Flipkart

WRED 8.0

Campus case challenge

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Ideas that Empower Dreams

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Case Overview

High-Level Analysis

PROBLEM STATEMENT

- Suggest a **mid-mile operations** strategy for **Tamil Nadu**.
- Design a **supply chain network** and process flow that **maximizes** demand fulfillment using **optimal resources**.
- **Meet** customer expectations for delivery within **10-15 minutes**.
- **Strategic positioning** of **dark stores** to facilitate rapid fulfillment.

PROBLEM IDENTIFICATION

- **Inefficient load utilization** in inbound and outbound logistics - **15%** of transportation cost
- **Suboptimal routing** between dark stores - long travel **time** and high **fuel** consumption.
- Frequent **damage** to products during transit - replacement **costs** and customer **dissatisfaction.**
- **Manual picking and billing** at the souring hub and dark stores - **takes 1.5-2.0 Hours**.
- Data mismanagement and communication breakdowns - **Inaccurate Inventory Levels**.

FACTORS CONSIDERED

- **Tamil Nadu local landscape and Technological integration with ease**
- **First mover and adaptable to the recent trends in quick commerce**
- **The solution implementation timeline should not exceed 3 - 4 months**
- **Scalability of the ideas for future implementation**
- **Enhancement of customer experience**

MID-MILE SUPPLY CHAIN NODES

Sourcing hub (SH)

Distribution Centre (DC)

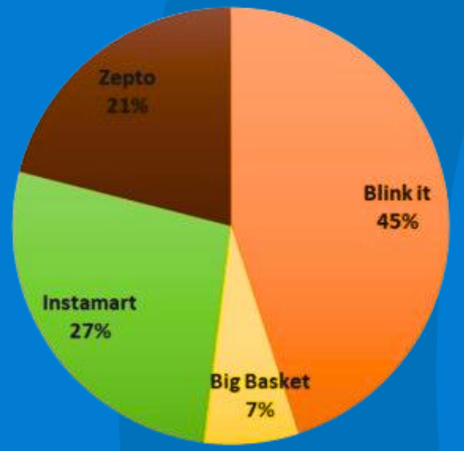
Dark Store (DS)

Methodology & Approach

1. Q-Comm Industry Analysis
2. Flipkart Supply chain network understanding
3. Bench mark competitor processes
4. New mid mile technology research
5. Field manager interview of Flipkart & Blinkit
6. Tamil Nadu Demographics study & Analysis
7. Map clustering & network design
8. Process flow diagram design
9. Inventory management Strategy development
10. Improvement proposal

COMPETITOR

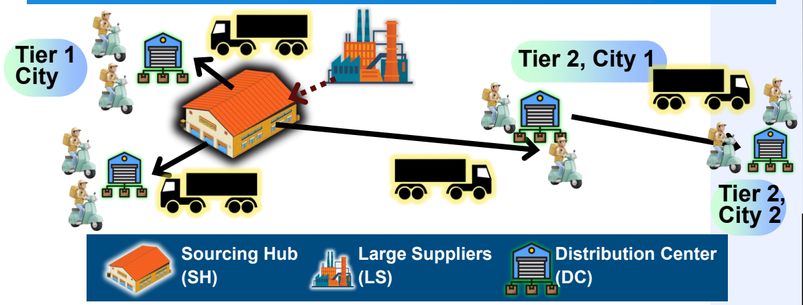
Q-Commerce Market Share



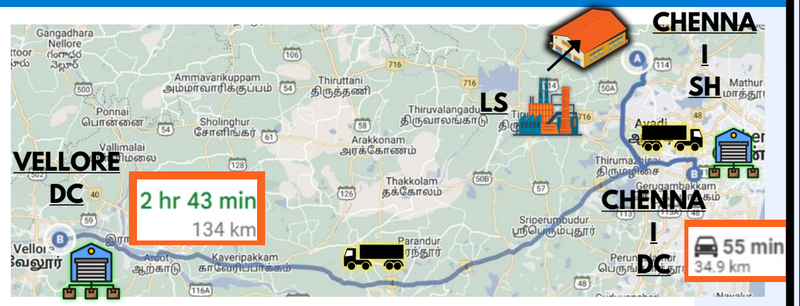
	Blink it	Big Basket	Instamart	Zepto
Model	Inventory	Inventory	Hybrid	Hybrid
Avg Delivery time	<20 min	10-20 min	<20 min	10 min
No of Dark Store	451	350	450+	330
AOV	635	425	450+	450+

Tamil Nadu Cities	Population (Lakhs)	Area (km^2)	Pop Density (Pop/km^2)	Zone	# of 5X5km grid (DS - 2.5 R)	# of 8X8km grid (DS - 4 R)	Blinkit	Instamart	Zepto	BB Now
Chennai	122	910	13407	Z1	36	14	✓	✓	✓	✓
Madurai	14	115	12174	Z2	5	2	✗	✗	✗	✗
Tiruchirappalli	12	115	10435	Z2	5	2	✗	✗	✗	✗
Salem	11	165	6667	Z2	7	3	✗	✗	✗	✗
Vellore	2.6	52	5000	Z1	2	1	✗	✗	✗	✗
Tirupur	6.3	172	3663	Z2	7	2	✗	✗	✗	✗
Coimbatore	15	440	3409	Z2	18	7	✗	✓	✗	✓
Erode	2.2	86	2558	Z2	3	1	✗	✗	✗	✗

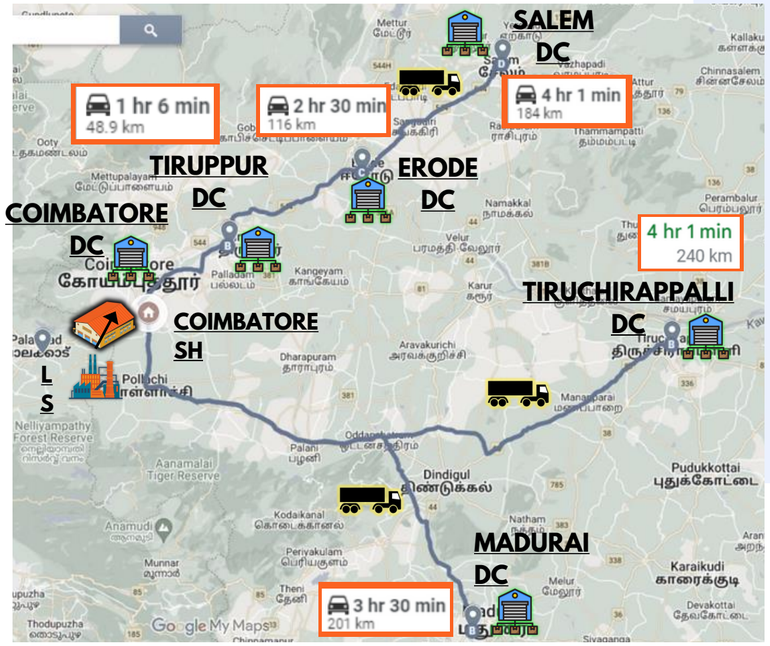
‘FLIPKART GROCERY’ EXISTING NETWORK



Zone - Z1



Zone - Z2



‘FLIPKART GROCERY’ MID-MILE

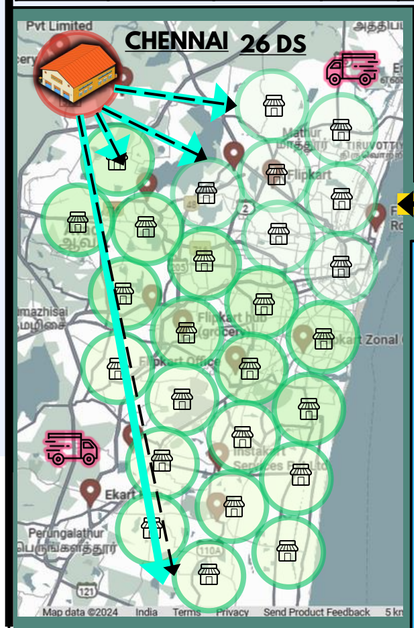
- **Supplies** are sourced from the **Large Supplier** at the **SH**.
- Orders are packed (**1 box/order**) and shipped to DCs twice daily (~**1,600 orders/day**) - (70% at night, 30% in the day).
- Canceled or damaged products are labeled ‘**bad stock**’ and **returned** to the **SH** via the returning truck.

‘MINUTES’ OPERATIONAL STRATERGY

‘GROCERY’++

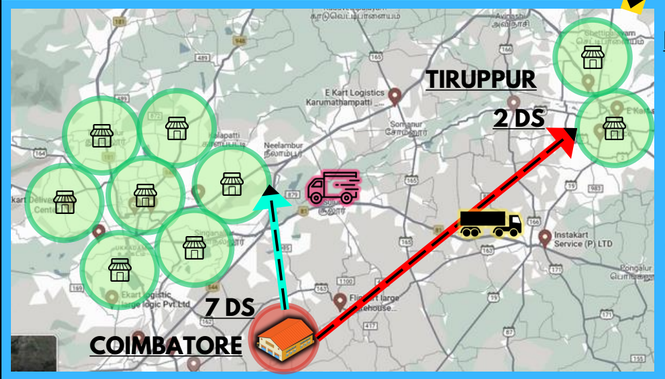
- Leverage current **Grocery’s LS and SH** for high-shelf life products; **add** SH **capability** for **F&V** storage.
- Source Fruits & Vegetables (**F&V**) from local **APMCs**, **FPOs**, and **FPCs** (TN leads with 165 FPOs and 500 FPCs nationwide).
- Include local Small & Medium **(S&M) suppliers** for **cost efficiency**.
- **1 box/order** causes product **damage** and **inefficient** space utilization - send **goods** to the **DS** in **fixed** quantity **batches**.
- Transportation to BS: **Mini trucks** for **Tier 1** and **large trucks** for **Tier 2** will **navigate** through predetermined BS routes based on past analytics.

Cities	Chennai	Madurai	Trichy	Salem	Vellore	Tirupur	Coimbatore	Erode
# of DS	26	5	5	3	2	2	7	1

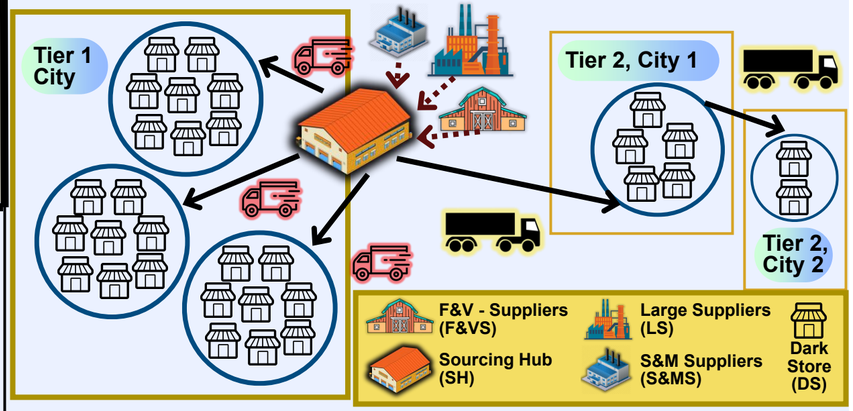


***Note**: The number of Dark Stores (DS) req. to cover the city is determined by circle mapping with a 2.5 km radius or 4 km, depending on the city's population density.*

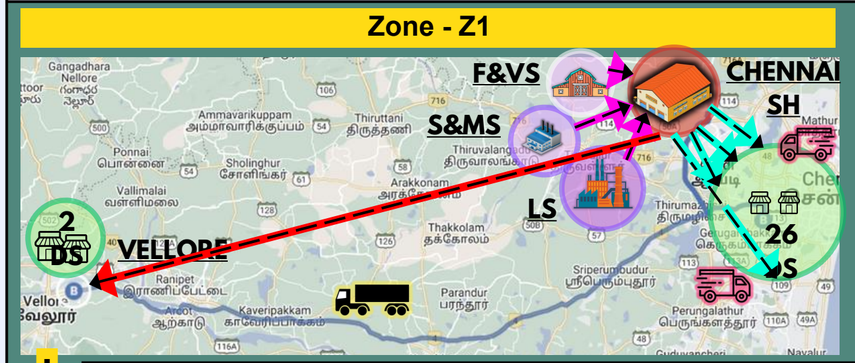
First Phase will only have 20 DS and that too only in Chennai and then DS creation will be incremented in steps.



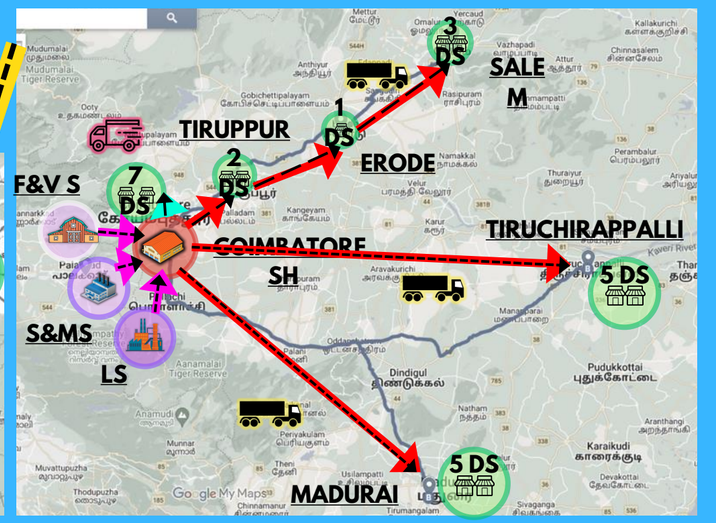
‘FLIPKART MINUTES’ PROPOSED NETWORK



Zone - Z1



Zone - Z2



Optimization Strategies

UNIT ECONOMICAL ANALYSIS OF THE MODEL

Variables	Per Month
Dark store area (assumed)sq. ft	3500
Avg. no. of DS staff (working 3 shifts per day)	25
Avg. staff salary (INR)	17500
Total staff cost (INR)	437500
Store rent per sq. ft.	95
Total store rent (INR)	332500
Utilities and other store costs per sq. ft.	40
Total utilities and other store costs (INR)	140000
Dark store Operational cost	**910000**
No of dark store	51
Quaterly opex of dark store (MINR)	**139.23**

No of dark store	51
Sales in MINR	2754
Dark store opex	139.23
% of sales	5%
Capex(MINR)	408

	Zone 1	Zone 2
No of DS	28	23
Size of DS sq. ft	3500	3500
Size of SH sq. ft	98000	80500

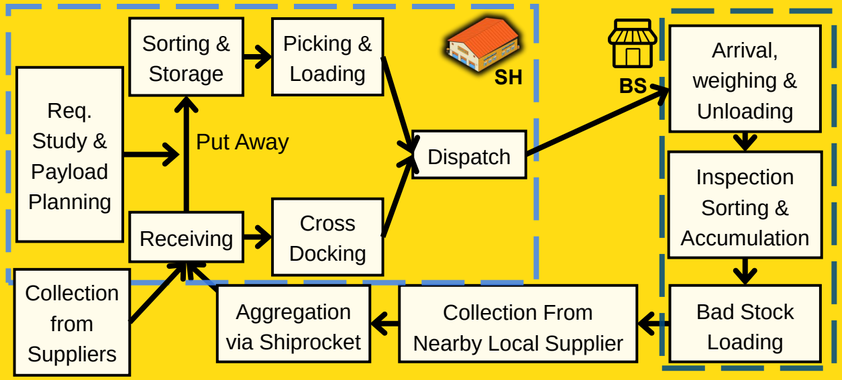
Revenue	
Avg Order/DS (Nos)	1200
AOV (Rs)	500
DailyRevenue/DS (Rs)	600000
Quaterly Sales Revenue(MINR)	**2754**
Opex as % of sales	5%

Capex - Fixed cost, DS Setup (MINR)	
Racks, shelves, scanners, etc.	3
Freezers, chillers, refrigerators, etc.	1
Inventory	3
Upfront capex to set-up a DS	7
Rental deposits	1
Upfront capital to set-up a DS	8
No of DS	51
Capex(MINR)	**408**

Unit Economics		
Income	Rs Per order	MINR Per quarter
Warehousing services + Marketplace commissions	60	330
Ad income	17.5	96
Customer fees (Delivery + Handling + Other)	15	83
Total	92.5	509
Direct cost		
Platform discounts/incentives	1.5	8
Dark store operations cost	25	138
Mid-mile and warehousing cost	15	83
Last mile delivery cost	34.5	190
Packaging costs + wastage + communication cost + support	10.5	58
Total	86.5	476
Contribution margin	6	33

Payback period in quarters = Capex/Contribution Margin **12.3**

Mid Mile Process Flow Diagram



Tech-enabled Warehouse Management

AI-based SaaS solutions - Korber Supply Chain & Softeon WMS

- **Order Picking Optimization:**

AI-Driven Picking Routes: Efficient paths, minimizing travel time and maximizing throughput.
Voice-Activated Systems: Implement hands-free, voice-guided picking to boost accuracy and speed.
Real-Time Tracking: Monitor and optimize picking operations on the go.

- **Intelligent Slotting**

Data-Driven Slotting AI: Optimize storage locations to reduce picking times by placing frequently req items in strategic locations.
Real-Time Adjustments: Continuously refine slotting strategies with real-time data, enhancing space utilization.

- **Increase picking speed** by **20-50%**, reducing the time it takes to retrieve items in narrow aisles.
- **Picking accuracy** by **10-30%**, minimizing errors, and reducing the need for costly returns or re-picks.
- **Lower operational costs (15-30%)** by reducing labor needs, minimizing errors, and optimizing storage space.
- **K-Means Clustering** to design **DS** network collection

Inventory planning & Management

Blue	Green
Seasonal (IS) - Procure from outside the state - off-season(OS)	**Locally Sourced Perishables - Available Year-Round**
Red	**Grey**
Procured from other states or far cities - Non-Perishables	**Locally Sourced Non Perishables**

Parameters	Blue	Red	Green	Grey
Demand Forecasting	**2 Days - IS 3-5 Days (P) & 7 Days (NP) - OS**	**7 Days**	**2 Days**	**2 Days**
Perishability	**Y & N**	**N**	**Y**	**N**
Procurement	**Optimized for cost - IS Optimized for cost - OS**	**Optimized for time**	**Optimized for cost**	**Optimized for cost**
Suppliers	**F&VS (APMCs, FPOs, and FPCs), S&MS**	**LS**	**F&VS (APMCs, FPOs, and FPCs)**	**S&MS**

Inventory Risk Mitigation:

- **Auto-Reorder point** = (**Inventory consumption rate * time < 2.5* Traveling Time**) OR (**Inventory time > Dark Shelf life**) OR (**Inv qty < 0.5 * Dark Inventory capacity**)

Inventory management:

- Material **SKU** allocation is to be done based on the **Pareto principle** of **freq** of the **order** of the material.
- Proper Batch Tracking and **FIFO** (First-In-First-Out) implementation using **RFID** tag.
- **Real-time** inventory **synchronization** b/w all **Dark Stores** and the **Sourcing Hub** for auto-order.
- **F&Vs** are to be procured in **packed** bundles of **1 kg or 1/2 kg**.
- Unload & **Weigh** and collect at **DS** - **Quick verification** and **unloading** of fixed quantity batches.
- **IoT**-based **waste** management - **qZense Labs** solution for F&V.

References

1. https://drive.google.com/drive/folders/1pqzSN9MxPoIIqBewWz1jDHpZG0Q-nkeO?usp=drive_link
2. https://www.coursesidekick.com/business/5392025
3. https://www.solvoyo.com/case-studies/q-commerce-case-studies/grocery-q-commerce-startup/
4. https://docsend.com/view/zqgfupfzyud499hn
5. https://enam.gov.in/web/stakeholders-Involved/fpos
6. https://blog.swiggy.com/2022/05/23/11799/
7. https://nabfpo.in/images/staticFPO.html#Tamil_Nadu7
8. https://blog.swiggy.com/2022/05/23/11799/
9. https://nabfpo.in/images/staticFPO.html#Tamil_Nadu7
10. https://research.ebsco.com/c/cnfw4m/viewer/pdf/uvnhb65c4v
11. https://www.dhl.com/global-en/delivered/ecommerce/changing-the-last-mile-three-words-at-a-time.html
12. https://www.solvoyo.com/case-studies/q-commerce-case-studies/grocery-q-commerce-startup/