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**Tools Used:** SQL, Power BI, Excel

**Timeframe:** 2021–2024

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## Executive Summary

### Purpose:

This analysis evaluates customer churn in a retail banking dataset to identify drivers of attrition and provide actionable recommendations to retain high-value clients.

### Key Findings:

- **Demographics:** Female (25.6%) and middle-aged clients (35–54, 26.7%) show elevated churn. German customers are at highest risk (32.1%).
- **Behavioral Patterns:** Clients with 2 products churn the least (8%), while those with 3+ products churn at 83–100%, indicating a need for better product engagement. Inactive clients have nearly double the churn rate of active clients.
- **Financial Factors:** Credit score and salary minimally impact churn. High-balance clients (\$80K+) churn disproportionately (24%), suggesting retention opportunities.

### Business Implications:

Churn threatens revenue, increases acquisition costs, and risks eroding market share. Targeted interventions focused on high-risk segments can directly reduce attrition and improve profitability.

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## Objective & Approach

### Business Questions:

- Which customers are most likely to churn and why?
- How can product usage and engagement strategies reduce churn?
- Are there regional or demographic segments at higher risk?

### Approach:

1. **Data Cleaning & Preprocessing:** Removed NULLs, duplicates, standardized variables, created age buckets, calculated churn rates.
2. **Analysis:**
  - SQL for extraction, segmentation, and KPI calculation
  - Power BI for interactive dashboards showing churn trends by demographic, behavioral, and financial features
3. **Limitations:**

- Dataset lacks transaction-level details and product specifics.
  - Extreme churn among 4-product clients (100%) requires further investigation.
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## Data Analysis & Insights

### Demographic Drivers:

- Female clients churn higher than males (25.6% vs 17%).
- Middle-aged clients (35–54) churn at 26.7%; seniors (55+) at 39.1%, though in a smaller sample.
- Germany: 32.1% churn, highlighting urgent retention focus.

### Behavioral Drivers:

- 2-product customers are the most loyal (8% churn).
- Customers with 3+ products experience extreme churn (83–100%).
- Inactive clients churn at 27.6% vs active clients at 14.8%.

### Financial Drivers:

- Minimal impact from credit score or salary (2–3% variance).
  - High-balance clients (\$80K+) show elevated churn (24%), indicating retention opportunities.
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## Recommendations & Business Impact

### Retention & Engagement Strategies:

1. **High-Risk Segments:** Develop loyalty programs for females, middle-aged clients, and German customers to reduce attrition by 10–15%.
2. **Product Strategy:**
  - Encourage 1-product customers to adopt a second product to reduce churn.
  - Investigate and resolve extreme 4-product churn to stabilize retention.
3. **Activity & Communication:**
  - Re-engage inactive clients via personalized campaigns.
  - Provide high-balance clients with premium offers to prevent churn.

**Projected Impact:**

Implementing these strategies could **reduce churn by up to 15%** among high-risk groups, directly improving customer lifetime value and revenue retention.

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**Next Steps**

- Conduct predictive modeling to proactively flag at-risk customers.
  - Deep-dive into German market churn drivers.
  - Explore behavioral drivers for multi-product clients.
  - Test targeted interventions and monitor KPI improvements.
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**Deliverables**

- SQL queries for data cleaning and KPI calculation
- Power BI dashboard with demographic, behavioral, and financial insights
- Excel files for raw and cleaned datasets
- Python scripts for data preprocessing (optional predictive modeling)