



DIPLOMA IN DATA ANALYTICS CO-OP

Data Design

Final Group Project

Project Name: Retail Banking

Executive Summary

The project is based on a group of professionals trained for data analysis with a vision focused on the information collected by the company to find the key points at both macro and micro levels, with the aim of creating growth, productivity, efficiency, balance, and above all a strengthening in the relationship between the company and its customers.

The group is based on the information collected historically, organizes the information, consolidates it, makes it friendly for both the company and the client, sees patterns, predictions and creates business strategies, always aware of the market and its changes. Study not only the market but also the company to have an absolute understanding and to be able to achieve the objectives set.

The project is formed by professionals trained in different markets, who contribute directly to decision-making for the good of the common goal.

Problem: In recent customer feedback, Eagle National bank found that 40% of its customers weren't receiving products and services that apply to their specific situation/context, and based on this feedback, ENB wants to create new products and services that will be useful to its clients but needs help figuring out how to target the right class of clients for these products.

Proposed Solution: Eagle National Bank collects a wealth of data on client activities over time and a couple of data points from their databanks have been extracted to help monitor customer behavior, based on the number of loans they take, transactions they complete, date their accounts were created to track how long they have been with Eagle National bank. Card details will also be monitored and grouped based on credit card type to see which card type takes out the most amount of credit, this will help better understand customer behavior. The location also comes in handy to help ascertain the districts and states with the highest volume of transactions.

Value: Better understanding of the clients and their needs will save Eagle National Bank 35% on advertising and will see an increased reach of 50% with their advertised content due to the increased level of customer understanding.

Also, customer satisfaction is anticipated to see a 60% rise due to a better understanding of Eagle National Bank's clients and their needs.

Based on the prescriptions of this report, better customer behavior understanding, and fine-tuning services based on contextual customer needs it is anticipated that these will lead to a 3% increase in market share over the next 2 years.

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1. Introduction

Eagle National Bank is a leading bank in the Americas with its headquarters in the USA that focuses on the Americas top growing markets and provides top-notch advice and services to help their customers advance, making them a top-five universal bank in each of their main countries and a top-15 wholesale bank in the United States.

Eagle Banking provides a full suite of financial advice and banking solutions, supported by an excellent customer experience, to over 10 million Retail, Small Business, and Commercial Banking customers.

The Eagle National Bank is compromised with Retail and Small Business Banking, which provides financial advice and solutions and day-to-day banking products, including debit cards, chequing accounts, credit cards, mortgages, loans, and related creditor insurance products, to individuals and small businesses.

The banking sector has faced many adversities and challenges through the years such as the 2008 financial crisis, which cause deep damage to the banking industry all over the world, now at days, the banking industry is in a better place, however, the challenges didn't end with the 2008 crisis, the most recent challenge the banking industry faced was de COVID-19 pandemic and the sector had to evolve in order to satisfy the new need of the client.

The Banker's Top 1000 World Banks Ranking for 2018 shows that the total value of all global assets increased to \$124 trillion in 2018. The US retail banking market is expected to witness a CAGR of 4.49%, during the forecast period (2021-2026).

With a huge amount of money to manage Major banks, including JK GOLD Chase, Bank of America, Eagle National Bank, and others, are introducing new features to draw in new clients and keep hold of their current ones. Additionally, neo banks and start-ups are entering the market with disruptive banking technologies, and established financial institutions are either competing with them or combining with them to enhance their customer experiences.

The world and the way the economy works it's uncertain, therefore, it is imperative for companies to develop adaptability to overcome every future situation that represents a risk. The Eagle National Bank is aware of that, and for that reason has launched a project led by the Marketing Department, a Project manager, and a group of five Data Analysts with expertise in the banking sector. The following report is the work of the Data analysts, the report shows the segmentation of products offered by the bank and the main features of the clients in a dynamic, explicit, and visual way.

2. Business Case and Objectives

2.1. Case Study

Eagle National Bank is a banking company based in New York, USA. The population of the USA grows with stability year by year, and many banking companies have entered the market in recent years. Accordingly, the market has become more intense than before. Eagle National Bank wants to get more new customers to beat the competition with other companies.

Due to the new challenges that the banking industry is facing, Eagle National Bank has decided to launch different projects to keep growing and improving the products and services offered to the clients. The next project is the work of five Data analysts hired by Eagle National Bank and the focus of the project is to segment ENB client's data into various clusters, each cluster seeks to classify clients based on their similarity in transaction, products, accounts and orders. By segmenting and monitoring ENB client's spending behavior to improve customer retention and anticipate whatever future needs they may have, this Project will help them grow their client base.

2.2. Internal stakeholders

- **Project manager:** Responsible for planning, execution, and results of the project. Also, the project manager must communicate and make sure the work is done properly by the Data Analytics Team and should be a bridge that connects business with the data process to achieve the main goals or objectives of the project. The project manager is also responsible for reporting advances and results to the company managers and marketing department.
- **Project Team members:** Group of people, in the charge of developing the products required for the project. They must understand the business process to be able to analyze and find data insights and then create the outcome.
- **Company Managers:** Responsible for and primarily interested in the results of the business. They are accountable to the bank's board of directors for the overall results of the company. They request the use of project results for the improvement of business processes.
- **Marketing department:** In charge of defining the business strategies to be applied after the project findings to achieve the business objectives. They report to the bank's management and work hand in hand with the project leader.

2.3. External Stakeholders

- Competitors: Other companies or businesses that can offer direct or indirect substitute products to customers and are also seeking to increase their market share. They can apply similar business strategies and apply data analysis to achieve business objectives.
- Government regulators: Governmental entities in charge of regulating and monitoring the use of customer information based on ethics and correct data handling, as well as those in charge of monitoring financial entities that have products that comply with regulations and the law.

2.4. Business objectives

1. Create a Power BI report that allows Eagle National Bank to understand better their client's activities related to the products offered in order to be more competitive in the retail banking sector.
2. Visualize the status of each loan and what is it used for.
3. Visualized the kind of operation done in every transaction.
4. Visualize the product acquired by the clients.
5. Visualized the distribution and concentration of clients around the country.

3. Data Understanding and Objectives

3.1. Data Sources

This case study was carried out using secondary data sources from www.data.world.com it contains 8 sheets of data based on activities from Eagle national bank which include:

- Transaction: A transaction consists of moving money from one account to another. In other words, it is the operation by which a person or entity decides to send a certain amount of money to the bank account of another person or entity.

This entity specifically lists what the banking company's customers did, shows the balance and the amount of the transaction also to whom the transaction is addressed.

- Order: When a company or payer issues an order, it gives instructions and express authorization to its bank to withdraw funds from its account and make them available to the payee at the bank where the payee's account is held.

This entity lists how much money the customer borrowed from the bank and for what purpose is the order.

- Loan: A loan is a financial transaction whereby one person gives an asset to another person in exchange for interest (the price of money).

This entity lists how often and how much customer subscribes to a loan and for what purpose. Shows Information about the amount of the loan, the year, their status, the duration of the customers, etc.

- District: A geographical subdivision of a county, municipality, or similar entity, for political, judicial, or administrative ends.

This entity list provides information about the state, the region, and the division in which the customer lives.

- Disposition: It is the legitimate owner of the funds deposited therein. These may be natural or legal persons. The debtor in a financing operation is also referred to as the owner of an account. It should be noted that an account may be opened with one or more owners.

The disposition sheet indicates ownership of the account, it shows if the account is being held primarily by the owner or if it has other users/signatories to the account.

- **Client:** It is the natural or legal person with whom the supervised entities establish relationships of legal or contractual origin, for the supply of products or services, in the development of their corporate purpose.

The client ID datasheet contains personal information about each client at Eagle National Bank, it contains their Full Name, gender, date of birth, address, and how we can contact them.

- **Account:** A bank account is a virtual space in which a bank customer can store his money in the form of a deposit. In addition, he/she can manage this money by making payments, receiving deposits, or making cash withdrawals.

In the datasheet of account, find information about the frequency of the account, the parsed date and the district ID

- **Card:** A card is a means of payment issued by a financial institution in favor of a consumer, through an associated account, and which is accepted in countless businesses and establishments. The datasheet contains de card ID, the type of card, also the full date.

3.2. Final integrated data design

In the ERD is visualize the connections between the entities, and the attributes of each one. There are eight entities with their respective attributes (Figure 1).

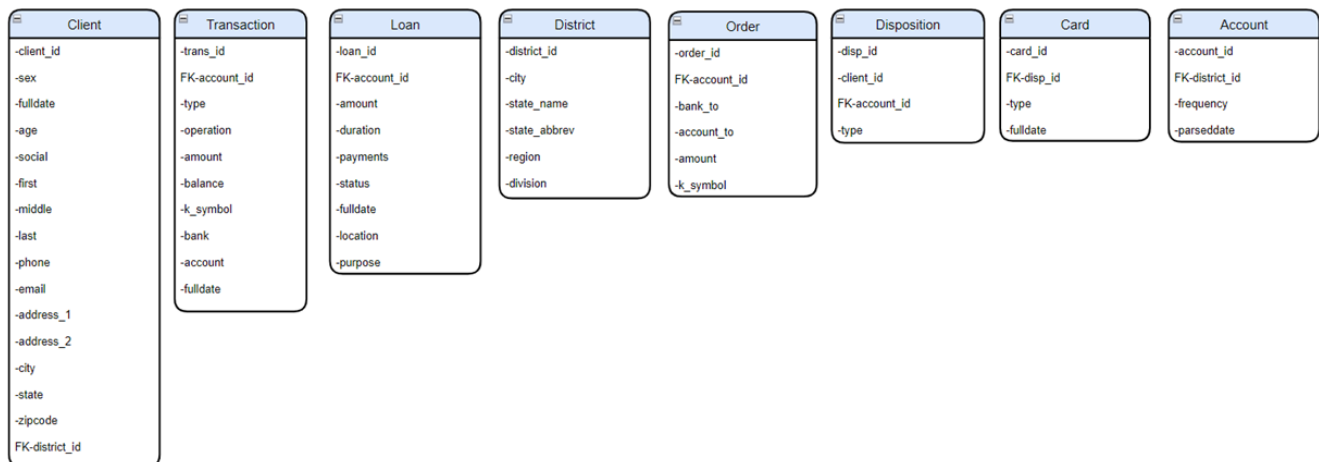


Figure 1 The list of entities and their attributes

Figure 2 shows the Entity Relationship Diagram of the dataset. The entities “Transaction” and “Order” relate to the entity “Account”, in the same entity (Account) exists another relation with the entity “Loan” which is connected to the entity “Client”. The client has two relations in addition to the already aforementioned, the first one is with the entity “District”, and the second one is with the entity “Disposition” which has a relationship with another entity called “Card”.

At the left side, the entities “Order” and “Transaction” have a direct relationship with the entity “Account” and have a One-to-Many relation with each one. The entity “Account” also has another relation with the entity “Loan” and has a One-to-One relation. Now the diagram is moving to the right side the entity “Loan” has another relation with the entity “Client” both form a relation One-to-Many. In the entity (Client) there are two other relations. The first one is One-to-Many relation with the entity “District”, and the second one but not least important is a one-to-one relation with the entity “Disposition”, and at the end this last mentioned (Disposition) has a relation One-to-One with a new entity called “Card”.

3

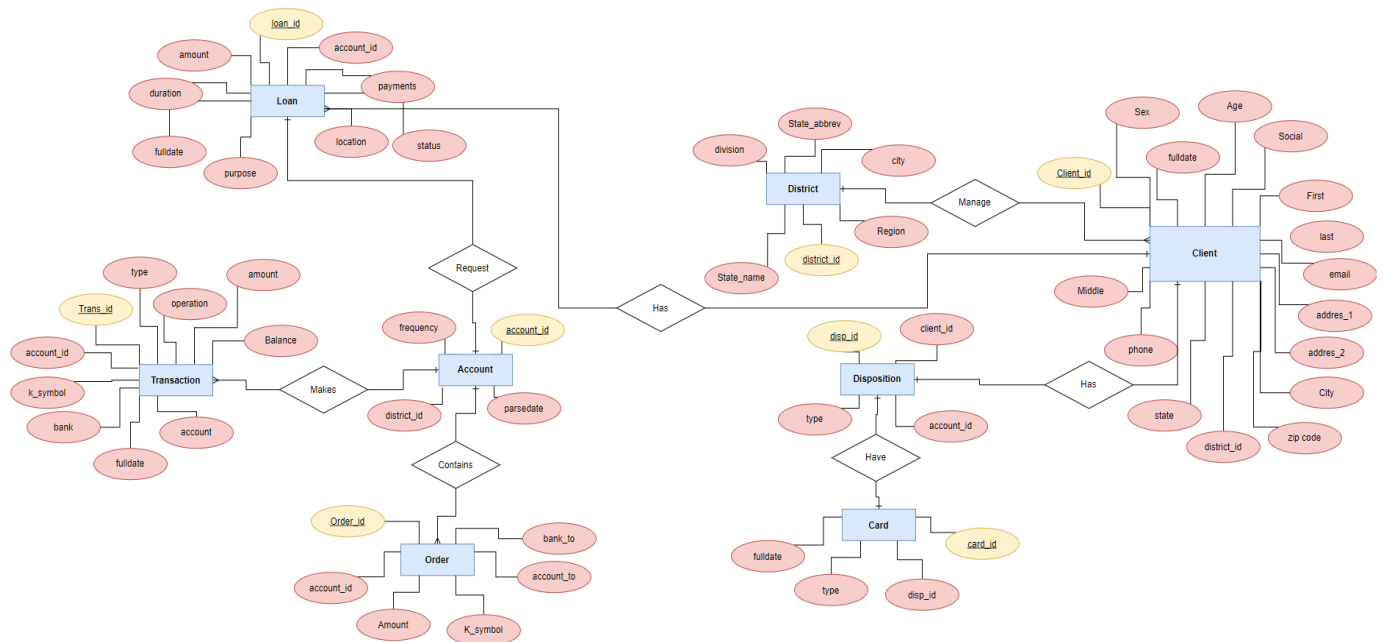


Figure 2 Entity Relationship Diagram from the Eagle National bank dataset

3.3. Analytical objectives

1. Understand the business background, goals and define the data sources
2. Understand the data through initial exploration and relate it to the business objectives
3. Select, prepare, and clean the data
4. Prepare an entity relationship diagram that allows to better understand of initial discovery
5. Integrate the data through a dataset model tool such as excel and power BI
6. Generate and calculate statistical measures that allow to identify descriptive insights about the customers.
7. Identify and analyze the most common features about clients based on the location, transaction, type of product, loan, account information using and through tables, indicators, and data visualization tools.

4. Project Plan

4.1. Project Management Methodology

Using the crisp-dm methodology, the aim is to help Eagle National Bank make sense of the data it gets from its day-to-day activities; the data collected will be used to tell a story that clearly shows how it manages client data. Eagle national bank is a Retail Bank in the United States and credit is one of the many services it provides to its customers.

Understanding the data gathered on the credit made accessible to clients will aid in improving the services offered to customers and in identifying the areas that require more focus to foster customer satisfaction and boost customer retention.

A secondary data collection method was used in preparing this report and the dataset was sourced from data world. Data was collected on every client Eagle National bank has the transactions they make, the loans they have taken out, the cities these loans were taken, their loan repayment plans, and credit card information.

The data collected has been processed, it's been checked for erroneous inputs, its relevant entities have been extracted and erroneous inputs have been corrected, the data has also been appropriately formatted and integrated to make it easier to work with.

The datasets have been modeled using Entity Relationship Diagrams and excel sheets and they paint a clear picture of the relationship between all the created entities, which will help inform decision-making. The results gathered will be evaluated to make sure nothing's been overlooked, and all the data has been incorporated into the analysis, to yield the best possible results if everything checks out, the data analytics process will move along to the next level where it will be deployed

In the deployment stage, a final report will be drafted, and visualizations will be presented for management to decide on what to do with the data presented.

4.2. Project/Product Scope

Create a report that allows the marketing and managers of the company to identify the main features of the customers related to the bank product they use or are owners of.

Create a Power BI report that includes (pages). All pages must be 16:9 in dimension. The power BI report must include visualizations and charts and be clear and understandable for the marketing team.

F1 The report must show the main features of the products the client is using.

F1.1. The report must show the most common products (loans and credit card) that the customer has.

F1.2 The report must show the average amount of loan by purpose.

F1.3 The report must show the average amount of loan by type of card.

F1.4 The report must show the evolution over the years of the number of loans and the average value amount be identified.

F1.5 The report must include information about the average duration and the average amount of loans.

F1.6 The report must show the number or distribution of loans by issuance frequency

F1.7 The user must be able to filter by Year, Purpose, and Type of card

F2 The report must show the main features related to the client.

F2.1 The report must show the distribution of sex of the client (Female and Male)

F2.2 The report must show the distribution of age of the client by labels. The labels must be: "Under 18", "18-35", "36-45", "46-59", "60-75" and "Above 75".

F2.3 The report must show a table with the top 10 clients with the biggest amount of loan, the next information about the client must be shown: Full name, amount of loan, purpose, type of user, age and sex.

F2.4 The report should show a map showing the concentration of customers according to the city where they live.

F2.5 The report must include the name of the city with the largest number of clients

F2.6 The user must be able to filter by Year, Age label, Sex, and city

F3 The report must show the main features related to the accounts opened by the clients and the orders.

F3.1 The report must show the location of each bank where the account was opened

F3.2 The report must show the average amount of money in the order by reason

F3.3 The report must show the number of accounts opened per year and quarter using a column chart

F3.4 The report must indicate the total amount of accounts opened by the bank

F3.5 The report must indicate the average of order amount

F3.6 The report must indicate the max and min of order amount

F3.7 The user must be able to filter by year and city

F4 The report must show the main features related to the transactions the clients made.

F4.1 The report must show the average amount as balance

F4.2 The report must show the operation of the transaction and the average amount of money

F4.3 The report must show the name of the bank the transaction was made to and the average transaction amount in a bar chart.

F4.4 The report must show the distribution for purpose or type of operation

F4.5 The report must indicate the minimum and maximum balance

F4.6 The report must show the average transaction amount by weekday (Monday to Sunday)

F4.7 The user must be able to filter by year, type and operation

The scope of this project doesn't include the solutions or a proposal to improve the client experience or services offered by the eagle national bank, the goal of this project is to show and expose the main features of the data set, make a visual representation so that the marketing team will make a decision and decide how they are going to act, change and implement to improve the client experience and the products they offer to improve their services and become more attractive for the clients and enhance their competitiveness in the retail banking sector.

4.3. Project Schedule

Figure 3 shows the project schedule. The project took seven days, from October 10 to October 16, 2022. The project schedule was divided into four steps.

In the first part, "Business", setting up the project schedule for setting up a Business Case and Business Objectives for the problem behind the client's data. This part requires a good understanding of the business problem addressed.

The second part, "Data Set," is the project schedule for understanding the contents of the data set. In this part, it needs an "Entity relationship diagram" to understand the big picture of the data and the interrelation within the data. And it listed the objectives to be analyzed.

The third part, "Plan," is the project schedule to determine what services will provide to the client for this project. Specifically, the Project Methodology, Functional Requirements of the product, Project Schedule, Budget, and Non-Functional Requirements of the product are determined in that order.

The final "Analysis" part is the project schedule that describes the analysis process to solve the problem the client commissioned. In turn, a huge amount of data is cleaned, and it's integrated into Excel and Power BI, the tools used for this analysis. The charts, the mathematical and statistical formulas required for them are determined to achieve our goals of "segmenting our clients and monitoring our client's

spending behavior”. Finally, the report summarizing our findings from the analysis is prepared for our client. This is the workflow of our project.

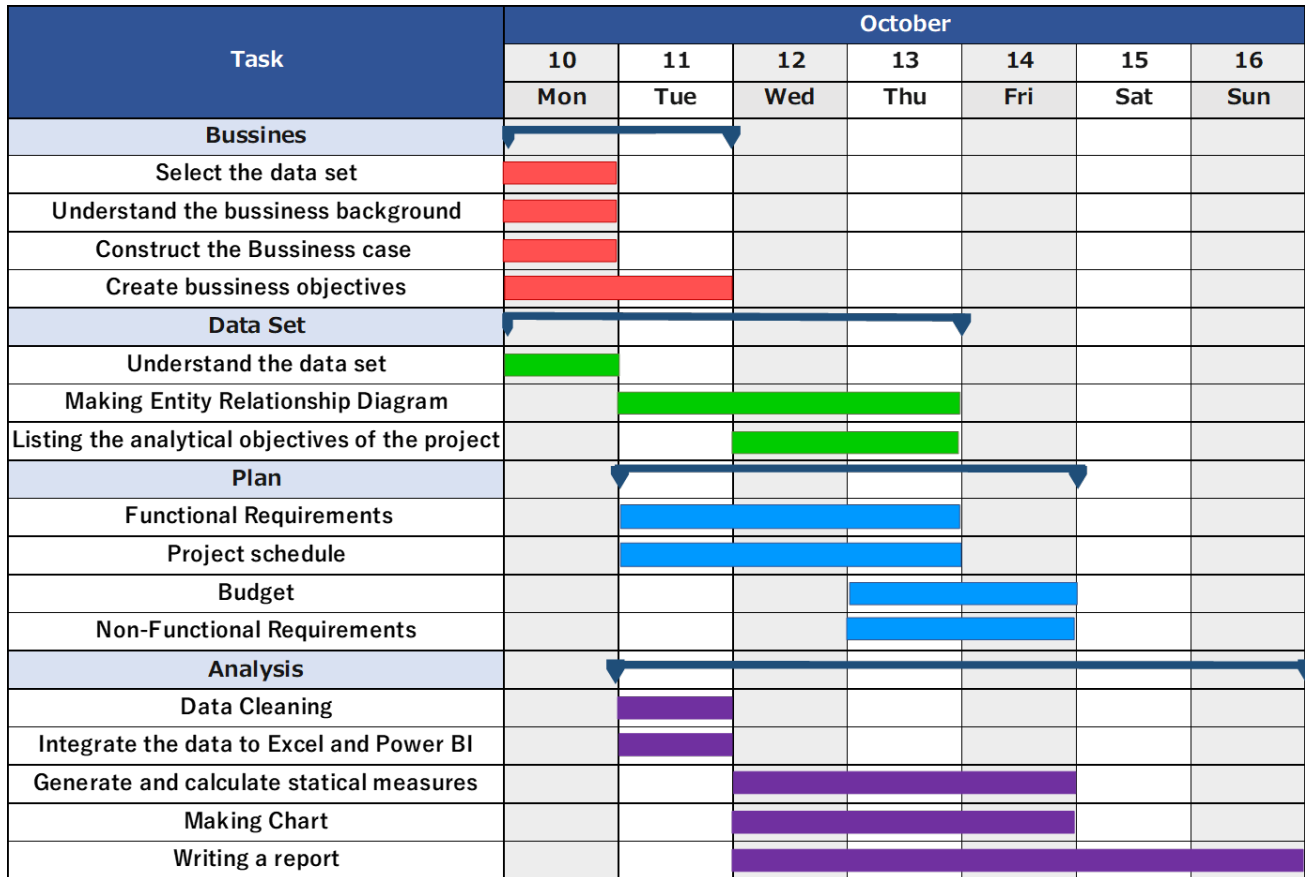


Figure 3 The task schedule for this project

4.4. Project Budget

The Eagle National Bank launched a power BI data project on October 10, 2022. The Company requires one Power BI with at least four pages and twenty visualizations that show the products and clients' main features in a clear, dynamic, and organized way.

To carry out this project, the marketing team has requested five Data analysts with experience in the Retail Banking sector to design and create the power Bi report and a written report that shows the main features of the power bi report.

The Eagle National Bank has hired five Data analysts with experience in the field to work with the marketing team. For seven days the analyst will work on this project for a wage of \$60/hour, 40 hours/week. For the project, the company will purchase an annual Power BI subscription for the cost of \$399 per month.

In addition, the Manager of the project requested that two of the five analysts continue working in the Company for a period of twelve months to keep improving the Power BI report and to help the marketing team to create future strategies and projects. This analyst will work for a wage of \$40/hour 40 hours a week.

The budget for this project considering all the requirements of the company is shown in the table below (Table 1). As the table shows the expense for this project extends to \$55,188.00. The project lasted one week, and the expenses for the first week only included the five analysts and the Power BI Plan, giving a total amount of \$16,788.00. The \$38,400 wage for the 2 maintenance analysts will be split over 12 months.

| Expenses | | |
|-----------------------|-----------|------------------|
| Analyst 1 | \$ | 2,400.00 |
| Analyst 2 | \$ | 2,400.00 |
| Analyst 3 | \$ | 2,400.00 |
| Analyst 4 | \$ | 2,400.00 |
| Analyst 5 | \$ | 2,400.00 |
| Power BI plan | \$ | 4,788.00 |
| 2 Maintenance analyst | \$ | 38,400.00 |
| Total | \$ | 55,188.00 |

Table 1 The budget list for the project.

4.5. Product Quality

NF1 The report must have a cover page

NF1.1 The cover page must include the logo of the bank

NF1.2 On the cover page must display the name of the bank (Eagle National Bank)

NF1.3 There should be navigation buttons linked to each page that allows the user to be redirected to the desired page

NF1.4 The name of the report must be displayed as “Customer understanding and product analysis report”

NF2 The report must use a modern design

NF3 The colors used must be blue (#282D50), grey (#B3B3B3), and yellow (#D9B300)- referring to brand colors. However, colors such as black, white, and pale blue (#A0A7D8) can be used in a complementary way.

NF3.1 The color blue (#282D50) is the main color to be used in the design followed by yellow (#D9B300) and then grey (#B3B3B3) color.

NF3.2 Black must be only used as a color for text in the charts

NF4 The bank logo (eagle) in grey palette color must be used always with the bank name

NF5 The bank name must be written as Eagle National Bank

NF5.1 The bank name must be written capitalizing each word (Eagle National Bank)

NF5.2 The bank name must be in 18 size letter

NF5.3 The bank name must be displayed on each page of the report

NF6 The titles of the pages and in the charts must use Tahoma font

NF7 The text in other objects must be in DIN font (text in charts and text boxes)

NF8 The text in the slicer’s titles must use DIN font

NF9 The values of amounts must be formatted as currency (\$)

NF10 The number values shouldn’t display more than two (2) decimal positions

NF11 The display units must be in thousand formats if the number is lower than one million (21k instead of 21.000) and if the number has more than four digits

4.6. Deployment

Upon completion of the report, the report will be scanned through for bugs and errors, and once it is ensured that the report is bug free, the final product will be released to the management of Eagle National Bank, and it will be expected that the report be shared across the board so it can provide feedback from

everyone at every level at the bank to ensure the report provides nuanced feedback that may end up being an oversight if shared with management staff alone.

The report will help visualize data on client information, and the goal of this is to help provide clear segments of customers. It will provide visuals on who Eagle National Bank's biggest clients are and who their biggest debtors are, and this information will help Eagle National Bank serve their clients better.

The report will also shed some light on the states and even the districts that bring Eagle National Bank the most business, and this can help inform management on the areas that will benefit from more branches and outlets to help better serve their clients in those areas. Doing this will.

Essentially, the deployment of this report will seek to provide Eagle National Bank with information that will help them deliver relevant products to client segments that will find them useful, based on their quality and applicability to their context. This way, their products can be more targeted and effective.

5. Data and Final Product Features

5.1. Integration of the dataset into the final product

The dataset consists of eight entities, related to each other, where there is information about the products that the bank has and offers to its clients, the orders placed by clients, the transactions that they carry out, the bank accounts opened by the clients, as well as general information about the clients.

There are dimension tables such as `tbl_district`, `tbl_card`, `tbl_client`, `tbl_disposition` that seek to define aspects of the business such as customer information related to the card used, whether it is a user or owner. Likewise, there is correlated information about the locations of the bank's offices and the customers themselves. These tables require a unique identifier for each record or group of observations represented in the other columns.

On the other hand, there are different fact tables, such as `tbl_order`, `tbl_transaction`, `tbl_account` and `tbl_loan`. These tables seek to create and maintain records that can increase over time, each of these tables are related with foreign keys to the dimension tables.

All the tables were previously prepared in excel, then loaded to power bi, once there the required data formats are adjusted and the relationships between the tables are established from the primary keys and foreign keys available.

As can be seen in the figure, the relationships between the tables are identified.

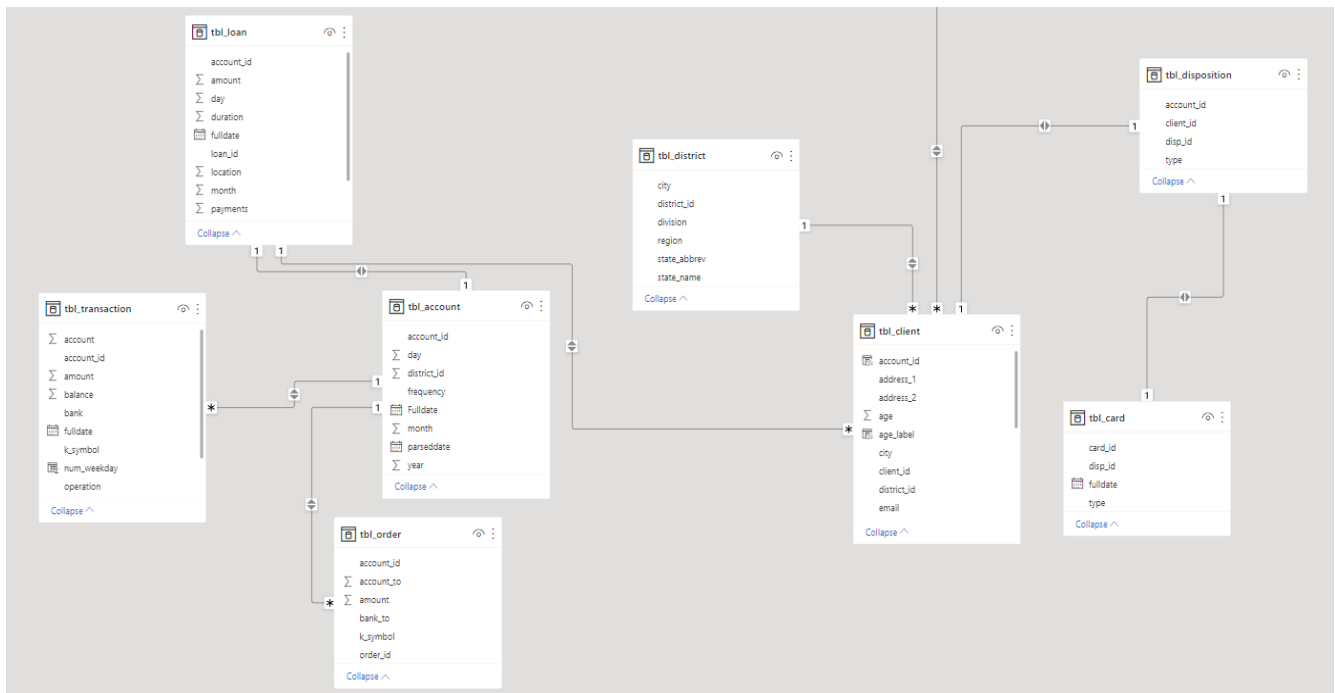


Figure 4 Dataset model in Power BI

Once the relationships are active and established, we proceed to set the cross-filter direction, which enables the flow of data from one table to another in both directions.

Then the data is manipulated and used in the different graphs, charts, and text boxes, first defining according to the functional requirements previously defined the focus of the analysis from the business point of view.

On the product pages the tables used are `tbl_card`, `tbl_loan` and `tbl_account`, the relationships between the tables are used starting from the `account_id` key, creating visualizations focused on the evolution and the amount of the disbursed loans, as well as the distribution of the type of cards, the frequency of the issuance and the amounts used in each type of card.

The client page contains the relevant client information, based mainly on the `tbl_client` table that brings social and demographic information of the client, it seeks to visualize it easily for the user, through simple pie charts and labeled range of data such as age, also creates a summary table of the top 10 customers based on the amount of the loan requested.

The `tbl_account`, `tbl_district` and `tbl_order` tables are used in the accounts and orders page. These tables are related from the key `account_id`. which allows to relate the data and to obtain visualizations of the value or amount per order reason, the location of the offices of the bank where the client opens his accounts as well as the evolution of the number of open accounts, as well as summary data like the total of open accounts, the minimum, maximum and average of the amount of the orders.

Only the `tbl_transaction` table is used on the transaction page. Columns such as the amount of transaction, operation, type, and bank are used to create an analysis of the distribution of transactions according to the type of operation, as well as to identify which bank customers make the most transactions and to identify which day of the week customers make the largest transactions in quantity and amount.

5.2. Product features

The report has a simple structure of four pages and a cover, in the cover, are the buttons to go to each page, you must ctrl + click to be redirected to each page.



Figure 5 Power BI report Cover Page

1. Product Page

The report is showing the main features of the products the client is using.

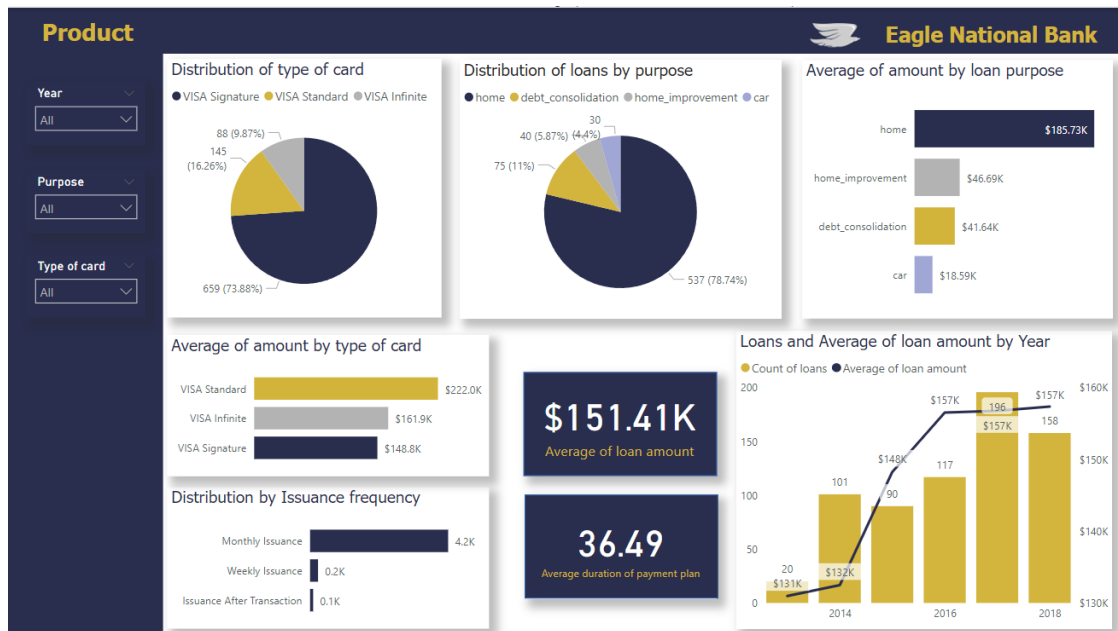


Figure 6 Power BI report Product Page

- 1.1. The report shows the most common products (loans and credit cards) that the customer has. The user can see the segments representing each type of card and the loan usage. Also using the tooltip, the user can have the detail of the chart.

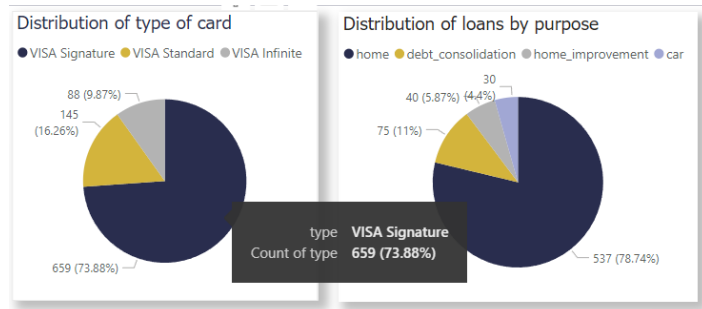


Figure 7 Pie charts on Power BI report Product Page

- 1.2. The report shows the average amount of loans by purpose. Also using the tooltip, the user can have the detail of the chart.

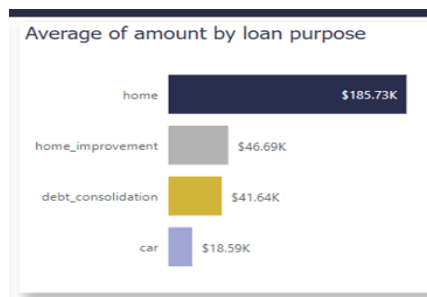


Figure 8 Bar chart on Power BI report Product Page for Average amount by loan purpose

- 1.3. The report shows the average amount of loan by type of card. Also using the tooltip, the user can have the detail of the chart.

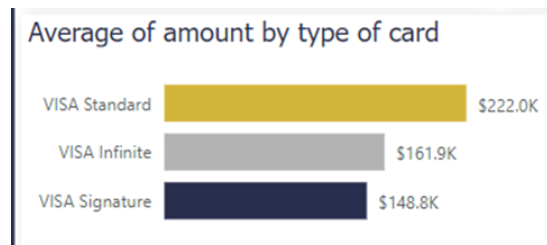


Figure 9 Bar chart on Power BI report Product Page for Average amount by type of card

- 1.4. The report shows the evolution over the years of the number of loans and the average amount is identified. The main y-axis represents the sum of the number of loans (columns) related to the x-axis, the secondary y-axis has the average amount of loans with the same x-axis (lines), the x-axis is a date value, and the year is used. The user can relate these values and have conclusions. Also using the tooltip, the user can have the detail of the chart.

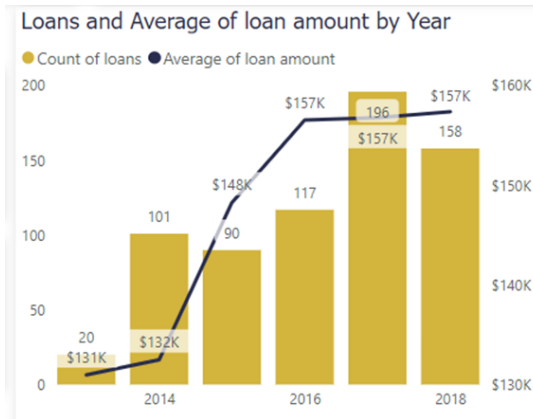


Figure 10 Loans and Average of loan amount by Year Column and line chart on Power BI report

1.5. The report includes information about the average duration and the average amount of loans. These values could change based on filters and selections the user made.



Figure 11 Text boxes on Power BI report Product Page

1.6. The report shows the number or distribution of loans by issuance frequency

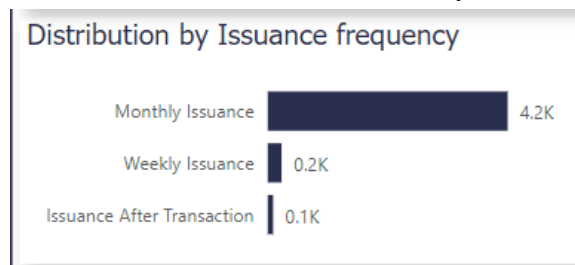


Figure 12 Distribution of loans by issuance frequency bar chart on Power BI report

1.7. The user is to be able to filter by Year, Purpose and Type of card using slicers

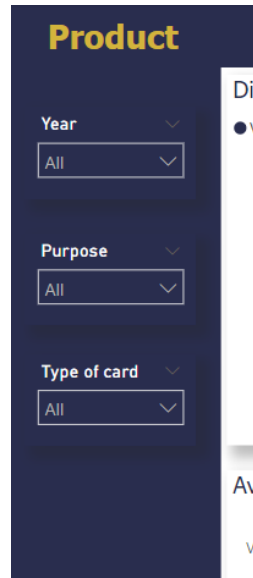


Figure 13 Slicers on Product Page

2. Client Page

The report is showing the main features of the client.

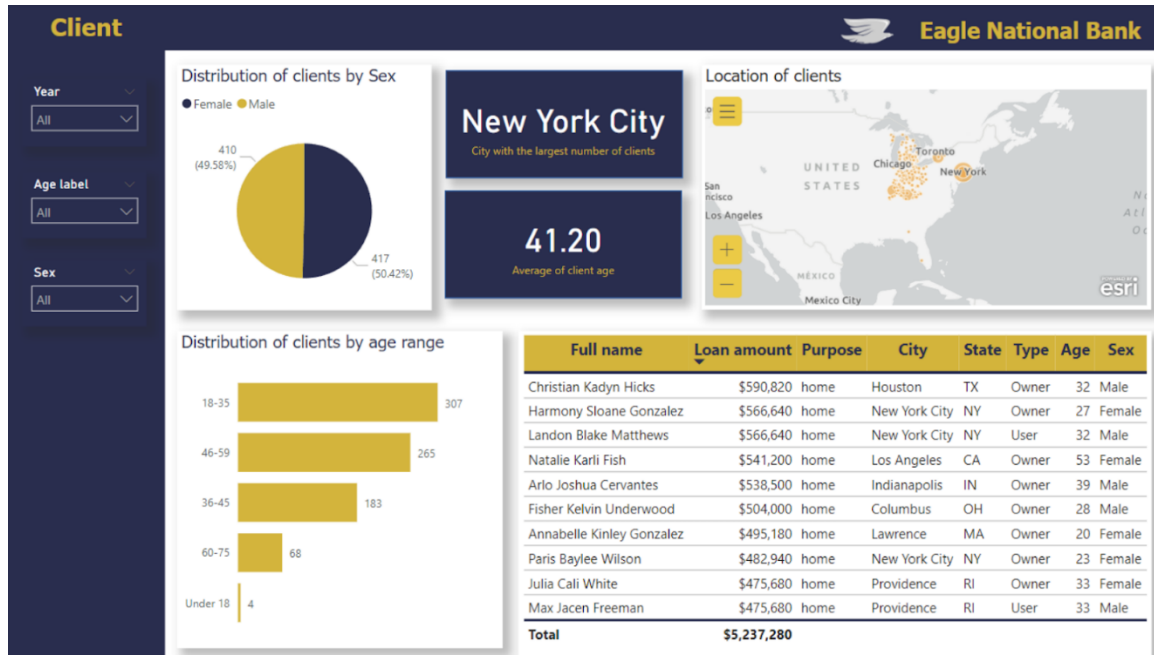


Figure 14 Power BI report Client Page

2.1 The report shows the distribution of sex of the client.

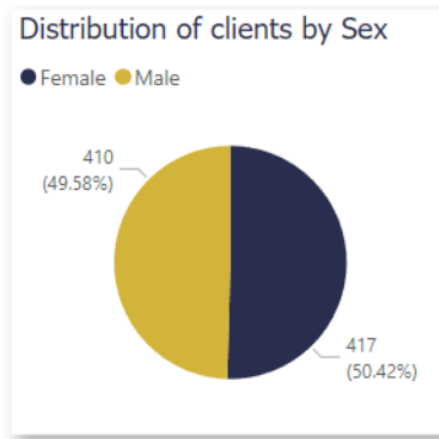


Figure 15 Pie chart on Power BI report Client Page

2.2 The report represents in bar the distribution of the age of the client by labels.

Distribution of clients by age range

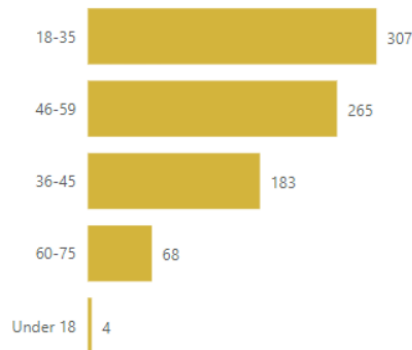


Figure 16 Bar chart on Power BI report Product Page for distribution of clients by age range

2.3 The report shows the top 10 clients with the biggest amount of loan from highest to lowest. The table shows the next features about the client as the Full name, the loan amount and the purpose, city, and state where the client lives, type of ownership, age and sex.

| Full name | Loan amount | Purpose | City | State | Type | Age | Sex |
|---------------------------|--------------------|---------|---------------|-------|-------|-----|--------|
| Christian Kady Hicks | \$590,820 | home | Houston | TX | Owner | 32 | Male |
| Harmony Sloane Gonzalez | \$566,640 | home | New York City | NY | Owner | 27 | Female |
| Landon Blake Matthews | \$566,640 | home | New York City | NY | User | 32 | Male |
| Natalie Karli Fish | \$541,200 | home | Los Angeles | CA | Owner | 53 | Female |
| Arlo Joshua Cervantes | \$538,500 | home | Indianapolis | IN | Owner | 39 | Male |
| Fisher Kelvin Underwood | \$504,000 | home | Columbus | OH | Owner | 28 | Male |
| Annabelle Kinley Gonzalez | \$495,180 | home | Lawrence | MA | Owner | 20 | Female |
| Paris Baylee Wilson | \$482,940 | home | New York City | NY | Owner | 23 | Female |
| Julia Cali White | \$475,680 | home | Providence | RI | Owner | 33 | Female |
| Max Jacen Freeman | \$475,680 | home | Providence | RI | User | 33 | Male |
| Total | \$5,237,280 | | | | | | |

Figure 17 Table on Power BI report Client Page for Top 10 of clients

2.4 The report shows the concentration of customers according to the city where they live. The user can select on the spots that identify each city and see more information using the tooltip on the map.



Figure 18 Map on Power BI report for client's location

2.5 The report includes the name of the city with the largest number of clients

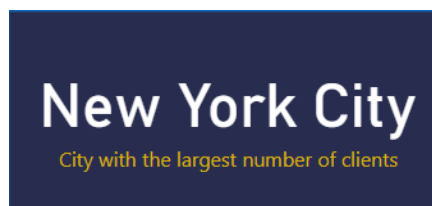


Figure 19 Text boxes on Power BI report Client Page

2.6 The user can filter the Client report by Year, Age Label, Sex and City.

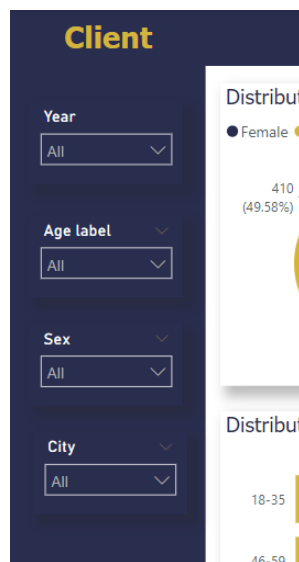


Figure 20 Slicers on Client Page

3. Accounts and orders Page

The report shows the main features related to the accounts opened by the clients and the orders.

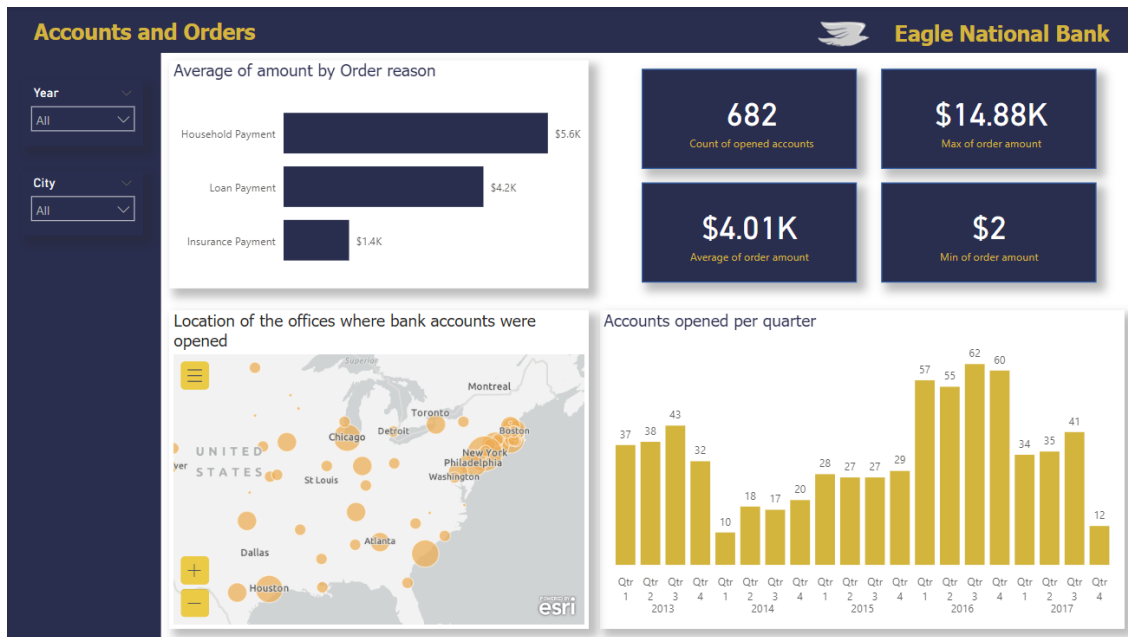


Figure 21 Power BI report Accounts and Orders Page

3.1. The report shows the location of each bank where the account was opened using a map, the user can select on the spots that identify each city and see more information using the tooltip on the map.

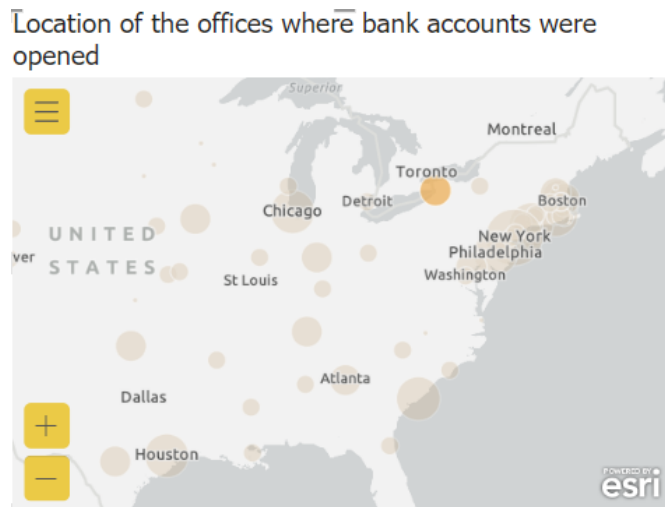


Figure 22 Map on Power BI report for Bank Office's location

3.2. The report shows the average amount of money in the order by reason, the values are in thousand formats.



Figure 23 Bar chart on Power BI report Accounts and Orders Page for Average of Amount by Order reason

3.3. The report shows the number of accounts opened per year and quarter using a column chart, the x-axis follows a timeline.

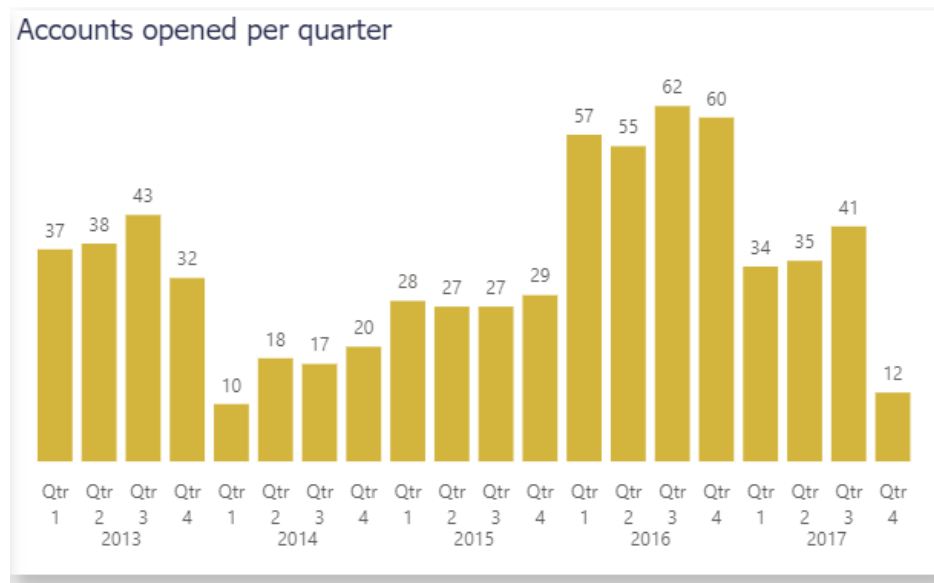


Figure 24 Column chart on Power BI report Accounts and Orders Page for the number of accounts opened per year and quarter

3.4. The report indicates the total amount of accounts opened by the bank. This value does not change when filters are applied.

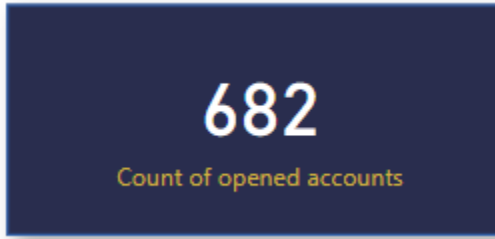


Figure 25 Text boxes on Power BI report Accounts and Orders Page for number of opened accounts

3.5. The report indicates the average of order amount. This value could change based on the slicer filters applied and the selections on the charts.



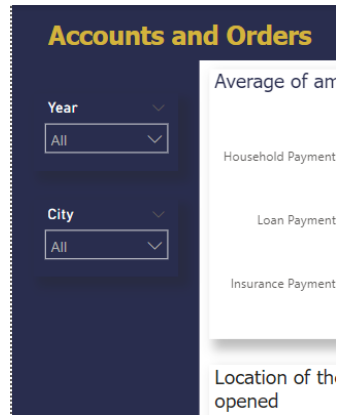
Figure 26 Text boxes on Power BI report Accounts and Orders Page for average of order amount

3.6. The report indicates the max and min of order amount. This value could change based on the slicer filters applied and the selections on the charts.



Figure 27 Text boxes on Power BI report Accounts and Orders Page for max and min of order amount

3.7. The user can filter by year and city using slicers.



4. Transactions Page

The report shows information to be considered about the transactions

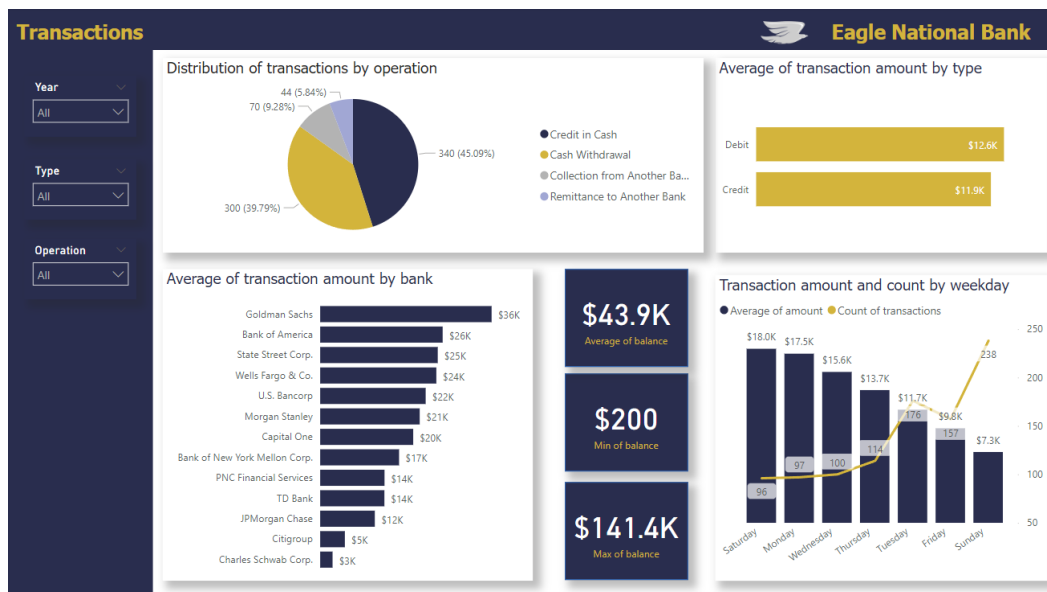


Figure 28 Power BI report Transaction Page

The user can manage the year, the type, and the operations about the transactions, and recognize the distribution of the transactions by operation. The user will appreciate the Average by type, by bank and the amount by weekday.

4.1 The report must show the distribution for purpose or type of operation

Distribution of transactions by operation

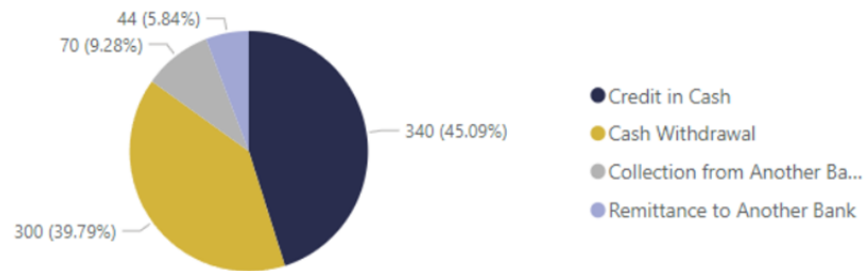


Figure 29 Pie chart on Power BI report distribution of transactions by operation

4.2 The report shows the average amount by type of transactions

Average of transaction amount by type



Figure 30 Bar chart on Power BI report Average amount by type of transaction

4.3 The report projects the Average of transactions amount by bank of transactions in order from highest to lowest

Average of transaction amount by bank

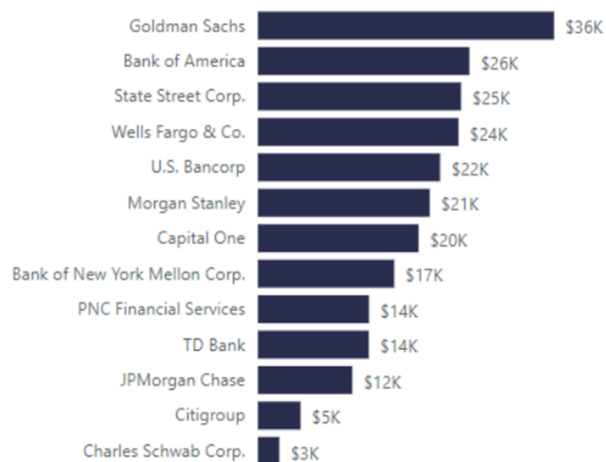


Figure 31 Bar Chart on Power BI report Average of transaction amount by bank

4.4 The report includes information about the average balance of the transactions and their MAX balance and MIN balance for the transactions.

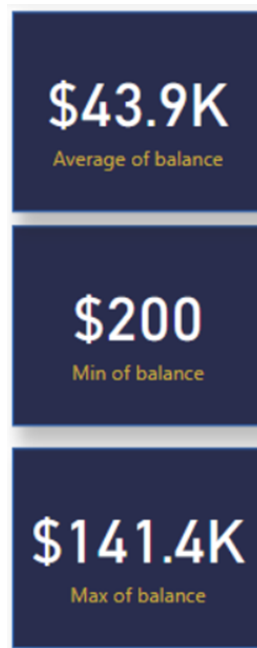


Figure 32 Text boxes on Power BI report Transaction Page

4.5 The report shows a bar chart with the average of transactions amount for each day of the week.

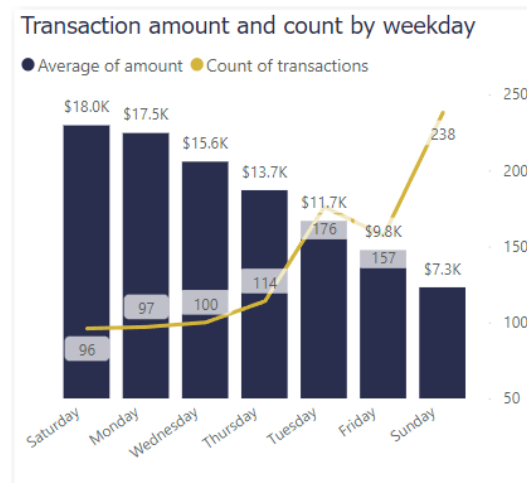


Figure 33 Column and line chart on Power BI report of Transaction amount and count by weekday

4.6 The user is to be able to manage by Year, Type and Operation using the filters

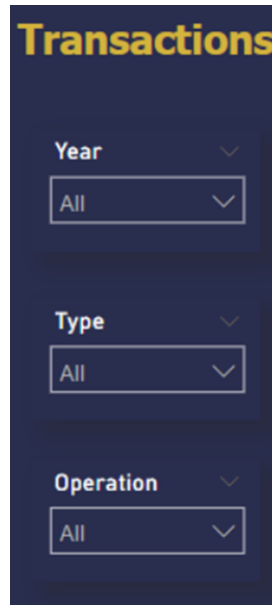


Figure 34 Slicers on Page Transaction

5. User scenarios

5.1 Scenario 1: Filter the year and select the options from the slicer. In this scenario the year 2013 was the filter applied, the report just shows the information about the selected year. All charts and text boxes changed based on it. This is available on all the pages based on the slicers defined for each page.

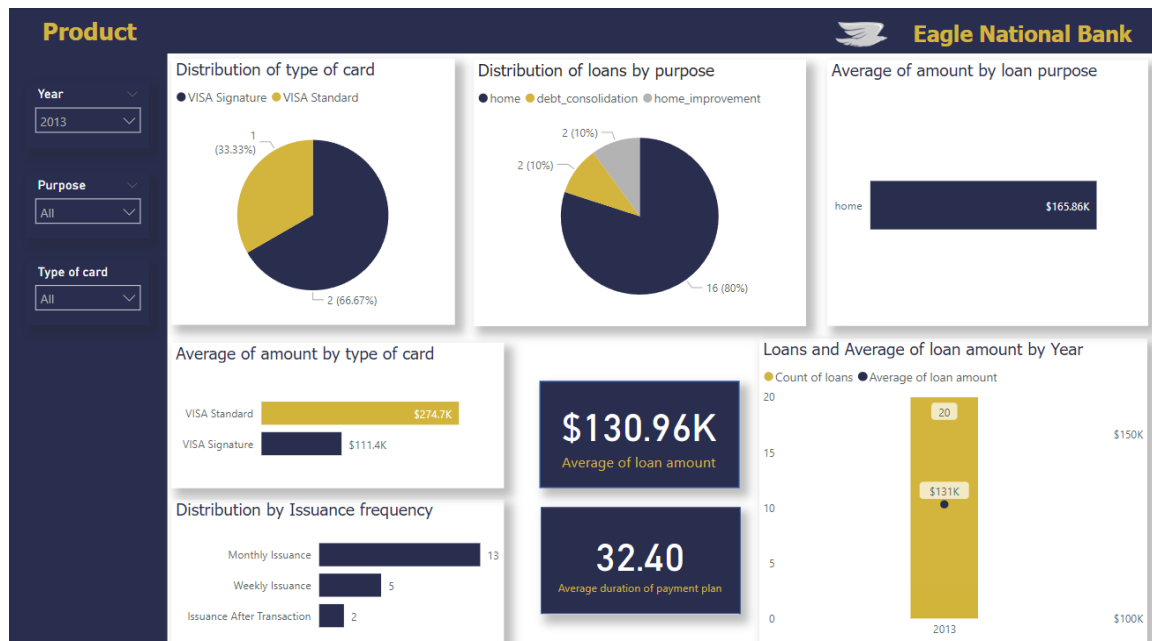


Figure 35 Power BI report Product Page of filtered for the year 2013

5.2 Scenario 2: Chart selected filter. When the user selects a label, a column, a bar, or some of these elements in the visualizations, dynamics filters could be used. In the scenario, the section “home” on the chart “Distribution of loans by purpose” was selected. And all the data visualizations on the page were filter base on that action. This is available on all the pages.

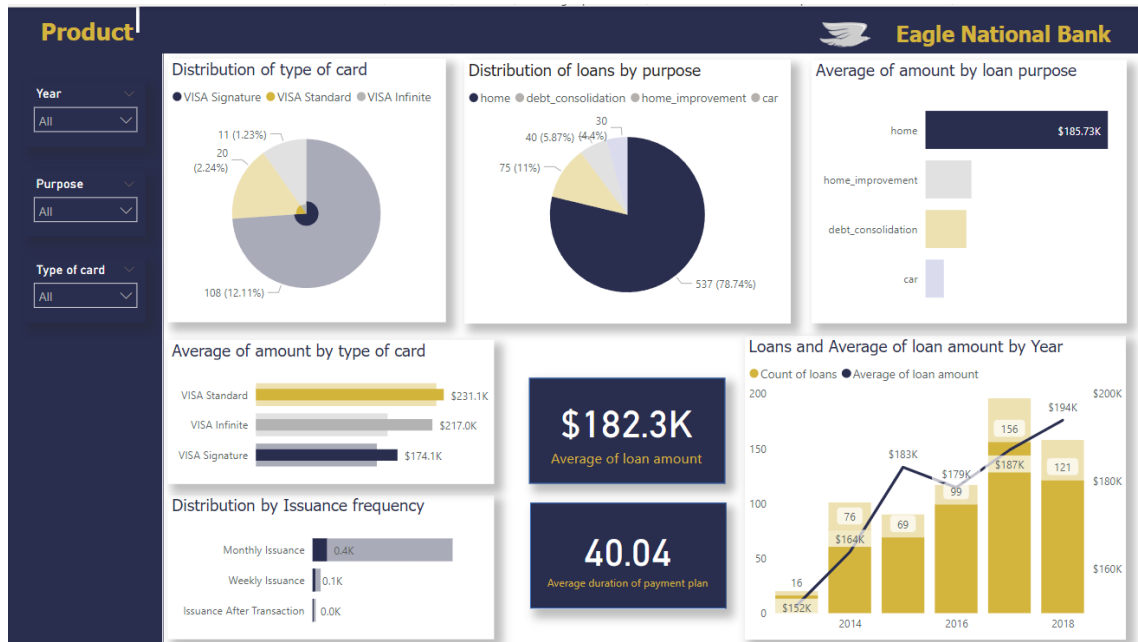


Figure 36 Power BI report Product Page filtered for selection on a chart

5.3 Scenario 3: Uses of maps. The maps on the report are interactive and dynamic, the user can zoom on it, select the spots on the map to filter all the charts on the page, and can check information on the tooltip of each map. The zoom buttons are on the left bottom corner of each map. The user can also move the map using click and keep while is moving the mouse.

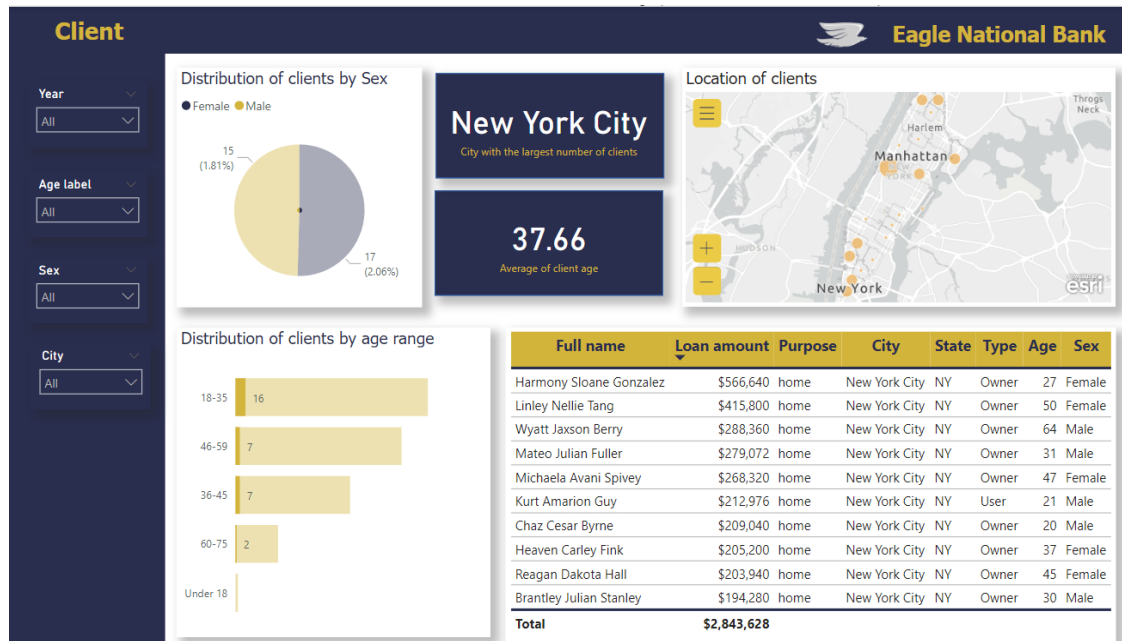


Figure 37 Power BI report Client Page Uses of maps

6. Recommendations and Future Work

After the Data Analysts team finished the Power BI report by segmenting and classifying the product and the main features of the clients, some recommendations were suggested to improve the report and show information that can enhance and be helpful in the future decision-making of the company.

The Power BI report is composed of 4 pages, the first one it's "Product" this page shows the distribution of type cards as well as the average amount of card types acquired by the clients, Distribution of loans purpose, average loan amount by year and the distribution by issuance frequency. The second page it's "Client" and shows the Distribution of clients by sex, age range, location by city, type of account, and full name. The third page "Accounts and orders" shows the average amount by order reason, location of the offices where bank accounts were opened, count of opened accounts, and the average amount of orders. Finally, the page "Transaction" shows the Distribution of transactions by operation, the average transaction amount by a bank, the average transaction by type, and the average transaction amount by weekday. This power BI report contains all the requirements asked by Eagle National Bank Marketing Team and Project Manager; however, some suggestions can complement, improve, and helps to gain some insights from other important factors of the retail banking area. The following recommendations were proposed by the Analysts team.

- Add a page in the report that shows the two main sources of income of the retail area: interest income and fee income. This page must include the total amount of income of each source per

month and year. It must include the city that generates more income. It must include the products that generate the income and the total income generated by them.

- Add a page in the report that shows the growth of Eagle National Bank in the retail sector in the last eight years as well as the growth of the principal retail banks' that represent strong competition for the ENB. The page may show the most demanded products through the years for the ENB and for the competitors.
- Add a page in the report that shows the financial services offered and led by financial advisors. The report must include the main features of the investment services such as wealth management, brokerage account, private banking, and retirement planning.
- Create a different report that focuses on digital banking activities. Nowadays the most prevalent trend in financial services is the shift to digital (mobile and online banking), so it's imperative to monitor and actively work on the client's interaction with this banking model. The report must include the main features of digital banking products and the main features of the clients that use digital banking.
- Create a model of customer sentiment with the bank, based on the client's comments on social networks, product evaluations and surveys, to further deepen the customer's needs.

To create these reports and keep gaining insights into the retail banking area, it is strongly recommend that at least one analyst keep working with the marketing team and the project manager to keep getting the most out of the client's data, and offer high qualities and cutting edge products that satisfy the need of the clients and to position Eagle National Bank as one of the best retail banks.

7. References

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