

System Thinking Hackathon 2025

Team Details

- **Team Name** : Interlinked
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- **Problem Domain** : E-Commerce
- **Specific Problem Statement** :Return and Waste problems in Online Shopping

Introduction

India's e-commerce sector has experienced explosive growth, becoming a key driver of the country's retail economy. However, this expansion has brought with it a significant challenge: high product return rates. These returns not only erode profit margins but also generate substantial waste and logistical complexity, making them a systemic issue for platforms like Amazon, Flipkart, and Myntra. High return rates in Indian e-commerce are particularly problematic because they:

- Lead to massive financial losses (estimated at nearly ₹2 lakh crores annually).
- Increase operational and reverse logistics costs, especially for categories like apparel, which see return rates as high as 25–40%.
- Create environmental waste due to damaged goods, excess packaging, and inefficient transportation.

Understanding the systemic factors behind this trend is crucial for building sustainable, profitable, and environmentally responsible e-commerce models in India.

Process Followed

- Identified the Core Problem
 - Focused on the rising trend of product returns and waste in Indian e-commerce platforms
 - Recognized its impact on logistics costs, seller experience, platform trust, and environmental sustainability.
- Mapped the Event → Pattern → Structure → Mental Model (EPSM)
- Collected and Mapped Variables (No Surveys Conducted)
- Identified Applicable System Archetypes
- Constructed the Causal Loop Diagram (CLD)
- Designed the Stock and Flow Diagram
- Plotted Behaviour-over-Time (BoT) Graphs
- Derived Systemic Leverage Points
- Included Additional Insights

Causal Loop Diagram (CLD)

No.	Variable Name	Simple Definition
1.	Sales	Number of products sold through the platform.
2.	Profit Margins	The profit made on each sale after subtracting costs.
3.	Pressure for More Sales	Internal or market-driven urge to boost sales.
4.	Frequent Discounts / Flash Sales	Short-term sales campaigns offering reduced prices.
5.	Impulse Purchases	Sudden, unplanned purchases often influenced by discounts.
6.	Returns	Items sent back by customers after purchase.
7.	Data on Return Reasons	Collected info on why customers return products.
8.	Quality of Product Listing	Accuracy and detail of product descriptions, images, sizing, etc.
9.	Customer Expectations Gap	The mismatch between what a customer expects and what they receive.
10.	Data Quality for Niche Products	Accuracy and richness of product data for uncommon or specialized items.
11.	Popularity of Product	Products frequently bought or trending.
12.	More Purchases	Increase in product buying activity.
13.	Collaborative Filtering	Bias in recommendations due to popularity-driven

	Bias	algorithms.
14.	Environmental Impact	Negative ecological effects from waste and returns.
15.	Non-Refurbishable Inventory / Waste	Returned goods that cannot be reused or resold.
16.	Disposal Cost	Cost of discarding unsellable returned items.
17.	Logistics Cost	Expense incurred in shipping and reverse logistics.
18.	Damage to Brand Image	Harm to the brand's reputation due to poor return experience or quality issues.
19.	Customer Trust and Loyalty	Customers' faith in and repeated preference for the platform.
20.	Return Fraud	Instances where customers misuse the return policy (e.g., wear and return).
21.	Return Policy Strictness	How lenient or strict the platform's return rules are.
22.	Virtual Try-On Tools	AR tools for digitally trying clothes, accessories, etc.
23.	Packaging Waste	Non-recyclable or excess packaging material generated per order.
24.	Inventory Reshelving Time	Time taken to inspect, process, and restock returned goods.
25.	Seller Exit Rate	Number of sellers leaving the platform due to losses or dissatisfaction.
26.	Product Personalization Accuracy	How well the platform suggests items that match customer preferences.
27.	Customer Education on Returns	Awareness campaigns about sustainable purchasing and return behaviors.

Leverage Points Analysis

Leverage Point	Thinking in Systems Category	Why Important	Expected Impact
Improve Product Descriptions & Images	Information Flows	Clearer, more accurate product details reduce mismatches between expectations and	Lower return rates and improved customer satisfaction.

		reality.	
Use of AI for Personalized Recommendations	Structure of Information Flows	Reduces chances of customers buying ill-suited products.	Leads to better product fit and fewer returns.
Customer Education on Return Costs	Paradigms	Educating users on environmental and economic impact can shift behavior.	Encourages more thoughtful purchases, reducing unnecessary returns.
Tighter Return Policies	Rules of the System	Discourages impulsive buying and increases accountability.	Helps reduce volume of returns and associated waste.
Real-time Feedback Loop for Return Reasons	Strength of Feedback Loops	Helps sellers continuously improve product quality or descriptions based on return data.	Enhances product-market fit and reduces systemic inefficiencies.
Incentivize Lower Return Rates	Rules of the System	Offering rewards for consistent, low-return customers can promote conscious shopping behavior.	Leads to culture of responsible consumption.
Shift to Sustainable Packaging	Parameters of the System	Addresses environmental waste from returns.	Reduces overall ecological footprint even when returns occur.

System Archetypes

Archetype Name	System Behavior / Pattern	Leverage Point to Intervene	Expected Impact
Fixes that Fail	Platforms use liberal return policies to gain trust, but this worsens the problem long-term.	Address root causes like poor product info and misaligned expectations, not just easy returns.	Reduced dependence on return systems; more sustainable customer behavior.
Shifting the Burden	Reliance on short-term fixes (returns, refunds) instead of solving underlying	Invest in product transparency, sizing tools, and AI-based personalization.	Builds long-term resilience and reduces need for frequent returns.

	mismatches.		
Tragedy of the Commons	Users overuse the return option, harming platform sustainability and increasing carbon waste.	Introduce policies that make users accountable — e.g., return limits, eco-impact visibility.	Promotes collective responsibility; reduces systemic exploitation of returns.
Drifting Goals	Platforms lower their quality and customer expectation standards to keep return rates tolerable.	Set higher internal quality benchmarks and monitor long-term return trends transparently.	Prevents normalization of inefficiency; raises systemic standards.
Growth & Underinvestment	Platforms grow rapidly without investing in logistics, sizing tools, or product quality control.	Increase investments in backend tech, quality assurance, and support staff training.	Enhances system capacity to manage growth and reduce product mismatch.

Event → Pattern → Structure (EPS) Analysis

Layer	Our Analysis	
Event	Indian e-commerce platforms are facing high product return rates, leading to increased operational costs, customer dissatisfaction, reverse logistics burden, and growing environmental waste from packaging and transportation.	
Pattern	Customers frequently engage in bulk or impulsive ordering, often purchasing multiple sizes or variants with the intention of returning most items. This behavior is sustained across major categories such as fashion and electronics. Over time, this has become normalized as part of the online shopping experience.	
Structure	Incentives	Platforms reward rapid growth and customer acquisition over long-term efficiency or sustainability. Liberal return policies are designed to reduce purchase hesitation, not prevent returns.
	Norms	Returning products is culturally normalized and even encouraged by platforms, reinforcing a low-friction, no-consequence mindset around consumption.
	Process	Poor product standardization (e.g., inconsistent sizing across brands), weak feedback loops between return data and

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Additional Insights

- **Misaligned Platform Incentives :**

E-commerce platforms prioritize customer acquisition and growth over systemic efficiency, encouraging liberal return policies that worsen return rates and operational costs.

- **Ineffective Use of Return Data :**

Platforms collect extensive return-related data but rarely use it to improve product quality, seller accountability, or customer experience, leading to recurring product mismatches.

- **Return Culture is Normalized :**

The “buy more, return most” behavior has become normalized due to easy, no-cost returns — reinforcing careless buying habits and disincentivizing mindful shopping.

- **Opportunities for Smart Systemic Interventions :**

AR/VR-based try-ons, user return history transparency, and rewards for low-return behavior could reshape norms while advancing sustainability and system health.