CASE STUDY - Data Visualization / Data Mining

For your Demo project, you will be working with a Loans DataSets from The Bank of National Commercial (BNC).

The scenario is as follows:

The Bank of National Commercial (BNC) is trying to target customers for a new marketing campaign which should increase their current loan portfolio and focus their earnings stream more on the consumer loans market. Fortunately, they have a robust customer data management unit which has been able to extract a dataset of their customers' behaviour in the past year and wishes to see if there are any insights that would guide them in targeting specific customers for this particular campaign.

However in this case, instead of you providing the answers and insights, your assignment is to create an Analytical Dashboard that will enable the Marketing Analysts to interactively explore the data to identify prospects for targeting.

Teams should use the following modified dataset, that includes fields for Loan prospects:
BankLoan Dataset 2022

Instructions

1. Data Preparation / Cleaning

We know very well that doing Analytics with poor quality data leads to poor quality decisions and potentially costly outcomes to the business. So start by profiling your dataset in R to ensure that the data is reasonably clean before the user starts any analysis.

2. Design your Dashboard:

Write a User Story to reflect your understanding of what Marketing needs. Identify the primary set of KPIs for your Dashboard. Create a "low-fidelity" model of your Dashboard using Wireframes and colors.

3. Build your Dasboard using PowerBI:

Load your "*clean*" dataset into PowerBI. Create an interactive analytical dashboard that will enable the Marketing analysts to explore the customer data to identify prospects for their Loan campaign. They want to target persons with higher balances and more active deposit activity in the last 3 years, who don't currently have loans. For the persons who already have loans, they want to be able to identify any significant influencers and patterns in terms of their age, profession, marital status & education. Use the various Dashboard design good practices that you've learned in order to ensure that your Dashboard has all the desirable attributes of being:

- **Visceral**: Visually impactful and aesthetically appealing
- **Behavioral**: Provides interactive functionality for the Analyst to explore the data and ask questions
- **Reflective**: Ultimately enables the Analyst to make a decision and select prospects to target for their Marketing campaign

4. Predictive Modelling

To enhance the guidance for the Marketing analysts, write a script in "R" using a "decision tree algorithm" to identify rules that predict a Loan applicant, i.e. Lead, as a function of the variables: *education, age, marital status, profession, deposit, balance.* You should build multiple models and justify your choice of the selected model.

Using the integration features between PowerBI and R, display the predicted value of a Loan candidate [**Yes (1), No(0)**] and the associated likelihood in your Dashboard.

Data Dictionary

Column Name	Description	
refNum	A unique identifier for each customer	
age	numeric age of the customer	
agerange	Age category of the customer	
job	Type of Job ("admin", "unemployed", "management", "housemaid", "entrepreneur", "student", "blue-collar", "self-employed", "retired", "technician", "services")	
marital	Marital status ("married","divorced","single"; note: "divorced" means divorced or widowed)	
education	("secondary","primary","tertiary")	
balance	Average yearly balance in Euros	
housing	Does this person have a current mortgage	
loan	Does this person currently have a personal loan	
day	Last deposit day of the month (numeric)	
month	Last deposit month of year	
year	Last deposit year	
duration	Time spent on call when Last contact was done with customer, in seconds (numeric)	
deposit	Amount deposited by customer in the last transaction	
Lead	Loan prospect? (1-yes | 0 -no)	Leads Funnel
product	Type of loan product being considered	
qualified	Loan prospect qualified for the loan (1-yes | 0 -no)	
contacted	Loan prospect contacted? (1-yes | 0 -no)	
won	Successful sale (1-yes | 0 -no)	
Loanvalue	Value of the loan	
NPS	Net Promoter Score[1]	

[1] **Net Promoter Score** - a tool that measures customer loyalty. NPS is rated on a scale of 0 to 10 and calculated by asking, "How likely are you to recommend us to a friend or colleague?" Promoters (9-10) are best described as your brand ambassadors who are loyal and enthusiastic about your brand. Passives (7-8) are neutral with your brand and most likely won't tarnish your brand reputation. Detractors (0-6) are assumed to be dissatisfied customers who can damage your brand through negative word of mouth