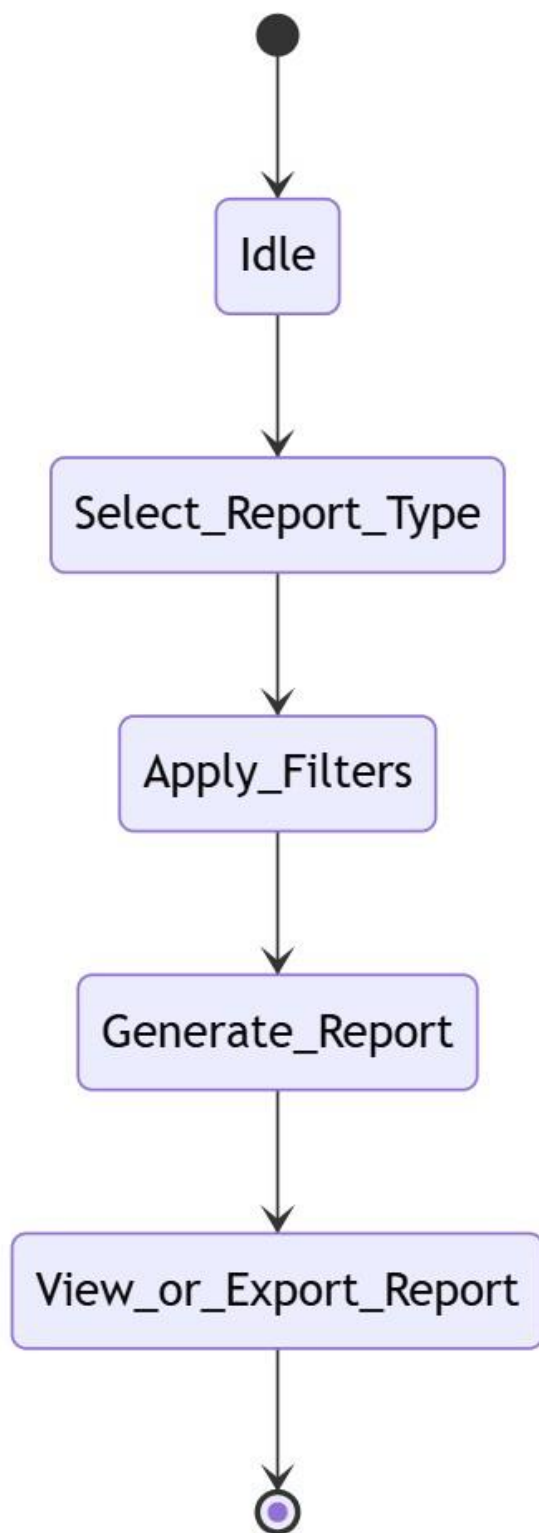


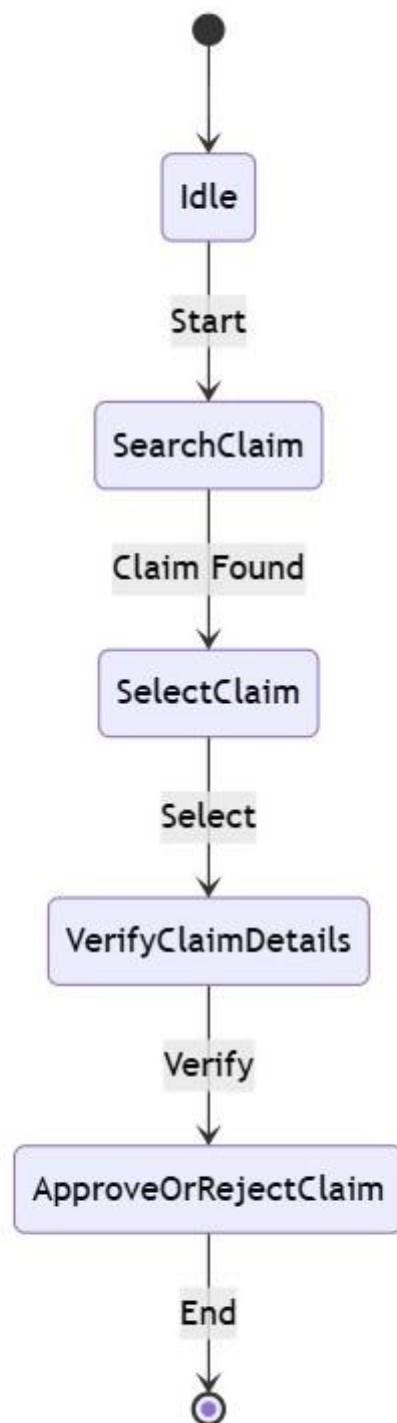


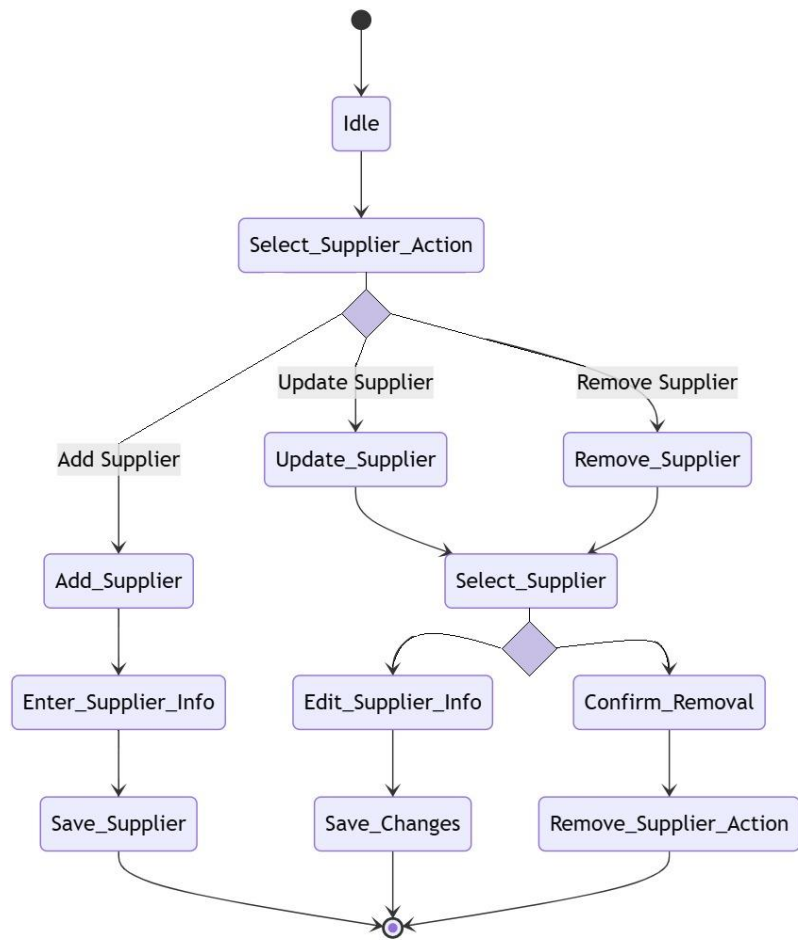


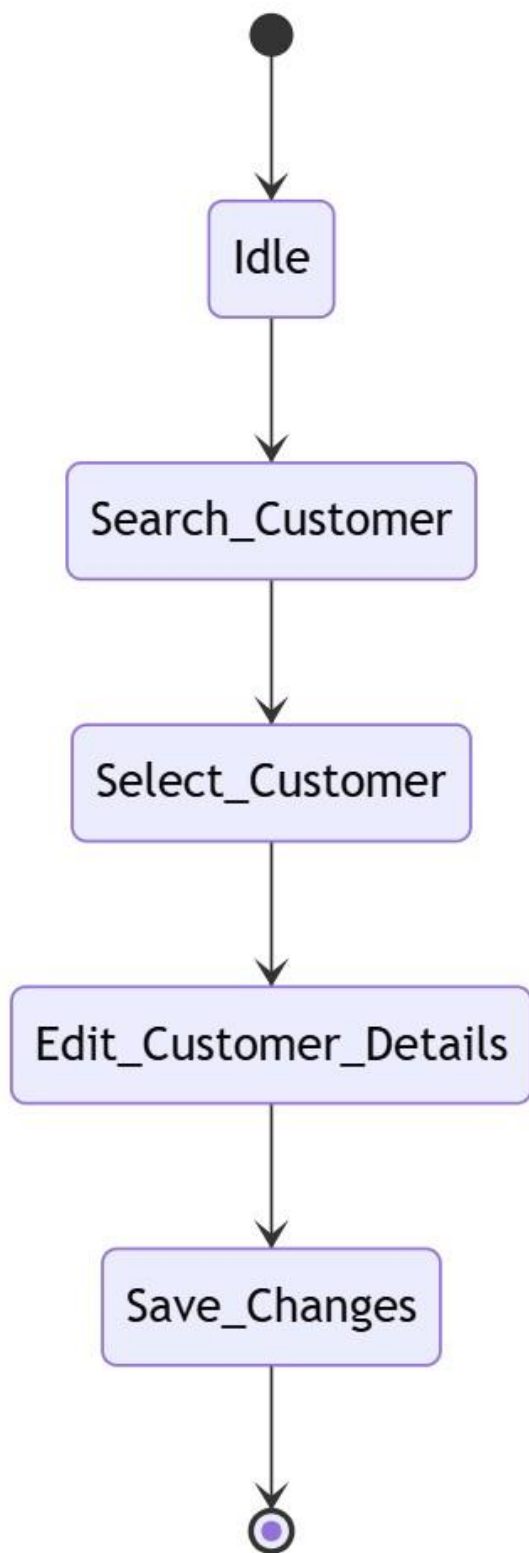


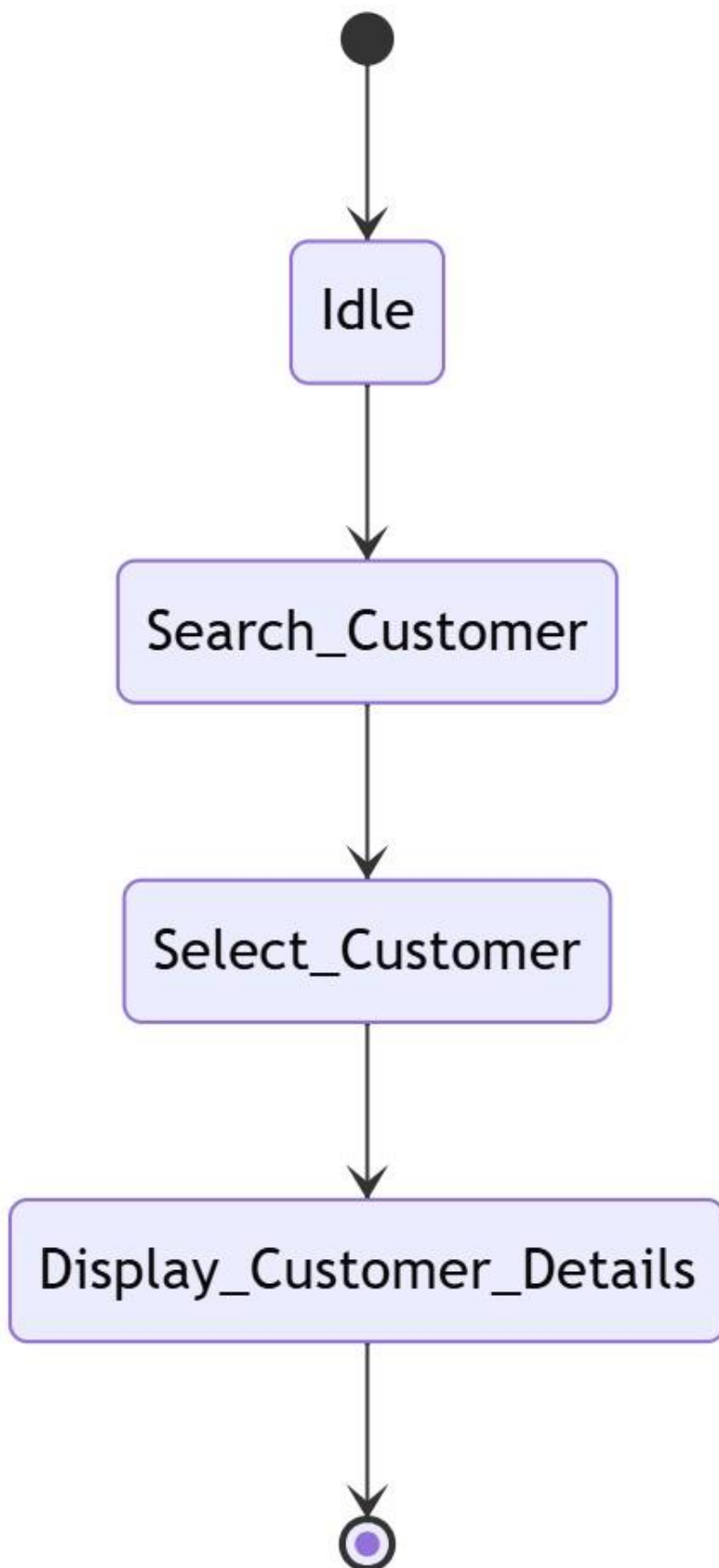


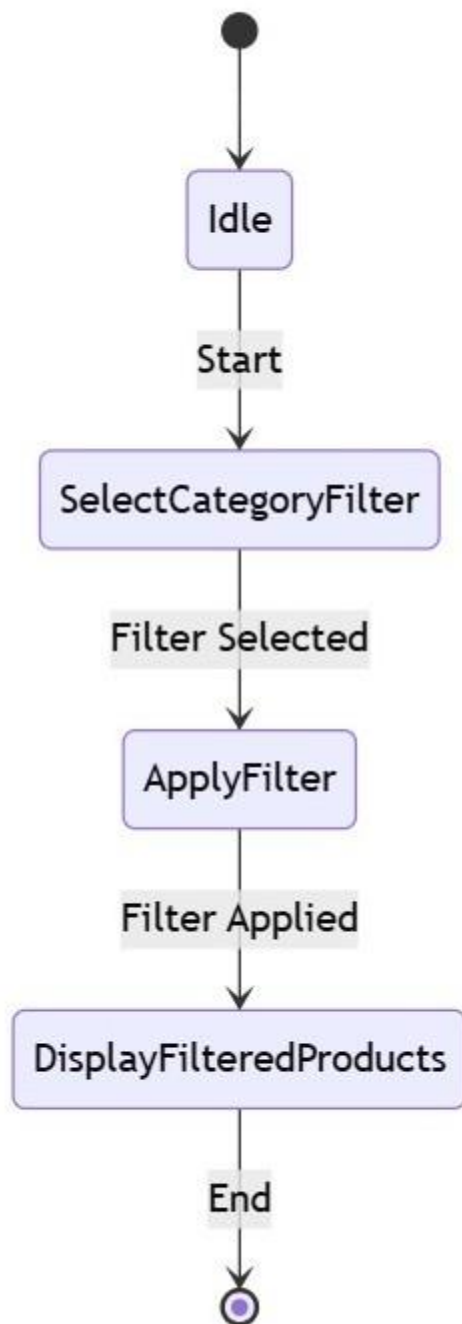


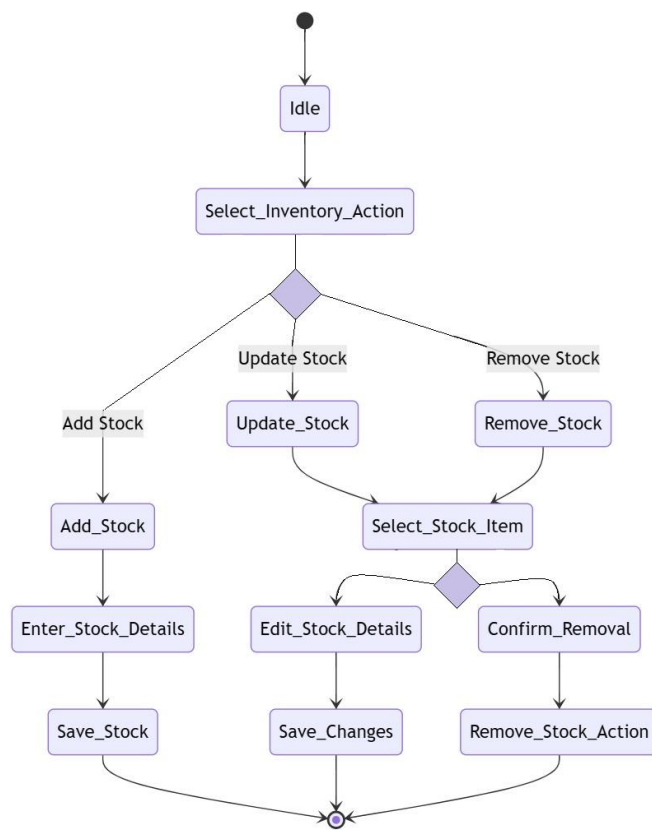




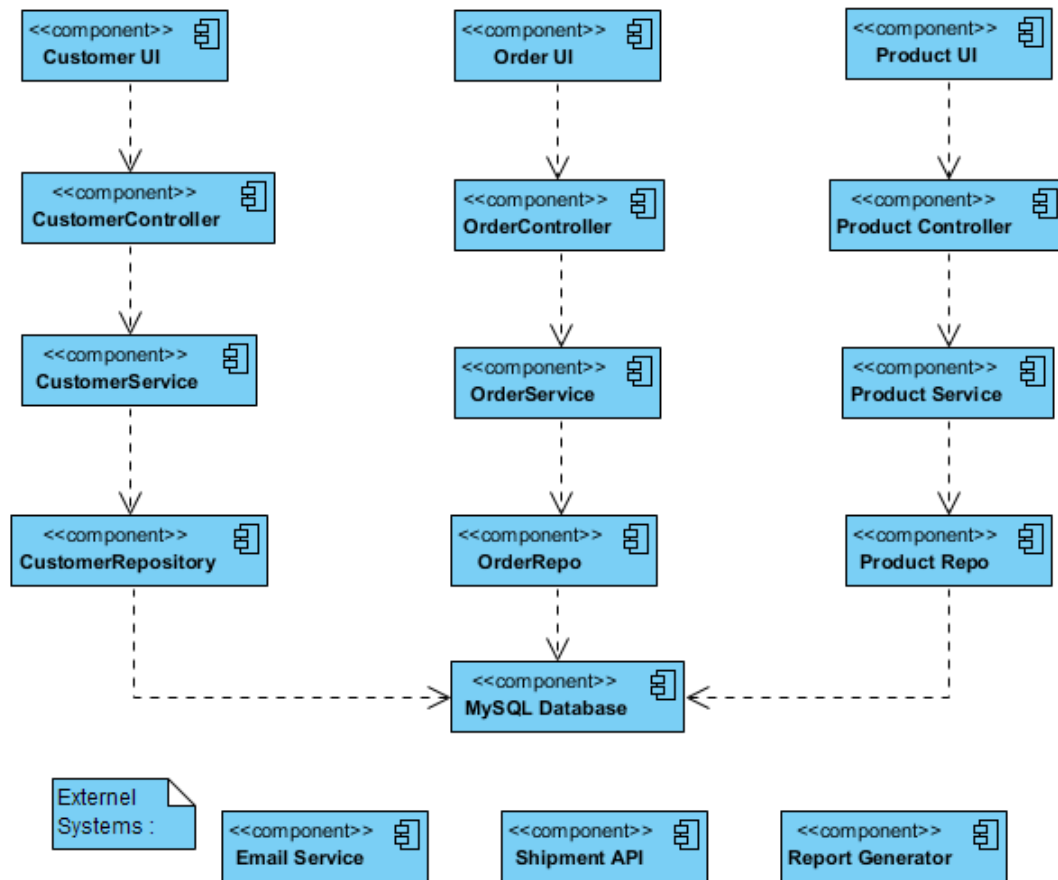




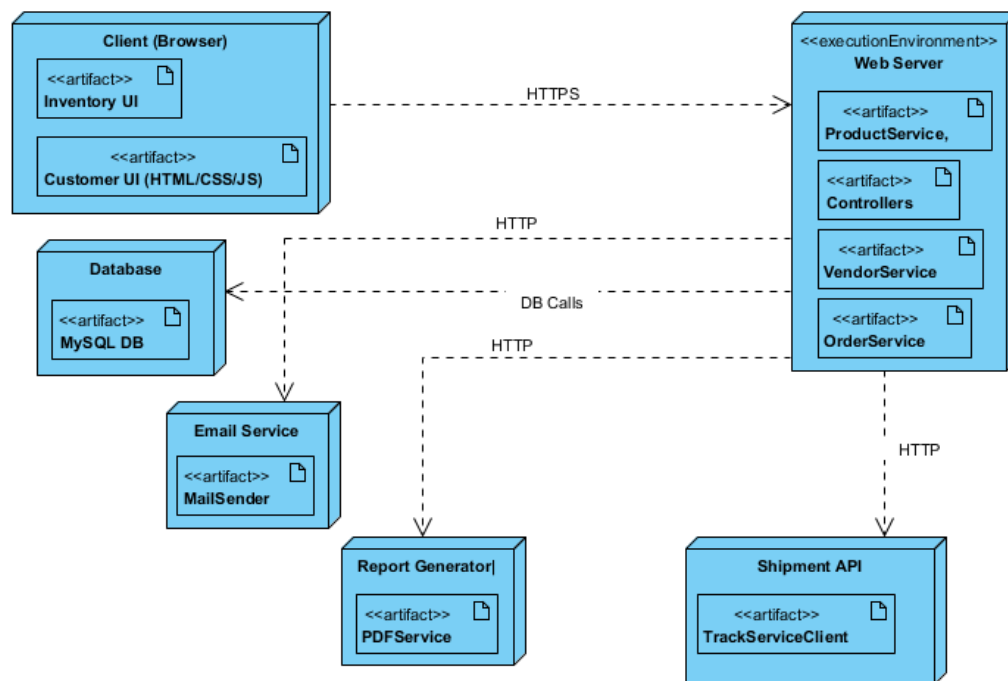




7. Component Diagram



8. Deployment Diagram



Use Case Descriptions

Use Case 1: Manage Products

Brief Description: System shall allow staff to add, update, and delete product details.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Manage Products' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 2: Manage Orders

Brief Description: System shall allow staff to create and update customer orders.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Manage Orders' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:

1. If input is invalid, system shows validation error.
2. If database is unreachable, system shows connection error message.
3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 3: Manage Suppliers

Brief Description: System shall allow staff to add and update supplier information.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Manage Suppliers' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
- 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 4: Manage Stock Inventory

Brief Description: System shall allow staff to view and update stock levels.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Manage Stock Inventory' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).

5. System processes the request and displays success confirmation.

- Alternative Flow:

1. If input is invalid, system shows validation error.

2. If database is unreachable, system shows connection error message.

3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 5: Generate Reports

Brief Description: System shall allow staff to generate product and sales reports.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:

1. Staff accesses the respective module via UI.

2. Staff selects 'Generate Reports' functionality.

3. System displays relevant form/data.

4. Staff performs the operation (add/update/delete/search/etc.).

5. System processes the request and displays success confirmation.

- Alternative Flow:

1. If input is invalid, system shows validation error.

2. If database is unreachable, system shows connection error message.

3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 6: Add Customer

Brief Description: System shall allow staff to add a new customer into the database.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:

1. Staff accesses the respective module via UI.

2. Staff selects 'Add Customer' functionality.

3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 7: Update Customer

Brief Description: System shall allow staff to update customer details.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Update Customer' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 8: Delete Customer

Brief Description: System shall allow staff to remove customer records.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:

1. Staff accesses the respective module via UI.
 2. Staff selects 'Delete Customer' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 9: View Customer Details

Brief Description: System shall allow staff to view complete customer information.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'View Customer Details' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 10: Search Customers

Brief Description: System shall allow staff to search customers using filters.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Search Customers' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 11: Search Products

Brief Description: System shall allow staff to search products by name or category.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Search Products' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 12: View Product Details

Brief Description: System shall allow staff to view product information.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:

1. Staff accesses the respective module via UI.
2. Staff selects 'View Product Details' functionality.
3. System displays relevant form/data.
4. Staff performs the operation (add/update/delete/search/etc.).
5. System processes the request and displays success confirmation.

- Alternative Flow:

1. If input is invalid, system shows validation error.
2. If database is unreachable, system shows connection error message.
3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 13: Filter Products by Category

Brief Description: System shall allow staff to filter product listings by category.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:

1. Staff accesses the respective module via UI.
2. Staff selects 'Filter Products by Category' functionality.
3. System displays relevant form/data.
4. Staff performs the operation (add/update/delete/search/etc.).
5. System processes the request and displays success confirmation.

- Alternative Flow:

1. If input is invalid, system shows validation error.
2. If database is unreachable, system shows connection error message.
3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 14: Delete Order

Brief Description: System shall allow staff to delete a customer order.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Delete Order' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 15: Search Orders

Brief Description: System shall allow staff to search and view orders.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Search Orders' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.

2. If database is unreachable, system shows connection error message.
3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 16: Cancel Order

Brief Description: System shall allow staff to cancel an existing order.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Cancel Order' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 17: Manage Vendors

Brief Description: System shall allow staff to manage vendor profiles.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Manage Vendors' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.

- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 18: Update Vendor Info

Brief Description: System shall allow staff to update vendor details.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Update Vendor Info' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 19: Manage Warranty Claims

Brief Description: System shall allow staff to handle warranty claim processes.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Manage Warranty Claims' functionality.
 3. System displays relevant form/data.

4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

Use Case 20: Track Product Shipments

Brief Description: System shall allow staff to track shipment status of products.

Actors: Staff, System

Preconditions: Staff must be authenticated and authorized to perform the action.

Postconditions: Action completed successfully, and changes are reflected in the system.

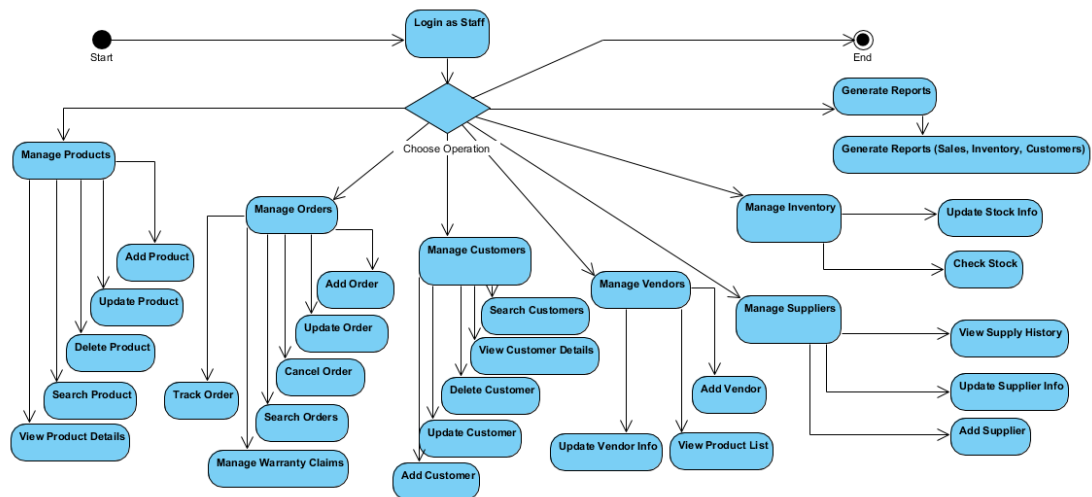
- Basic Flow:
 1. Staff accesses the respective module via UI.
 2. Staff selects 'Track Product Shipments' functionality.
 3. System displays relevant form/data.
 4. Staff performs the operation (add/update/delete/search/etc.).
 5. System processes the request and displays success confirmation.
- Alternative Flow:
 1. If input is invalid, system shows validation error.
 2. If database is unreachable, system shows connection error message.
 3. If operation fails due to constraints, system logs the issue and notifies the user.

CRC – Cards

Order	Vendor	Staff																												
Responsibilities:	Responsibilities:	Responsibilities:																												
<table><tr><th>Name</th><th>Collaborator</th></tr><tr><td>Create a new order</td><td>Customer</td></tr><tr><td>Update order status</td><td>Customer, Product, Payment</td></tr><tr><td>Calculate total amount</td><td>Customer, Product, Payment</td></tr><tr><td>Cancel/Delete order</td><td>Customer</td></tr></table>	Name	Collaborator	Create a new order	Customer	Update order status	Customer, Product, Payment	Calculate total amount	Customer, Product, Payment	Cancel/Delete order	Customer	<table><tr><th>Name</th><th>Collaborator</th></tr><tr><td>- Update product stock</td><td>Product</td></tr><tr><td>- View product list</td><td></td></tr></table>	Name	Collaborator	- Update product stock	Product	- View product list		<table><tr><th>Name</th><th>Collaborator</th></tr><tr><td>- Log in</td><td>Vendor, Supplier, Customer, Report</td></tr><tr><td>- Manage vendors</td><td></td></tr><tr><td>- Manage suppliers</td><td></td></tr><tr><td>- Manage customers</td><td></td></tr><tr><td>- Generate reports</td><td></td></tr></table>	Name	Collaborator	- Log in	Vendor, Supplier, Customer, Report	- Manage vendors		- Manage suppliers		- Manage customers		- Generate reports	
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Supplier Responsibilities: <table> <tr> <th>Name</th><th>Collaborator</th></tr> <tr> <td>- Supply products</td><td>Product</td></tr> <tr> <td>- View supply history</td><td></td></tr> </table>	Name	Collaborator	- Supply products	Product	- View supply history		Product Responsibilities: <table> <tr> <th>Name</th><th>Collaborator</th></tr> <tr> <td>- Update price and stock</td><td>Inventory, Vendor, Supplier, Order</td></tr> <tr> <td>- Display product details</td><td></td></tr> <tr> <td>- Filter/search products by category</td><td></td></tr> </table>	Name	Collaborator	- Update price and stock	Inventory, Vendor, Supplier, Order	- Display product details		- Filter/search products by category	
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- Filter/search products by category															
Customer Responsibilities: <table> <tr> <th>Name</th><th>Collaborator</th></tr> <tr> <td>- View purchase history</td><td>Order, Product</td></tr> <tr> <td>- Request support</td><td></td></tr> <tr> <td>- Add/update/delete/search customer</td><td></td></tr> </table>	Name	Collaborator	- View purchase history	Order, Product	- Request support		- Add/update/delete/search customer		Supplier Responsibilities: <table> <tr> <th>Name</th><th>Collaborator</th></tr> <tr> <td>- Supply products</td><td>Product</td></tr> <tr> <td>- View supply history</td><td></td></tr> </table>	Name	Collaborator	- Supply products	Product	- View supply history	
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- Supply products	Product														
- View supply history															

Activity Diagram



High level Architecture :

