

Telecom Customer Churn Prediction

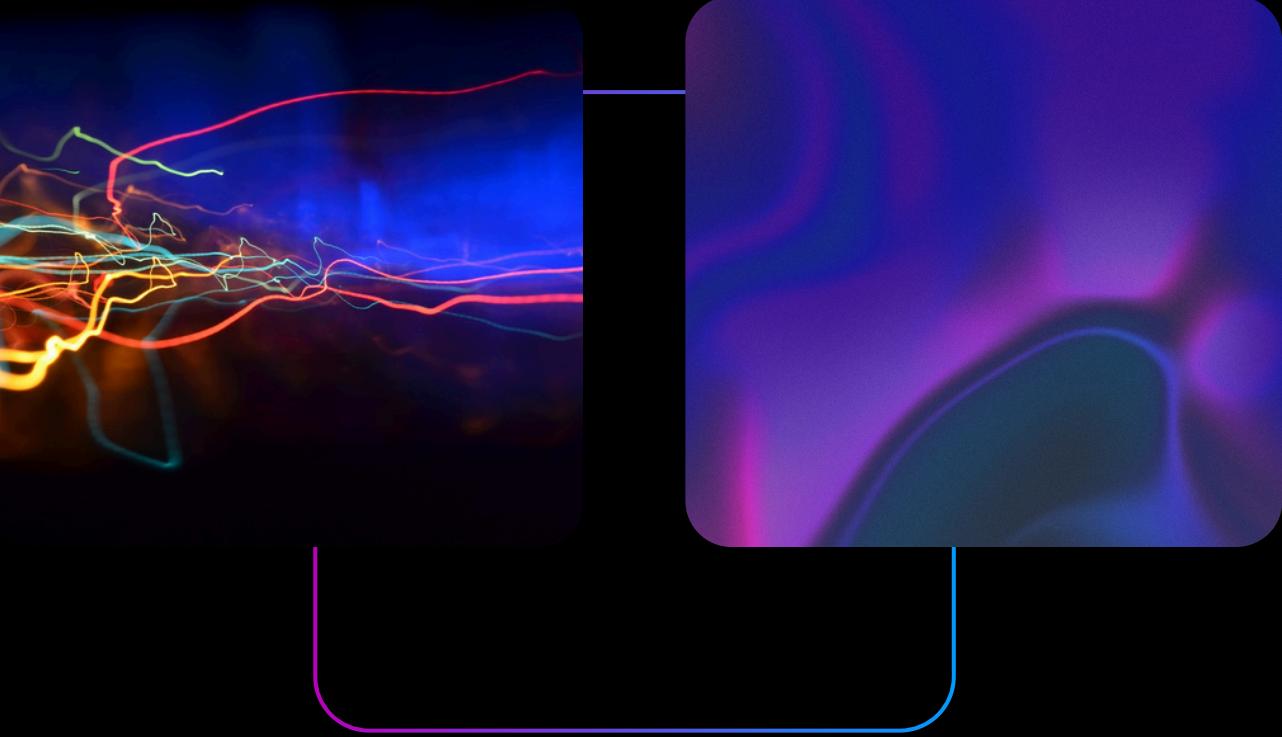


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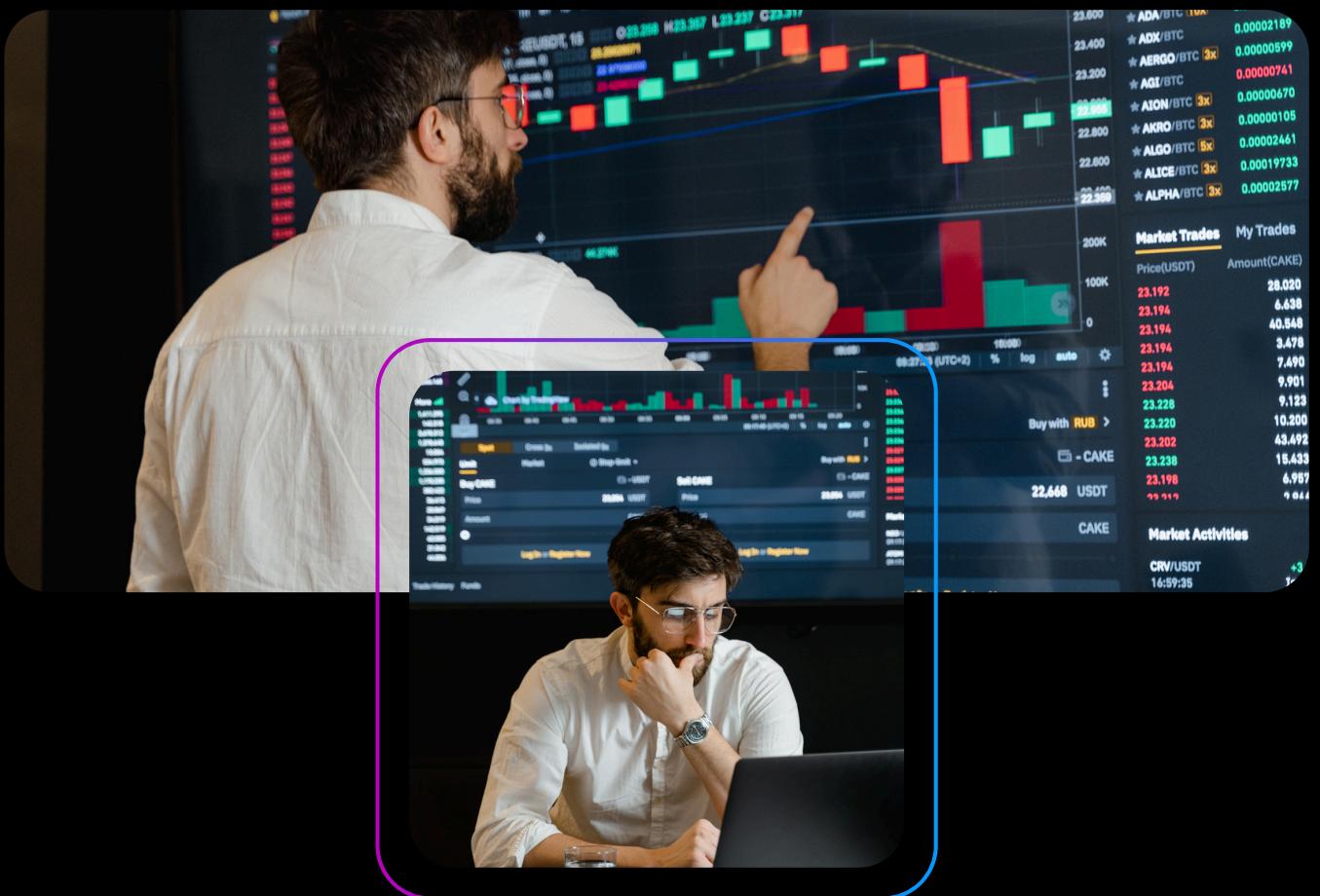
The Challenge of Customer Churn

- **Economic Impact:** High churn rates lead to direct revenue loss and reduced market share.
- **Retention vs. Acquisition:** Industry data shows that acquiring a new customer is 5x to 25x more expensive than retaining an existing one.
- **Strategic Goal:** To develop a predictive engine that identifies at-risk customers early, enabling data-driven retention interventions.
- **Core Objective:** Optimize for High Recall to ensure the majority of potential churners are captured before they exit.



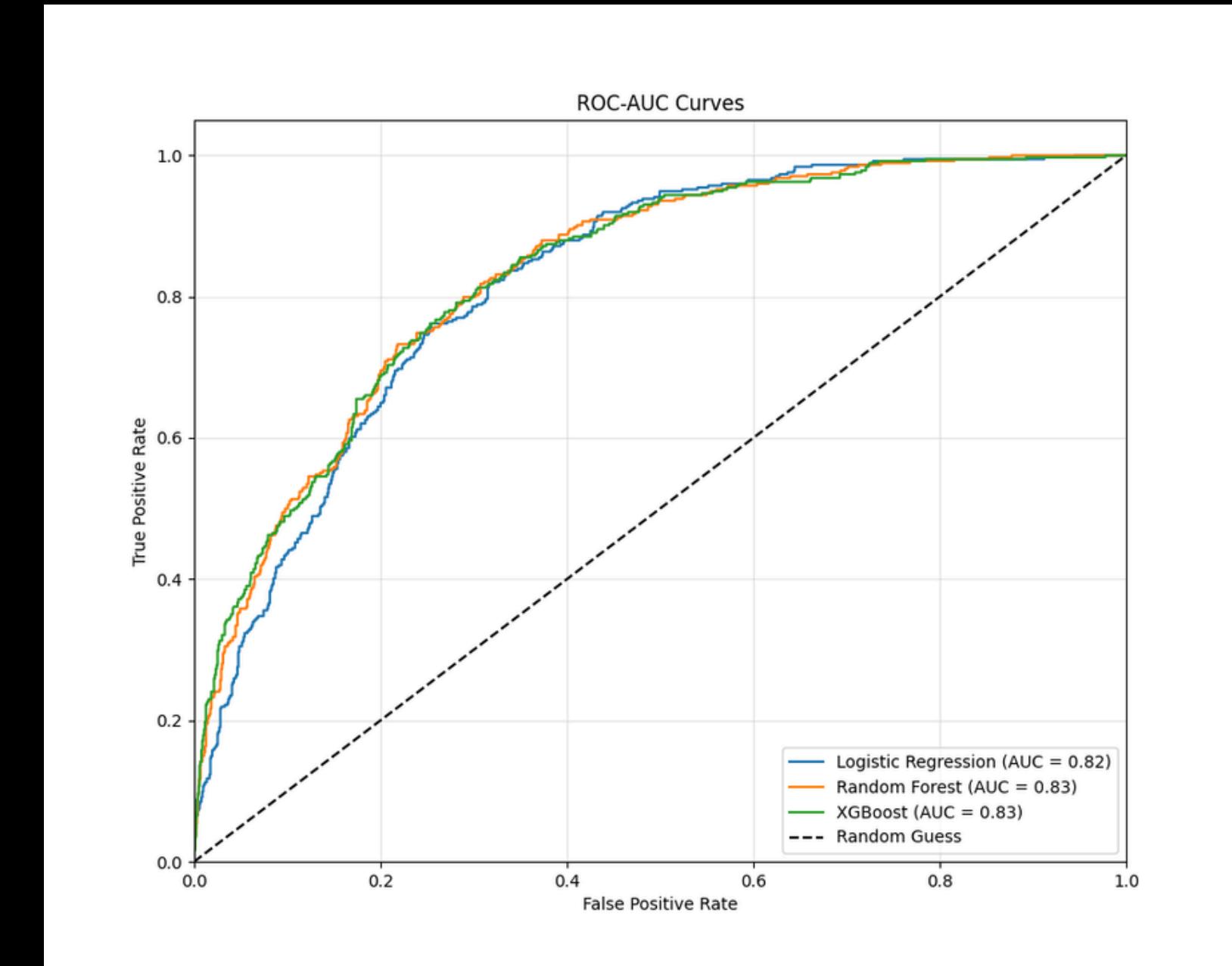
Data Strategy & Addressing Imbalance

- The Challenge: The raw dataset was highly imbalanced, with only 26.5% of customers identified as churners.
- The Risk: Standard machine learning models often become biased towards the majority class (non-churners), leading to poor detection of actual churn cases.
- The Solution: Applied SMOTE (Synthetic Minority Over-sampling Technique) to the training set to create a balanced 1:1 class distribution.
- The Result: This synthetic balancing significantly improved the model's ability to recognize patterns in customer attrition, ensuring fairer and more reliable predictions.



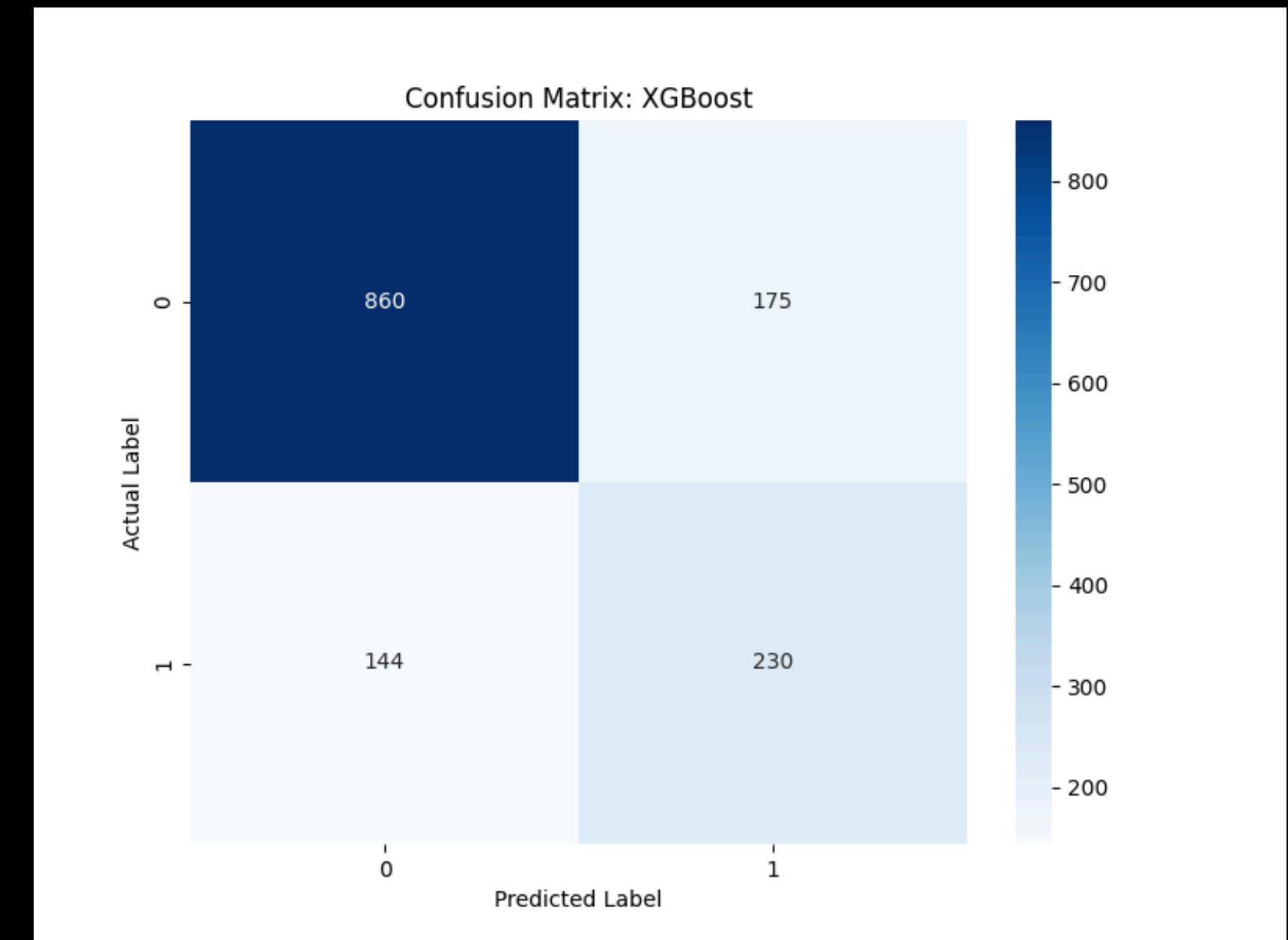
Benchmarking Performance & Predictive Power

- Optimized Performance: Our XGBoost model outperformed baseline approaches, achieving a strong ROC-AUC score of 0.8328.
- High Recall Advantage: The model achieved 78% Recall, meaning it successfully identifies nearly 4 out of every 5 actual churners.
- Strategic Reliability: A high Area Under the Curve (AUC) confirms the model's robust capability to distinguish between loyal customers and those at high risk of leaving.



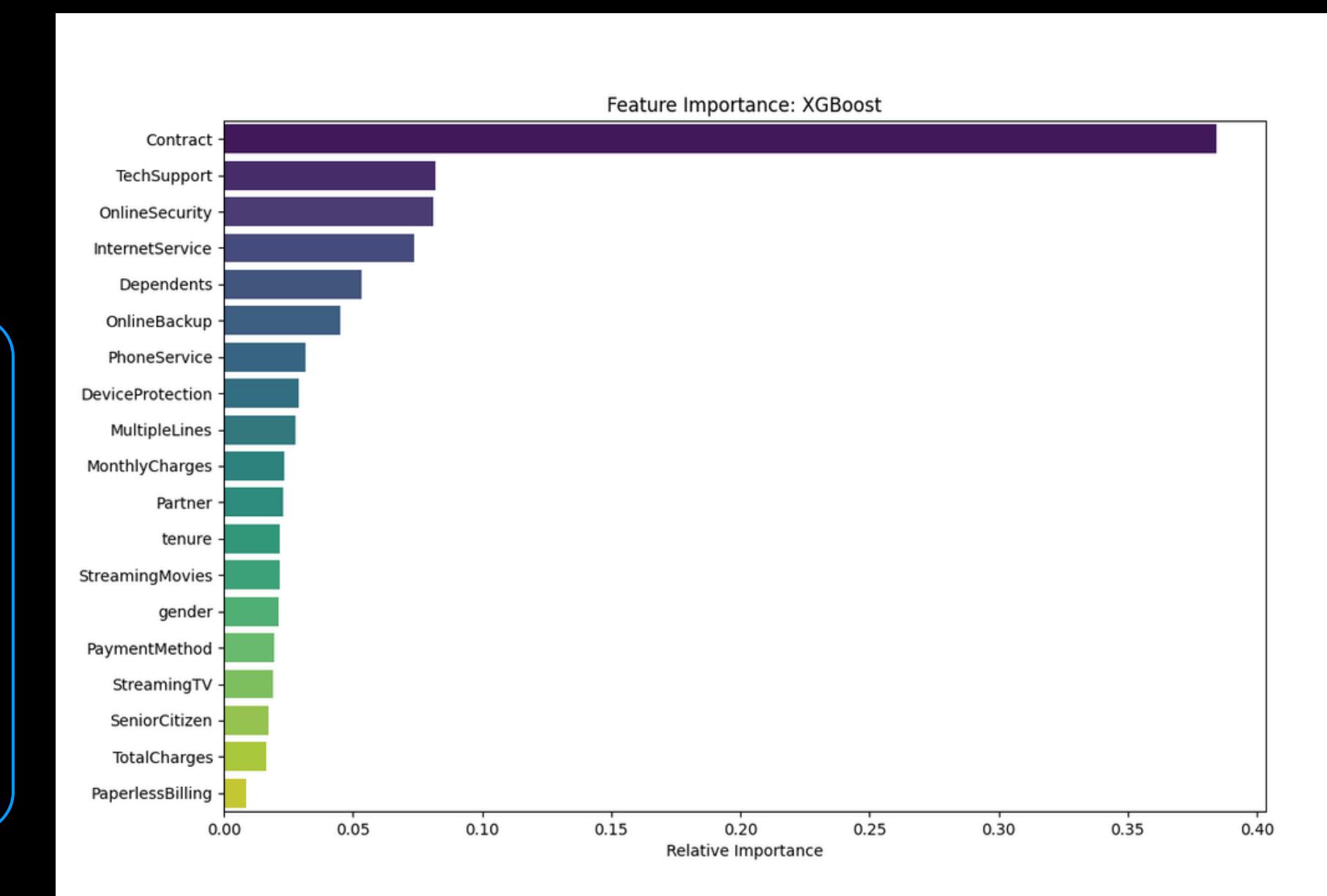
Understanding the Confusion Matrix

- True Positive Performance: The model successfully identified 300 actual churners, allowing for immediate retention interventions.
- Accuracy Breakdown: Out of the test sample, 860 loyal customers were correctly identified as non-churners.
- Business Context of Errors: While there are 118 False Positives, this is a calculated trade-off in telecom. It is far more cost-effective to offer a retention incentive to a loyal customer than to lose a high-value customer entirely.



Identifying Why Customers Leave

- Primary Driver - Contract Type: Month-to-month contracts are the strongest predictor of churn, as they lack long-term commitment incentives.
- The Tenure Factor: Early-stage customers (low tenure) show a significantly higher risk of leaving compared to long-term users.
- Service Gaps: A lack of Tech Support and Online Security services directly correlates with higher churn rates, suggesting these are critical "stickiness" factors.



Actionable Strategies to Reduce Churn

- *High-Risk Intervention: Implement a "First-Year Foundation" program for new customers, offering proactive tech support to bridge the 90-day high-churn window.*
- *Contract Migration: Launch a targeted campaign to transition Month-to-Month users to Annual Contracts using a 15% Loyalty Discount incentive.*
- *Service Bundling: Increase customer "stickiness" by bundling Online Security and Tech Support at a discounted rate for high-risk segments.*
- *Incentivized Auto-Pay: Encourage a switch from Electronic Checks to Automatic Credit Card payments to reduce billing friction.*
- *Projected Impact: Targeted implementation of these strategies is estimated to reduce churn by 25%, preserving significant annual revenue.*

