Data Analysis Project with Power BI

Luigi Mennella

Project Description

Purpose: The purpose of the project is to create a dashboard in Power BI Desktop starting from data coming from different Excel sheets .

Input data: Fictional data* that simulates the typical information of a company accounting management system, such as that relating to invoices, customers, suppliers.

The data therefore contains several dimensions, such as the customers' place of origin, the invoice date, the invoiced amounts.

* Data taken from the course «The school of data», www.formazione.yimp.it

Analysis of input files

The input is represented by a single excel file with two sheets:

Invoices: list of invoices.

Database : containing customer, courier and supplier data.

	A	B	C	D	E	F	G	H
1	IdFattura	IdCliente	IdFornitore	DataFattura	DataTerminePagamento	DataPagamento	Importo	IdCorriere
2	1	1	15	12/08/2018	12/11/2018		2,7	3
3	2	39	1	23/07/2018	23/10/2018	21/10/2018	10,5	1
4	3	10	1	25/08/2018	25/11/2018	23/11/2018	3,3	1
5	4	10	2	03/12/2018	03/03/2019	03/03/2019	5,1	3
6	5	29	2	15/11/2018	15/02/2019	13/02/2019	2,3	1
7	6	15	2	26/07/2018	26/10/2018	24/10/2018	8,5	3
8	7	35	2	28/01/2018	28/04/2018	28/04/2018	8,8	1
9	8	21	2	27/03/2018	27/06/2018	30/06/2018	1,3	1
10	9	40	3	27/06/2018	27/09/2018	25/09/2018	5,7	1
11	10	35	2	28/11/2018	28/02/2019	26/02/2019	9,5	2
12	11	32	1	11/05/2018	11/08/2018	09/08/2018	2,7	2
13	12	22	2	11/08/2018	11/11/2018	09/11/2018	10,8	1
14	13	7	2	09/09/2018	09/12/2018	08/12/2018	3	3

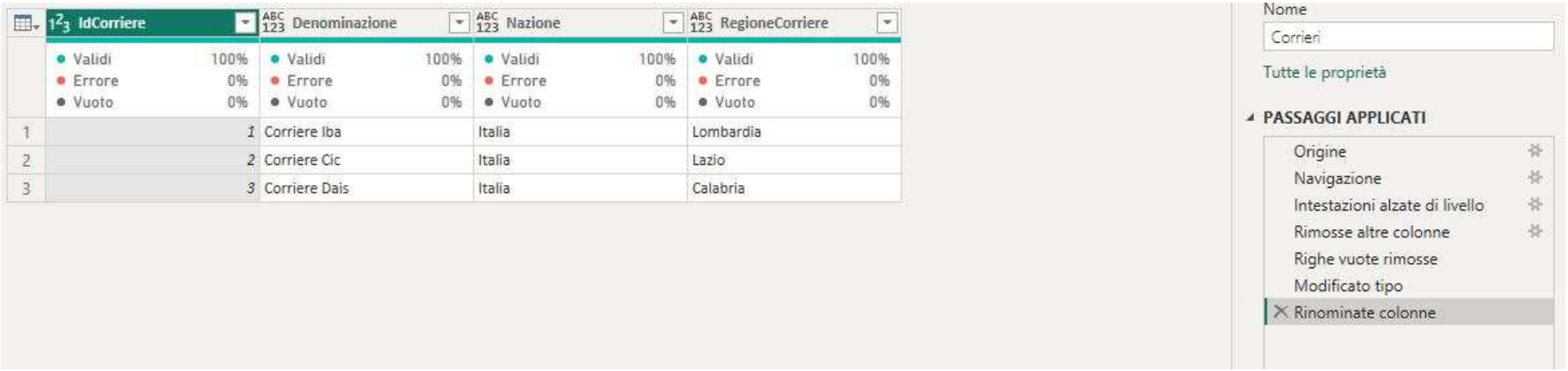
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	IdCliente	Nome	DataNascita	Regione			IdCorriere	Denominazione	Nazione	Regione			IdFornitore	Denominazione	Regione
2	1	Nicola	01/01/2010	Lazio			1	Corriere Iba	Italia	Lombardia			1	Fornitore Ava	Lombardia
3	2	Giovanni	01/03/1976	Lazio			2	Corriere Cic	Italia	Lazio			2	Fornitore Bcb	Lazio
4	3	Marco	01/04/1980	Lazio			3	Corriere Dais	Italia	Calabria			3	Fornitore Asa	Calabria
5	4	Giovanna	01/05/1977	Lazio									4	ciao	Calabria
6	5	Alice	01/06/1969	Sicilia											
7	6	Fabrizio	01/07/1996	Sicilia											
8	7	Irene	01/08/1990	Sicilia											

Data Import

The import was handled with Power BI.

Select columns and ***Delete empty rows*** functions were used for the Database sheet.

In any case, particular attention was paid to the ***type*** of columns, modifying them where necessary.



	IdCorriere	Denominazione	Nazione	RegioneCorriere
	Validi 100% Errore 0% Vuoto 0%	Validi 100% Errore 0% Vuoto 0%	Validi 100% Errore 0% Vuoto 0%	Validi 100% Errore 0% Vuoto 0%
1	1	Corriere Iba	Italia	Lombardia
2	2	Corriere Cic	Italia	Lazio
3	3	Corriere Dais	Italia	Calabria

Data enrichment using DAX language

Using the **Dax language** the information in the tables has been enriched.

For example, in the ***Invoices,*** the column ***Delay*** has been created, which shows whether the invoice has been paid on time, by combining ***Payment data*** and ***Payment deadline data*** .

Main functions used:

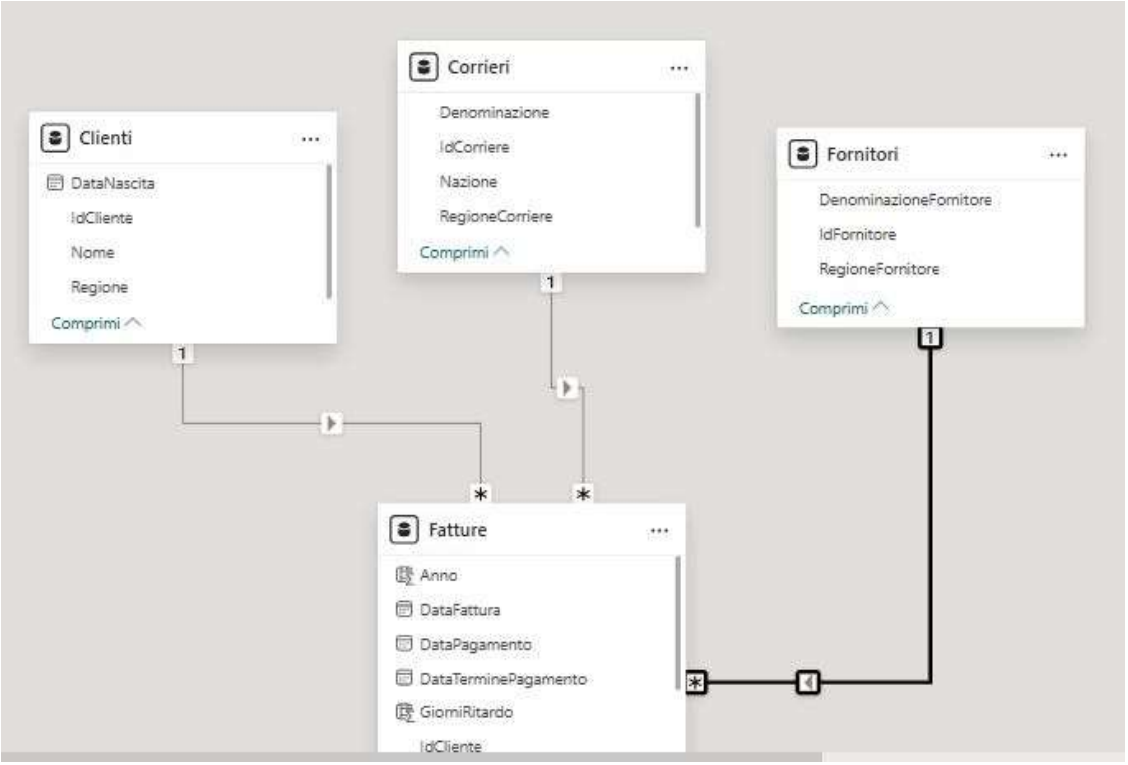
- *IF*
- *DATEDIFF*
- *BLANK*
- *OR*


```
1 Ritardo = IF(OR(Fatture[DataTerminePagamento]=BLANK(),Fatture[DataPagamento]=BLANK()),"NON DISPONIBILE", IF(Fatture[GiorniRitardo]<0,
  "anticipo", IF(Fatture[GiorniRitardo]=0,"puntuale", IF(Fatture[GiorniRitardo]>7,"extraritardo","ritardo"))))
```

	DataPagamento	Importo	IdCorriere	Anno	ImportoCorretto	ImportoFinale	GiorniRitardo	Ritardo	Importo2018	Importo2019
8	domenica 21 ottobre 2018	10,5	1	2018	#ERROR	#ERROR	-2	anticipo	10,5	

Creating relationships between tables

Primary and foreign keys were used, with **one-to-many relationships**, in particular, between the ***Invoices*** *table* and the other three tables.



Creating the Dashboard and Home Page

Home Page was created , which reports:

- Title
- Area chart with amounts per month and year, with a filter
- Histogram with amounts per customer
- Donut chart with amounts per s upplier

- *A filter for IdCourier*
- Some summary cards.

Data Detail by Customer

A page has been dedicated to the details of the **Customers** , with:

- Histogram and table with amount per region
- Pie chart for customer count by region
  - Matrices with the amount per year
  - Button to return to the Home Page
  - Filter.

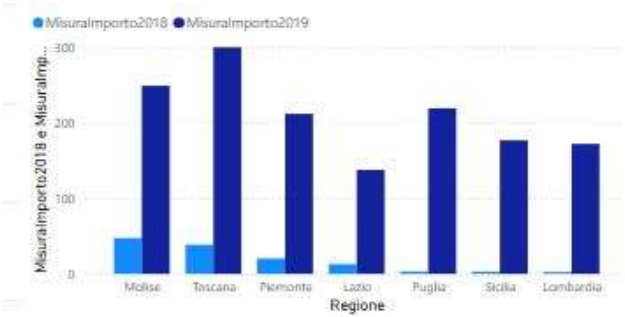
Data detail by year

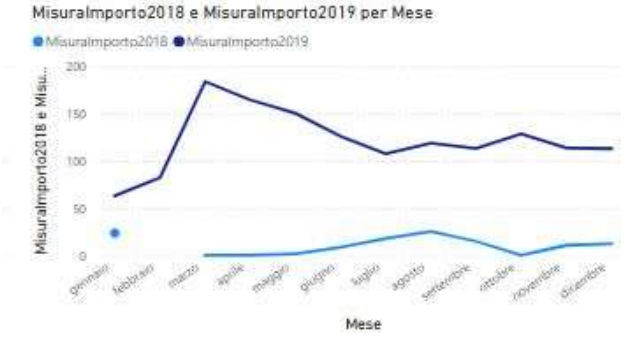
Another page was dedicated to the trend of invoices in the two years considered (2018 and 2019), also using the Power BI ***measures function:***

- Creation of the measures amount 2018 and amount 2019
  - Histogram with amount by year and region
- Line chart with amount per year

```
MisuraImporto2018
= CALCULATE ( sum
( Invoices[Amount]
), filter (
Invoices ,
Invoices[
InvoiceDate ] .
[Year] = 2018 ))
```

```
MeasureImport2019
= CALCULATE ( sum
(
Invoices[Amount]
), filter (
Invoices ,
Invoices[
InvoiceDate ] .
[Year] = 2019 ))
```





Further analysis

Further analyses and graphical representations were performed, including:

- Histogram with delay types
- Table with comparison of amount year by month, using the measure Increase%
- Amount per supplier and quarter with ribbon chart
- Tree chart to break down amounts

Improved dashboard aesthetics

Aesthetic adjustments have been made to improve the readability of reports:

- Adding a background
- Change the size
- Review of titles, labels and legends
- Choosing the axes and data to display
- Interventions on edges and other aesthetic elements
- In particular, these changes affected two additional Home Page proposals, with a vertical layout.

Dashboard-2 aesthetic improvement

The first alternative version of the Home Page is simpler and in line with the aesthetics used at the beginning of the work.

The second one is more elaborate and foresee the use of complementary colors