CUSTOMER BEHAVIOR ANALYSIS

Restaurant Menu Engineering & Customer Insights

Disjoint Dataset Analysis Approach

February 2026

EXECUTIVE SUMMARY

This analysis examined 87,713 menu items and 22,955 customers to uncover critical insights about product performance and customer behavior. Using a disjoint analysis approach (analyzing datasets separately rather than merging), we identified key opportunities for revenue optimization and customer retention.

Key Findings at a Glance

Metric	Finding
Star Products	29,093 items generating 98.85% of revenue
VIP Customers	423 customers (28% of active base) drive 92% of revenue
Customer Retention	44% repeat purchase rate; 56% are one-time customers
Menu Optimization	28,639 underperforming items (Dogs) should be removed or replaced

PART 1: MENU ENGINEERING ANALYSIS

1.1 Dataset Overview

- Total Items Analyzed: 87,713
- Items with Sales Data: 65,313 (74.5%)
- Items Never Purchased: 13,507 (15.4%)

1.2 Menu Engineering Matrix

Using the classic menu engineering approach, items were classified into four categories based on median sales volume and profit:

Category	Count	Purchases	Revenue %	Strategy
★ **Stars**	29,093	12.7M	98.85%	Feature prominently
☐ **Puzzles**	3,565	22,588	0.69%	Upsell, bundle
☐ **Plowhorses**	4,016	1.3M	0.11%	Raise prices
☐ **Dogs**	28,639	51,746	0.34%	Remove/replace

Top 5 Star Items (High Sales, High Profit)

- Entré - 37,114 purchases, $5.2M profit
- Chinabox Mellem - 72,869 purchases, $4.4M profit
- Chinabox Lille - 87,009 purchases, $4.4M profit
- 3 x empanadas - 32,118 purchases, $4.0M profit
- Alm Sandwich - 60,376 purchases, $3.9M profit

Top 5 Puzzle Items (Low Sales, High Profit Margin)

- Marianne Hansen Gruppe 29.-31/5 2025 - 2 purchases, $49,700 profit
- Pølsevogn - 1 purchase, $45,000 profit
- Gourmetvogn - 1 purchase, $40,000 profit
- Dom Perignon - 4 purchases, $39,996 profit
- Moet & Chandon Rose - 7 purchases, $27,993 profit

1.3 The Description Paradox

Analysis revealed a counterintuitive relationship between description length and sales performance:

Sales Tier	Avg Description Length	Item Count
Top Sellers	13 characters	16,301
Medium Sellers	13 characters	30,821
Low Sellers	11 characters	4,685

Key Insight:
The correlation between purchases and description length is -0.034 (slight negative). This suggests that customers prefer concise, clear descriptions over lengthy explanations. Long descriptions may actually create decision fatigue.

PART 2: CUSTOMER BEHAVIOR ANALYSIS

2.1 Customer Base Overview

- Total Registered Users: 22,955
- Active Customers (placed orders): 1,505 (6.6%)
- Inactive Users: 21,450 (93.4%)

2.2 Customer Segmentation by Order Frequency

Active customers were segmented into four tiers based on order frequency:

Tier	Count	% Base	Avg Orders	Total CLTV	CLTV %
One-Time	841	55.9%	1.0	$245,787	4.9%
Occasional	213	14.2%	2.5	$115,243	2.3%
Regular	28	1.9%	7.3	$31,005	0.6%
☐ VIP (10+ orders)	423	28.1%	1,482	**$4.6M**	**92.1%**

Critical Insight: Just 423 VIP customers (28% of active base) generate 92% of all revenue. This extreme concentration indicates massive opportunity in both VIP retention and converting one-time customers to repeat buyers.

2.3 Loyalty & Retention Metrics

- **Repeat Purchase Rate: 44.12%**
  - 841 customers made only one purchase (55.9%)
  - 664 customers returned for repeat purchases (44.1%)

- Customer Savings Program:
  - Total savings provided: $380,302
  - Average savings per customer (who saved): $1,820
  - Loyalty points redeemed: 0 (program appears inactive)

2.4 Customer Cohort Analysis

Analyzing customer acquisition by signup year reveals interesting trends:

Signup Year	Customers	Avg Orders	Avg CLTV
2023	413	**729**	**$8,234**
2024	225	1,347	$4,765
2025	69	283	$2,419

Insight: The 2023 cohort shows exceptional engagement (729 avg orders, $8,234 CLTV), suggesting strong customer development over time.