

Smart Recommendations Engine for Wings R

Optimizing Every Cart – One Choice at a Time



The Problem

Personalized recommendations are an untapped opportunity in the QSR industry, with the potential to boost customer satisfaction, basket size, and retention. Despite a loyal customer base and rich order history, Wings R Us lacks a robust, data-driven system for relevant add-on suggestions, limiting cross-sell potential and leading to repetitive recommendations.

Impact

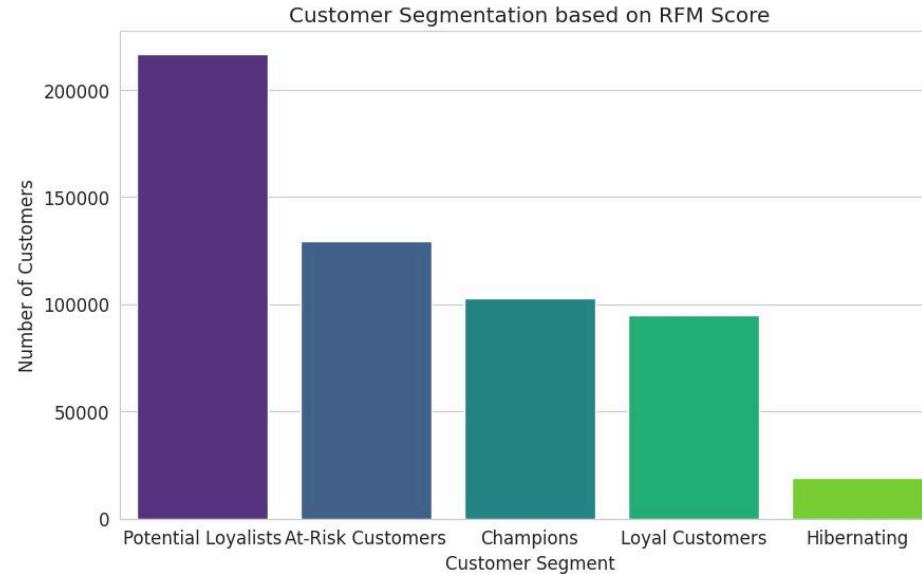
- For Customers: Less engaging ordering experience, missed discovery of new menu items, and reduced perceived value from the brand.
- For Wings R Us: Lower average order value, underutilized product lines, reduced loyalty engagement, and lost competitive advantage in a crowded QSR market

- **Exploratory Data Analysis (EDA):** Analyzed ~1.4 M past orders to uncover customer purchase patterns, frequently co-occurring items, and seasonal demand trends.
- **Predictive Modeling:** Developed item-based collaborative filtering and ALS models to generate top-3 recommendations per cart, targeting $\geq 30\%$ Recall@3 accuracy.
- **Personalization Strategy:** Designed a scalable approach that adapts to customer type (first-time vs. loyal), avoids repetitive suggestions, and balances popularity with novelty.
- **Pilot Implementation Plan:** Proposed a low-risk, cross-platform pilot for app, website, and kiosks to validate uplift in basket size and engagement before full rollout.

The Outcomes

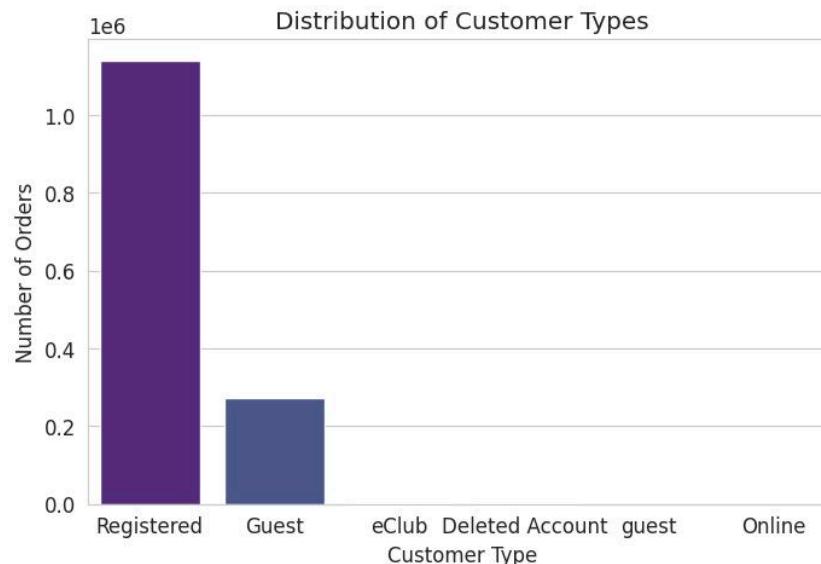
EDA

Customer Segmentation



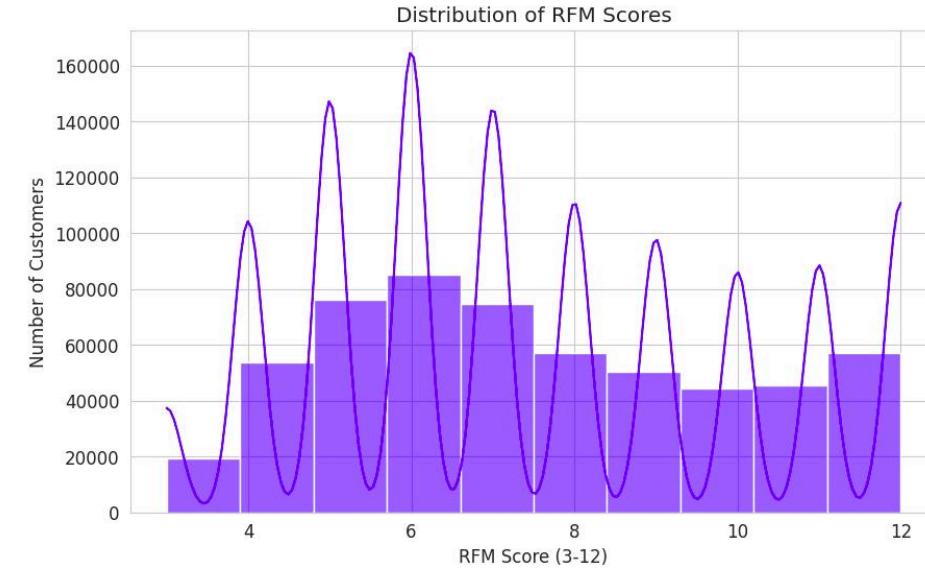
- **Potential Loyalists** largest group (~200k)
- **Champions & Loyal Customers** valuable, At-Risk need reactivation

Customer Type Distribution



- **Registered users** dominate all top products.
- **Guests contribute much less volume**

RFM Score Distribution



- **Most customers in mid-range (5-7) → room to boost high-value scores.**

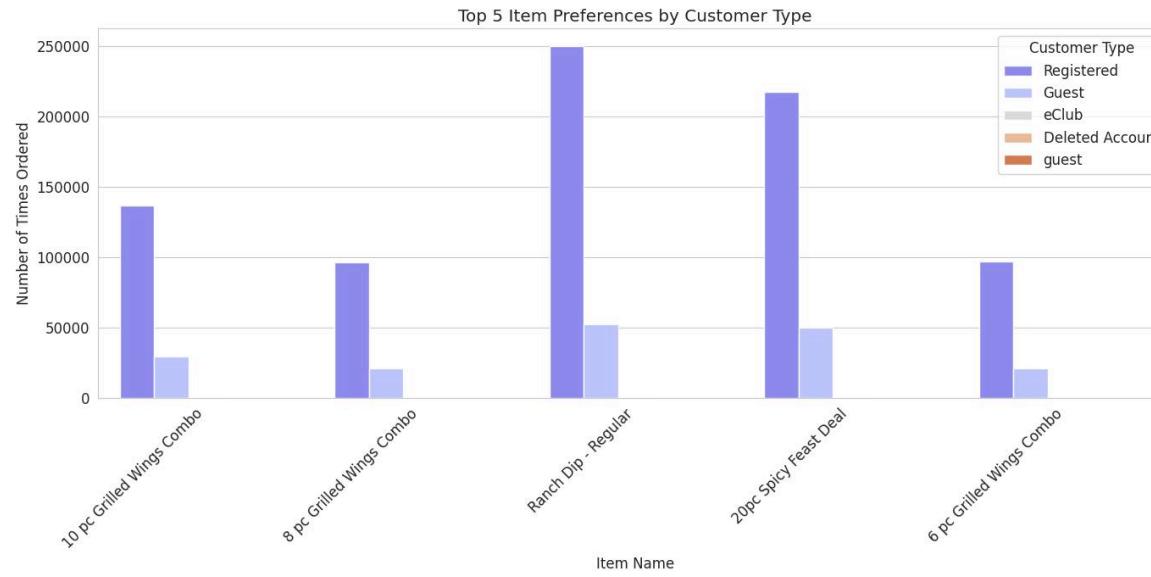
Order Occasion (To-Go vs Delivery)



- **To-Go ~86% of all orders, Delivery is smaller share**

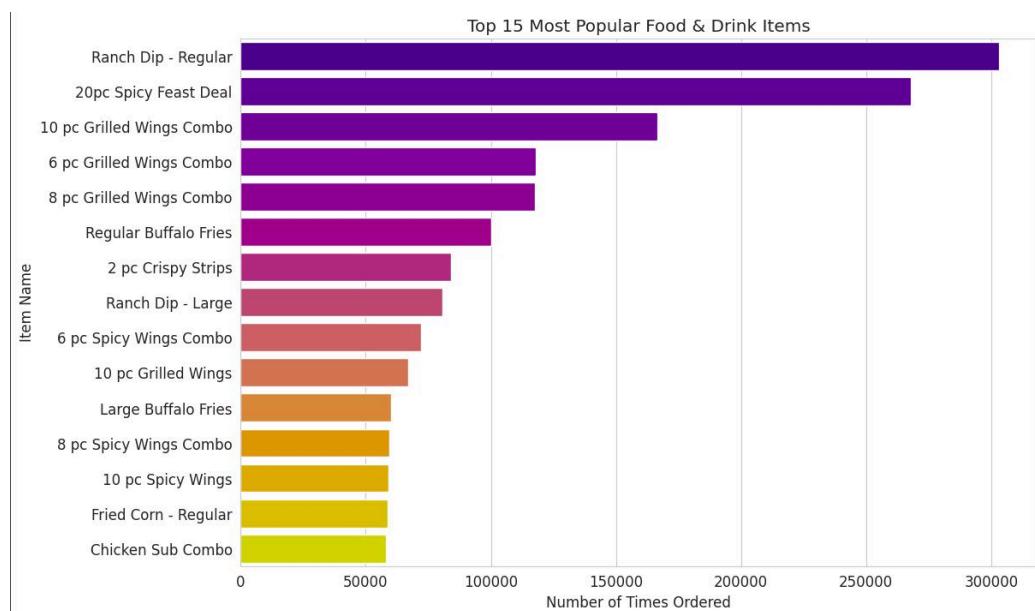
EDA contd...

Top 5 Item Preferences by Customer



- Registered users dominate all top products

Top 15 Most Popular Items



- Ranch Dip, Spicy Feast, Grilled Wings lead.
- Many are sides/combo deals.

Orders by Day of the Week

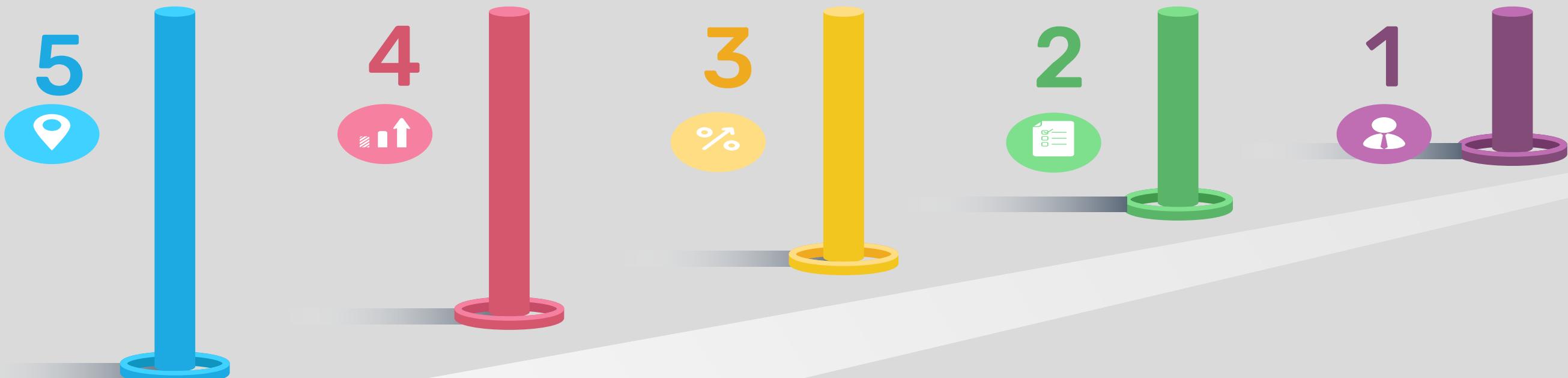
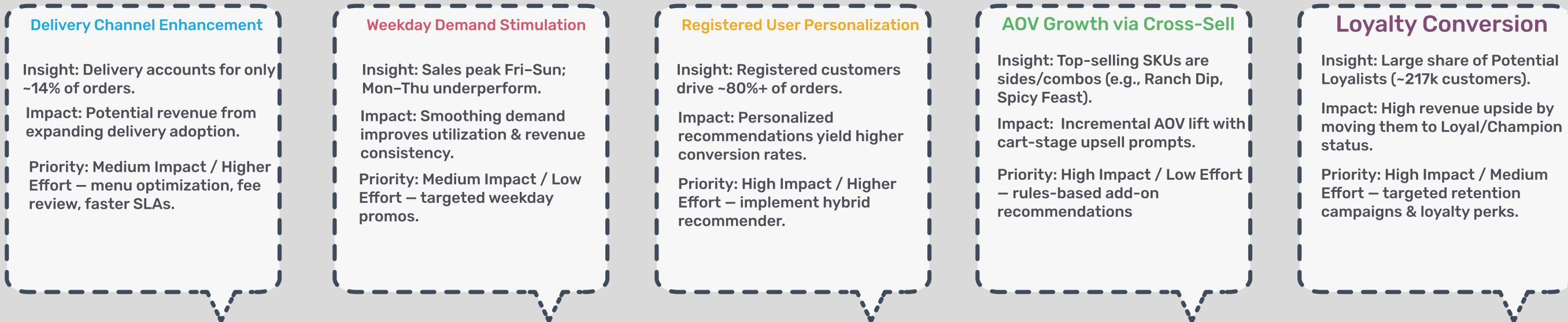


- Friday highest sales, weekend stronger than weekdays.

Root Cause Analysis

- Many Potential Loyalists - retention triggers missing.
- Mid-range RFM - not enough upsell/repeat purchase push.
- Guests low orders - lack of personalization & re-engagement.
- TX dominates - other states under-leveraged.
- Weekend peaks - weekdays lack strong pull.
- Sides/combos lead - cross-sell potential untapped.
- Delivery low share - menu/fees/time barriers.

Key Opportunities & Problem Prioritization



Model Approach & Performance

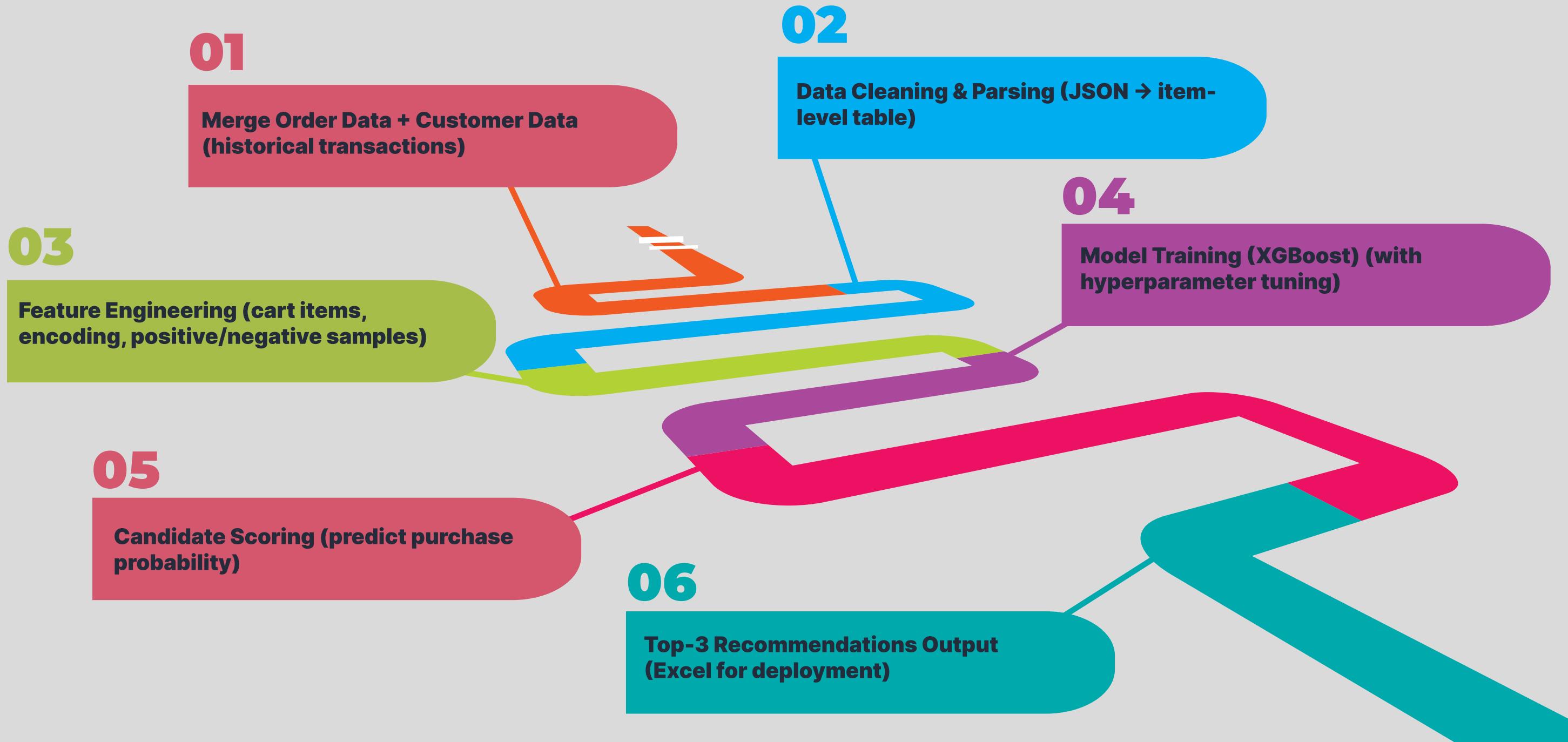
Model Approach

- Goal: Predict top-3 items for each cart.
- Prep: Parse JSON orders → clean names → remove non-food items.
- Features: Encode items, take first 3 cart items, create positive & negative samples.
- Model: XGBoost Classifier + RandomizedSearchCV tuning.
- Logic: Score candidates, rank by probability, output top-3.
- Deliverable: Excel sheet with recommendations.

Classification Report

- Accuracy: 97%
- Precision: 0.97 (both classes)
- Recall: 0.98 for negatives, 0.96 for positives
- F1-score: ~0.97–0.98
- Balanced, high performance across both purchased and non-purchased classes.

Recommendation System Logic Flow



Pilot Plan

Week 1

Deploy

- Launch in TX stores & Online To-Go
- Integrate recommendations into the Point-of-Sale (POS) system or User Interface (UI)

Week 2

Monitor

- Track key metrics: Average Order Value (AOV), and Add-to-Cart rate.
- Collect qualitative feedback from staff and customers to assess recommendation usefulness.

Week 3

Analyze

- Compare results across control, rules-based, and AI model groups.
- Evaluate KPI uplift in AOV, Add-to-Cart rate, and Recall@3 to measure impact.

Week 4

Decide

- Choose which approach (control, rules, or AI model) performed best during the pilot.
- Create a step-by-step rollout plan starting with a few more stores or regions, then expanding company-wide if results stay strong

Recommendations

1 Pilot & Deployment Strategy

- Run 2–4 week A/B test in high-volume Texas stores + Online To-Go.
- Compare baseline, rules-based, and model-based (XGBoost) recommendations.

2 Personalization via RFM

- Target Potential Loyalists with upsells/loyalty perks.
- Keep Champions engaged with premium/new items.
- Win back At-Risk/Hibernating customers with tailored offers.

3 Cross-Sell & Demand Boost

- Recommend high-attach items (dips, drinks, sides) in-cart.
- Offer weekday promotions and bundle deals to increase AOV and balance traffic.

4 Pilot & Deployment Strategy

- Launch the recommendation engine in high-volume Texas stores and the online To-Go channel.
- Run a 2–4 week A/B test: baseline (no recs), rules-based (association rules), and model-based

Meet Our Team



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Thank You