

# Analytics Startup Plan

**Synopsis:** *This document provides a high-level walkthrough of the activities required to guide completion of the analysis.*

<b>Project</b>	Predicting Term Deposit Subscription
<b>Requestor</b>	Centennial College
<b>Date of Request</b>	July 4, 2022
<b>Target Quarter for Delivery</b>	August 12, 2022
<b>Epic Link(s)</b>	Not Applicable
<b>Business Impact</b>	Increase customers' subscription rates to term deposits.

## 1.0 Business Opportunity Brief

**i** *Clearly articulated business statement of the Ask, opportunity, or problem you are trying to solve for. An important step is to understand the nature of the business, system or process and the desired problems to be addressed. This will be communicated back to All stakeholders for alignment.*

Banks offer a variety of products and services based on their capacities. More services will be offered by a bank if its capabilities and quality are greater. Direct product introduction is prevalent in numerous industries, including the banking industry. When directly offering products, banks might do market research by utilizing the information technology sector to assist in decision making. By evaluating bank marketing data, it is possible to select the style of marketing to implement.

In this project, we will assess the likelihood of clients signing up for a term deposit as a result of a marketing campaign run by a Portuguese banking organization. A financial institution must discover the elements that impact a customer's decision to subscribe to a term deposit in order to determine the efficacy of its marketing campaign. To be effective with their marketing strategy, the banking institution would benefit from understanding and grasping the characteristics of clients who opened a term deposit.

### **The specific ask:**

Will a customer subscribe for a term deposit?

*Clearly articulate the specific task you will be conducting to help achieve the opportunity*

We will examine how clients respond to the marketing effort of their financial institution. Regarding the customer's financial records and behavior, we will carefully determine which characteristics, in this case the factors, significantly influence their decision to subscribe to a term deposit. After taking into account all of the variables, we will conduct statistical analysis and evaluate the various models in order to determine the most accurate model for predicting term deposit subscriptions.

## 1.1 Supporting Insights

**i** *Define any supporting insights, trends and research findings. Where relevant, list key competitors in the market. What are their key messages, products & services? What is their share of market, nationally and regionally?*

The financial institution is a Portuguese bank that offer financial services to Portuguese clients. In order for us to have some idea of the financial institutions in Portugal, below are some of the big banks in Portugal, according to the Corporate Finance Institute (2021):

1. Caixa Geral de Depósitos
2. Banco Santander Totta S.A.
3. Banco Comercial Portugues
4. Banco Internacional do Funchal
5. Banco Popular Portugal

In Portugal, the five largest banks' market share in terms of total assets reached 73.6% in 2020., according to the National Central Bank. This is an increase of 0.300 percent from the previous year. They also reached an all-time high of 80 percent in 1996 and a record low of 44.2 percent in 1999 (HelgiLibrary, 2022).

According to Expatica (2022), the majority of banks in Portugal provide a comprehensive set of financial products and services to both individuals and businesses. These products and services include current accounts, loans and overdrafts, mortgages, savings and investments, and insurance.

Different financial institutions, such as banks, employ distinct marketing strategies. Their successful marketing initiatives improve the likelihood that their clients will have faith in them. TheDubs (2022) identified the following financial marketing trends for 2022:

1. Artificial Intelligence
2. Hybrid client experience
3. Inclusive advertising
4. value-based determination
5. Increased openness in financial marketing

## 1.2 Project Gains

**i** *Describe any revenue gains, quality improvements, cost and time savings (as applicable). What will you do differently and why would our customers care. What are the implications if we do nothing? This section is particularly key for prioritization against company goals and KPI's.*

By executing this project and developing predictive models, the bank will be able to reduce labor costs and increase revenues through the use of increasingly productive direct marketing methods that do not interfere with client relationships. This project may provide insight to the bank's marketing effectiveness to improve client trust. In addition, it is feasible to determine the type of marketing to execute by analyzing a bank's marketing data. Marketing campaigns can be undertaken via email, telephone, and direct email in order to allow potential customers to determine whether or not to accept the offered product. In this study, the marketing campaign used was through a direct phone call.

*Note: Completion of the following sections is possible only after a careful assessment and triage of the Ask. This is required to determine scope, resource, time, priority and data availability.*

## 2.0 Analytics Objective

**i** *List the key questions, assumptions and define the hypotheses. Often the deliverable may not just be an analysis output, however a recommended operating model or blueprint for a pilot etc.*

*Note: Asking the right questions and truly understanding the problem will lead to the right data, right mathematics, and right techniques to be employed.*

### Key Questions:

- Will a customer subscribe or avail a term deposit?
- Can the desire to subscribe to term deposit be predicted by criteria such as education, marital status, and other variables?
- What are the characteristics of clients who are willing to invest in a term deposit?

### Assumption(s):

- Most of the variables would contribute a significant impact for the determination of clients who will subscribe a term deposit.

### Hypothesis:

Education and marital status can determine a customer's likelihood to subscribe to a term deposit.

## 2.1 Other related questions and Assumptions:

**i** *List any assumptions that may affect the analysis*

- A customer's highest education level will have a significant impact his/her willingness to subscribe for a term deposit
- Identifying potential term deposit subscribers may reduce bank marketing costs.

## 2.2 Success measures/metrics

**i** *What does success look like? Define the key performance indicators (success definition/indicators, drivers and key metrics) against which the objectives will be analyzed. These should be drawn from the interlock meeting with key stakeholders and will inform the approach and methodology for the analysis.*

- Analyzed the results from different predictive modelling techniques
- Identified the best model among the predictive models used
- Predicted the likelihood of customers who will subscribe for a term deposit
- Offered recommendations for a successful marketing campaign

## 2.3 Methodology and Approach

**i** *Now that you have a good understanding of the Ask and deliverable, detail the recommended approach/methodology.*

### Type of Analysis:

*Decision Tree, Logistic Regression, Random Forest*

The initial approach will be to use a decision tree to determine which variables (education, marital status, job...) are most significant related to a client's likelihood to subscribe a term deposit. We will also use other techniques to verify our findings.

### Methodology:

We will start by analyzing all variables and classify them if necessary. We will then categorize variables with only two values as binary values. We will build a decision tree based on the data, and observe which variables are the most important in determining whether the bank clients will subscribe for a term deposit or not. We can use the same data to execute logistic regression and

random forest. The idea is to compare the results from these 3 predictive modelling techniques and identify which among the 3 yielded the best result.

**Output:**

The output will be a set of results from the different predictive modeling techniques, insights and strategic recommendations that will help us to evaluate clients based on likelihood to subscribe a term deposit.

### 3.0 Population, Variable Selection, considerations

**i** *Capture learning about the data available today location, structure, and reliability; this would include data in operational systems including dealer sourced, data warehouse and any CRM or email marketing systems available today.*

<b>Audience/population selection:</b>	Portuguese bank clients
<b>Observation window:</b>	Phone call duration: 0s – 4,918s
<b>Inclusions:</b>	All variables
<b>Exclusions:</b>	None
<b>Data Sources:</b>	Bank Marketing Data Set, found on UCI Machine Learning repository Link: <a href="https://archive.ics.uci.edu/ml/datasets/Bank+Marketing">https://archive.ics.uci.edu/ml/datasets/Bank+Marketing</a>
<b>Audience Level:</b>	Finance Team, Marketing team
<b>Variable Selection:</b>	All variables
<b>Derived Variables:</b>	None
<b>Assumptions and data limitations:</b>	Some inputs are not considered from the original dataset

## 4.0 Dependencies

**i** Identification of key factors that may influence the outcome of the project and likelihood of it happening:

Data exploration and selection of final variables are necessary before applying predictive modeling techniques.

## 5.0 Deliverable Timelines

**i** List key dates and timelines as a work-back schedule. Activate line items based on complexity and line-of-sight required. Will set the stakeholder expectations for the process.

Item	Deliverables	Description	Target Start Date	Target Completion Date
1.	Analysis Plan and Data Finalization	<i>Selection of final raw data and creation of analysis plan</i>	July 12, 2022	July 15, 2022
2.	Data Exploration	<i>Exploratory Data Analysis</i>	July 15, 2022	July 21, 2022
3.	Modeling	<i>Application of the selected modeling techniques</i>	July 22, 2022	July 28, 2022
4.	Analysis Completion	<i>Formulation of Analysis based on the different models</i>	July 29, 2022	August 5, 2022
5.	Conclusion and Recommendations	<i>Draw conclusion and suggest recommendations</i>	August 5, 2022	August 7, 2022
6.	Final Consultation	<i>Final meeting with advisor</i>	August 7, 2022	August 10, 2022
7.	Final Revision	<i>Completion of final project</i>	August 10, 2022	August 12, 2022
8.	Project Presentation	<i>Presentation of the capstone project to advisors and students</i>	August 22, 2022	August 24, 2022

## References

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