Business Analysis

ECOMMERCE RETURN & REFUND SYSTEM

RABBI ISLAM YEASIN
OFFICIAL.RABBIYEASIN@GMAIL.COM

Table of Contents

Introduction

Objective of the System Design

The goal of this Ecommerce Return & Refund System is to establish a robust, transparent, and user-friendly process that efficiently manages product returns, refunds, exchanges, and related financial adjustments. The system is designed to accommodate various business models, including marketplace and on-demand delivery, ensuring all return scenarios—happy paths, exceptions, and edge cases—are clearly defined and automated where possible. It aims to enhance customer satisfaction by providing timely resolutions while protecting the business from fraud and operational inefficiencies through clear business rules, status tracking, and reconciliation processes.

Reference Platforms

This design draws inspiration from leading ecommerce platforms such as **Daraz** and **Foodpanda**, which operate extensive marketplace and on-demand delivery services respectively. Both platforms maintain comprehensive return and refund ecosystems that balance customer-friendly policies with operational control. Daraz employs detailed coupon and cashback management aligned with multi-seller marketplace dynamics, while Foodpanda focuses on fast, reliable returns in their quick-commerce delivery model. Our system adapts the best practices and workflows from these platforms to ensure scalability, clarity, and compliance in local and international contexts.

Marketplace and On-Demand Delivery Context

The system supports two primary ecommerce models:

- **Marketplace Model:** Multiple third-party sellers list products under the platform. Returns and refunds involve coordination between customers, sellers, and the platform's finance and logistics teams. The system manages multi-seller orders, allocates refunds and coupon/cashback adjustments per seller, and ensures marketplace-specific compliance.
- **On-Demand Delivery Model:** Products (e.g., food, groceries) are delivered immediately or within a short window. Returns typically happen at or near point of delivery, requiring rapid verification and processing. The system handles time-sensitive returns, supports cash-on-delivery (COD) payments, and processes wallet-based refunds where applicable.

Supporting both models requires flexible business rules, multi-channel communication, and integrated status workflows to maintain operational efficiency and customer trust.

Benchmark Analysis

This table provides a concise comparative view to help understand each company's strengths and weaknesses in the Return & Refund space as of now.

Aspect	Steadfast Courier Ltd (Dhaka)	Daraz (Bangladesh)	Foodpanda (Bangladesh)
Return Policy	No clear public info found; some evidence of 14-day return window with 20% restocking fee for some items (from a related Steadfast Specialist Products source). Return shipping costs borne by customer unless item faulty.	Returns accepted within set timelines if item unused, unopened, original packaging. Customers can initiate return via app or site. Doorstep pickup/dropoff options available.	Returns/refunds follow individual shop policies. Requires proof (e.g., receipts). Refund may be delayed due to verification process.
Refund Process	Takes up to 21 days to inspect and process refunds (for some product categories). Refund shipping cost covered for faulty items.	Refund timeline varies with payment method: bank/bKash/Nagad refunds 5-10 working days, refund vouchers instant.	Refunds credited to original payment method; refund time can vary. May require doc verification; some complaints about delays.
Coupon Handling in Returns	No specific public information available.	If return invalidates coupon min spend, coupon may be voided; refunds may be adjusted accordingly.	Policies allow voucher voidance if coupon conditions not met in returns. Customer complaints indicate voucher issues.
Cashback Handling in Returns	Not publicly detailed.	Cashback reversed or adjusted on partial/full returns following business rules; customers notified via app.	Cashback balance capped; refunds affect cashback amount; detailed terms apply.
Customer Reviews on Return & Refund	Mixed to negative reviews overall; common complaints: delays, app bugs, unresponsive customer service, damaged parcel handling, poor refund communication. Not many explicit return/refund reviews but general dissatisfaction impacts perception.	Mixed reviews; many successful returns/refunds reported but some customers experienced expired vouchers, slow refunds, or unclear communication.	Customers report refund delays, rejected refund claims, vouchers issued instead of cash refunds, and poor customer support for refunds.
Special Notes	Shipping and return shipping paid by customer unless item faulty. Must call customer service for return details.	Robust online return portal, multiple return options, refund through various payment channels.	Stringent refund conditions often require photos/documents; some complaints of poor communication and slow resolutions.
Refund Timeline (Typical)	Up to 21 days (inspection + processing for returns)	5-10 business days depending on method	Varies, often several days to weeks depending on case

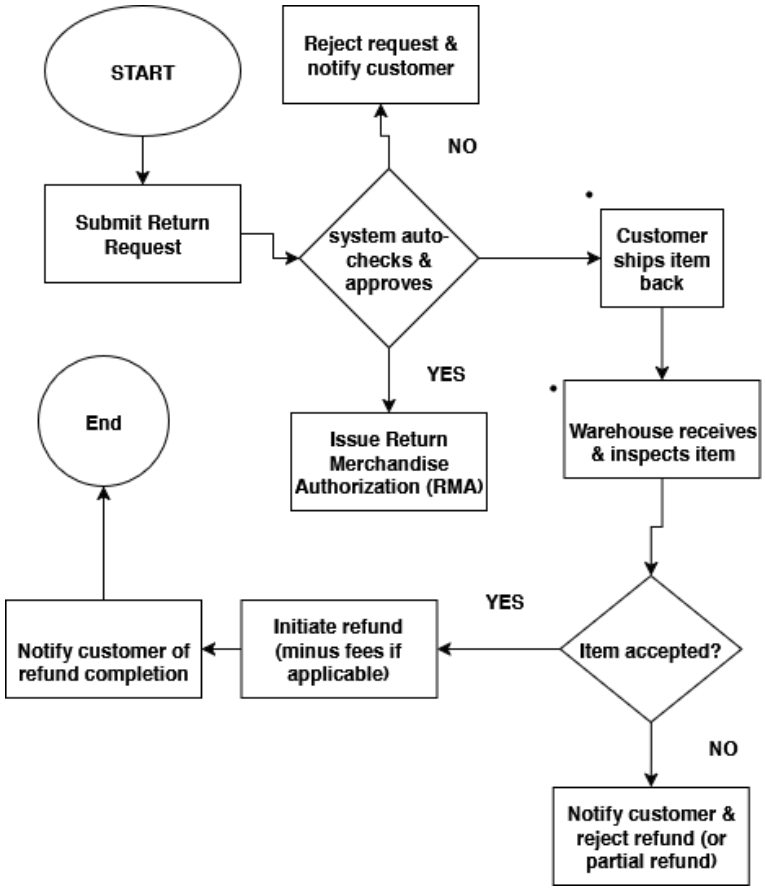
Summary

- **Steadfast** has less transparent or accessible official return/refund policy information and shows signs of slower processing with additional fees and customer-borne return shipping for most cases, alongside customer complaints mostly on service quality.
- **Daraz** offers clearer, customer-friendly return options with multiple channels for refund, but some issues reported about voucher refunds and delayed communication.
- **Foodpanda** emphasizes strict return verification and refund conditions; customer feedback highlights delays and limited direct cash refunds, with reliance on vouchers being a pain point

Functional Flows

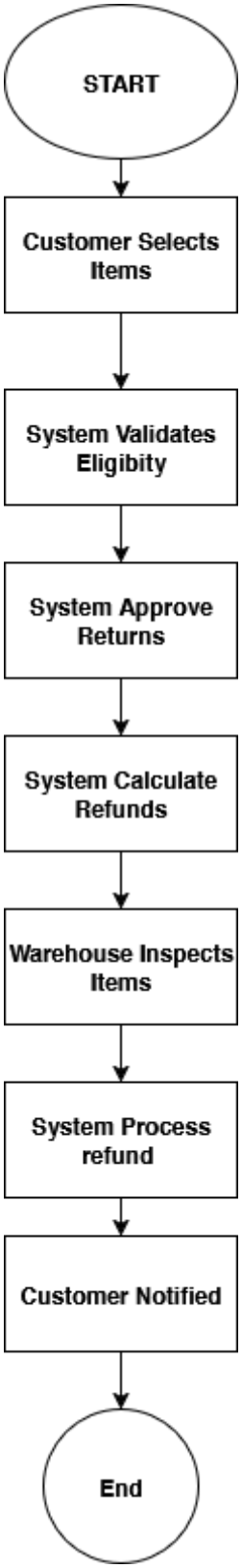
Flow 1: Full Return and Refund (Prepaid Payment)

.



- **Submit Return Request**
  - Actor: Customer
  - Trigger: Wants to return item
  - Result: Request submitted.
- **System auto-checks & approves –**
  - Actor: System
  - Trigger: Request received
  - Result: Approved or Rejected.
- **Warehouse receives & inspects item**
  - Actor: Warehouse;
  - Trigger: Item delivered;
  - Result: Accepted or Rejected.
- **Initiate refund (minus fees if applicable)**
  - Actor: System/Finance;
  - Trigger: Accepted inspection;
  - Result: Refund processed.

Flow 2: Partial Return and Refund



Step	Actor	Trigger	Result
Select item for return	Customer	User wants to return product	Return request submitted
Validate time/eligibility	System	Receipt of request	Request approved/rejected; notification
Calculate coupon/cashback	System	Request approved	Refund amount computed
Ship item	Customer	RMA/instructions issued	Item delivered to warehouse
Inspect returned item	Warehouse	Item received	Item accepted/rejected
Process refund	System	Item accepted; refund calculated	Refund transaction, update coupon/cashback
Notify outcome	System	Refund processed or denied	Customer receives notification

Flow 3: Exchange Process

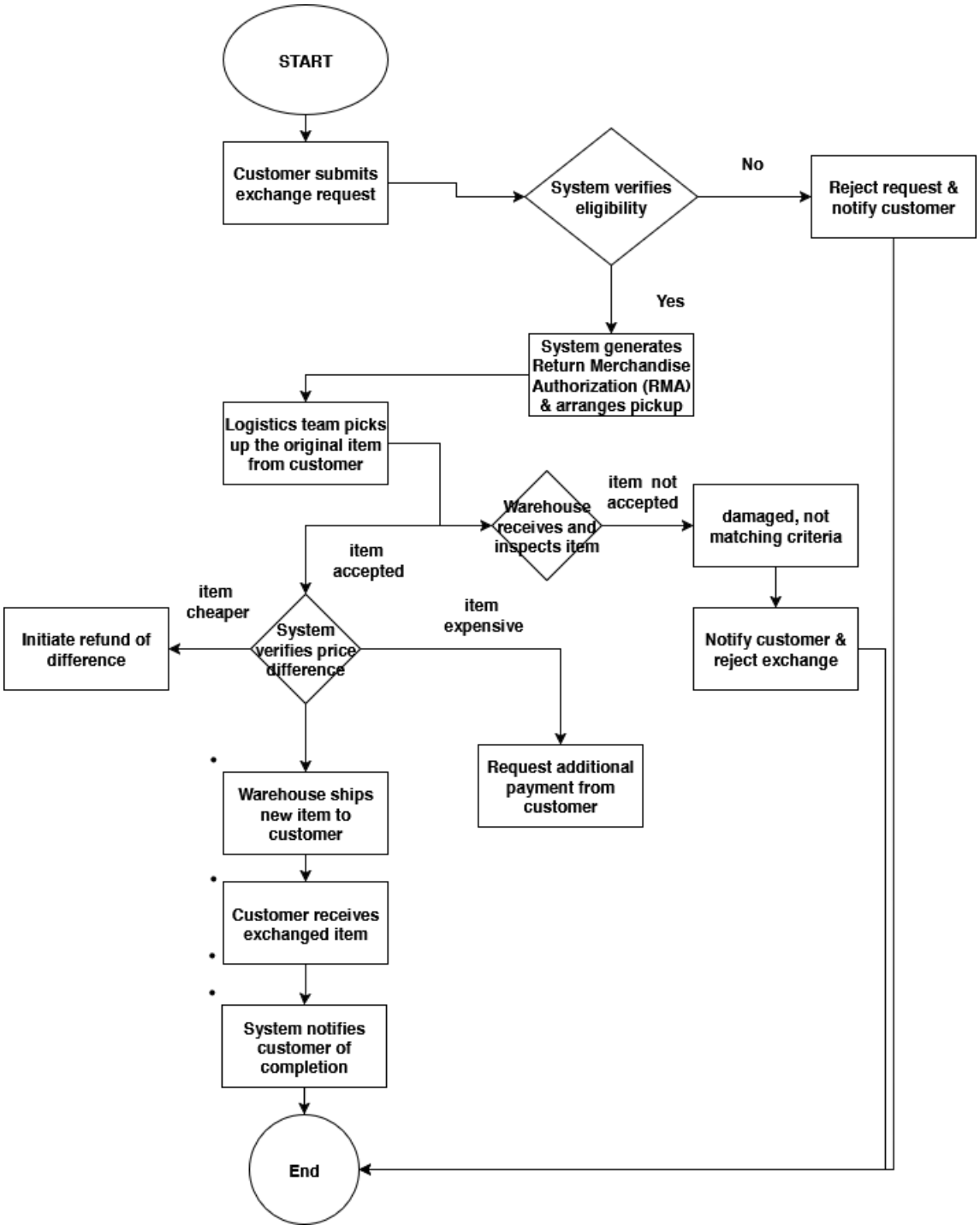
Annotations -

Actor: Customer
Trigger: Submits exchange request
Result: Receives replacement item or notification of rejection

Actor: System
Trigger: Verifies eligibility, generates RMA
Result: Informs next actor (Logistics/Warehouse) or notifies customer of rejection

Actor: Warehouse
Trigger: Receives item
Result: Accepts (proceeds) or rejects (notifies)

Actor: System/Warehouse
Trigger: Ship new item after approval and any payment adjustment
Result: Exchange completed



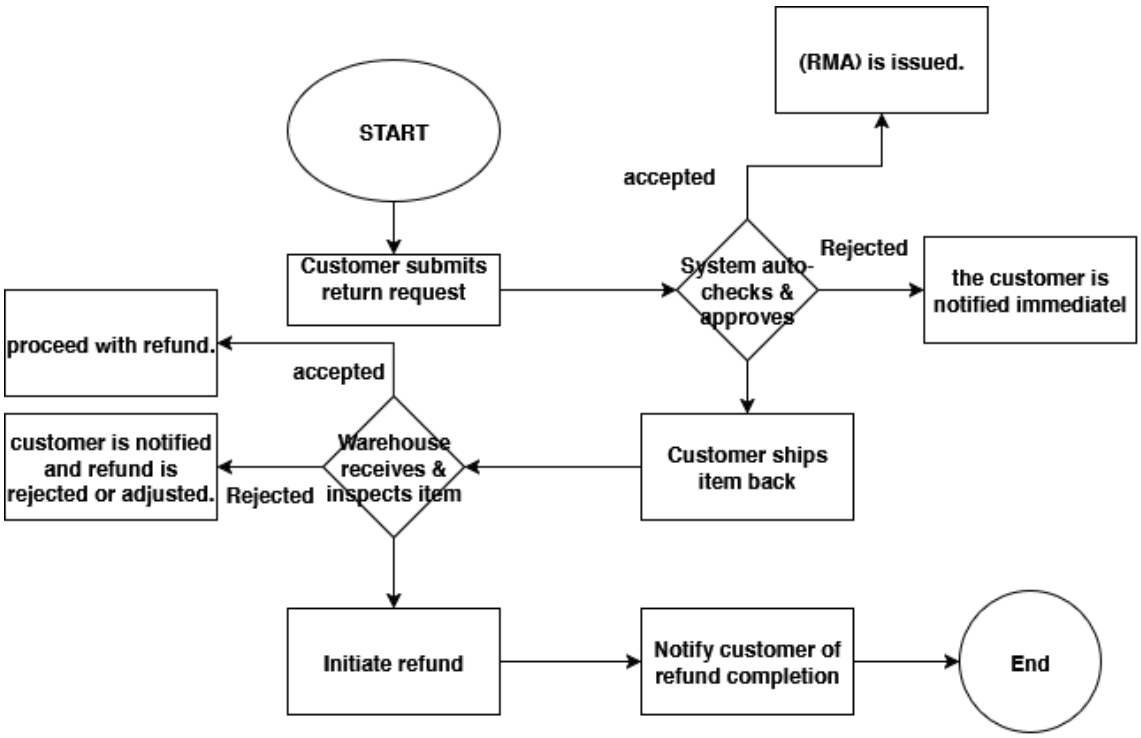
Flow 4: COD Return and Wallet Refund

Annotations-

- **Actors:**
  - Customer: submits return request, ships item
  - System: auto-checks, approves/denies, issues RMA
  - Warehouse: receives and inspects item
  - CSR/Finance: processes refund
- **Triggers:**

- Customer initiates return
- System validates request
- Warehouse inspection complete

- **Results/Outcomes:**
  - RMA issued
  - Refund credited (wallet/bank)
  - Notifications sent



Flow 5: Damage/Lost-in-Transit Fast-Track

Annotation –

Actors:

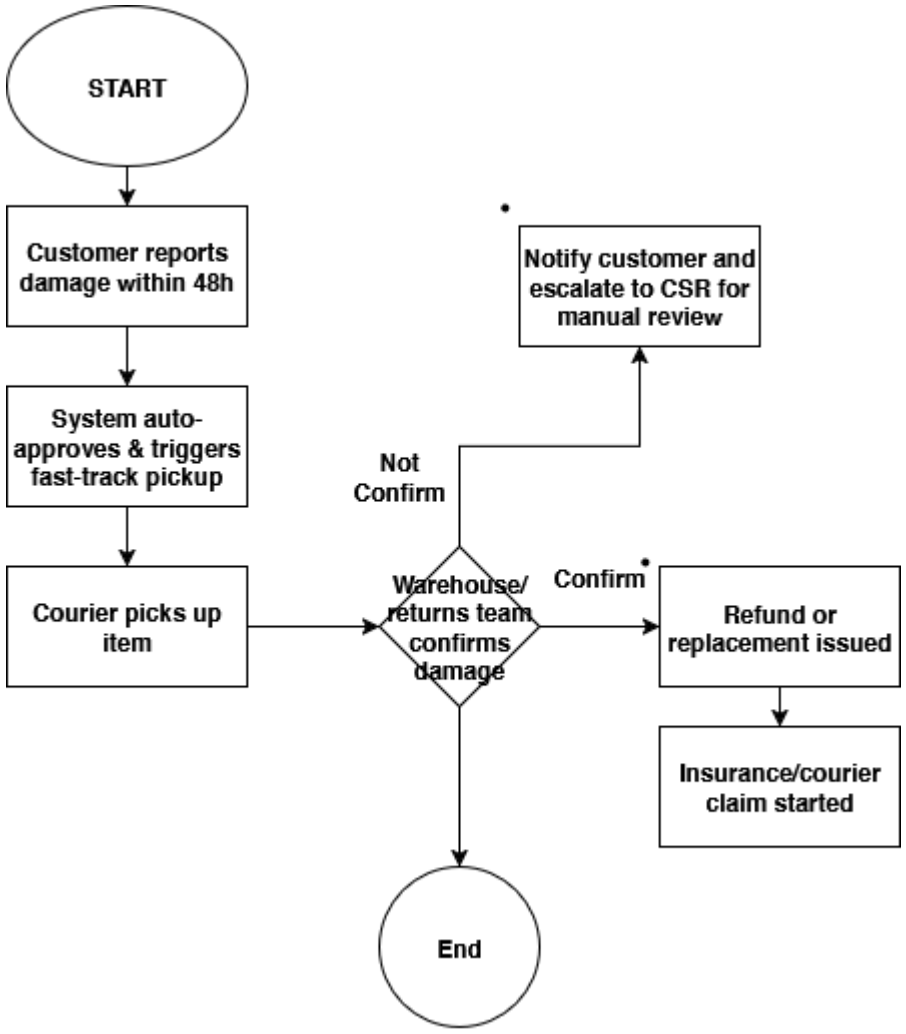
- Customer: Reports damage and provides evidence.
- System: Approves and coordinates fast-track process.
- Courier: Picks up item.
- Warehouse/Returns Team: Confirms damage.
- CSR: Manual review if needed.
- Insurance/Finance: Processes claim and refund.

Triggers:

- Customer submits damage report (with photos) within 48 hours.
- Damage confirmation by warehouse.
- System escalation if not confirmed.

Results:

- Fast-track pickup initiated.
- Refund or replacement provided to customer.
- Insurance/courier claim started if damage confirmed.
- Escalation to customer support for cases not confirmed.



High-Level Concepts & Actors

Before diving into scenarios, imagine the key players in this system:

- **Customer (Buyer):** The person purchasing and potentially returning items.
- **Delivery Agent:** Delivers and picks up products.
- **Warehouse/Returns Team:** Inspects returned items.
- **Customer Support (CSR):** Handles approvals, disputes.
- **Payments Gateway & Bank:** Processes refunds.
- **Finance Team:** Manages settlements.
- **Seller (in Marketplace):** Ships products and handles seller-specific returns.
- **Platform:** Oversees rules and final reconciliation.

Everything revolves around objects like **Orders**, individual **Order Lines** (items), **Return Requests**, and **Refund Transactions**.

Order and return statuses give clear stages of progress, e.g., from PLACED → DELIVERED → RETURN_REQUESTED → REFUNDED.

Use Cases — Comprehensive scenarios including coupon & cashback

Happy Path Scenarios

Story 1: Full Return & Refund (Prepaid Payment)

Preconditions

- **Order delivered**
- **Within return window**
- **Item unused**

Steps

1. **Customer requests full return**
2. **System auto-approves (or CSR review)**
3. **Courier pickup arranged**
4. **Warehouse inspection passed**
5. **Refund processed to original card**

Business Rules

- **Refund excludes shipping if policy requires**
- **Coupon reinstated or consumed based on admin config**

Outcome

- **Refund to original payment method**
- **Pending cashback canceled**
- **Coupon state updated**

Story:
Sarah bought a jacket online but decided she didn't want it anymore. She requested a return within 7 days, exactly as the policy allowed. The return team quickly approved her request, sent her the return instructions, and Sarah sent the jacket back in its original packaging. Upon receiving and inspecting the jacket, the warehouse gave the green light. Sarah received a full refund to the payment card she used, minus any applicable restocking fees, all processed smoothly over a few days. Sarah was kept informed every step via email updates.

Story 2: Partial Return on Multi-Item Order

Preconditions

- **Multi-item order**
- **Coupon applied**
- **Return does not drop subtotal below coupon.min_spend**

Steps

1. **Customer selects item(s) for return**
2. **System validates coupon remains valid**
3. **Allocates coupon share to returned items**
4. **Refund computed**
5. **Return accepted**
6. **Refund processed**

Calculation

Refund = Σ(P_returned - CouponShare_returned) - applicable fees

Outcome

- **Partial refund processed**

- **Coupon remains active for remaining items**
- **Cashback reversed proportionally**

Story:
John bought two pairs of shoes. After trying both, he decided to return just one. He filed a return request specifically for the unwanted pair. The team approved the partial return, and John shipped only the one pair back. Refund was calculated for that single item, adjusting for shipping and prorated discounts. The remaining shoe's order stayed active. John got his refund, and his account was updated accordingly.

Story 3: Exchange Instead of Return

Preconditions
- Multi-item order
- Coupon requires min_spend
- Return drops subtotal below min_spend

Steps
1. Customer selects return
2. System detects coupon invalidation
3. Computes retroactive adjustment:
    - Refund = PaidAmount - GrossRemaining
    - If refund < 0 → CSR intervention → settle with store credit or cap refund

Business Rules
- Admin flag CouponRetroactive = true/false controls behavior

Outcome
- Refund adjusted downward
- Coupon voided
- Cashback recalculated

Story:
Lisa ordered a dress but needed a size bigger. She chose to exchange rather than refund. After submitting the exchange request, the system arranged a pickup of the original dress while shipping the correct size. Because both sizes had the same price, no extra payment was needed. Lisa quickly received the new dress and was happy with the seamless exchange process.

Story 4: COD Return & Refund to Wallet

Preconditions
- Cashback state = PENDING (hold period not over)

Steps
1. Customer returns order
2. System cancels pending cashback entry
3. No wallet impact

Outcome
- Cashback never credited

Story:
Ahmed paid Cash on Delivery (COD) for an electronic gadget. After delivery, he returned the item. Since there was no online payment, the platform credited his user wallet with the refund

amount after validating the return, enabling him to use it for future purchases securely.

Exceptions & Edge Case Stories

Story 5: Damaged Item in Transit

Preconditions

- Cashback already credited to wallet

Steps

1. For partial return → compute proportional reversal
2. Deduct from wallet if funds available
3. If wallet insufficient → set clawback_due and notify customer

Outcome

- Wallet balance adjusted
- Negative balances flagged for CSR intervention

Story:

Nila received her order but it was damaged. She immediately reported this within 48 hours. The support team approved fast-track processing, arranged pickup, and a full refund was issued including shipping charges. The platform also initiated an insurance claim on the item, ensuring the business minimized losses.

Story 6: Return Request After Window

Preconditions

- COD order returned

Steps

1. Warehouse acceptance
2. Refund issued to wallet by default
3. Optional bank transfer after KYC (if admin approved for high-value)

Business Rules

- Wallet refund is default for speed
- High-value transfers require admin approval

Outcome

- Refund credited to wallet
- Amount usable for future purchases

Story:

Alex tried to return a product after 30 days (outside policy). The system auto-rejected the request but escalated it for CSR review as Alex explained courier delays. The CSR decided on partial acceptance with a restocking fee, and Alex was notified accordingly.

Story 7: Customer Returns Wrong Item

Maya accidentally returned a different product that was not hers. The system rejected the return and notified her. To help Maya keep good relations, customer support offered a goodwill partial refund but deducted restocking and shipping fees.

Story 8: Multiple Returns on Same Item

Raj tried to return the same item multiple times. The system blocked duplicate refunds after the first successful return, flagging his account for CSR review.

Coupon Case Scenarios

Story 9: Coupon Applied on Full Return

Emma used a 10% off coupon for her entire order of $100. She decided to return all items. Since the order was fully returned, the coupon became invalid. Emma was refunded the $90 she paid (the $100 minus 10% coupon), not the full $100.

Story 10: Partial Return with Coupon Valid

David ordered items worth $1000, applied a coupon for 20% off, paying $800. He returned an item priced $300. The coupon was allocated proportionally ($60 discount for returned item). The refund for this item was $240 ($300 - coupon allocation). Since remaining items still met the coupon minimum spend, the coupon stayed valid on remaining items.

Story 11: Partial Return Invalidates Coupon

Sofia had the same order as David, but after returning $300 worth, her remaining items totaled below the coupon's minimum spend of $800. Hence, the coupon got retroactively invalidated. Sofia's refund was recalculated with coupon benefits removed, resulting in a smaller refund than expected and a notification explaining the change.

Cashback Case Scenarios

Story 12: Cashback Pending and Full Return Before Credit

Michael's purchase had an expected cashback of $50, still pending. He returned the order fully before the cashback was credited. The pending cashback was canceled, no wallet credits were made.

Story 13: Cashback Credited and Full Return After Credit

Rachel already received $50 cashback in wallet credits. After returning her order fully, the platform reversed $50 from her wallet. If insufficient balance, Rachel's wallet had a negative balance flagged for CSR follow-up.

Story 14: Partial Return and Cashback Prorated

John's order promised $100 cashback. He returned items worth 30% of total value, so $30 of cashback was reversed from wallet or canceled if pending.

System Behavior – State changes, business rules, and edge case handling.

State Changes

Order Status Flow:
PLACED → CONFIRMED → SHIPPED → DELIVERED → RETURN_REQUESTED → REFUNDED or EXCHANGED → CLOSED.

Return Request Status: OPEN → APPROVED → REJECTED → CANCELLED → COMPLETED.

Refund Status: INITIATED → PENDING → COMPLETED → FAILED → REVERSED.
Cashback Record: PROMISED → PENDING_HOLD → CREDITED → REVERSED

Business Rules

- Return window: 7–30 days based on product category.
- Auto-approval for damaged or mis-shipped items; CSR review for others.
- Coupon discounts allocated pro-rata and recalculated on returns; retroactive invalidation triggers refund adjustments.
- Cashback pending state allows cancellation before credit. Credited cashback is reversed proportionally on returns.
- Restocking fees ranging from 0–15% applied based on reason/category.
- Refunds prioritized to original payment method; wallet used only if payment method unavailable.
- Duplicate returns are blocked by system flags.
- Fraud and chargeback cases escalate to Risk Team with mandatory evidence.
- Split payments refunded proportionally to original methods

Edge Case Handling

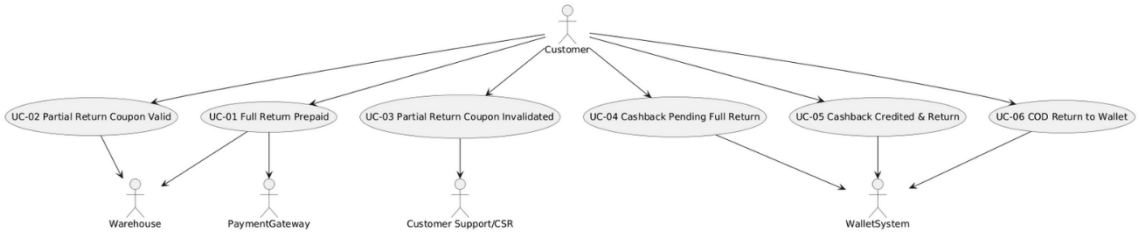
- Late returns after window auto-rejected with CSR override option.
- Damaged-in-use returns rejected or partially refunded after inspection.
- Wrong item returns rejected with notification.
- Multiple returns on the same line prevented automatically.

Reconciliation and Auditing

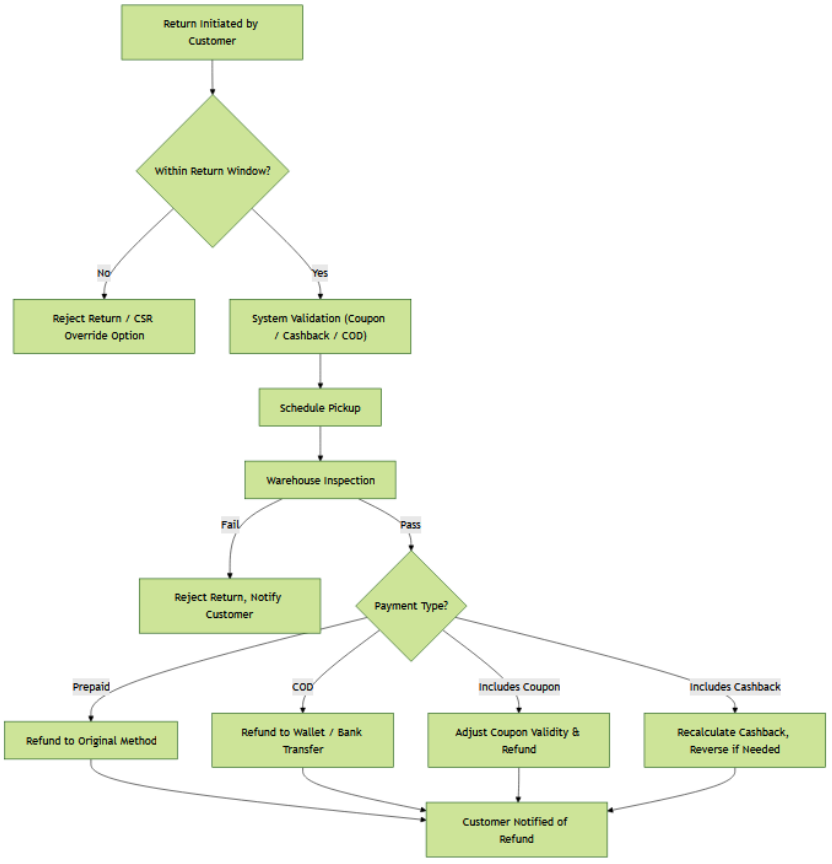
- Immutable logs for each RMA action, inspection photo, approver ID, timestamps.
- Daily reconciliation: compare Refund records vs Payment Gateway settlements; Cashback ledger vs wallet transactions.
- Settlement adjustments for marketplace sellers on returns (deduct returned item value from seller payable for the settlement cycle).

UML Diagrams – Include Use Case, Activity, and Sequence diagrams.

Use Case Diagram

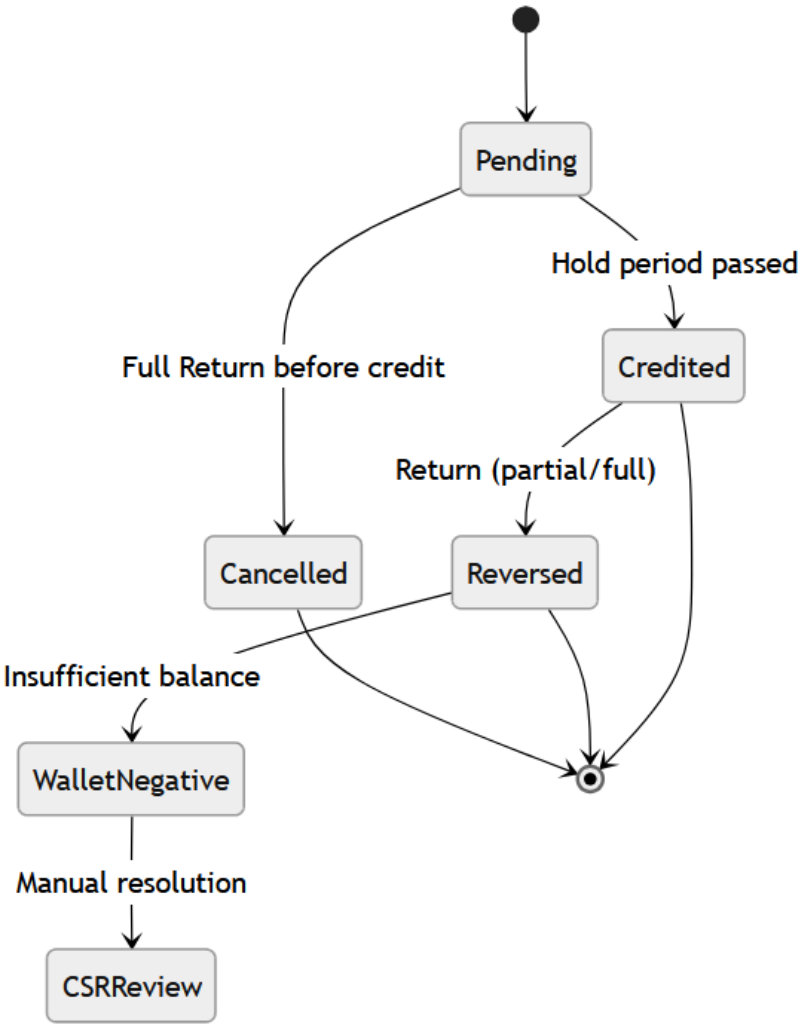


Activity Diagram

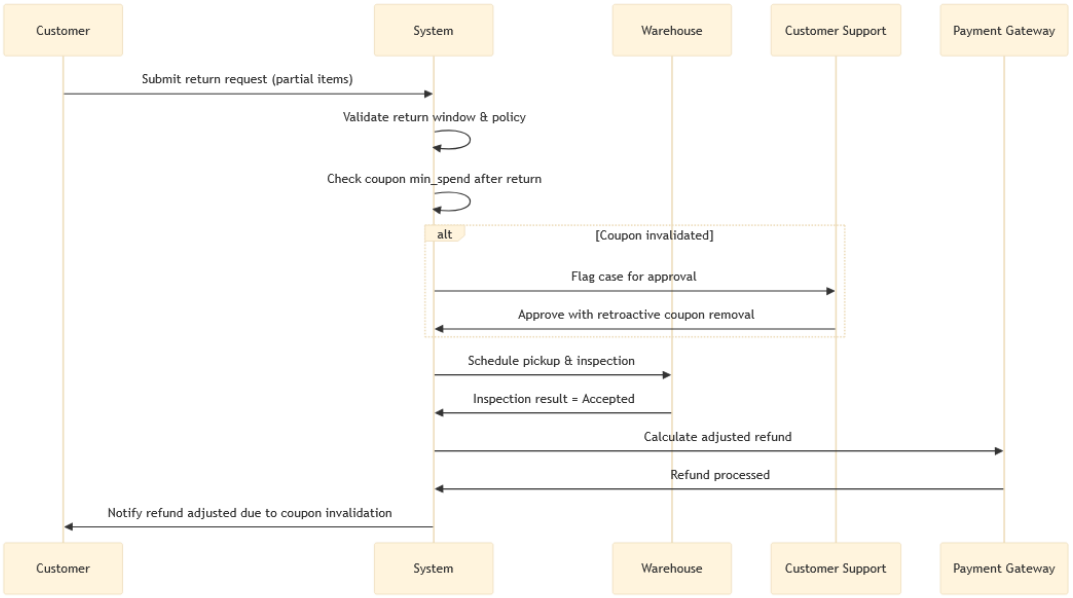


❌ **Reject Return** → "CSR Override" possible
📦 **Warehouse Inspection Fail** → triggers "Insurance Claim"
💳 **Coupon/ Cashback Adjustments** → system annotated in refund flow

State Diagram

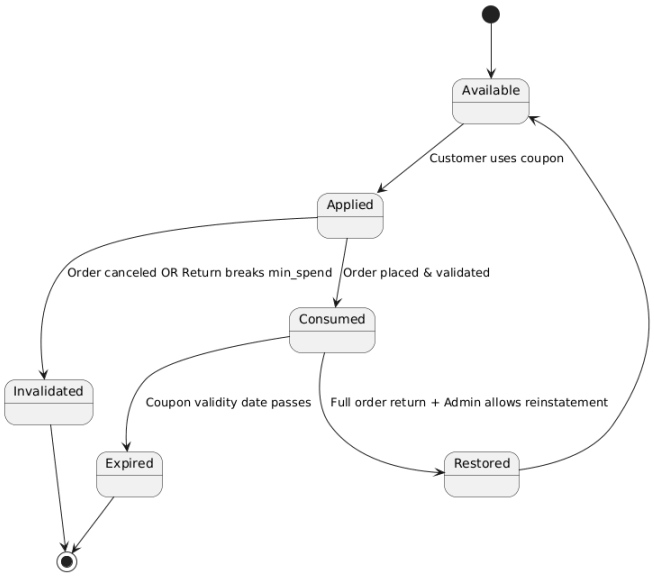


Sequence Diagram

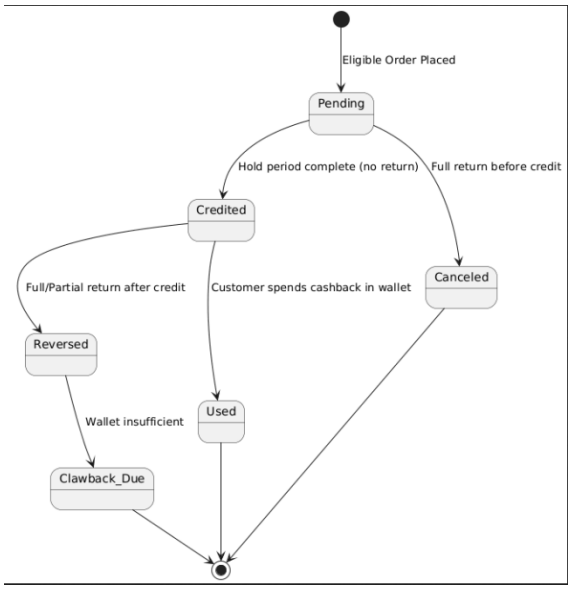


Charts/Visuals – Flowcharts or lifecycle visuals for clarity.

Coupon Lifecycle



Cashback Lifecycle



Conclusion

Comparative Analysis with Foodpanda and Daraz Ecommerce Return & Refund Systems

Aspect	Attached Document (Rabbi Islam Yeasin)	Foodpanda (Bangladesh)	Daraz (Bangladesh)
Scope & Business Model Coverage	Covers both Marketplace and On-Demand delivery; reflects multi-seller and COD models with wallet refund integration.	Primarily on-demand delivery with fast refund condition processes; strict verification for returns; use of vouchers common.	Marketplace-focused; multi-seller returns and refunds, coupon management, multiple refund channels supported.
Functional Flows	Detailed stepwise flows for full and partial returns, exchanges, COD returns, and damage fast-track. Includes actor-trigger-result annotations.	Focuses on quick refunds post verification; presence of proof requirements; process varies by vendor/shop policies.	Comprehensive portal-based returns; doorstep returns and various refund timelines based on payment method.
Coupon Handling	Detailed prorated coupon allocation on multi-item returns; logic for retroactive coupon invalidation with numeric examples.	Coupon voidance if conditions unmet post-return; customer complaints recorded for voucher issues.	Coupon invalidation and refund adjustment on returns; voucher and coupon management well integrated.
Cashback Handling	Thorough cashback lifecycle covering pending and credited states; reversal logic for	Cashback tied to user wallet; reversed on returns; limited detail publicly.	Cashback selectively adjusted; multi-channel notification; detailed but less

	partial/full returns; handles negative wallet balances and CSR intervention.		public info.
Exception & Edge Case Handling	Extensive handling of late returns, wrong items, damaged goods, multiple returns, and fraud escalation with CSR involvement.	Known for strict conditions; delayed refunds are frequent customer complaints.	Structured fraud and chargeback processes; multi-seller reconciliation covered.
User Stories & Business Rules	Organized, story-driven use cases facilitate understanding; business rules clear and integrated with system states and exception workflows.	Less openly documented but policy available via app; some complexity in refund delays.	Public detailed refund policies with timelines and processes well documented.
UML and Visual Documentation	Includes Use Case, Activity, State, Sequence diagrams with flowcharts and lifecycle visuals.	Limited public UML; mostly textual and video tutorials.	Some documentation for developers; public-facing mainly policy documents.

In conclusion, this Ecommerce Return & Refund System design thoroughly addresses the platform's operational needs and business objectives. It presents a customer-centric, transparent, and robust process encompassing all critical return scenarios, coupon and cashback complexities, and exception handling mechanisms. The detailed functional flows, user stories, and UML diagrams provide an actionable blueprint ready for development and testing.

Moving forward, I recommend initiating a phased rollout complemented by stakeholder training and detailed QA planning to ensure seamless adoption. This system is well poised to enhance both customer satisfaction and operational efficiency, aligning strongly with Steadfast's business goals.

I am confident this design will provide a solid foundation for the platform's return and refund ecosystem.