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1. INTRODUCTION

TechnoTrek is comprehensive solution for managing day-to-day operations in the computer retail business. It comprises essential modules such as Sales and Distribution, Customer Relationship Management, Production Planning, and Material Management. This system helps you streamline daily sales activities and manage vital customer data. Production Planning facilitates the efficient creation of custom PCs, supported by an Automated Compatibility Checker that ensures selected components are compatible, minimizing errors during assembly. Additionally Material Management functionalities helps you manage inventory and procurement activities. A unique feature we offer is the ability to create bundles, allowing customers to easily purchase entire PC setups including mouse, keyboard, and other accessories.

2. SCOPE

2.1 Customer Relationship Management

- Customer Database

2.2 Sales and Distribution

- Quotation Creation
- Sale Order Creation
- Refund Processing

2.3 Production Planning

- Assemble to order
- BOM
- Production order
- Goods issue
- Quality Control
- Goods Receipt

2.4 Material Management

- Purchase requisition
- Material Master
- Purchase order
- Goods Receipt
- Item alternative

2.5 Finance

- Invoice Creation
- Record Payment

3. PROJECT OVERVIEW

This final year project involves developing a retail management system called TechnoTrek to streamline business processes for a computer store. The proposed system will integrate key functions such as sales, inventory, procurement and customer management to simplify daily operations.

4. DOMAIN

- Production Planning
- Material Management
- Customer Relationship Management
- Sales and Distribution
- Finance

5. PROBLEM STATEMENT

The computer retail store is currently manually handling key business processes such as sales, production, inventory management and customer relationship management. This is leading to various inefficiencies.

The sale process for walk-in and bulk customers is not systematic, making it difficult to efficiently manage quotations, orders and invoices.

The production planning process to assemble custom PCs in a way that components are compatible is done manually without any checks. This increases the risk of errors during assembly.

Inventory levels and supplier purchases are also managed manually without any automated system to track real-time stock availability.

Customer data is fragmented across different records instead of a centralized database, creating challenges in relationship management.

Additionally, sales analysis and tracking purchase orders requires extensive manual effort.

6. PROBLEM IDENTIFICATION

- Inefficient management of sales, production, inventory and customer data

- Difficulty handling quotations, orders and invoices

- Risk of errors in assembling custom PCs without compatibility checks

- Lack of real-time stock availability tracking

- Extensive manual effort required for sales analysis and reporting

7. APPROACH

7.1 ASAP Methodology

1. **Project Initiation**

   This initial phase defines the project objectives, scope and assembles the project team. Stakeholders identify their roles and a high-level project plan is created.

2. **Process Design**

   Current processes are understood in-depth. Processes are mapped and a comprehensive design is developed to align the proposed system with business needs.

3. **System Build**

   The system is configured and developed as per the design specifications. Implementation and data migration activities are carried out.

4. **Testing and Training**

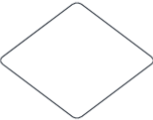   Users are trained on the new system and data is migrated. Comprehensive testing is performed to fix any issues.

5. **Go-Live and Support**

   The system goes live in production. Support teams address initial issues and provide continuous support post go-live.

8. LEGENDS

Following are the description of the symbols used in flow-charts.

Process	Description of The Process
⬭	Represents the Start point of process.
⬤	Represents the End point of process.
▭	Represents processes conducted.
◇	Represents Decision making process.
⬜	Represents Document.
⊗	Represents converging of process.
⬠	Represents Off-Page Connector.
→	Represents System Direction and Sequence of flow

9. AS IS

SALE PROCESS
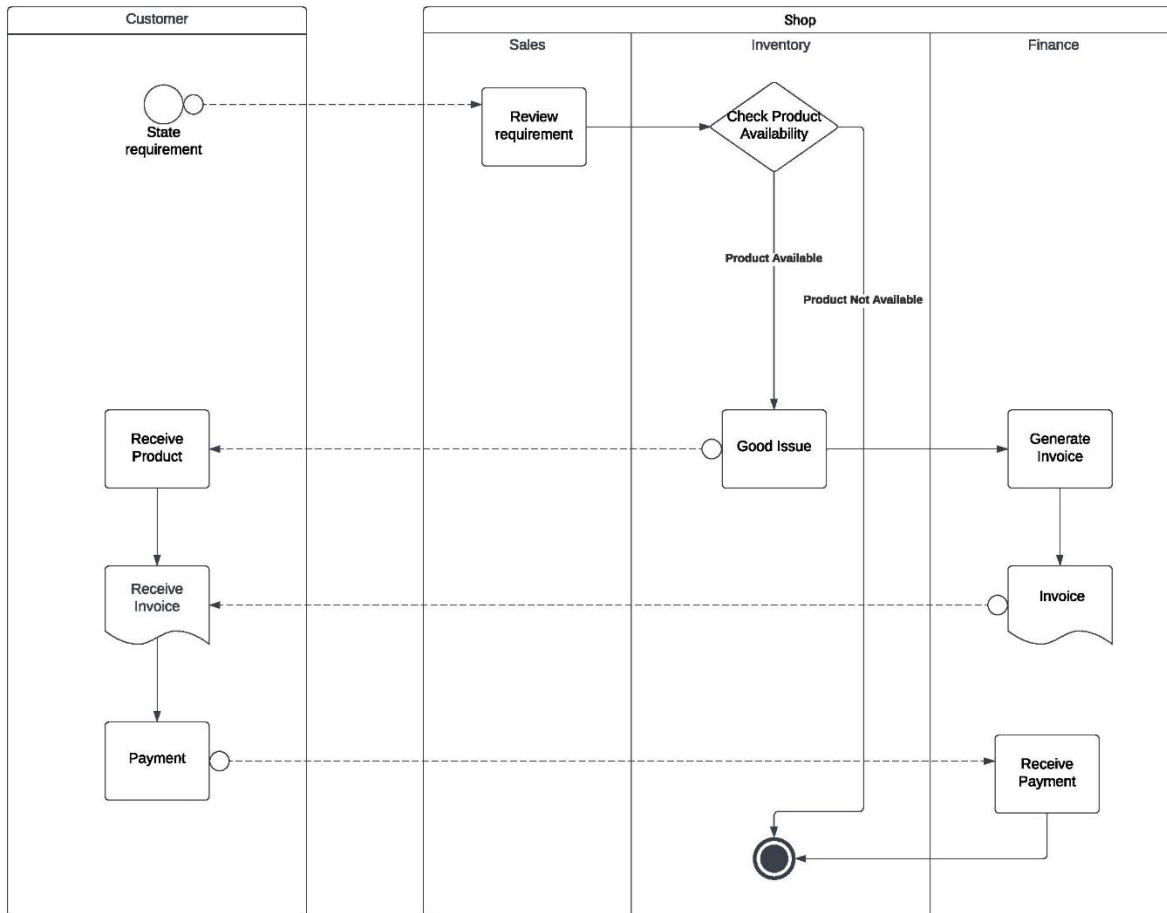
9.1 Walk-In Sale Description

1. The customer tells the sales team what product they are looking for and what their specific requirements are.
2. The sales team reviews the customer's requirements to make sure that they have a good understanding of what the customer is looking for.
3. Warehouse team checks to see if the product is in stock and available for sale.
4. If product is available:
   - The Warehouse issues the good.
   - The Finance team generates an invoice for the customer.
   - The customer receives the product and pays the invoice.
5. If product is not available:
   - The sales team informs the customer that the product is not available.

BULK SALE PROCESS
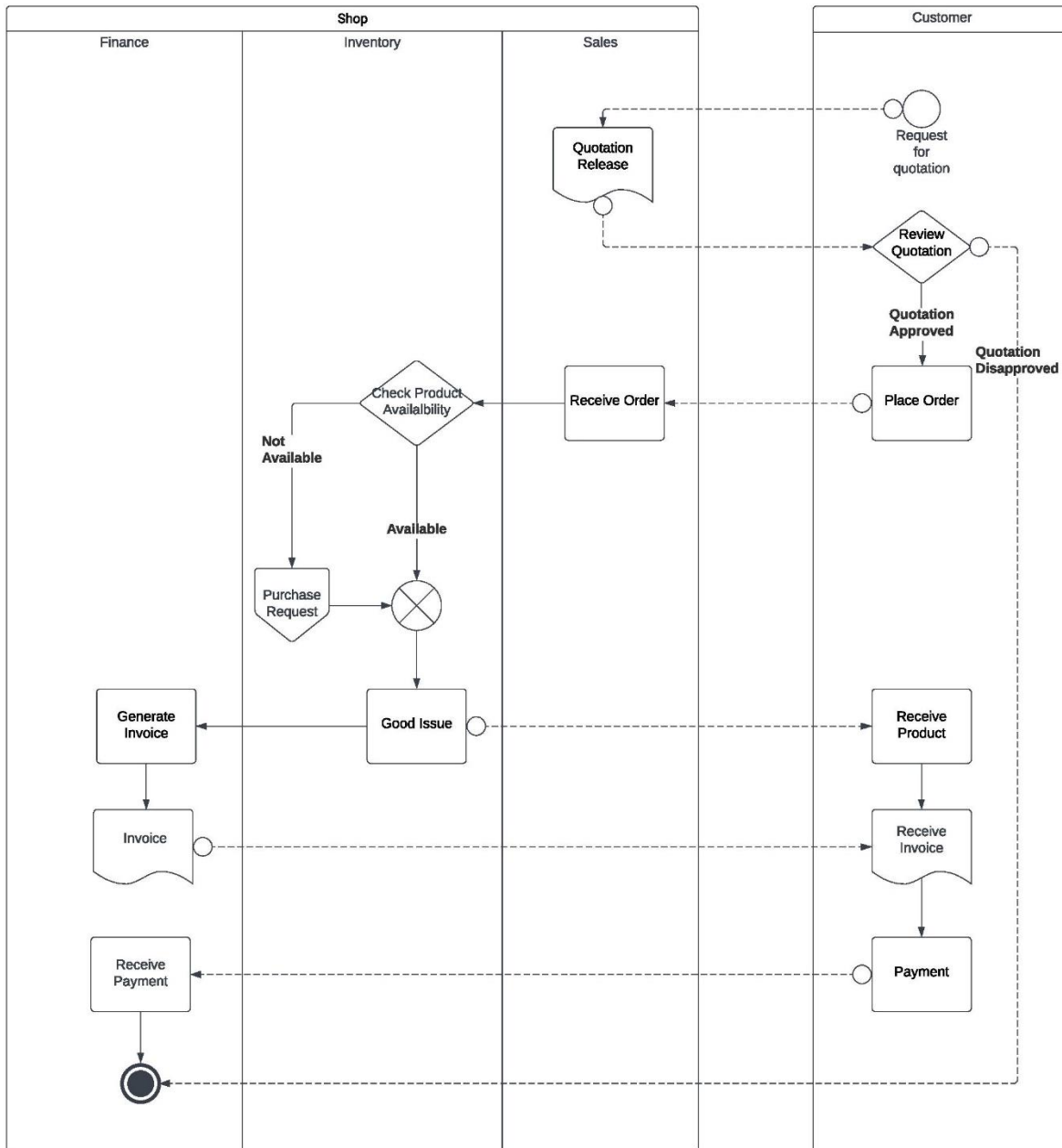
9.2 Bulk Sale Description

1. The customer contacts the sales team and request for quotation for a large quantity of goods.

2. In response of Request sales team sends a quotation to the customer.

3. The customer reviews the quotation and either approves or disapproves it.

4. If customer approves quotation:

   - The customer places an order to the sale team.
   - Warehouse team checks to see if the product is in stock and available for sale.
   - If product is available:
     a. The Warehouse issues the good.
     b. The Finance generates an invoice for the customer.
     c. The customer receives the goods and pays the invoice for the goods.

   - If product is not available:

     a. Warehouse procure the product from supplier.
     b. The Warehouse issues the good.
     c. The Finance generates an invoice for the customer.
     d. The customer receives the goods and pays the invoice for the goods.

5. If customer disapproves quotation:

   - The sale is lost.

SALE RETURN PROCESS
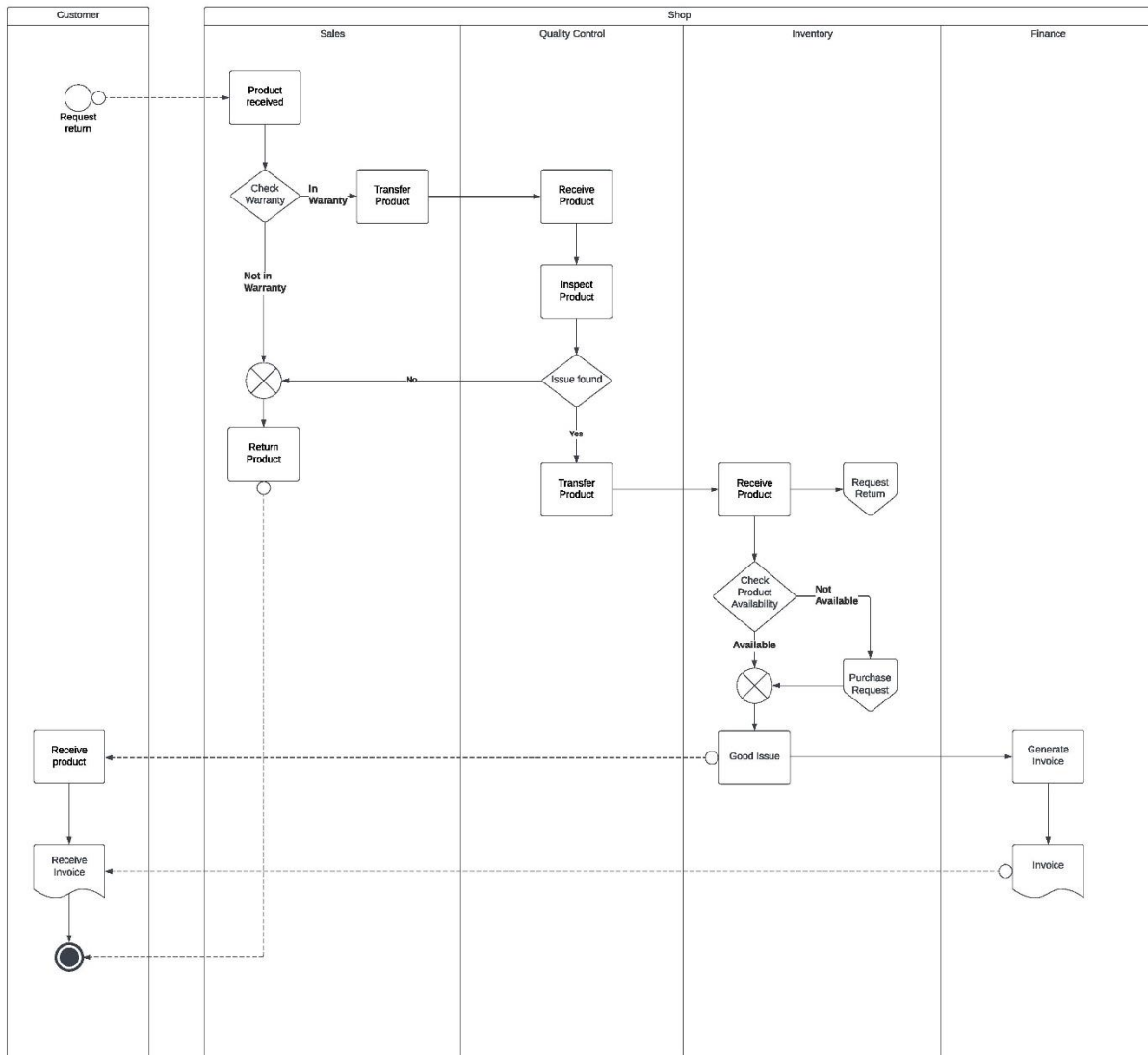
9.3 Sale Return Description

1. The customer requests a return to sale department for defect in the product.
2. The sales team receives defected product and check whether it's in warranty or not.
3. If product is in warranty:

   - The Quality Control evaluates the issue to determine whether the product is defected or not.

   - If the issue is found:

     a) The defected product is sent for return by warehouse
     b) Warehouse team checks to see if the product is in stock and available for sale.
     c) If product is available:
        i. The Warehouse issues the good.
        ii. The sales team generates an invoice for the customer.
        iii. The customer receives the goods and invoice.
     d) If product is not available:
        i. Warehouse procure the product from supplier.
        ii. The Warehouse issues the good.
        iii. The sales team generates an invoice for the customer.
        iv. The customer receives the goods and invoice.

   - If no issue is found:
     a) The product is returned to the customer.

4. If product is not in warranty:
   - The product is returned to the customer.

PROCUREMENT PROCESS
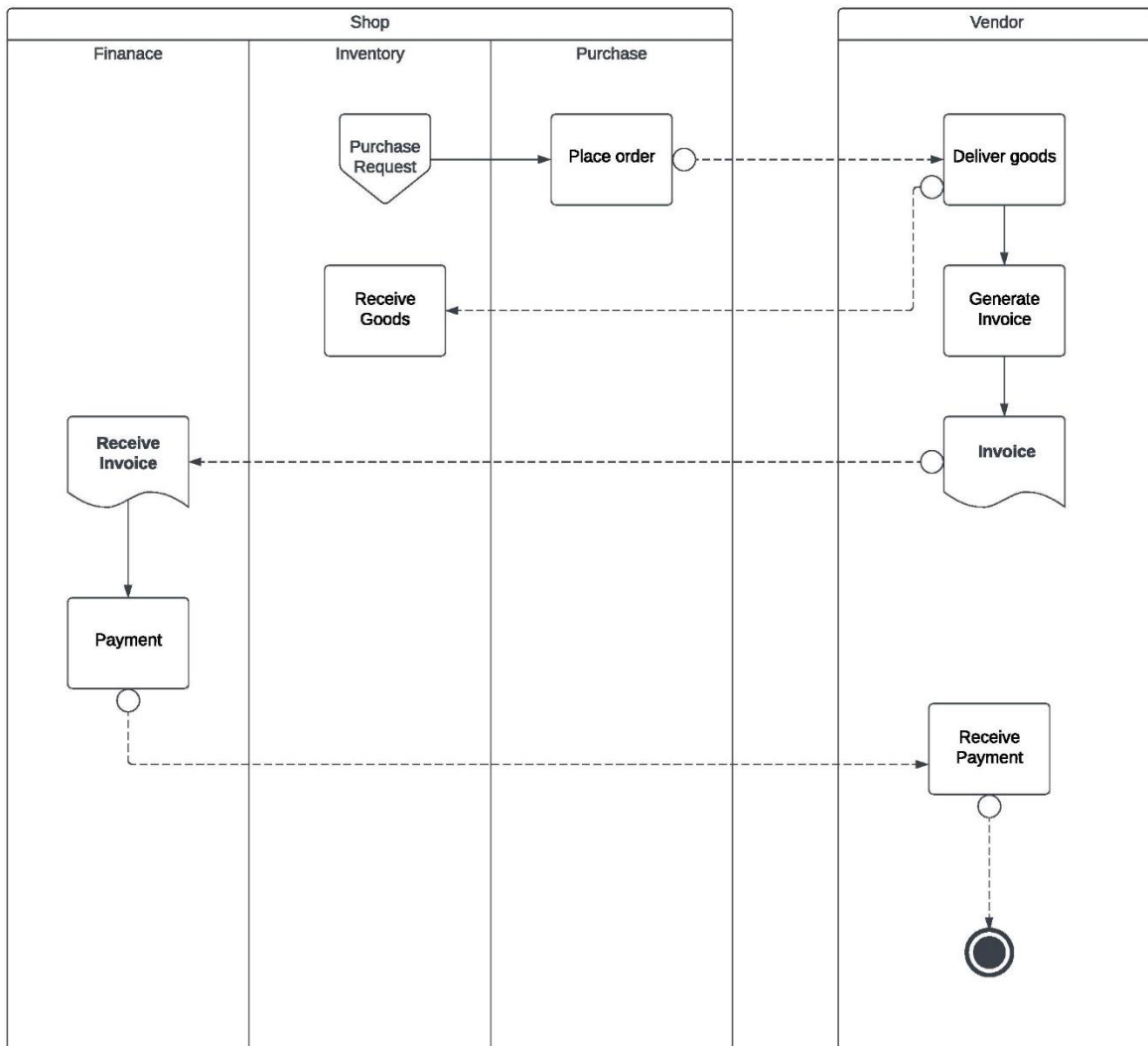
9.4 Procurement Description

1. A request for purchase is made to the purchase department for the needed product.
2. Purchase department places order to vendor for the product.
3. Vendor delivers the goods and generate invoice of the goods.
4. Warehouse team receives goods.
5. Finance department receives invoice and pays the invoice for the goods.
6. The vendor receives the payment against the invoice.

PURHCASE RETURN PROCESS
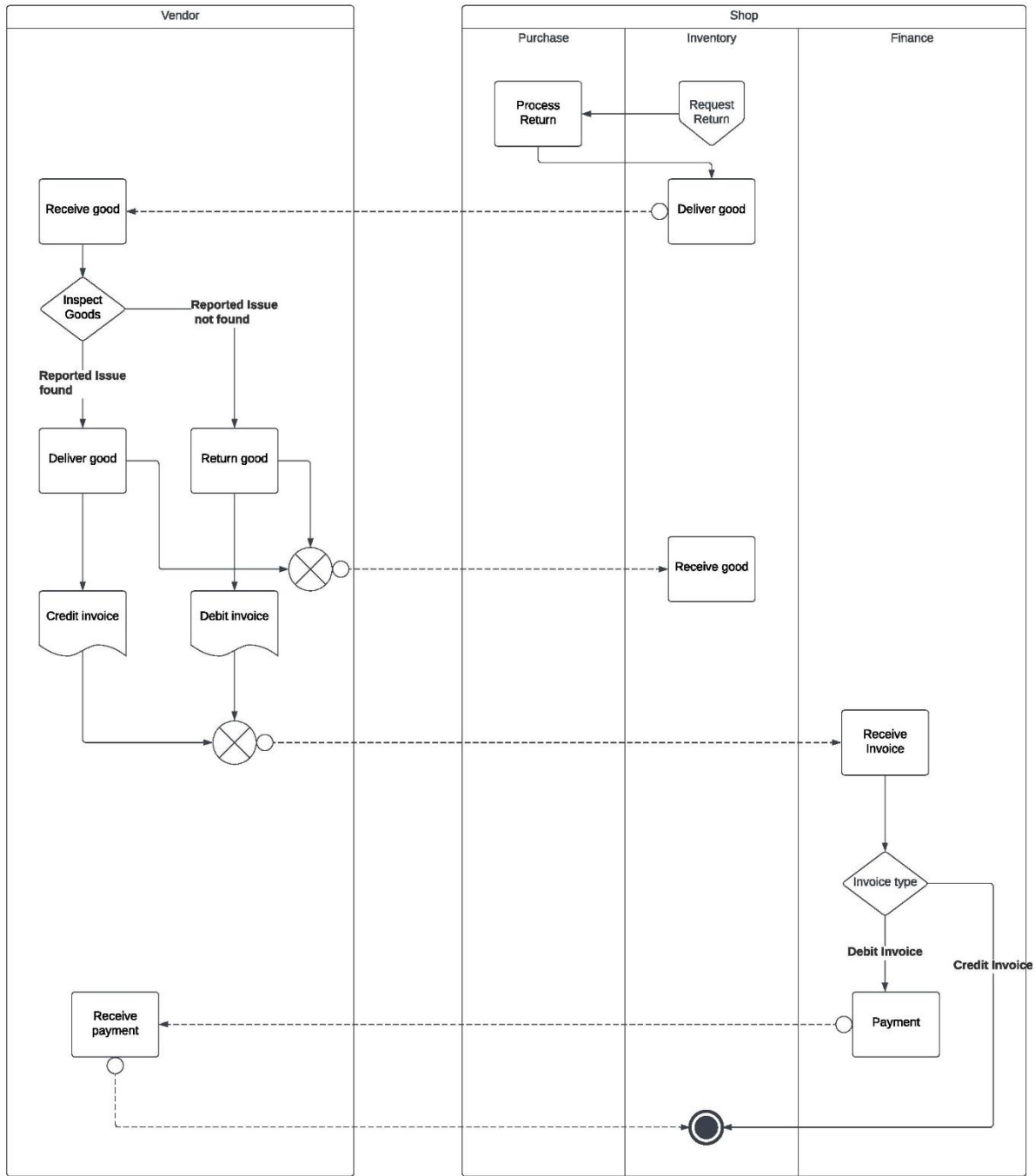
9.5 Purchase Return Description

1. The warehouse requests a return for defected product.
2. Purchase process the return and warehouse deliver good to vendor.
3. Vendor inspects good to evaluate the issue.
4. If Reported issue is found:
   - Vendor replace the goods and generates a credit invoice.
   - Warehouse receives replaced goods.
   - Finance receives the invoice against returned product.
5. If Reported issue is found:
   - Vendor returns the defected product and generates a debit invoice.
   - Warehouse receives the defected product.
   - Finance receives the invoice and pays the charges.

Production Process
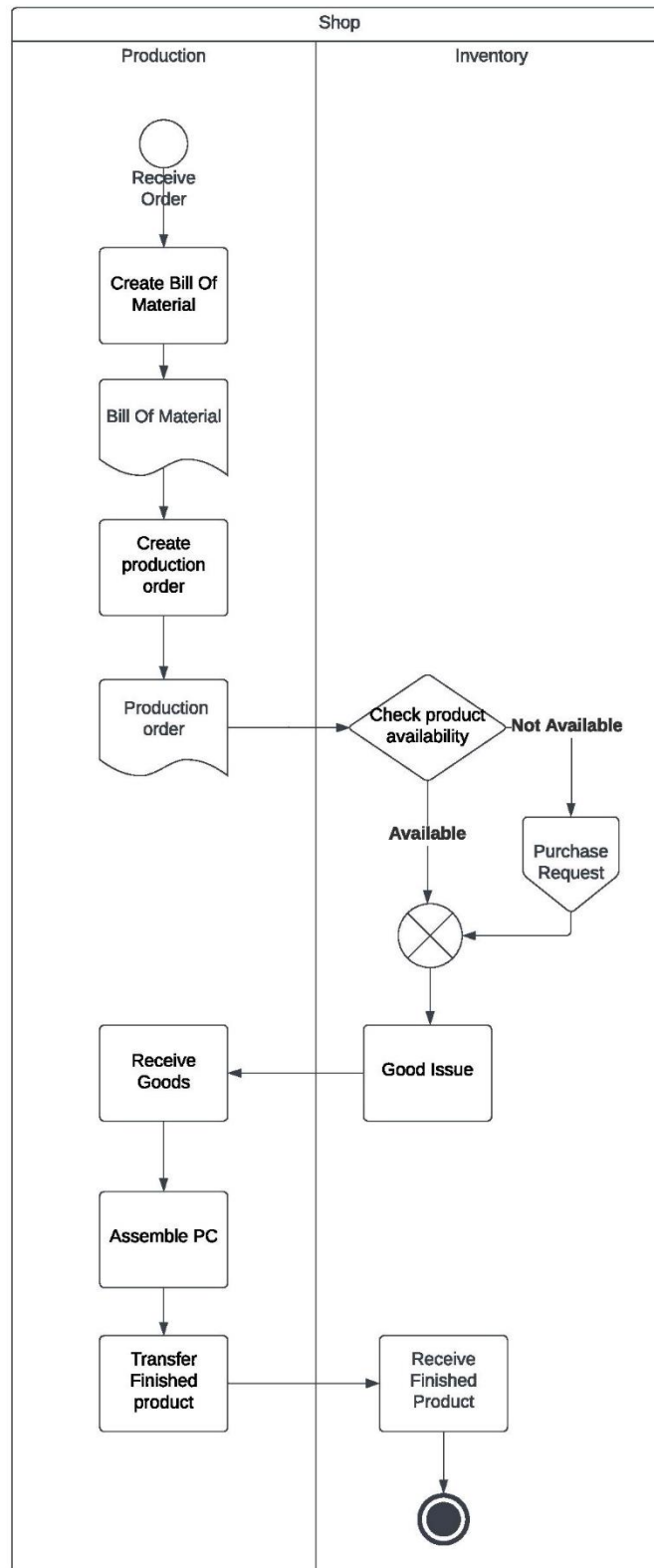
9.6 Production Description

1. The Production department receives an order for custom PC.
2. Production team creates a Bill of material and Production order document.
3. Warehouse team checks to see if the product is in stock and available for sale.

   - If product is available

     - The Warehouse issues the raw material.
     - Production team uses the raw material to assemble PC.
     - PC is transferred to Inventory.
     - Warehouse receives the finished product

   - If product is not available

     - Warehouse procures the product from supplier.
     - The Warehouse issues the raw material.
     - Production team uses the raw material to assemble PC.
     - PC is transferred to Inventory.
     - Warehouse receives the finished product

10.   TO BE

SALE PROCESS
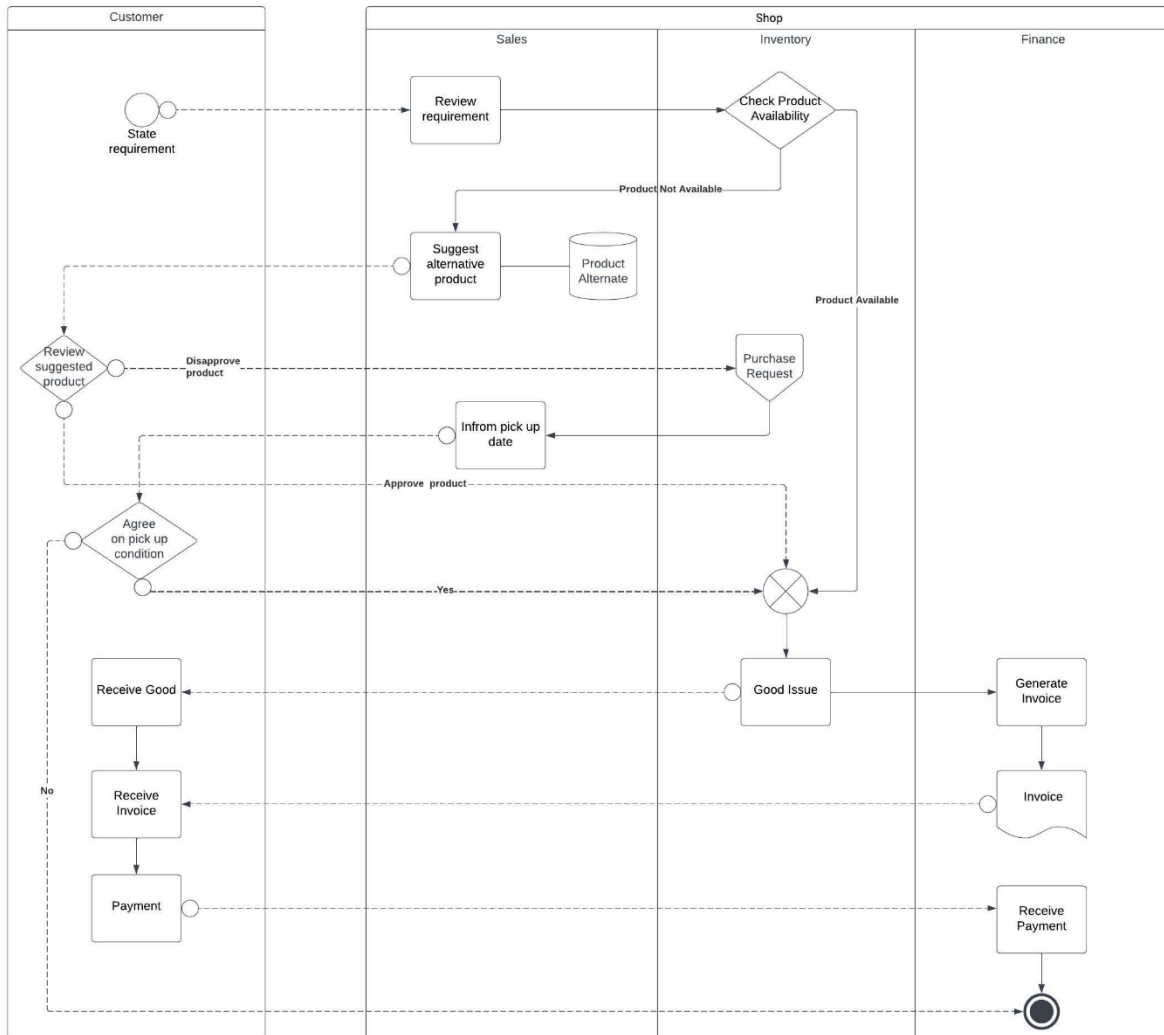
10.1 To-Be Sale Description

1. The customer tells the sales team what product they are looking for and what their specific requirements are.

2. The sales team reviews the customer's requirements to make sure that they have a good understanding of what the customer is looking for.

3. Sales team checks to see if the product is in stock and available for sale.

4. If the product is not available, the sales team suggests an alternative product.

5. The customer reviews the suggested product and either approves or disapproves it.

6. If the customer disapproves the suggested product

   - Sales team generates a purchase request.

7. If the product is available.

   - The warehouse issues the good.

   - The finance team generates an invoice for the customer.

   - The customer receives the invoice and pays it.

BULK SALE PROCESS

Shop

Finance	Inventory	Sales

Customer

- Visit Website
- Browse Product → Product
- Select Product
- Enter Details
- Place Order → Receive Order

Sales:
- Receive Order
- Request Order Confirmation
- Create Sale Order → Sale Order

Confirm Order — Yes → Create Sale Order; No

- Generate 50% payment Invoice
- 50% Payment Invoice → Receive Invoice
- 50% Payment
- Receive 50% Payment
- Check Product Availability
  - Not Available → Purchase Request → Generate Remaining Payment Invoice → Invoice
  - Available → Good Issue → Good Issue
- Receive Goods
- Receive Invoice
- Payment
- Receive Payment

10.2 To-Be Bulk Sale Process Description

1. The customer visits the website and browses the products.

2. The customer selects a product and enters the required details.

3. The customer places the order.

4. The sales team receives the order and confirms it.

5. The sales team creates a sale order.

6. The finance team generates a 50% payment invoice.

7. The customer receives the invoice and pays the 50% payment.

8. The warehouse team checks the product availability.

9. If the product is not available.

   - Sales team places a purchase request.

10. If the product is available.

    - Warehouse team issues the good.

    - The customer receives the goods.

    - The finance team receives the 50% payment and generates the remaining payment invoice.

   - The customer receives the invoice and pays the remaining payment.

SALE RETURN PROCESS
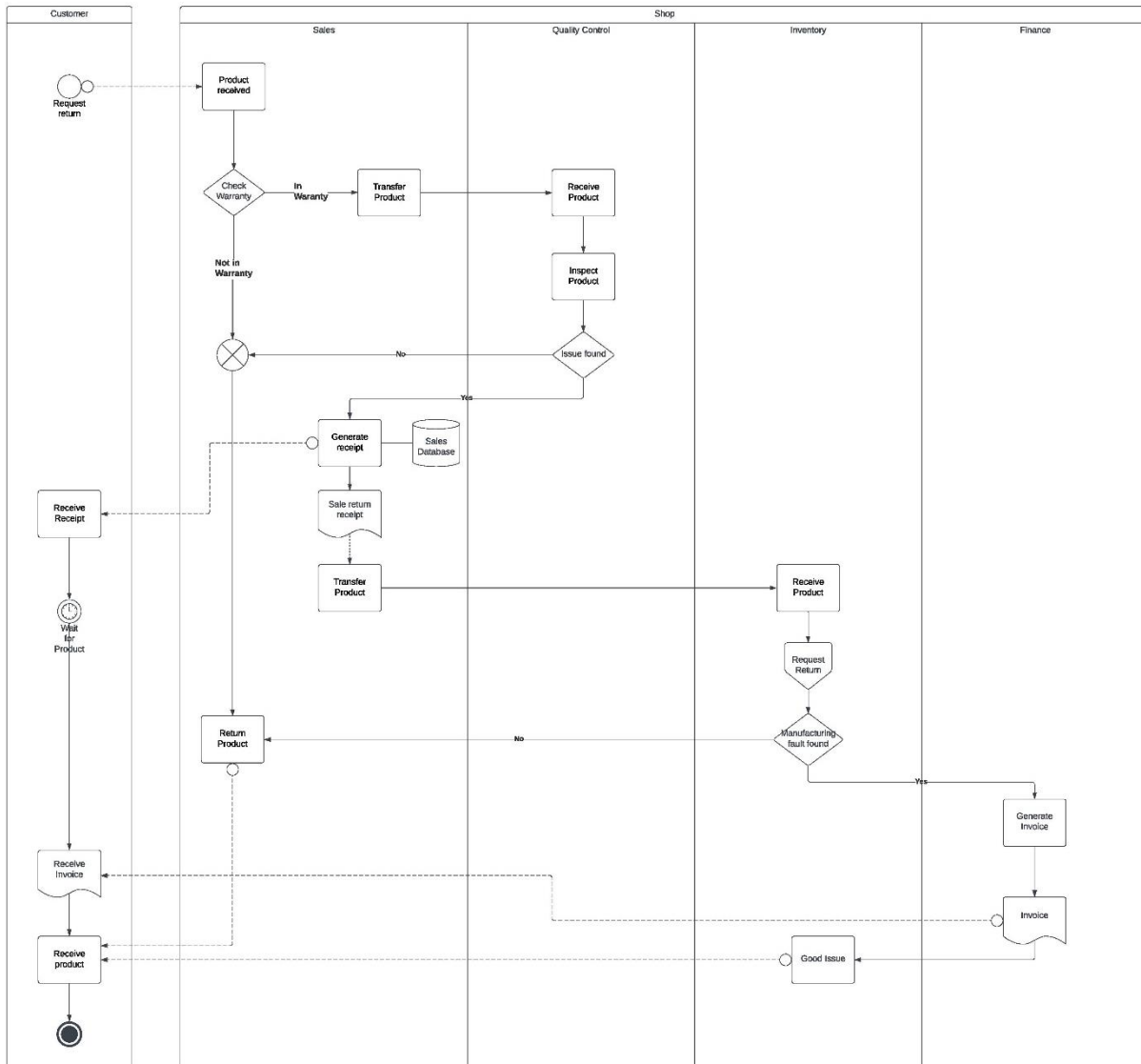
10.3 To-Be Sale Return Process Description

1. The customer requests a return.

2. The sales team receives the product.

3. The sales team if the product is in warranty.

4. If the Product is in warranty.

   - The quality inspection team inspects the product and checks if there is an issue.

   - If an issue is found.

     i. Sales team generates a return receipt and gives to the customer.

     ii. The quality control team transfers the product to inventory.

     iii. The inventory team generates a return request.

     iv. The customer is informed of an expected pickup date.

   - If an issue is not found.

     - Sales Team returns the product to the customer.

5. If the product is not in warranty.

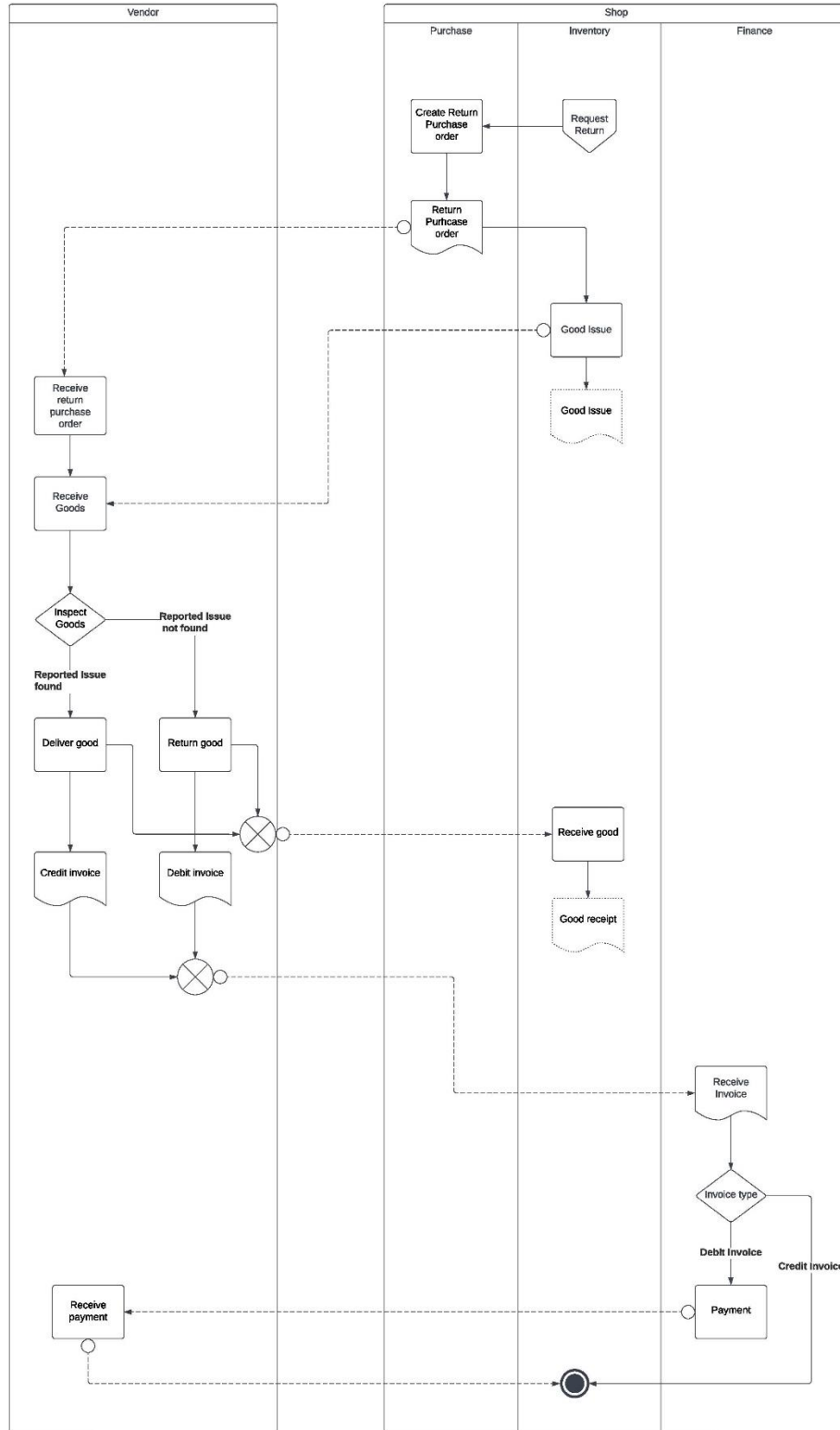   - Sales Team returns the product to the customer.

PROCUREMENT PROCESS
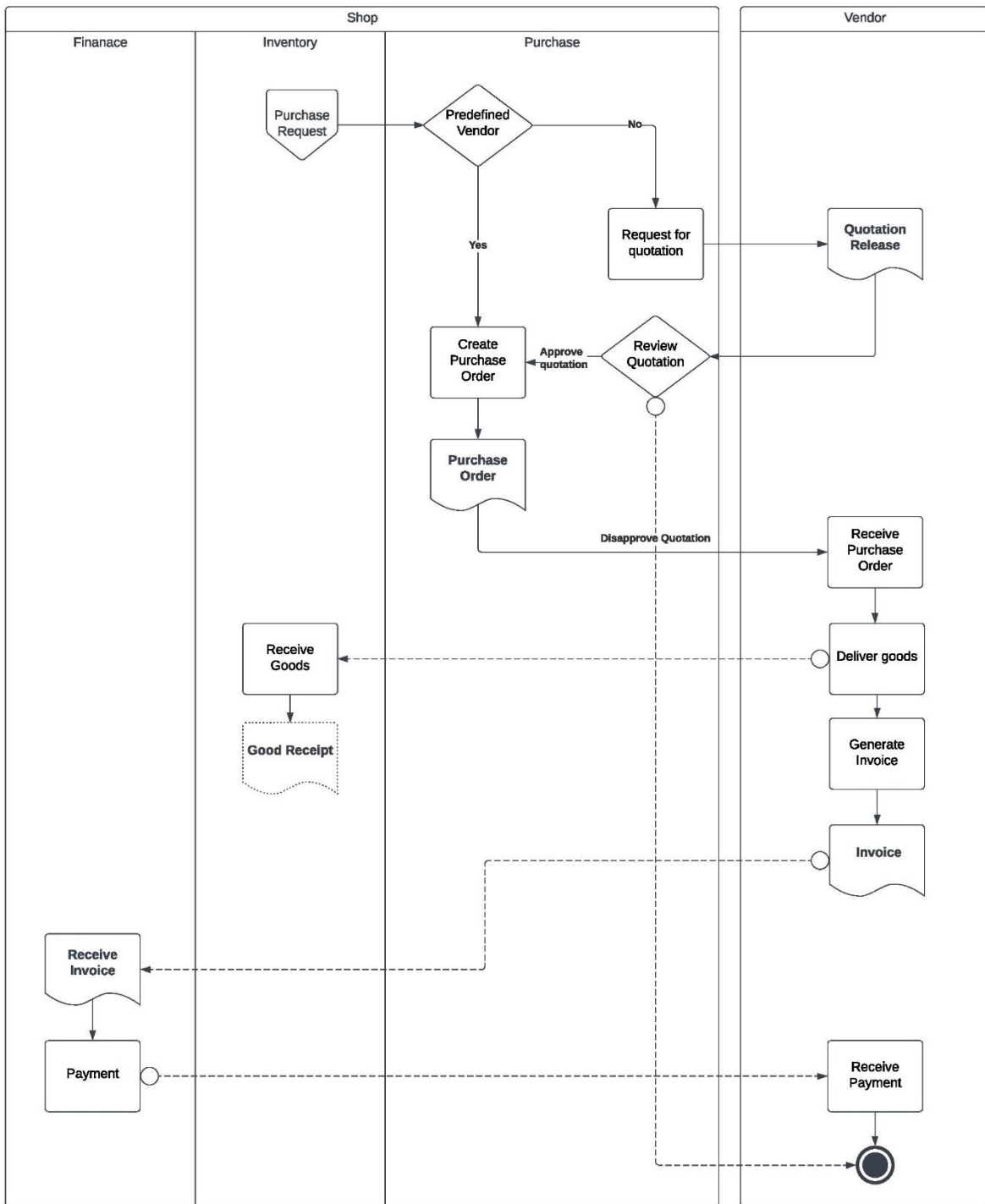
10.4 To-Be Procurement Process Description

1. The inventory department creates a purchase request.

2. The purchase department checks if there is a predefined vendor for the product or service.

3. If there is a predefined vendor, the purchase department creates a purchase order.

4. If there is no predefined vendor, the purchase department requests a quotation from potential vendors.

5. The vendors submit their quotations to the purchase department.

6. The purchase department reviews the quotations and selects the best vendor.

7. The purchase department sends a purchase order to the selected vendor.

8. The vendor delivers the goods to the company.

9. The vendor generates an invoice for the goods.

10. The inventory department receives the goods and performs a good receipt.

11. The finance department receives the invoice from the vendor.

12. The finance department pays the invoice.

PURHCASE RETURN PROCESS

10.5 To-Be Purchase Return Process Description

1. The purchase department creates a return purchase order.

2. The purchase department issues a good issue for the returned goods.

3. The vendor receives the return purchase order.

4. The vendor receives the returned goods and performs a good receipt.

5. The vendor inspects the returned goods.

6. If the reported issue is not found.

   - The vendor delivers the replaced goods to the inventory department.

   - The inventory department performs a good receipt upon receiving the replaced goods.

   - The Vendor issues a debit invoice to the finance department.

7. If the reported issue is found.

   - The Vendor issues a credit invoice to the finance department.

8. The finance department receives the invoice from the vendor.

9. The finance department pays the invoice.

Production Process
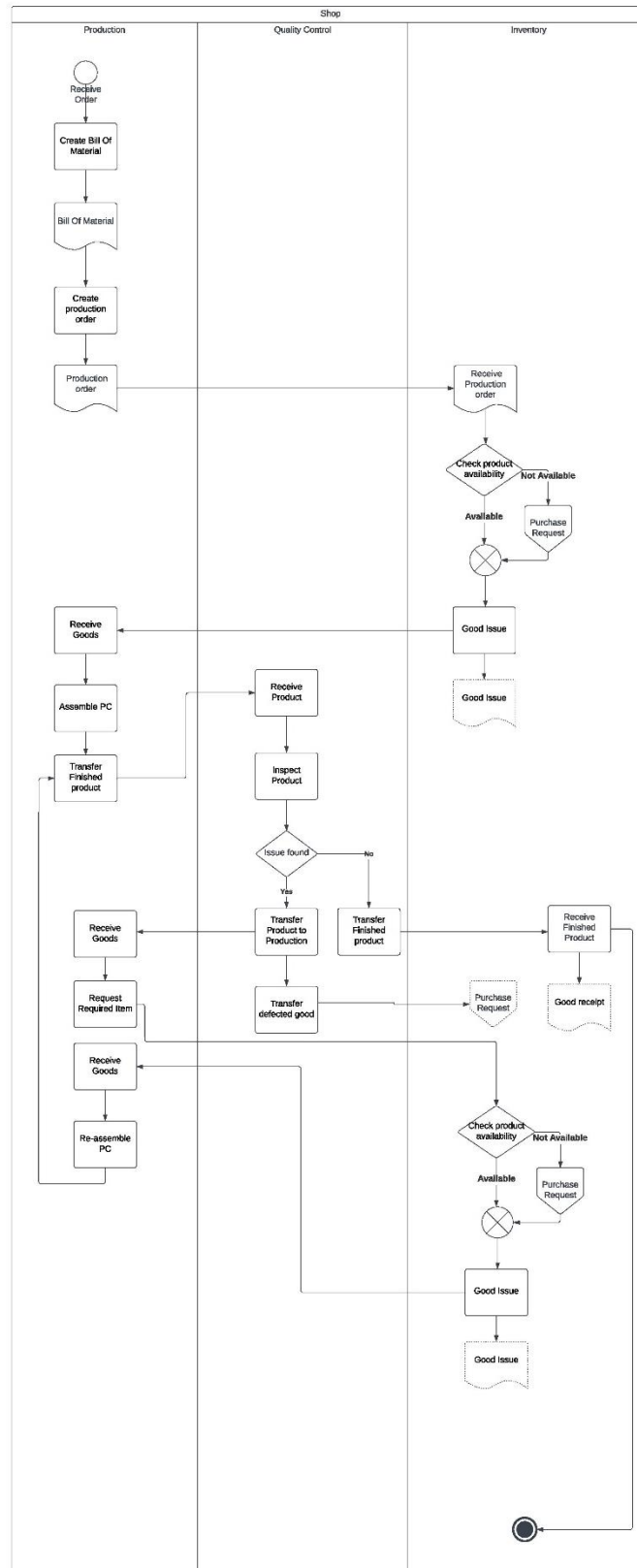
## 10.6 To-Be Production Process Description

1. The production department receives an order from the sales department.

2. The production department creates a bill of material for the order.

3. The inventory department receives the raw materials and components for the order.

4. The production department creates a production order for the order.

5. The production team assembles the PC according to the production order.

6. The quality control department inspects the finished PC.

7. If no issue is found, the finished PC is transferred to the inventory department.

8. If an issue is found, the defective part is transferred to the inventory department.

9. The inventory department receives the defective part.

10. The inventory department checks the product availability of the defective part.

11. If the defective part is not available, the inventory department creates a purchase request for the defective part.

12. If the defective part is available, the inventory department issues a good issue for the defective part.

13. The shop re-assembles the defective part.

14. The quality control department inspects the re-assembled PC.

15. If no issue is found, the re-assembled PC is transferred to the inventory department.

16. If an issue is found, the re-assembled PC is transferred to the inventory department.

11.   GAP ANALYSIS

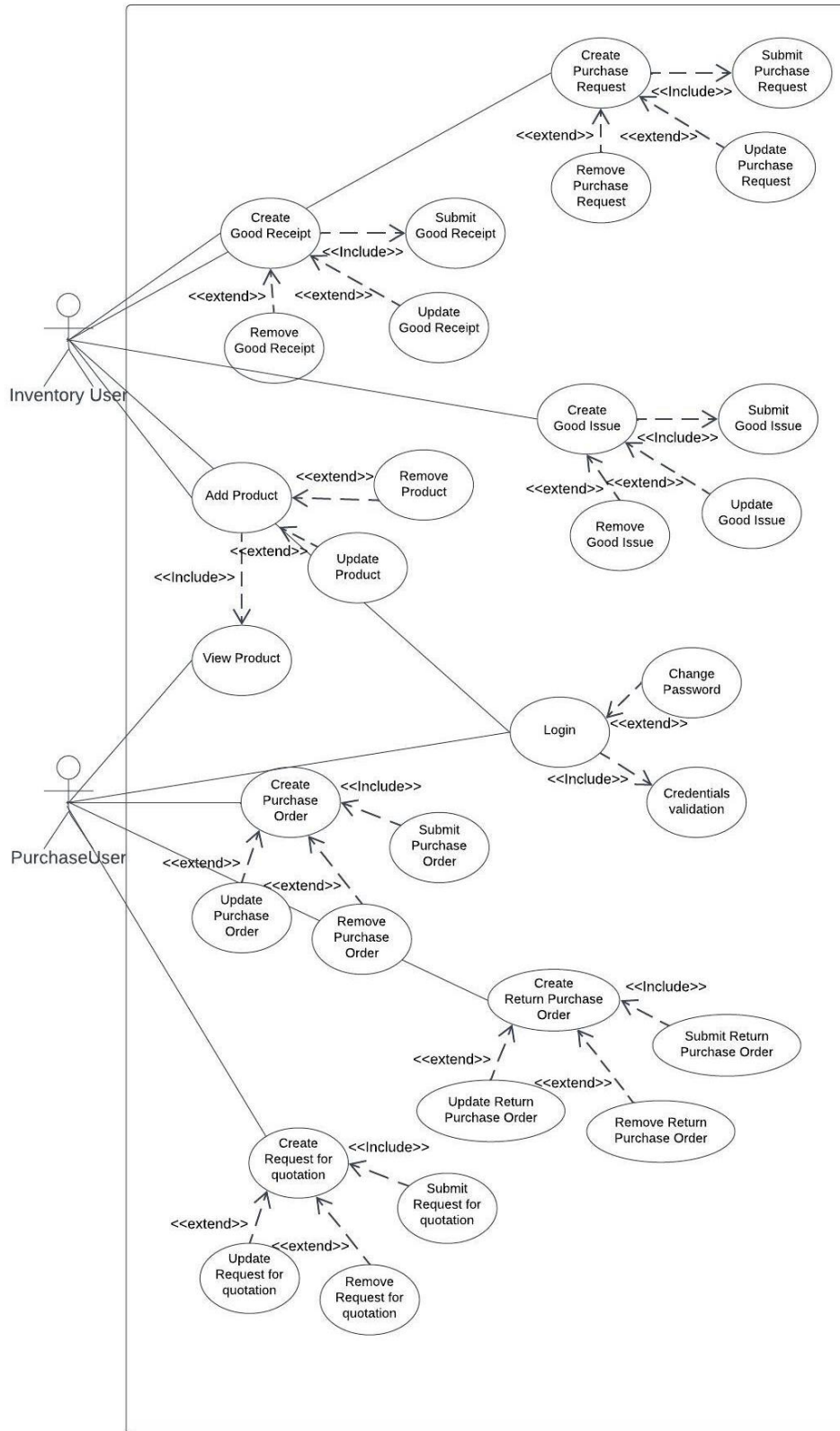| CURRENT STATUS	TARGET	GAP ANALYSIS
No alternate product suggestion for unavailable products	Product suggestion for unavailable products	This will improve customer satisfaction
No actions for unavailable products	Create a Purchase Request for unavailable products	This will improve customer satisfaction
No Order Confirmation	Order Confirmation	Improves transparency and reduces errors
No Advance Payment	50% Advance Payment upon order confirmation	Efficient Order Fulfillment
Replace Product without Replacement from Vendor	Replace product after receiving Replacement from Vendor	Effectively Manage Warranty Claims and Replacements
No Request for quotation	Request for quotation before Creating Purchase Order	Improves Efficiency and Transparency
Lack of Documentation	Return Purchase Order and Goods Receipt Creation	More Efficient and Accurate
Lack of Quality Control after Production	Quality Inspection upon Assembly	Improves quality of products

12. USE CASE
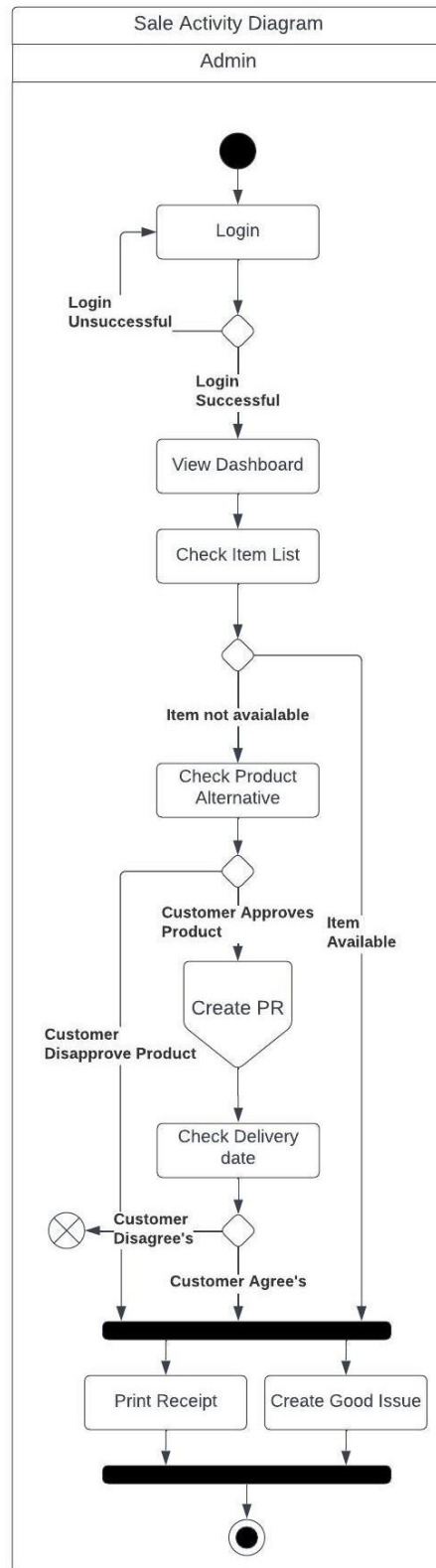### 12.1 PRODUCTION USE CASE
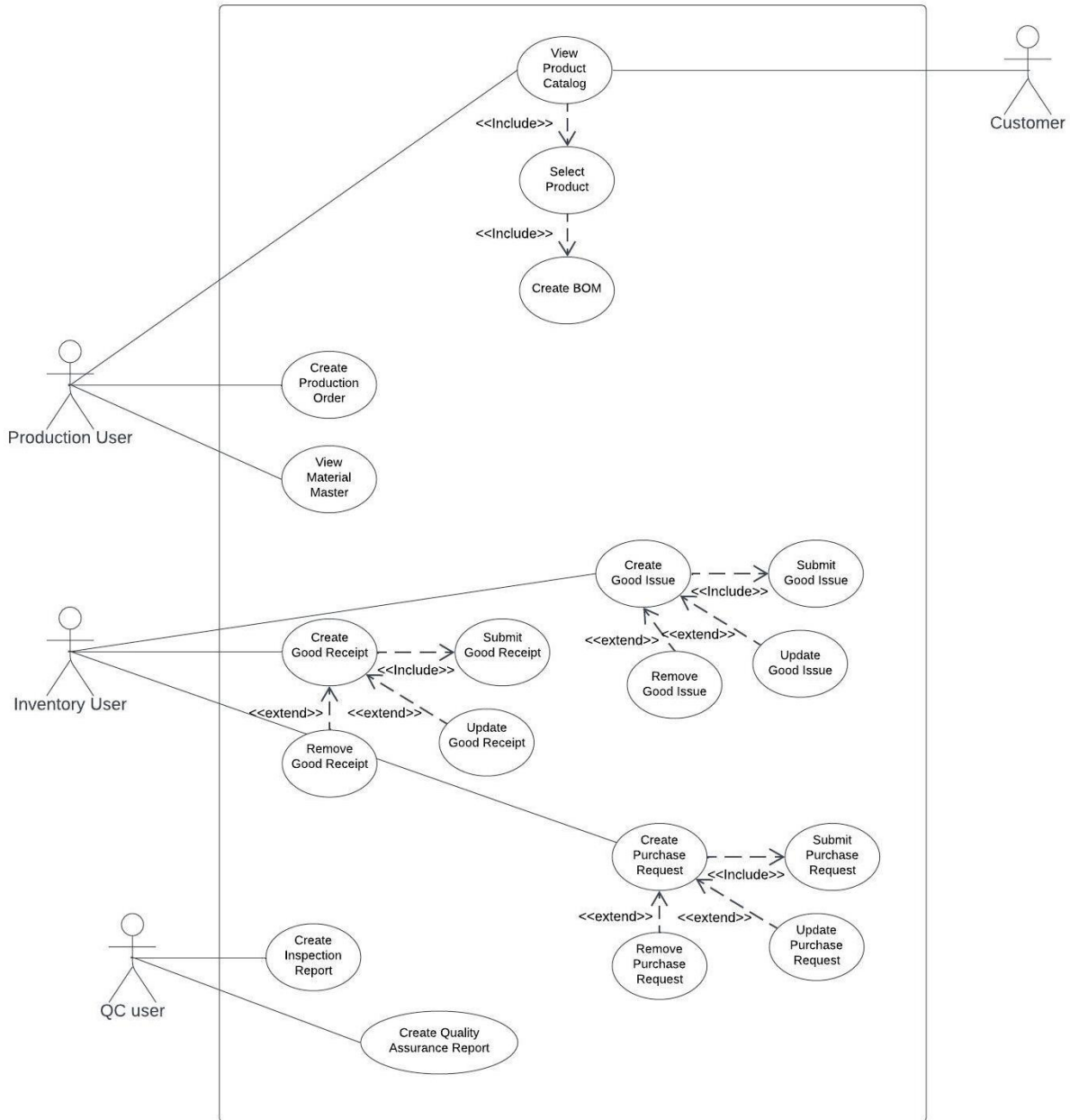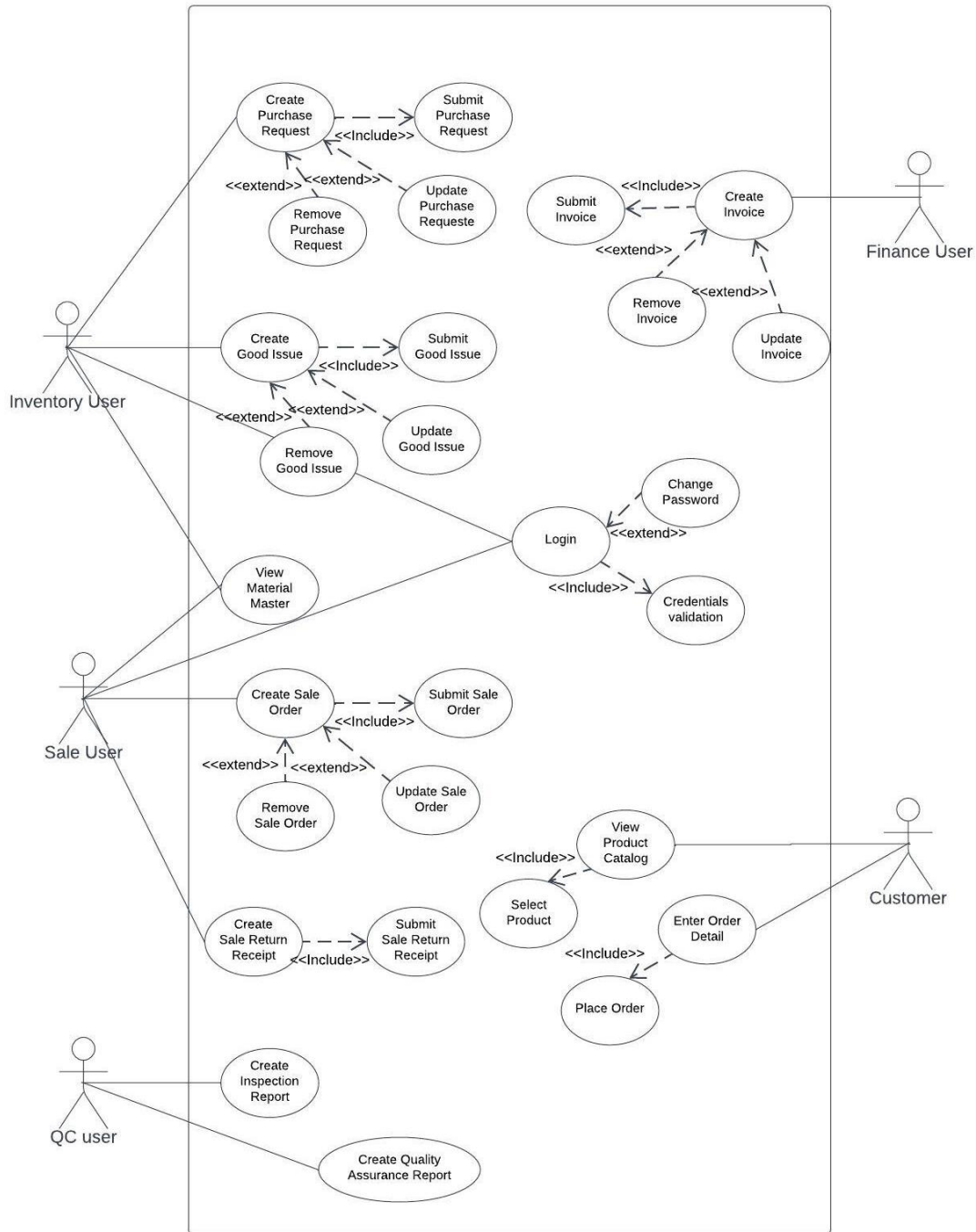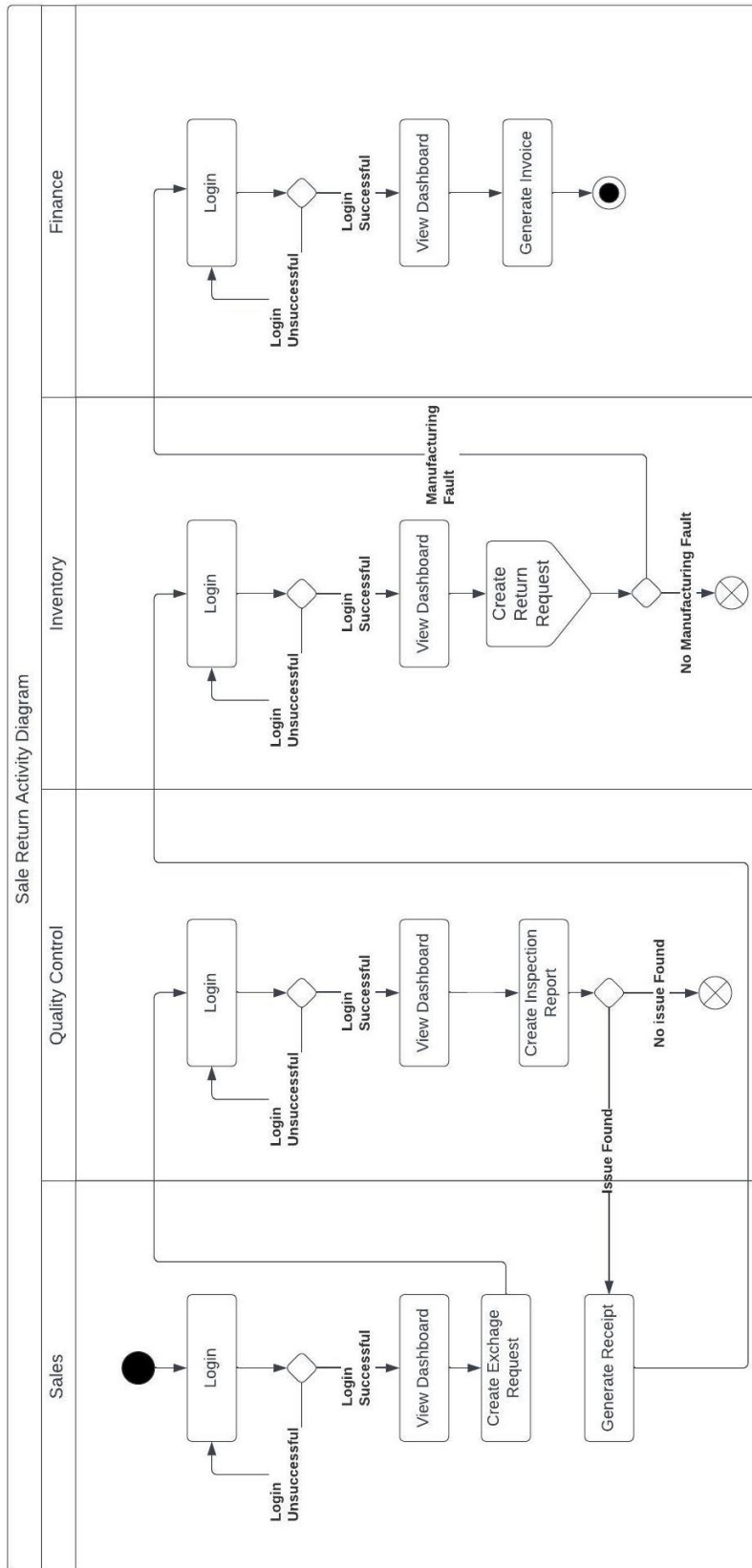
12.2 SALES USE CASE

13. ACTIVITY

13.1 WALK-IN SALE ACTIVITY

Sale Activity Diagram

13.2 BULK SALE ACTIVITY

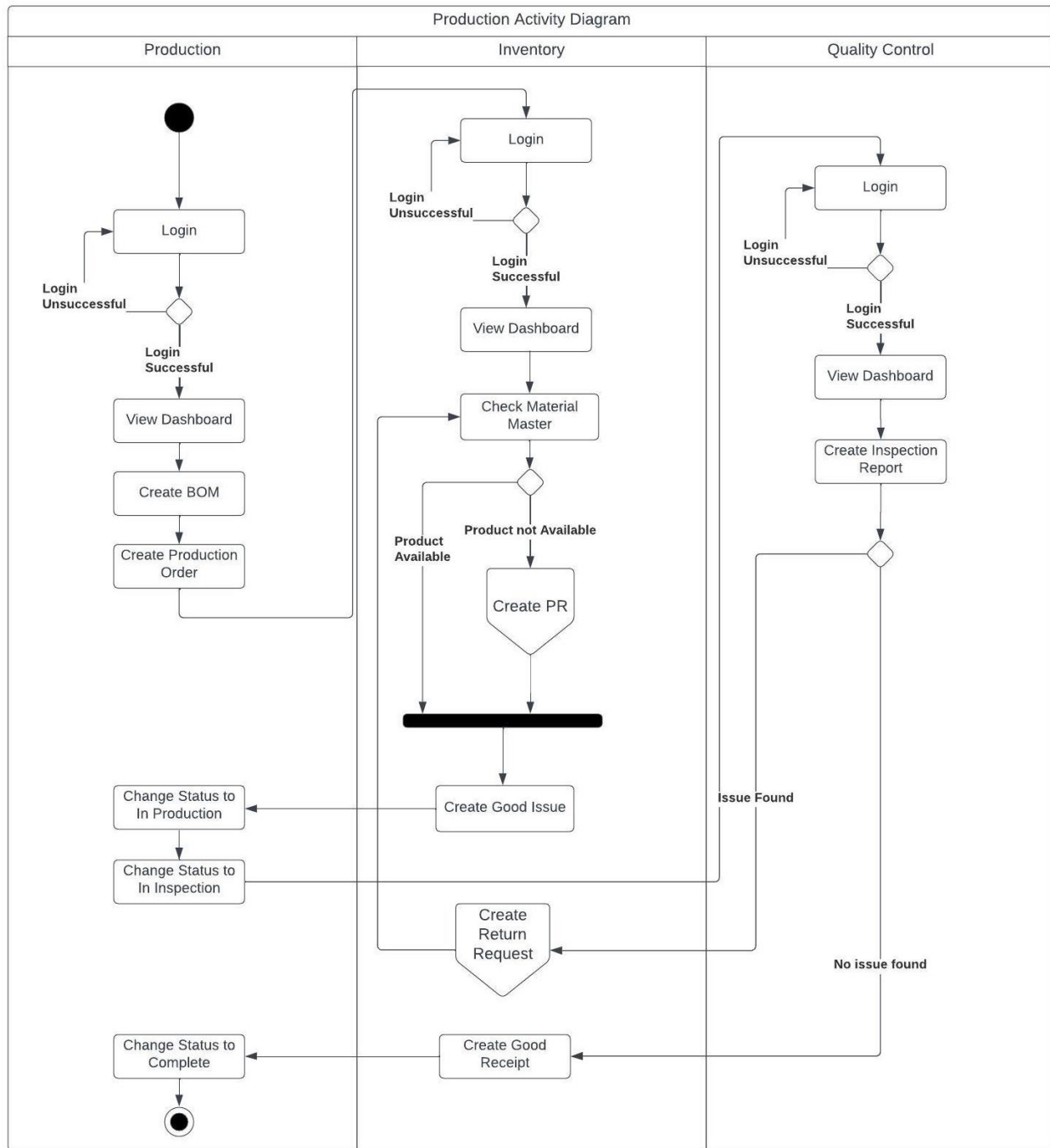Bulk Sale Activity Diagram

13.3 SALE RETURN ACTIVITY

Sale Return Activity Diagram

![SAP]
Karachi Institute
of Economics
and Technology
KIET
Collaboration with Pakistan Air Force
TechnoTrek

13.4 PROCUREMENT ACTIVITY

Procurement Activity Diagram

Purchase Return Activity Diagram

Finance: Login → (Login Successful / Login Unsuccessful) → View Dashboard → Record Payment → End

Inventory: Create Return Request → Login → (Login Successful / Login Unsuccessful) → View Dashboard → Create Good Issue → Create Good Receipt → Credit Invoice

Purchase: Login → (Login Successful / Login Unsuccessful) → View Dashboard → Create Return Purchase Order

Debit Invoice

13.6 PRODUCTION ACTIVITY

Production Activity Diagram

![SAP]
Karachi Institute
of Economics
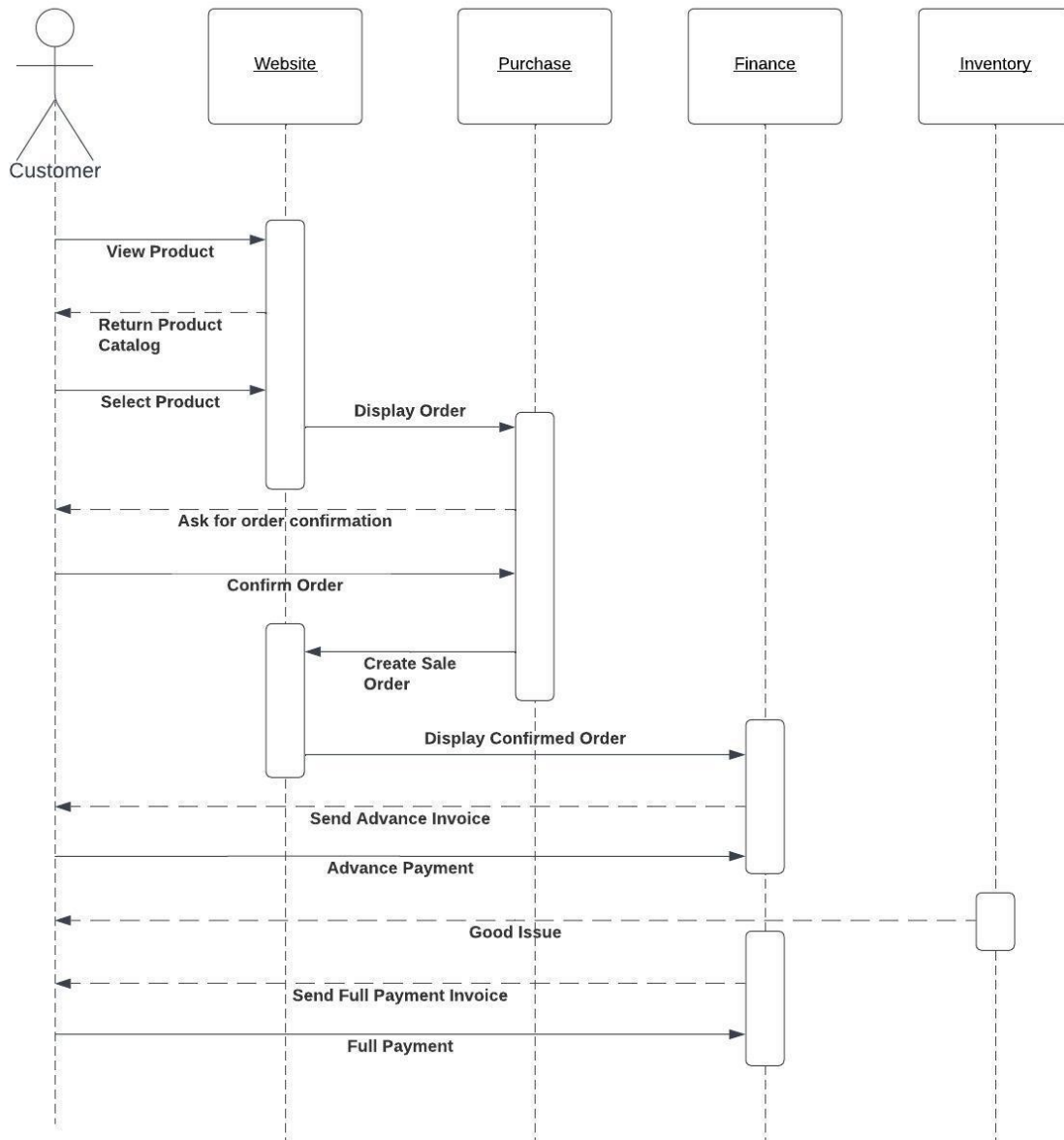and Technology
KIET Collaboration with Pakistan Air Force
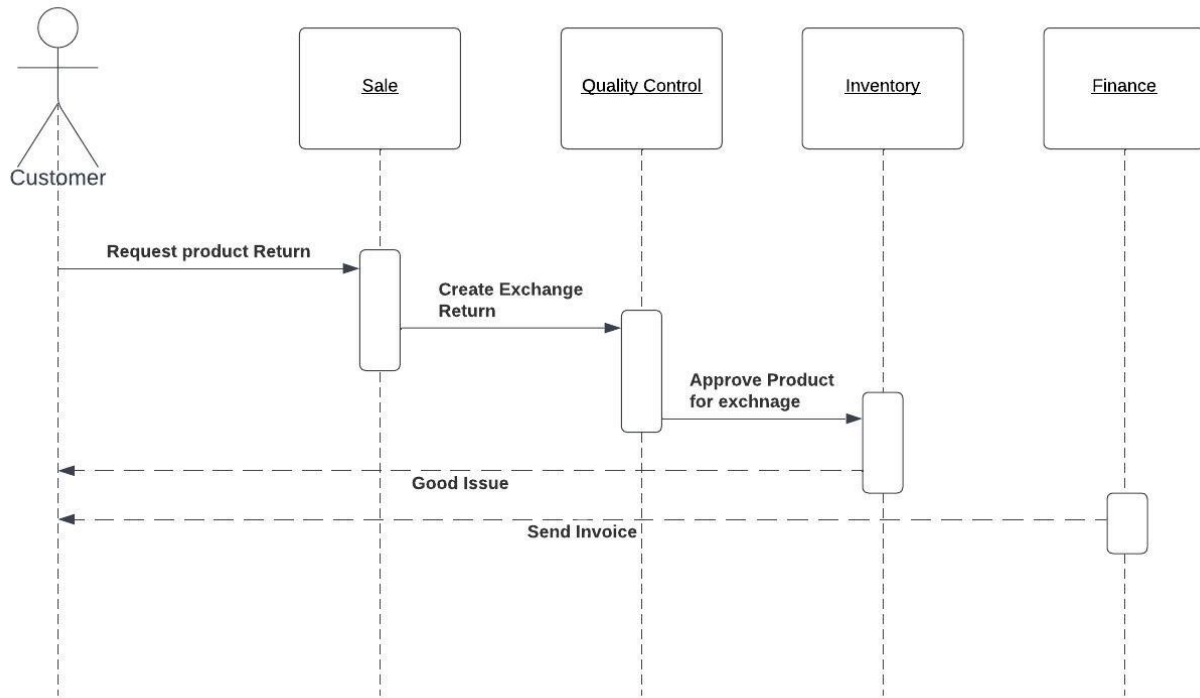TechnoTrek
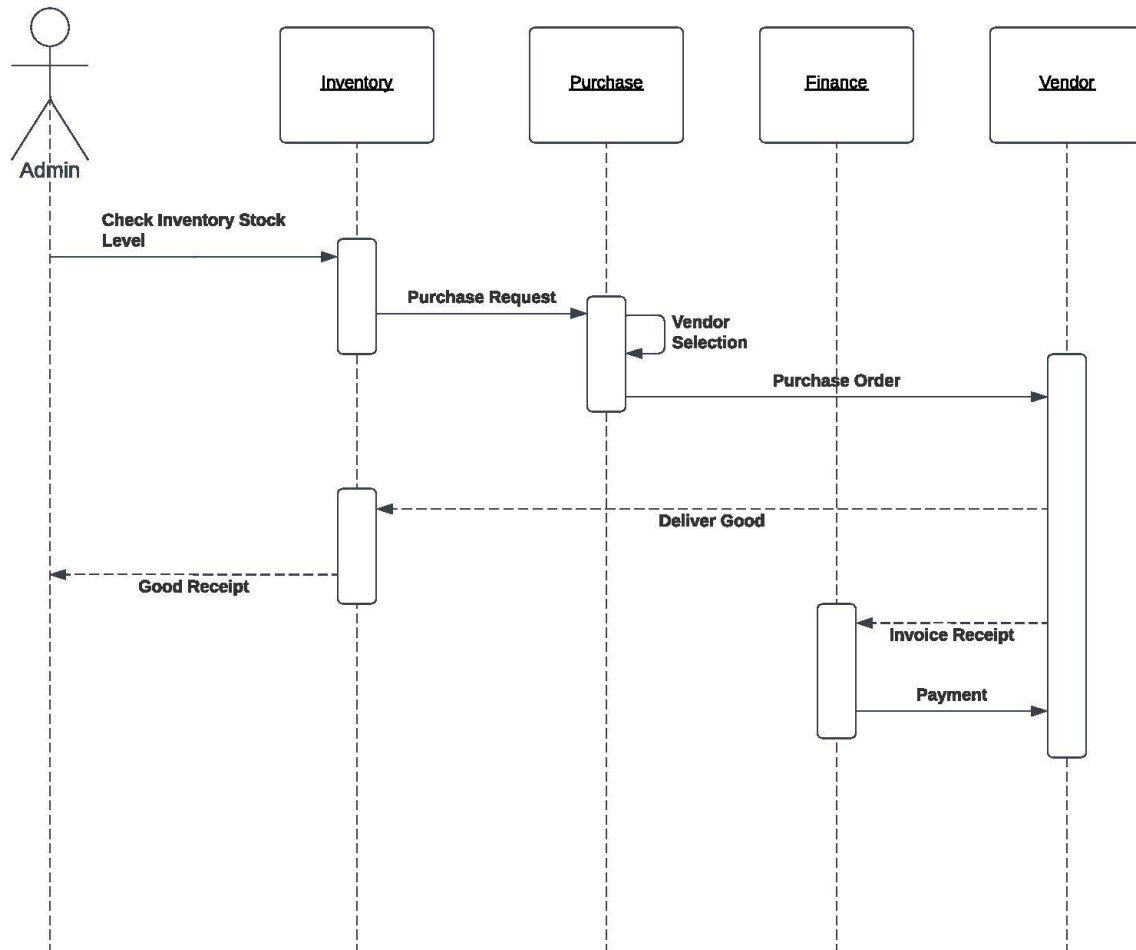
14. SEQUENCE

14.1 WALK-IN SALE SEQUENCE
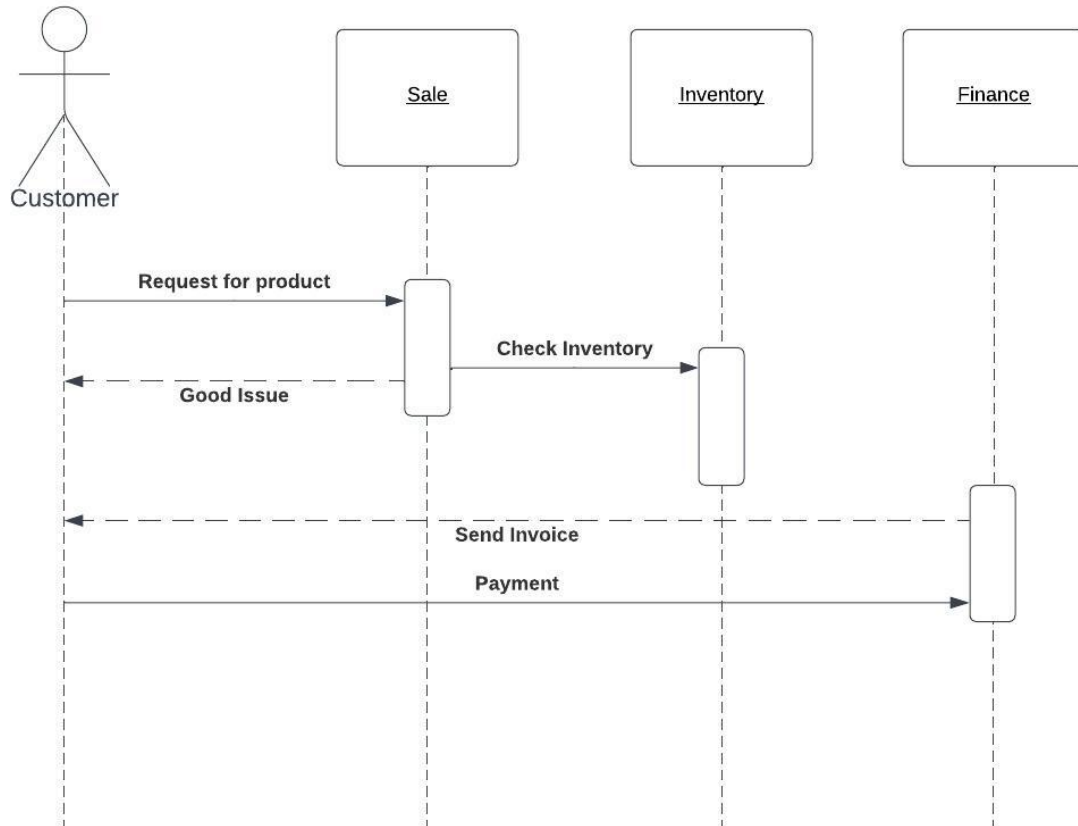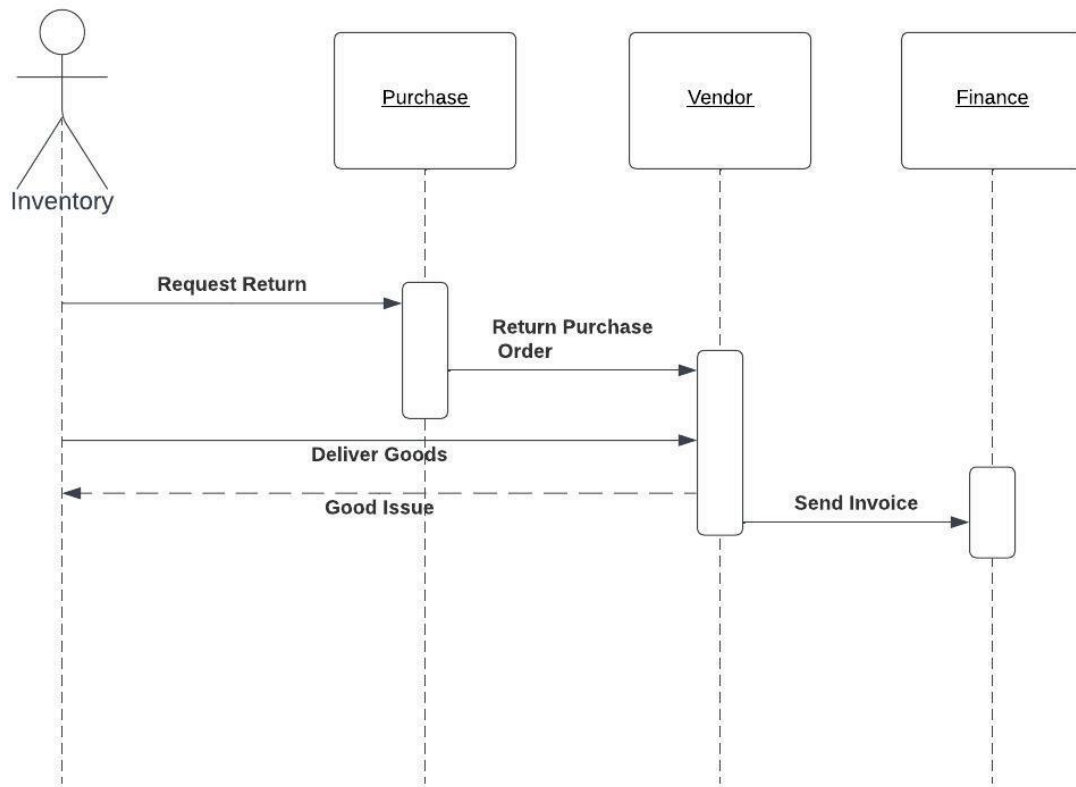
14.2 BULK SALE SEQUENCE

14.3 SALES RETURN SEQUENCE

14.4 PROCUREMENT SEQUENCE

14.5 PURCHASE RETURN SEQUENCE

14.6 PRODUCTION SEQUENCE