

Projet – Requêtes d'une base de données et création d'un tableau de bord

« Toys and models » : base de données d'une entreprise fictive de vente de modèles réduits de véhicules

Sujet et objectifs

Contexte

You are commissioned by a company selling models and scale models.

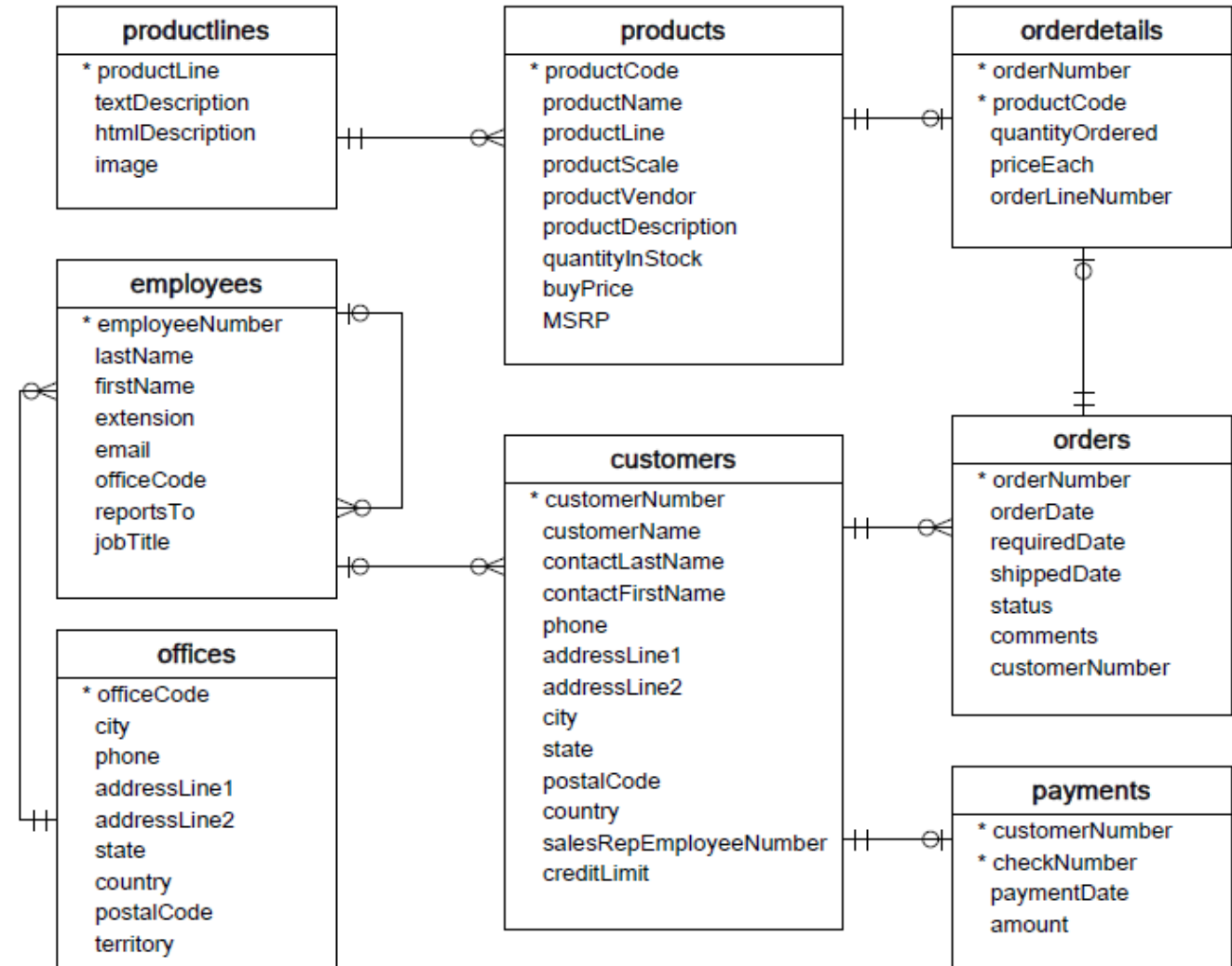
The company already has a database that lists employees, products, orders, and much more. You are invited to browse and discover this database.

The director of the company wishes to have a dashboard which he could refresh each morning to have the latest information in order to manage the company.



Contexte

- Schéma de la BDD



Objectifs

- Your dashboard should revolve around these 4 main topics: sales, finance, logistics, and human resources.
- Here are the indicators that should be present in your dashboard. Visualizations would also be appreciated. And you are invited to **practice your advisory role, by proposing additional KPIs and charts.**
 - Sales: The number of products sold by category and by month, with comparison and rate of change compared to the same month of the previous year.
 - Finances:
 - The turnover of the orders of the last two months by country.
 - Orders that have not yet been paid.
 - Logistics: The stock of the 5 most ordered products.
 - Human Resources: Each month, the 2 sellers with the highest turnover.

Objectifs

The manager does not want to do SQL, he wants to be able to access the data automatically and graphically. You can therefore propose a tool of your choice, as long as the dashboard is relevant.

For information, the database is available on a company server. You can access it in read-only mode with a user provided below.

You can use the tool of your choice. For information, the company uses Microsoft Power BI. Of course, you can use other reporting Business Intelligence tools like Tableau Software. It's up to you to present the best possible dashboard on the tool of your choice.

Be careful: you chose your own reporting tool. But the goal is to practice SQL. So you need to get the data in SQL queries.

Requêtes avec SQL

Requêtes SQL



- Utilisation de MySQL Workbench pour faire des requêtes SQL de la base de données, et afficher les résultats.
- Permet de préparer les requêtes qui serviront ensuite pour :
 - Sélectionner uniquement les données utiles
 - Croiser les données de différentes tables (jointures)
 - Grouper les données si nécessaire
- Ces requêtes seront ensuite utilisées directement lors du chargement des données dans Power BI

Requêtes SQL – Exemple MySQL Workbench

```
3  # Query : turnover per country and per month (nb and name) and year
4  • SELECT SUM(p.amount) AS turnover, c.country,
5     CONCAT(YEAR(p.paymentDate), '-', CASE WHEN MONTH(p.paymentDate) < 10 THEN CONCAT('0', MONTH(p.paymentDate))
6     ELSE MONTH(p.paymentDate) END) AS payment_year_month,
7     MONTH(p.paymentDate) AS payment_month_nb, MONTHNAME(p.paymentDate) AS payment_month,
8     YEAR(p.paymentDate) AS payment_year
9  FROM payments AS p
10 INNER JOIN customers AS c ON p.customerNumber = c.customerNumber
11 GROUP BY c.country, payment_month_nb, payment_month, payment_year, payment_year_month
12 ORDER BY payment_year_month, c.country;
13
```

	turnover	country	payment_year_month	payment_month_nb	payment_month	payment_year
▶	10549.01	Germany	2021-01	1	January	2021
	10223.83	USA	2021-01	1	January	2021
	53959.21	Denmark	2021-02	2	February	2021
	50218.95	Norway	2021-02	2	February	2021
	40206.20	Spain	2021-02	2	February	2021
	5494.78	USA	2021-02	2	February	2021
	52151.81	Italy	2021-03	3	March	2021
	51001.22	Philippines	2021-03	3	March	2021
	48425.69	UK	2021-03	3	March	2021

Result 1 x

Read Only

Requêtes SQL – Exemple Power BI

fx = MySQL.Database("51.178.25.157:23456", "toys_and_models", [ReturnSingleDatabase=true, Query="SELECT SUM(p.amount) AS turnover, c.country, CONCAT(YEAR(p.paymentDate), '-', CASE WHEN MONTH(p.paymentDate) < 10 THEN CONCAT('0', MONTH(p.paymentDate)) ELSE MONTH(p.paymentDate) END) AS payment_year_month, MONTH(p.paymentDate) AS payment_month_nb, MONTHNAME(p.paymentDate) AS payment_month, YEAR(p.paymentDate) AS payment_year"])

1.2 turnover	country	payment_year_month	payment_month_nb	payment_month	payment_year
10549,01	Germany	2021-01	1	January	2021
10223,83	USA	2021-01	1	January	2021
53959,21	Denmark	2021-02	2	February	2021
50218,95	N...				2021
40206,2	Sp...				2021
5494,78	U...				2021
52151,81	Ita...				2021
51001,22	Ph...				2021
48425,69	U...				2021
48125,76	U...				2021
1627,56	Be...				2021
33383,14	Fr...				2021
44380,15	Si...				2021
7674,94	Sv...				2021
49248,13	U...				2021
45864,03	Ar...				2021
35826,33	Ar...				2021
67525,13	Fr...				2021
3101,4	Sp...				2021
7565,08	Ar...				2021
14571,44	Fr...				2021
57131,92	Sp...				2021
108515,62	U...				2021
51572,43	Fr...				2021
34957,44	N...				2021
36251,03	Spain	2021-07	7	July	2021

Base de données MySQL

Serveur
51.178.25.157:23456

Base de données
toys_and_models

Options avancées

Délai de commande en minutes (facultatif)

Instruction SQL (facultatif, nécessite une base de données)

```
SELECT SUM(p.amount) AS turnover, c.country,  
CONCAT(YEAR(p.paymentDate), '-', CASE WHEN MONTH(p.paymentDate) < 10 THEN CONCAT('0', MONTH(p.paymentDate)) ELSE MONTH(p.paymentDate) END) AS payment_year_month,  
MONTH(p.paymentDate) AS payment_month_nb, MONTHNAME(p.paymentDate) AS payment_month,  
YEAR(p.paymentDate) AS payment_year
```

☒ Inclure des colonnes de relation

☐ Naviguer avec la hiérarchie complète

OK Annuler

Paramètres d'une requête

PROPRIÉTÉS

Nom
q_turnover_per_country_month_year

Toutes les propriétés

ÉTAPES APPLIQUÉES

Source

Colonnes renommées

Tableau de bord sur Power BI

Représentations graphiques



- Connexion directement à la source de données distante, avec requêtes SQL
- Pré-traitement, transformation des données :
 - Changements de formats
 - Ajout de colonnes « calculées »
 - Gestion des relations
- Utilisation des données pour créer des graphiques permettant de répondre aux problématiques.
- Ci-après : plusieurs exemples de graphiques tirés de notre tableau de bord

Sales - Product line sales follow up

YEAR

☐ Sélectionner tout

☐ 2021

☒ 2022

☐ 2023

MONTH

☐ Sélectionner tout

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7

☐ 8

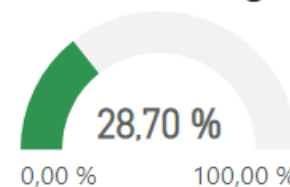
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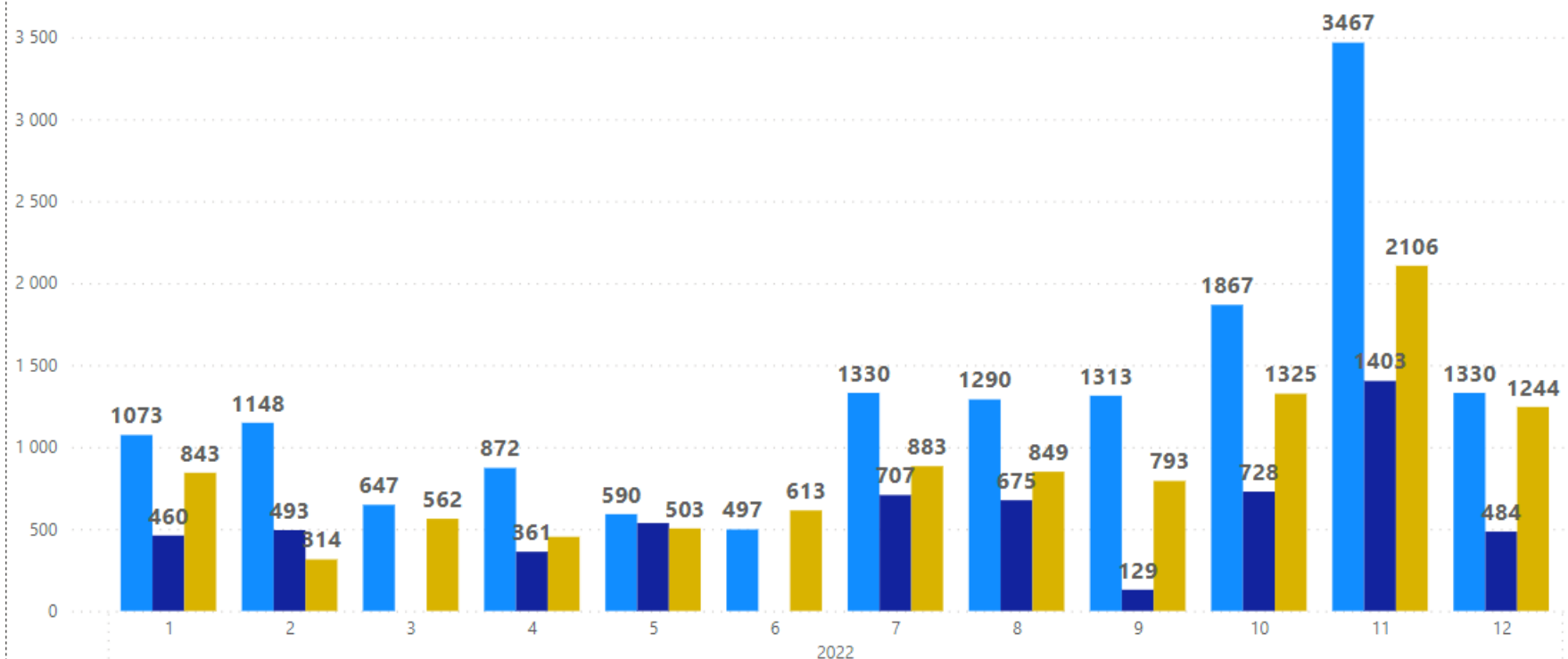
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Rate of change



Number of products sales by category

● Classic Cars ● Motorcycles ● Vintage Cars



Sales - Product scale sales follow up

YEAR

☐ Sélectionner tout

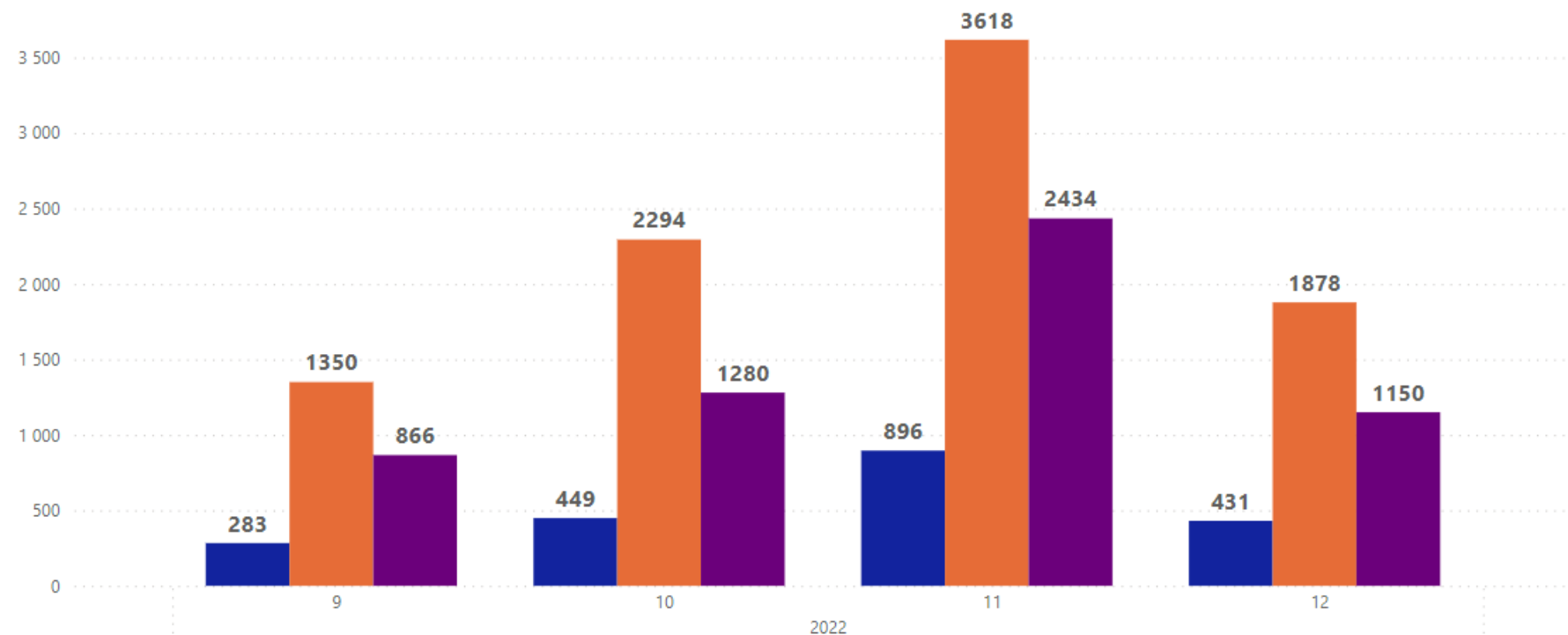
☐ 2021

☒ 2022

Sélectionner tout	1:10	1:12	1:18	1:24	1:32	1:50	1:700	1:72
-------------------	------	------	------	------	------	------	-------	------

Number of products sales by scale

● 1:12 ● 1:18 ● 1:24



MONTH

☐ Sélectionner tout

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7

☐ 8

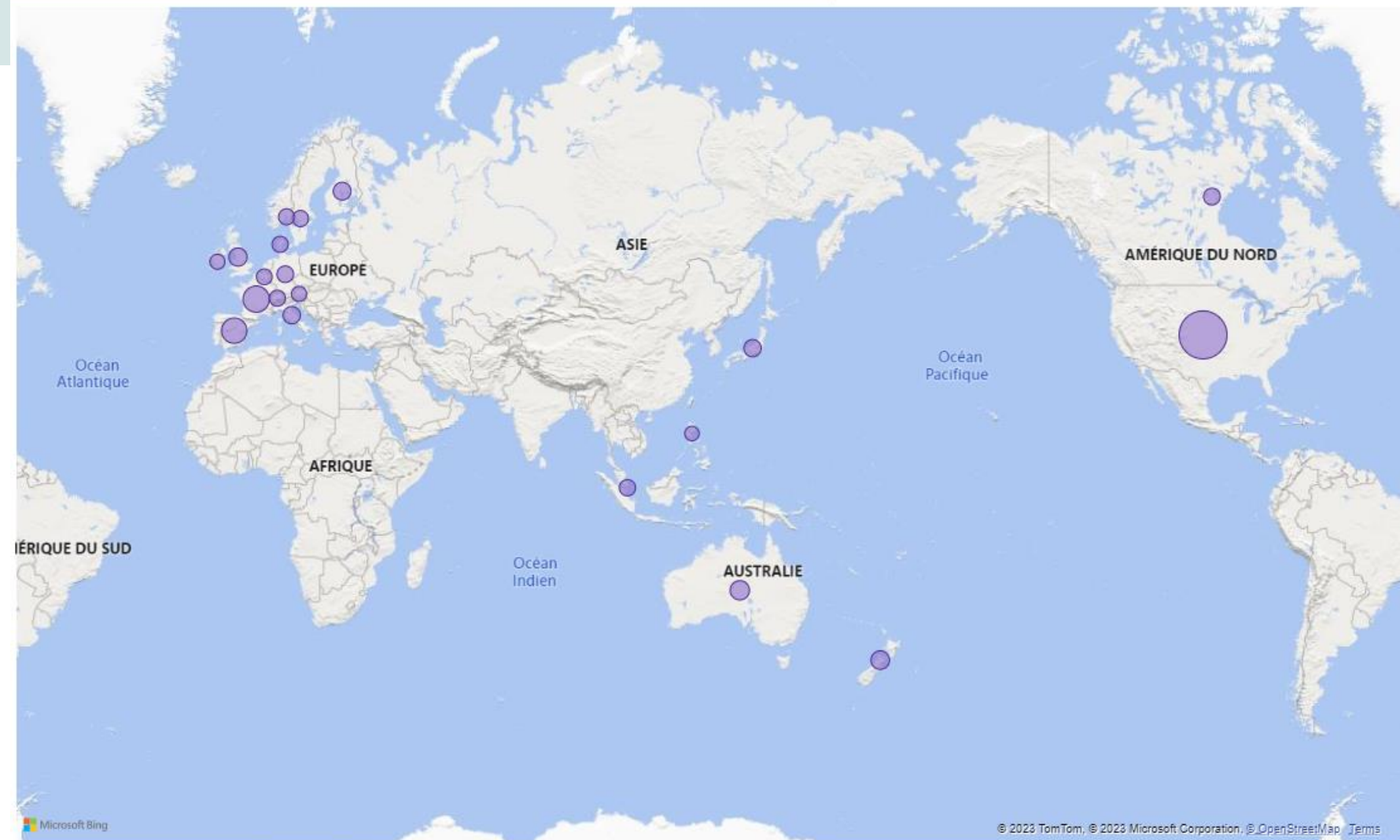
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☒ 12

Sales - Number of products sales per customers' country



YEAR

☒ Sélectionner tout

☐ 2021

☒ 2022

☒ 2023

MONTH

☐ Sélectionner tout

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7

☐ 8

☐ 9

☐ 10

☐ 11

☐ 12

Finances - Turnover

Year

2021 2023

Month

01-Jan	03-Mar	05-May	07-Jul	09-Sep	11-Nov
02-Feb	04-Apr	06-Jun	08-Aug	10-Oct	12-Dec

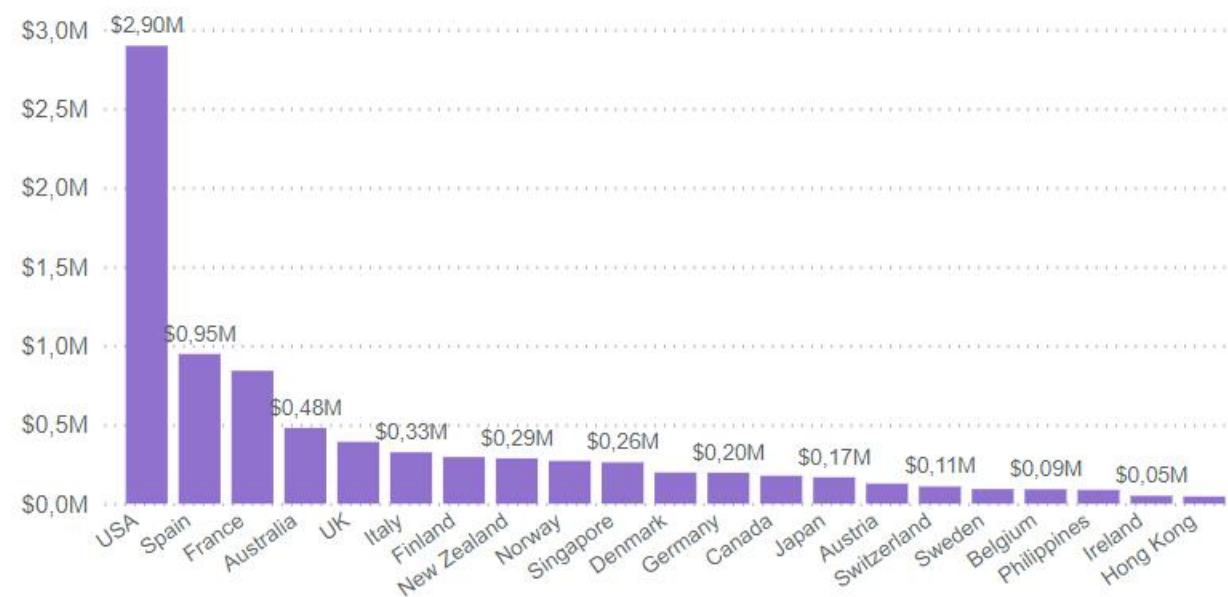
Year & month

Tout

Country

Tout

Turnover per country

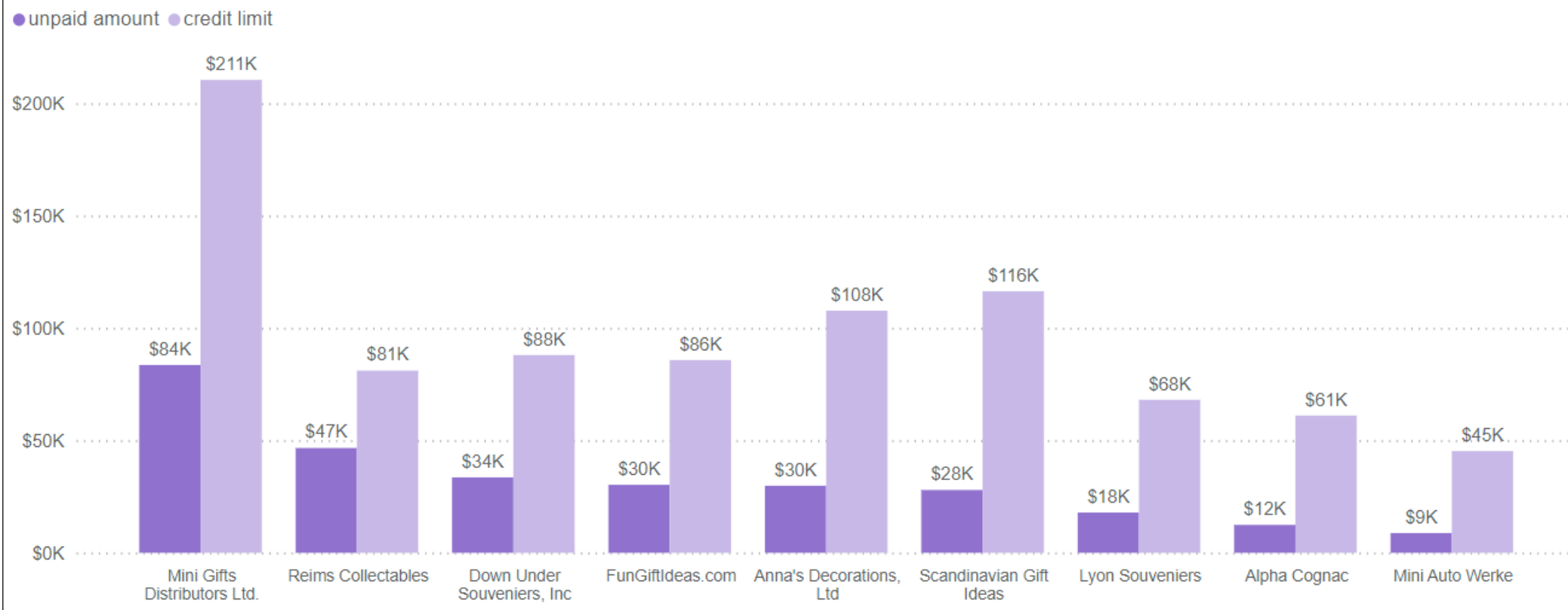


Turnover localisation



Finances - Unpaid orders

Unpaid amount vs. credit limit per customer



Logistics - Stocks, orders

Stock of 5 most ordered products

product code	product name	product line	stock quantity
S24_1937	1939 Chevrolet Deluxe Coupe	Vintage Cars	733
S12_4675	1969 Dodge Charger	Classic Cars	732
S24_1444	1970 Dodge Coronet	Classic Cars	407
S24_3420	1937 Horch 930V Limousine	Vintage Cars	290
S32_1374	1997 BMW F650 ST	Motorcycles	18

Stock of 5 least ordered products

product code	product name	product line	stock quantity
S24_2000	1960 BSA Gold Star DBD34	Motorcycles	2
S700_2047	HMS Bounty	Ships	350
S24_2841	1900s Vintage Bi-Plane	Planes	594
S10_1678	1969 Harley Davidson Ultimate Chopper	Motorcycles	793
S24_3151	1912 Ford Model T Delivery Wagon	Vintage Cars	917

Orders on hold

order nb	order date	status	comments
10334	22/11/2022	On Hold	The outstanding balance for this customer exceeds their credit limit. Order will be shipped when a payment is received.


Supply forecast

product code	product name	forecast
S12_1099	1968 Ford Mustang	-23,00
S24_2000	1960 BSA Gold Star DBD34	-47,00
S32_1374	1997 BMW F650 ST	-26,00
S32_4289	1928 Ford Phaeton Deluxe	-15,00

HR - Sales rep. performance over time

Year

2022 2023



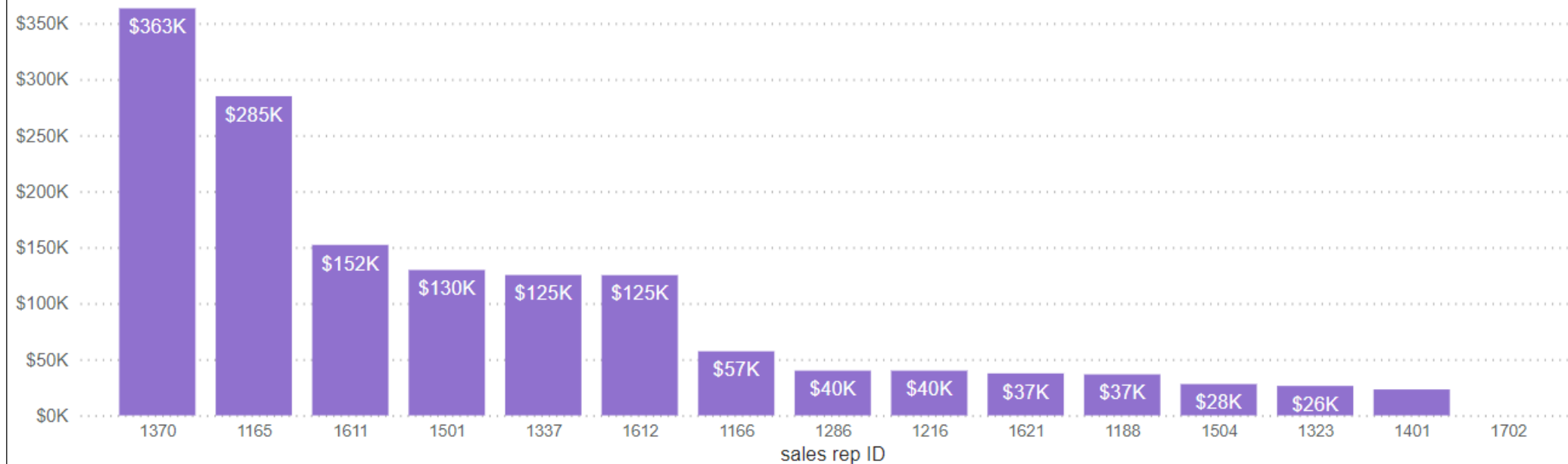
Month

1	3	5	7	9	12
2	4	6	8	10	11

Year & month

Plusieurs sélections


Orders amount per sales rep.



HR - Sales rep. performance over time

Year

2022 2023



Month

1	3	5	7	9	12
2	4	6	8	10	11

Year & month

Plusieurs sélections

Orders amount per sales rep.

