

Manager Brief

Project: Bank Customer Churn Prediction

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1. Background

Customer churn is a critical issue in the banking sector. Losing clients not only reduces revenue but also increases acquisition costs to replace them. Proactively identifying customers at risk of churn enables banks to design retention strategies, protect revenue and strengthen customer loyalty.

2. Objective

To build a predictive model that:

- Estimates the likelihood of customer churn.
 - Identifies the key factors driving churn.
 - Supports management decision making with actionable insights and a dashboard.
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3. Data

- Source: 10,000 bank customer records.
 - Variables: Demographics (age, gender, geography), account details (tenure, balance, number of products), behavior (active membership, complaints, satisfaction scores) and target variable (Exited).
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4. Approach

- Exploratory Analysis (EDA): Measured churn rate (~20%) and explored key relationships (e.g., geography, age, satisfaction).
- Modeling:
 - Baseline: Logistic Regression (ROC-AUC ~0.79).

- Advanced: Random Forest improved recall, capturing more at risk customers.
 - Evaluation: Confusion matrix, ROC curve, and feature importance analysis.
 - Visualization: Designed a 1 page Power BI dashboard with KPIs, churn by segments, and high-risk customer lists.
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5. Key Findings

- Inactive members with low satisfaction are 3× more likely to churn.
 - Customers in certain regions (e.g., Germany) have higher churn rates.
 - Customers with fewer products and low engagement are more churn prone.
 - High balance inactive customers represent an especially valuable at risk segment.
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6. Recommendations

- Retention Campaigns: Prioritize outreach to inactive, dissatisfied customers.
 - Customer Engagement: Design loyalty programs to increase product usage.
 - Regional Focus: Tailor retention strategies for high risk geographies.
 - Monitoring: Use the Power BI dashboard to track churn KPIs continuously.
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7. Tools Used

- Python (Colab): pandas, scikit-learn, matplotlib.
 - Machine Learning: Logistic Regression, Random Forest.
 - Visualization: Power BI dashboard for insights and decision support.
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8. Deliverables

- Python Notebook (EDA, modeling, evaluation).
- Power BI dashboard (interactive 1-page view).
- GitHub Repository (full project code & documentation).

Summary

This project demonstrates how machine learning plus data visualization can help banks reduce churn. By acting on key drivers (satisfaction, activity, geography), management can proactively retain valuable customers and protect revenue streams.