AXON CARS

Problem Statement:

A small company Axon, which is a retailer selling classic cars, is facing issues in managing and analysing their sales data. The sales team is struggling to make sense of the data and they do not have a centralized system to manage and analyze the data. The management is unable to get accurate and up-to-date sales reports, which is affecting the decision-making process.

To address this issue, the company has decided to implement a Business Intelligence (BI) tool that can help them manage and analyze their sales data effectively.

Database Description:

The MySQL sample database schema for this project includes eight tables:

1. **Customers:** Contains customer data, providing insights into Axon's client base.

2. **Products:** Stores a list of model cars and other automobile.

3. **Product Lines:** Categorizes products into different product line categories.

4. **Orders:** Contains sales orders placed by customers.

5. **Order Details:** Stores sales order line items for each sales order.

6. **Payments:** Stores payments made by customers based on their accounts.

7. **Employees:** Stores all employee information as well as the organization structure such as who reports to whom.

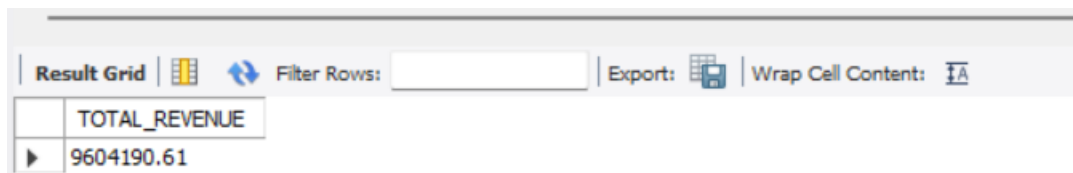8. **Offices:** Stores sales office data.

Data Analysis Using MySQL:

After an establishment of relationships between all tables they derive important insights including sales pattern, customer ordering behaviour, and product performance. It portrays a comprehensive structure of Axon Cars footprint in the market.

Total Revenue:

Query –

```
-- Total Sales Or Revenue--
SELECT SUM(quantityOrdered * priceEach) AS TOTAL_REVENUE FROM ORDERDETAILS;
```
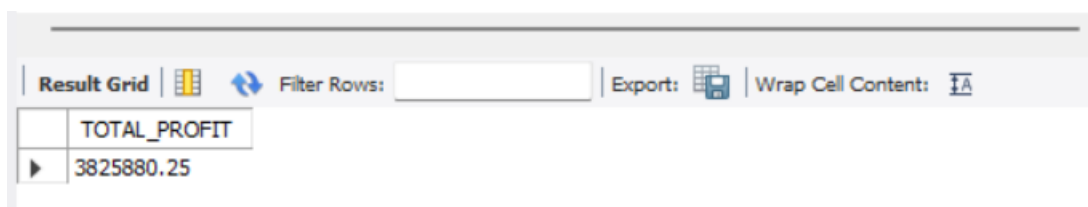
Output –

TOTAL_REVENUE
9604190.61

Total Profit:

Query –

```
-- Total Profit --
SELECT  SUM((quantityOrdered * priceEach) - (buyprice * quantityOrdered)) as TOTAL_PROFIT FROM PRODUCTS P
JOIN ORDERDETAILS O ON O.PRODUCTCODE = P.PRODUCTCODE;
```

Output –

TOTAL_PROFIT
3825880.25

Total Orders:

Query –

```
-- Total Orders --
SELECT COUNT(distinct ordernumber) AS TOTAL_ORDERS FROM ORDERDETAILS;
```

Output –

Total Products Sold:

Query –

```sql
-- Total Products Sold  --
SELECT SUM(quantityOrdered) AS TOTAL_PRODUCTS_SOLD FROM ORDERDETAILS;
```

Output –

Products Sold Monthly:

Query –

```sql
-- Monthly Products Sold --
SELECT DATE_FORMAT(ORDERDATE, '%Y-%m') AS YEARMONTH, SUM(QUANTITYORDERED) AS TOTAL_PRODUCTS_SOLD
FROM ORDERDETAILS OD
JOIN ORDERS O ON O.ORDERNUMBER = OD.ORDERNUMBER
GROUP BY YEARMONTH
ORDER BY YEARMONTH;
```

Output –

YEARMONTH	TOTAL_PRODUCTS_SOLD
2003-01	1357
2003-02	1449
2003-03	1755
2003-04	1993
2003-05	2017
2003-06	1685
2003-07	2145
2003-08	1974
2003-09	2510
2003-10	5731
2003-11	10862
2003-12	2961

Note: There are still some results other than those in this image.

Monthly Revenue:

Query –

```
-- Monthly Revenue --
SELECT DATE_FORMAT(ORDERDATE, '%Y-%m') AS YEARMONTH, SUM(quantityOrdered * priceEach) AS TOTAL_REVENUE
FROM ORDERDETAILS OD
JOIN ORDERS O ON O.ORDERNUMBER = OD.ORDERNUMBER
GROUP BY YEARMONTH
ORDER BY TOTAL_REVENUE desc;
```

Output –

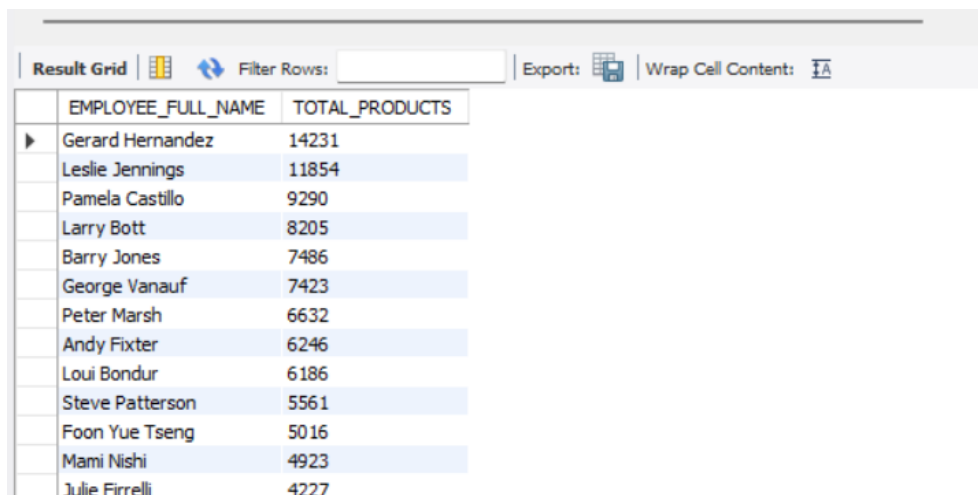| YEARMONTH	TOTAL_REVENUE
2003-11	988025.15
2004-11	979291.98
2003-10	514336.21
2004-10	500233.86
2005-05	441474.94
2004-12	428838.17
2004-08	419327.09
2005-03	359711.96
2005-04	344820.62
2004-06	343370.74
2004-07	325563.49
2005-02	317192.17

Note: There are still some results other than those in this image.

Products Sold By Each Sales Rep:

Query –

```sql
-- Products Sold by Sales Representative --
SELECT CONCAT(FIRSTNAME, ' ', LASTNAME) AS EMPLOYEE_FULL_NAME, SUM(QUANTITYORDERED) AS TOTAL_PRODUCTS
FROM EMPLOYEES E
JOIN CUSTOMERS C ON C.SALESREPEMPLOYEENUMBER = E.EMPLOYEENUMBER
JOIN ORDERS O ON C.CUSTOMERNUMBER = O.CUSTOMERNUMBER
JOIN ORDERDETAILS OD ON O.ORDERNUMBER = OD.ORDERNUMBER
GROUP BY EMPLOYEENUMBER
ORDER BY TOTAL_PRODUCTS DESC;
```

Output –

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

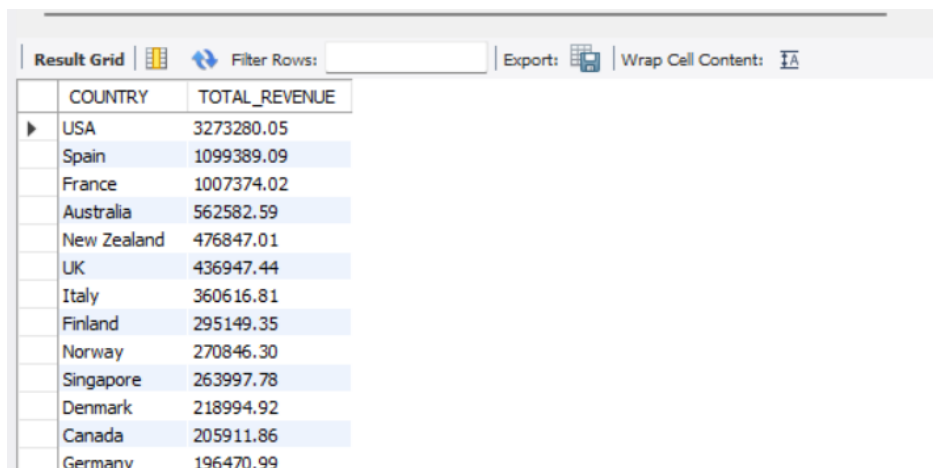| EMPLOYEE_FULL_NAME	TOTAL_PRODUCTS
Gerard Hernandez	14231
Leslie Jennings	11854
Pamela Castillo	9290
Larry Bott	8205
Barry Jones	7486
George Vanauf	7423
Peter Marsh	6632
Andy Fixter	6246
Loui Bondur	6186
Steve Patterson	5561
Foon Yue Tseng	5016
Mami Nishi	4923
Julie Firrelli	4227

Note: There are still some results other than those in this image.

Total Revenue By Country:

Query –

```sql
-- Total Revenue by Country --
SELECT COUNTRY, SUM(QUANTITYORDERED * PRICEEACH) AS TOTAL_REVENUE
FROM CUSTOMERS C
JOIN ORDERS O ON O.CUSTOMERNUMBER = C.CUSTOMERNUMBER
JOIN ORDERDETAILS OD ON O.ORDERNUMBER = OD.ORDERNUMBER
GROUP BY COUNTRY
ORDER BY TOTAL_REVENUE DESC;
```
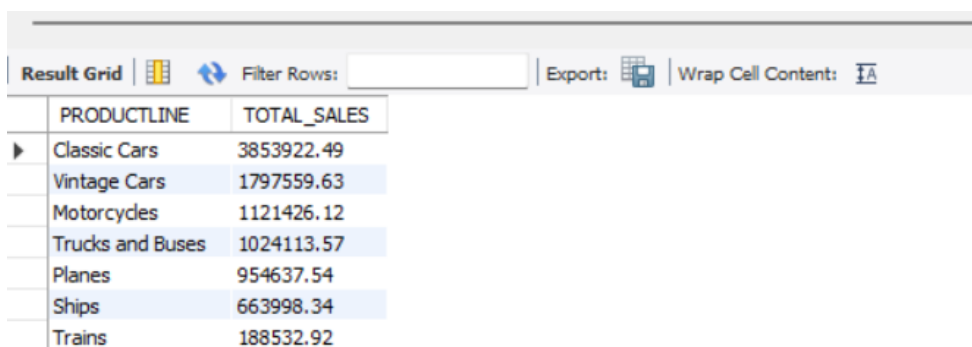
Output –

Note: There are still some results other than those in this image.

Total Sales By Product Category:

Query –

```
-- Total Sales by Product Category(Product lines) --
SELECT PRODUCTLINE, SUM(QUANTITYORDERED * PRICEEACH) AS TOTAL_SALES
FROM PRODUCTS P
JOIN ORDERDETAILS OD ON P.PRODUCTCODE = OD.PRODUCTCODE
GROUP BY PRODUCTLINE
ORDER BY TOTAL_SALES DESC;
```

Output –

Total Sales By Products:

Query –

```sql
-- Total Sales by Products --
SELECT PRODUCTNAME, SUM(QUANTITYORDERED * PRICEEACH) AS TOTAL_SALES
FROM PRODUCTS P
JOIN ORDERDETAILS OD ON P.PRODUCTCODE = OD.PRODUCTCODE
GROUP BY PRODUCTNAME
ORDER BY TOTAL_SALES DESC;
```

Output –

PRODUCTNAME	TOTAL_SALES
1992 Ferrari 360 Spider red	276839.98
2001 Ferrari Enzo	190755.86
1952 Alpine Renault 1300	190017.96
2003 Harley-Davidson Eagle Drag Bike	170686.00
1968 Ford Mustang	161531.48
1969 Ford Falcon	152543.02
1980s Black Hawk Helicopter	144959.91
1998 Chrysler Plymouth Prowler	142530.63
1917 Grand Touring Sedan	140535.60
2002 Suzuki XREO	135767.03
1956 Porsche 356A Coupe	134240.71
1969 Corvair Monza	132363.79
1928 Mercedes-Benz SSK	132275.98

Note: There are still some results other than those in this image.

Top 10 Customer By Revenue:

Query –

```sql
-- Customers by Revenue --
SELECT CUSTOMERNAME, SUM(QUANTITYORDERED * PRICEEACH) AS TOTAL_REVENUE
FROM CUSTOMERS C
JOIN ORDERS O ON C.CUSTOMERNUMBER = O.CUSTOMERNUMBER
JOIN ORDERDETAILS OD ON O.ORDERNUMBER = OD.ORDERNUMBER
GROUP BY C.CUSTOMERNUMBER
ORDER BY TOTAL_REVENUE DESC
LIMIT 10;
```

Output –

CUSTOMERNAME	TOTAL_REVENUE
Euro+ Shopping Channel	820689.54
Mini Gifts Distributors Ltd.	591827.34
Australian Collectors, Co.	180585.07
Muscle Machine Inc	177913.95
La Rochelle Gifts	158573.12
Dragon Souveniers, Ltd.	156251.03
Down Under Souveniers, Inc	154622.08
Land of Toys Inc.	149085.15
AV Stores, Co.	148410.09
The Sharp Gifts Warehouse	143536.27

Total Products Bought By Each Customer:

Query –

```
-- Total quantity of products ordered by each customer --
select o.Customernumber,Customername,country,sum(quantityordered) Total_Quantity_of_Products
from orderdetails od
join orders o on od.ordernumber=o.ordernumber
join customers c on c.customernumber=o.customernumber
group by O.customernumber
order by Total_Quantity_of_Products desc;
```

Output –

Customernumber	Customername	country	Total_Quantity_of_Products
141	Euro+ Shopping Channel	Spain	9327
124	Mini Gifts Distributors Ltd.	USA	6366
114	Australian Collectors, Co.	Australia	1926
119	La Rochelle Gifts	France	1832
187	AV Stores, Co.	UK	1778
151	Muscle Machine Inc	USA	1775
323	Down Under Souveniers, Inc	New Zealand	1691
450	The Sharp Gifts Warehouse	USA	1656
278	Rovelli Gifts	Italy	1650
496	Kelly's Gift Shop	New Zealand	1647
131	Land of Toys Inc.	USA	1631
282	Souveniers And Things Co.	Australia	1601
148	Dragon Souveniers, Ltd.	Singapore	1524

Note: There are still some results other than those in this image.

Orders In Each Product Line:

Query –

```sql
-- Orders in each productline --
select productline,count(o.orderNumber) Total_orders
from products p
join orderdetails od on p.productcode=od.productcode
join orders o on o.ordernumber=od.ordernumber
group by productline
order by Total_orders desc;
```

Output –

productline	Total_orders
Classic Cars	1010
Vintage Cars	657
Motorcycles	359
Planes	336
Trucks and Buses	308
Ships	245
Trains	81

Product With High Number Of Customers:

Query –

```sql
-- Which product has highest number of Customers --
select p.Productcode,productname,count(c.customernumber) Total_customers
from customers c
join orders o on c.customernumber=o.customernumber
join orderdetails od on o.ordernumber=od.ordernumber
join products p on p.productcode=od.productcode
group by p.Productcode,productname
order by Total_customers desc
limit 1;
```

Output –

Productcode	productname	Total_customers
S18_3232	1992 Ferrari 360 Spider red	53

Product With Low Number Of Customers:

Query –

```
-- Which product has least number of Customers --
select p.Productcode,productname,count(c.customernumber) Total_customers
from customers c
join orders o on c.customernumber=o.customernumber
join orderdetails od on o.ordernumber=od.ordernumber
join products p on p.productcode=od.productcode
group by p.Productcode,productname
order by Total_customers asc
limit 1;
```

Output –

	Productcode	productname	Total_customers
▶	S18_4933	1957 Ford Thunderbird	24

Product With Zero Customers:

Query –

```
-- Product which is not ordered by any customer --
select distinct P.Productcode,productname,p.productline
from products p
left join orderdetails od on p.productcode=od.productcode
join productlines pl on p.productline=pl.productline
where od.productcode is null;
```

Output –

	Productcode	productname	productline
▶	S18_3233	1985 Toyota Supra	Classic Cars

DATA VISUALIZATION:
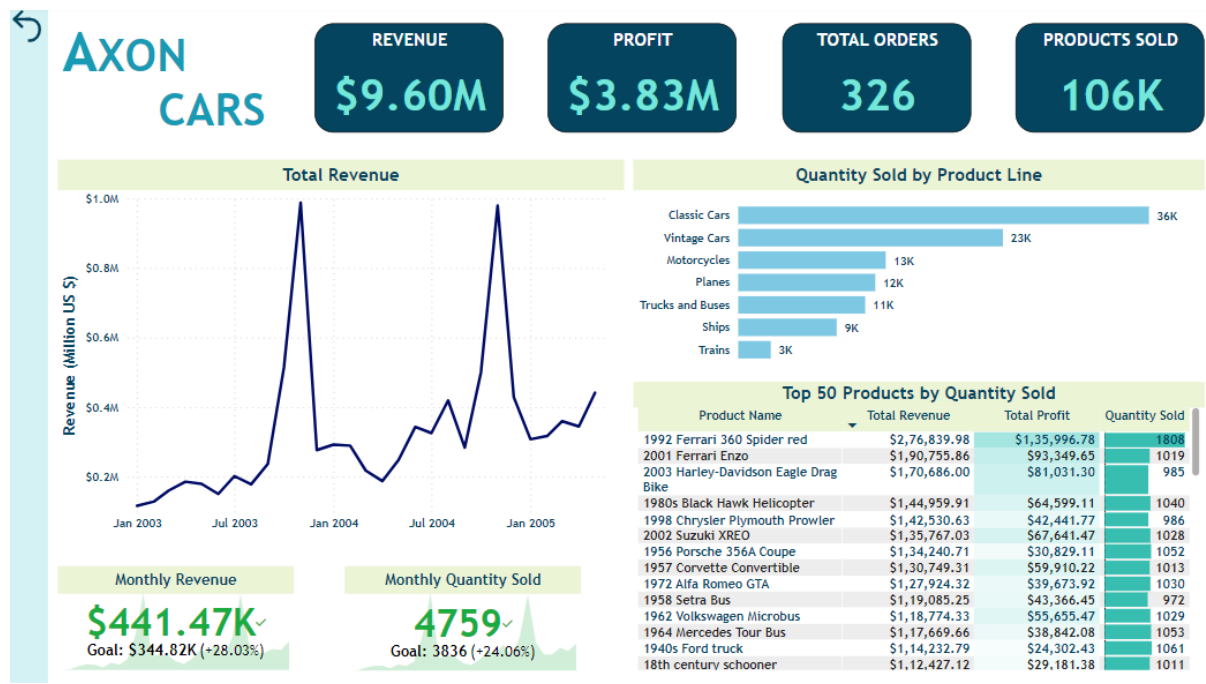
The Homepage of the dashboard displays Total Revenue and Total Profit made by the company and Total Orders ordered by the customers and Total Products sold to the customers. It also displays Monthly Revenue and Quantity of Products Sold and their deviation with respect to the previous month numbers.

It majorly focuses on the Total Revenue made by the company over time periods in years, quarters and months using Line Graph. It also visualises Quantity of Products Sold by Each Product Line Category using Bar Chart and also provides information about Top 50 Products based on the Quantity of Product Sold.

All the visuals in the page are interactive with each other such that one can view Revenue, Profit, Quantity Sold, Orders, Top 50 Products and Sales Distribution between Product Lines for every change over the Revenue line in Total Revenue Line Visual. One can also view Product Details by using Drill Through option on Product Name parameter.

The Revenue is quite fluctuating significantly but we can observe the revenue in the month November is significantly higher than the other months.
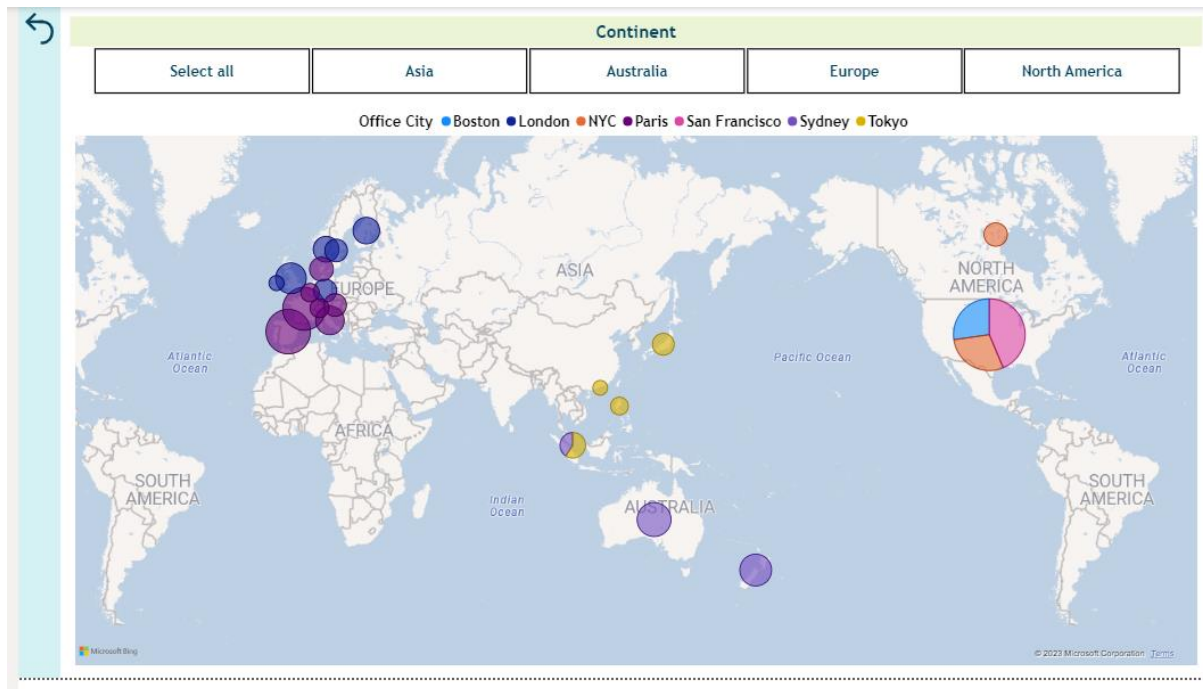
Page 2

The page 2 displays the Sales Distribution across Geographies. It also shows the sales generated by the Office City. In the country bubble, if the bubble size is high so is the revenue generated. We can observe The USA is generating high revenue significantly than the other countries.

The Axon Cars sales offices are situated in cities Boston, London, New York, Paris, San Fransisco, Sydney and Tokyo. Every Geography makes a sale with nearest office. But USA is the country which makes sales with three of the offices.

We can observe the major portion of sales are happening in North America region followed by European Countries. The South East Asian countries accumulates a small chunk of revenue.
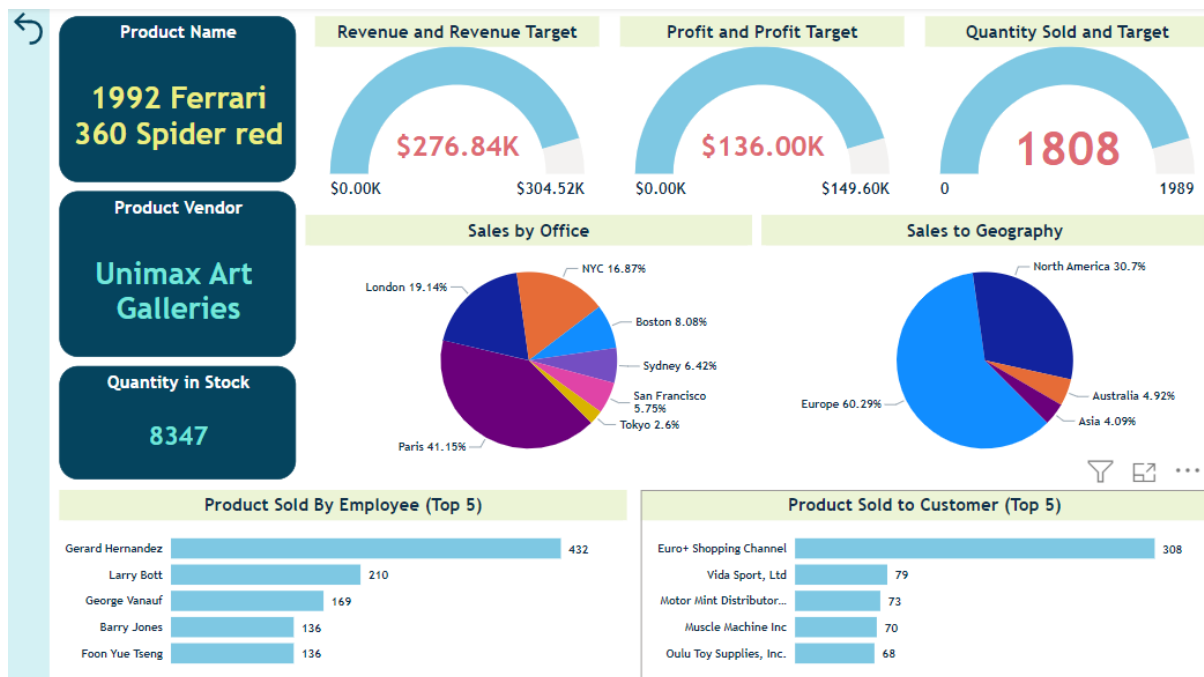
Page 3

The page 3 of the report is of drill through type where you can visualize the details of an individual product by using drill through option on product name parameter on any page.

This Product Detail page showcases the Product Vendor, Quantity in Stock and other details for a specific product at Axon. It also shows Revenue Target, Profit Target and Quantity of Products Sold Target using Gauge Charts with respect to the previous month numbers with taking 10 percent more than the previous numbers as the target number for current month.

It shows the quantity of products sold by the office and sold to the geographies using Pie Chart. As the entire page is exclusively for a single product the distribution ratios vary significantly for product to product. It also shows Top 5 Sales Representatives who sold the product and Top 5 Customers who bought it using Bar Charts.

We can also view a individual customer footprint by using Drill Through option on Customer Name parameter. It takes us to the page 5 of the report.

Customers Who Made a Sale

98

Employees Who Made a Sale

15

Average Revenue Per Customer

$98.00K

Average Revenue Per Order

$29.46K

Top 20 Customers by Revenue

| Customer Name	Total Revenue	Total Profit	Quantity Sold
Euro+ Shopping Channel	$8,20,689.54	$3,26,519.66	9327
Mini Gifts Distributors Ltd.	$5,91,827.34	$2,36,769.39	6366
Australian Collectors, Co.	$1,80,585.07	$70,311.07	1926
Muscle Machine Inc	$1,77,913.95	$72,370.09	1775
La Rochelle Gifts	$1,58,573.12	$60,875.30	1832
Dragon Souveniers, Ltd.	$1,56,251.03	$60,477.38	1524
Down Under Souveniers, Inc	$1,54,622.08	$60,013.99	1691
Land of Toys Inc.	$1,49,085.15	$58,669.10	1631
AV Stores, Co.	$1,48,410.09	$60,095.86	1778
The Sharp Gifts Warehouse	$1,43,536.27	$55,931.37	1656
Salzburg Collectables	$1,37,480.07	$54,724.68	1442
Kelly's Gift Shop	$1,37,460.79	$51,771.50	1647
Anna's Decorations, Ltd	$1,37,034.22	$54,551.66	1469
Souveniers And Things Co.	$1,33,907.12	$52,331.45	1601
Corporate Gift Ideas Co	$1,32,340.78	$55,674.28	1447

Revenue by Employee

productLine ● Classic Cars ● Motorcycles ● Planes ● Ships ● Trains ● Trucks and Buses ● Vintage Cars

Gerard Hernandez $1.26M, Leslie Jennings $1.08M, Pamela Castillo $0.87M, Larry Bott $0.73M, Barry Jones $0.70M, George Vanauf $0.67M, Peter Marsh $0.58M, Loui Bondur $0.57M, Andy Fixter $0.56M, Steve Patterson $0.51M, Foon Yue Tseng $0.49M, Mami Nishi $0.46M, Martin Gerard $0.39M, Julie Firrelli $0.39M, Leslie Thompson $0.35M

Page 4

This page of the report deals with the Office and Sales Representatives who made a sale. It displays Customers who made a sale out of all the customers and employees who made a sale to a customer out of all the employees. It displays Average Revenue Per Customer and Average Revenue Per Order by taking actual customers who made a sale into consideration.

It uses a Stacked Column Chart to showcase the sales made by each employee and the distribution of sales across product lines. There is a table which displays Top 20 Customers by Revenue. The page is quite interactive, we can view Top 20 Customers of a single individual Sales Representative as well as Top Customers in a particular product line of a specific Sales Representative.
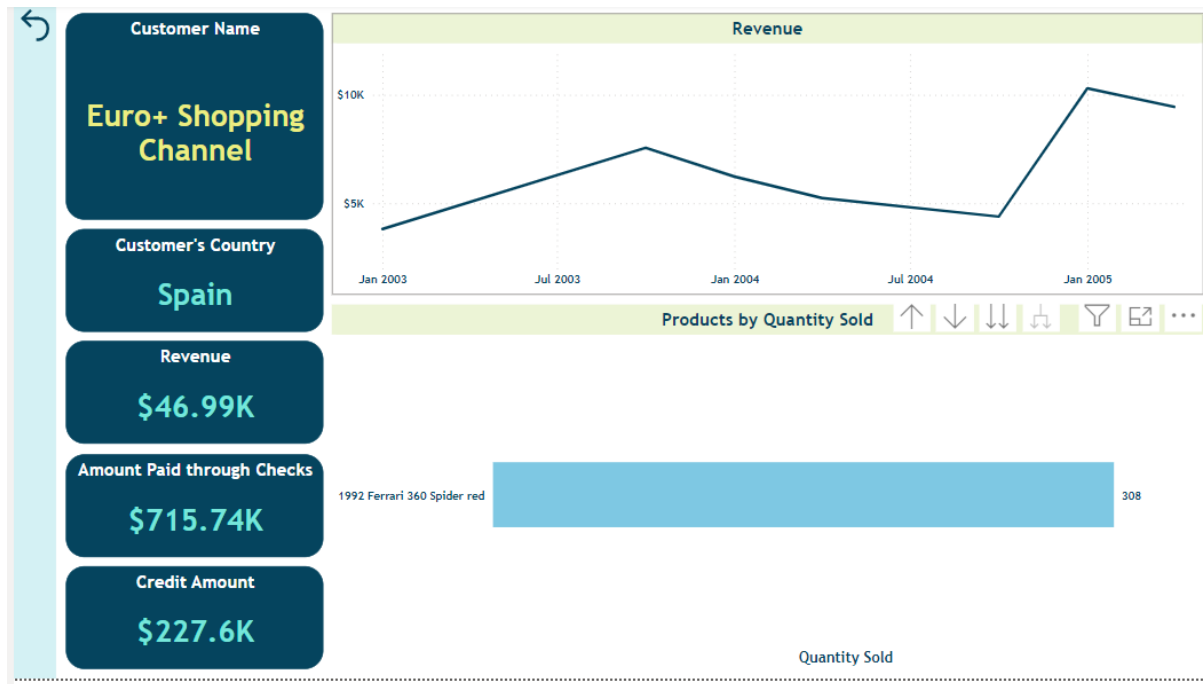
Page 5

This final page of the report is a drill through page where you can view the customer's details in specific. It shows the footprint in terms of Revenue, Quantity of products sold and the amount paid through checks and credit amount.

It uses a Line Graph to visualise the revenue pattern over the time period and a Bar Chart which shows quantity of products bought by the particular customer. It basically displays all the information related to the customer.

Conclusive Insights:

- The Total Revenue is approximately 9.60 million USD.
- The Total Profit is approximately 3.83 million USD.
- There are 326 unique orders.
- The Total Products Sold are 106K.
- The Product Line - Classic Cars has made highest number of products sold which is 36k where as Trains are the least with 3k products being sold.
- The major chunk of revenue has generated from the customers from USA.
- Sales Rep Gerard Hernandez made highest number of sales approximately 1.26 million USD followed by Leslie Jennings with 1.08 million USD. Gerard also tops in the quantity of products sold followed by Leslie.
- Out of all the months in the given time period, Axon has seen a significant amount of revenue in the month November in both the years.
- Euro+ Shopping Channel from Spain has made highest sales with approximately 820k USD. It ordered 9237 products from Axon in the given time period.
- The product '1992 Ferrari 360 Spider red' has highest number of customers.
- The product '1957 Ford Thunderbird' has least number of customers.
- The product '1985 Toyota Supra' has not been ordered by any of the customers.