
# Birzeit University

Department of Computer Science

## COMP433: SOFTWARE ENGINEERING

## Requirements Analysis and Modelling

### Mobile Phones Shop

**Team Members:**

1. Ahmad Hamdan 1210241 Section 3
2. Mohammad Fareed 1212387 Section 3
3. Omar Hussain 1212739 Section 3
4. Ismail Tarteer 1211243 Section 3
5. Sohaib Badaha 1210472 Section 3

**Date:** January 9, 2026

## Task 3.1: Scenario Analysis

### 3.1.1 Scenario 1 – Returning a Newly Delivered Order

**Writer:** Mohammad Fareed

**Initial Assumptions:** Customer Ahmad has recently received an order purchased through the system. The delivery has been completed successfully, and the order status is marked as Delivered. The return management service is operational.

**Normal Flow:** Customer Ahmad receives his mobile phone order and determines that it should be returned due to an issue such as a defect or receiving an incorrect model. Ahmad navigates to his order history, and selects the delivered order containing the mobile phone. The system presents a return request form where Ahmad selects a predefined return reason and may provide additional details. Upon submission, the system registers the return request and forwards it to the return staff for review. The return staff reviews the request through the system and decides whether to accept or reject the return based on delivery date and return policy constraints. If accepted, the system displays the expected refund timeline based on the original payment method, generates return instructions, and updates the item status to Return in Progress.

**Alternative Flow 1** Customer Ahmad receives an order containing multiple products. After inspecting the delivered products, the customer decides to return only a specific product. He decides to return only the mobile phone and submits a return request for the selected item through the system. The system forwards the request to the return staff, who reviews it, and the system calculates the refundable amount for the phone, while leaving the remaining items unaffected.

→ **Successful Output?** Yes

**Alternative Flow 2** Customer Ahmad receives his delivered order and, after inspection, discovers an extra mobile phone that he did not order. He decides to submit a return request for the extra phone and selects the option for misdelivered item, providing a description explaining that the phone was not part of his order. The system forwards the request to the return staff, who accept it, and the system generates return instructions, didn't calculate refundable amount and updates the case status to Return in Progress.

→ **Successful Output?** Yes

**Error Flow** Customer Ahmad receives his delivered order and attempts to submit a return request for a phone after the allowed return period has expired or for a phone marked as non-returnable. The system reject the request directly and notifies Ahmad of the rejection and displays the reason with a reference to the store's return policy.

→ **Successful Output?** No

**System State on Completion:** For successful returns, the system stores the return request with associated metadata, including reason, and selected return type. The item status is updated to Return in Progress. For unsuccessful attempts, no return record is created, and the event is logged without affecting the order.

### 3.1.2 Scenario 2 – Customer Support Ticket Handling

**Writer:** Ahmad Hamdan

**Initial Assumptions:** Customer Ahmad is using the system and encounters an issue while interacting with it. If the issue is related to an order, the referenced order exists in the system database. The customer support module is operational, and support staff are available.

**Normal Flow:** Customer Ahmad encounters a delivery-related issue and logs into the system. He navigates to the Customer Support section and selects the option to submit a new support request. The system presents a support form where Ahmad selects the issue category and provides a description of the problem. After submission, the system creates a support ticket, assigns it a unique identifier, and sets its status to Open. A support staff member reviews the ticket, provides guidance or resolution steps through the system, and updates the ticket status to In Progress. Once the issue is resolved, the support staff updates the ticket status to Resolved, and the system notifies Ahmad of the resolution.

**Alternative Flow 1:** Customer Ahmad submits a support ticket describing an issue but provides limited details. The system creates the ticket and assigns it an Open status. A support staff member reviews the ticket and requests additional information through the system. Ahmad replies with the required details, which are appended to the ticket. The ticket remains in the In Progress state until the issue is resolved and then is marked as Resolved.

→ **Successful Output?** Yes

**Alternative Flow 2:** Customer Ahmad submits a support request related to a known issue with predefined resolution steps. The system automatically presents a suggested solution to Ahmad. Ahmad accepts the solution, and the system closes the ticket and marks it as Resolved without further staff intervention.

→ **Successful Output?** Yes

**Error Flow:** Customer Ahmad attempts to submit a support request without selecting an issue category or providing a description. The system blocks the submission and displays a message indicating the missing required information. No support ticket is created until Ahmad corrects the input.

→ **Successful Output?** No

**System State on Completion:** For successful cases, the system stores the support ticket with its full interaction history, timestamps, and final status. Resolved tickets are archived but remain accessible to both customers and support staff for future reference and auditing. Notifications are logged and delivered to the appropriate users upon status changes. In error cases, no ticket is created, and the failed submission attempt is logged without affecting system data integrity.

### 3.1.3 Scenario 3 – Process Payment

**Writer:** Ismail Tarteer

**Initial Assumptions:** Customer Sara is logged into the system and has at least one valid order ready for checkout. The order exists in the system database and has not yet been paid. The checkout module is operational. For bank card payments, the external payment gateway is available unless otherwise specified. The invoicing subsystem is active and capable of generating electronic invoices.

**Normal Flow:** Customer Sara is ready to pay for her order during checkout. The system displays the available payment methods, including cash on delivery and bank card payment. Sara selects bank card payment and enters the required card-payment details in the checkout payment step. After confirming the payment, the system sends the payment request to the external payment gateway. The payment gateway approves the transaction and returns a success response. The system confirms the payment and generates and stores an electronic invoice for the order.

**Alternative Flow:** Customer Sara chooses cash on delivery as the payment method instead of bank card payment. The system records the selected payment method as cash on delivery and confirms the checkout payment step. The system generates and stores an electronic invoice for the confirmed order.

→ **Successful Output?** Yes

**Error Flow 1:** Customer Sara selects bank card payment and enters the required payment details. The system sends the payment request to the external payment gateway. The payment gateway declines the transaction due to reasons such as insufficient funds or invalid authorization. The system displays a payment failure message and does not confirm the payment. Sara is given the option to retry the payment or select cash on delivery instead.

→ **Successful Output?** No

**Error Flow 2:** Customer Sara selects bank card payment and submits the payment details. The system attempts to communicate with the external payment gateway, but the gateway is unavailable due to a network or timeout issue. The system displays an error message asking Sara to try again later. The payment process is not completed, and no invoice is generated.

→ **Successful Output?** No

**System State on Completion:** For successful cases, the system records the completed checkout with the selected payment method. The order status is updated to Paid for bank card payments or Pending Payment on Delivery for cash on delivery orders. The generated electronic invoice is stored with timestamps, and payment confirmation details are logged for auditing purposes. For error cases, the order remains unpaid, no invoice is generated, and the failed payment attempt is logged without affecting order data integrity.

### 3.1.4 Scenario 4 – Deliver Order

**Writer:** Sohaib Badaha

**Initial Assumptions:** The delivery personnel is authenticated and logged into the chocolate shop system with proper permissions. Orders with status "Shipped" are already assigned by the Delivery Coordinator. Customer addresses are valid within the West Bank. Orders are packaged and ready, the delivery personnel has access to a vehicle, and for cash on delivery orders, sufficient change is available.

**Normal Flow:** Sohaib logs into the system at 10:00 AM and views five assigned orders. He selects order ORD-2025-1223-045, confirms its details, and marks it as "Out for Delivery" at 10:15 AM. He arrives at the customer's address at 10:45 AM, verifies the customer's identity, delivers the package in good condition, and collects a digital signature. He updates the order status to "Delivered" at 10:50 AM. The system records the delivery timestamp and sends a confirmation notification to the customer.

→ **Successful Output?** Yes

**Alternative Flow 1:** Sohaib delivers a cash-on-delivery order worth 150 NIS. After the customer inspects the items, the customer pays in cash and receives change and a receipt. The customer signs digitally, and Sohaib updates the order to "Delivered – Cash Collected". The system records the payment and notifies the customer and accountant.

→ **Successful Output?** Yes

**Alternative Flow 2:** Sohaib arrives at the delivery address but the customer is unavailable. After contacting the customer, the delivery is rescheduled to a later time. The system updates the order to "Delivery Rescheduled" and sends a notification. The order is later delivered successfully and marked as "Delivered."

→ **Successful Output?** Yes

**Error Flow:** Sohaib cannot complete a delivery due to an incorrect address and an unreachable customer. He marks the order as "Delivery Failed" with detailed notes. The system creates a support ticket, sends notifications to relevant staff, and keeps the order pending until the issue is resolved and delivery is rescheduled.

→ **Successful Output?** No

**System State on Completion:** The system maintains an audit trail for deliveries including timestamps, customer signatures, and cash-on-delivery payment records, updates the final order status, and sends automatic customer notifications. In case of delivery failure, it logs all attempts and reasons, creates support tickets, notifies relevant staff, and keeps the order active until the issue is resolved

### 3.1.5 Scenario 5 – Place Order

**Writer:** Omar Hussain

**Initial Assumptions:** The customer is browsing the online mobile phones and accessories catalog and intends to complete a purchase by placing an order online. The system is operational, all required services such as inventory, payment, and delivery estimation are available, and the customer has items already added to the shopping cart.

**Normal Flow:** The customer opens the shopping cart and reviews the selected items, such as a mobile phone and a phone accessory. The customer clicks on the *Checkout* button to continue with the purchasing process. The system prompts the customer to enter the delivery address details. The customer enters a valid delivery address located within the supported delivery areas in the West Bank, and the system displays the estimated delivery time. The customer then enters a valid coupon code and selects a preferred payment method, either cash on delivery or bank card payment, and confirms the order. The system verifies product availability, successfully places the order, generates a unique order number, and displays a confirmation message to the customer.

**Alternative Flow** Before confirming the order, the customer decides to modify the quantity of one of the selected products. The system updates the shopping cart accordingly and allows the customer to continue the checkout process without any issues.

→ **Successful Output?** Yes

**Error Flow 1** During the checkout process, one of the selected products becomes out of stock. The system notifies the customer that the item is no longer available and prompts the customer to either remove the product from the cart or select an alternative product.

→ **Successful Output?** No

**Error Flow 2** The customer enters an invalid or expired coupon code during checkout. The system rejects the coupon code and displays an error message, allowing the customer to enter a valid code or proceed without applying a discount.

→ **Successful Output?** No

**System State on Completion:** For successfully placed orders, the system updates the inventory quantities, generates an electronic invoice, and stores the order in the database with a unique order ID. The order status is marked as *Placed* and becomes visible in the customer's order history, ready to be processed for delivery. For unsuccessful attempts, the order is not created, and no inventory changes occur.

## Task 3.2: Actor Analysis

**Lead:** Ahmad Hamdan
**Contributors:** Sohaib Badaha (review), Mohammad Fareed (review), Omar Hussain (discussion), Ismail Tarteer (discussion)

- **Customer** Represents the primary role of the system. Can browse and search mobile phones and accessories, view product information, add items to the shopping cart, apply coupon codes, make payments, provide delivery address details, view order history, track order status, initiate return or exchange requests for delivered products within policy limits, and submit customer support requests.
- **Customer Support Staff** Represents authorized staff responsible for handling customer inquiries and issues through the support module. Can view submitted support requests, respond to customers, update ticket statuses (open, in progress, resolved), and track each case until resolution.
- **Dispatch Staff** Represents staff responsible for preparing confirmed orders for shipment. Can review confirmed orders, pack and label items, and confirm handoff to the delivery staff by updating the order status to shipped.
- **Delivery Staff** Represents staff responsible for delivering shipped orders to customers. Can deliver orders, update the order status to delivered, and if cash on delivery is selected, confirm payment collection by marking the payment as received.
- **Return Processing Staff** Represents authorized staff responsible for handling return and exchange requests through the system. Can review submitted return requests, accept or reject them based on return policies, update return statuses, and trigger follow-up actions such as refund processing or replacement shipment linked to an existing order return.
- **IT Support** Represents technical staff responsible for maintaining system operation and access control. Can manage user roles and permissions, support system configuration, troubleshoot technical issues, and ensure system availability and recovery.
- **Payment Gateway** Represents an external service used to process online card payments securely. Responsible for validating payment information and returning a success or failure response to the system. The system does not store sensitive payment data such as full card numbers.
- **Notification Service** Represents an external notification mechanism used to send transactional messages such as order confirmations, delivery updates, electronic invoices, and support ticket status notifications to customers.

## Task 3.3: Use-Case Modeling

**Lead:** Mohammad Fareed
**Contributors:** Sohaib Badaha (discussion), Ahmad Hamdan (discussion), Omar Hussain (review), Ismail Tarteer (review)

### 3.3.1 Use Case List

- **UC01 – Browse Products** A customer browses available mobile phones and accessories.
- **UC02 – View Product Details** A customer views detailed information about a selected product including specifications, price, images, and current availability status.
- **UC03 – Manage Shopping Cart** A customer adds products to the shopping cart, updates quantities, or removes items.
- **UC04 – Provide Delivery Details** A customer enters the delivery address information including city, street, and contact number.
- **UC05 – Place Order** A customer confirms an order, selects a payment method, and submits the checkout request. A unique order identifier is generated upon successful confirmation.
- **UC06 – Process Payment** This use case represents the general payment process associated with placing an order. The payment is completed using one of the supported payment methods.
- **UC07 – Pay by Cash** A customer selects cash on delivery as the payment method. The payment is collected later by the delivery staff at the time of order delivery.
- **UC08 – Pay by Credit** A customer selects card payment as the payment method. The payment is processed electronically before the order is confirmed.
- **UC09 – Pay Using Secure Gateway** The system communicates with an external secure payment gateway to authorize and process a card payment without storing sensitive card information.
- **UC10 – Apply Coupon Code** A customer applies a valid coupon code during checkout. The system validates the coupon and applies the corresponding discount to the order total if the code is valid.
- **UC11 – View Order History** A customer views previously placed orders along with their associated details such as order date, total amount, and delivery information.
- **UC12 – Track Order Status** A customer tracks the current status of an order through stages such as placed, processing, shipped, delivered.
- **UC13 – Dispatch Order for Shipment** A dispatch staff member reviews a confirmed order, prepares and packages the items, and updates the order status to shipped when the order is handed to the delivery staff.

- **UC14 – Deliver Order** A delivery staff member delivers a shipped order to the customer, updates the order status to delivered.
- **UC15 – Record Cash Payment** A delivery staff member records the receipt of a cash payment in the system using a delivery device after successfully collecting payment from the customer.
- **UC16 – Place Return Request** A customer submits a request to return a delivered product within the defined return policy period, specifying the reason for return.
- **UC17 – Place Exchange Request** A customer submits a request to exchange a delivered product for another item or variation within the defined exchange policy period.
- **UC18 – Review Return Request** A return processing staff member reviews a submitted return request, verifies eligibility according to the return policy, and either approves or rejects the request. If approved, the refund process is initiated.
- **UC19 – Review Exchange Request** A return processing staff member reviews a submitted exchange request, verifies product availability and policy compliance, and either approves or rejects the request. If approved, a replacement shipment is initiated.
- **UC20 – Submit Support Ticket** A customer submits a support ticket related to payment, delivery, returns, exchanges, or other issues. A unique support ticket identifier is generated for tracking purposes.
- **UC21 – Resolve Support Ticket** A customer support staff member reviews a support ticket, responds to the customer, updates the ticket status, and tracks the issue until it is resolved.
- **UC22 – Manage Roles** An IT support staff member manages role-based permissions for an administrative or support user.
- **UC23 – Manage Access** An IT support staff member assists a user with access recovery and account-related issues.
- **UC24 – Send Notification** The notification service sends automated notifications regarding order confirmations.

### 3.3.2 Use Case Diagram

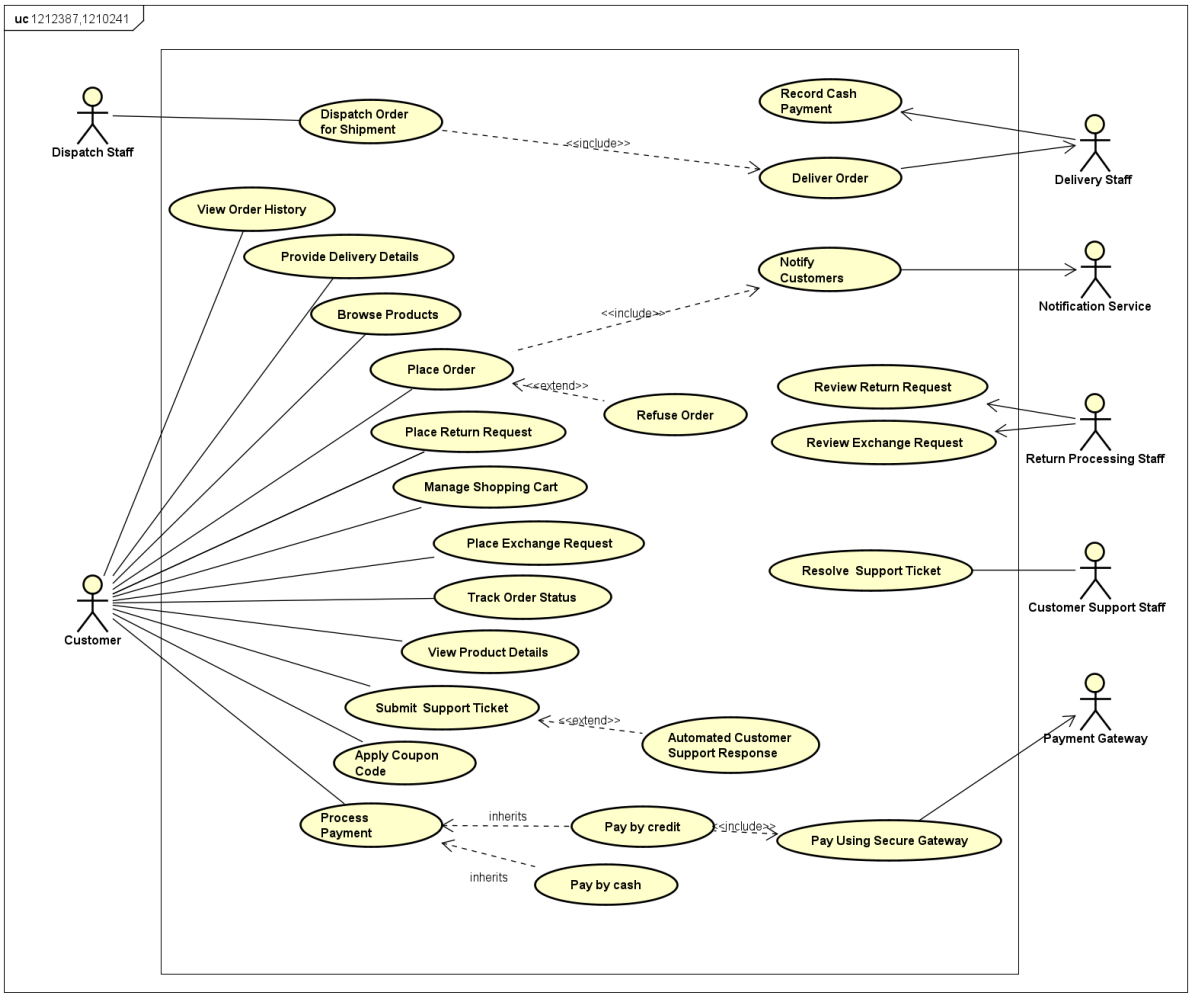


Figure 1: Use Case Diagram for the Mobile Phones Shop System

## Task 3.4: Use-Case Specifications

### 3.4.1 UC16 – Place Return Request

**Writer:** Mohammad Fareed

| **Use Case Title** | Place Return Request |
|---|---|
| **Description** | This use case describes how a customer submits a return request for a delivered product within the store's return policy period. The system forwards the request to return staff for review, and updates the return status based on the staff's decision. |
| **Actors** | **Primary Actor:** Customer and Return Processing Staff |
| **Data** | • Order details (order ID, delivery status, delivery date)<br>• Product details (product ID, return eligibility, non-returnable flag)<br>• Return request details (reason for return, additional notes, return type)<br>• Store return policy rules |
| **Trigger** | Customer initiates a return request for a delivered product through the system. |
| **Pre-conditions** | 1. Customer has an existing order in the system.<br>2. The order status is marked as Delivered. |
| **Normal Flow** | 1. Customer receives the delivered mobile phone.<br>2. Customer inspects the product and decides it should be returned due to a defect or incorrect model.<br>3. Customer navigates to the order history section.<br>4. Customer selects the delivered order containing the mobile phone.<br>5. Customer selects a predefined return reason and optionally enters additional details.<br>6. The system calculates the refundable amount<br>7. Customer submits the return request.<br>8. The system registers the return request.<br>9. The system forwards the request to the return staff for review.<br>10. The system updates the item status depending on the decision of the staff. |

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| **Alternative Flow 1: Partial Return** | 1. Customer receives the delivered order.<br>2. The delivered order contains multiple products.<br>3. Customer selects items for return.<br>4. Customer submits the return request for the selected item.<br>5. The system forwards the request to return staff.<br>6. The system calculates the refundable amount for the mobile phone only.<br>7. The remaining items in the order remain unaffected.<br>8. The system updates the phone status depending on the decision of the staff and keep the others unchanged. . |
| **Alternative Flow 2: Misdelivered Item** | 1. Customer receives the delivered order.<br>2. Customer discovers an extra item that was not part of his order.<br>3. Customer initiates a return request and selects the option Misdelivered Item.<br>4. Customer provides a description explaining the issue.<br>5. The system accepts the request.<br>6. The system forwards the accepted request details to return staff.<br>7. The system updates the case status to Return in Progress. |
| **Error Flow** | 1. Customer receives the delivered order.<br>2. Customer inspects the product.<br>3. Customer submits a return request.after the return period has expired or for a non-returnable product.<br>4. The system records the rejection.<br>5. The system logs the rejcted request.<br>6. The system displays the rejection reason with a reference to the store's return policy. |
| **Post-conditions / System State** | • Request will be in pending state until the return staff respond.<br>• For automated accepted requests as alternative flow 2: the return request status is Return in Progress.<br>• For automated rejected requests as error flow: no return record is created. |
| **Comments** | • The system strictly enforces return policy constraints directly. |

### 3.4.2 UC20 - Submit Support Ticket

**Writer:** Ahmad Hamdan

| **Use Case Title** | Submit Support Ticket |
|---|---|
| **Description** | This use case allows a customer to submit a support ticket for an issue related to payment, delivery, return or exchange requests, or other system-related problems. The system validates the submitted information, creates a ticket with a unique identifier, sets the ticket status to Open, and makes it available for customer support staff to handle. |
| **Actors** | **Primary Actor:** Customer and Customer Support Staff |
| **Data** | • Ticket category (payment, delivery, return, exchange, other)<br>• Ticket description<br>• Optional order ID reference<br>• Customer contact information |
| **Stimulus / Trigger** | The customer navigates to the Customer Support section and selects Submit Support Ticket (or New Support Request). |
| **Pre-Conditions** | • The customer is logged in and has an active session.<br>• The customer support module is operational.<br>• If the ticket references an order, the referenced order exists in the system. |

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| **Normal Workflow:** | • The customer navigates to the Customer Support section and selects Submit Support Ticket.<br>• The system displays the support ticket submission form.<br>• The customer selects an issue category and enters a description of the issue.<br>• The customer enters a reference order ID if the issue is related to an order.<br>• The customer submits the support ticket.<br>• The system validates the required fields and verifies the reference order ID if provided.<br>• The system creates a new support ticket, generates a unique ticket identifier, and sets the ticket status to Open.<br>• The system stores the ticket with its creation timestamp and associated customer information.<br>• The system confirms successful submission and displays the ticket identifier to the customer.<br>• The system notifies customer support staff that a new support ticket is available. |
| **Alternative Flow 1 – Submission with Missing Details:** | • The customer navigates to the Customer Support section and selects Submit Support Ticket.<br>• The system displays the support ticket submission form.<br>• The customer selects an issue category and enters a brief or unclear description.<br>• The customer submits the support ticket.<br>• The system validates the required fields and creates a support ticket with status Open.<br>• The system stores the ticket and displays the ticket identifier to the customer.<br>• Customer support staff later requests additional information through the ticket communication interface.<br>• The customer provides the requested information, which is appended to the ticket history. |

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| **Alternative Flow 2 – Known Issue with Suggested Solution:** | • The customer navigates to the Customer Support section and selects Submit Support Ticket.<br>• The system displays the support ticket submission form.<br>• The customer selects an issue category and enters a description that matches a known issue.<br>• The system displays suggested resolution steps to the customer.<br>• The customer accepts the suggested solution and cancels the submission.<br>• The system does not create a support ticket and returns the customer to the support section. |
| **Error Flow – Missing Required Fields:** | • The customer navigates to the Customer Support section and selects Submit Support Ticket.<br>• The system displays the support ticket submission form.<br>• The customer attempts to submit the form without selecting an issue category or entering a description.<br>• The system blocks the submission and displays validation error messages indicating the missing information.<br>• No support ticket is created and the system remains in the submission state. |
| **Post-Conditions / Response** | On Success:<br>• A support ticket exists with a unique identifier.<br>• The ticket status is Open.<br>• The ticket is linked to the customer account.<br>• Customer support staff is notified.<br>On Failure:<br>• No support ticket is created.<br>• Validation feedback is displayed to the customer. |
| **Comments** | • Ticket status transitions after submission are handled in UC18.<br>• Ticket interaction history is stored for auditing and tracking purposes. |

### 3.4.3 UC06 – Process Payment

**Writer:** Ismail Tarteer

| **Use Case Title** | Process Payment |
|---|---|
| **Description** | This use case allows a customer to select a payment method during checkout and complete the payment step using either cash on delivery or bank card payment via an external payment gateway. The system confirms the payment step and generates and stores an electronic invoice for the order. Sensitive payment data such as full card numbers are not stored by the system. |
| **Actors** | **Primary Actor:** Customer<br>**Secondary Actor:** External Payment Gateway |
| **Data** | • Selected payment method<br>• Card payment authorization response (if applicable)<br>• Order payment status<br>• Electronic invoice |
| **Stimulus / Trigger** | The customer proceeds to the payment step during the checkout process. |
| **Pre-Conditions** | • The customer has items ready for checkout and is confirming an order.<br>• The system displays available payment options (cash on delivery and bank card). |
| **Normal Workflow:** | • The system displays the available payment methods during checkout.<br>• The customer selects a payment method.<br>• If cash on delivery is selected, the system records the payment method.<br>• If bank card payment is selected, the system communicates with the external payment gateway.<br>• The payment gateway processes the transaction and returns an approval response.<br>• The system confirms the payment step.<br>• The system generates and stores an electronic invoice for the order. |

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| **Alternative Flow – Change Payment Method:** | • The customer selects a payment method.<br>• Before confirming the payment step, the customer changes the selected payment method.<br>• The system updates the selected payment method.<br>• The customer continues the checkout process successfully. |
| **Error Flow – Payment Failure or Gateway Unavailable:** | • The customer selects bank card payment.<br>• The system sends the payment request to the external payment gateway.<br>• The payment gateway declines the transaction or is unreachable.<br>• The system displays a payment failure message.<br>• The payment step is not confirmed.<br>• The customer may retry the payment or select cash on delivery. |
| **Post-Conditions / Response** | On Success:<br>• The selected payment method is recorded.<br>• Card payment is approved if bank card payment is used.<br>• An electronic invoice is generated and stored.<br>On Failure:<br>• The payment step is not completed or confirmed.<br>• No invoice is generated. |
| **Comments** | • Sensitive payment information is handled by the external payment gateway only.<br>• Payment confirmation is required before order processing continues. |

### 3.4.4 UC14 - Deliver Order

**Writer:** Sohaib Badaha

| **Use Case Title** | Deliver Order |
|---|---|
| **Description** | A delivery personnel delivers assigned chocolate orders to customers, collects payment if required, confirms delivery, and updates the order status in the system. |
| **Actors** | **Primary Actor:** Delivery,Customer |
| **Data** | • Order and customer details<br>• Delivery address and contact information<br>• Payment method and amount<br>• Delivery status and timestamp<br>• Customer confirmation (signature) |
| **Stimulus / Trigger** | • Orders are assigned to the delivery personnel by the Delivery Coordinator.<br>• Delivery personnel accesses assigned orders with status ”Shipped”. |
| **Pre-Conditions** | • Delivery Personnel is authenticated with proper permissions.<br>• Orders are assigned and in ”Shipped” status.<br>• Orders are packaged and delivery address is valid.<br>• Delivery vehicle and cash change (if needed) are available. |
| **Normal Workflow:** | • Delivery Personnel logs into the system and selects an assigned order.<br>• The order is marked as ”Out for Delivery”.<br>• Delivery Personnel arrives at the customer location and verifies identity.<br>• The order is handed over and customer confirms receipt digitally.<br>• Delivery Personnel updates the order status to ”Delivered”.<br>• The system records the delivery timestamp and notifies the customer. |

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| **Alternative Flow 1 – Cash on Delivery:** | • Customer pays the required cash amount after receiving the order.<br>• Delivery Personnel provides change and receipt if needed.<br>• Order is marked as ”Delivered - Cash Collected”.<br>• System records payment and notifies the accountant. |
| **Alternative Flow 2 – Reschedule Delivery:** | • Customer is unavailable at delivery time.<br>• Delivery Personnel contacts the customer and agrees on a new delivery time.<br>• Order status is updated to ”Delivery Rescheduled”.<br>• System sends a confirmation notification to the customer. |
| **Error Flow – Delivery Failed:** | • Delivery fails due to incorrect address or unreachable customer.<br>• Order is marked as ”Delivery Failed” with notes.<br>• System creates a support ticket and notifies relevant staff.<br>• Failed attempt is logged and package is returned to the shop. |
| **Post-Conditions / Response** | • Order status is updated (Delivered, Cash Collected, Rescheduled, or Failed).<br>• Delivery timestamp and customer confirmation are recorded.<br>• Payment transactions are logged if applicable.<br>• Notifications are sent to customers and relevant staff. |
| **Comments** | • The system supports prepaid and cash on delivery orders.<br>• All delivery attempts are logged for tracking and reporting. |

### 3.4.5 UC05 – Place Order

**Writer:** Omar Hussain

| **Use Case Title** | Place Order |
|---|---|
| **Description** | This use case describes how a customer completes the checkout process by reviewing the shopping cart, entering delivery details, applying a coupon if available, selecting a payment method, and confirming the order. The system validates the request, places the order, and prepares it for delivery processing. |
| **Actors** | **Primary Actor:** Customer |
| **Data** | • Shopping cart details (selected products, quantities)<br>• Customer delivery address<br>• Coupon code (optional)<br>• Payment method details<br>• Product availability and inventory data |
| **Trigger** | Customer initiates the checkout process by clicking the *Checkout* button from the shopping cart. |
| **Pre-conditions** | 1. Customer has items added to the shopping cart.<br>2. The system and related services are operational.<br>3. The customer is within a supported delivery area. |
| **Normal Flow** | 1. Customer opens the shopping cart.<br>2. Customer reviews the selected products and quantities.<br>3. Customer proceeds to checkout.<br>4. The system prompts the customer to enter delivery address details.<br>5. Customer enters a valid delivery address.<br>6. The system displays the estimated delivery time.<br>7. Customer enters a valid coupon code (optional).<br>8. Customer selects a payment method.<br>9. Customer confirms the order.<br>10. The system verifies product availability.<br>11. The system places the order successfully.<br>12. The system generates a unique order ID.<br>13. The system displays an order confirmation message. |
| **Alternative Flow 1: Modify Cart Before Checkout** | 1. Customer reviews the shopping cart.<br>2. Customer updates the quantity of a selected product.<br>3. The system recalculates the total order amount.<br>4. Customer continues with the checkout process. |

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| **Error Flow 1: Product Out of Stock** | 1. Customer proceeds to checkout.<br>2. The system detects that one or more products are out of stock.<br>3. The system notifies the customer of unavailable items.<br>4. The system prompts the customer to remove or replace the product. |
| **Error Flow 2: Invalid Coupon Code** | 1. Customer enters a coupon code.<br>2. The system validates the coupon code.<br>3. The system detects that the coupon is invalid or expired.<br>4. The system displays an error message.<br>5. Customer may enter a valid coupon or continue without a discount. |
| **Post-conditions / System State** | • The order is saved in the system with status *Placed*.<br>• Inventory quantities are updated.<br>• An electronic invoice is generated.<br>• The order appears in the customer's order history and is ready for processing. |
| **Comments** | • The system validates inventory and coupon data before order confirmation.<br>• Errors are handled gracefully and allow the customer to correct issues. |

## Task 3.5: Activity Modeling

**Lead:** Sohaib Badaha
**Contributors:** Ahmad Hamdan (review), Mohammad Fareed (review), Omar Hussain (discussion), Ismail Tarteer (discussion)

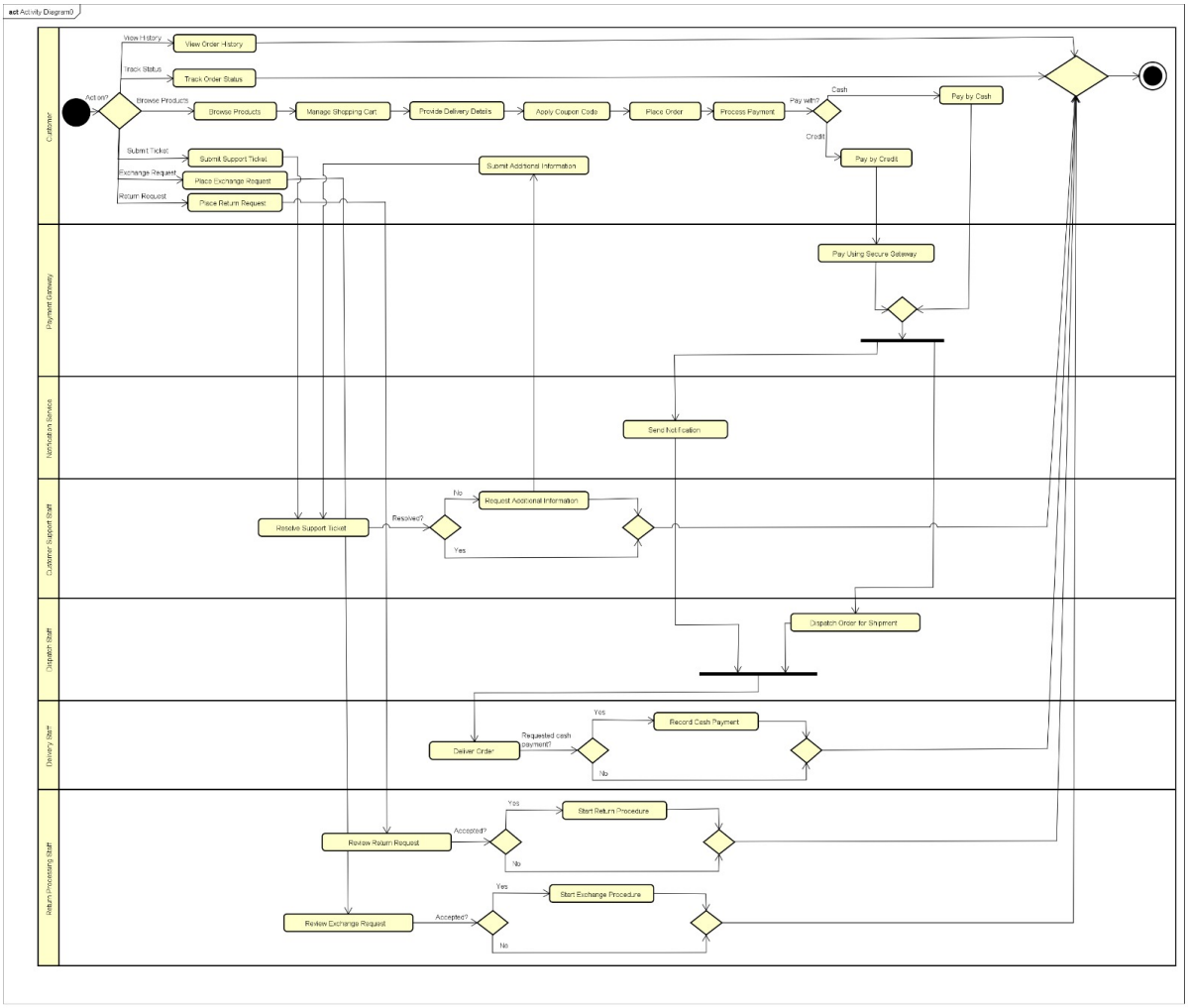


Figure 2: Activity Diagram for the Mobile Phones Shop System

## Task 3.6: Use-Case Activity Modeling

### 3.6.1 UC16 – Place Return Request

**Writer:** Mohammad Fareed

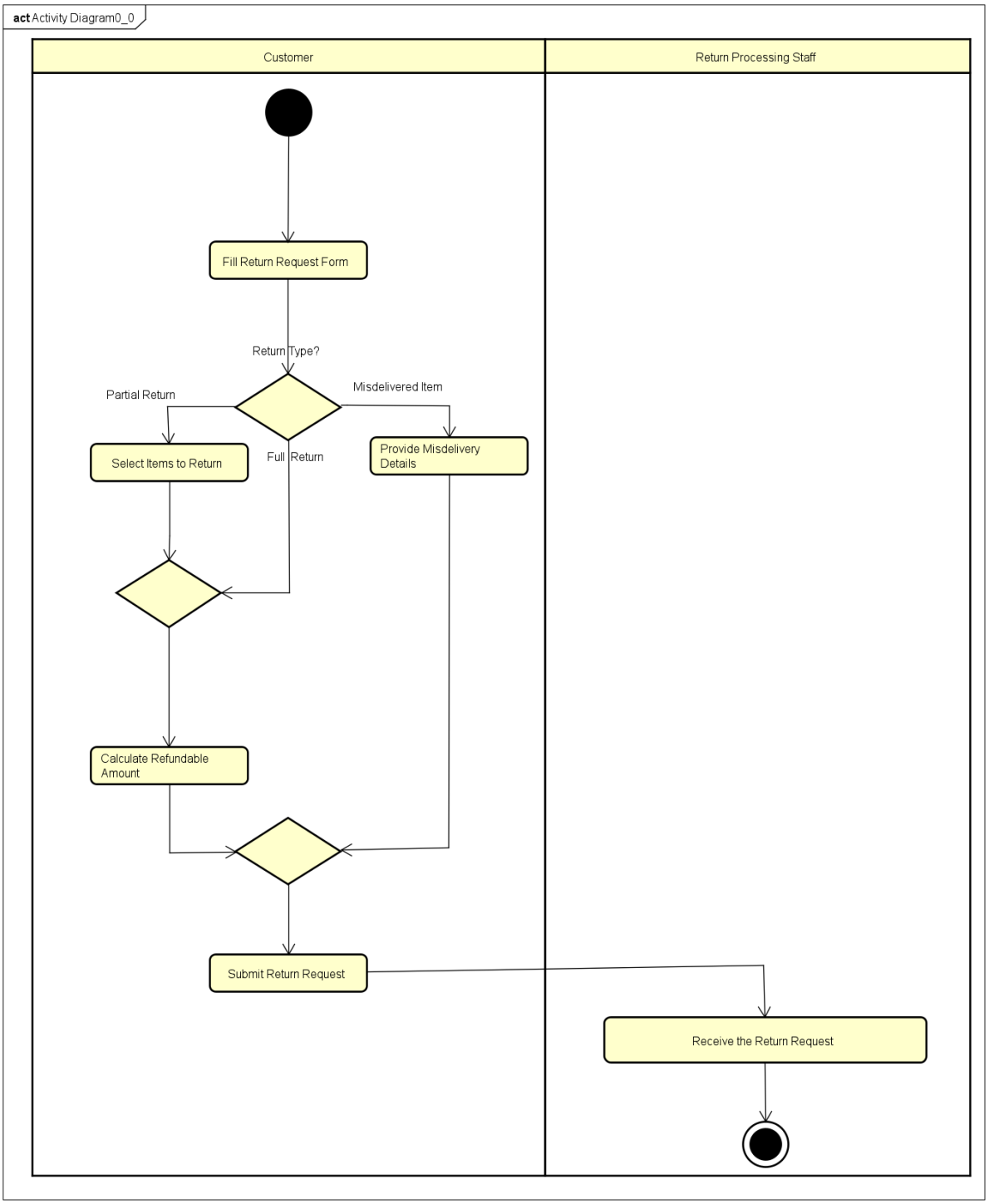


Figure 3: Activity Diagram for Place Return Request

### 3.6.2 UC20 – Submit Support Ticket

**Writer:** Ahmad Hamdan

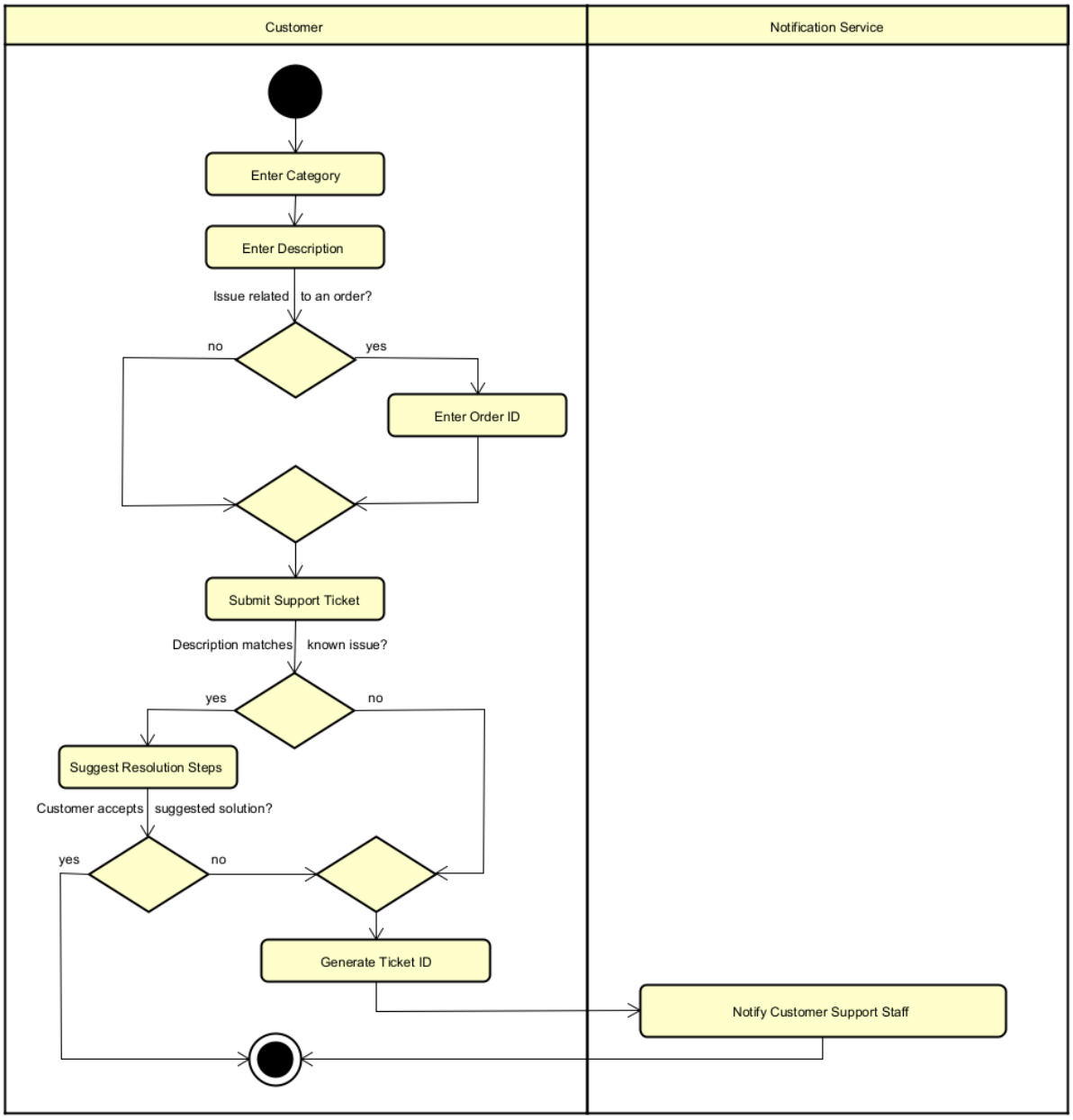


Figure 4: Activity Diagram for Submit Support Ticket Use Case

### 3.6.3 UC06 – Process Payment

**Writer:** Ismail Tarteer

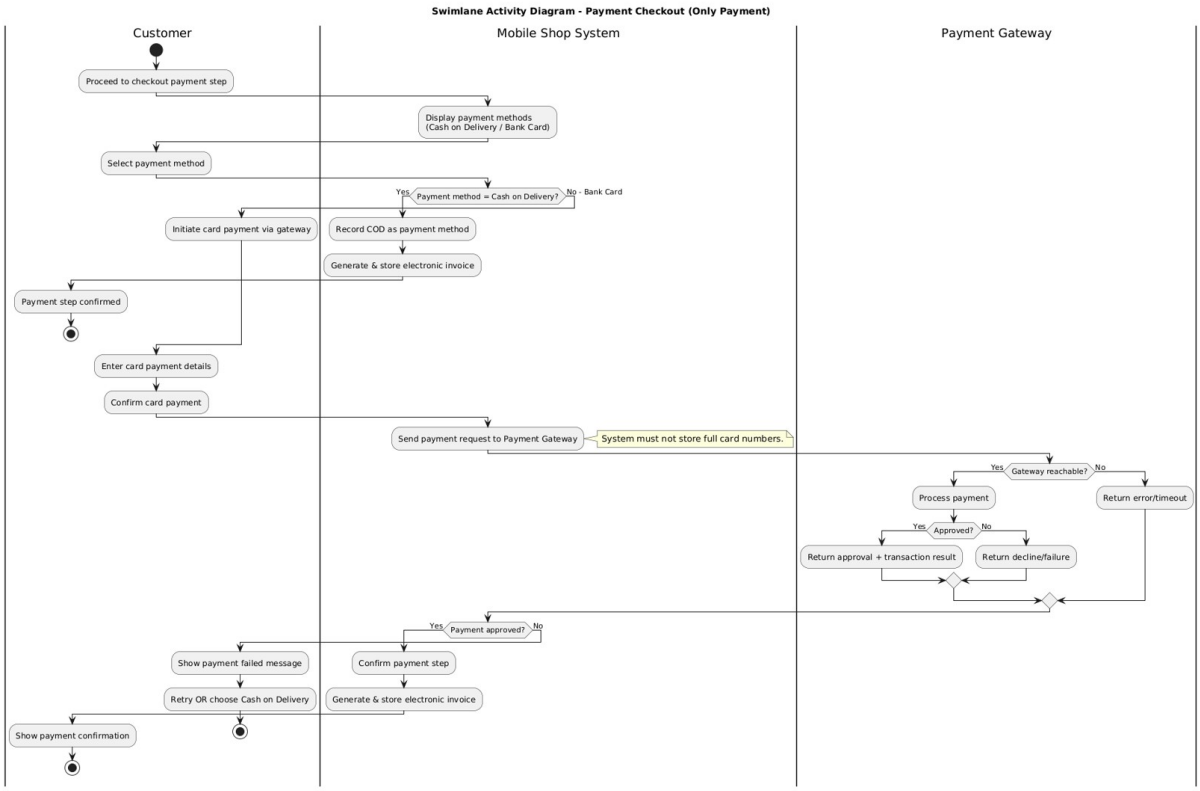


Figure 5: Activity Diagram for Payment Checkout Use Case

### 3.6.4 UC14 – Deliver Order

**Writer:** Sohaib Badaha

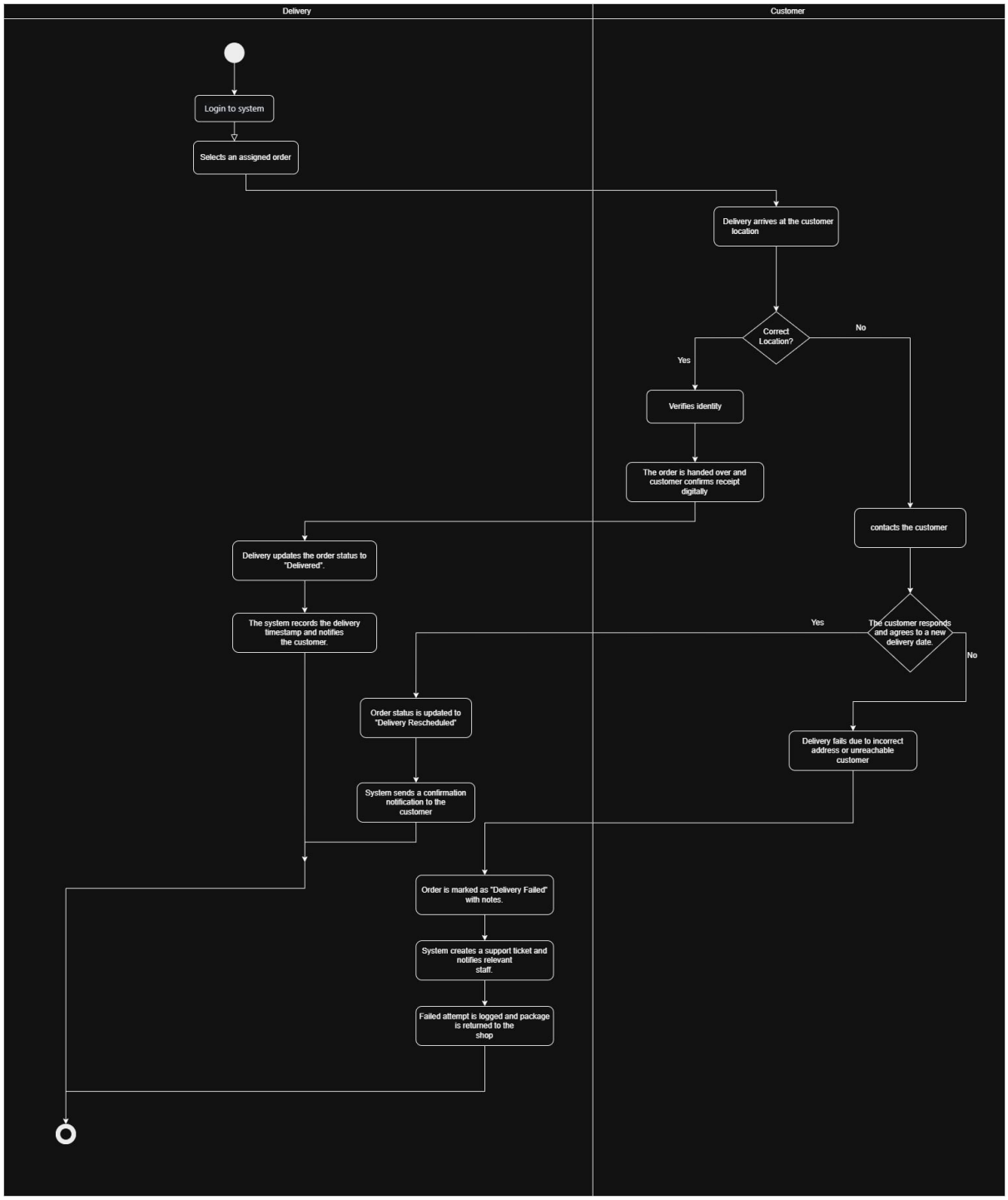


Figure 6: Activity Diagram for Deliver Order Use Case

### 3.6.5 UC05 – Place Order

**Writer:** Omar Hussain

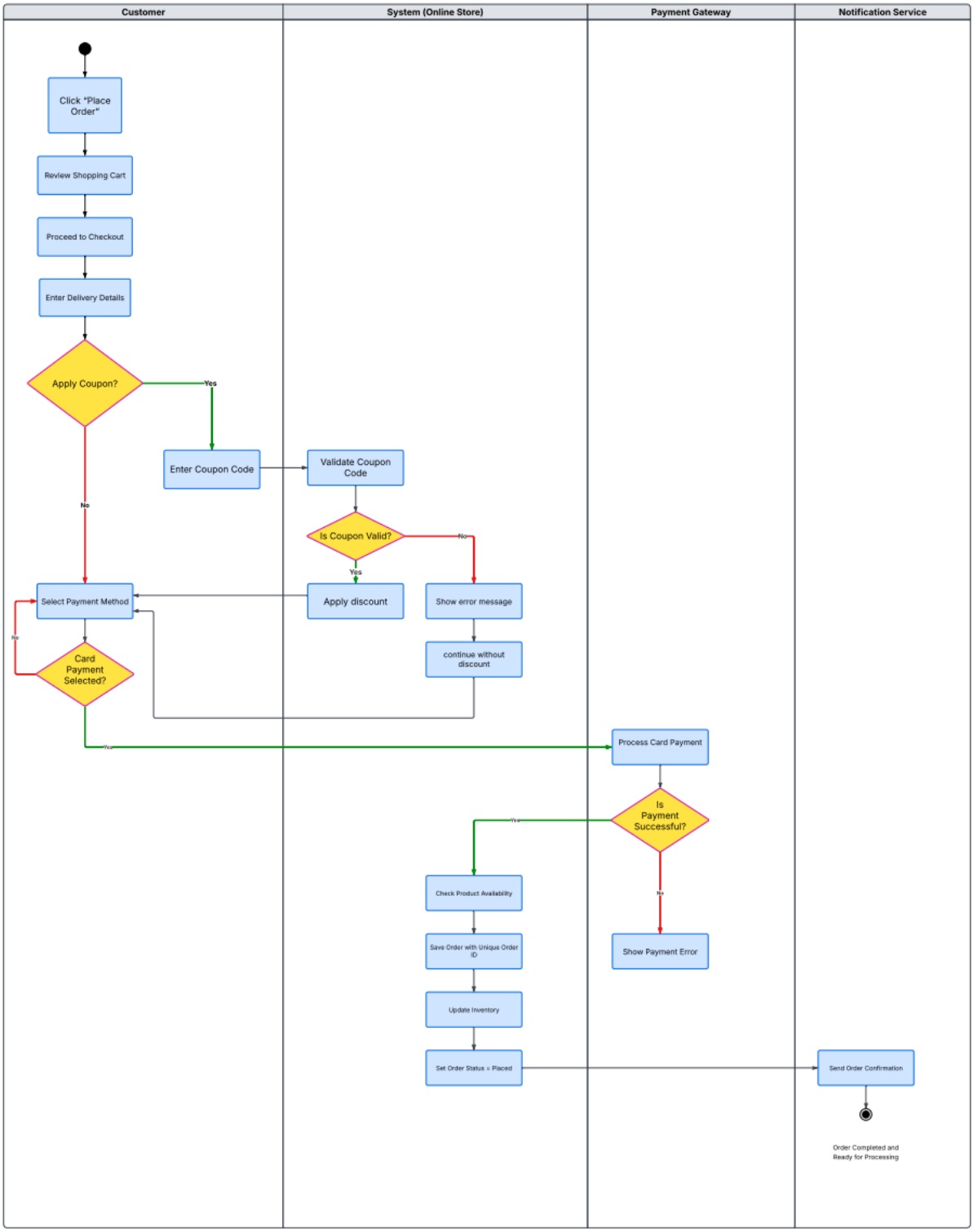


Figure 7: Activity Diagram for Place Order Use Case