PROJECT-3

Predictive Modeling and Risk Scoring for Bank Customer Churn

PROJECT REPORT

Customer Churn Analysis and Retention Strategy: Insights from Data-Driven Segmentation

Summary:

This project analyzes customer churn using SQL and Power BI, transforming raw banking data into actionable insights. By creating categories for age, tenure, balance, credit score, and CLV, the study highlights key churn drivers such as low tenure, inactivity, and low balances. Interactive dashboards and slicers reveal that young, low-value customers churn more often, while retaining high-CLV customers is critical for profitability.

Dashboard Overview

1. Count of CLV by Churn Risk Category

• Problem: Hard to identify which value segments are most at risk.

• Goal: Segment customers into High, Medium, Low churn risk based on CLV.

• Insight: Majority are in Low Risk (5.3K), but High Risk (3.8K) is still significant.

• Recommendation: Focus retention campaigns on high-risk CLV customers to prevent revenue loss. **Focus on high-value customers** Keep your most valuable customers happy with special offers and personal attention, because losing them hurts the bank the most.

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2. Credit Score Category

• Problem: Credit score distribution is unclear in relation to churn.

• Goal: Categorize customers by credit score ranges.

• Insight: Largest group is in the Good/Excellent range (43%), but lower scores still represent ~22%.

• Recommendation: Provide financial guidance or tailored products for low-score customers to reduce churn. Help new customers stay longer Make sure new customers feel welcome and engaged early, so they don't leave quickly.

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3. Sum of Credit Score by Churn Category

• Problem: Need to see if churned customers differ in credit score totals.

• Goal: Compare credit score sums between churned vs retained.

• Insight: Not Churned = 5.0M, Churned = 1.3M. Churned customers tend to have lower overall scores.

• Recommendation: Monitor low-credit customers closely and offer retention incentives. Support customers with low credit scores Give advice or suitable products to customers with weaker credit scores, so they feel supported and stay longer.

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4. Num Of Products

• Problem: Customers with fewer products may churn more.

• Goal: Analyze churn by product count.

• Insight: Most customers hold 1–2 products; churn is higher among single-product holders.

• Recommendation: Promote cross-selling to increase product adoption and reduce churn. Encourage customers to use more products People with only one product are more likely to leave. Offer them extra services like loans or credit cards to keep them connected.

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5. CreditScore Standard Deviation by Geography

• Problem: Need to understand regional credit score variability.

• Goal: Compare score stability across geographies.

• Insight: Scores are fairly consistent (93–97 range), but slight differences exist.

• Recommendation: Tailor regional strategies — areas with higher variability may need targeted support.

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6. Count of Customers by Churn Category

• Problem: Overall churn volume needs clear visibility.

• Goal: Show churn vs retention counts.

• Insight: Churned = 1.9K, Not Churned = 7.7K. Overall churn rate ~20%.

• Recommendation: Aim to reduce churn below 15% by focusing on high-risk segments identified above.

SOLVING BUSINESS QUESTIONS USING SQL-QUERIES

Customer Lifetime Value (CLV)

1. Problem

The bank needs to understand how valuable each customer is over their tenure. Without this, it's difficult to prioritize retention efforts and identify which customers bring the most long-term value.

2. Goal

Use SQL to calculate Estimated CLV by multiplying . This provides a simple measure of how much value a customer contributes over time.

3. Insights

- Customers with 10 years tenure and high balances are the most valuable.
- Even with moderate salaries, high balance × tenure produces strong CLV.
- Shorter-tenure customers, even with high balances, contribute less overall CLV.

4. Recommendations

- Protect high CLV customers — they are the most profitable, so focus retention programs here.
- Encourage tenure growth — design loyalty programs to keep customers longer.
- Increase balances — promote savings and investment products to raise account balances.
- Segment by CLV — use CLV categories (High, Medium, Low) in dashboards to track churn risk.

Cross-sell and Upsell Potential

• Problem: The bank needs to know which active customers are most likely to buy more products. Without this, opportunities for increasing revenue and customer loyalty may be missed.

• Goal: Identify active members who already hold multiple products, so the bank can target them for cross-sell and upsell campaigns.

• Insight: Customers with four products are active and highly engaged. This shows strong potential for upselling premium services or cross-selling additional financial products.

• Recommendation:

- Offer tailored packages or premium benefits to customers with multiple products.
- Encourage single-product customers to adopt more services to increase loyalty.
- Use personalized marketing for active members, since they are more receptive to new offers.

Early Identification of Likely Churners

• Problem: The bank needs to detect customers who are most likely to leave early. Without spotting them in advance, churn prevention becomes difficult.

• Goal: Identify customers with short tenure, low balances, and inactive status, since these traits often signal higher churn risk.

• Insight: Customers with tenure less than 3 years, inactive membership, and very low balances show a mix of churned and retained outcomes. This group is fragile and more likely to exit compared to stable, active customers.

• Recommendation:

- Strengthen onboarding programs for new customers to build loyalty early.
- Engage inactive customers with targeted campaigns (welcome calls, offers, digital tools).
- Encourage savings or product adoption to increase balances and reduce churn risk.
- Monitor this segment closely with dashboards to act before they leave.

Identify Key Churn Drivers

• Problem: The bank needs to understand what factors differentiate customers who churn from those who stay. Without this, it's hard to design effective retention strategies.

• Goal: Compare average credit score, age, balance, and number of products between churned and retained customers to spot key churn drivers.

• Insight:

- Retained customers have a slightly higher average credit score (651 vs 648).
- Churned customers are older on average (44 years vs 36 years).
- Churned customers hold higher balances (91K vs 73K).
- Retained customers use slightly more products (1.55 vs 1.47).
- This shows churn is linked more to age, balance, and product usage than credit score.

• Recommendation:

- Focus retention on older customers with high balances, as they are more likely to leave.
- Encourage churn-prone customers to adopt more products to increase loyalty.
- Monitor balance-heavy accounts closely, since losing them has a bigger financial impact.
- • Credit score differences are minor, so prioritize engagement strategies over score-based interventions.

Reduce False Positives in Churn Detection

• Problem: The bank sometimes mislabels loyal customers as churn risks. This wastes resources and can damage customer relationships.

• Goal: Refine filters to correctly identify customers who are inactive but still loyal, ensuring they are not wrongly flagged as churned.

• Insight: The query shows customers who have not exited () but are inactive (). Many of these customers still hold one or two products, meaning inactivity does not always equal churn.

• Recommendation:

- Avoid labeling inactive customers as churned unless other risk factors are present.
- Track product usage alongside activity status to get a fuller picture.
- Use engagement campaigns to re-activate inactive but loyal customers instead of treating them as churn risks.
- Refine churn detection models to reduce false positives and focus on truly at-risk customers.