[redacted] OPERATIONS ANALYTICS DATA CHALLENGE

ASSORTMENT RECOMMENDATION & SUCCESS METRICS

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EXECUTIVE SUMMARY

BRIEF OVERVIEW:-

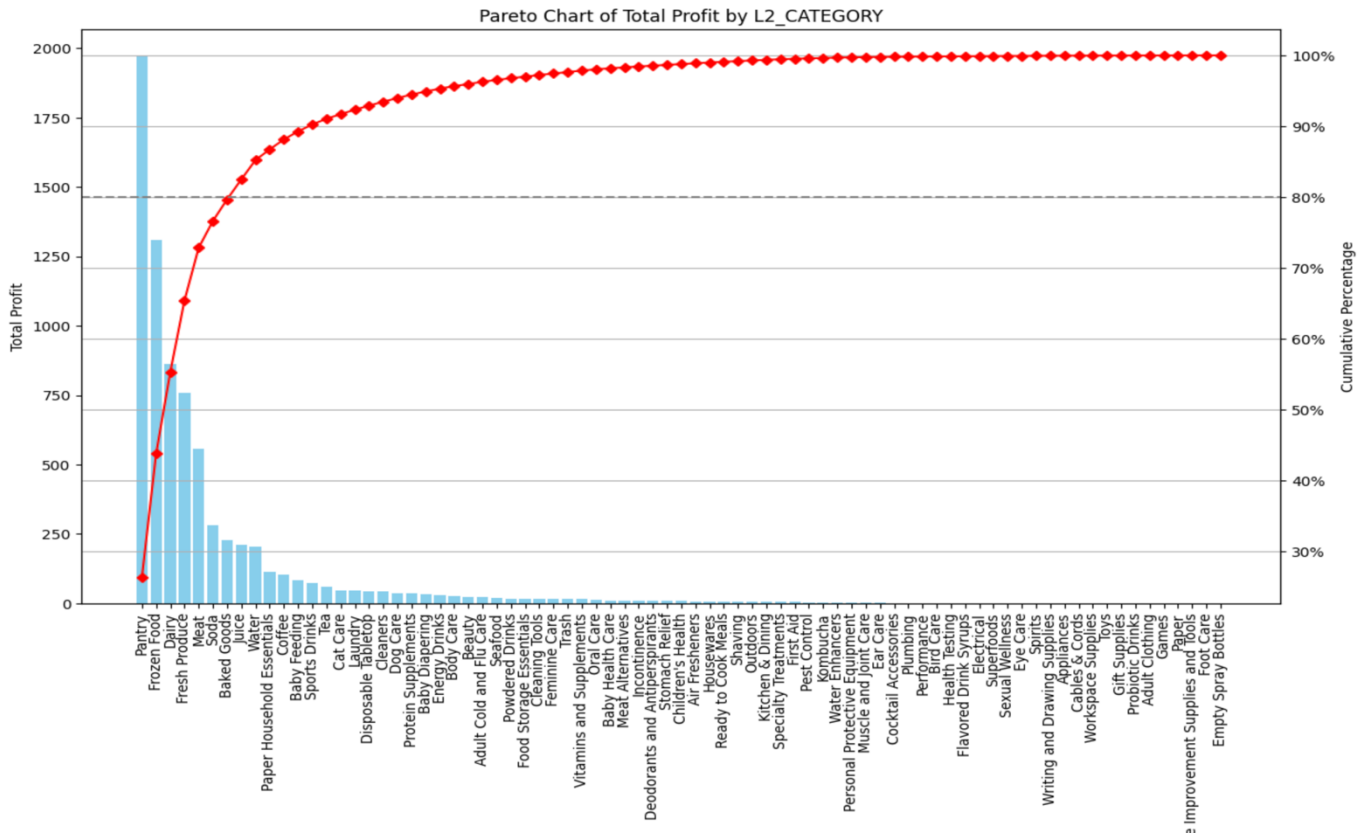
- Increase in dark store model with high demand for quick commerce & instant delivery
- Higher growth from COVID-19
- Expected to grow by 30% to $414.3 Bn by 2033

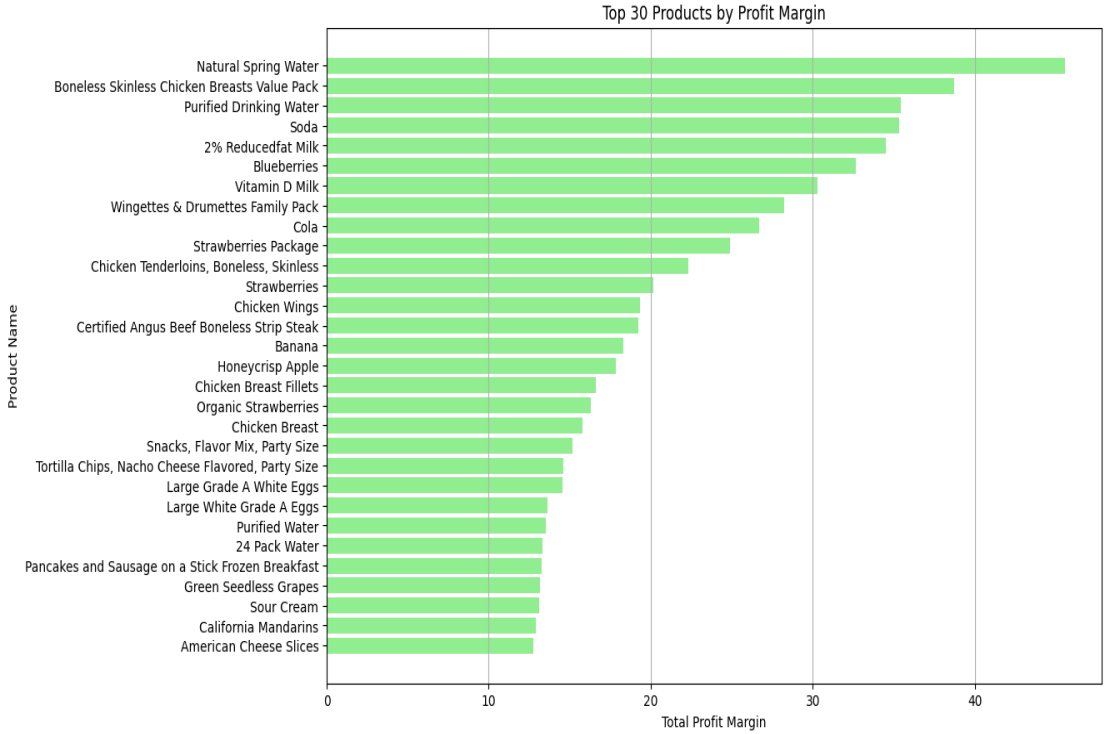
KEY FINDINGS & RECOMMENDATIONS:-

- **Yes, [redacted] can open the new Dark Warehouse**
- Optimal product grouping & fulfillments ensure better profitability - **Total profit value at 4% profit per product at order price is $ 7491.65**
- Fulfilling orders with the least distance to delivery can save 8.0% loss in last mile logistics cost & improve revenue per mile values – It is crucial to **include 571 products that has a delivery distance > 4 miles & the top 5 categories has a revenue per mile >$5**
- Maintain the dark store specific to products of highest demand, order reoccurrence to ensure optimal in-fill rate, inventory planning efficiency & customer satisfaction.

IDENTIFYING ‘GOOD’ ORDERS

- Key Factor 1:- **PROFITABILITY**



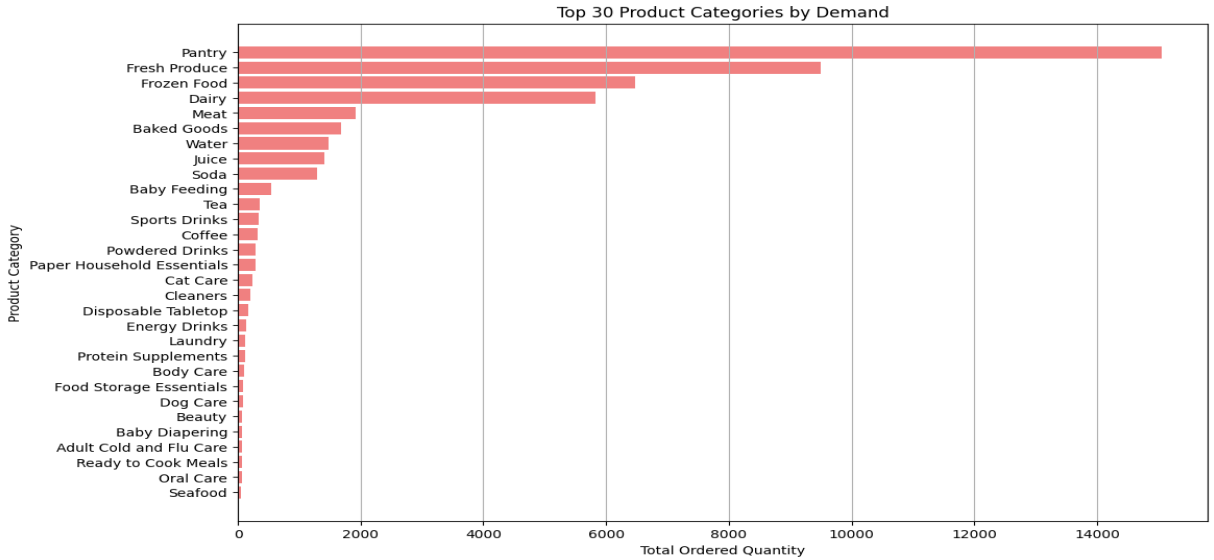


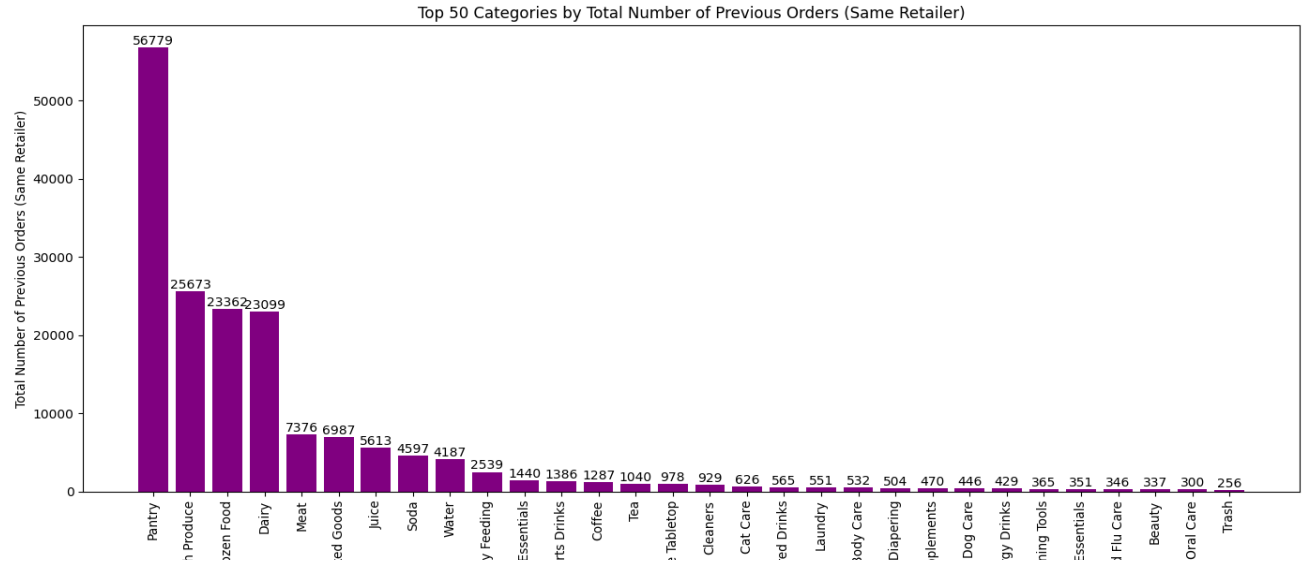
- Profit contributed by first 5 L2_Category is $5739.14 (76.60%) with 5045 products

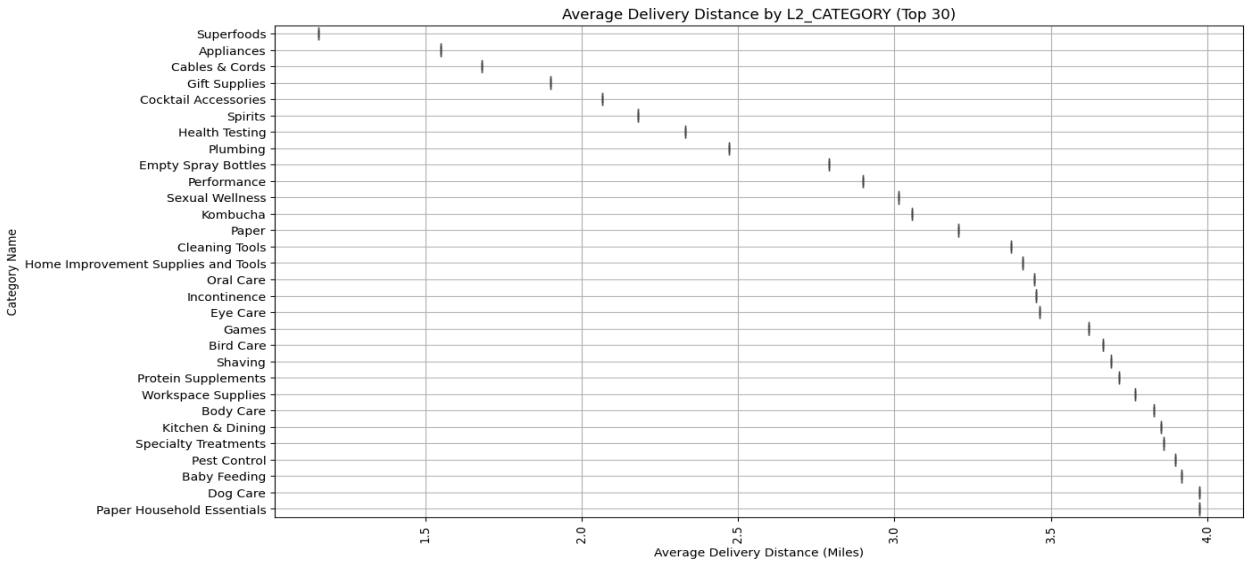
- Profit contributed by the fulfillment of top 30 products = $648.17

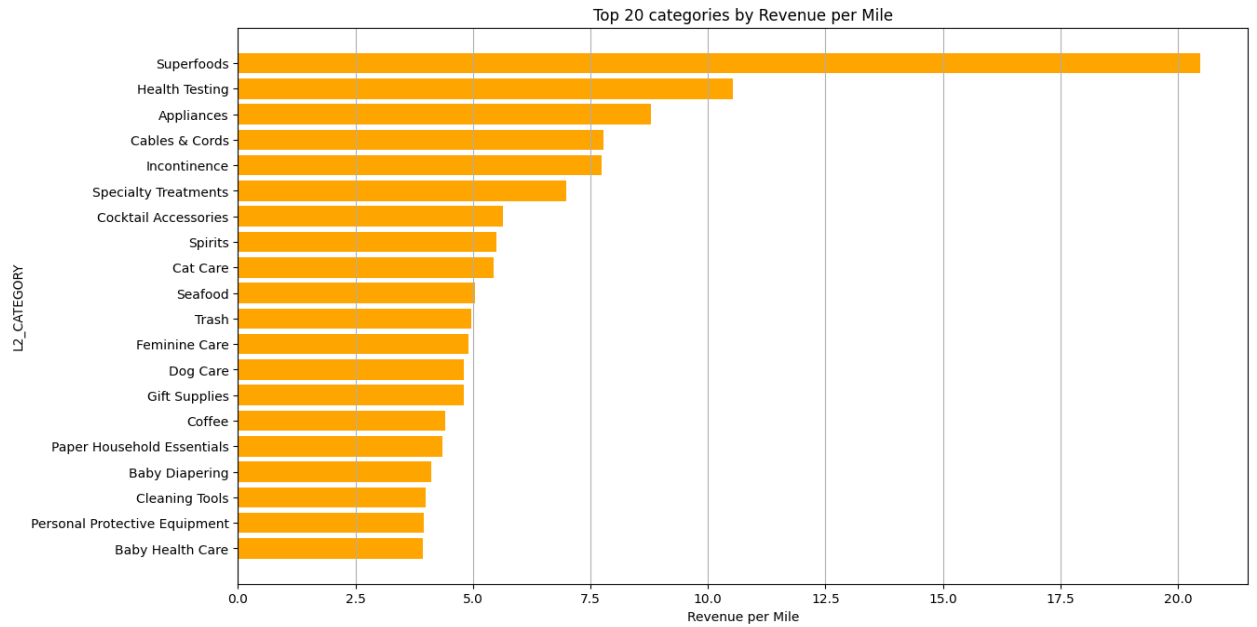
IDENTIFYING ‘GOOD’ ORDERS

- Key Factor :- **ORDER FREQUENCY & EFFICIENCY**









FACTORS OPTIMIZED BY ASSORTMENT

- Focusing on frequent orders categories improves **INVENTORY PLANNING**
- Stocking frequently ordered products offers better in-fill rates & improves **CUSTOMER SERVICE**
- Categories with minimal delivery distance provides better **COST SAVINGS** in **LAST MILE DELIVERY**

CRITERIA FOR PRODUCT SALES

- Product with **HIGH & CONSISTENT DEMAND**
- SKUs with **LONGER EXPIRY & FAST MOVING (BETTER INVENTORY TURNOVER)**
- SKUs with **HIGH ORDER VALUE** to compensate for labor & last mile delivery cost

KEY METRICS FOR WAREHOUSE SUCCESS

1. Profit Margin:

- **Metric:** Profit margin calculated as 4% of ordered price (PROFIT_MARGIN = 0.04 * ORDERED_PRICE).
- **Explanation:** Calculates the profit generated from each product based on the average profit margin.
- **Importance:** Focuses on items that contribute more to the profitability of the warehouse, ensuring better financial returns
- **Reference:** https://www.mckinsey.com/industries/retail/our-insights/achieving-profitable-online-grocery-order-fulfillment

2. Order Frequency and Efficiency:

- **Metrics:** 1. Number of previous orders for the same retailer(NUM_PREVIOUS_ORDERS_SAME_RETAILER).

  2. The average Delivery Distance for products in specific categories (DELIVERY_DISTANCE_FROM_STORE, L2_CATEGORY)
- **Explanation:** Tracks the frequency of items being reordered by the same retailer & the distance to be travelled to make the delivery.
- **Importance:** 1. High recurrence indicates consistent demand, ensuring better inventory management and customer satisfaction.

  2. Lesser distance to delivery improves the on-time delivery rate, reduces last mile delivery cost

COUNTER-METRICS TO MONITOR

1. Pick Rate Analysis:

- **Metric:** Time taken for picking an order inside a warehouse.
- **Explanation:** Tracks operational costs associated with labor & cost of picking.
- **Importance:** Identifies cost-saving opportunities by increasing the number of picks per hour.

2. Stockout Rate:

- **Metric:** Frequency at which items are out of stock.
- **Explanation:** Measures the rate of product unavailability.
- **Importance:** Ensures effective inventory management to meet customer demand.

3. Order Accuracy rate:

- **Metric:** Percentage of orders fulfilled correctly without errors.
- **Explanation:** Tracks the functionality of the system in place at the warehouse.
- **Importance:** Provides insights into areas of picking, packing & shipping process

ADDITIONAL ANALYSIS OPPORTUNITIES

1. Customer Loyalty Index:

- **Metric:** Product of the total number of orders and the variety of unique products purchased by each customer.
- **Explanation:** Measures the loyalty of customers based on their order frequency and diversity of products purchased.
- **Importance:** High customer loyalty index indicates a strong and loyal customer base, ensuring sustained demand and long-term profitability.

2. Demand Forecasting:

- **Description:** Predict future product demand using historical sales data.
- **Tools and Skills:** Time series analysis, machine learning, Python, R, forecasting software.

QUESTIONS