Internship Report On

ING
TS Card Solutions
Data Analysis Dashboard

"do your thing"

TS Cash Advisory & Structuring Department

Submitted by

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Acknowledgement

In preparing the internship report on my four months long experience with ING, Firstly, I would like to thank Jos van de Ven and Matthias Wahnschaffe for giving me the opportunity to do an internship within the organization. For me it was a unique experience. I also would like to show my appreciation to Sehid Karadag and Frank ten Veen who helped me to understand the basics of this business.

I also would like to thank all the people who worked in the office of TS CA&S in Amsterdam. With their patience and openness, they created an enjoyable working environment. I experienced great things with them, and they have shown me a beautiful part of their culture.

Contents

Introduction

This report is a short description of my four-month internship carried out MSc. Business Information Technology (BIT). The internship was carried out within TS sales Cash Advisory & Structuring team, the Card Solutions sector at ING in 2022.
This report also is a manual of the dashboard for the team and the future administrator.

Card solutions issues corporate cards for customers and offers merchant acquiring services for Wholesale Banking retail clients.
The TS Sales Cash Advisory & Structuring team is an integral part of the team in Amsterdam, Brussels and Frankfurt and they help TS Sales consultants to increase sales by:

- Advising an optimal Cash Management solution based on client needs and ING's products & capabilities
- Providing standardized high-quality sales material (e.g., proposal and presentation templates)
- Increasing knowledge of TS Sales organization

My internship within this team is completely focused on creating an analytic dashboard. This dashboard is a business intelligence tool that presents different data sources gathered from multiple systems within the bank on a single platform.
Employees and management have access to all information, data visuals and insights via the dashboard.

Principles

The following key project goals:
• Share data about comparing a company and a transaction across industries, super levels, and other factors with the team.
• Achieved analytics for transactions, categories, and business insights that are not locally accessible.
• For the team, the solution should be as straightforward as possible to prevent adding to their already heavy workloads.

For diverse data sources, the TS team maintained a variety of portals. They wanted one place where they could retrieve all of their information. In order to notice trends, they also desired to visualize the data. They must collect data from numerous sources and evaluate it in Excel, which takes time, if the dashboard is not available.
As a result, they want a dashboard that provides a comprehensive overview of the specific period.

Objective of the study

At the beginning of the internship, I formulated several learning goals, which I wanted to achieve:

- to understand the functioning and working conditions of cards solution.
- to experience what it is like to work in an office setting.
- to determine how a career in this field is a chance for me.
- to put my gained knowledge to work.
- to determine what information and skills I still require for a professional setting to work in.
- to gain knowledge about how to set up a research project (planning, preparation, etc.)
- to gain experience working with people from different cultures.
- to improve my ability to communicate.

Business Question

How did the TS Sales Cash Advisory & Structuring team use BI to help their clients' and internal teams' businesses?

Method

The data is incredibly detailed and complex, involving various currencies, formats, product type, super levels, company names, and industries. Data is collected monthly and stored in a SharePoint until it is retrieved for Power BI, tableau, or other data analysis.

Basically, in this report I have tried to support card managers by translating transaction business challenges into data & analytic solutions and accumulate all the resources that I have learnt from the last few months of my internship period.

Power BI is a strong dashboard and data visualization development tool to track business performance based on various factors. Power BI is used in the banking industry to build the dashboard to manage data and get insights. Also, it collects data from the sources provided and analyzes it to share comparisons and insights on the dashboard.

Because of Power BI's excellent features and Microsoft's comprehensive support, this report chose to use it. The report considers interactive dashboards that display data from various viewpoints. All the formulas needed to be written in DAX language and executed directly in Power BI in order to calculate specific components of our metrics.

Power BI RS Desktop

In this assignment, three following stages for developing Power BI Reports are applied that each stage has sub-steps:

I. Data preparation & Analysis,
II. Visualization,
III. Publishing & Sharing

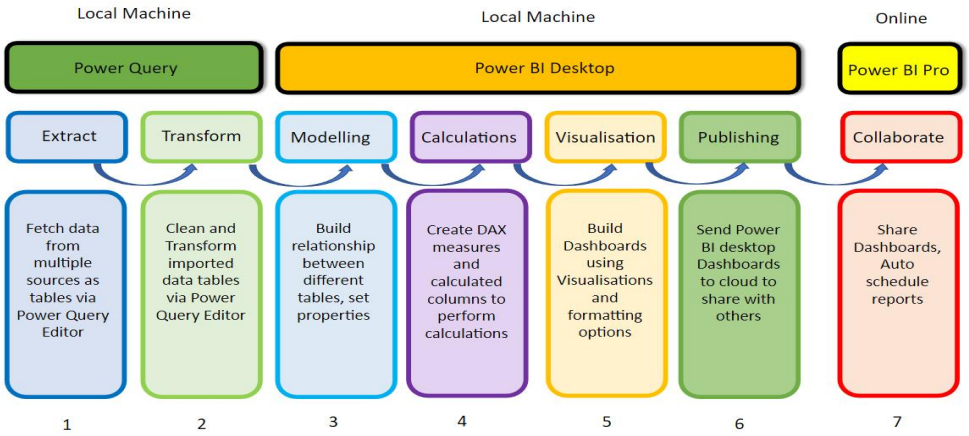
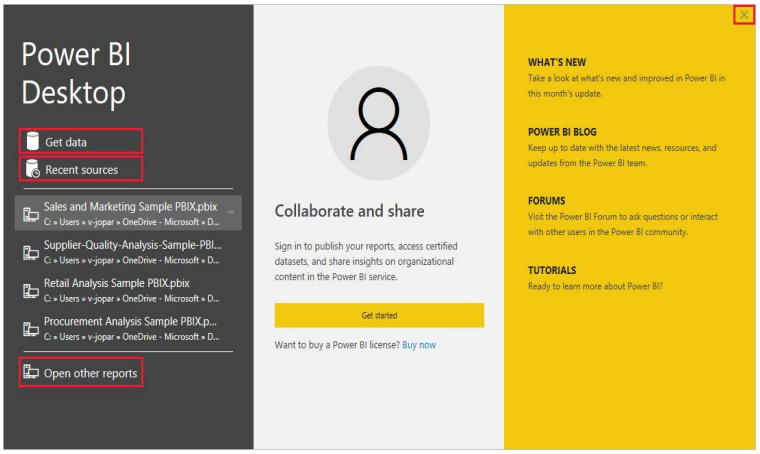


Figure 1 - Typical process for creating Power BI reports and dashboards

Run Power BI Desktop

The Welcome screen appears when Power BI Desktop launches for the first time.

You can get data, view recent sources, access recent reports, open other reports, or choose other links from the welcome screen.



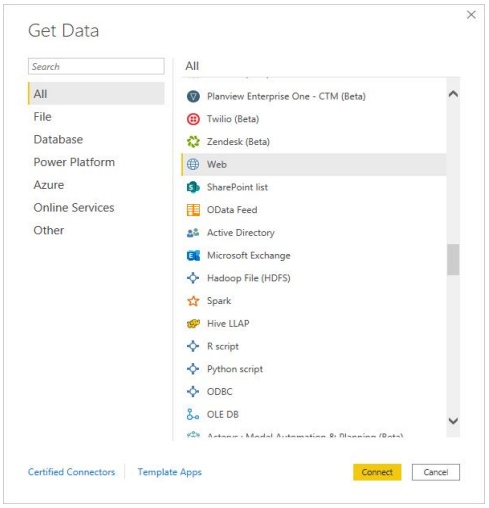
Regarding ING rules, it is not possible to access files on your local machine from Citrix. To access the files, user can read on a SharePoint or shared network drive.

Access to data within ING

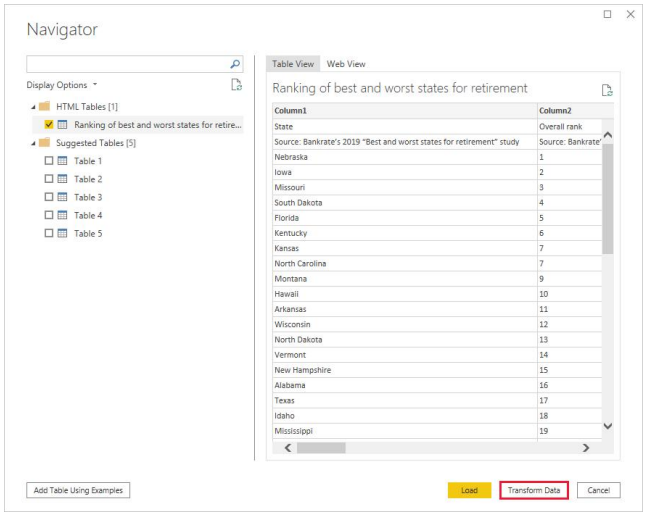
At ING, there is no access files on local machine from Citrix. Having access the files needs on a SharePoint or shared networked drive. ING only allows connections to databases with reports running in DirectQuery.
When the report is in DirectQuery, it does not need to refresh the data since it is fetched live every time that user open the report.

Stage I: Data Preparation & Analysis

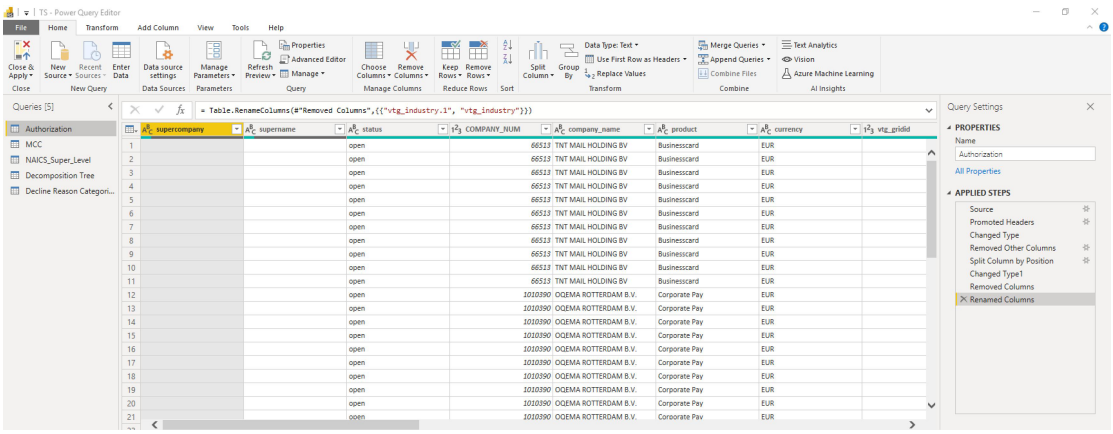
when user is connected to a data source, he/she can adjust the data to meet the needs. To shape data, Power Query Editor should be used. You can now apply your own changes and transformations to the data and see them in Applied Steps.
Power Query has an incredible number of features that are dedicated to helping you clean and prepare your data for analysis.
To see the many types of data sources available, select Get Data > More in the Power BI Desktop Home tab, and in the Get Data window, scroll through the list of All data sources. In this quick tour, you connect to a couple of different Web data sources.
User can get data into Power BI from different data sources e.g., Excel, CSV, Text, SQL Database etc.



The Navigator window returns what it found on the given path. At this point you can select Load to load the table or Transform data to make changes in the table before you load it.



When you select Transform data, Power Query Editor launches, with a representative view of the table. The Query Settings pane is on the right, or you can always show it by selecting Query Settings on the View tab of Power Query Editor.



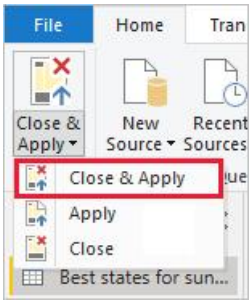
Power Query Editor in Power BI Desktop allows to shape (transform) the imported data. You can accomplish actions such as renaming columns or tables, changing text to numbers, removing rows, setting the first row as headers, and much more. It is important to shape your data to ensure that it meets your needs and is suitable for use in reports.

In this assignment, different datasets are used that each of them represents specific information.

- Authorization Data includes companies' data (transactions)
- Decline Reasons
- Merchant Codes (MCC)
- NAICS Super Level

Now there is a single query table that combines several data sources, each of which has been shaped to meet specific needs. This query can serve as a basis for more data connections.

For now, there are enough data to create a report in Power BI Desktop. Since this is a milestone, apply the changes in Power Query Editor and load them into Power BI Desktop by selecting Close & Apply from the Home tab of the ribbon. You can also select just Apply to keep the query open in Power Query Editor while you work in Power BI Desktop.



Create and manage relationships in Power BI Desktop

Our data must be arranged into distinct tables. Performance is the primary factor for doing this, but it also makes it simpler to scale and maintain the database. Data modeling is the procedure involved in this.

A common data modeling technique involves using fact and dimension tables with a star schema. In our report, authorization data is modeled using a fact table in the middle and dimension tables surrounding it in a star pattern. This approach serves as an example of data normalization.

When there are multiple tables, user might do some analysis using data from all those tables. In order to correctly calculate results and display the correct information in the reports, relationships between such tables are required. It is simple to create these connections with Power BI Desktop. Understanding relationships in Power BI Desktop as well as how to create and modify them is crucial.

1. On the Modeling tab, select Manage relationships > New.
2. In the Create relationship dialog box, in the first table drop-down list, select a table. Select the column you want to use in the relationship.
3. In the second table drop-down list, select the other table you want in the relationship. Select the other column you want to use, and then select OK.

Cardinality and cross-filter direction are complex settings that have ramifications across your data model in terms of performance, functionality, and ease of use.

The Cardinality setting reflects the directionality of the data and how the tables relate to each other. This relationship can be:

- One-to-many (1:*)
- Many-to-one (*:1)
- One-to-one (1:1)
- Many-to-many (*:*)

One-to-One Cardinality

Both columns in a one-to-one relationship have unique values. This cardinality type is uncommon, and it most likely indicates a suboptimal model design due to redundant data storage

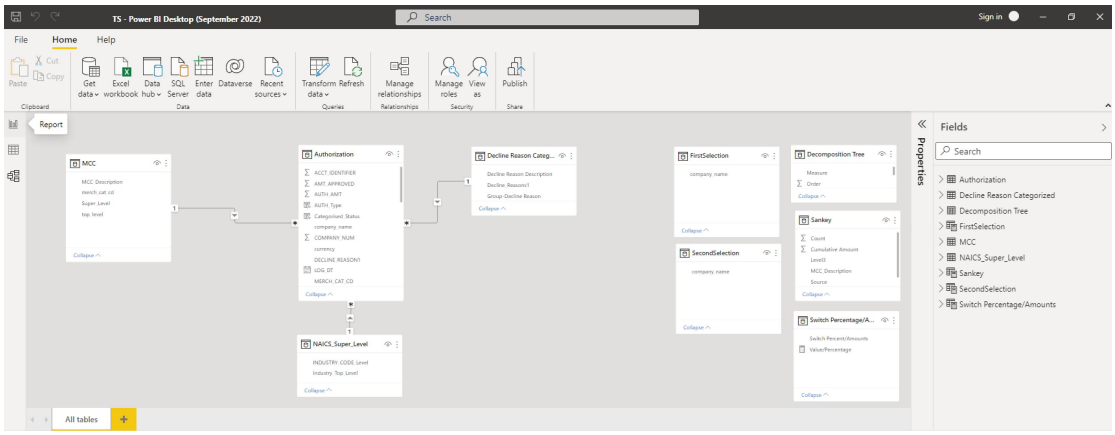
Many-to-Many Cardinality

Both columns can have duplicate values in a many-to-many relationship. This is a rare cardinality type. When creating complex model requirements, it is usually useful. It can be used to connect many-to-many facts or to connect facts of a higher grain.

These definitions describe how many values of one type might be found in each table.

Cardinality type	Cross filter options
One-to-many (or Many-to-one)	SingleBoth
One-to-one	Both
Many-to-many	Single (Table1 to Table2) Single (Table2 to Table1) Both

The Cross-filter setting tells the data model how filters propagate between two tables. In the Model view, the arrow(s) in the middle of the line represent the cross-filter direction.



Stage II: Visualization

Based on old platform, TS Data Analysis Dashboard at ING has several following sections.

1. General Statistics
2. Breakdown of payments by status
3. Comparison of Companies
4. Industry Comparative analytics
5. Company & Decline Reasons
6. Decline Reason Analytic

In the dashboard, all sections are upgraded by more accurate information and visuals. In fact, identifying customer needs and behavior is an important part of this dashboard and helps the team to offer better services to meet customer requirements, hence visualizations help to extract different insights and these behaviors.

General Statistics

In this part, the focus and analysis are on a “Super Company” and its related companies. Several slicers are provided to select a super group, company, the type of product and a slicer for date to select the specific date that user want to have analysis on. Based on selected companies, different transaction insights are calculated that can be seen as scatter chart and the table for all details. User can have the number of transactions, successful and failed transactions. Also, “Authorization Rate” section that indicates percentage of the ratio of approved amount to authorized amount.

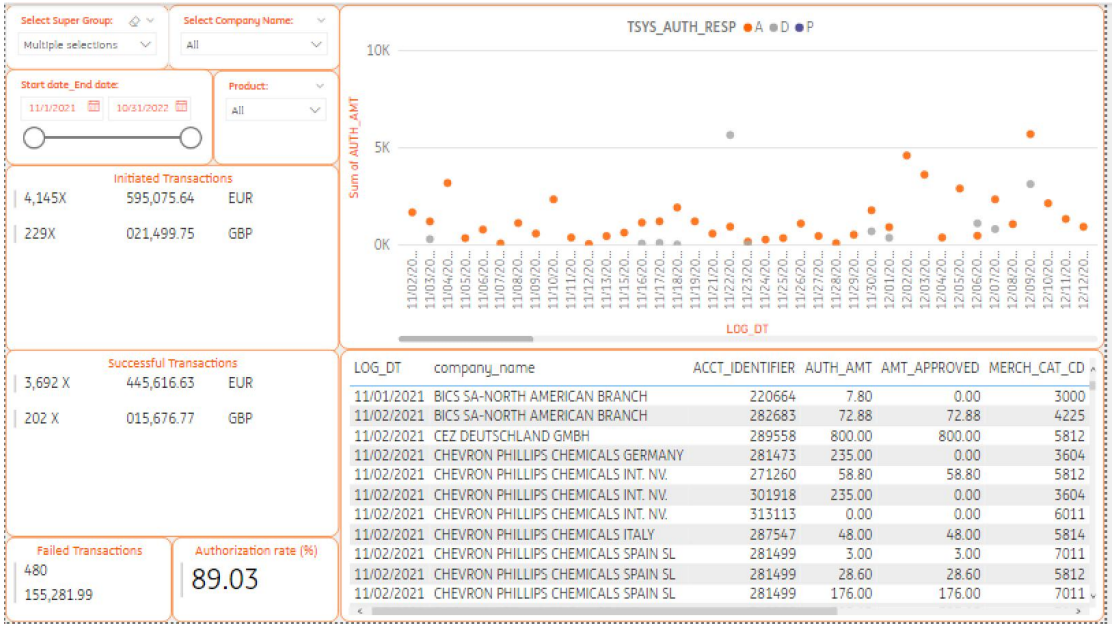


Figure 2 - General Statistics

Breakdown of payments by status

In this section, the focus is on super levels and related company over determined date by Sankey chart and the decomposition tree analysis.
Sankey is a type of flow diagram in which the width of the series is in proportion to the quantity of the flow.
The decomposition tree visual lets you visualize data across multiple dimensions. It automatically aggregates data and enables drilling down into your dimensions in any order. User can ask it to find the next dimension to drill down into based on certain criteria.

Figure 3- Breakdown of payments by status

Comparison of Companies

In this page, the main goal is comparing two companies specially in same industry in selected date. It gives you the possibility to compare the competitor companies. A bottom is provided to switch between value and percentage. The tables show the details of the selected company, cards which indicate the authorization rate and total amount of the company and line chart displays Multiple lines on a Line chart in Power BI based on approved amount that occurred by the company and date in the report canvas.

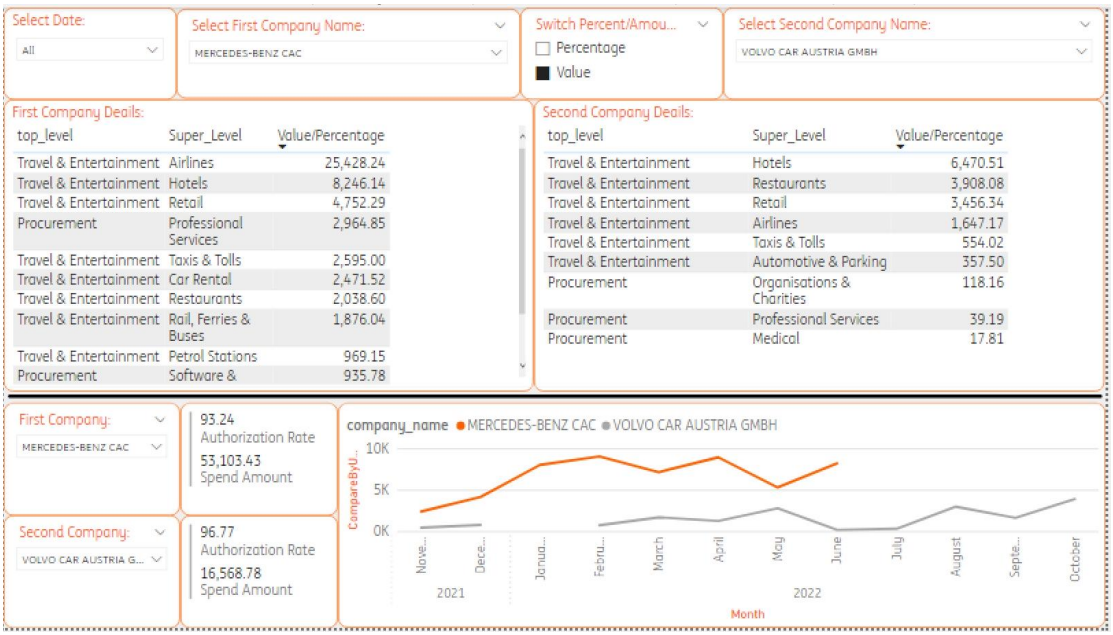


Figure 4 - Comparison of Companies

Industry Comparative analytics

The aim of this page is the comparison of a company within a related industry and the portion of the company in different industries. In the same time user can have comprehensive overview of the number of all transactions and details which are related to every super level in selected industries.

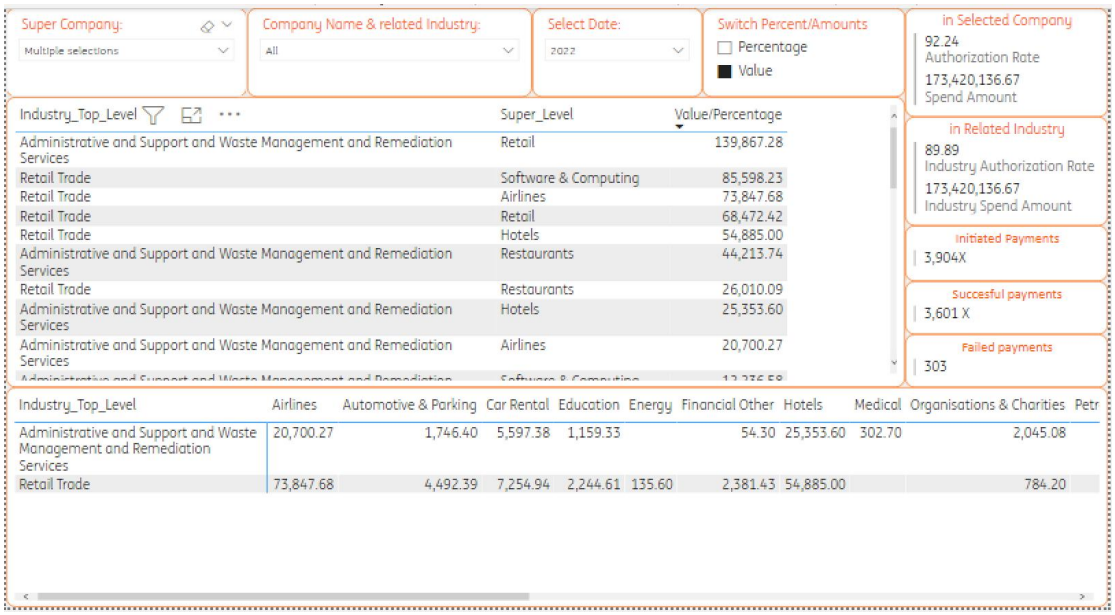


Figure 5 - Industry Comparative analytics

Company & Decline Reasons

In this part, analyze is done on a company and related decline reason. The pie chart tree shows a tree of decline reason categories with values represented in pie charts in each node.

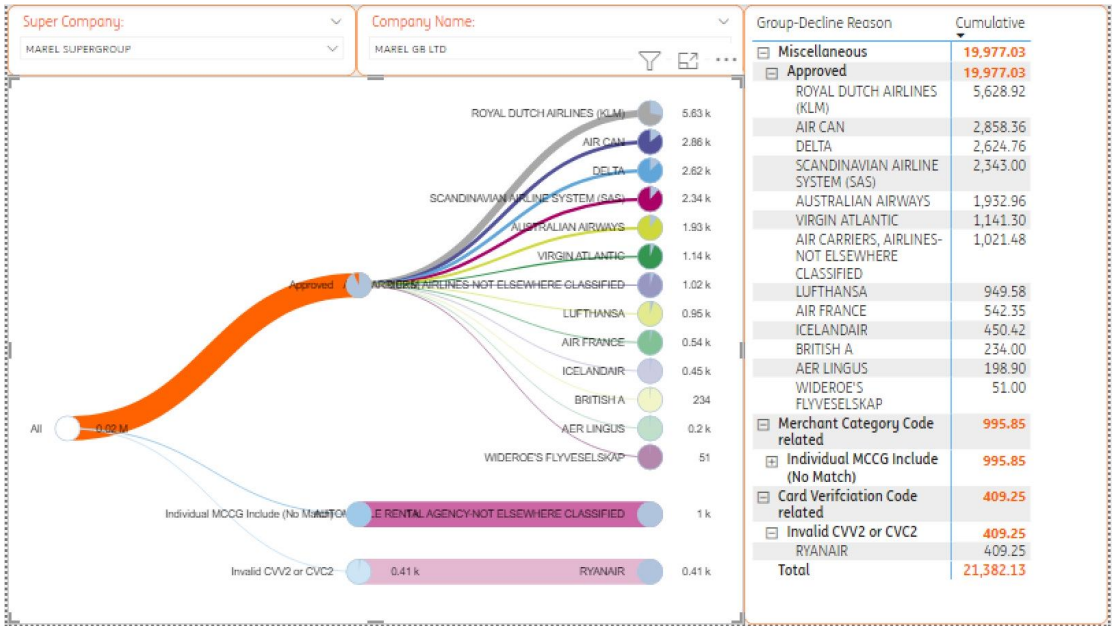


Figure 6 - Company & Decline Reasons

Decline Reason Analytic

In this page, by filtering a group decline reason and super level in particular date, user can have a table of related details over them, and line charts indicate a comprehensive insight.

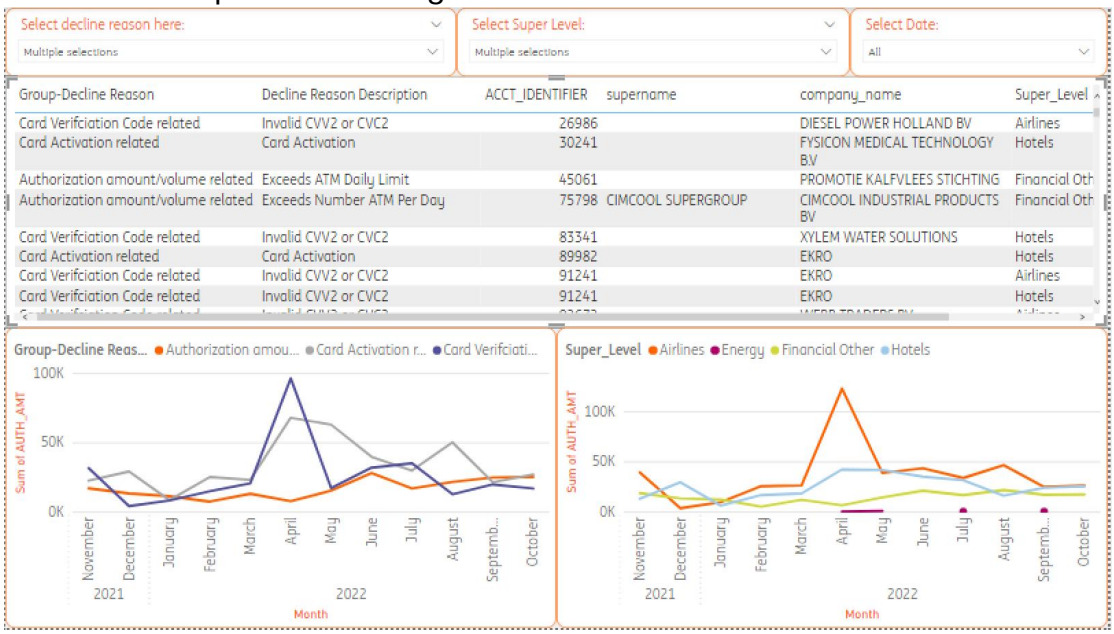
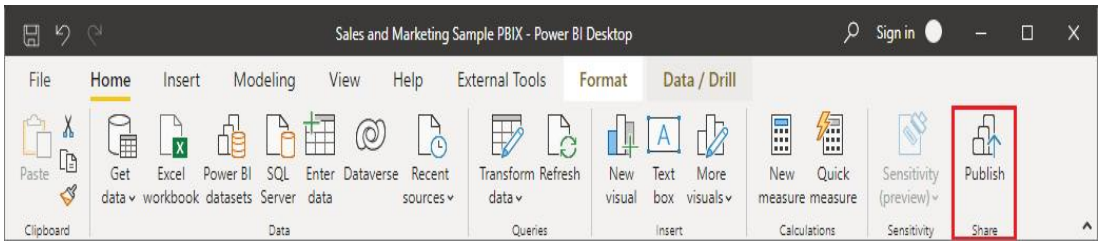


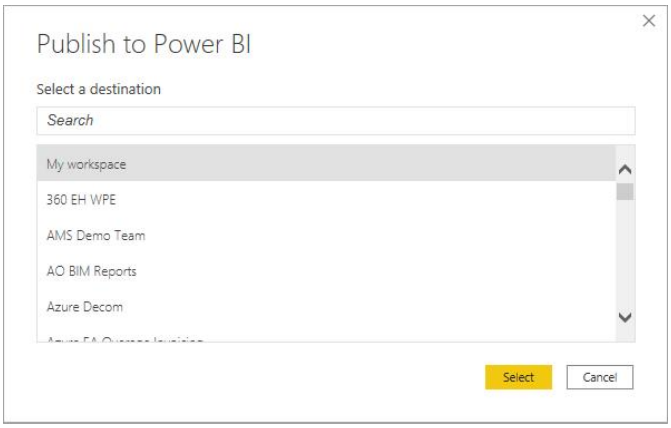
Figure 7 - Decline Reason Analytic

Stage III: Publishing & Sharing

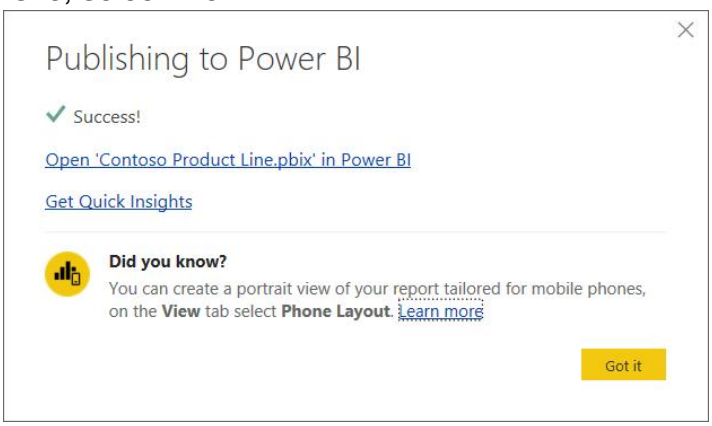
In general, in Power BI Desktop, choose File > Publish > Publish to Power BI or select Publish on the Home ribbon.



Decide where you want to go. In order to locate the workspace into which you wish to publish, you can search your list of accessible workspaces. Your workplaces can be filtered using the search box. To publish, select the workspace and then click the Select button.



You get a link to your report once posting is complete. To view the report in your Power BI site, select the link.

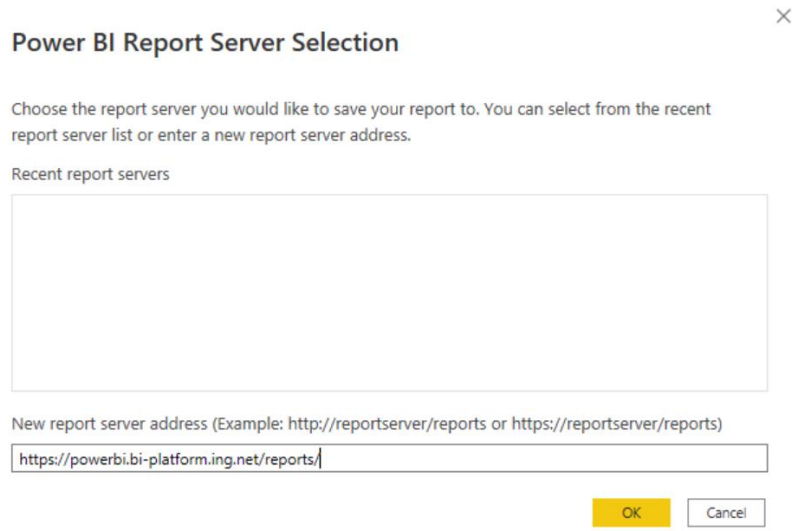


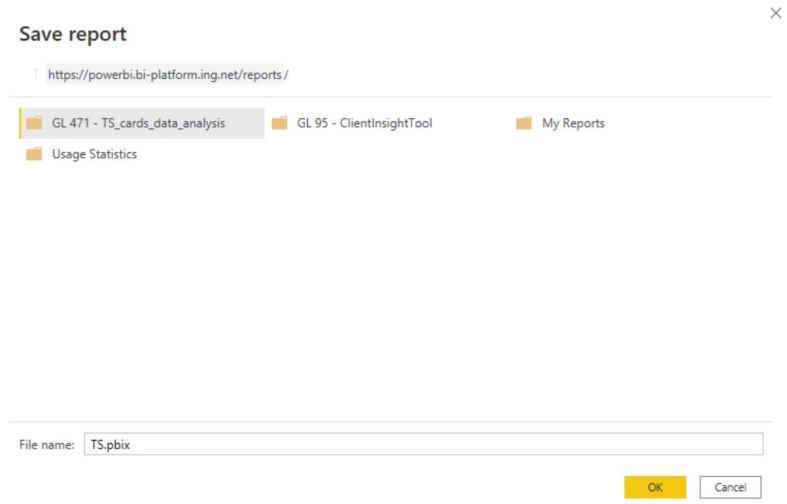
However, based on ING policy, it is possible only publish report from Citrix and the location where you can save the report is ING Report Server. Dashboard owner can request a group folder on ING PBI platform where can share reports with team members and others.

There are two types of access roles that you can request on ING platform:

- Publisher role: This role will grant you read, write, modify access to reports while on the Report Servers. Also, you will be granted access to the Power BI Desktop application via Citrix virtualization from where you can publish the reports you create, modify.
- Browser role: This role will grant you read-only access to reports.

After creating a folder, user can save as the dashboard file on the folder on ING platform.


Power BI Report Server Selection
Choose the report server you would like to save your report to. You can select from the recent report server list or enter a new report server address.
Recent report servers
New report server address (Example: http://reportserver/reports or https://reportserver/reports)
https://powerbi.bi-platform.ing.net/reports/
OK
Cancel


Save report
https://powerbi.bi-platform.ing.net/reports/
GL 471 - TS_cards_data_analysis
GL 95 - ClientInsightTool
My Reports
Usage Statistics
File name:
TS.pbix
OK
Cancel

Reference

- Power BI documentation. https://learn.microsoft.com/en-us/power-bi/
- https://bi-platform.ing.net/