

Customer Engagement & Product Utilization Analytics for Retention Strategy

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Abstract- Customer churn remains one of the most significant challenges facing retail banks. Traditional retention strategies often focus on demographic and financial indicators such as age, income, and account balances. However, these metrics alone fail to explain why financially valuable customers frequently discontinue their banking relationships. This study investigates the impact of customer engagement and product utilization on retention using a European retail banking customer dataset. Through exploratory data analysis, engagement profiling, and retention strength assessment, the study identifies behavioral indicators that influence churn. Findings indicate that customer activity levels and product adoption have stronger relationships with retention than financial balances alone. The results provide actionable recommendations for engagement-driven retention strategies and product optimization initiatives.

I. INTRODUCTION

Customer retention is a strategic priority for modern financial institutions. Acquiring new customers typically costs significantly more than retaining existing customers. While banks maintain extensive customer data, they often struggle to identify behavioral indicators that signal churn risk.

This study shifts the focus from demographic characteristics toward relationship strength, customer engagement, and product depth. The objective is to determine whether engagement-related variables provide stronger predictive value for retention than traditional financial indicators.

II. RESEARCH OBJECTIVES

Primary Objectives

- Evaluate the relationship between engagement and churn.
- Measure retention impact of product count and product mix.

- Identify disengaged yet financially valuable customers.

Secondary Objectives

- Support engagement-driven retention strategies.
- Improve product bundling decisions.
- Reduce silent churn among premium customers.

III. DATASET DESCRIPTION

The dataset contains customer-level information from a European retail bank.

Variables include:

- CustomerId
- CreditScore
- Geography
- Gender
- Age
- Tenure
- Balance
- NumOfProducts
- HasCrCard
- IsActiveMember
- EstimatedSalary
- Exited

Target Variable:

Exited

0 = Retained Customer

1 = Churned Customer

IV. METHODOLOGY

4.1 Data Validation

The dataset was examined for:

- Missing values
- Duplicate records
- Binary variable consistency

- Outlier detection
- Churn label validation

4.2 Engagement Classification

Customers were segmented into four groups:

Active Engaged Customers

- Active members
- Two or more products

Inactive Disengaged Customers

- Inactive members
- Single-product relationship

Active Low-Product Customers

- Active but limited relationship depth

Inactive High-Balance Customers

- High financial value
- Low engagement

4.3 Product Utilization Analysis

Analysis included:

- Churn by product count
- Single-product versus multi-product retention
- Product depth index creation

4.4 Financial Commitment Analysis

Cross-analysis performed between:

- Balance and activity status
- Salary and account balances
- Premium customer disengagement patterns

4.5 Retention Strength Assessment

A Relationship Strength Index (RSI) was developed:

$RSI = \text{Engagement Score} + \text{Product Score} + \text{Credit Card Score}$

The index measures overall customer stickiness.

V. EXPLORATORY DATA ANALYSIS

Customer Activity and Churn

Active customers exhibited significantly lower churn rates than inactive customers.

This suggests customer engagement serves as a stronger retention indicator than financial wealth alone.

Product Adoption Analysis

Customers holding multiple products demonstrated substantially higher retention rates.

Single-product customers were considerably more likely to churn.

Credit Card Ownership

Credit card ownership showed limited standalone influence on retention.

However, when combined with active engagement and multiple products, retention improved.

Balance Analysis

Several high-balance customers displayed low engagement levels.

These customers represent hidden churn risks because traditional retention systems often classify them as secure due to their balances.

VI. KEY FINDINGS

Finding 1

Engagement strongly influences retention. Inactive customers consistently exhibit higher churn rates.

Finding 2

Product depth reduces churn risk. Customers with multiple products demonstrate stronger loyalty.

Finding 3

High balances do not guarantee retention. Several premium customers remain vulnerable due to low engagement.

Finding 4

Relationship strength predicts loyalty better than financial variables alone. Behavioral indicators outperform static demographic measures.

VII. KPI FRAMEWORK

Engagement Retention Ratio

Measures retention difference between active and inactive customers.

Product Depth Index
Measures relationship depth through product ownership.
High-Balance Disengagement Rate
Tracks premium customer churn risk.

strategies and deeper customer relationships can reduce churn, improve retention, and maximize long-term customer lifetime value.

Credit Card Stickiness Score
Measures retention impact of card ownership.
Relationship Strength Index
Composite indicator combining:

- Activity
- Product ownership
- Credit card adoption

VIII. BUSINESS RECOMMENDATIONS

Recommendation 1
Launch engagement-focused retention campaigns.
Target inactive customers before churn occurs.

Recommendation 2
Promote multi-product adoption.
Bundled products increase switching costs and loyalty.

Recommendation 3
Monitor premium customers separately.
High balances should not be treated as retention guarantees.

Recommendation 4
Implement relationship-strength monitoring.
Use engagement metrics in customer health dashboards.

Recommendation 5
Introduce personalized loyalty programs.
Reward active product usage rather than balances alone.

CONCLUSION

The study demonstrates that customer engagement and product utilization provide stronger indicators of retention than traditional financial measures. While balances and salaries remain important measures of customer value, they are insufficient indicators of loyalty. Banks that prioritize engagement-driven