Case Study: Investigating the Impact of Presenting Banking Products

Problem Statement

Despite technological advances in the banking sector, face-to-face meetings still remain a key method for understanding client needs and offering personalized financial products. One of the leading banks introduced a new package of banking products and services, developed with active involvement from a customer insight team led by Isabelle, VP for Customer Loyalty.

To boost adoption, client managers (CMs) were trained to deliver a five-minute in-branch presentation. However, initial results showed that average annual profit from clients who received the presentation was lower than those who did not.

This case study challenges you to explore client-level data and determine why the presentation might have had a negative financial impact. You'll be using Python for analysis and Power BI to create an executive dashboard to summarize your findings.

What You Are Learning With This Case Study

- By completing this case study, you will learn how to:
- Perform exploratory data analysis (EDA) on client and profit data.
- Use statistical techniques to investigate the impact of an intervention (presentation).
- Understand how bias or segmentation can affect outcomes.
- Create visual stories and present insights using Power BI dashboards.
- Translate business questions into data-driven answers.

Objective of the Study

The objective is to analyze the financial impact of the new product presentation and determine whether client characteristics (like age, gender, and income) influenced the result.

You are expected to:

- Identify patterns or biases in the data.
- Segment the clients based on demographic information.
- Provide actionable insights to help the bank enhance their product presentation strategy.

Description of the Dataset

The dataset is provided in the Excel file: Presenting_Banking_Products.xls, which contains two sheets:

Table 1 – Client Profit Data

- Client_ID
- Forecast Annual Profit (USD) for clients without presentation (0).
- Forecast Annual Profit (USD) for clients with presentation (1).

Table 2 – Client Profile Data

- Client_ID
- Age
- Gender
- Monthly_Income (USD)

Data Snapshot

	A	B	C
1	Client_ID	Profit	Presentation
2	137	380.37	0
3	1809	333.11	0
4	1929	438.91	0
5	1976	383.21	0
6	2057	147.46	0
7	3594	518.84	0
8	4143	547.97	0
9	4283	528.03	0
10	4348	658.54	0
11	4375	507.86	0
12	4603	1129.97	0
13	5161	368.29	0
14	5689	385.64	0

Table 1

	A	B	C	D
1	Client_ID	Age	Gender	Monthly_Income
2	43	37	M	3905.48
3	137	37	M	4665.64
4	257	39	M	4744.88
5	477	36	M	3815.35
6	754	31	M	3916.61
7	825	31	M	3211.3
8	1180	39	F	4086.51
9	1718	37	F	2369.26
10	1809	40	M	4816.03
11	1929	38	F	2980.46
12	1976	32	M	4691.48
13	2057	33	M	4305.03
14	2377	30	M	6325.27

Table 2

Project Task

Part 1: Data Analysis in Python

1. Load both Excel sheets into Python using pandas.
2. Merge both datasets on Client ID.
3. Perform exploratory analysis:

- Compare average profit with and without presentation.
- Analyze the relationship between age, gender, and monthly income with profit.

4. Use visualizations (boxplots, histograms, scatter plots) to support your findings.
5. Investigate:

- Was the client selection random?
- Were higher-income or younger clients more or less likely to receive the presentation?
- Did the face-to-face presentation lead to higher client profitability?
    - Compare average profits of clients who received the presentation vs. those who did not.
    - Identify statistical significance using appropriate tests.
- Are there specific age groups or income levels where the presentation had a positive or negative impact?
    - Segment the data by age and income.
    - Analyze whether the presentation worked better for certain demographics.

Project Task

Part 1: Data Analysis in Python

- Is there a significant gender difference in profitability between clients who received the presentation and those who didn’t?
  - Perform a gender-wise comparison to evaluate any disparities.
- What are the key drivers of client profitability?
  - Use Linear Regression to identify which features (Age, Income, Gender, Presentation) most influence profit.
- Are there any distinct customer segments based on their age, income, and profit?
  - Apply K-Means Clustering to uncover natural client groupings.
  - Interpret the characteristics of each cluster.
- Can you build a profile of high-profit clients who benefited from the presentation?
  - Filter the top 20% of profitable clients with Presentation = Yes.
  - What are their common traits?
- Does the presentation have a different impact across income brackets (e.g., low vs. high-income clients)?
  - Create income brackets and compare profit differences within each.
- Should the bank continue offering these presentations to all clients, or focus on targeted segments?
  - Provide a strategic recommendation supported by your data analysis.

Project Task

Part 2: Dashboard in Power BI

Create an interactive Power BI dashboard including the following:

- Filters: Age range, Gender, Monthly Income range
- Cards/KPIs:
  - Average profit (with and without presentation)
  - Total number of clients by category
- Visuals:
  - Bar chart: Average profit by gender and presentation status
  - Boxplot or histogram: Profit distribution by income levels
  - Clustered bar or column: Profit comparison by age group
  - Slicer: Presentation status

Thank you