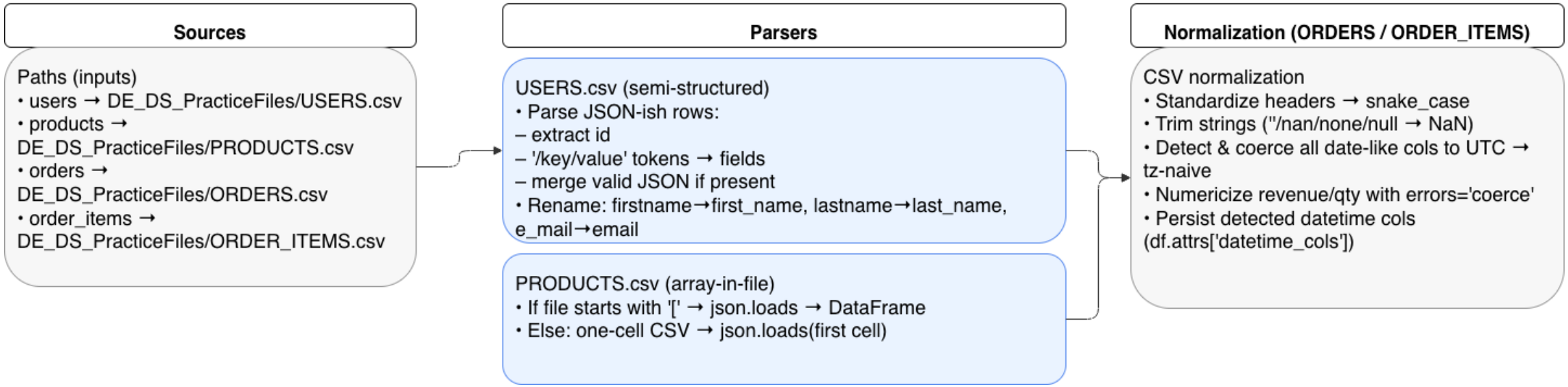
Presented By Yi He

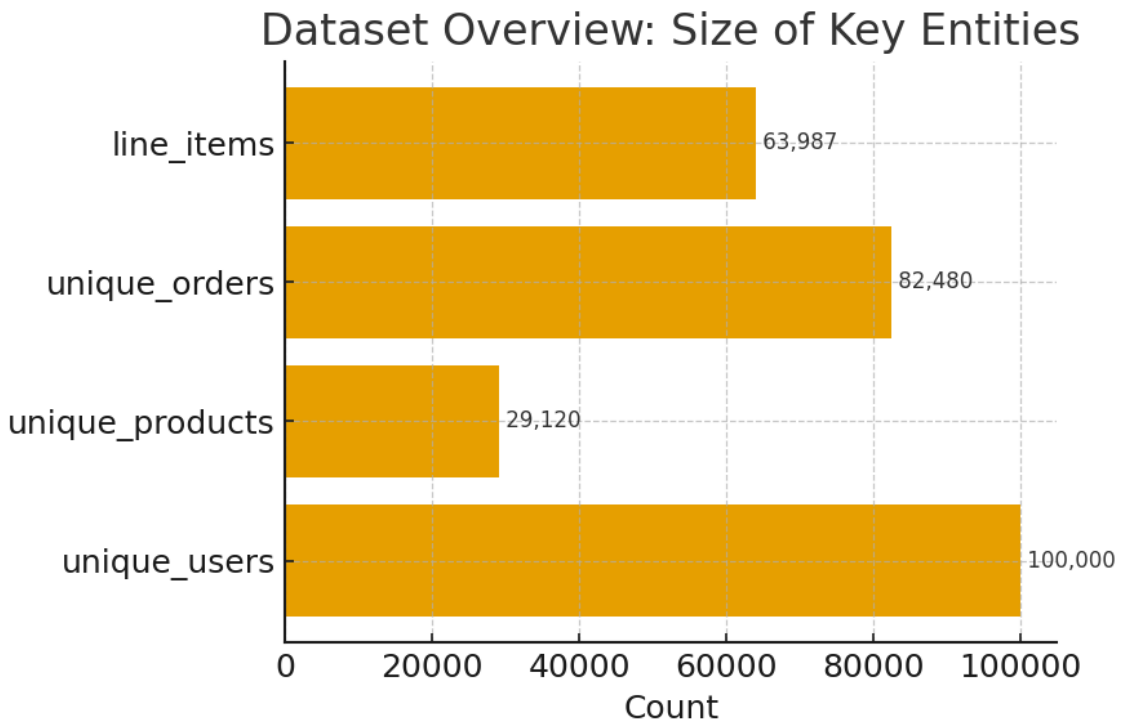
Loyalty & Growth

Data Ingestion & Parser Strategy



Dataset Overview

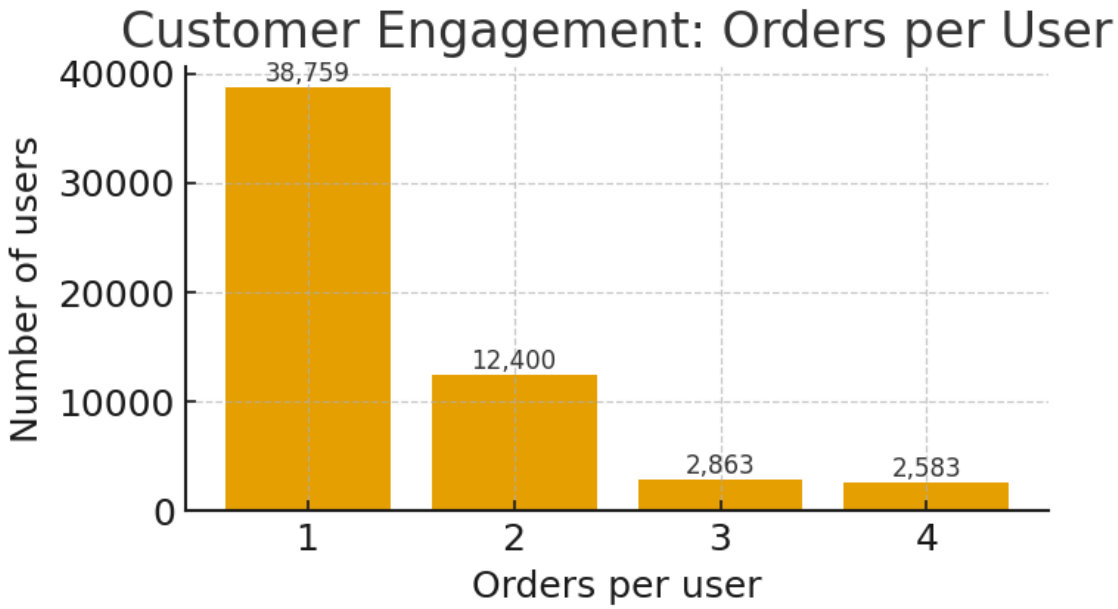
- A total of **100,000 users** have placed **82,480 orders** involving **29,120 products**.
- The dataset contains **63,987 line items**, providing detailed insights at the product level.
- Overall revenue amounts to **572,956.67**, with an **average order value of approximately 6.95**.
- This volume is adequate for conducting **segmentation, customer lifetime value (CLV), and churn analysis** without excessive data sparsity.



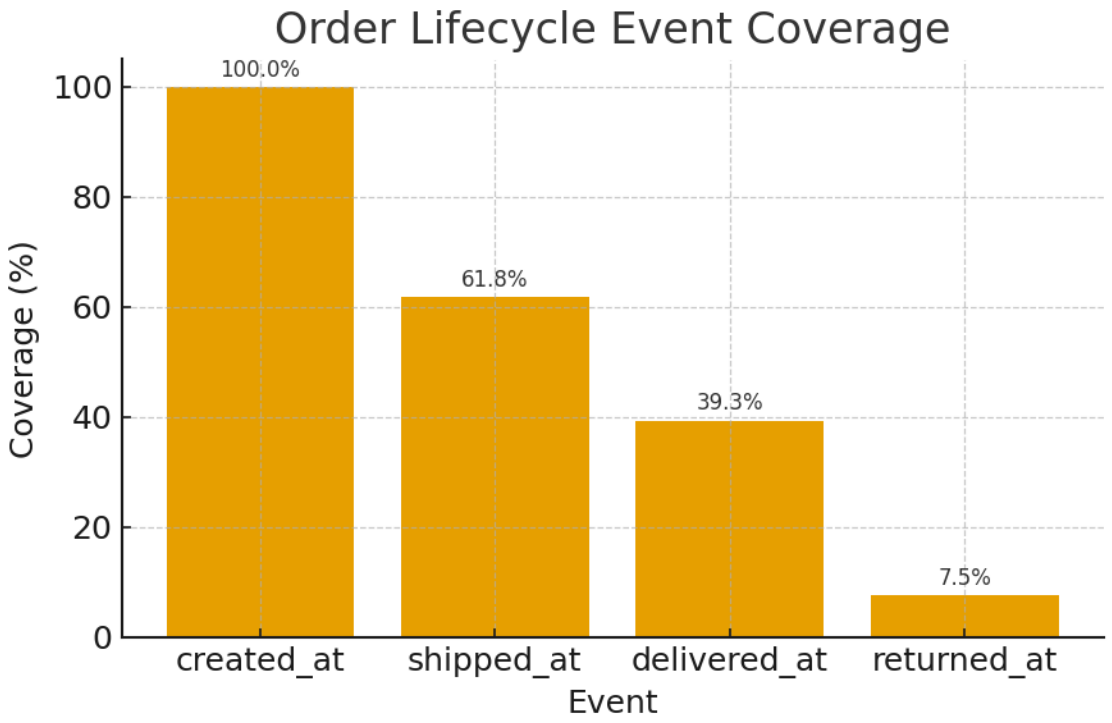
- Start: **2019-01-10**
- End: **2025-08-27**
- Span: **2,422 days ≈ 6.63 years**

Customer Engagement: Orders per User

- Most users are **one-time buyers**:
- **68%** place **1 order**, **22%** place **2 orders**.
- Only **~10%** place **3+ orders**.
- Average orders/user ≈ **1.46**, median = **1**, 90th percentile = **2**.
- This is a **low-frequency purchase environment** with a **long tail of repeat buyers**.



Order Lifecycle Event Coverage



Counts & conversions

- **Created:** 82,480 (100%)
- **Shipped:** 50,937 (**61.76%** of all)
- **Delivered:** 32,426 (**39.31%** of all; **63.66%** of shipped)
- **Returned:** 6,193 (**7.51%** of all; **19.10%** of delivered)

What to say

- Most loss occurs before shipment; a fifth of delivered orders are later returned—optimize fit/size guidance and exchange-first policies.

Medians (days)

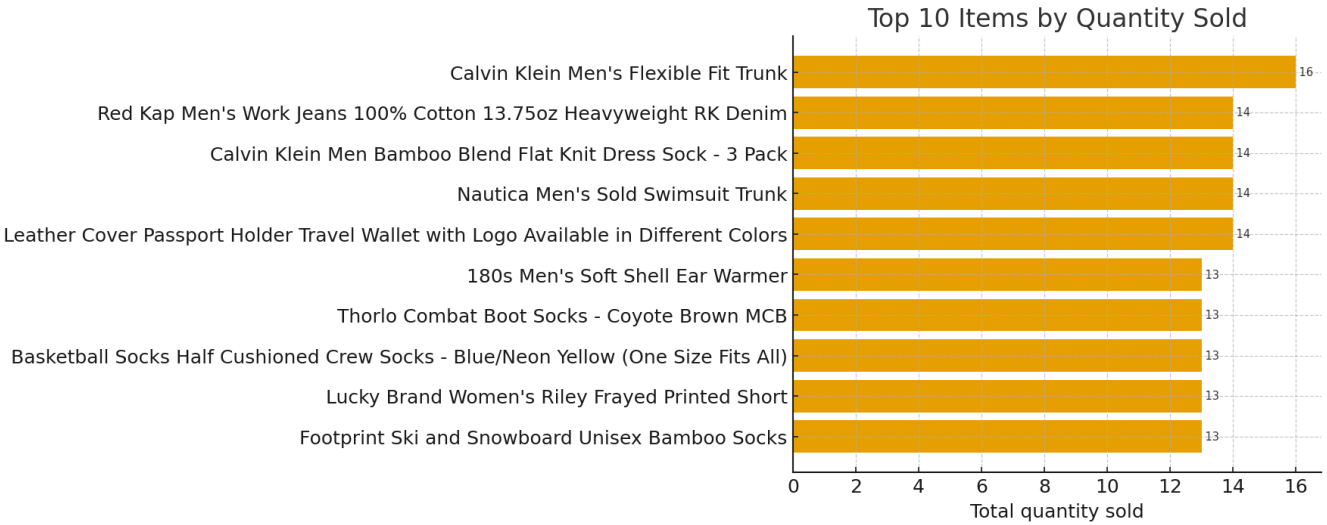
- **created → shipped: 1.50 d**
- **shipped → delivered: 2.48 d**
- **delivered → returned: 1.47 d**

What it means

- Typical door-to-door ~4 days; any corridor well beyond ~5 days is a likely churn risk.
- Returns cluster quickly after delivery; prioritize exchange-first flows.

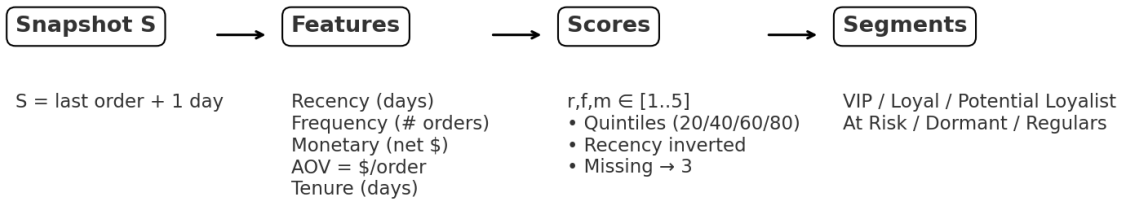
Top Items

- Best-selling SKUs include a mix of underwear, jeans, dress socks, swim trunks, and travel accessories.
- Quantities are quite close (13–16 units in the top 10), suggesting no single runaway SKU in this slice.
- This indicates a long-tail catalog where many items sell moderately rather than one product dominating.
- Customer: Karen Mason (ID 406) — AOV $113.88, 1 order, revenue $113.88 2B Buckle V-neck Sweater (ID 1051)



Customer Segmentation

RFM Segmentation Flow



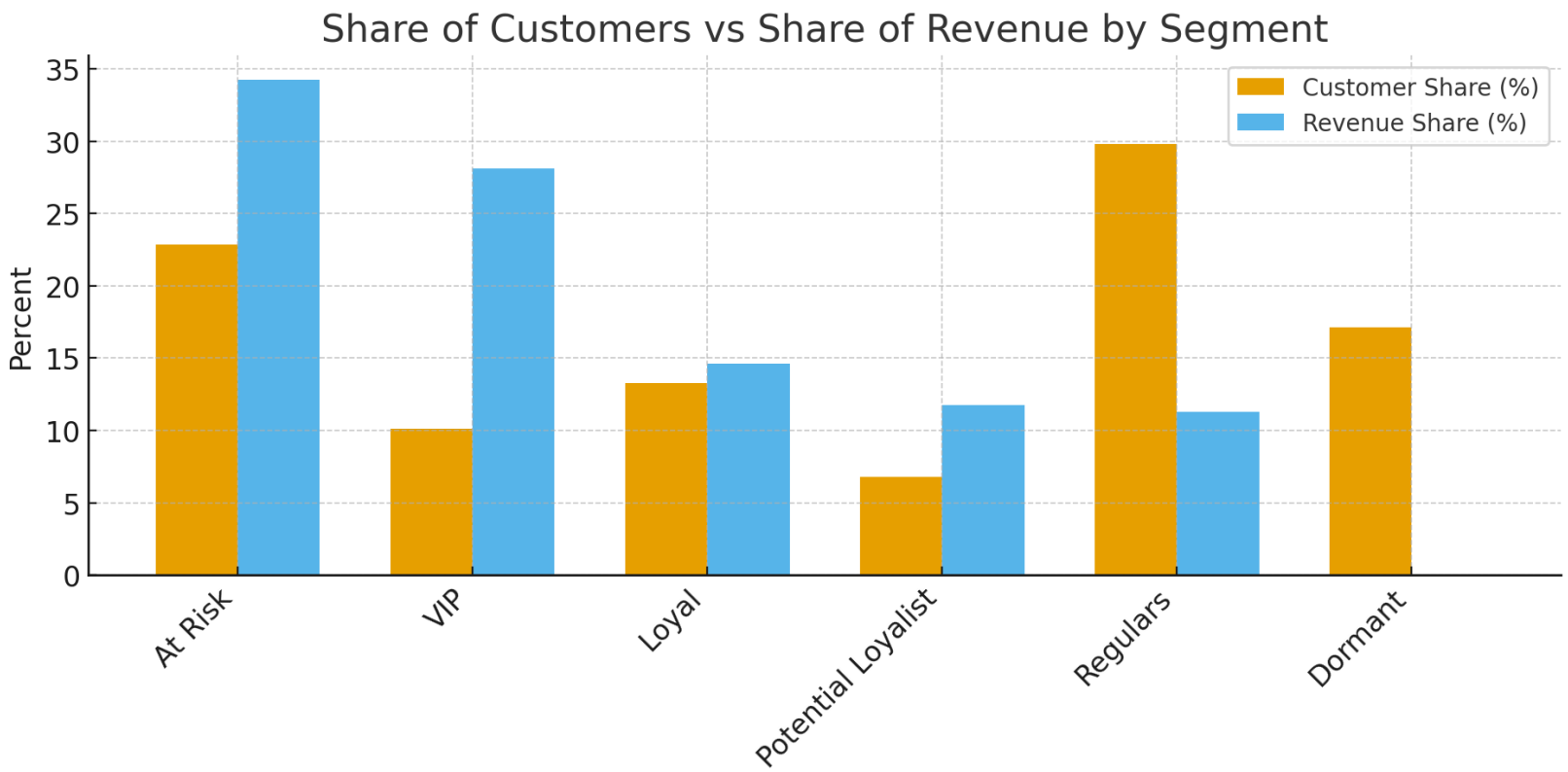
Segment Rules (apply in this order; first match wins)

Segment	Rule (r,f,m are 1..5)
VIP	r ≥ 4 AND f ≥ 4 AND m ≥ 4
Loyal	r ≥ 4 AND (f ≥ 4 OR m ≥ 4)
Potential Loyalist	r ≥ 3 AND f ≥ 3
At Risk	r ≤ 2 AND (f ≥ 3 OR m ≥ 3)
Dormant	r ≤ 2 AND f ≤ 2 AND m ≤ 2
Regulars	all others

Scoring: quintiles at 20/40/60/80. Recency is inverted (lower is better). Missing → score 3.

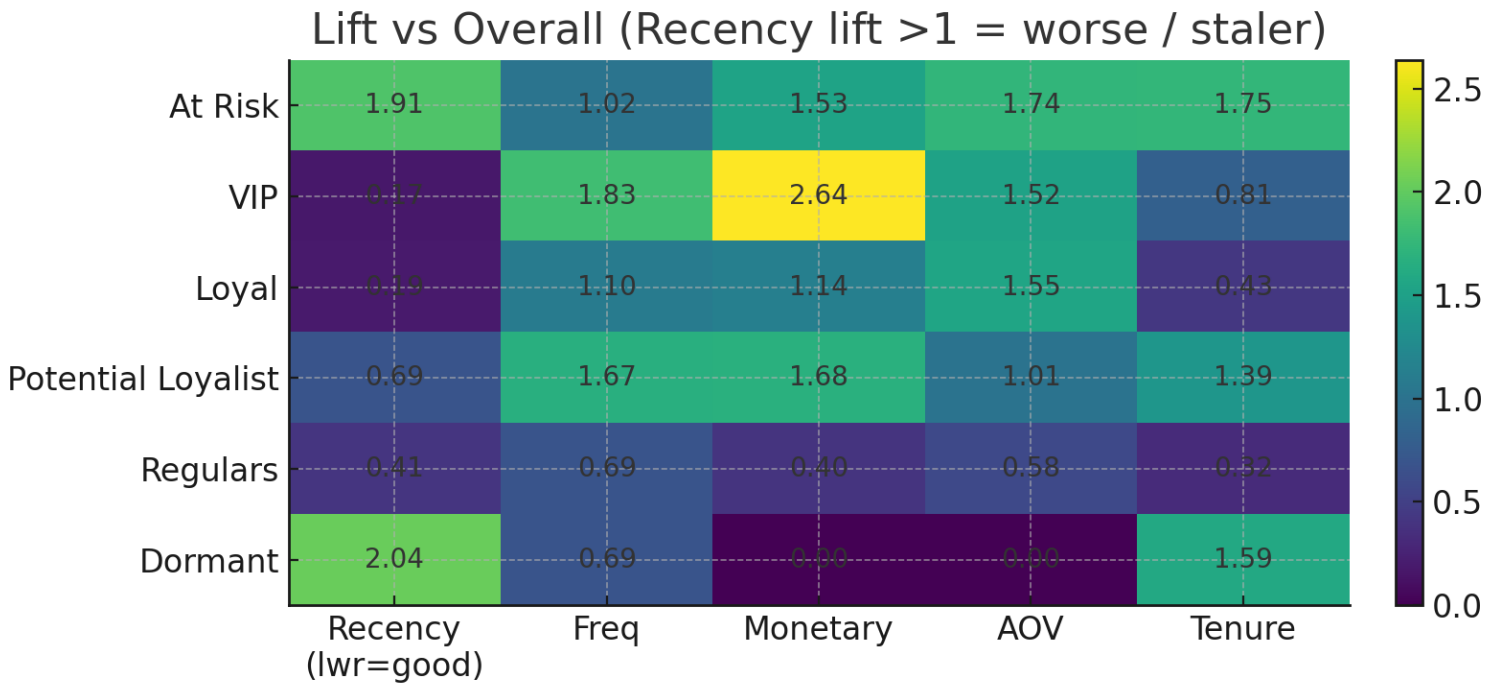
Customer Segmentation – Shares of customer vs. share of revenue

- **VIP**: only **10%** of customers but **28%** of revenue; **highest frequency** (+83%) and **monetary** (+164%) vs overall.
- **At Risk**: **23%** of customers and **34%** of revenue; **very stale recency** (×1.91 worse), yet **AOV** +74% and **monetary** +53%.
- **Regulars**: nearly **30%** of customers but only **11%** of revenue (low frequency and spend).
- **Dormant**: **17%** of customers, **0%** revenue in the window (stale and inactive).



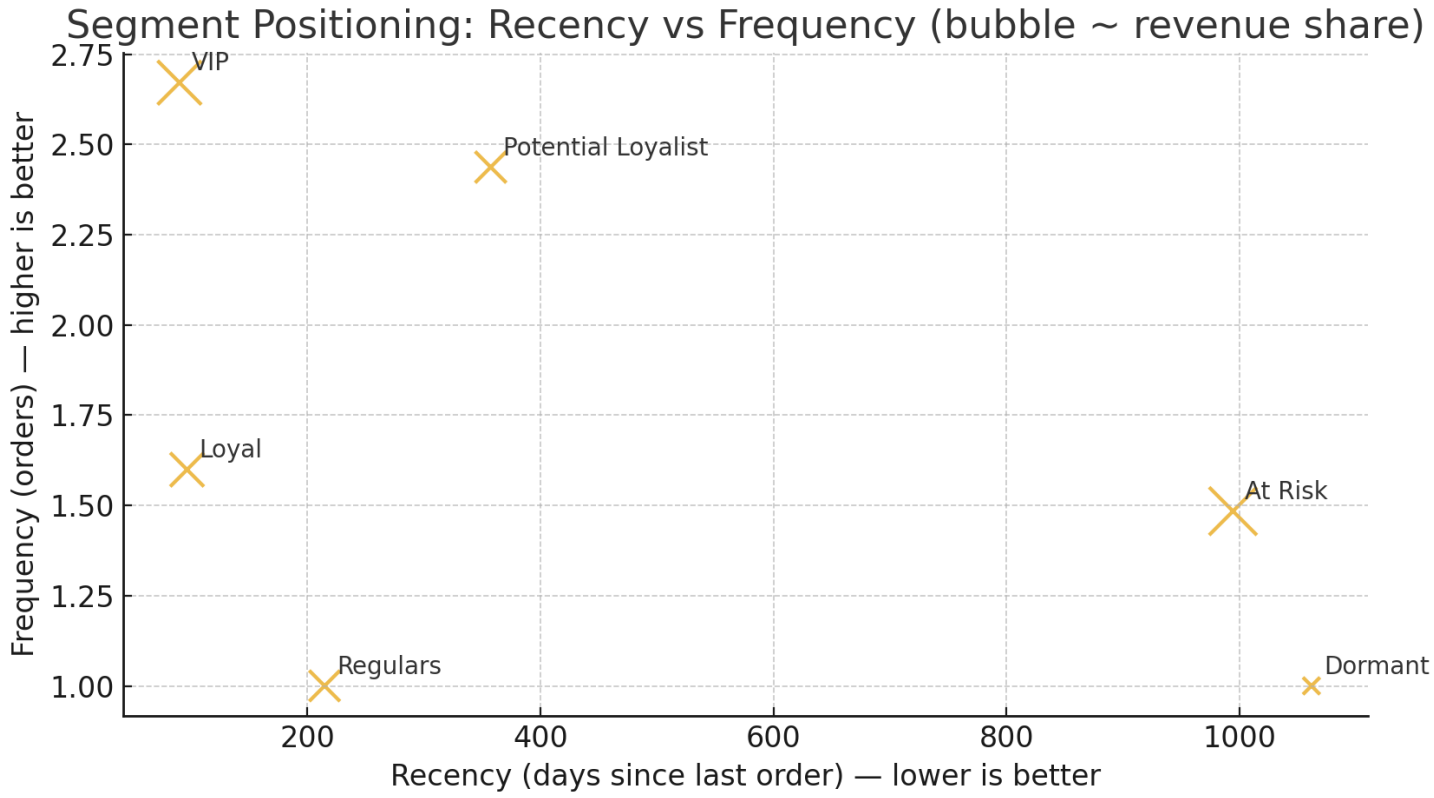
Segmentation- Lift vs. Overall

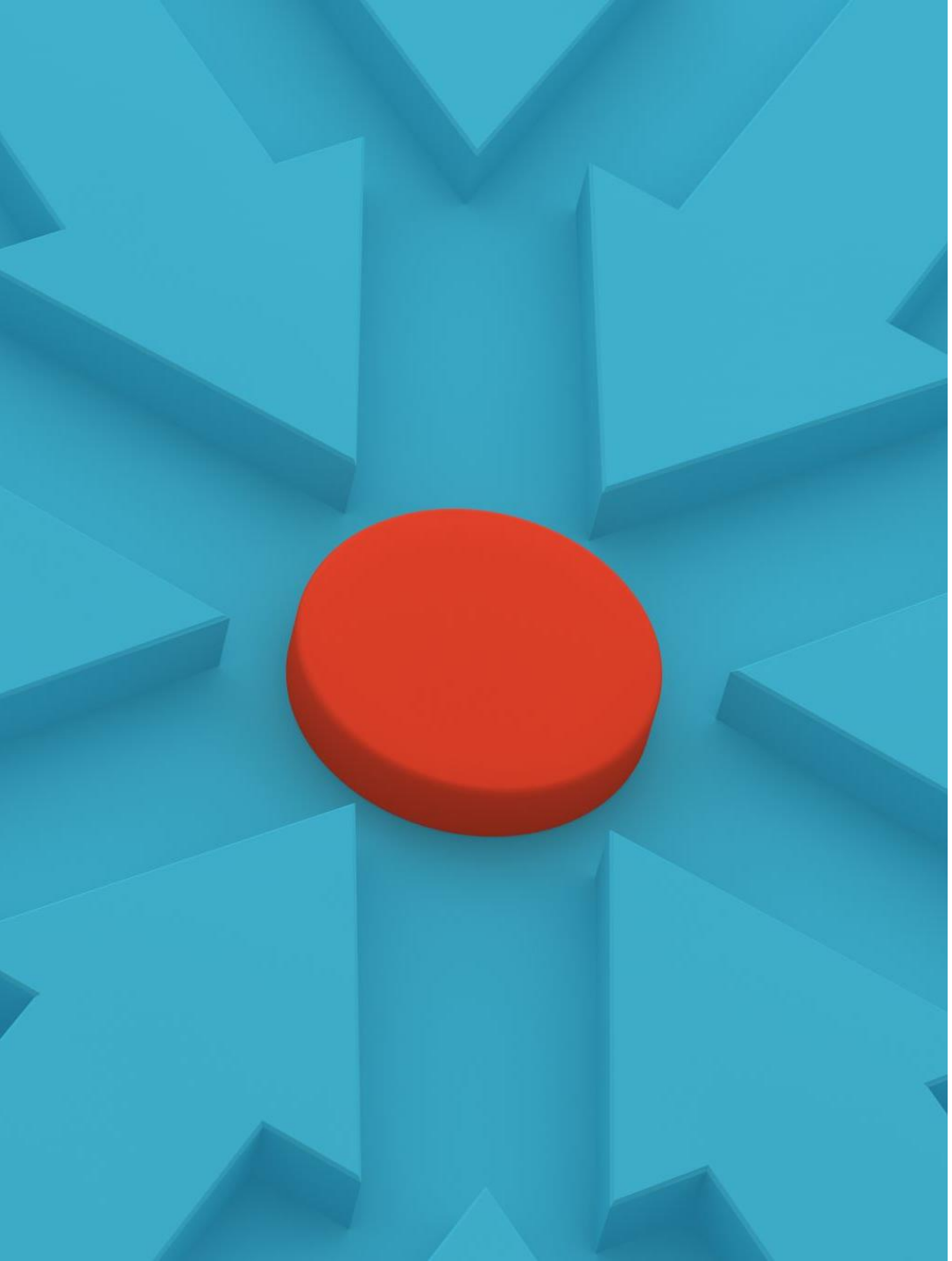
- **What it is:** a **ratio** comparing a segment's average to the **overall dataset** average for that metric.
- **Formula:** lift = segment_mean / overall_mean.
- **Interpretation:**
  - **> 1.0** = above average; **< 1.0** = below average.
  - **Recency exception:** lower is better (more recent), so **recency lift < 1.0 is good**, **> 1.0 is worse/staler**.
- **Examples from your table:**
- **At Risk:** AOV lift = 1.74 → their average order is **74% larger** than the overall average; Recency lift = 1.91 → they are **~91% staler** than average.
- **VIP:** Frequency lift = 1.83 and Monetary lift = 2.64 → VIPs buy **83% more often** and spend **2.64×** as much as the average customer.
- **Regulars:** Frequency lift = 0.69, Monetary lift = 0.40 → lower engagement and lower value than average.



Segment Position: Recency vs. Frequency

- **VIP:** low recency (~90d) + high freq (~2.7) with a big bubble (~28% revenue) → protect & grow.
- **At Risk:** very high recency (~995d) + mid-low freq (~1.48) but **largest bubble (~34%)** → biggest **save** opportunity.
- **Regulars:** mid recency (~215d), freq = 1, small revenue share → prime for **2nd-order accelerator**.
- **Loyal / Potential Loyalist:** fresher than average, decent frequency → upgrade to VIP with bundles/early access.
- **Dormant:** extremely stale (~1062d), freq = 1, zero window revenue → **suppress** broadly; selective win-back only if past spend was high.





Predictive

- Baseline (probabilistic): BG/NBD estimates E[#purchases] + Gamma–Gamma for E[AOV] ⇒ baseline CLV.
- Tweedie GLM (one-stage ML): predicts 90-day revenue from RFM, engagement (weekend/evening/morning shares, avg order hour), tenure, age/gender/country. Handles zeros + skew.
- Two-Stage:
- Logistic: estimate P(buy) in 90 days (handles extreme imbalance).
- Gamma (or Tweedie p≈2): estimate E[$ | buy] on positives.
- CLV_2stage = P(buy) × E[value | buy].
- Blend: validate a simple weight to combine baseline + ML for stability.

Predictive CLV — Results Summary

Classifier (P(buy))

PR-AUC (AP): 0.018

P@1%: 0.000 | P@5%: 0.014 | P@10%: 0.007

Two-Stage CLV (p × m)

MAE: 9.324

RMSE: 10.873

Median APE (non-zero): 0.612

Top-Decile Actual $/Cust

Blend: 0.186

Two-Stage: 0.371

↑ Higher is better (ranking power)

How We Boost Loyalty & Sales

- **At-Risk Save (largest ROI):** trigger at **0.75×** personal window; **value-add first**, then a small capped voucher (≤ **10–15% of CLV_90d**).
- **Second-Order Accelerator:** nudge **IPT + 7d**; starter bundles; free-ship threshold slightly **above AOV**.
- **VIP Protection:** early access, **exchange-first** returns, 2-day SLA — avoid blanket discounts.
- **Ops → Loyalty:** reduce **ship→deliver** in slow corridors; address high-return categories with fit guidance.
- **Offer governance:** cap incentives by **min(margin × CLV_predicted, max_offer)**

8-Week Plan & Owners

Weeks 1–2: finalize *orders_completed*, RFM & risk windows; generate CLV_2stage scores weekly; define D10/D20 audiences.

Weeks 3–6 (Experiments):

- A/B At-Risk Save ladder (value-add vs value-add+voucher).
- A/B 2nd-Order timing (IPT vs IPT+7d) + basket threshold.
- Geo pilots for CN/US/BR with localized creative.

Weeks 7–8: scale winners; push ops fixes (SLA, returns friction).

KPI guardrails: GM%, CAC/ROAS, complaint rates.