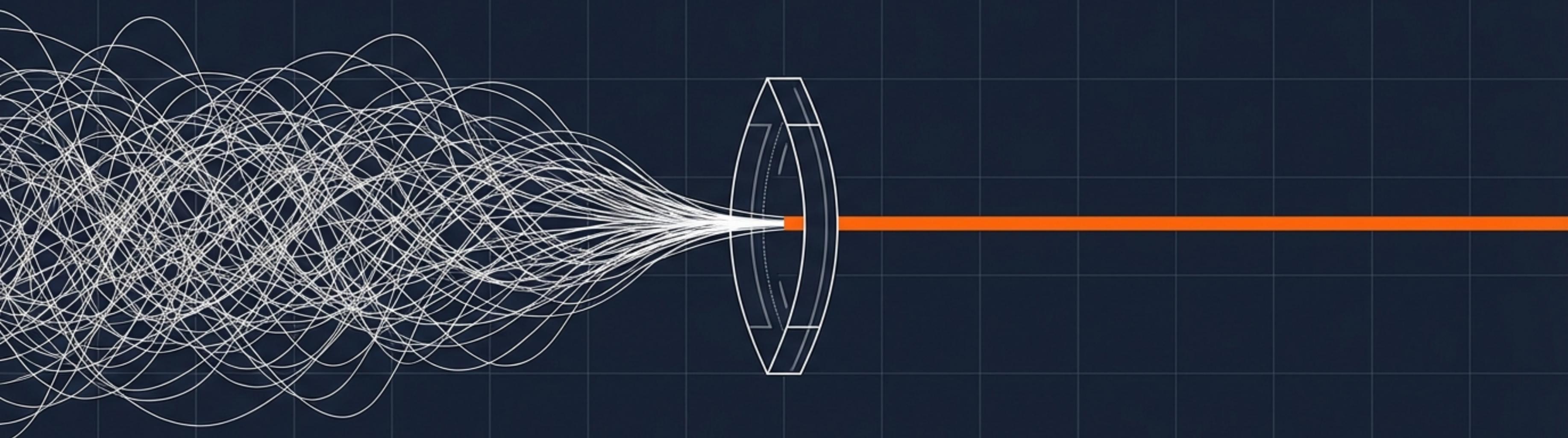


Precision Banking: Predicting Term Deposit Subscriptions

An Evidence-Based Strategy to Reduce Campaign Volume by 70% While Maintaining Revenue



The Bottom Line: Efficiency Through Intelligence

The current “call everyone” approach fails 9 out of 10 times. By shifting to a predictive ranking model, we transform a marketing cost center into a strategic asset.

70%

Reduction in Wasted Effort

Volume reduction achievable by targeting only top-tier leads.

11%

Current Conversion Rate

9/10 calls currently generate zero revenue.

4X

Catch Rate Improvement

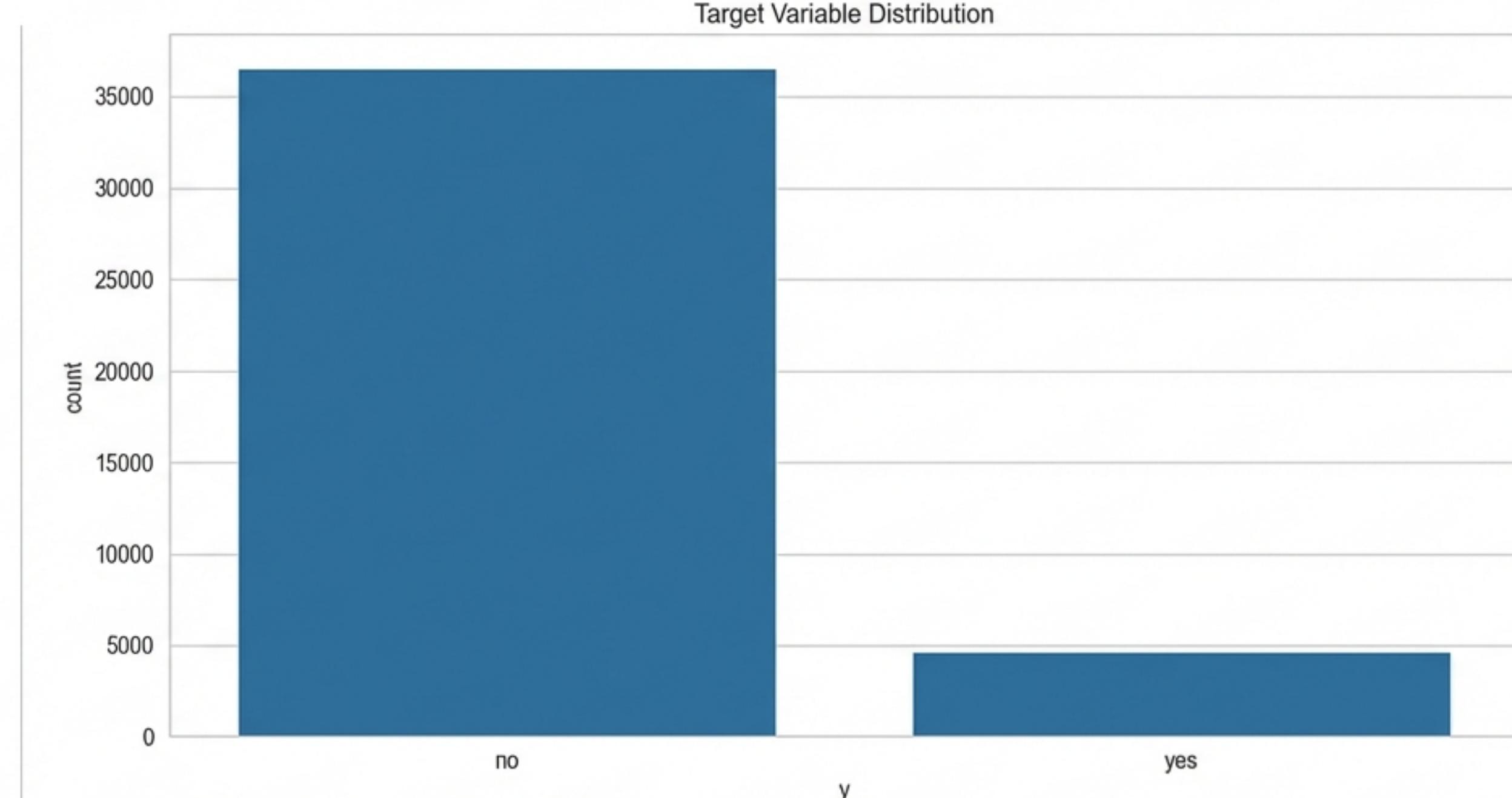
Model efficiency vs. random calling.

The Inefficiency of ‘Spray and Pray’

We are searching for a needle in a haystack. Out of 41,188 interactions, only 4,640 were successful.

The Imbalance:
88.7% of contacts
result in a refusal.

The Cost: 36,548
unsuccessful
calls consuming
agent time and
telephony budget.

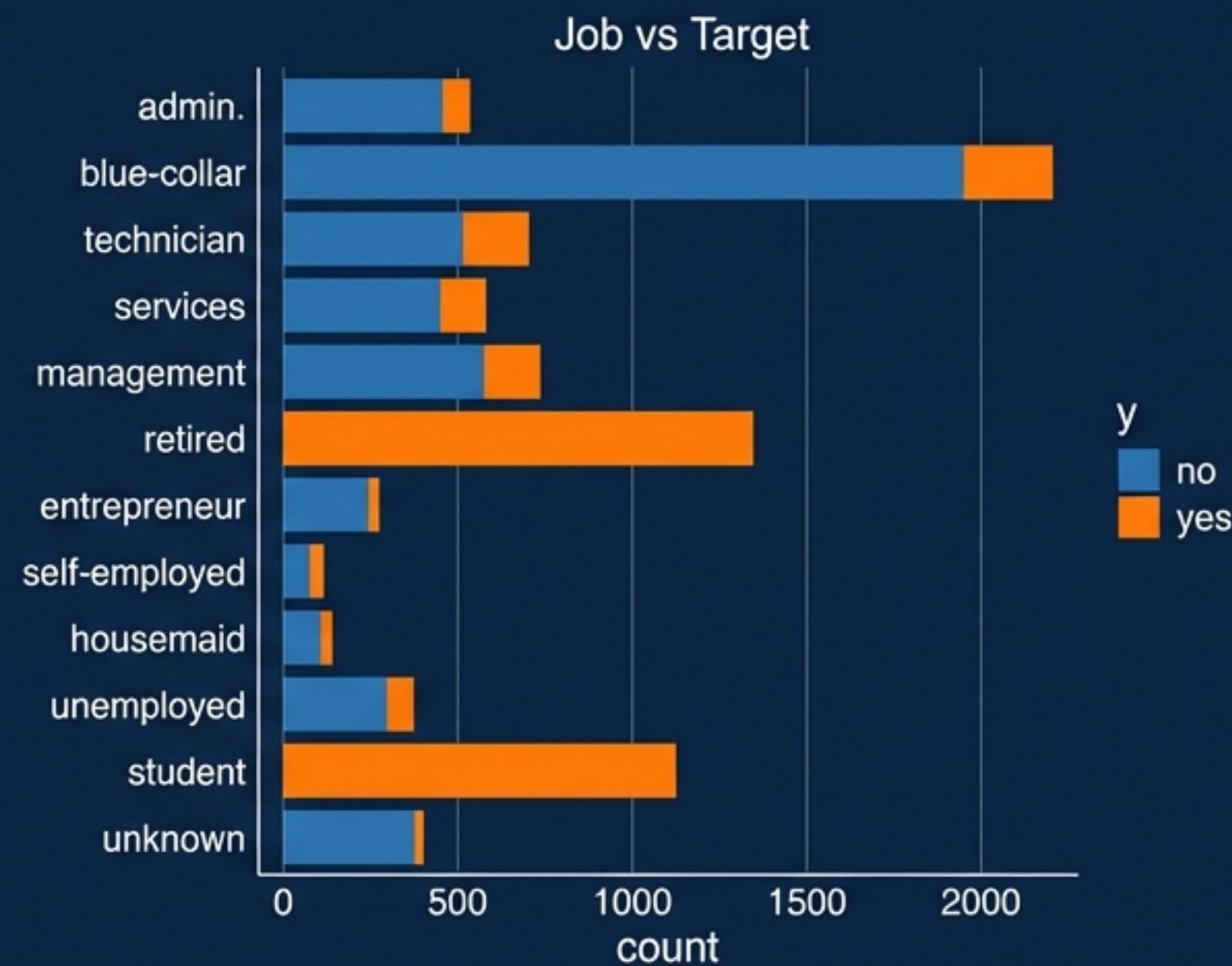


Who Buys? Success Leaves Clues

Insight 1: Success Breeds Success.
Past subscribers convert at >60%.

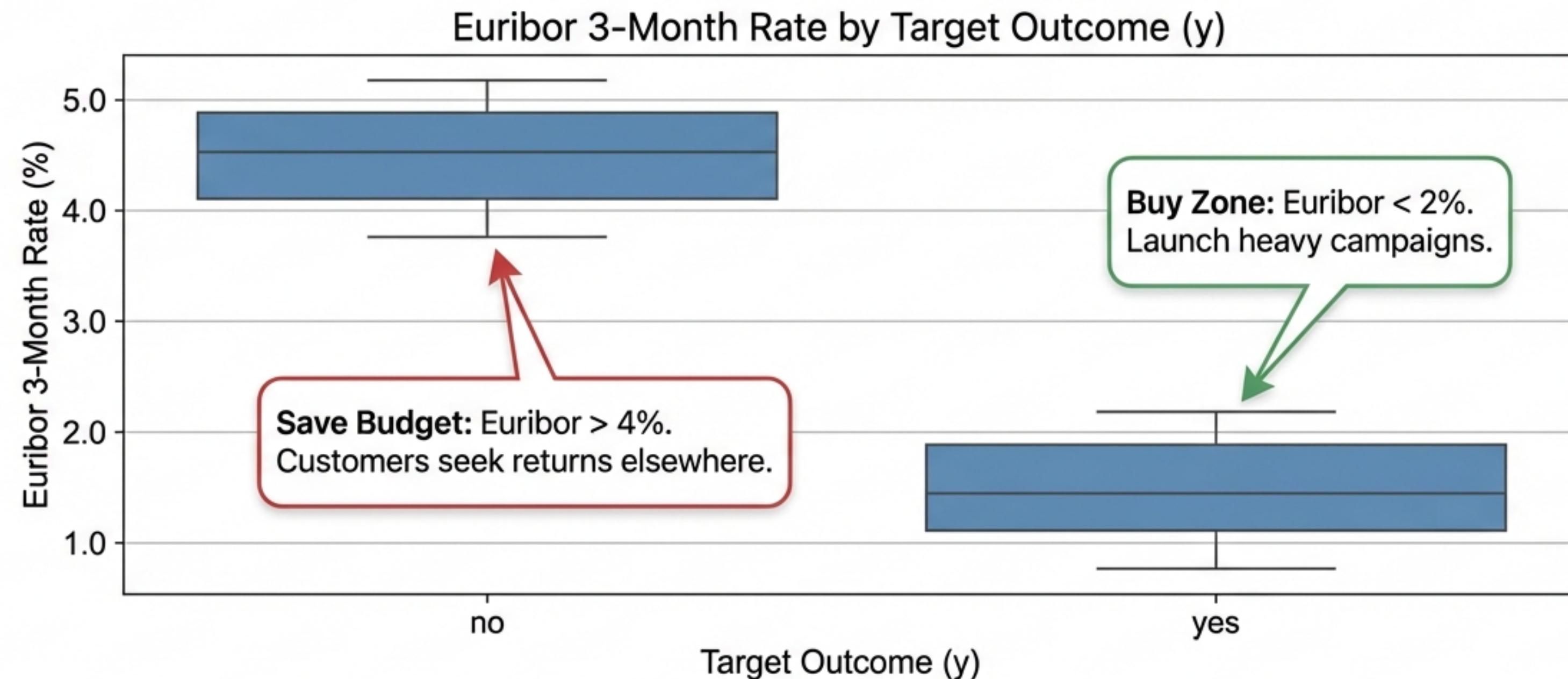


Insight 2: Retire and Dial. Students and Retirees are high-ROI segments.



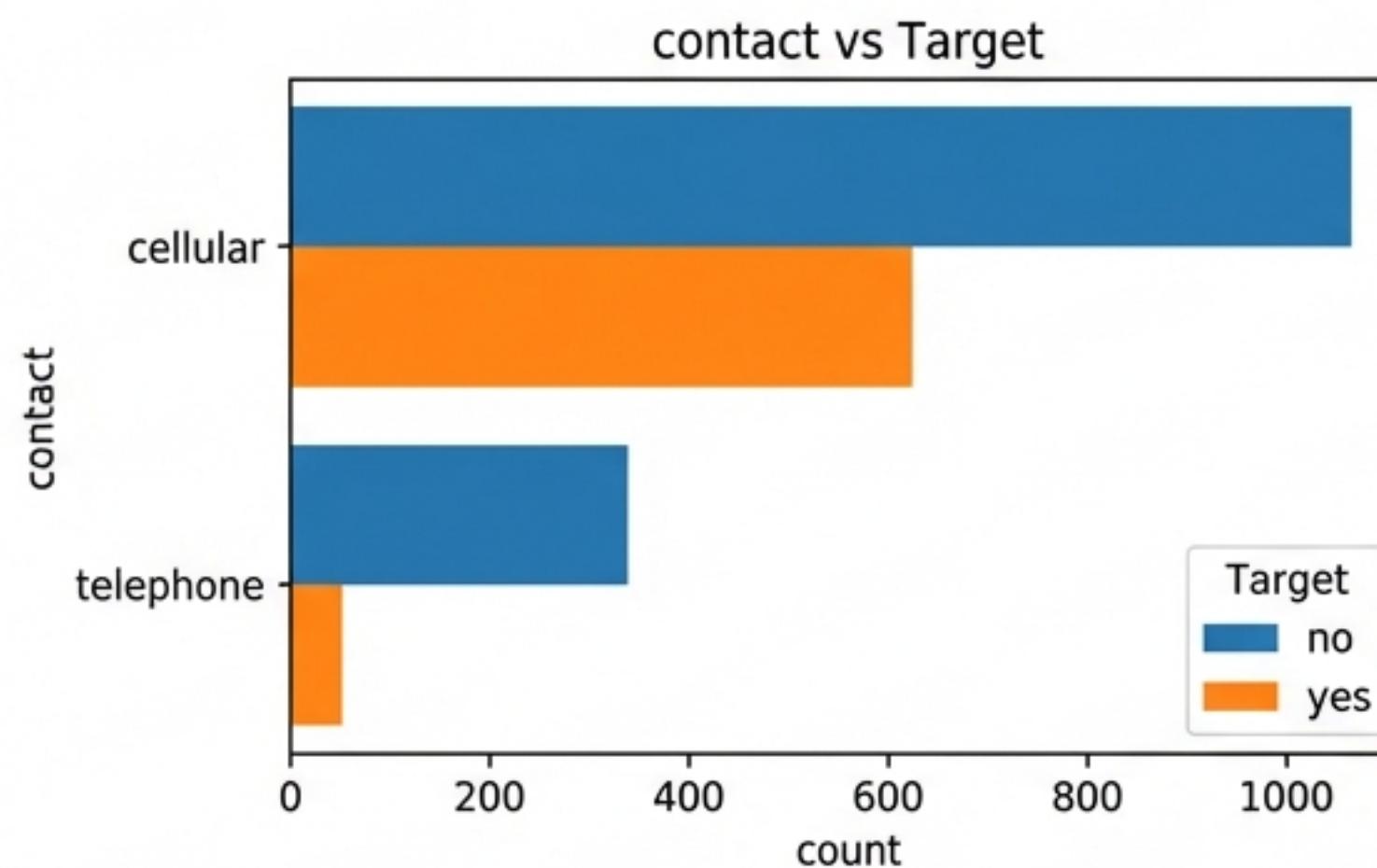
The 'Flight to Safety' Signal

Timing is the hidden variable. Economic uncertainty drives customers toward the safety of fixed-term deposits.



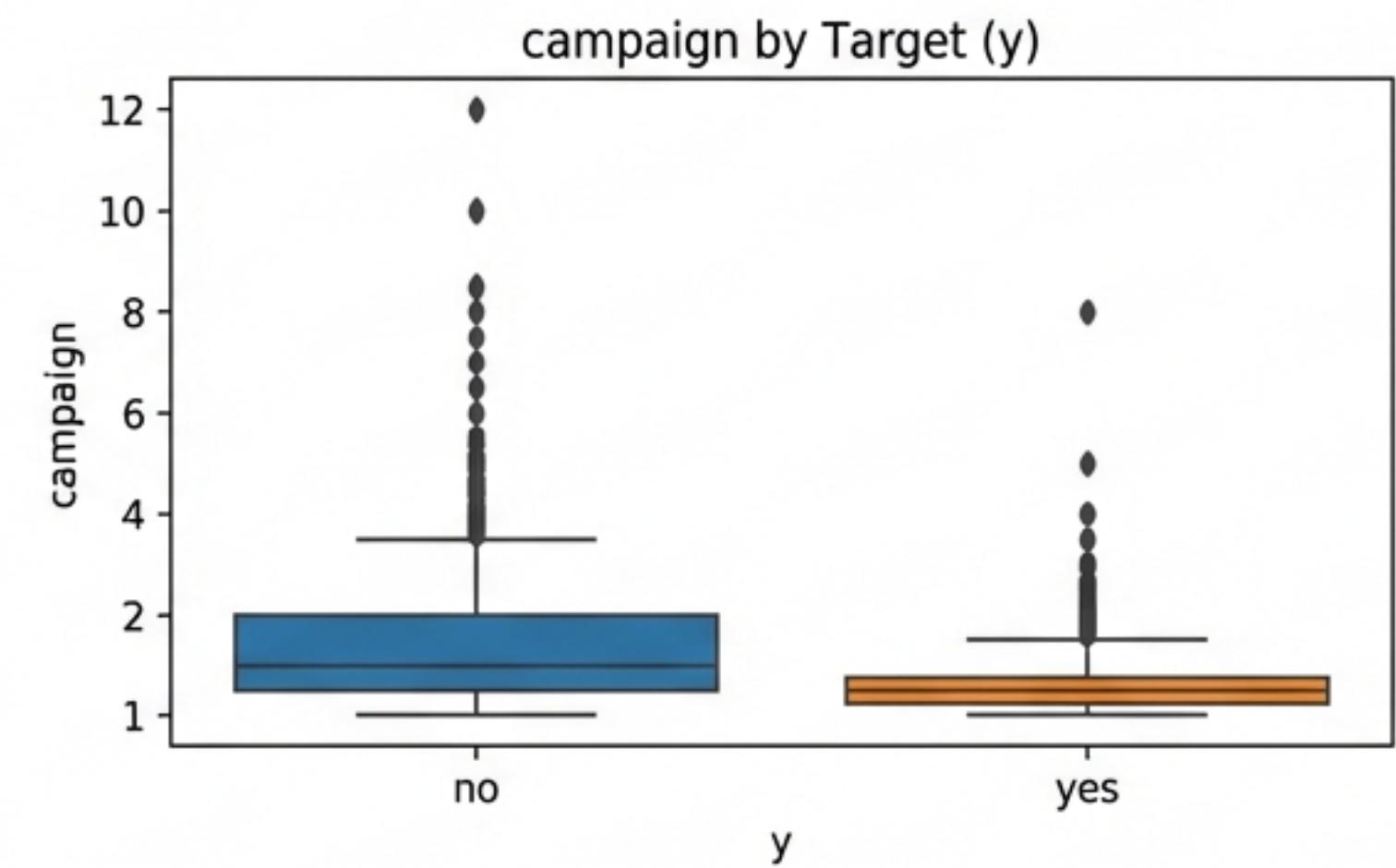
Optimizing the Outreach Channel & Intensity

Rule 1: The Channel Matters



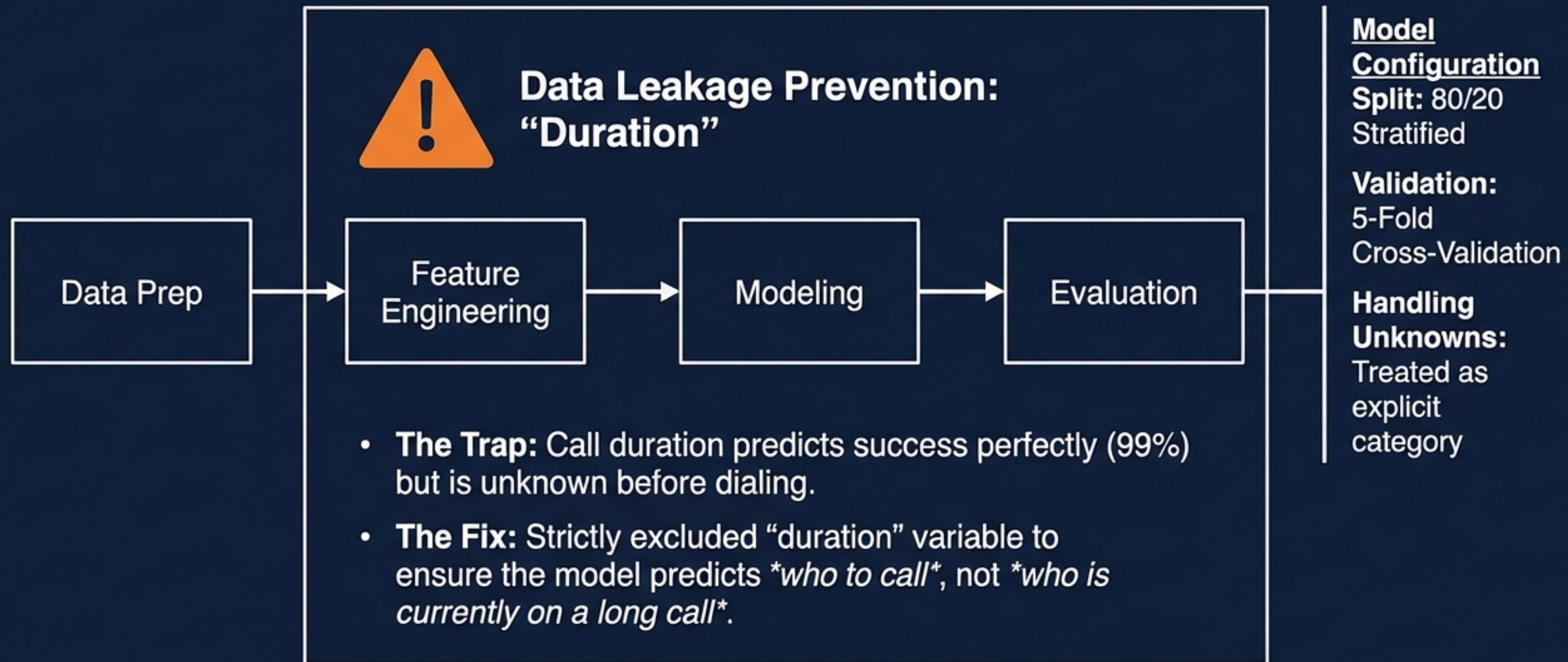
Mobile contacts outperform landlines.
Prioritize cellular numbers.

Rule 2: The Rule of 3



Diminishing Returns. Success happens in calls 1–2.
Stop calling after attempt #3 to prevent churn.

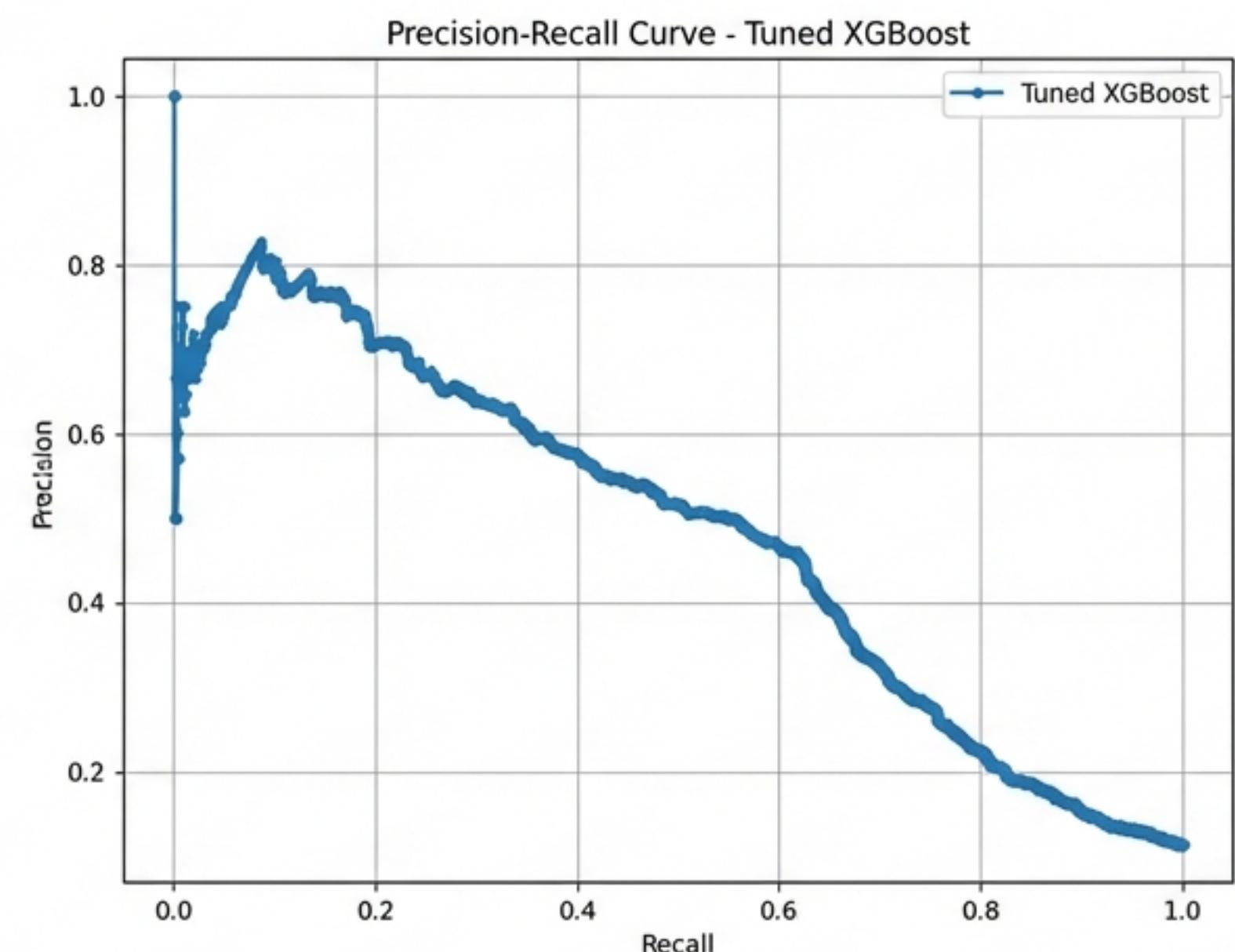
Methodology: Building a Model for the Real World



Model Selection: Why Tuned XGBoost Won

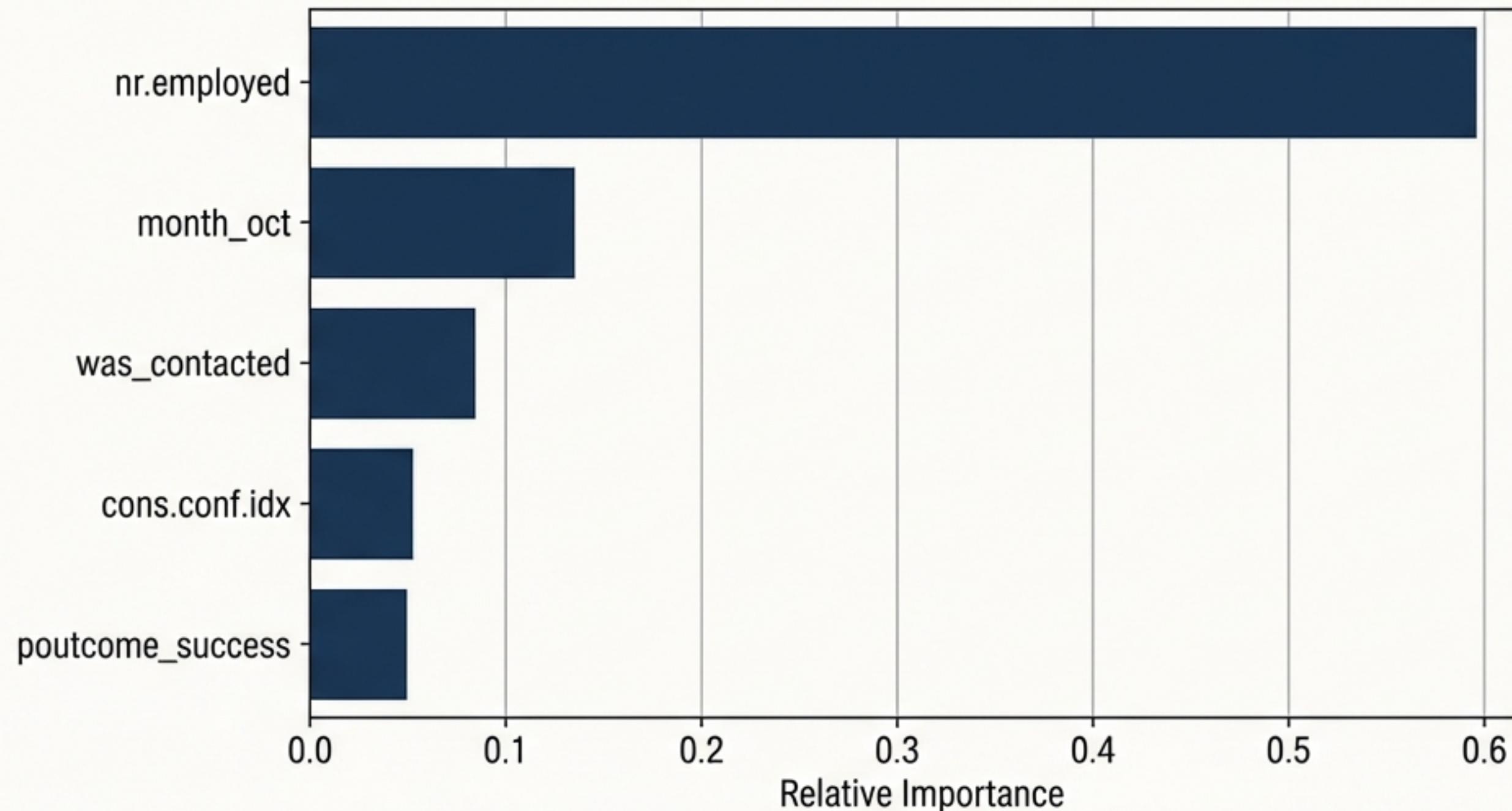
Balancing the need to find subscribers (Recall) with the cost of wrong calls (Precision).

Model	Recall	Precision	Verdict
Logistic Regression	High	Low	Too many wasted calls 
Random Forest	Low	High	Missed opportunities 
Tuned XGBoost	Balanced	Balanced	Winner (F1-Score 0.52) 



The Drivers: What Moves the Needle?

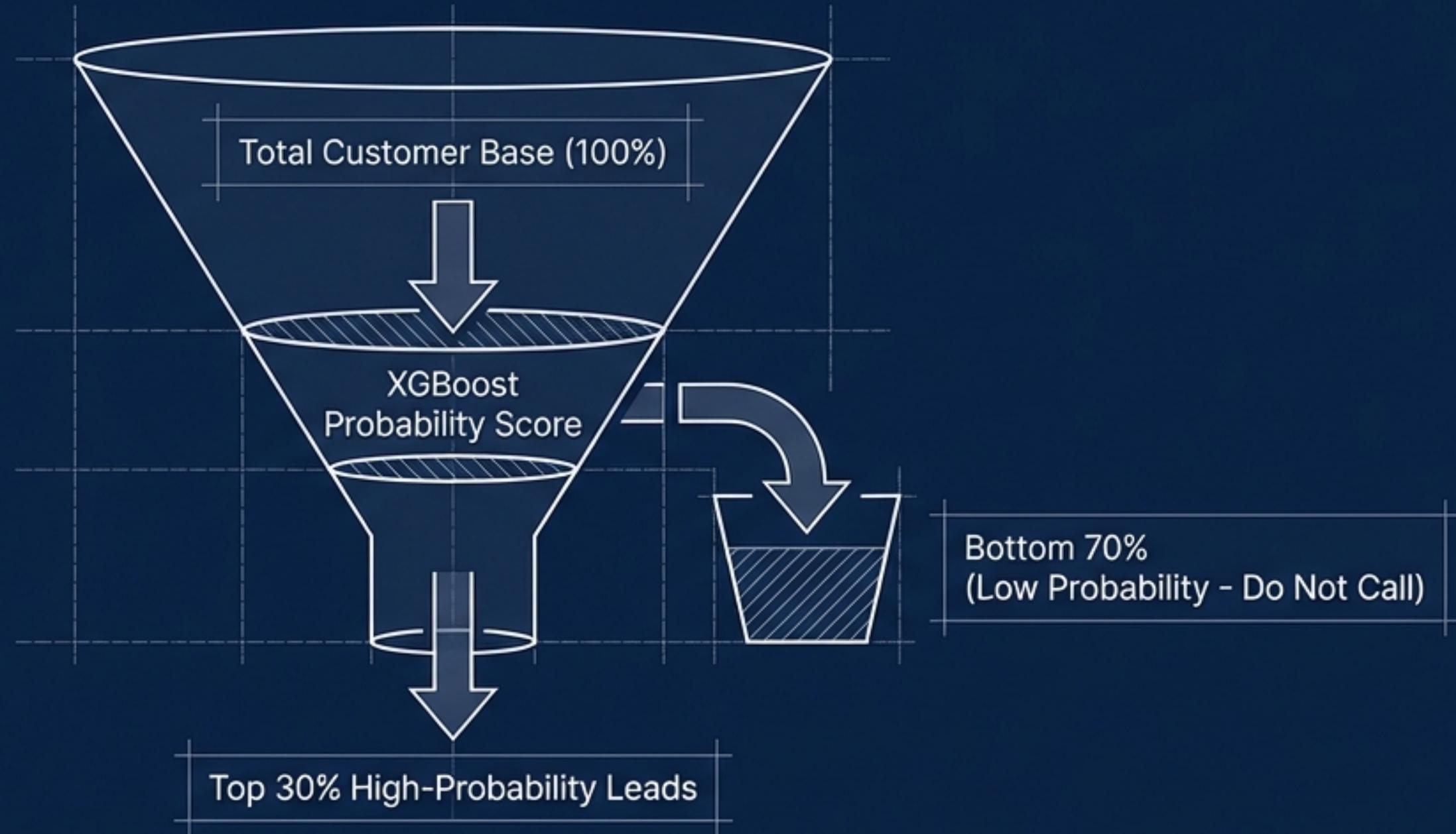
The model relies heavily on macroeconomic context, not just demographics.



Top Insight:

"Nr.Employed" and "Euribor3m" indicate that market conditions are stronger predictors than individual traits.

The Power of Ranking: Top 30% Strategy



Impact:



1. Capture: Catches the majority of actual subscribers.



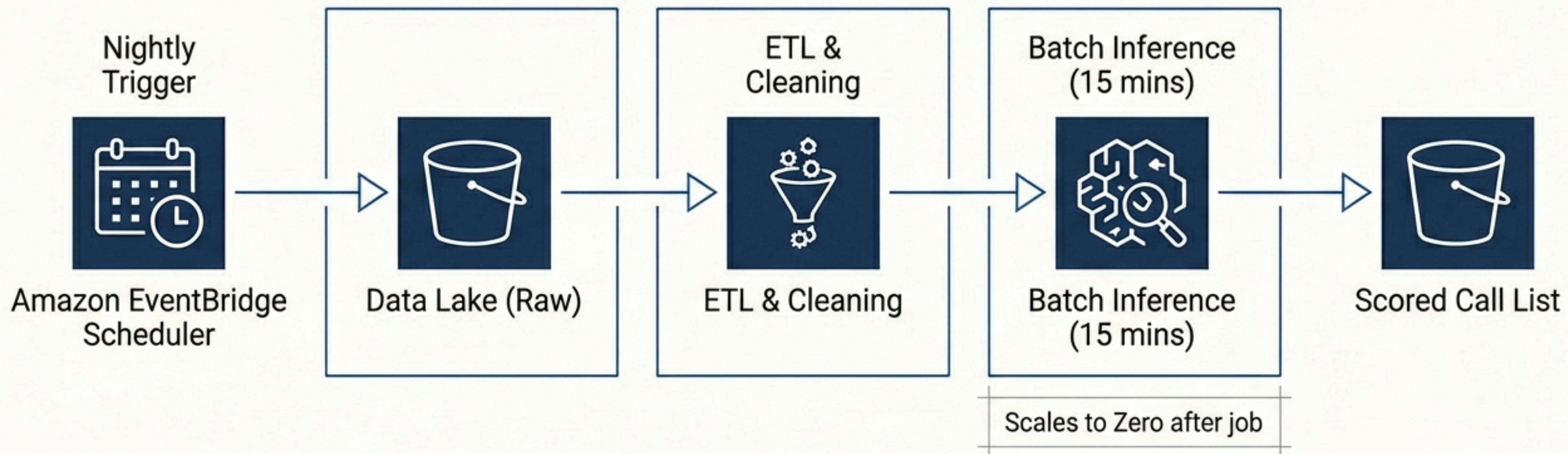
2. Efficiency: Reduces call volume by ~70%.



3. Agent Lift: 4x more deals closed per 100 calls compared to random selection.

Cloud Architecture: Efficiency at Scale

Event-driven ‘Scale-to-Zero’ architecture on AWS.



Cost Benefit: 70–90% cost reduction vs. persistent real-time endpoints.

The Future State: Predictive + Generative AI

Predictive AI (XGBoost)



WHO to call?

Probability Score (0.85)

Targeting & Ranking

Generative AI (LLM)



WHAT to say?

Script: 'Good morning, given rates are low...'

Personalization & Persuasion

Strategy: Model targets the top 30%; LLM personalizes the script based on age, job, and history.

Recommendations: The New Rules of Engagement

01. Rank the List

- Work the Top 30% of scored leads first. Stop wasting time on the bottom 70%.

02. Recycle Success

- Move previous subscribers to the front of the queue. They convert at >60%.

03. Watch the Macro

- Accelerate outreach when Euribor < 2%. Pull back budget when Euribor > 4%.

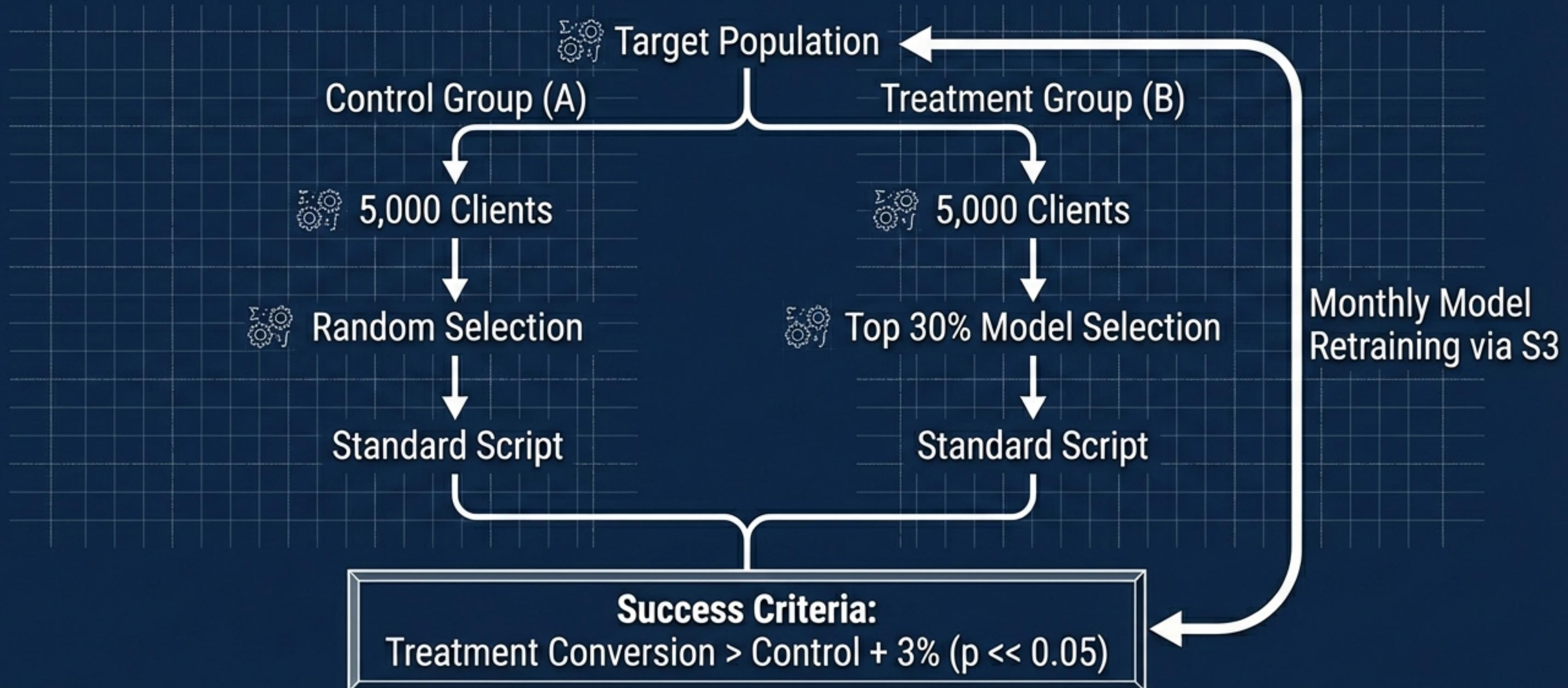
04. Operational Hygiene

- Cap attempts at 3 calls per customer. Prioritize cellular numbers.

05. Seasonal Surge

- Focus resources on high-conversion months: March, September, October, December.

Next Steps: Validation & A/B Testing



From Cost Center to Strategic Asset.

If your team makes 10,000 calls, this model allows
you to get the same results with 3,000.

End of Report
Juan Felipe Caicedo Castro