**Project 2**

**Bank Churn Analysis**

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1. **Executive Summary**

This report analyzes **customer churn** in a **retail banking dataset** to determine key factors driving attrition. Using **Power BI for visualization and SQL for data analysis**, we identified **demographic, behavioral, and financial** trends impacting churn.

Key findings include **higher churn among female, middle-aged (35-54), and German clients**. Customers with **2 products churn the least, while those with 3+ products churn at extreme rates (83%-100%)**. **Inactive clients churn at nearly double the rate of active ones.**

Our recommendations include **engagement strategies for high-risk groups, product optimization to prevent multi-product churn, and targeted interventions for the German market**.

1. **Introduction**

**Problem Statement**

Customer churn is a significant challenge for banks, as it leads to revenue loss and increased acquisition costs. This analysis aims to **identify key factors influencing churn** and provide actionable insights to **improve customer retention**.

**Importance of Analysis**

* **Reduce churn** among high-value customers
* **Optimize product offerings** to ensure customers are satisfied
* **Identify at-risk customers and intervene early** to prevent churn

**Dataset Overview**

* **10,000 customers,** with attributes such as credit score, balance, salary, age, region, tenure, and churn status
* **Churn Rate:** **20.4% overall**
* Three main analysis areas**: Demographic, Behavioral, and Financial**

1. **Data Preparation & Methodology**

**Data Cleaning & Preprocessing**

* **Checked for and removed any** NULLs, duplicates, or severe outliers
* **Created age buckets** to better analyze customer segments
* **Converted categorical variables (**gender, active status)
* **Standardized column names and dropped** unnecessary columns (surname, row number)
* **Created churn rate calculations**

**Tools & Techniques**

* **SQL:** Data extraction, transformation, and analysis
* **Power BI:** Dashboard development (demographic, behavioral, financial churn trends)

**Assumptions & Limitations**

* The dataset **does not include** insight into specifics about the products offered to clients
  + This information is needed to understand why more projects = higher churn
* **No transaction history or customer feedback**, which could provide deeper individual churn insights
* **Unknown reason for extreme churn (100%) among 4-product customers** – requires further investigation
* High number of $0 balance for individuals
  + Need further information as to whether this is expected or if the data needs updating

1. **Exploratory Data Analysis (EDA)**

**Demographic Trends**

* **Female customers churn at 25.6%** (higher than **male churn of 17%)**
* **Ages 35-54** account for over 50% of clients **(churn of 26.7%)**
  + **Ages 55+ churn at 39.1% (**much smaller sample size)
* **Germany has the highest churn rate (32.1%)**, nearly double that of France and Spain (~17%)

**Behavioral Patterns**

* **Customers with 2 products** churn the **least (8%),** while **3+ product** customers churn at a **83-100%** rate (requires further analysis)
* **Inactive customers** churn at a much higher rate **(27.6%)** than **active ones (14.8%)**
* **Credit card ownership** has no major impact on churn **(~.4% difference)**

**Financial Factors**

* **Credit score and salary have a minimal impact on churn (variations within 2-3%)**
* **High-balance customers ($80K+) churn more (24%),** despite representing over half the client base
* **Low-balance customers (<$1k) churn the least (15%)**

1. **Recommendations & Business Impact**

**Retention Strategies**

* **Target female and middle-aged customers** with loyalty programs and personalized support
* **Investigate and address the high churn in Germany** – this market needs urgent attention

**Product & Engagement Optimization**

* **Encourage 1-product customers to adopt a second product,** as this drastically reduces churn
* **Investigate extreme churn (100%) among 4-product clients** – this could be a policy-driven issue
* **Re-engage inactive customers** with special offers to reduce churn
* **Offer exclusive retention benefits to high-balance clients ($80K+)** to reduce churn

1. **Conclusion & Next Steps**

This analysis highlights key churn drivers and provides **strategies for retention, engagement, and product optimization**.

**Next steps:**

* **Investigate the German market for churn causes**
* **Target strategies for Females and Middle**-**aged clients to lower churn**
* **Understand why high-product clients leave at extreme rates**
* **Use predictive models to flag at-risk customers proactively**