Systems Thinking Hackathon 2025 – Team Report

Group Details

- **Group Number: 11**
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- **Problem Domain: E-commerce**
- **Specific Problem Statement: Addressing systemic challenges faced by small sellers on e-commerce platforms in India**

1. Introduction to the Problem

India's e-commerce sector is poised to reach a valuation of $200 billion by 2026, driven by increased internet penetration, smartphone usage, and digital payment adoption. However, small and medium-sized sellers face several interrelated challenges that hinder their sustainable development and competitiveness.

Problems in Indian Context :-

1. Platform Bias and Unfavourable Policies

Large e-commerce platforms often prioritize their own brands or select sellers, making it difficult for small vendors to gain visibility and compete effectively.

2. High Customer Acquisition Costs

Marketing and advertising expenses can account for up to 40% of total sales for online businesses, making it challenging for small sellers to attract and retain customers.

3. Logistical Challenges

Delivering products across India's diverse geography is hindered by inadequate infrastructure, leading to delays, increased costs, and difficulties in reaching remote areas.

4. Digital Literacy Gaps

Many small sellers lack the necessary digital skills to effectively manage online storefronts, process digital payments, and utilise digital marketing tools.

5. Regulatory and Compliance Hurdles

Navigating India's complex tax laws and compliance requirements, such as the Goods and Services Tax (GST), can be overwhelming and costly for small businesses.

2. Process Followed

1. **Defined the Problem**
   Focused on the specific challenges faced by small sellers in India's e-commerce sector.
2. **Stakeholder Analysis**
   Identified key players (sellers, platforms, logistics, consumers, regulators) and their roles.
3. **Data Collection**
   Used government reports, platform data, research, and seller testimonials.
4. **Key Challenges Identified**
   Highlighted issues like platform policies, low visibility, high fees, logistics, and digital literacy.
5. **Created & Refined CLD**
   Built and improved a Causal Loop Diagram to map interactions in the system.
6. **Leverage Points Analysis**
   Used Donella Meadows' framework to find areas for impactful intervention.
7. **System Archetypes Identified**
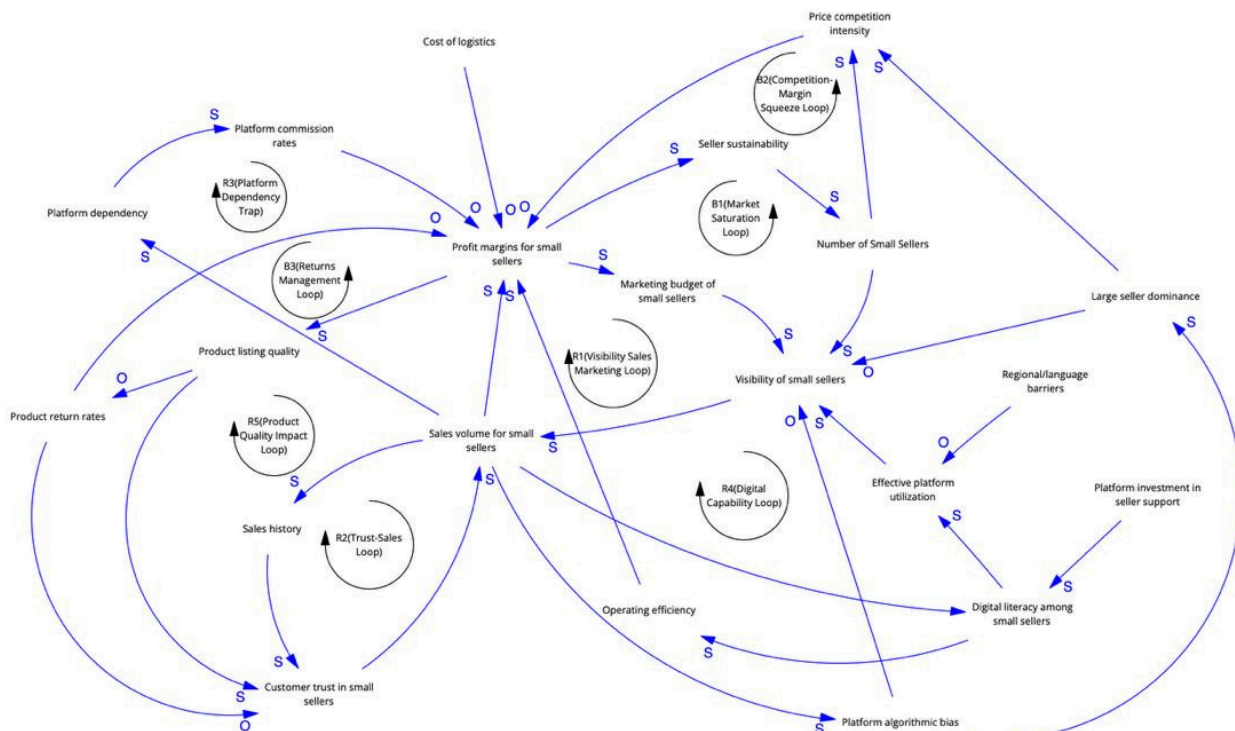   Spotted recurring patterns causing persistent problems in the system.
8. **Intervention Strategies Developed**
   Proposed structural solutions to support small seller success.
9. **Final Report Compiled**
   Consolidated insights and strategies to guide stakeholders and decisions.

3. Causal Loop Diagram (CLD)

Variable	Simple Definition
Profit margins for small sellers	How much money small sellers make after covering all costs.
Sales volume for small sellers	The total number of items sold by a small seller.
Visibility of small sellers	How easily customers can find small sellers on e-commerce platforms.
Platform commission rates	Percentage of each sale that platforms charge small sellers.
Customer trust in small sellers	The confidence buyers have in the product quality and service of small sellers.
Platform algorithmic bias	When platform algorithms favor big sellers or brands, reducing visibility for small ones.
Digital literacy among small sellers	The ability of sellers to use digital tools and platforms effectively.
Cost of logistics	The expense of packaging and delivering goods, which affects profits.
Marketing budget of small sellers	The amount of money small sellers can spend on promoting their products.
Platform investment in seller support	How much effort platforms make to help small sellers (e.g., training, tools).

>> Structure Flow Diagram
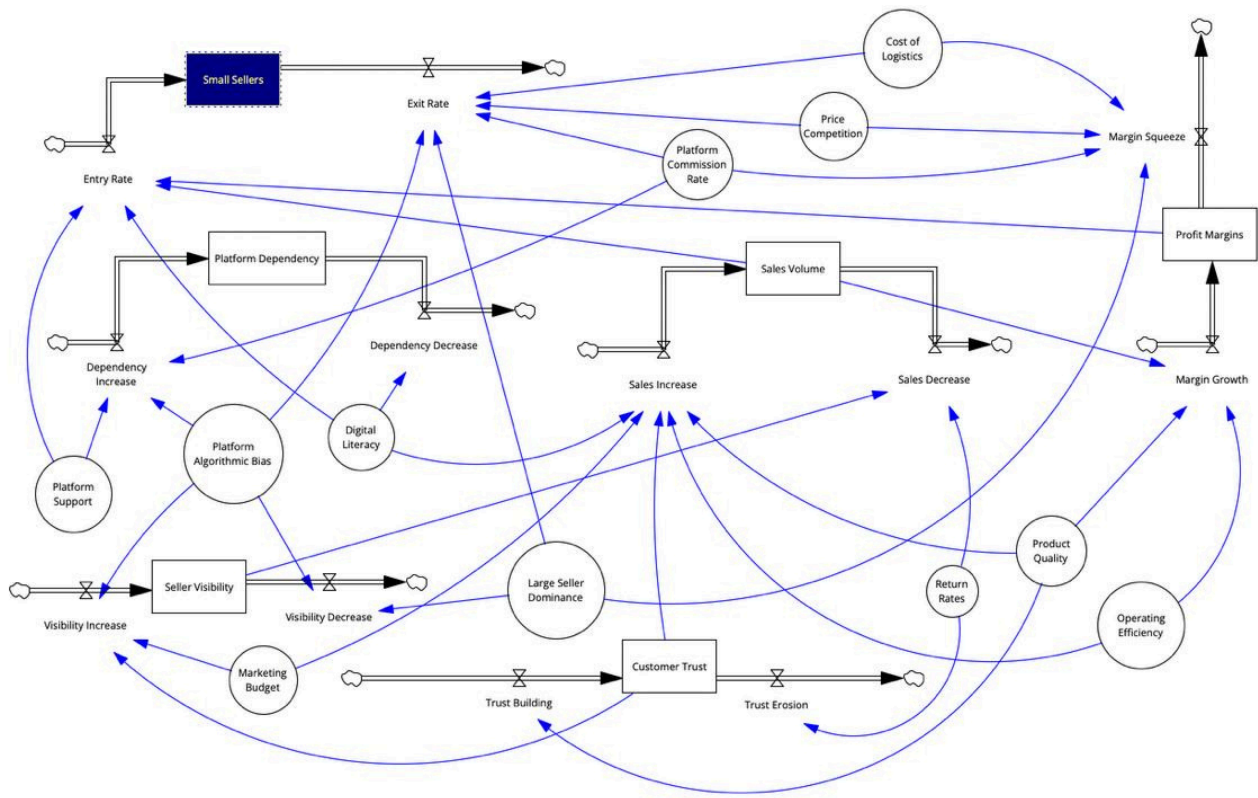
>> Behaviour Over Time Graph
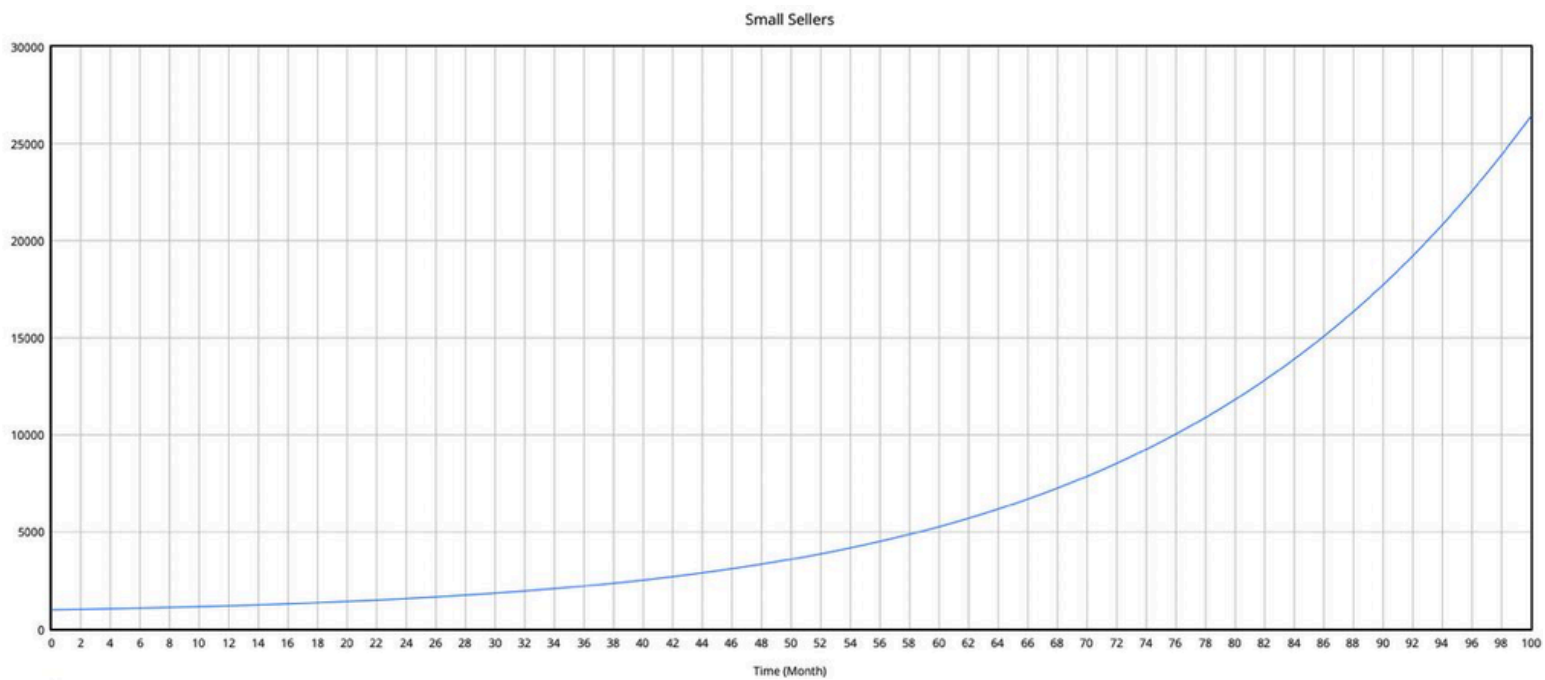
Small Sellers

4. Leverage Points Analysis

Leverage Point	Thinking in Systems Category	Why Important	Expected Impact
Digital literacy training programs for small sellers	Information Flows	Many small sellers lack skills to use platform analytics and tools effectively	Improved decision-making, better utilization of available resources
Community-based logistics networks	Structure of Material Stocks and Flows	Decentralizes delivery capabilities and reduces dependency on platform logistics	Lower operational costs and faster delivery times for small sellers
Alternative seller rating systems	Rules of the System	Current rating systems often disadvantage new and small sellers	More equitable visibility and trust-building opportunities
Collective bargaining associations for small sellers	Self-Organisation	Individual small sellers have minimal negotiating power with platforms	Better commission rates and policy terms for small sellers
Regulatory framework on algorithm transparency	Rules of the System	Hidden algorithmic biases often favour established sellers	More equitable distribution of visibility and opportunity
Working capital access programs	Buffers	Limited capital prevents inventory expansion and quality improvements	Enhanced ability to scale and invest in competitive advantages
Direct-to-consumer channels	Structure of Information Flows	Reduces dependency on major platforms	Diversified revenue streams and increased resilience
Platform cooperative ownership models	Goals of the System	Changes the fundamental incentive structure of platforms	Aligns platform success with seller success

5. System Archetypes

1. Success to the Successful

- **Loops:** R1, R2, R4
- **Effect:** Sellers with early gains (visibility, trust, digital skills) keep growing, while others lag behind.

2. Limits to Growth

- **Loops:** R1, B1
- **Effect:** Growth in small sellers hits limits due to market saturation and shrinking margins.

3. Shifting the Burden

- **Loops:** R3
- **Effect:** Sellers rely too much on platforms instead of building their own capabilities.

4. Fixes That Fail

- **Loops:** R5, B3
- **Effect:** Cost-cutting or poor quality leads to high returns, damaging trust and long-term sales.

5. Tragedy of the Commons

- **Loops:** B2, B1
- **Effect:** Too many sellers drive price wars, hurting everyone's profitability.

6. Event → Pattern → Structure Analysis

Layer	Your Analysis
Event	Small sellers experiencing declining sales despite increasing e-commerce market size; High churn rate of small sellers on major platforms; Frequent complaints about sudden policy changes
Pattern	Gradual concentration of sales among fewer, larger sellers; Cyclical protests and collective actions by small seller associations; Recurring financial distress during seasonal sales events when competing with discounted large sellers
Structure	Platform business models incentivize maximizing GMV rather than seller diversity; Commission structures that disadvantage low-volume sellers; Information asymmetry between platforms and sellers; Absence of effective collective bargaining mechanisms; Regulatory frameworks that haven't kept pace with market evolution

Analysis of Existing Interventions:

Most current interventions (seller education webinars, temporary fee reductions, special seller programs) primarily address events and patterns rather than underlying structures. They provide temporary relief but don't fundamentally alter power dynamics or incentive structures.

Proposed Structural Redesigns:

1. **Policy Reform**: Establish regulatory frameworks requiring algorithm transparency and fair competition practices
2. **Alternative Ownership Models**: Develop seller-owned cooperative platforms that align incentives between platform and sellers
3. **Decentralised Infrastructure**: Create shared logistics networks and fulfillment centers owned by seller collectives

4. **Financial Restructuring**: Implement progressive commission structures that scale with seller size rather than disadvantaging smaller entities
5. **Information Symmetry**: Mandate equal access to market data and customer insights for all sellers

8. Additional Insights

- There exists a critical threshold of digital capability beyond which small sellers experience exponential rather than linear growth
- Local contextualization of products creates resilience against competition from large standardized sellers
- The timing of seller onboarding relative to platform growth cycles significantly impacts long-term success
- Cross-platform selling strategies show more sustainability than single-platform dependence
- Community formation among sellers in similar categories creates unexpected collaborative advantages.

9. References

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