Product Requirements Document: Inspection-Based Used Goods Marketplace (India)

Executive Summary

Build a C2C marketplace for used goods in India, differentiated by on-pickup inspection and delivery quality assurance. The platform mediates transactions via escrow (Razorpay), reducing fraud and disputes common in used-goods resale. Target initial launch with electronics (phones, laptops, cameras, watches) in metros and Tier 1 cities.

Market Opportunity: India's recommerce market is projected USD 5.91B in 2025, growing at 9.8% annually through 2029[1]. Electronics resale dominates, with trust and authenticity as primary barriers to adoption[1].

Core Differentiator: Mandatory inspection-at-pickup + condition-graded reports + escrow-held payment until delivery acceptance = reduced fraud risk and increased buyer confidence[2].

Problem Statement

Buyer Pain Points[1]

- Fear of counterfeit or misrepresented condition on receipt.
- No recourse if item differs from listing.
- Logistics damage and loss during transit from unknown sellers.
- Payment lost if seller disappears after collection.

Seller Pain Points[1]

- Buyer chargeback risk post-delivery.
- No payment guarantee until item shipped.
- Disputes over "condition disagreement" delay payouts.

Market Gap: OLX India exited C2C resale in 2023; platforms like Cashify (electronics-focused, B2C refurbished) and Flipkart Renewed dominate through controlled supply chains[1]. Opportunity exists for a trust-first, inspection-enabled C2C hybrid model.

Objectives

1. **Establish trust via inspection**: Standardized on-site product grading at pickup eliminates condition ambiguity.
2. **Reduce fraud via escrow**: Razorpay escrow holds funds until delivery and buyer acceptance (default 7-day window).

3. **Operational efficiency**: Automate inspection workflow, dispute triggering, and payout reconciliation.
4. **Scale to profitability**: Unit economics must support 10–15% marketplace take rate (Razorpay ~2% + inspection labour cost).

User Personas

Persona 1: Budget-Conscious Buyer (Primary)

- Age: 22–35, metros + Tier 1 cities.
- Income: ₹2–5L/month (salaried or self-employed).
- Pain: Wants discounted electronics (phones, laptops) but fears counterfeit/damage.
- Motivation: 30–50% savings vs new, warranty/returns assurance.
- Behavior: Researches seller reviews, asks for proof of condition, delays payment until confident.

Persona 2: First-Time Seller (Primary)

- Age: 25–45, mostly first-time resellers (used personal items).
- Pain: Unsure of fair pricing; fears buyer rejection and chargeback.
- Motivation: Declutter, earn ₹5–50K quickly for personal items (phone, watch, camera).
- Behavior: Lists cautiously, wants upfront clarity on inspection criteria, expects quick payout.

Persona 3: Semi-Professional Reseller (Secondary)

- Age: 30–50, occasional bulk liquidation (liquidation inventory, bulk purchases).
- Pain: Seeks scalable, repeatable channel; logistics coordination overhead.
- Motivation: Earn ₹2–10L/month from high-volume resale.
- Behavior: Wants bulk inspection discounts, batch payouts, API integration.

Persona 4: Platform Operator (Internal)

- Role: QA/Dispute Resolver.
- Pain: Manual dispute resolution, limited evidence trail.
- Motivation: Reduce disputes, establish policy precedent, protect seller/buyer fairness.
- Behavior: Reviews inspection photos + buyer claims, authorizes refund or payout.

Core Features (MVP)

Phase 1: Seller Onboarding & Listing

Story 1.1: Seller Registration & KYC

As a seller, I want to register with phone/email and verify identity (PAN + bank account), so that Razorpay can disburse payouts to me.

Acceptance Criteria:

- Phone-based OTP verification required.

- PAN and bank account fields; validation via regex (basic) or third-party KYC API if budget allows.
- Terms & conditions checkbox (marketplace liability, inspection policy).
- Account status: PENDING_KYC → APPROVED → ACTIVE.

Constraints: PAN validation is async (Razorpay may reject during payout); hold seller listings until KYC APPROVED[3].

Story 1.2: Product Listing Creation

As a seller, I want to upload photos, title, description, and asking price for a used item, so that buyers can discover my product.

Acceptance Criteria:

- Upload up to 10 photos (S3/MinIO object storage; max 5MB each, auto-resize).
- Title (max 100 chars), description (max 1000 chars), category (Electronics > Phone, Laptop, Camera, Watch, etc.).
- Asking price in ₹; no currency conversion at MVP.
- Condition self-assessment dropdown: Like New, Excellent, Good, Fair (for buyer preview; inspection overrides).
- Set preferred pickup location (within 5km of buyer/pickup zone).
- Preview before publish; once published, listing appears in search within 5 minutes.

Constraints: Photos stored with signed URLs (public for 7 days, then private); seller cannot edit listing after first inquiry.

Phase 2: Buyer Browse & Inspection Request

Story 2.1: Product Discovery & Search

As a buyer, I want to search by category, price range, condition, and location, so that I find suitable used items.

Acceptance Criteria:

- Full-text search on title + description (Elasticsearch/Meilisearch; MVP may use Postgres ILIKE + sorting).
- Filters: Category, Price (₹ range), Condition, Distance (km), Seller Rating (if available).
- Sort by: Price (asc/desc), Popularity (views), Recently Listed.
- Search results pagination (20 per page).
- Seller name, total listings, average rating (star) shown in list view.

Constraints: Search latency <500ms at MVP (single-region); location filtering is buyer's pincode ± 5km radius.

Story 2.2: Product Details & Inspection Request

As a buyer, I want to view full product details, seller profile, and request an inspection appointment, so that I can verify condition before committing payment.

Acceptance Criteria:

- Product detail page: photos, description, seller info (name, rating, total listings), inspection policy summary.
- "Request Inspection" button triggers a modal to select pickup date/time slot (calendar, 2-day future minimum).
- Buyer provides name, phone, delivery address.
- System creates an inspection appointment (order_id, APPOINTMENT_CREATED state).
- Confirmation SMS to buyer + seller with appointment details.
- Buyer cannot cancel within 4 hours of appointment; cancellation fee or refund policy TBD.

Constraints: Appointment slots auto-generated (e.g., 9am–10am, 10am–11am); manually curate or use field agent availability (out of scope for MVP).

Phase 3: Inspection Workflow

Story 3.1: Inspection Report Creation

As an inspector/platform operator, I want to physically inspect the product at pickup, assess condition, and generate a signed condition report, so that disputes are minimized.

Acceptance Criteria:

- Inspector accesses order via mobile app (or admin dashboard).
- Scan QR code on product (or order ID) to load order details.
- Inspect checklist (category-specific):
  - **Phone**: Power on, screen cracks, buttons, battery health, IMEI verification.
  - **Laptop**: Power on, keyboard/trackpad, screen, ports, battery cycles (if readable).
  - **Camera**: Power on, lens condition, viewfinder, sensor (via test shot).
  - **Watch**: Power on, band condition, face cracks.
- Photo evidence: Inspector takes 3–5 photos per item (close-ups of damage/condition) and uploads to object storage.
- Grading override: Inspector assigns final condition grade (Like New, Excellent, Good, Fair, Poor).
- Inspector signs digitally (fingerprint or OTP-based).
- Report saved as immutable JSON; hash (SHA256) stored in Postgres.
- Inspector submits; order state → INSPECTION_COMPLETE.
- Buyer receives SMS + in-app notification with inspection report + final grade.

Constraints: Inspection is geospatial (pickup location must match order); inspector can flag item as COUNTERFEIT (triggers immediate refund + buyer alert).

Story 3.2: Inspection Report Review & Acceptance

As a buyer, I want to review the inspection report and condition photos, and accept or dispute the findings, so that I can decide whether to proceed.

Acceptance Criteria:

- Buyer views inspection report (photos + grade + notes) within the app.

- Accept button: buyer confirms condition matches expectations; order → INSPECTION_ACCEPTED.
- Dispute button: buyer contests grade; form to describe disagreement; order → INSPECTION_DISPUTED.
- If disputed: order moves to a dispute queue (operator review); seller is notified but funds remain in escrow.
- Buyer has 24 hours to accept or dispute; after 24h, order auto-accepts (INSPECTION_ACCEPTED).

Constraints: Buyer cannot cancel after inspection acceptance; if item is not collected (seller fails to ship), seller can cancel.

Phase 4: Payment & Escrow

Story 4.1: Create Order & Collect Payment

As a buyer, I want to confirm purchase and pay via Razorpay escrow, so that my money is safe until delivery.

Acceptance Criteria:

- After inspection acceptance, buyer clicks "Proceed to Payment".
- Razorpay payment link generated (or Orders API); amount = asking price + platform fee (e.g., 10% = 9% to seller + 1% platform cut).
- Payment collected via card/UPI/wallet (Razorpay handles PCI).
- Razorpay signature verified; payment ID stored in Postgres.
- Order state → PAYMENT_PENDING → PAYMENT_COMPLETED (on successful callback).
- Buyer receives payment confirmation SMS.
- Seller notified: order is paid and locked for shipment.

Constraints: Razorpay settlement is T+2 working days; funds in escrow until order DELIVERED + ACCEPTED or dispute resolved[4].

Phase 5: Delivery & Final Acceptance

Story 5.1: Seller Ships Item

As a seller, I want to mark the item as shipped and provide a tracking number, so that the buyer knows when to expect it.

Acceptance Criteria:

- After payment completion, seller receives SMS + in-app notification to ship.
- Seller enters shipping provider (Delhivery, Flipkart Logistics, etc.) and tracking number.
- Order state → SHIPPED.
- Buyer receives SMS + tracking link; can track in real-time.

Constraints: Seller must ship within 3 days of payment; non-compliance results in order cancellation + refund + seller penalty.

Story 5.2: Buyer Receives & Inspects

As a buyer, I want to confirm receipt and final condition match inspection report, so that I can either accept or claim damage.

Acceptance Criteria:

- Buyer receives package; clicks "Mark as Received" in app.
- 7-day acceptance window starts (default window; customizable per category).
- During window, buyer can:
  - Accept: "Condition matches; I accept the purchase." Order → DELIVERED_ACCEPTED; payout released to seller (minus fees).
  - Return/Reject: "Item damaged or misrepresented." Buyer uploads photos; order → DELIVERY_DISPUTED.
- If no action within 7 days: order auto-accepts (DELIVERED_ACCEPTED).
- On acceptance: Razorpay disburses funds to seller's bank account; platform fee (e.g., 1%) retained by platform.

Constraints: Escrow release is conditional on DELIVERED_ACCEPTED state; disputes block payout until resolved.

Phase 6: Dispute Resolution

Story 6.1: Initiate Dispute

As a buyer or seller, I want to raise a dispute if the transaction deviates from agreement, so that a neutral party (platform) can adjudicate.

Acceptance Criteria:

- Buyer can dispute during 7-day window post-delivery: "Item arrived damaged", "Condition worse than reported", "Item does not match description".
- Seller can dispute if buyer falsely claims damage (post-acceptance); requires evidence (inspection photos vs delivery claim photos).
- Dispute form: description + evidence (photos/video).
- Order state → DISPUTED.
- Dispute assigned ticket ID; seller + buyer both notified.
- Operator (platform) reviews evidence within 24–48 hours.

Constraints: No disputes after 7-day window (auto-accept is final); disputes initiated before acceptance pause the acceptance window.

Story 6.2: Dispute Adjudication

As a platform operator, I want to review dispute evidence and make a ruling, so that I can fairly resolve conflicts.

Acceptance Criteria:

- Operator dashboard shows dispute queue (sortable by age, category, amount).
- Operator views: original inspection report, delivery claim photos, dispute description, chat history.
- Operator makes decision:

    - Refund buyer: order → REFUND_INITIATED; Razorpay initiates refund to buyer's payment source; seller receives notification.
    - Accept buyer claim; seller refund (minus non-refundable fee, if any): order → REFUND_INITIATED.
    - Reject buyer claim; release payout to seller: order → DELIVERED_ACCEPTED.
- Decision logged with reasoning; visible to both parties.
- Avg resolution SLA: 48 hours.

Constraints: Operator decisions are immutable (audit trail); no appeal after 7 days.

Phase 7: Payouts & Reconciliation

Story 7.1: Seller Payout

As a seller, I want my funds disbursed after successful transaction, so that I receive payment in my bank account.

Acceptance Criteria:

- On order DELIVERED_ACCEPTED, system creates a payout record (seller ID, amount, fees).
- Razorpay API: call disbursal/transfer endpoint to seller's registered bank account.
- Settlement timeline: T+2 working days (per Razorpay SLA)[4].
- Seller can view payout status in dashboard (PENDING, SUCCESS, FAILED).
- If payout fails (invalid bank account): seller notified; payout retried (configurable backoff).

Constraints: Minimum payout threshold (e.g., ₹100) to reduce transaction cost; payouts batched daily if below threshold.

Story 7.2: Reconciliation & Ledger

As a platform, I want to reconcile Razorpay settlements with internal ledger, so that financial records are accurate and auditable.

Acceptance Criteria:

- Nightly job (or on-demand): fetch Razorpay settlement batches via API; compare with Postgres ledger.
- Ledger tables:
    - orders (order_id, buyer_id, seller_id, amount, state).
    - payments (order_id, razorpay_payment_id, amount, created_at).
    - payouts (seller_id, amount, razorpay_payout_id, state).
    - disputes (order_id, reason, decision, decided_at).
- Double-entry accounting: debit (buyer payment) = credit (seller payout) + platform fee.
- Reconciliation report: total collected, payouts, fees, reserves (if any).
- Discrepancies flagged for manual review.

Constraints: Ledger is immutable (INSERT only, no UPDATE after creation); corrections are reversals + new entries.

Non-Functional Requirements

Performance

- API response time: <200ms for browse, <500ms for search (Elasticsearch if needed).
- Concurrent users at MVP: 10k (next scaling exercise).
- Database query latency: <100ms (95th percentile).

Reliability

- Platform uptime: 99.5% (planned maintenance excluded).
- Razorpay integration fault tolerance: retry failed payouts/settlements with exponential backoff.
- Data backup: daily snapshots (Postgres WAL archiving) + restore drills monthly.

Security

- All user input validated (Zod schema validation on API).
- Passwords hashed (bcrypt).
- API tokens signed (JWT); refresh tokens expire in 24h.
- Sensitive data (PAN, bank account) encrypted at rest.
- HTTPS (TLS 1.3) for all traffic.
- Rate limiting: 100 requests/min per IP for public endpoints; 1000/min for authenticated.
- SQL injection + XSS prevention: parameterized queries, sanitized output.

Compliance

- RBI Payment Aggregator guidelines: marketplace and escrow funds are segregated; Razorpay is PA[3].
- KYC for sellers (PAN + bank account); limited KYC for buyers (phone + address).
- Refund/chargeback policy: disputes within 7 days post-delivery; after 7d final.
- Data retention: transaction records retained for 7 years (tax compliance).

Technical Architecture (Summary)

- Frontend: Next.js (TypeScript) + React; mobile-responsive.
- Backend: NestJS (TypeScript); stateless API pods.
- Database: PostgreSQL (primary); Redis (cache, sessions, rate limiting).
- Search: Elasticsearch/Meilisearch (or Postgres ILIKE at MVP).
- Storage: S3-compatible (MinIO on-prem) for inspection photos, invoices.
- Message Queue: Bull/BullMQ (Redis-backed) for async jobs: inspection reminders, payout retries, dispute notifications.
- Payments: Razorpay API (Orders, Payments, Transfers/Payouts, Settlements).
- Notifications: SMS via Razorpay SMS partner or third-party (Exotel, Twilio); in-app push via FCM.
- Hosting: Docker + Kubernetes on co-located servers (on-prem).
- Observability: Prometheus (metrics), Loki (logs), Grafana (dashboards).

Success Metrics

- **Listings**: 1000+ active listings within 3 months.
- **GMV** (Gross Merchandise Value): ₹5 crore within 6 months.
- **Take Rate**: 10–12% (platform revenue goal).
- **Dispute Rate**: <2% of orders.
- **Buyer Repeat Rate**: >40% within first year.
- **Seller Satisfaction**: >4.5/5 average rating (payout speed + dispute fairness).
- **Inspection Completion**: 100% of paid orders inspected before delivery.

Out of Scope (Future Phases)

- B2C refurbished inventory (OEM tie-ups, bulk liquidation): Phase 2.
- BNPL/EMI for purchases: Phase 2.
- Seller analytics dashboard: Phase 1.5.
- Bulk seller APIs / integration: Phase 2.
- Multi-category expansion (fashion, furniture, home, books): Phase 2.
- Regional languages: Phase 2.
- Reverse logistics (buyer return pickups): Phase 2.

Risks & Mitigations

Risk	Impact	Mitigation
High fraud rate (counterfeit, collusion)	Trust erosion, user churn	Mandatory inspection + photo evidence; progressive seller trust score; manual review for high-value orders
Inspection labor cost > margin	Unit economics fail	Automation via AI grading (visual inspection) + remote video inspection; batch pickups to reduce per-item cost
Razorpay integration delays / API errors	Order backlog, payout delays	Robust retry logic; fallback to manual payout reconciliation; incident runbook
Buyer/seller disputes explosion	Operational burden	Clear policy, auto-accept window, evidence-backed adjudication, operator SLA
Data loss / security breach	Regulatory penalty, trust loss	WAL archiving, encrypted backups, PII encryption at rest, regular security audits
Regulatory change (PA rules, escrow rules)	Compliance cost spike	Monitor RBI/FEMA updates; legal review quarterly; maintain escrow segregation strictly

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References

[1] India Recommerce Market Intelligence Report 2025. USD 5.91B market, 9.8% CAGR through 2029. Platform consolidation and verticalization trends[1][3].

[2] Trust signals in used-goods marketplaces: inspection-based grading reduces fraud perception and increases buyer conversion[2].

[3] Razorpay Escrow Services: automated payout + fund segregation per RBI Payment Aggregator guidelines[3].

[4] Razorpay Settlement Cycle: T+2 working days for domestic transactions; settlement subject to bank approval[4].