Conestoga College

School of Applied Computer Science & Information Technology

PROG8630 – Dashboard Proposal

Finance Industry

-Royal Bank of Canada

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**Abstract**

**Project Goal:**

This project's goal is to provide a consolidated, real-time platform for tracking and evaluating important financial performance metrics within our company. It seeks to equip our finance staff, executives, and stakeholders with useful insights so they can decide what to do and how to best execute financial strategies.

**Method:**

Our effort is to create a finance dashboard which aims to give real-time visibility into the financial performance and important financial KPIs (Key Performance Indicators)of our organization. This dashboard will act as a centralized platform for the finance teams and executives to track, examine, and make choices about our financial health. We will be working on databases and then calculating KPIs for various departments.

**Overview:**

This project encapsulates a comprehensive initiative aimed at developing a centralized finance dashboard to facilitate real-time tracking, evaluation, and analysis of critical financial metrics within our bank. The project endeavors to create a unified platform, empowering finance professionals, executives, and stakeholders with actionable insights to make informed decisions and effectively steer financial strategies.

By harnessing datasets and employing robust calculation methodologies in Excel, this initiative seeks to derive and display key performance indicators (KPIs) pertinent to various departments. The finance dashboard serves as a centralized hub, providing immediate access to critical financial data and trends for informed decision-making.

Through a combination of technological tools and analytical frameworks, i.e., Excel and Power BI, this project emphasizes the aggregation of real-time data for generating valuable insights. The abstract outlines the project's scope, methodologies, user functionalities, expected outcomes, data security measures, and potential scalability.

This endeavor aims to revolutionize financial oversight and decision-making, offering a comprehensive solution that enhances financial transparency, agility, and strategic planning within the bank.

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# Introduction

We will be working in the Financial Services Industry and the company- **Royal Bank of Canada**. Everything from payments and digital banking technologies to insurance and money management are included in this sector. The financial services industry refers to the wide range of services that banking institutions, brokerage houses, and other enterprises provide. The banking, mortgage, credit card, payment service, tax preparation and planning, accountancy, and investment industries all fall under the umbrella of financial services. It plays a pivotal role in facilitating the allocation of capital, managing risk, and promoting economic growth.

# Departments

The most crucial departments in the financial industry are:

1. **Investment Banking**
2. **Trading And Sales**
3. **Tech and IT security**
4. **Marketing**

## **Investment Banking**

An important part in facilitating the flow of capital in the economy is played by the specialized field of investment banking in the financial sector. It largely focuses on generating funds for firms, offering financial advising services, and enabling mergers and acquisitions (M&A) and other technical financial transactions.

***Return on equity (ROE):***

This is the ratio of net income to shareholders’ equity. It measures how well the bank generates profits from its own capital or how effectively is a company using shareholder’s equity to generate profits. A higher ROE indicates a more profitable and efficient bank. (Fernando J.,2023,p-14,Bibliography).

*Return on Equity =*

***Net interest margin (NIM):***

This is the result of dividing the difference between interest revenue and expense by the typical interest-earning assets. It measures how much money the bank makes from lending and investing. A bank with a higher NIM is more successful and effective. (Bloomenthal A.,2023 , p-14).

*Net Interest Margin =*

***where:***

*IR=Investment returns*

*IE=Interest expenses*

***Cost-to-income ratio (CIR):***

This is the ratio of operating expenses to operating income. It measures how well the bank controls its costs relative to its revenues. A lower CIR indicates a more profitable and efficient bank. (“Cost/income ratio”, 2006, p-14)

*Cost-to-income-ratio =*

***Return on Assets (ROA):***

ROA calculates how efficiently a firm uses its assets to generate revenue and how efficiently operations are being run. It is a measure of asset performance. ROA looks at the net income reported for a period and divides that by total assets. A higher ROA indicates a more successful and reputable bank. (Kenton W.,2022,p -14 ).

*Return on Assets =*

## **Trading and Sales**

The Trading and Sales department in banking is critical in financial markets, facilitating the purchase and sale of financial products such as stocks, bonds, currencies, commodities, and derivatives. This branch acts as a link between its customers (investors, institutions, and businesses) and the financial markets. On behalf of customers or the bank, traders oversee carrying out, buying, and selling orders. They aim to complete transactions effectively and at the finest pricing.

***Trading revenue growth:***

Revenue represents the bank's overall revenue from trading activity after deducting costs and losses. It measures the trading department's performance and profitability. Revenue growth is used to track whether sales are rising or falling over time. It is computed by taking the difference between the revenue from one period and the revenue from the next and multiplying by 100 to get the percentage. (“ *How to Calculate Total Revenue Growth in Accounting*”,2016, p-14)

Revenue Growth =

***Average Daily Trading volume:***

This is the total amount or number of transactions executed by the bank in each period. It measures the activity and market share of the bank in different financial markets. A higher trading volume indicates a more active and competitive trading division. (Thompson C., 2023, p -14).

*Average Daily Trading Volume =*

***Trading margin:***

This is the ratio of trading revenue to trading volume, expressed as a percentage. It measures the profitability and efficiency of each transaction executed by the bank. A higher trading margin indicates a more profitable and efficient trading division.

*Trading margin =*

***Sharpe ratio:***

This is the ratio of excess return to standard deviation of return, expressed as a percentage. It measures the risk-adjusted performance of the trading division. A higher Sharpe ratio indicates a higher return per unit of risk taken by the trading division. (“Sharpe Ratio”, p-14 )

*Sharpe Ratio =*

*where:*

*Rx = Expected portfolio return*

*Rf = Risk-free rate of return*

*StdDev Rx = Standard deviation of portfolio return (or, volatility)*

## **Tech and IT Security**

The tech and IT security department in the banking industry protects against attacks, damage, viruses, malware, hacking, data theft, and illegal access to networks, devices, programs, and data. The main objective of this department in banking is to safeguard the user's funds. There are more online activities and transactions as more individuals go cashless. People make purchases using digital payment systems like credit and debit cards, which need to be secured by IT and tech.

***Cybersecurity Incident Rate:***

This measures the frequency of cybersecurity incidents, such as data breaches or system intrusions. Lowering this rate is critical for safeguarding sensitive financial data.

*Cybersecurity Incident Rate = \*100*

***Value at risk:***

This is an assessment of the highest possible loss that the bank's trading portfolio might sustain over a specific period of time, with a particular degree of confidence. It measures the trading division's risk exposure and volatility, which are impacted by technology and IT systems that offer tools for risk analysis, modeling, and mitigation. (“CFI Team” 2019, p-14).

*Value at Risk = Vm*

*where,*

*Vi is the number of variables on day* (e.g., stock prices, asset returns).

*Vm is the number of days from which data is taken.*

***Data Encryption Coverage:***

This assesses the extent to which sensitive financial data is encrypted, both at rest and in transit. A higher percentage indicates better security.

*Data Encryption Coverage = \*100*

***Phishing click-through rate:***

This is the proportion of people that follow links in phishing emails in an effort to share personal information or download harmful applications. It assesses both the robustness of the bank's email security systems and the success of its security awareness and training initiatives. An informed and secure bank is one with a reduced phishing click-through rate.

*PCTR = \*100*

## **Marketing**

Bank marketing is well known for its aptitude for creating a distinctive brand image, which is regarded as the financial academy's capital reputation. A bank must establish strong relationships with its most significant clients and come up with creative solutions that may be implemented to satisfy their needs.

***Customer retention rate:***

The rate at which consumers remain with a company over a specific amount of time is referred to as customer retention. (“Customer retention rates formula” 2021, p-14).

*Customer retention rate* ***=*** *\* 100*

*Where:*

*E=customers at the end*

*S= customers at the start*

*N= customers acquired during the period of measuring*

***Net Promoter Score:***

This is the percentage of how many people promote to become member of same bank. To measure the net promoter score number of detractors, subtract from the promoters.

*Net Promoter Score = number of promoters - number of detractors*

*Where:*

*Detractors are unlikely to recommend your product or service*

*Promoters are likely to recommend your product or service.*

***Cross-sell rate:***

The cross-sell rate calculates the typical number of goods or services a client buys from a bank. In order to compute the cross-sell rate, divide cross-selling revenue by the total revenue.( “Cross-Sell Rate”, p-14)

*Cross-Sell Rate =*

***Customer lifetime value:***

This represents the bank's estimated overall net profit from a particular client. (“Austin Caldwell” 2022, p-15).

*CLV = Average Transaction Size \* Number of Transactions \* Retention Period*

# Dashboard Mockup

1. **Investment Banking**

A screenshot of a financial planning

Description automatically generated

We can apply filters for years as investment banking dashboard will be containing data for many years, then will be compared to know the growth. We will be using Assets as filters with 2 values, beginning assets and ending assets. Lastly, a Revenue filter will allow users to view data based on revenue figures, such as revenue generated from specific deals or clients. The KPIs will be answering the questions as explained below.

1. **Return on Equity (ROE):** A high ROE indicates that a company efficiently turns shareholders' equity into profits, making it an attractive investment.
2. **Net Interest Margin (NIM):** A NIM is vital for banks, showing their ability to make money from lending and investments after accounting for the cost of funds. A healthy NIM is crucial for the profitability of banks, as it reflects their ability to generate income from their core lending and investment activities.
3. **Cost-to-Income Ratio:** A lower cost-to-income ratio signifies efficient cost management, critical for profitability, particularly in financial services. It is particularly important in financial services where cost control is essential for maintaining profitability and competitiveness.
4. **Return on Assets (ROA):** A higher ROA reflects a company's effective use of its assets to generate earnings, which is key for investors and creditors evaluating financial health.
5. **Trading and Sales**

A screenshot of a chart

Description automatically generated

**Filters:** By using these filters, users may adapt the dashboard to their own requirements. The analysis of data by month and transaction type offers a detailed review of performance. Different areas may have different aims.

**Data Cards:** These data cards provide rapid access to important metrics and a short snapshot of the performance of the department.

**Questions:** The questions offer useful information. They assist users in comprehending the trade and sales department's financial stability, effectiveness, and risk management as explained below.

* + - 1. **Trading revenue growth:** An obvious and measurable indicator of a department's financial health is trading revenue growth. It shows whether the department is consistently increasing its revenue, which is a key objective of financial operations. It acts as an indicator for assessing the efficacy of trading tactics and activities as well.
      2. **Average Daily Trading volume:** Average Daily Trading Volume is a critical indicator of a security or asset's liquidity. Liquidity is crucial for investors and traders because it reduces the risk of price swings and enables effective trade execution. High trading volume is an indicator that an item can be bought or sold quickly without having a big impact on the price.
      3. **Trading Margin:** A trading margin is used as a direct indicator of profitability. It displays the ratio of the overall trading income to the profit made from trading operations. It will reflect the trading department's capacity for risk management.
      4. **Sharpe Ratio:** The risk-adjusted returns of an investment or portfolio are assessed by the Sharpe Ratio. Both the returns produced, and the degree of risk connected to those returns are considered. This makes it a crucial KPI for assessing the success of a portfolio or investing plan.

1. **Tech and IT Security**

A diagram of information on a computer

Description automatically generated with medium confidence

**Filters:** The "Day" filter enables users to perform a detailed analysis of the data, identifying certain problems or trends on days. For flexibility in evaluating various transaction types, which is necessary for spotting trends or abnormalities, use the "Transactions" filter.

**Data Cards:** Users may rapidly understand important metrics by using data cards, which provide information immediately. For keeping an eye on important data points, they work well.

**Questions:** Users are guided by the questions in understanding the importance of the metrics and how they contribute to the safety and operational effectiveness of the bank. By emphasizing the main problems, they encourage awareness and action. These questions will be answered by the KPIs.

**1**. **Cybersecurity Incident Rate:** The organization's security posture is directly reflected in the Cybersecurity Incident Rate. A high incident rate could be a sign that there are security infrastructure flaws or vulnerabilities that need to be fixed.

**2.** **Value at Risk :** The volatility of bank’s trading division will be measured by this KPI. It is a central tool for managing risk.

**3.** **Data Encryption Coverage:**The security of sensitive financial data will be assessed by Data Encryption Coverage. It provides a clear measure of the organization’s commitment to data security and privacy.

**4.** **Phishing click-through rate:** The effectiveness of an organization's defenses against phishing assaults is determined by the phishing click-through rate. It provides a quantitative evaluation of how effectively workers can recognize and resist phishing attacks.

1. **Marketing**

A screenshot of a chart

Description automatically generated

1. For customer retention rate, use the "Customer Retention Rate" as KPI.
2. To identify the age of customers to focus on for promotion offers, analyze "Customer Lifetime Value" by age group.
3. To find the percentage of customers buying services per year, use the "Cross-Sell Rate" KPI.
4. For identifying regions with the most valuable customers, perform a geographic analysis using "Customer Lifetime Value" as a guiding metric.

Final Dashboards:

1. **Investment Banking**

**A screenshot of a graph

Description automatically generated**

The dashboard of the Investment Banking Department provides a thorough summary of the key performance indicators (KPIs) for the previous six years.

Net Interest Margin (NIM), Return on Equity (ROE), Return on Assets (ROA), and Cost-to-Income Ratio (CIR) are the four main KPIs included in this dashboard. These KPIs are presented as data cards, giving rapid, concise insights into the financial health of the department. With the use of a slicer, users can view and filter average KPI values for years, facilitating focused study and comparisons.

The dashboard's visualization components make it easier for complex financial data to be understood on an intuitive level. The net income for each year is presented in a clear and concise column chart that provides a comparative analysis of the annual results. With the help of this visual aid, patterns and the growth or decrease in net income from year to year may be easily identified.

All KPIs' historical trajectories are plotted on a line chart, providing a thorough overview of their trends. Understanding the department's overall financial performance over a six-year period is made easier with the help of this representation.

Furthermore, a pie chart illustrates how the entire assets are distributed throughout the course of 2023. This graphic provides a clear picture of the distribution of assets within the given year, which is helpful for strategic planning and resource allocation evaluation.

From the provided data about RBC bank's investment department, the following trends and insights can be inferred:

1. Net Interest Margin (NIM) has remained almost consistent at 0.05 over the last 6 years with a very slight increase. It indicates stability in the interest earned from assets compared to interest paid on liabilities. The consistent **growth in net income** despite a steady NIM implies that the bank is successfully growing its profits from other sources or through other strategies apart from the interest margin.

2. Return on Equity (ROE) has decreased steadily over the years. A decreasing ROE can indicate that the bank's efficiency in generating profits from its shareholders' equity has declined. This might be due to various reasons such as increased expenses, lower income, or less effective use of equity. It might prompt the need for strategies to enhance profitability or optimize the utilization of equity.

3. Return on Assets (ROA) has been consistently increasing. A rising ROA indicates that the bank is becoming more efficient in generating profits from its assets. It suggests that the bank is effectively using its assets to generate earnings.

4. Cost-to-Income Ratio (CIR) has declined over the years, reaching 0.14 for 2023. A decreasing CIR suggests that the bank has been able to control its operating expenses more effectively relative to its income. This indicates improved cost management efficiency.

In summary, while the bank maintains a consistent Net Interest Margin (NIM) and experiences steady growth in net income, there's a decline in Return on Equity (ROE) despite an increase in Return on Assets (ROA). The decreasing Cost-to-Income Ratio (CIR) suggests improved cost efficiency. These trends indicate that while the bank effectively manages its costs and assets to increase profitability, there might be a need to focus on strategies to enhance shareholder value and maintain a competitive edge in the market.

1. **Trading and Sales**

**A screenshot of a computer

Description automatically generated**

The Trading and Sales Department's dashboard neatly presents important numbers from the last three years. It uses data cards to show key performance indicators (KPIs) and has charts for clearer visuals.

The main data card shows how much revenue grew in October 2023 compared to September 2023. It's an easy way to see if the department's making more money. Other cards display the average Trading Margin and Trading Volume for Apple, Microsoft, and Alphabet stocks in August, September, and October 2023. These cards help compare how well they're doing in trading over those months. Another data card shows the average Sharpe ratio for different products like Equities, Fixed Income, Derivatives, Commodities, Forex, Options, Futures, Bonds, Stocks, and Mutual Funds for the year 2023. It tells us about their risk-adjusted returns. There's a slicer too, letting users pick specific years and months to focus on. It helps to look at specific parts of the data.

The dashboard's graphic palette improves its readability even more. A pie chart shows how many shares were traded for Apple, Microsoft, and Alphabet stocks. This helps visualize the trading volumes for these stocks.

The line chart plots the daily revenue from these stocks across August, September, and October 2023. It's helpful to see how revenues change day-to-day.

Finally, the donut chart gives an overview of Sharpe's ratio for all products in 2023. This chart summarizes the risk-adjusted returns for different products.

From the provided data about RBC bank's investment department, the following trends and insights can be gleaned:

Revenue Growth: October experienced an 11% growth in revenue compared to September. This indicates a positive trend in sales performance, potentially attributed to successful sales strategies, market demand, or effective client engagement during that period.

Average Trading Margin: The average trading margin of 32.92K for major stocks (Apple, Microsoft, Google) suggests the profit earned on each trade. It showcases the department's ability to generate profits from its trading activities with these prominent stocks. It implies that the trading strategies employed have been successful in yielding higher margins.

Average Trading Volume: The average trading volume of 2.28K for (Apple, Microsoft, Google) represents the number of shares traded for these stocks. This metric indicates the level of market activity and interest in these specific stocks within RBC BANK's trading portfolio. It suggests that these stocks are actively traded and attract considerable attention within the trading portfolio.

Sharpe Ratio: The Sharpe Ratio of 0.78 for various sales products (Equities, Fixed Income, Derivatives, Commodities, Forex, Options, Futures, Bonds, Stocks, and Mutual Funds) in 2023 measures the risk-adjusted return on investment. A ratio above 0 generally indicates a positive risk-adjusted performance, suggesting efficient risk management strategies for the products traded.

Shares Traded (Pie Chart): The pie chart depicting shares traded shows that Apple holds the majority share of 45.1%, followed by Microsoft at 32.35%. This distribution signifies the dominance and preference of trading in Apple and Microsoft stocks compared to Google within RBC BANK's trading activities.

Revenue Generated Per Day (Line Chart): The fluctuating pattern of revenue generated per day signifies varying daily sales performance. Analyzing the fluctuations over time can reveal specific trends, market volatility, or seasonal variations impacting daily revenues.

Sharpe Ratio for Various Products (Donut Chart): The donut chart displaying Sharpe ratios for different products reveals that Futures have the highest Sharpe ratio, indicating potentially higher risk-adjusted returns in this product category. Conversely, Bonds have the lowest Sharpe ratio, implying relatively lower risk-adjusted returns compared to other products.

In summary, these insights from the provided data highlight aspects of RBC BANK's trading and sales performance.

1. **Tech and IT Security**
2. **Marketing**

# Data Source and Data Model

Data models are vital for data visualization because they simplify complex data, define its structure, ensure consistency, enable data transformation, enhance performance, and facilitate interactivity. They also support scalability, data governance, ease of maintenance, and collaboration among stakeholders, making it easier to create meaningful and effective visualizations.

To calculate the financial ratios mentioned, one needs specific financial data and information. Here's a breakdown of the data required for each ratio:

1. **Return on Equity (ROE):**

* Net Income: This can be found on the income statement.
* Average Shareholder's Equity: The calculation requires the beginning and ending shareholder's equity from the balance sheet, then determining the average: (Beginning Shareholder's Equity + Ending Shareholder's Equity) / 2.

1. **Net Interest Margin (NIM):**

* Investment Returns (IR): This represents the income generated from investments.
* Interest Expenses (IE): This can be found on the income statement.
* Average Earning Assets: To compute this, one should obtain the beginning and ending balances of earning assets from the balance sheet and then calculate the average: (Beginning Earning Assets + Ending Earning Assets) / 2.

1. **Cost-to-Income Ratio:**

* Operating Costs: Located on the income statement.
* Operating Income: Also available on the income statement.

1. **Return on Assets (ROA):**

* Net Income: As mentioned earlier, this can be found on the income statement.
* Total Assets: To calculate, one should gather the beginning and ending total assets from the balance sheet and then determine the average: (Beginning Total Assets + Ending Total Assets) / 2.

1. **Revenue Growth:**

* Revenue from the current year: Available on the income statement for the current year.
* Revenue from the last year: This data should also be available on the income statement for the previous year.

1. **Average Daily Trading Volume:**

* Trading in the last 20 days: Historical trading data for the last 20 days is required.
* Number of days: This represents the number of days over which the trading volume is averaged.

1. **Trading Margin:**

* Trading Revenue: This can be found on the income statement.
* Trading Volume: This is the average daily trading volume calculated in the previous step.

1. **Sharpe Ratio:**

* Expected Portfolio Return (Rx): It's necessary to estimate the expected return of the portfolio.
* Risk-Free Rate of Return (Rf): Typically, this is the yield on a risk-free asset such as Treasury bonds.
* Standard Deviation of Portfolio Return (StdDev Rx): Historical return data for the portfolio is needed to calculate this.

1. **Cybersecurity Incident Rate:**

* Number of Cybersecurity Incidents: This represents the overall number of cybersecurity events that have happened over a certain time frame.
* Total number of IT transactions: This represents the total count of IT transactions.

1. **Value at risk:**

* Vi: The number of variables on day i (e.g., stock prices, asset returns).
* Vm: The number of days from which data is taken.

1. **Data Encryption Coverage:**

* Number of Encrypted Data Items: Data items that are encrypted.
* Total Data Items: Total number of items.

1. **Phishing click-through rate:**

* Number of clicks: How many time recipients clicked on phishing link or email.
* Number of Phishing Emails sent: This is the total number of phishing emails or messages.

1. **Customer retention rate:**

* E: The number of customers at the end of the measurement period.
* S: The number of customers at the start of the measurement period.
* N: The number of customers acquired during the period of measurement.

1. **Net Promoter Score:**

* Number of Promoters: The count of customers who are promoters (likely to recommend your product or service).
* Number of Detractors: The count of customers who are detractors (unlikely to recommend your product or service).

1. **Cross-sell rate:**

* Cross-Sell Revenue: Cross-Sell Customers
* Total Revenue: Total Number of Customers

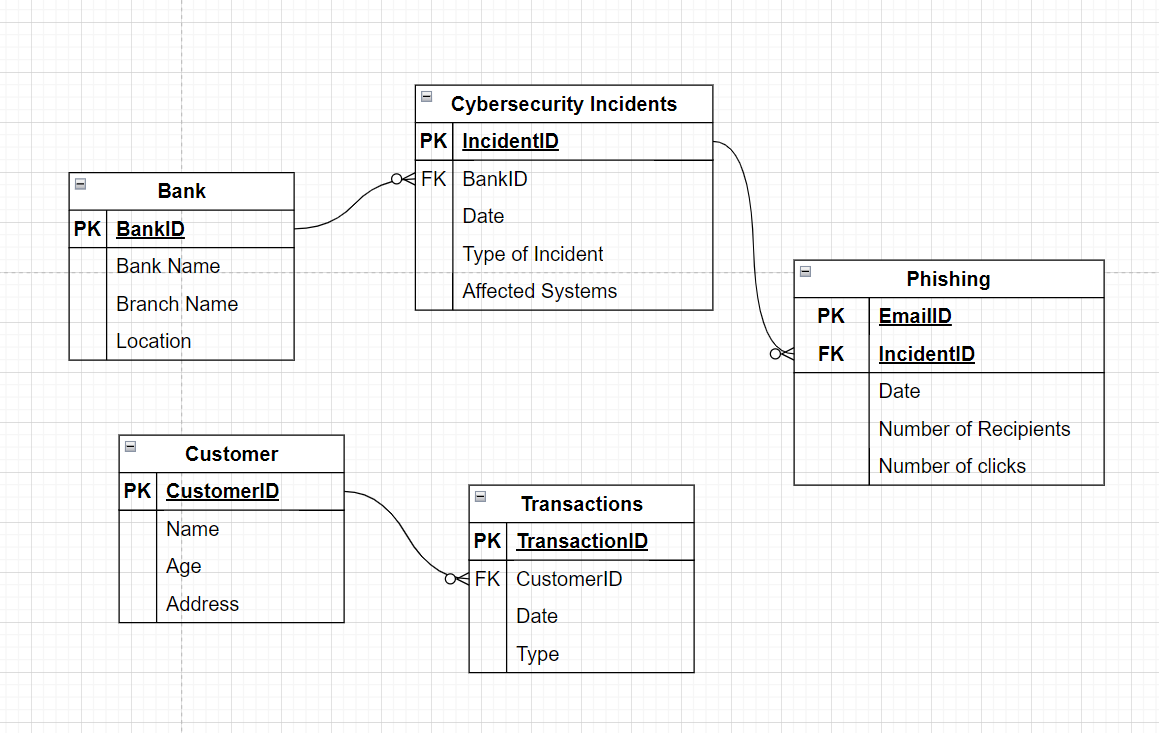
1. **Customer lifetime value:**

* Average Transaction Size: The average amount of money spent by a customer in a single transaction.
* Number of Transactions: The total number of transactions made by a customer.
* Retention Period: The average length of time a customer remains engaged with your business.

**DATA MODEL USING ATTRIBUTE TABLES**

A screenshot of a computer program

Description automatically generated

A diagram of a customer

Description automatically generated with medium confidence

# Tool Selection

Earlier ,we have decided to use MS Excel as our tool to build dashboards for all the departments as we were setting up a mock-build. Although Excel might not have the sophisticated features of some specialized business intelligence applications, such as Power BI or Tableau, we determined that it could be a good middle-tier option for developing the dashboard for our banking project. Its user-friendliness, data management, calculation capabilities using built-in formulas, and visualization tools make it a sensible option for creating and presenting KPIs for every department.

But subsequently, we have decided to use Power BI along with Excel as visualization is much easier and interactive in Power BI than in excel. After gathering data and assessing the complex nature of the algorithms we would be employing, we made the decision to move to Power BI. We have used Excel for calculations and Power BI for visualization and building our dashboard.

The following are some advantages of Power BI:

**Advanced Visualizations:** Unlike Excel, Power BI provides a large array of dynamic and aesthetically pleasing charts, graphs, and visual elements that may dynamically portray complex data in a way that is more engaging and intelligible.

**Data Modeling Capabilities:** Complex data modeling, linkages, and computations are possible with Power BI. It can be used to create complex data models because of its efficiency in managing massive datasets and support for data from many sources.

**Real-time Data Analysis:** Without requiring human data entry, Power BI can link to live data sources and refresh reports either in real-time or at predetermined intervals to give current insights.

**Interactive Dashboards:** Users may explore and analyze data interactively with Power BI by creating interactive dashboards that include drill-down capabilities, filters, and slicers.

**Scalability:** Power BI is scalable and works well with big datasets, which makes it appropriate for businesses or scenarios requiring the handling of enormous volumes of data.

**Sharing and Cooperation:** When it comes to sharing and collaboration, Power BI outperforms Excel. Multiple individuals within a company can effortlessly view, collaborate on, and share reports and dashboards created using Power BI.

# Update/Refresh Plan

1. **Data Sources:**

Identify where the data for the dashboard originates. Is it from databases, spreadsheets, APIs, or other sources? Understand the data retrieval process.

1. **Data Frequency:**

Determine how often the data is updated. Is it daily, weekly, monthly, or in real-time? The frequency will influence the dashboard design and automation level.

1. **Automation:**

Automation is key to ensuring the dashboard stays current. Consider the following:

* Scheduled Data Refresh: Automate the retrieval and integration of data into the dashboard at regular intervals.
* ETL (Extract, Transform, Load) Processes: Set up automated scripts or tools to transform and load data into the dashboard.

1. **Manual Updates:**

Some data may still require manual input or validation. Identify which parts of the dashboard might need manual updates and why. Minimize manual work whenever possible to reduce errors.

1. **Data Quality Assurance:**

Regularly check the data for quality and consistency. Implement data validation checks and alert mechanisms to catch data anomalies early.

Each department’s dashboard will be updated according to new updates as follows:

**Investment Banking:** Financial reports and statements, as well as other new data for investment banking, are normally delivered quarterly, annually or whenever there are substantial financial revisions. This dashboard has some automation potential. We may configure data connections or flows to automatically retrieve the most recent financial reports from internal or external sources. However, manual updates after **each month** may be necessary for the analysis and computation of financial ratios including ROE, ROA, NIM, and CIR.

**Trading And Sales:** For real-time or almost real-time monitoring, trade data, including trading volume and income, might be gathered **daily or weekly.** Real-time data streams that automatically update the dashboard as new trade data becomes available can be put in place.

**Tech and IT security:** Continuously, ideally in real-time, data collection on cybersecurity events, value at risk, data encryption coverage, and phishing click-through rates is required. This dashboard needs to be **fully automatic.** To respond quickly to any security risks or events, security information and incident reports should relate to the dashboard in real-time.

**Marketing:** Marketing data and metrics pertaining to customers are routinely gathered and updated **every month or three months**. To reduce human data entry, KPIs like customer retention rate, Net Promoter Score, and cross-sell rate may be automatically incorporated into the dashboard and updated on a regular basis.

# Testing Strategy

Here we are discussing just the outline of testing not the details. After creating the dashboard, we will do the testing in detail.

1. ***Functional***
   1. **Validation**:

By double-examining the KPI calculations and formulas, we will validate our data. We'll attempt to calculate a few entities using a calculator to see if the formula in Excel is accurate or if it needs updating. Simple arithmetic operations including addition, subtraction, multiplication, division, and average are needed for the majority of our computations. These can be validated with a simple calculator in any of our technological gadgets. Also. We will test data validation by entering invalid or incorrect data to check how the dashboard handles errors. We will make sure that the data displayed in charts and graphs is correct and corresponds to the original data.

* 1. **Filters, Triggers**

We'll make sure that each dashboard feature and function performs as intended. To ensure that the interactions, such as filtering, sorting, and data drill-down, yield the expected outcomes, we will test them.

We will be applying various filters for different dashboards as ***listed in mockups above*.** Then we will be checking that the filtered data is displayed accurately and work logically on all the different charts of one dashboard or not. Also, we will be testing the sorting feature to make sure that data can be sorted accurately and in both ascending and descending order.

Additionally, the highlights of growth and decline of the trading and sales will be tested.

1. ***Non-Functional***
   1. **User Interface**

We will ensure that the data is accurately shown , is overall pleasing, and free of formatting errors, such as overlapping text or improperly aligned columns.

All UI components, including tables, buttons, graphs, charts, and filters, will be accurately presented.

To ensure readability, we will test the font styles, sizes, and colors.

We will verify the clarity and description of labels and headings.

We will check the color scheme for clarity and coherence making sure to use colors to convey meaning (for example, use green for positive, and red for negative).

We will verify that when users need to, they can drill down into more granular data and return to the summary view.

We'll check that users can export data into popular formats (such CSV and Excel) and that the data is accurate and full.

* 1. **Compatibility**

By adjusting the size of the browser window, we will test the responsiveness of the dashboard and see how well the layout adapts.

To verify compatibility, we will test the dashboard on various web browsers (such as Chrome, Firefox, Edge, and Safari).

We will examine  if the dashboard displays properly on different gadgets (desktop, laptop, tablet, and mobile)

# Proposed Allocation Project Team Roles

Project Team:

Project Manager (PM): Raman

Content Creator/Writer (CC): Daljeet

Data Acquisition (DA): Soubik

Allocation of Roles and Responsibilities:

Raman (Project Manager):

* Responsible for project planning and coordination.
* Communicates with stakeholders and clients.
* Sets project timelines and deadlines.
* Monitors project progress and adjusts plans as needed.
* Ensures effective communication within the team.

Daljeet (Content Creator/Writer):

* Creates written content for the website.
* Collaborates with Soubik on content layout and presentation.
* Ensures that the content is engaging, error-free, and aligns with the project goals.
* Adheres to content deadlines set by the Project Manager.

Soubik (Data Acquisition):

* Conducts data acquisition for the project, collecting necessary information or assets needed for the redesign.
* Identifies and gathers any data, images, or information required for the website redesign.
* Verifies the accuracy and relevance of the acquired data.
* Ensures data is properly organized and stored for use by the content team.

Data Acquisition Responsibilities for Soubik:

* Collaborate with Daljeet to integrate acquired data into the website's content.
* Provide regular updates to the team during meetings regarding data acquisition progress and any data-related needs or challenges.

Communication and Meeting Plan:

1. Weekly Team Meetings:

* Conduct weekly virtual team meetings on Mondays.
* Rotate the role of meeting facilitator among team members.
* Use video conferencing tools for face-to-face communication.

1. Task Assignments:

* The Project Manager assigns tasks and responsibilities during team meetings.
* Tasks are documented in a shared project management tool.

1. Feedback and Collaboration:

* Encourage open communication for feedback and collaboration.

Maintain a shared document repository for collaborative work.

# Project Timeline

This is primarily for your benefit to make sure that you are scheduling your time well in preparation for a successful project completion. This does not need to be especially detailed but should be a useful tool to help you plan your time and work.

A partial example of a schedule is below. Please note, it does not (and probably should not) be identical to this: develop something that will help you!

|  |  |  |
| --- | --- | --- |
| **Date** | **Deliverable** | **Responsible** |
| Sep 30 | Data Collected and planned | Ramanpreet |
| Oct 11 | 1st Draft of Dashboard Circulated to Team | Daljeet, Soubik |
| Oct 16 | 1st Draft of Presentation Circulated | Ramanpreet, Soubik |
| Oct 22 | User testing by the team and errors/refinements identified. | Ramanpreet, Daljeet |
| Nov 17 | Final Adjustments made and checked | Daljeet, Ramanpreet |
| Nov 21 | Dashboard and Report Due at 10pm | Soubik |

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