Business Intelligence and Business Analytics

Specification Report

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Abstract—This paper investigates the impact of customer base on the financial growth and profit for a bank or any financial institution. The main factor for a bank to prosper is its customers and the type of relationship they have. The relationship is more of a generic term with respect to this context and it consists primarily about the satisfaction of the customer with respect to the services or product offered by the bank. The product or services purchased by the customer from the institution is directly proportional to the revenue factor and in terms lead to the revenue generated by the bank. The time period or tenure of this relationship is a major element corresponding to revenue generated and defines the relationship in terms of longevity i.e., the longer a customer stays with the bank, the more he/she is expected to invest in various products offered by them. The primary form of investment that a customer makes in a bank or any other Non-Banking Financial Company is in the form of deposits and it can be of any type ranging from saving deposits to fixed deposits. Also, Current deposits and Recurring deposits add to the revenue factor and the financial well-being of a bank. Any financial establishment should have a well maintained and robust system to monitor the investments of its customers and ought to have a well-defined pipeline to offer and ultimately extract more investment from its customers by offering them lucrative and tailor-made products or services depending upon the plethora of attributes related to a particular customer.

Index Terms—financial growth, deposits, revenue, investments

I. BACKGROUND

A. Organization Background and History

Banco Comercial Portugues is the largest bank in Portugal with a focus on the retail segment and has headquarters in Porto. The bank is part of the investor compensation scheme and Deposit Guarantee Fund. Notwithstanding, it still offers its clients access to conventional banking products and services.

Banco Comercial Portugues was founded in 1985 by Jardim Gonçalves and a group of investors from the Porto region [1].

It operates 600 domestic branches, and 500 branches in other countries including Poland, Switzerland, China, Angola, and Mozambique. With 15,700 employees, the bank was ranked as Best Foreign Exchange bank in Portugal by Global Finance in 2019. At the end of the same year, the bank had a market capitalization of $3.3 billion. Banco Comercial Portugues has over 4 million clients within their business folders across the Portuguese states.

B. Marketplace Participation

BCP is based in Porto, but its operations are headquartered in Oeiras, Greater Lisbon. It operates a branch brand-dubbed and restyled in 2004 as Millennium BCP as well as Banque BCP and ActivoBank. It has nearly 4.3 million customers throughout the world and over 695 branches in Portugal. It was ranked at number 1,623 in 2017.Bank of Montreal (BMO) purchased the Canadian division of BCP Bank in the summer of 2007. All branches in Canada remained BCP Bank branches until October 2007, when they became BMO branches. These branches continue to operate as specialty branches to Lusophone communities, including Azorean communities in Toronto, Ontario, except the Dundas Street West and University Avenue branches, which have turned towards the Chinese community. The introduction of the new Millennium BCP brand, in 2004, represented the final stage of a process that formally began with the implementation of a new business model by the end of 2001, but had been triggered by the merger by incorporation of the Banks Atlântico, Mello and SottoMayor into BCP, in 2000, unifying 4 brands in one only brand known to the public—the Millennium brand.

The brand, at the time of its launch, came to break with the standards implemented at the level of the Portuguese bank-

ing sector: a differentiating color, demonstrating innovation, modernity/youth, dynamism, and quality.

In one single night, BCP rebranded its entire commercial network, reopening in the next day surprising the market with its new color and designation.

C. Vision

Banco Comercial Portugues serves a vision to create experiences that give people control of their finances, helping people to make more of their money via thoughtful, appealing design and a customer-centric approach.

D. Objectives

- Effortless immediacy
- Focus on retail
- Superior efficiency levels, reflected in the commitment to achieve a benchmark cost-to-income ratio
- Reinforced capital and cost management discipline
- To boost sales and public outreach yet not to yield the quality of the products

II. System Design

A. Process Flow

The following diagram depicts the different stages involved in the process of data collection. The process starts at the creation of Leads or prospective customer and ends at the Invoice generation stage where the order is considered to be complete. Figure 1 shows the process flow from the generation of Leads (i.e the potential customer) to the generation of invoice (i.e the completion of order).
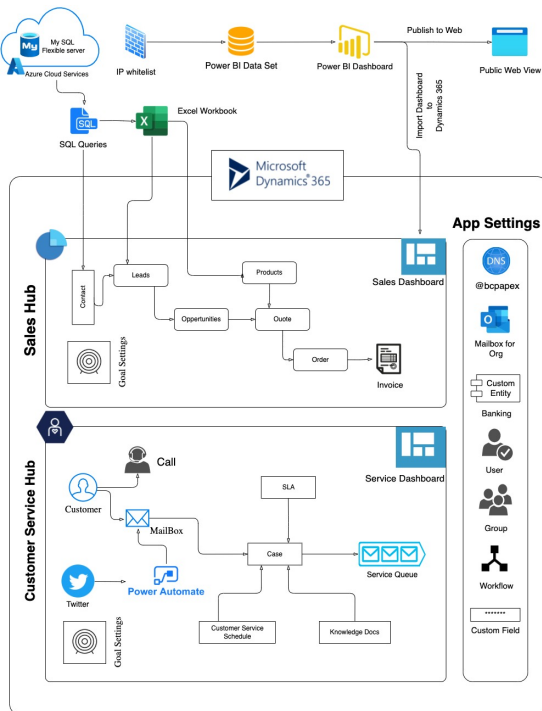

Fig. 1. Process Flow Diagram

B. Data Capture Points

The following table shows the data capture points in the database for Banco Comercial Portugues.

Data Capture Points	
Capture Points	**Data**
Lead	Customers interested in buying the product(potential customers)
Opportunity	Details of engaged customers
Quote	Details of product preferences and price offered to the customers
Order	Details of product preferences and price agreed upon the customers
Invoice	Customer purchase details and order confirmation

Fig. 2. Data Capture Points

C. Analytical Requirements

When developing the analytical requirements for this company, we needed to identify and define any high-level business needs that the project might need to focus on by enhancing any existing or creating new requirements. We looked into details of their customer data, including Lead generat- ing processes to end of the transaction completion. We created visuals from the database provided, studied them and revised a successful future strategy and investment for the company. To get a better picture of the analytical requirements of the solution, we focused on:

1) Trend Identification in the revenues generated by the products or services.
2) Analysis of geographic location of the client and the type of services and products purchased by them.
3) Main trends created by the products and services over past years and focus on them.
4) Comparison of the Leeds and Invoice ratio over the years and study unique pattern created by them over the years.

III. SWOT Analysis

SWOT analysis is a strategic planning and strategic management technique used to help a person or organization identify strengths, weaknesses, opportunities, and threats related to business competition or project planning and plays a critical role in the planning and management [2].

The internal factors comprise of Strengths and Weaknesses, which primarily are the resources and experience readily available to us, such as the company's financial and human resources and on the other side the external factors can be categorized into Opportunities or Threats which in general can be anything that our company cannot control, such as market trends, economic trends, fundings, political or environmental regulations.SWOT diagrams can be particularly helpful when trying to determine whether or not to embark on a specific venture or plan by clearly analyzing and outlining the pros and cons of a business [3]. For businesses to remain successful in the long term, it is necessary to look at things from a holistic approach. The strategies and policies need to be analyzed regularly to ensure the optimum performance and output of the company SWOT analysis plays a very crucial role for these kinds of analysis. Strengths refer to the robustness of

the company where as Weaknesses are the factors that acts as a deterrent for the company to achieve its objectives. Opportunities refer to those external factors which can give it a competitive edge over other companies in the similar market or domain. Threats are anything that can cause harm or loss to the company or the product. Threats include anything from the rival companies in the market to the problems like supply shortages.

Fig. 3. SWOT Analysis - Elements

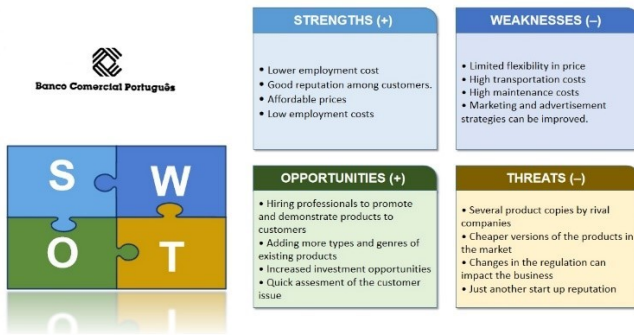The SWOT diagram for the Banco Comercial Portugues is shown in Figure 4

Fig. 4. SWOT Analysis for the Banco Commercial Protugues

IV. DATABASE DESIGN

A. Entity Relationship Diagram (ERD)

Entity Relationship Diagrams, also known as ERD is a visual depiction of the inter relationships or connections between the different entities in a database. An entity is a determinable thing or a concept within a database. In layman's terms, an entity is a table which has several properties known as the attributes or columns in it. A primary key is a unique attribute which defines an entry or record in a table. ER diagrams come in handy while creating database for an organisation since it allows to study the connections between different stages

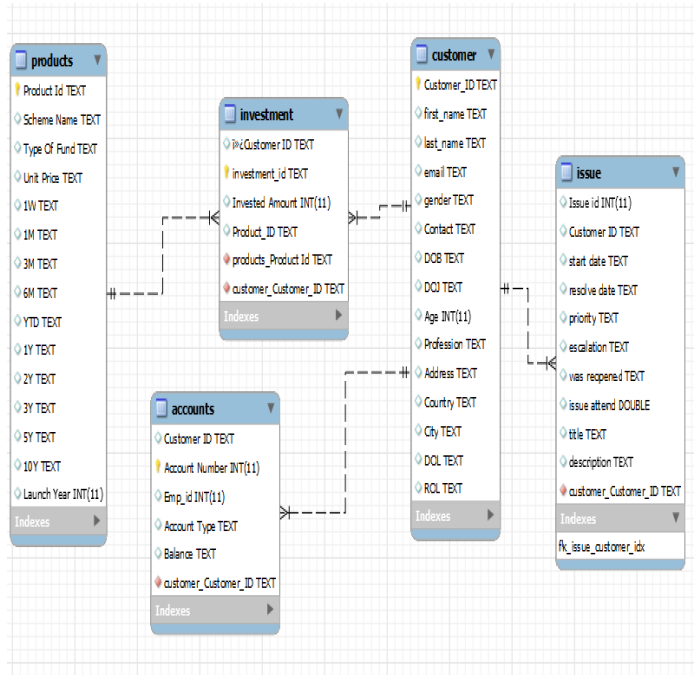of the sales process and hence make wise decisions for the organization. The ER diagram is shown in the Figure 5.

Fig. 5. Entity Relationship Diagram

V. DATA DICTIONARY

A. Leads

Attribute Name	DataType	Description
Lead_ID	String/Integer	Unique ID for potential customer
First_Name	String	First Name of potential customer
Last_Name	String	Last Name of potential customer
Full_Name	String	Full Name of potential customer
Email_address	String/Integer	Email address of the potential customer
Product_Name	String	Name of the product
Product_ID	String/Integer	Unique ID of the product
Date_Of_Birth	String	Date of Birth of potential Customer
Lead_Created_On	Date	Date on which the lead was generated
Product_Category	String	Category of the product

Fig. 6. Leads (Potential Customers) data dictionary

B. Opportunities

Attribute Name	DataType	Description
Lead_ID	String/Integer	Unique ID for potential customer
Opp_ID	String/Integer	Unique ID for engaged customer
Product_ID	String/Integer	Unique ID for product being offered
Product_Name	String	Name of the product being offered
Email_address	String/Integer	Email address of engaged customer
Created_On	Date	Date on which opportunity was created
Closed_Date	Date	Date on which opportunity was closed
Estimated_Revenue	Integer	Estimation of the revenue that will be generated
Actual_revenue	Integer	Actual revenue that is generated by the engaged customer
Description	String	Status of the customer engagement (Won, Lost, Open)
Rating	String	Rating of the engaged customer (Hot, Warm, Cold)
Last_Modified_By	String	Name of the agent who last engaged with the customer
Probability	Integer	Estimated Probability of customer qualification

Fig. 7. Opportunities(Engaged Customers) data dictionary

C. Accounts

ACCOUNTS		
Attribute Name	**DataType**	**Description**
Lead_ID	String/Integer	Unique ID for potential customer
Opportunity_ID	String/Integer	Unique ID for engaged customer
Account_ID	String/Integer	Unique ID for customer account
Full_Name	String	Full Name of potential customer
City	String	City of the customer
Email_address	String	Email address of customer
Phone_no	Integer	Phone number of the customer
Status	String	Status of customer account (Active/Inactive)

Fig. 8. Accounts data dictionary

D. Quotes

QUOTES		
Attribute Name	**DataType**	**Description**
Lead_ID	String/Integer	Unique ID for potential customer
Opportunity_ID	String/Integer	Unique ID for engaged customer
Account_ID	String/Integer	Unique ID for customer account
Quote_ID	String/Integer	Unique ID for customer quote
Product_Name	String	Name of product which is of interest
Product_ID	String/Integer	Unique ID of product which is of interest
Product_Category	String	Category of product which is of interest
Actual_Revenue	String	Actual Revenue generated
Email_address	String	Email address of Customer
Status	String	Status of Customer Engagement (Won/Active/Closed)

Fig. 9. Quotes data dictionary

E. Orders

ORDERS		
Attribute Name	**DataType**	**Description**
Lead_ID	String/Integer	Unique ID for potential customer
Opportunity_ID	String/Integer	Unique ID for engaged customer
Account_ID	String/Integer	Unique ID for customer account
Quote_ID	String/Integer	Unique ID for customer quote
Order_ID	String/Integer	Unique ID for customer order
Product_Name	String	Name of product being ordered
Product_ID	String/Integer	Unique ID of product being ordered
Product_category	String	Category of the product ordered
Actual_Revenue	String	Actual Revenue generated
Email_address	String	Email address of customer

Fig. 10. Orders data dictionary

F. Invoice

INVOICES		
Attribute Name	**DataType**	**Description**
Lead_ID	String/Integer	Unique ID for potential customer
Opportunity_ID	String/Integer	Unique ID for engaged customer
Account_ID	String/Integer	Unique ID for customer account
Quote_ID	String/Integer	Unique ID for customer quote
Order_ID	String/Integer	Unique ID for customer order
Invoice_ID	String/Integer	Unique ID for customer invoice
Product_Name	String	Name of the product of interest
Product_ID	String/Integer	Unique ID of the product of interest
Actual_Revenue	Integer	Actual Revenue generated
Email_address	String/Integer	Email address of Customer
Phone_no	Integer	Phone number of the customer

Fig. 11. Invoices data dictionary

G. Products

PRODUCTS		
Attribute Name	**DataType**	**Description**
Product_ID	String/Integer	Unique ID for product in inventory
Product_Name	String	Name of product in inventory
Product_Category	String	Category of product
Age_Group	Integer	Suitable age group of the customer for the product
Status_of_Product_availability	String	Status of product availability (Available/Unavailable)

Fig. 12. Products data dictionary

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