



Data Glacier

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Data Science Internship at Data Glacier

Project: Cross-selling Recommendations for Banking Products

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1. Problem Description

XYZ Credit Union, a prominent financial institution in Latin America, has been successful in selling various banking products including credit cards, deposit accounts, retirement accounts, and safe deposit boxes. However, despite the initial success, the existing customers do not show any inclination to purchase more than one product. This indicates that the bank is not effectively utilizing the opportunity of cross-selling to its customers. To address this issue, XYZ Credit Union has sought the assistance of ABC Analytics to analyze the data and provide actionable insights to increase cross-selling.

2. Business Understanding

Based on the given problem statement, while XYZ Credit Union has been successful in selling a variety of banking products in Latin America, they have not been able to capitalize on cross-selling opportunities. Despite having a large customer base, the bank's existing customers do not purchase more than one product, which is indicative of a lack of effective cross-selling strategies. This project aims to identify the factors that affect cross-selling, understand customer behavior, and propose strategies that can improve the bank's overall performance in selling multiple products to its existing customers.

3. Project Lifecycle

The project lifecycle and expected completion date are given below.

S/N	Task	Completion Date
1	Problem Statement, Business Understanding, Data Intake Report	April 19, 2023
2	Data Understanding	April 26, 2023
3	Data Cleaning and Transformation	May 2, 2023
4	Exploratory Data Analysis (EDA)	May 9, 2023
5	EDA Presentation	May 16, 2023
6	Dashboard	May 23, 2023
7	Final Submission (Report + Presentation)	May 30, 2023

4. Data Understanding

The dataset that has been provided includes comprehensive customer information such as age, gender, and country of residence, alongside the various bank products that they currently own, such as credit cards, deposit accounts, retirement accounts, safe deposit boxes, and more. In total, the dataset comprises 48 features (columns) and 13647308 observations (rows), offering a large volume of data for analysis and providing valuable insights into the bank's customer base and product preferences.

Table 1: Data Intake Report

Total number of observations	13647308
Total number of files	1
Total number of features	48
Base format of the file	CSV
Size of the data	2.13 GB

5. Data Cleaning

As a data analyst, I recognize the importance of data cleaning to ensure that the data is accurate and reliable for any downstream analysis or use. In this case, the dataset required several cleaning steps. The following data-cleaning steps were taken:

- The column names were changed to make them more descriptive and understandable.
- The gender values were converted from "H" and "V" to "M" and "F" to standardize the data.
- The values "S" and "N" were also converted to "Yes" and "No" to make them more explicit.
- The rows filled entirely with missing values (NA) were removed.
- Finally, any Spanish words present in the dataset were translated to English to ensure consistency in the language used throughout the dataset.

These cleaning steps were necessary to improve the quality of the data and enable accurate analysis and interpretation of the results.

6. Exploratory Data Analysis

Exploratory Data Analysis (EDA) is a crucial step in any data analysis project as it helps us to understand the structure of the data, uncover patterns and relationships, and identify potential outliers or anomalies. The goal of EDA is to gain insights into the data that can help inform business decisions.

In this project, we will conduct EDA to identify and analyze key metrics and performance indicators (KPIs) that can provide valuable insights to XYZ Credit Union. We will explore the relationships between customer demographics and their banking behavior, such as the number and types of banking products they own. By analyzing these relationships, we can gain insights into customer preferences and identify potential cross-selling opportunities.

Some of the key metrics and KPIs that we will explore include:

1. Customer demographics: We will examine the age, gender, and country of residence of the bank's customers to understand their distribution across different groups. This will help us to identify potential target markets for cross-selling campaigns.
2. Product ownership: We will explore the distribution of different banking products across the customer base, including credit cards, deposit accounts, retirement accounts, safe deposit boxes, and more. By analyzing the ownership of these products, we can identify potential cross-selling opportunities and tailor our marketing campaigns to specific customer segments.
3. Cross-selling opportunities: We will analyze the co-ownership patterns of different banking products to identify potential cross-selling opportunities. For example, if a large percentage of customers who own credit cards also own deposit accounts, we can infer that there may be an opportunity to cross-sell deposit accounts to credit card customers.
4. Performance metrics: We will calculate various performance metrics such as customer lifetime value, retention rate, and churn rate to understand the bank's overall performance and identify areas for improvement.

Overall, our EDA will provide valuable insights that can help XYZ Credit Union to optimize its cross-selling strategies and improve customer engagement and retention.

7. Recommendations

Based on the analysis, here are some recommendations to increase cross-selling at XYZ Credit Union:

1. **Analyze customer behavior:** Conduct a thorough analysis of customer behavior to understand their preferences and identify patterns that can be used to drive cross-selling. This could include analyzing customer demographics, transaction history, and product ownership data to determine which products are most popular among which customer segments.
2. **Develop targeted marketing campaigns:** Based on the insights gained from customer behavior analysis, develop targeted marketing campaigns to promote cross-selling of specific products to relevant customer segments. This could include personalized offers, incentives, and rewards to encourage customers to purchase additional products.
3. **Train employees on cross-selling:** Ensure that employees are trained in cross-selling strategies and are equipped with the knowledge and skills to effectively promote additional products to customers. This could include offering incentives for successful cross-selling and providing ongoing training and support to employees.
4. **Streamline product offerings:** Consider streamlining the bank's product offerings to reduce complexity and make it easier for customers to understand and purchase multiple products. This could include bundling products together or simplifying product names and descriptions.
5. **Improve customer experience:** Focus on improving the overall customer experience to build trust and increase loyalty, which can lead to increased cross-selling opportunities. This could include providing personalized service, offering easy-to-use online and mobile banking tools, and responding quickly to customer inquiries and issues.

By implementing these recommendations, XYZ Credit Union can improve cross-selling and increase revenue from existing customers.