

AXON SALES DASHBOARD DOCUMENTATION

NOTE: please zoom to see dax formulas in pictures

User manual : [click here](#)

Validation SQL queries : [click here](#)

Problem Statement:

A small company Axon, which is a retailer selling classic cars, is facing issues in managing and analyzing 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. They have shortlisted Microsoft PowerBI and SQL as the BI tools for this project.

DATABASE : classicmodels

Database Description:

Here is a short description of the data tables included that contains typical business data such as customers,

products, sales orders, sales order line items, etc.

MySQL Sample Database Schema

The MySQL sample database schema consists of the following 8 tables:

Customers: stores customer's data.

Products: stores a list of scale model cars.

ProductLines: stores a list of product line categories.

Orders: stores sales orders placed by customers.

OrderDetails: stores sales order line items for each sales order.

Payments: stores payments made by customers based on their accounts.

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

Offices: stores sales office data

TOOLS USED :

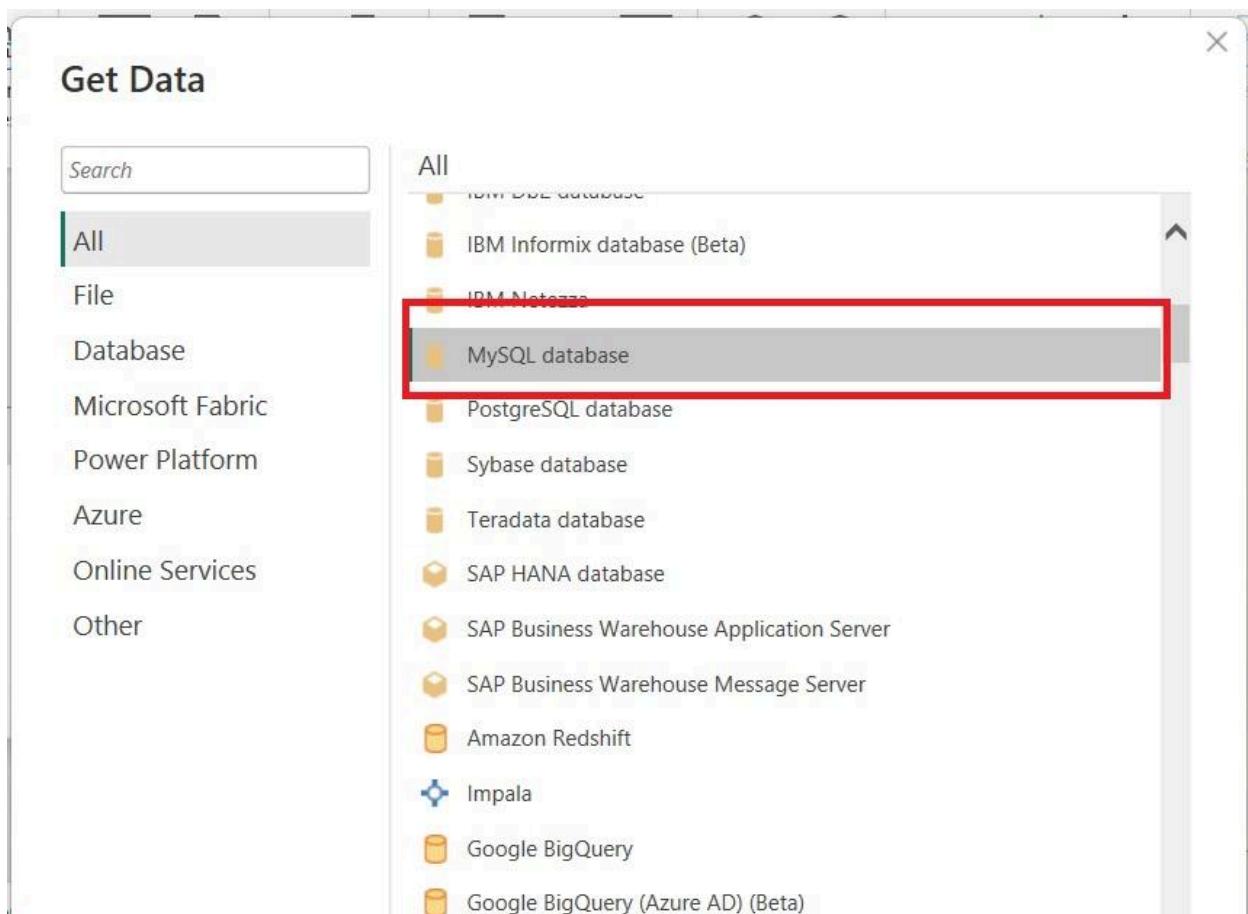
- 1.MYSQL WORKBENCH for database management and Data validation Queries
- 2.POWER BI for visualization
- 3.POWER BI SERVICE for publish
- 3.GOOGLE DOC for Development documentation
- 4.MS OFFICE POWER POINT for user manual

APPROACH:

EXTRACT - TRANSFORM - LOAD - VISUALIZATION - VALIDATION - PUBLISH - PRESENTATION

EXTRACT :

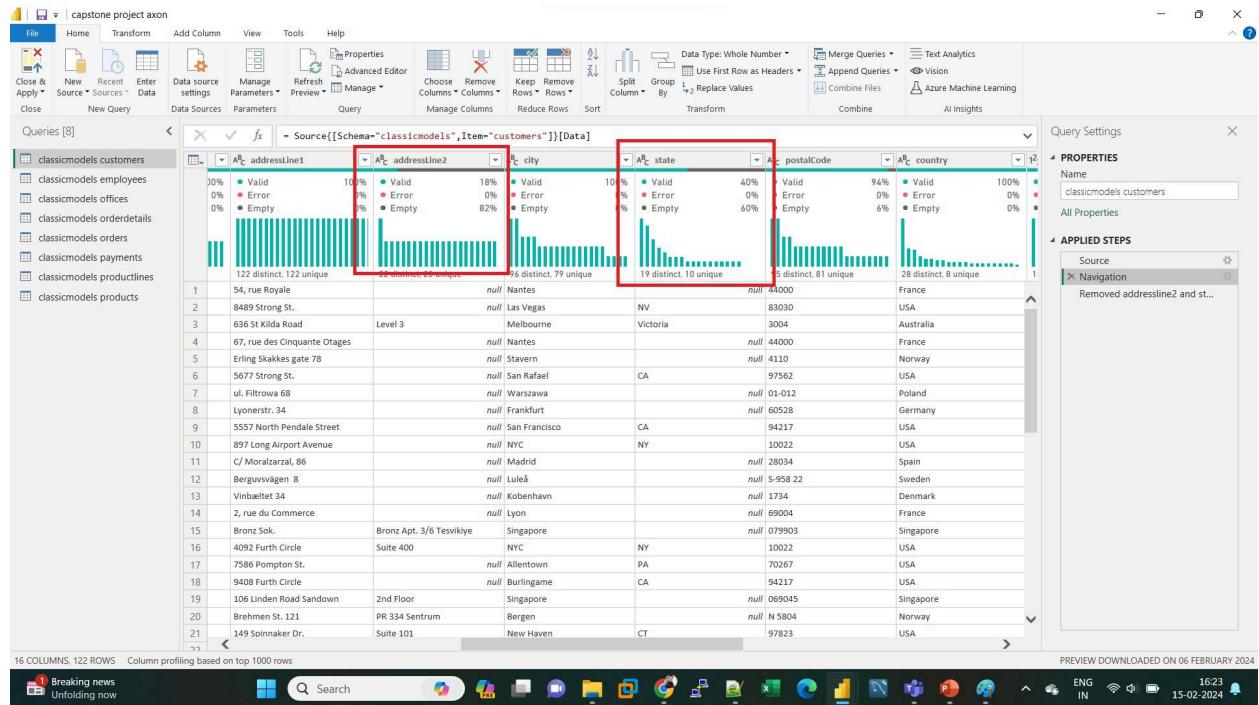
Extract data from the give data base file by using getdata option in Power bi
Power bi has a option to load data from MYSQL database



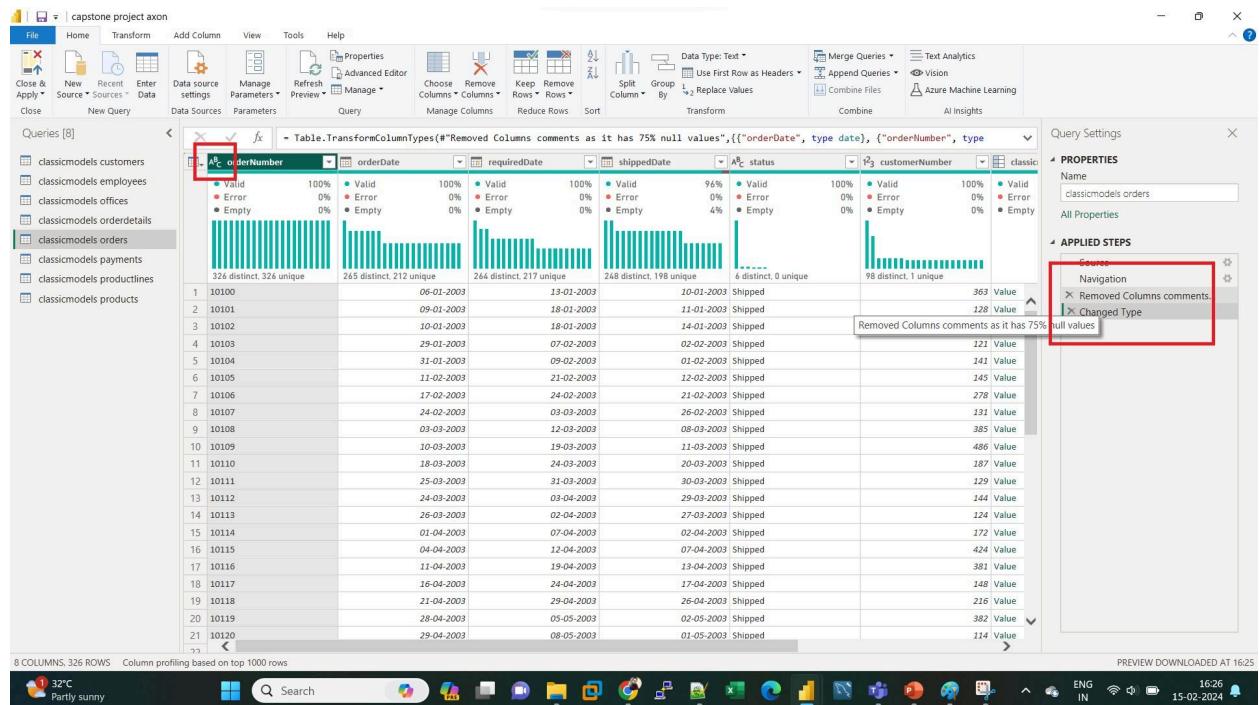
From mysql workbench data is extracted and then transformed data and it extracts entire data so selected data is checked to transform into power query editor

TRANSFORM:

1. In transforming of data we utilized the power query editor where null values having columns more than 70% are removed



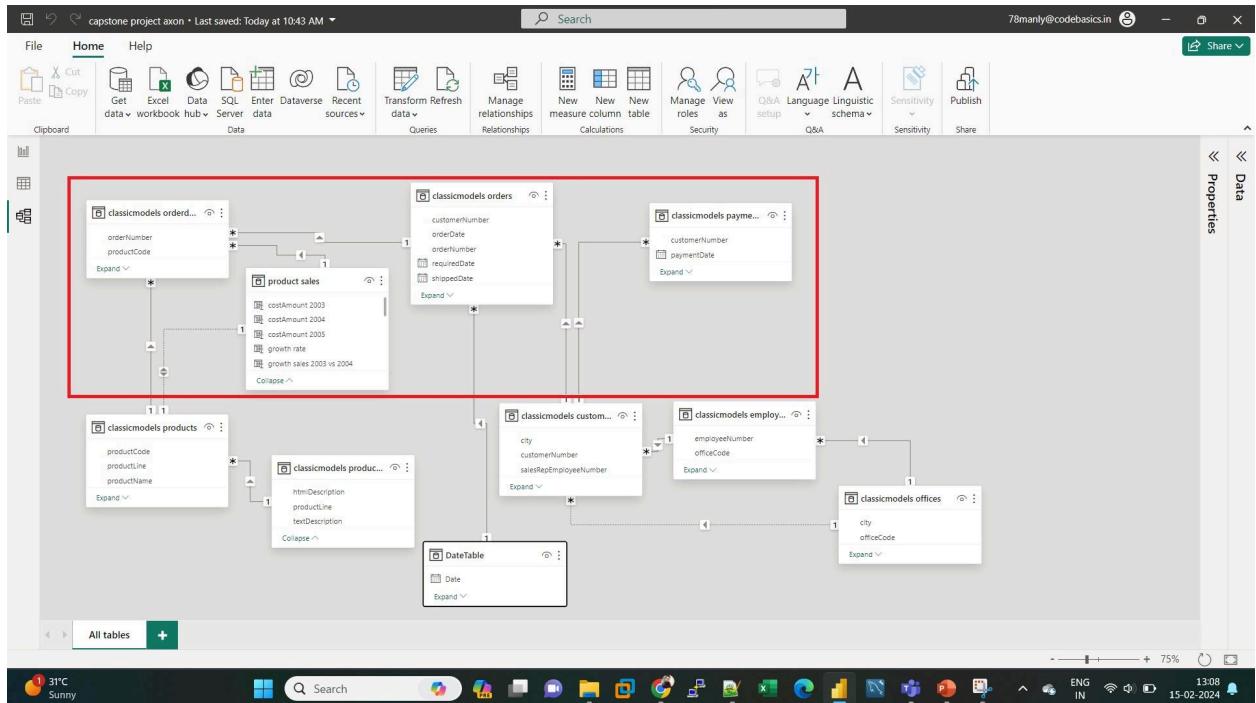
2. Category types were changed to text from numbers as they are id columns



Checked for duplicates by using column distribution and column quality and no duplicates were found

Data modeling:

All tables are connected with cardinal relationships and here i used the snowflake schema of modeling as i have fact and dimension tables follows



I kept upper rows consisting of FACT tables

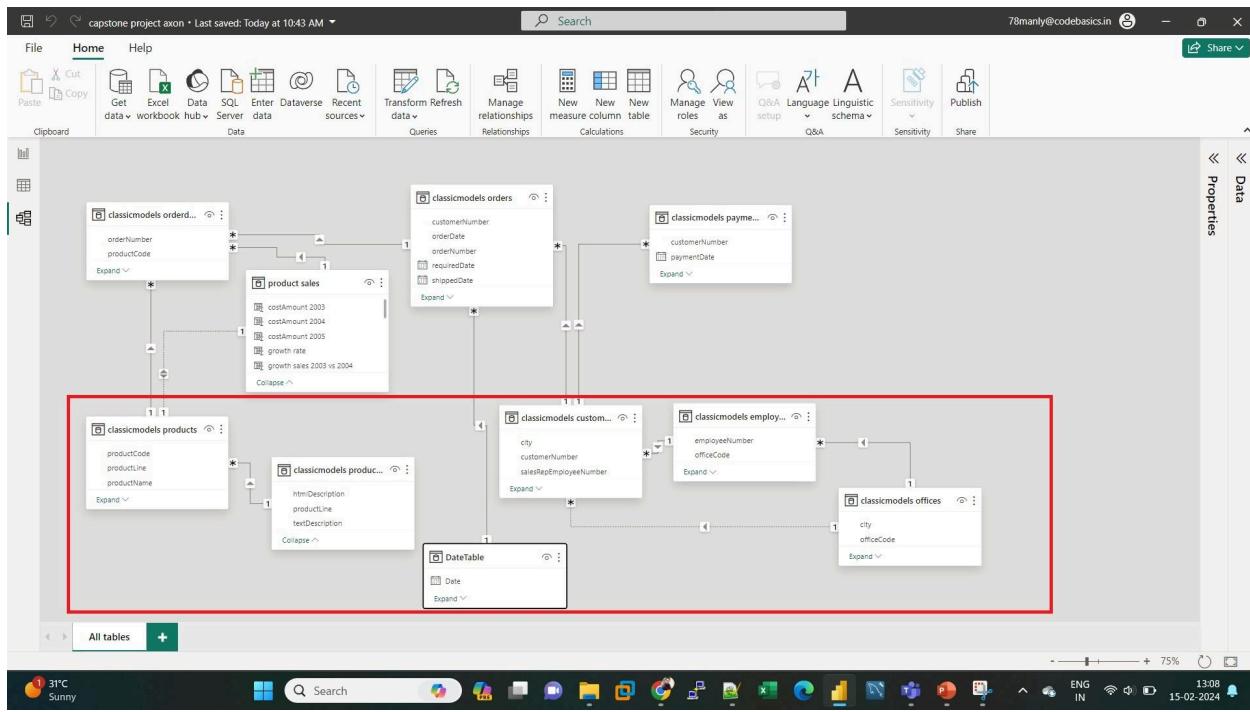
Order details

Orders

Payments

Product sales - it is derived table i created

Dimension table are those giving information on particular category and following are dim tables:



Customers table

Product table

Product line table

Office table

Employees table

Date table - i created using DAX

Every connection in this schema is one to many relations

LOAD:

After completion of transforming data then applied close and load so that enters into Power BI desktop

As problem statement's requirements sales report is prepared using power bi desktop And additionally to sales report some performances of data features are also added because they also shows impact on the sales

Totally provided pages in Dashboard are:

- 1.sales report
- 2.product performance
- 3.customer report
- 4.employee performance
- 5.Inventory management
- 6.A home page

In order to visualize these reports BI features like measures and custom columns were used to build on original tables

Created a date dimension table:

Created a date table using dax formula for the purpose on entire period of sales

Calenderauto can be used but i used calender min and max to generate calender dates and these dates are created based on existing data dates automatically if we use calenderauto

This date table also useful in analysing trends of sales so it automatically creates hierarchy of day month quarter and year

The screenshot shows the Microsoft Power BI Data Editor interface. A red box highlights the DAX formula in the 'Structure' pane:

```
1 DateTable = CALENDAR(MIN('classicmodels orders'[orderDate]),MAX('classicmodels orders'[orderDate])
2 )
```

The main area displays a table with three columns: Date, calendaryear, and calendermonth. The data starts from January 6, 2003, and continues sequentially. The right side of the screen shows the 'Data' pane with a tree view of the data model, including tables like classicmodels customers, classicmodels employees, and the newly created DateTable.

Calculated columns:

These columns are created using DAX formulas by clicking on new column in ribbon In the Table view then clicking on the new column created following calculated columns

The date year and date month can be extracted by dax created a new columns in date table

This screenshot shows the Power BI desktop interface. A new column named 'calendermonth' has been created, as indicated by the formula bar at the top which contains the DAX formula: `1 calendermonth = MONTH(DataTable[Date])`. The 'calendermonth' column is highlighted with a red box. The data table below shows dates from 06-01-2003 to 02-02-2002, with the 'calendermonth' column populated with values 1 through 2. The Power BI data model pane on the right shows the newly created column under the 'DateTable' node.

This screenshot shows the Power BI desktop interface again. A new column named 'calenderyear' has been created, as indicated by the formula bar at the top which contains the DAX formula: `1 calenderyear = YEAR(DataTable[Date])`. The 'calenderyear' column is highlighted with a red box. The data table below shows dates from 06-01-2003 to 02-02-2002, with the 'calenderyear' column populated with values 2003 and 2002. The Power BI data model pane on the right shows the newly created column under the 'DateTable' node.

In customers table to calculate either customer new customer or not a new column is created as isnewcustomer says new customer and existing customer so this will helps to calculate the CUSTOMER RETENTION RATE

The screenshot shows the Power BI Data Editor interface. A red box highlights the DAX formula in the 'Column tools' ribbon:

```

    1 IsNewCustomer =
    2 IF(
    3     NOT("classicmodels customers'[customerNumber] IN VALUES('classicmodels orders'[customerNumber])),
    4     "New Customer",
    5     "Existing Customer"
    6 )
    7
  
```

The formula uses the `IF` function to check if the `customerNumber` from the `customers` table is not present in the `customerNumber` column of the `orders` table. If it's not found, it's a new customer; otherwise, it's an existing customer.

The table below shows the resulting data with the 'IsNewCustomer' column populated. A red box highlights the 'IsNewCustomer' column header.

contactLastName	contactFirstName	phone	addressLine1	city	postalCode	country	salesRepEmployeeNumber	creditLimit	IsNewCustomer
Schmitt	Carine	40.32.2555	54, rue Royale	Nantes	44000	France	1370	21000	Existing Customer
King	Jean	7025551838	8489 Strong St.	Las Vegas	83030	USA	1166	71800	Existing Customer
Ferguson	Peter	03 9520 4555	636 St Kilda Road	Melbourne	3004	Australia	1611	117300	Existing Customer
Labrune	Janine	40.67.8555	67, rue des Cinquante Otages	Nantes	44000	France	1370	118200	Existing Customer
Bergulsen	Jonas	07-98 9555	Erling Skakkes gate 78	Stavem	4110	Norway	1504	81700	Existing Customer
Nelson	Susan	4155551450	5677 Strong St.	San Rafael	97562	USA	1165	27050	Existing Customer
Piestrzewicz	Zbyszek	(26) 642-7555	ul. Filtrowa 68	Warszawa	01-012	Poland	1504	59700	New Customer
Ketel	Roland	+49 69 66 90 2555	Lyonerstr. 34	Frankfurt	60528	Germany	1165	64600	Existing Customer
Murphy	Julie	650555787	5537 North Pendale Street	San Francisco	94217	USA	1022	114900	Existing Customer
Lee	Kwai	212557818	897 Long Airport Avenue	NYC	10022	USA	1323	227600	Existing Customer
Freyre	Diego	(91) 555 94 44	C/ Moralzarzal, 86	Madrid	28034	Spain	1370	84000	Existing Customer
Berglund	Christina	0921-12 3555	Berguvsvägen 8	Luleå	S-958 22	Sweden	1504	53100	Existing Customer
Petersen	Jytte	31 12 3555	Vinbæltet 34	København	1734	Denmark	1401	83400	Existing Customer
Saveley	Mary	78.32.5555	2, rue du Commerce	Lyon	69004	France	1337	123900	Existing Customer
Natividad	Eric	+65 221 7555	Birou Sok.	Singapore	079903	Singapore	1621	703800	Existing Customer
Young	Jeff	212557413	4092 Furth Circle	NYC	10022	USA	1286	138500	Existing Customer
Leong	Kelvin	215551555	7586 Pompton St.	Allentown	70267	USA	1216	100600	Existing Customer
Hashimoto	Juri	6505556809	9408 Furth Circle	Burlingame	94217	USA	1165	84600	Existing Customer
Victorino	Wendy	+65 224 1555	106 Linden Road Sandown	Singapore	069045	Singapore	7612	97900	Existing Customer
Oeztan	Veysel	+47 2267 3215	Brehmen St. 121	Bergen	N 5804	Norway	1504	96800	Existing Customer
Franco	Keith	2035557845	149 Spinnaker Dr.	New Haven	97823	USA	1286	0	New Customer
de Castro	Isabel	(1) 356-5555	Estrada da saude n. 58	Lisboa	1756	Portugal	1286	0	New Customer

In employee table names are not concatenated so by concatenating the last name and first name we can get the full names by using DAX and created a new column with full name

The screenshot shows the Power BI Data Editor interface. A red box highlights the DAX formula in the 'Column tools' ribbon:

```

    1 employee name = 'classicmodels employees'[firstName] & " " & 'classicmodels employees'[lastName]
  
```

The formula concatenates the `firstName` and `lastName` columns from the `employees` table using the ampersand operator and a space character.

The table below shows the resulting data with the 'employee name' column populated. A red box highlights the 'employee name' column header.

employeeNumber	lastName	firstName	extension	email	officeCode	reportsTo	jobTitle	TotalSal	employee name	workingCity
1002	Murphy	Diane	5800	dmurphy@classicmodelcars.com	1	1002	President	\$0.00	Diane Murphy	San Francisco
1056	Patterson	Mary	4611	mpatterson@classicmodelcars.com	1	1002	VP Sales	\$0.00	Mary Patterson	San Francisco
1076	Firelli	Jeff	9273	jfirelli@classicmodelcars.com	1	1002	VP Marketing	\$0.00	Jeff Firelli	San Francisco
1088	Patterson	William	4871	wppatterson@classicmodelcars.com	6	1056	Sales Manager (APAC)	\$0.00	William Patterson	Sydney
1102	Bondur	Gerard	5408	gbondur@classicmodelcars.com	4	1056	Sales Manager (EMEA)	\$0.00	Gerard Bondur	Paris
1143	Bow	Anthony	5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)	\$0.00	Anthony Bow	San Francisco
1165	Jennings	Leslie	3291	ljennings@classicmodelcars.com	1	1143	Sales Rep	\$10,813.50	Leslie Jennings	San Francisco
1166	Thompson	Leslie	4065	lthompson@classicmodelcars.com	1	1143	Sales Rep	\$34,753.00	Leslie Thompson	San Francisco
1188	Firelli	Julie	2173	jfirelli@classicmodelcars.com	2	1143	Sales Rep	\$3,86,632.20	Julie Firelli	Boston
1216	Patterson	Steve	4434	spatterson@classicmodelcars.com	2	1143	Sales Rep	\$5,05,875.42	Steve Patterson	Boston
1286	Tseng	Foon Yue	2240	ftseng@classicmodelcars.com	3	1143	Sales Rep	\$4,88,212.61	Foon Yue Tseng	NYC
1323	Vanau	George	4102	gvanau@classicmodelcars.com	3	1143	Sales Rep	\$6,69,377.00	George Vanau	NYC
1337	Bondur	Loui	6493	lbondur@classicmodelcars.com	4	1102	Sales Rep	\$5,69,485.75	Loui Bondur	Paris
1370	Hernandez	Gerard	2028	ghernande@classicmodelcars.com	4	1102	Sales Rep	\$12,58,577.80	Gerard Hernandez	Paris
1401	Castillo	Pamela	2759	pcastillo@classicmodelcars.com	4	1102	Sales Rep	\$8,68,220.55	Pamela Castillo	Paris
1501	Bott	Larry	2311	lbott@classicmodelcars.com	7	1102	Sales Rep	\$7,32,096.75	Larry Bott	London
1504	Jones	Barry	x102	bjones@classicmodelcars.com	7	1102	Sales Rep	\$7,04,853.91	Barry Jones	London
1611	Fixter	Andy	x101	afixter@classicmodelcars.com	6	1088	Sales Rep	\$5,62,582.59	Andy Fixter	Sydney
1612	Marsh	Peter	x102	pmarsh@classicmodelcars.com	6	1088	Sales Rep	\$5,84,593.76	Peter Marsh	Sydney
1619	King	Tom	x103	tking@classicmodelcars.com	6	1088	Sales Rep	\$0.00	Tom King	Sydney
1621	Nishi	Mami	x101	mnishi@classicmodelcars.com	5	1056	Sales Rep	\$4,57,110.07	Mami Nishi	Tokyo
1625	Kato	Yoshimi	x102	ykato@classicmodelcars.com	5	1621	Sales Rep	\$0.00	Yoshimi Kato	Tokyo
1702	Gerard	Martin	x2312	mg Gerard@classicmodelcars.com	4	1102	Sales Rep	\$3,87,477.47	Martin Gerard	Paris

In orderdetails table to calculate actual cost of products of the company a new column is created

The screenshot shows the Microsoft Power BI Data Editor interface. A new column named 'each_cost_price' is being created. The formula bar at the top contains the expression: `1 each_cost_price = RELATED('classicmodels products'[buyPrice])`. The column properties pane on the right indicates the data type is 'Decimal number'. The data grid below shows rows of order details, with the newly created 'each_cost_price' column highlighted by a red box.

orderNumber	productCode	quantityOrdered	priceEach	orderLineNumber	TotalSales	each_cost_price	Tot_cost_price	profit	profit%
10100	S24_3969	49	35.29	1	\$1,729.21	21.75	1065.75	\$663.46	62.25%
10101	S18_2795	26	167.06	1	\$4,343.56	72.56	1886.56	\$2,457.00	130.24%
10102	S18_1367	41	43.13	1	\$1,768.33	24.26	994.66	\$773.67	77.78%
10103	S24_2300	36	107.34	1	\$3,864.24	61.34	2208.24	\$1,656.00	74.99%
10104	S12_3148	34	131.44	1	\$4,468.96	89.14	3030.76	\$1,438.20	47.45%
10105	S24_3816	50	75.47	1	\$3,773.50	48.64	2432	\$1,341.50	55.16%
10106	S700_2834	32	113.9	1	\$3,644.80	59.33	1896.56	\$1,746.24	91.98%
10107	S12_2823	21	122	1	\$2,562.00	66.27	1391.67	\$1,170.33	84.10%
10108	S24_3856	40	132	1	\$5,280.00	98.3	3932	\$1,348.00	34.28%
10109	S18_2870	26	126.72	1	\$3,294.72	56.76	1475.76	\$1,818.96	123.26%
10110	S18_2795	31	163.69	1	\$5,074.39	72.56	2249.36	\$2,825.03	125.59%
10111	S18_3136	43	94.25	1	\$4,052.75	60.74	2611.82	\$1,440.93	55.17%
10112	S10_1949	29	197.16	1	\$5,717.64	98.55	2858.82	\$2,858.82	100.00%
10113	S32_3522	23	58.82	1	\$1,352.86	33.61	773.03	\$579.83	75.01%
10114	S24_2840	24	28.64	1	\$687.36	15.91	381.84	\$305.52	80.01%
10115	S24_4048	44	106.45	1	\$4,683.80	69.78	3070.32	\$1,613.48	52.55%
10116	S32_3207	27	60.28	1	\$1,627.56	26.72	721.44	\$906.12	125.60%
10117	S700_3962	45	89.38	1	\$4,022.10	53.63	2413.35	\$1,608.75	66.66%
10118	S700_3505	36	86.15	1	\$3,101.40	51.09	1839.24	\$1,262.16	68.62%
10119	S700_4002	26	63.67	1	\$1,655.42	36.27	943.02	\$712.40	75.54%
10120	S24_1578	35	110.45	1	\$3,865.75	60.86	2130.1	\$1,735.65	81.48%
10121	S50_4713	44	72.41	1	\$3,186.04	34.17	1503.48	\$1,682.56	11.91%
10122	S18_1984	31	113.8	1	\$3,527.80	93.89	2910.59	\$617.21	21.21%
10123	S24_1628	50	43.27	1	\$2,163.50	29.18	1459	\$704.50	48.29%
10124	S24_2022	22	36.29	1	\$798.38	20.61	453.42	\$344.96	76.08%
10125	S18_1342	32	89.38	1	\$2,860.16	60.62	1939.84	\$920.32	47.44%
10126	S24_2300	27	122.68	1	\$3,312.36	61.34	1656.18	\$1,656.18	100.00%
10127	C10_2001	42	160.66	1	\$7,131.57	69.76	3400.1	\$3,222.42	78.17%

Profit column is created out of existing columns cost and total sales columns

The screenshot shows the Microsoft Power BI Data Editor interface. A new column named 'profit%' is being created. The formula bar at the top contains the expression: `1 profit% = 'classicmodels orderdetails'[profit]/'classicmodels orderdetails'[Tot_cost_price]`. The column properties pane on the right indicates the data type is 'Decimal number'. The data grid below shows rows of order details, with the newly created 'profit%' column highlighted by a red box.

orderNumber	productCode	quantityOrdered	priceEach	orderLineNumber	TotalSales	each_cost_price	Tot_cost_price	profit	profit%
10100	S24_3969	49	35.29	1	\$1,729.21	21.75	1065.75	\$663.46	62.25%
10101	S18_2795	26	167.06	1	\$4,343.56	72.56	1886.56	\$2,457.00	130.24%
10102	S18_1367	41	43.13	1	\$1,768.33	24.26	994.66	\$773.67	77.78%
10103	S24_2300	36	107.34	1	\$3,864.24	61.34	2208.24	\$1,656.00	74.99%
10104	S12_3148	34	131.44	1	\$4,468.96	89.14	3030.76	\$1,438.20	47.45%
10105	S24_3816	50	75.47	1	\$3,773.50	48.64	2432	\$1,341.50	55.16%
10106	S700_2834	32	113.9	1	\$3,644.80	59.33	1896.56	\$1,746.24	91.98%
10107	S12_2823	21	122	1	\$2,562.00	66.27	1391.67	\$1,170.33	84.10%
10108	S24_3856	40	132	1	\$5,280.00	98.3	3932	\$1,348.00	34.28%
10109	S18_2870	26	126.72	1	\$3,294.72	56.76	1475.76	\$1,818.96	123.26%
10110	S18_2795	31	163.69	1	\$5,074.39	72.56	2249.36	\$2,825.03	125.59%
10111	S18_3136	43	94.25	1	\$4,052.75	60.74	2611.82	\$1,440.93	55.17%
10112	S10_1949	29	197.16	1	\$5,717.64	98.55	2858.82	\$2,858.82	100.00%
10113	S32_3522	23	58.82	1	\$1,352.86	33.61	773.03	\$579.83	75.01%
10114	S24_2840	24	28.64	1	\$687.36	15.91	381.84	\$305.52	80.01%
10115	S24_4048	44	106.45	1	\$4,683.80	69.78	3070.32	\$1,613.48	52.55%
10116	S32_3207	27	60.28	1	\$1,627.56	26.72	721.44	\$906.12	125.60%
10117	S700_3962	45	89.38	1	\$4,022.10	53.63	2413.35	\$1,608.75	66.66%
10118	S700_3505	36	86.15	1	\$3,101.40	51.09	1839.24	\$1,262.16	68.62%
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10123	S24_1628	50	43.27	1	\$2,163.50	29.18	1459	\$704.50	48.29%
10124	S24_2022	22	36.29	1	\$798.38	20.61	453.42	\$344.96	76.08%
10125	S18_1342	32	89.38	1	\$2,860.16	60.62	1939.84	\$920.32	47.44%
10126	S24_2300	27	122.68	1	\$3,312.36	61.34	1656.18	\$1,656.18	100.00%
10127	C10_2001	42	160.66	1	\$7,131.57	69.76	3400.1	\$3,222.42	78.17%

A new column for order fulfillment time is created by using orderdate and shipment date columns from orders table

The screenshot shows the Axon Data Grid interface. A new column named 'order fulfillment time' has been created using the formula `=ABS(DATEDIFF('classicmodels orders'[orderDate],'classicmodels orders'[shippedDate],DAY))`. The column is formatted as a whole number. The data grid displays various rows of order information, and the newly created column is highlighted with a red box.

A growth rate for 2004 year column is created

The screenshot shows the Axon Data Grid interface. A new column named 'growth rate' has been created using the formula `=DIVIDE('product sales'[growth sales 2003 vs 2004],'product sales'[SalesAmount 2003],0)`. The column is formatted as a percentage. The data grid displays various product sales data, and the newly created column is highlighted with a red box.

Measures :

Measure creates scalar values out of existing data In Power BI, measures are calculations or formulas that one can create using the DAX (Data Analysis Expressions) language to perform calculations on your data. Measures allow you to derive new insights from your dataset by performing aggregations, calculations, or creating custom metrics. Unlike calculated columns, measures are dynamic and respond to changes in the context of your reports or visualizations.

I used measure for following calculations

For sum of sales a measure is created which finds total sum of sales dynamically

The screenshot shows the Power BI desktop interface with the 'Measure tools' tab selected. A new measure named 'sumofsales' is being defined. The formula entered is: `sumofsales = SUM('classicmodels.orderdetails'[Totalsales])`. The formula bar has a red box around it. The 'Data' pane on the right lists various measures and tables, with 'sumofsales' highlighted.

Then to find previous sales another measure is created

The screenshot shows the Power BI desktop interface with the 'Measure tools' tab selected. A new measure named 'previousyearsales' is being defined. The formula entered is: `previousyearsales = CALCULATE(SUM('sumofsales'), DATEADD('DateTable', [Date], -1, QUARTER))`. The formula bar has a red box around it. The 'Data' pane on the right lists various measures and tables, with 'previousyearsales' highlighted.

By using above measures we can calculate the growth rate in percentage

The screenshot shows the Power BI desktop interface with a calculated column named 'GrowthRate'. The formula is: `1 GrowthRate = IF({ISBLANK([previousyearsales]),BLANK(),DIVIDE(([sumofsales]-[previousyearsales]),[previousyearsales],0))}`. The 'Measure tools' ribbon is visible at the top, and the 'Data' pane on the right lists various measures like 'batch_cost_price' and 'GrowthRate'.

orderNumber	productCode	quantityOrdered	priceEach	orderLineNumber	TotalSales	each_cost_price	Tot_cost_price	profit	profit%
10100	S24_3969	49	35.29	1	\$1,729.21	21.75	1065.75	\$663.46	62.25%
10101	S18_2795	26	167.06	1	\$4,343.56	72.56	1886.56	\$2,457.00	130.24%
10102	S18_1367	41	43.13	1	\$1,768.33	24.26	994.66	\$773.67	77.78%
10103	S24_2300	36	107.34	1	\$3,864.24	61.34	2208.24	\$1,656.00	74.95%
10104	S12_3148	34	131.44	1	\$4,468.96	89.14	3030.76	\$1,438.20	47.45%
10105	S24_3816	50	75.47	1	\$3,773.50	48.64	2432	\$1,341.50	55.16%
10106	S700_2834	32	113.9	1	\$3,644.80	59.33	1896.56	\$1,746.24	91.98%
10107	S12_2823	21	122	1	\$2,562.00	66.27	1391.67	\$1,170.33	84.10%
10108	S24_3856	40	132	1	\$5,280.00	98.3	3992	\$1,348.00	34.28%
10109	S18_2870	26	126.72	1	\$3,294.72	56.76	1475.76	\$1,818.96	123.85%
10110	S18_2795	31	163.69	1	\$5,074.39	72.56	2249.36	\$2,825.03	125.59%
10111	S18_3136	43	94.25	1	\$4,052.75	60.74	2611.82	\$1,404.93	55.17%
10112	S10_1949	29	197.16	1	\$5,717.64	98.58	2858.82	\$2,858.82	100.00%
10113	S32_3522	23	58.82	1	\$1,352.86	33.61	773.03	\$579.83	75.01%
10114	S24_2840	24	28.64	1	\$687.36	15.91	381.84	\$305.52	80.01%
10115	S24_4048	44	106.45	1	\$4,682.80	69.78	3070.32	\$1,613.48	52.55%
10116	S32_3207	27	60.28	1	\$1,627.56	26.72	721.44	\$906.12	125.60%
10117	S700_3962	45	89.38	1	\$4,022.10	53.63	2413.35	\$1,608.75	66.66%
10118	S700_3505	36	86.15	1	\$3,101.40	51.09	1839.24	\$1,262.16	68.62%
10119	S700_4002	26	63.67	1	\$1,655.42	36.27	943.02	\$712.40	75.54%
10120	S24_1578	35	110.45	1	\$3,865.75	60.86	2130.1	\$1,735.65	81.48%
10121	S50_4713	44	72.41	1	\$3,186.04	34.17	1503.48	\$1,682.56	11.91%
10122	S18_1984	31	113.8	1	\$3,527.80	93.89	2910.59	\$617.21	21.12%
10123	S24_1628	50	43.27	1	\$2,163.50	29.18	1459	\$704.50	48.29%
10124	S24_2202	22	36.29	1	\$798.38	20.61	453.42	\$344.96	76.08%
10125	S18_1342	32	89.38	1	\$2,860.16	60.62	1939.84	\$920.32	47.44%
10126	S24_2300	27	122.68	1	\$3,312.36	61.34	1656.78	\$1,656.18	100.00%
10127	S10_2004	42	160.44	1	\$7,171.53	69.34	3600.1	\$3,655.43	100.00%

CUSTOMER RETENTION RATE:

Customer Retention Rate (CRR) is a key performance indicator that measures the percentage of customers a business retains over a specific period. It provides insights into how well a company is retaining its existing customers and is often used to assess customer loyalty and satisfaction.

To calculate CRR first unique customers in entire period is calculate for that we use a measure of unique customers

The screenshot shows the Power BI desktop interface with a calculated measure named 'unique customers'. The formula is: `1 unique customers = DISTINCTCOUNT('classicmodels.orders'[customerNumber])`. The 'Measure tools' ribbon is visible at the top, and the 'Data' pane on the right lists various measures like 'orderDate' and 'unique customers'.

orderNumber	status	customerNumber	orderYear	orderMonth	quarter	order fulfillment time			
10100	On Hold	13	2003	10	2003	363	2002	7	4
10101	On Hold	13	2003	11	2003	128	2003	7	1
10102	On Hold	13	2003	18	January 2003	181	2003	1	4
10103	On Hold	07	2003	02	February 2003	121	2003	1	4
10104	On Hold	31	2003	03	February 2003	141	2003	1	1
10105	On Hold	11	2003	21	February 2003	145	2003	2	1
10106	On Hold	17	2003	24	February 2003	278	2003	2	1
10107	On Hold	24	2003	03	March 2003	131	2003	2	2
10108	On Hold	03	2003	12	March 2003	385	2003	3	5
10109	On Hold	10	2003	19	March 2003	486	2003	3	1
10110	On Hold	18	2003	24	March 2003	167	2003	3	1
10111	On Hold	25	2003	31	March 2003	30	2003	3	5
10112	On Hold	02	2003	29	March 2003	129	2003	3	1
10113	On Hold	26	2003	02	April 2003	144	2003	3	5
10114	On Hold	01	2003	07	April 2003	124	2003	3	1
10115	On Hold	04	2003	12	April 2003	172	2003	4	1
10116	On Hold	11	2003	19	April 2003	424	2003	4	3
10117	On Hold	16	2003	24	April 2003	381	2003	4	2
10118	On Hold	21	2003	29	April 2003	148	2003	4	1
10119	On Hold	28	2003	05	May 2003	216	2003	4	5
10120	On Hold	29	2003	08	May 2003	382	2003	4	4
10121	On Hold	07	2003	13	May 2003	114	2003	4	2
10122	On Hold	08	2003	16	May 2003	353	2003	5	6
10123	On Hold	20	2003	29	May 2003	103	2003	5	2
10124	On Hold	21	2003	29	May 2003	112	2003	5	4
10125	On Hold	23	2003	24	May 2003	114	2003	5	3
10126	On Hold	28	2003	07	June 2003	458	2003	5	5
10127	On Hold	02	2003	02	June 2003	161	2003	5	3

Then after retained customers are who purchased items more than once

The screenshot shows the Power BI interface with the 'Measure tools' ribbon selected. A new measure named 'RetainedCustomers' is being defined in the 'Calculations' pane. The measure uses the following DAX code:

```

1 RetainedCustomers =
2 CALCULATE(
3     COUNTROWS(
4         FILTER(
5             SUMMARIZE('classicmodels orders', 'classicmodels orders'[customerNumber], "Count", COUNTROWS('classicmodels orders')),
6             [Count] > 1
7         )
8     )
9 )
10

```

The table below shows the data from the 'classicmodels orders' table, with the 'RetainedCustomers' column highlighted.

orderNumber	orderDate	requiredDate	shippedDate	status	customerNumber	orderYear	ordermonth	quarter	order fulfillment time	RetainedCustomers
10100	06-01-2003	13 January 2003	10 January 2003	Shipped	363	2003	1	1	4	0
10101	09-01-2003	18 January 2003	11 January 2003	Shipped	128	2003	1	1	2	0
10102	10-01-2003	18 January 2003	14 January 2003	Shipped	181	2003	1	1	4	0
10103	29-01-2003	02 February 2003	02 February 2003	Shipped	121	2003	1	1	4	0
10104	31-01-2003	09 February 2003	01 February 2003	Shipped	141	2003	1	1	1	0
10105	11-02-2003	21 February 2003	12 February 2003	Shipped	145	2003	2	1	1	0
10106	17-02-2003	24 February 2003	21 February 2003	Shipped	278	2003	2	1	4	0
10107	24-02-2003	03 March 2003	26 February 2003	Shipped	131	2003	2	1	2	0
10108	03-03-2003	12 March 2003	08 March 2003	Shipped	385	2003	3	1	5	0
10109	10-03-2003	19 March 2003	11 March 2003	Shipped	486	2003	3	1	1	0
10110	18-03-2003	24 March 2003	20 March 2003	Shipped	187	2003	3	1	2	0
10111	25-03-2003	31 March 2003	30 March 2003	Shipped	129	2003	3	1	5	0
10112	24-03-2003	03 April 2003	29 March 2003	Shipped	144	2003	3	1	5	0
10113	26-03-2003	02 April 2003	27 March 2003	Shipped	124	2003	3	1	1	0
10114	01-04-2003	07 April 2003	02 April 2003	Shipped	172	2003	4	2	1	0
10115	04-04-2003	12 April 2003	07 April 2003	Shipped	424	2003	4	2	3	0
10116	11-04-2003	19 April 2003	13 April 2003	Shipped	381	2003	4	2	2	0
10117	16-04-2003	24 April 2003	17 April 2003	Shipped	148	2003	4	2	1	0
10118	21-04-2003	29 April 2003	26 April 2003	Shipped	216	2003	4	2	5	0
10119	28-04-2003	05 May 2003	02 May 2003	Shipped	382	2003	4	2	4	0
10120	29-04-2003	08 May 2003	01 May 2003	Shipped	114	2003	4	2	2	0
10121	07-05-2003	13 May 2003	13 May 2003	Shipped	353	2003	5	2	6	0
10122	08-05-2003	16 May 2003	13 May 2003	Shipped	350	2003	5	2	5	0
10123	20-05-2003	29 May 2003	22 May 2003	Shipped	103	2003	5	2	2	0
10124	21-05-2003	29 May 2003	25 May 2003	Shipped	112	2003	5	2	4	0
10125	21-05-2003	27 May 2003	24 May 2003	Shipped	114	2003	5	2	3	0
10126	28-05-2003	07 June 2003	02 June 2003	Shipped	458	2003	5	2	5	0
10127	02-06-2003	06 June 2003	06 June 2003	Shipped	141	2003	6	2	2	0

finally retained rate is ratio of retained customers to unique customers

The screenshot shows the Power BI interface with the 'Measure tools' ribbon selected. A new measure named 'customer retention rate' is being defined in the 'Calculations' pane. The measure uses the following DAX code:

```

1 customer retention rate = DIVIDE([RetainedCustomers],[unique customers],0)

```

The table below shows the data from the 'classicmodels orders' table, with the 'customer retention rate' column highlighted.

orderNumber	orderDate	requiredDate	shippedDate	status	customerNumber	orderYear	ordermonth	quarter	order fulfillment time	customer retention rate
10100	06-01-2003	13 January 2003	10 January 2003	Shipped	363	2003	1	1	4	0.00
10101	09-01-2003	18 January 2003	11 January 2003	Shipped	128	2003	1	1	2	0.00
10102	10-01-2003	18 January 2003	14 January 2003	Shipped	181	2003	1	1	4	0.00
10103	29-01-2003	02 February 2003	02 February 2003	Shipped	121	2003	1	1	4	0.00
10104	31-01-2003	09 February 2003	01 February 2003	Shipped	141	2003	1	1	1	0.00
10105	11-02-2003	21 February 2003	12 February 2003	Shipped	145	2003	2	1	1	0.00
10106	17-02-2003	24 February 2003	21 February 2003	Shipped	278	2003	2	1	4	0.00
10107	24-02-2003	03 March 2003	26 February 2003	Shipped	131	2003	2	1	2	0.00
10108	03-03-2003	12 March 2003	08 March 2003	Shipped	385	2003	3	1	5	0.00
10109	10-03-2003	19 March 2003	11 March 2003	Shipped	486	2003	3	1	1	0.00
10110	18-03-2003	24 March 2003	20 March 2003	Shipped	187	2003	3	1	2	0.00
10111	25-03-2003	31 March 2003	30 March 2003	Shipped	129	2003	3	1	5	0.00
10112	24-03-2003	03 April 2003	29 March 2003	Shipped	144	2003	3	1	5	0.00
10113	26-03-2003	02 April 2003	27 March 2003	Shipped	124	2003	3	1	1	0.00
10114	01-04-2003	07 April 2003	02 April 2003	Shipped	172	2003	4	2	1	0.00
10115	04-04-2003	12 April 2003	07 April 2003	Shipped	424	2003	4	2	3	0.00
10116	11-04-2003	19 April 2003	13 April 2003	Shipped	381	2003	4	2	2	0.00
10117	16-04-2003	24 April 2003	17 April 2003	Shipped	148	2003	4	2	1	0.00
10118	21-04-2003	29 April 2003	26 April 2003	Shipped	216	2003	4	2	5	0.00
10119	28-04-2003	05 May 2003	02 May 2003	Shipped	382	2003	4	2	4	0.00
10120	29-04-2003	08 May 2003	01 May 2003	Shipped	114	2003	4	2	2	0.00
10121	07-05-2003	13 May 2003	13 May 2003	Shipped	353	2003	5	2	6	0.00
10122	08-05-2003	16 May 2003	13 May 2003	Shipped	350	2003	5	2	5	0.00
10123	20-05-2003	29 May 2003	22 May 2003	Shipped	103	2003	5	2	2	0.00
10124	21-05-2003	29 May 2003	25 May 2003	Shipped	112	2003	5	2	4	0.00
10125	21-05-2003	27 May 2003	24 May 2003	Shipped	114	2003	5	2	3	0.00
10126	28-05-2003	07 June 2003	02 June 2003	Shipped	458	2003	5	2	5	0.00
10127	02-06-2003	06 June 2003	06 June 2003	Shipped	141	2003	6	2	2	0.00

this CRR can be transferred as percentage using format options in ribbon and adjusted to 2 decimal points

Profit percentage is calculated

Screenshot of Power BI showing a calculated column named "profit %". The formula is `profit % = [total profit]/SUM('classicmodels orderdetails'[Tot_cost_price])`. The Data pane shows various tables and measures.

productCode	productName	SalesAmount 2003	SalesAmount 2004	SalesAmount 2005	growth sales 2003 vs 2004	growth rate
S10_1678	1969 Harley Davidson Ultimate Chopper	\$28,563.07	\$46,223.30	\$15,371.4	\$17,660.23	61.83%
S10_1949	1952 Alpine Renault 1300	\$67,985.34	\$69,955.42	\$34,037.2	\$20,010.08	29.43%
S10_2016	1996 Moto Guzzi 1100i	\$32,213.78	\$51,645.70	\$26,139.34	\$19,431.92	60.32%
S10_4698	2003 Harley-Davidson Eagle Drag Bike	\$54,193.69	\$81,636.19	\$34,485.12	\$27,442.50	50.64%
S10_4757	1972 Alfa Romeo GTA	\$43,098.40	\$57,600.08	\$27,725.84	\$14,501.68	33.65%
S10_4962	1962 LanciaA Delta 16V	\$28,454.67	\$64,642.73	\$23,025.61	\$29,188.06	82.33%
S12_1099	1968 Ford Mustang	\$56,462.25	\$73,369.72	\$37,699.51	\$16,907.47	29.94%
S12_1100	2001 Ferrari Enzo	\$59,852.24	\$10,497.46	\$25,416.16	\$45,635.23	76.25%
S12_1666	1958 Setra Bus	\$40,589.88	\$54,843.28	\$23,652.09	\$14,253.40	35.12%
S12_2823	2002 Suzuki XREO	\$40,359.98	\$64,972.96	\$30,434.09	\$24,612.98	60.98%
S12_3148	1969 Corvair Monza	\$46,819.89	\$62,422.14	\$23,121.76	\$15,602.25	33.32%
S12_3380	1968 Dodge Charger	\$40,137.63	\$43,607.54	\$14,973.59	\$3,469.91	8.65%
S12_3891	1969 Ford Falcon	\$57,403.47	\$76,546.51	\$18,593.04	\$19,143.04	33.35%
S12_3990	1970 Plymouth Hemi Cuda	\$20,487.78	\$28,981.16	\$14,021.01	\$8,493.38	41.46%
S12_4000	1968 Ford Pickup	\$40,137.63	\$44,549.39	\$24,415.19	\$4,412.46	24.43%
S12_4675	1969 Dodge Charger	\$34,016.55	\$39,826.80	\$20,567.27	\$5,010.25	14.39%
S18_1097	1940 Ford Pickup Truck	\$36,361.06	\$48,608.61	\$20,331.45	\$12,507.55	34.40%
S18_1129	1993 Mazda RX-7	\$38,261.42	\$52,253.62	\$24,133.08	\$13,992.20	26.57%
S18_1342	1937 Lincoln Berlinie	\$33,391.49	\$48,116.35	\$27,055.68	\$14,724.86	44.10%
S18_1367	1936 Mercedes-Benz 500K Special Roadster	\$20,590.62	\$7,7362.43	\$8,155.24	(\$3,198.19)	-15.55%
S18_1588	1965 Aston Martin DB5	\$43,142.40	\$38,822.78	\$19,812.95	(\$4,319.62)	-10.01%
S18_1668	1980s Black Hawk Helicopter	\$45,774.48	\$80,076.41	\$19,109.02	\$34,301.93	74.94%
S18_1749	1917 Grand Touring Sedan	\$54,561.50	\$58,143.40	\$27,830.7	\$3,581.90	6.56%
S18_1889	1948 Porsche 356-A Roadster	\$25,178.94	\$27,882.47	\$13,454.21	\$2,763.53	11.00%
S18_1984	1995 Honda Civic	\$47,143.78	\$47,971.69	\$23,935.48	\$827.91	1.76%
S18_2238	1998 Chrysler Plymouth Prowler	\$52,214.15	\$69,240.97	\$21,075.51	\$17,026.82	32.61%
S18_2248	1911 Ford Town Car	\$18,043.57	\$19,313.80	\$7,949.4	\$1,270.23	7.04%
Total product sales		\$47,408.73	\$48,653.16	\$20,622.40	\$2,987.13	6.26%

Year to date sales calculated

Screenshot of Power BI showing a calculated measure named "sumofsales YTD". The formula is `IF(ISFILTERED('DateTable'[Date]), TOTALYTD([sumofsales], 'DateTable'[Date].[Date]),)`. The Data pane shows various tables and measures.

Date	calenderyear	calendermonth
06-01-2003	2003	1
07-01-2003	2003	1
08-01-2003	2003	1
09-01-2003	2003	1
10-01-2003	2003	1
11-01-2003	2003	1
12-01-2003	2003	1
13-01-2003	2003	1
14-01-2003	2003	1
15-01-2003	2003	1
16-01-2003	2003	1
17-01-2003	2003	1
18-01-2003	2003	1
19-01-2003	2003	1
20-01-2003	2003	1
21-01-2003	2003	1
22-01-2003	2003	1
23-01-2003	2003	1
24-01-2003	2003	1
25-01-2003	2003	1
26-01-2003	2003	1
27-01-2003	2003	1
28-01-2003	2003	1

Year to end sales gives the sales for every year

Year over year change percentage is also calculated by using quick measure

The screenshot shows the Power BI desktop interface with the 'Measure tools' tab selected. A new measure named 'sumofsales YoY%' is being created. The formula is:

```

1 sumofsales YoY% =
2 IF(
3     ISFILTERED("DateTable'[Date]"),
4     ERROR("Time intelligence quick measures can only be grouped or filtered by the Power BI-provided date hierarchy or primary date column."),
5     VAR __PREV_YEAR = CALCULATE([sumofsales], DATEADD('DateTable'[Date], -1, YEAR))
6     RETURN
7         DIVIDE([sumofsales] - __PREV_YEAR, __PREV_YEAR)
8 )

```

The formula uses the 'DIVIDE' function to calculate the percentage change from the previous year. The 'Data' pane on the right shows the 'DateTable' and its columns.

And for balance amount ,fullfilment order time and shipment succes rate is calculated by using measures

The screenshot shows the Power BI desktop interface with the 'Measure tools' tab selected. A new measure named 'successful_shipment_rate' is being created. The formula is:

```

1 successful_shipment_rate = DIVIDE(COUNTROWS(FILTER('classicmodels orders','classicmodels orders'[status]="Shipped")),COUNTROWS('classicmodels orders'),0)

```

The formula uses the 'COUNTROWS' function with a filter to count successful shipments and then divides it by the total number of orders. The 'Data' pane on the right shows the 'classicmodels orders' table and its columns.

Visualization:

Initially at a glance purpose a home page is created for user information

BUSINESS INSIGHTS 360

AXON Classic Models COMPANY

ICON	DESCRIPTION
Home	AXON company Sales Analysis, insights and other additional insights for Decision making of the company
Sales Report	consisting of Sales in every Year Quarter wise Growth Rates and profit % Dashboard view by country , year,
Product Line Performance	Consists of Distinct Products of Axon & their demand by Revenue Country wise and Top Revenue
Customer Report	Consists of All customers of AXON and best customers list CRR and Demographic
Employee Performance	Consisting of Employee performance by Revenue generated Profit Tree
Inventory and Shipping	Consists of Inventory Insights to make a decision for maintaining inventory Total stock quantity
Help	Documentation Regarding AXON Sales Dashboard and reports SQL data validation

Provided Home Page for user friendly and provides the information regarding each icons and reports inside the Dashboard

ICONS :

HOME - home page

Sales report -Provides sales report

Product line performance - It gives information regarding different kind of products and their performance related towards Revenue generated

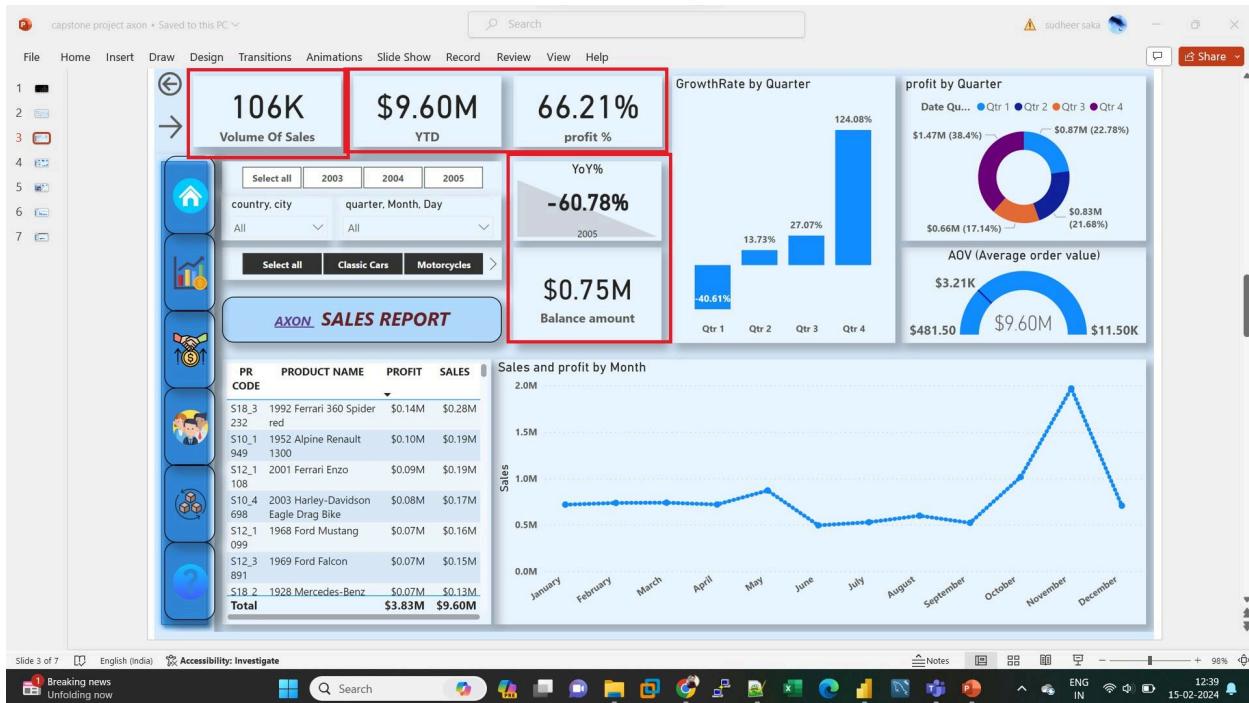
Customer report- Different customers from different countries and best customers and customer retention rate

Employee performance : Employees and their performance based on revenue generated and number of offices and kind of employees

Inventory management and Shipping : inventory managing decision taking information provided and

Average order fulfillment time and successful shipping rate is provided

Sales page:



First page gives the insights of sales especially KPI from this page are

Volume of sales :

The total number sales of products happened in the total period of sales

Insights:

Total volume of sales were happened in axon company are 1.06 lakhs of sales from 2003 to may,2005

YTD :

Year to date ie end of the latest date in every year

Since we have full completed single year 2004 so trend are moving up

Profit % :

Profit percentage is also increasing trends and total profit % is more than 50%

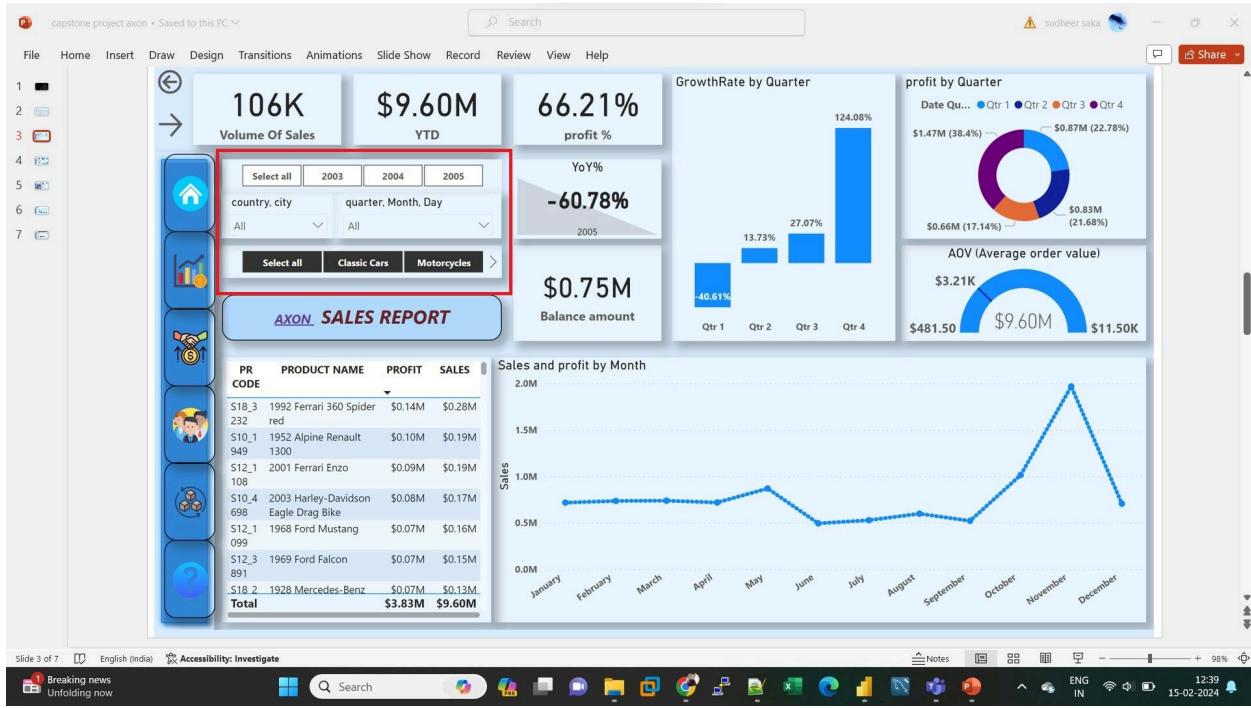
YOY % :

For the year 2004 it is 36.13% and 2004 is not yet completed

Balance amount : Pending amount of \$ 7.5 lakhs are to be received to axon

So these KPI are showed in form of cards and interactive by using slicers consisting of years ,months and places and type of products

Slicers can give different views according to different years, months, quarters, country and city office wise

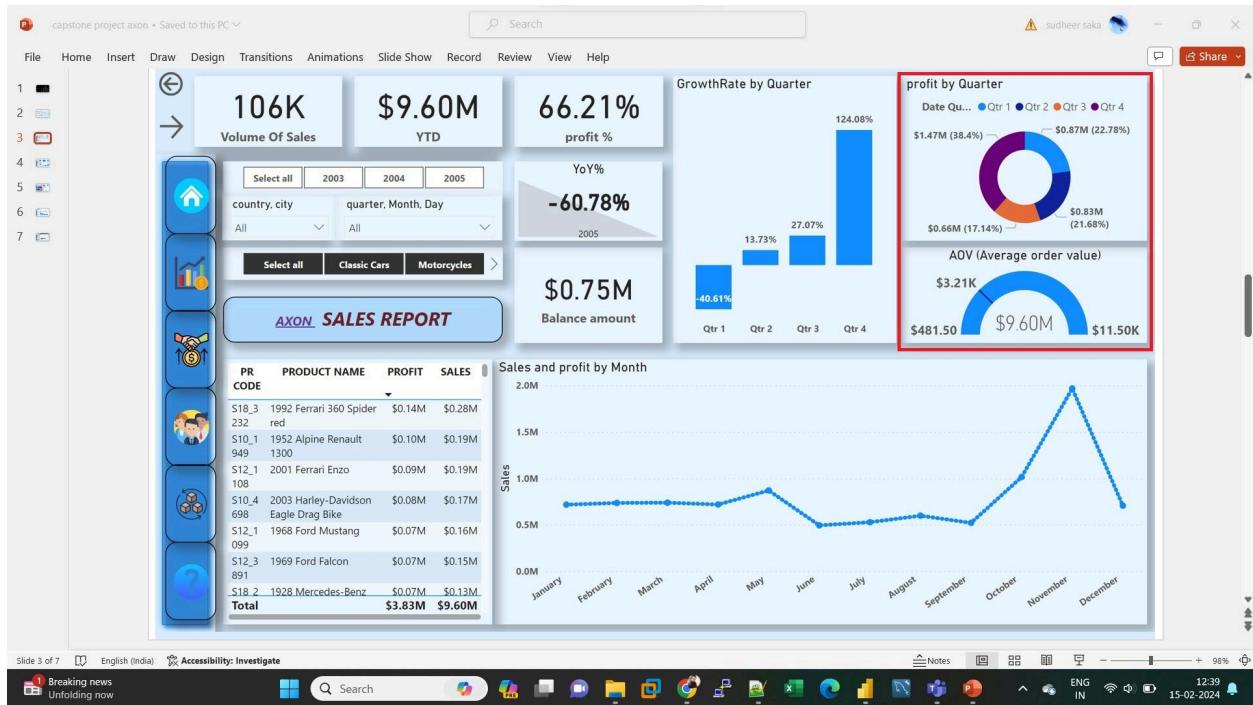


Some other KPI in the page 1 are sales growth quarter wise and profit % quarter wise and these can be achieved by using bar chart and donut chart



INsights: in every year fourth Quarter is making good profits and especially november and december are making good profits and growth rate

Average Order Value: the average order values are mostly lying in the range below \$ 6k
This can be observed from AOV gauge chart



The above gauge chart is saying min order value at 500 and max is 12k and average is lying below the mid range of 3.2k so most of orders are below 6k only

SALES TRENDS:

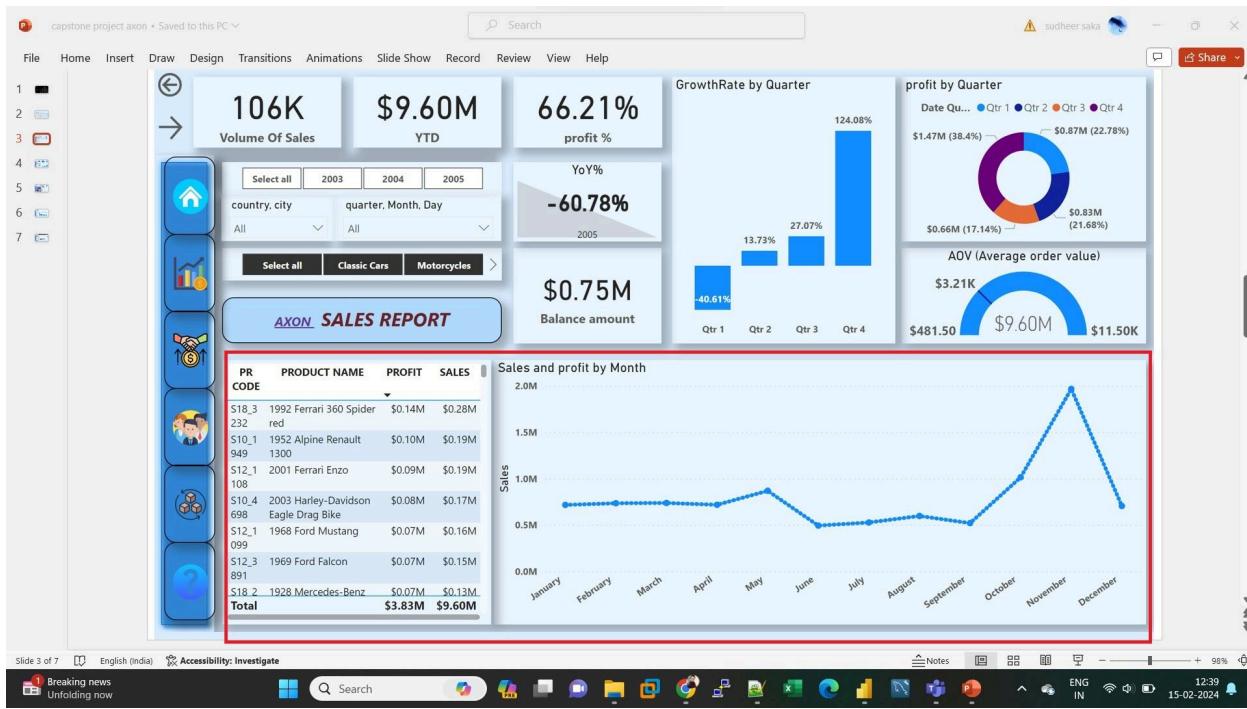
A sudden hike during november is observing almost in every year and during early months flat line is also observing so year starting is not best sales time

May be offers seasons are most effecting in november season

Year by year it is increasing trends

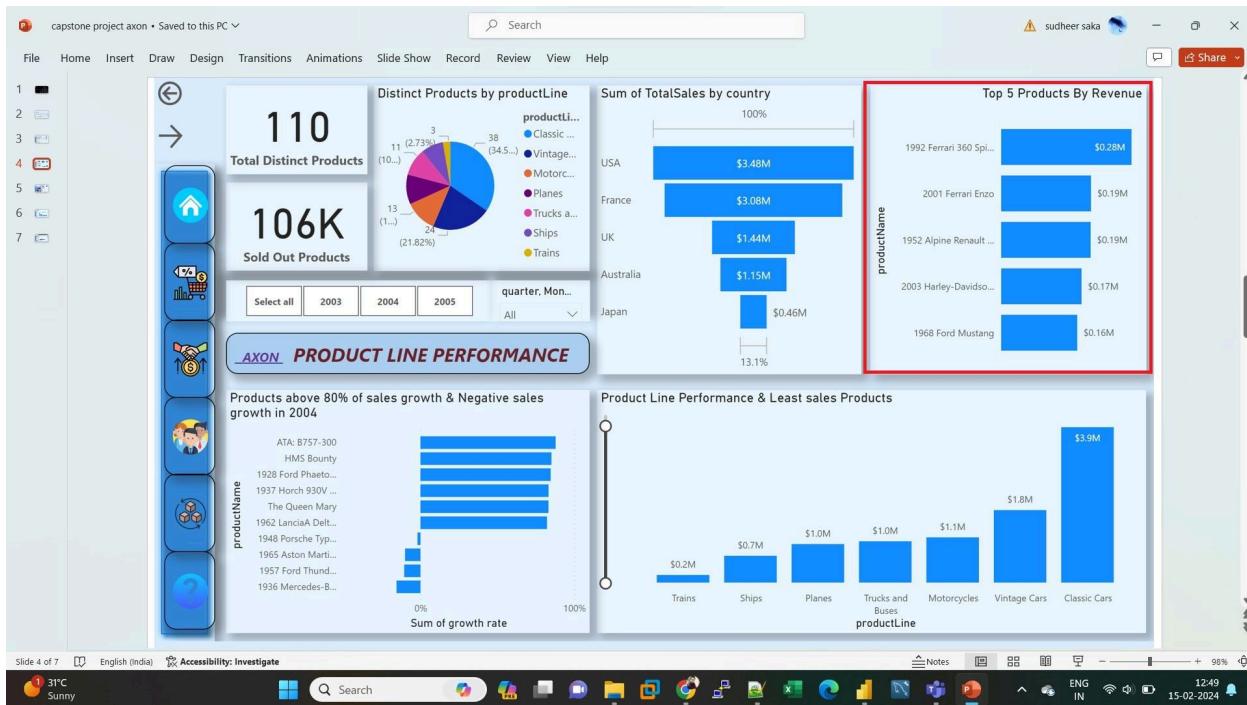
Least sales are observed in Q1

There will be report of sales and profit according to products and totals are also provided so that every office can open and see their figures



PRODUCT LINE PERFORMANCE:

This page provides the info regarding all products towards sales like best top products are Ferrari 360 spider red 1922 model is the best one by revenue generated so far And least one will be chevrolet Deluxe coupe 1939 model



Total distinct products are 110 and sold out are 106k products and can be say out of total product line classic cars type product sales are more percentage and also getting more profits which says classic cars are backbone for the Axon

And product line Trains are making very less so axon need to focus on sales strategy of trains

When we look sales through office country wise USA is topper and japan is lagging in every type of product its growth rate is also falling down by 43.21 %

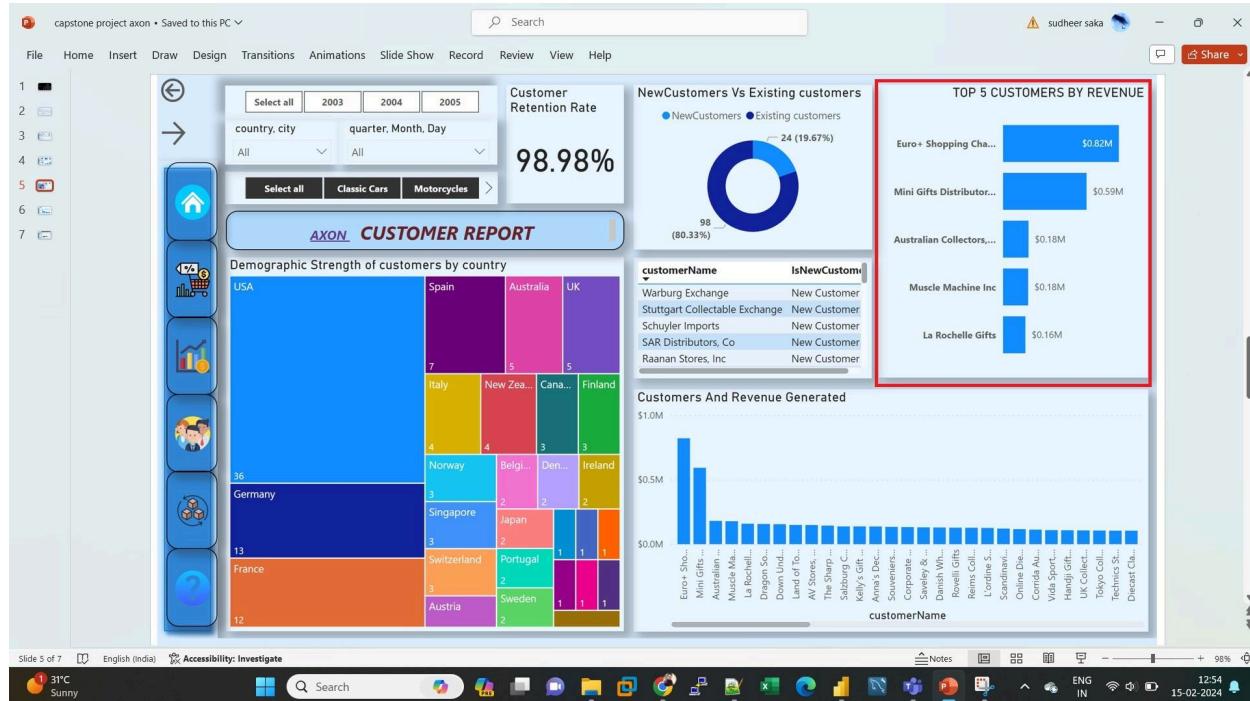
Growth sales 2004 of products above 80% are only 6 out of 110 distinct products

There are four products with negative growth in 2004

CUSTOMER REPORT:

This page consists customers towards the revenue generation and best customers like having EURO shopping channel making revenue of \$0.82 M
And least is boards and toys company

KPI CRR customer retention rate is show that how many customers are interested to purchase products more than once in given period so it is 98% so very good CRR says customer satisfaction which increases sales of axon

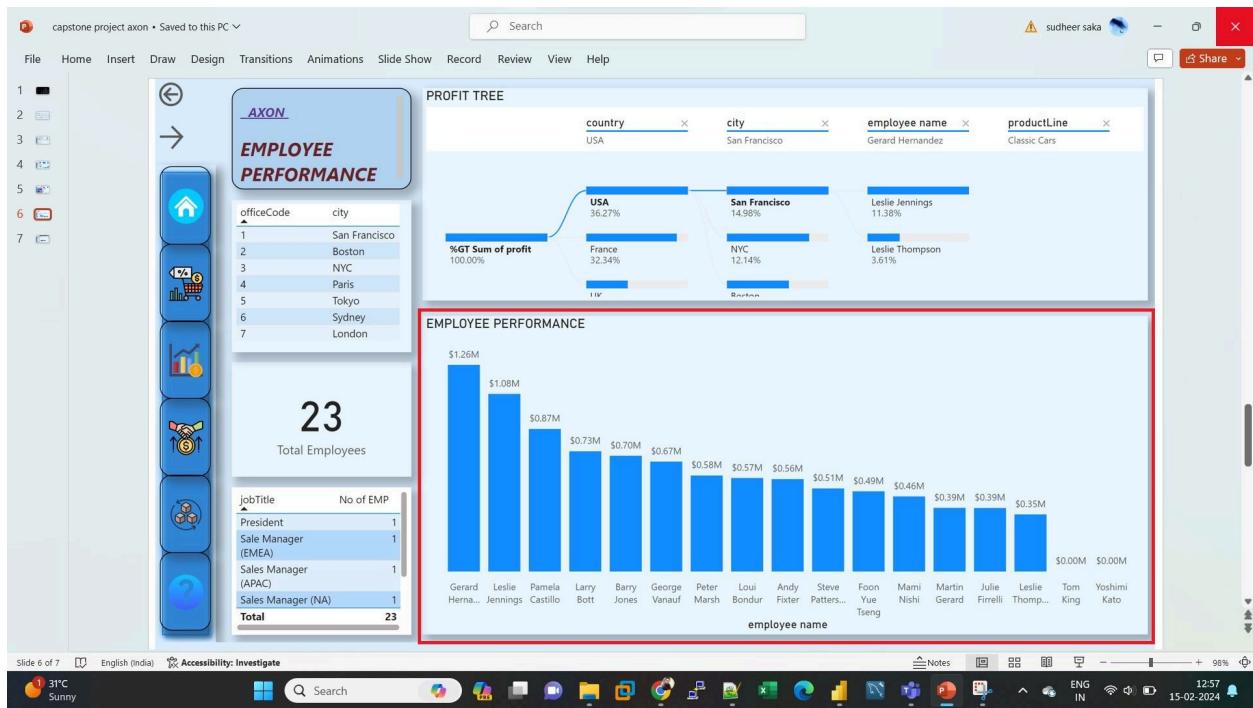


There are 24 new customers who are not purchased single product and axon has to know them so a list is provided in the dashboard it is dynamical so new persons are accumulates in the given table so that any marketing strategy on new customers will helps to improve revenue and sales of axon

Customers demographic strength is also in dashboard so that focus can be on most and least making countries

EMPLOYEE PERFORMANCE:

Best employees and zero sales employees are also included in the dashboard so that axon can have clear picture on their employees who are working



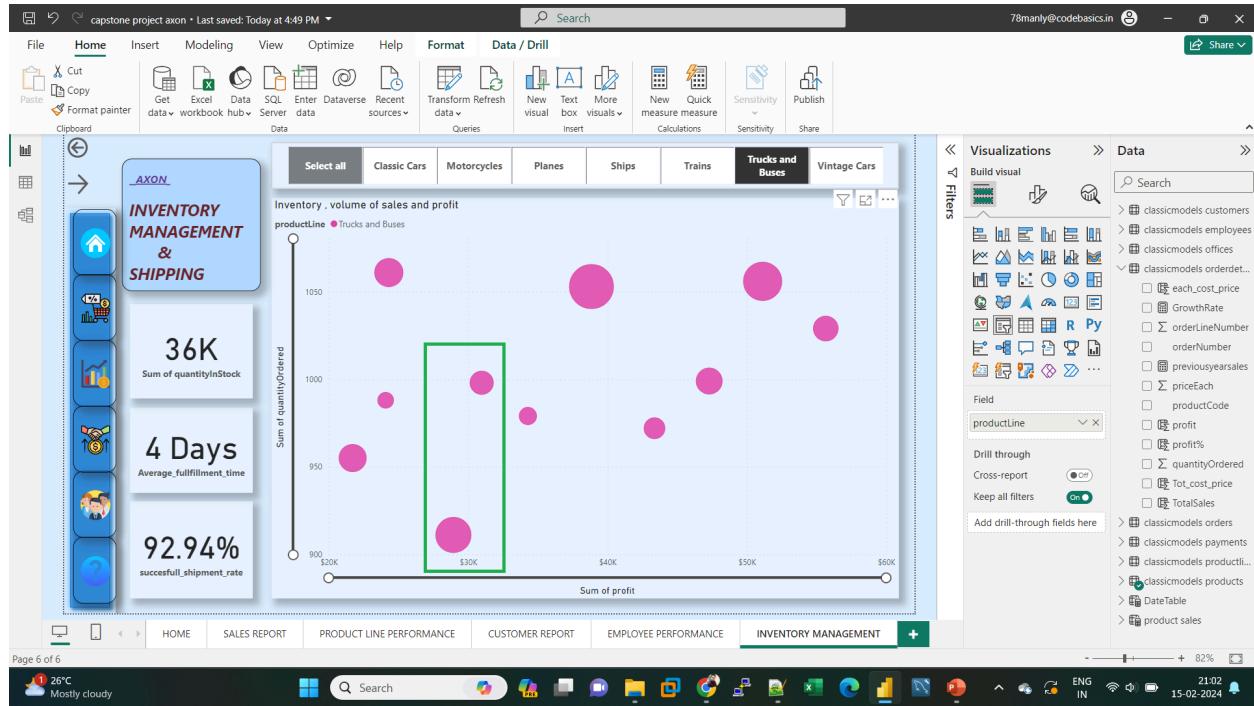
And also profit tree is presented to see the profit share of each hierarchy and at each sales employee

Here only sales representatives are accountable according to given data

So each office can see their performance

Inventory management and shipping :

Here inventory managing is key performance for the improvement of best sales and also reduction of cost of inventory



If we observe above two bubbles and their sizes small bubble is having higher profit and sales where bigger bubble having lower comparative to smaller bubble

Size representing the quantity of products in stock

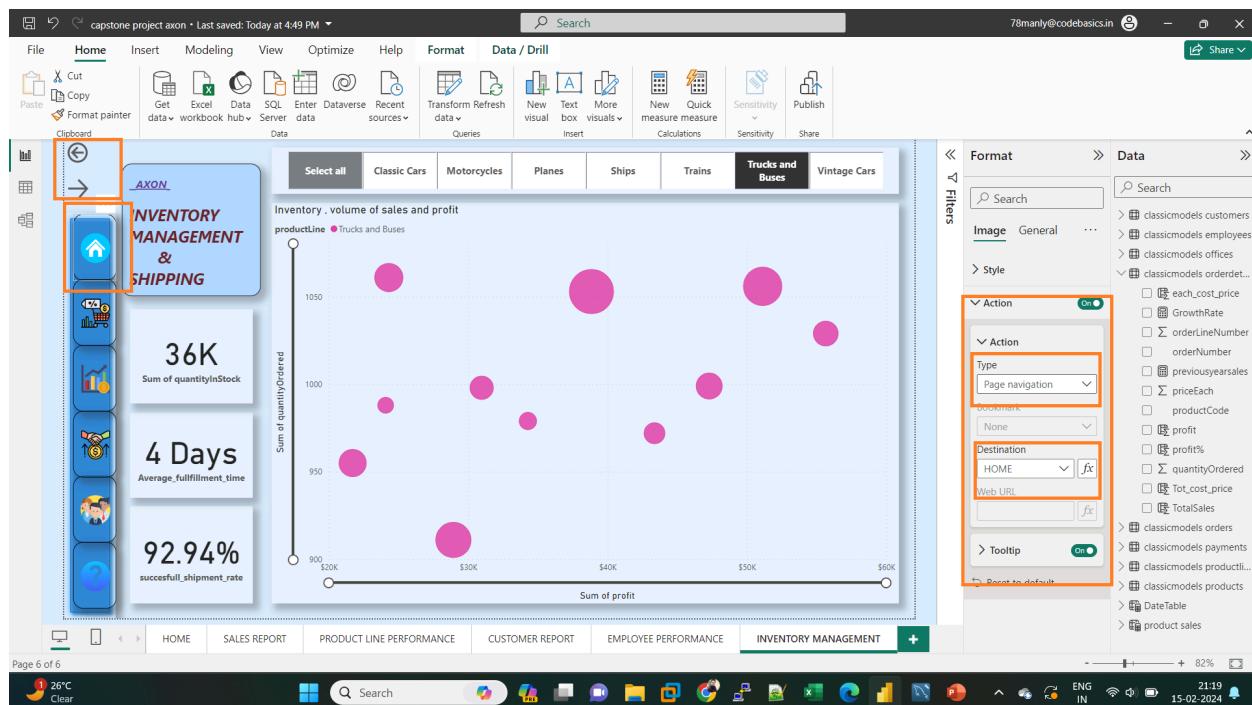
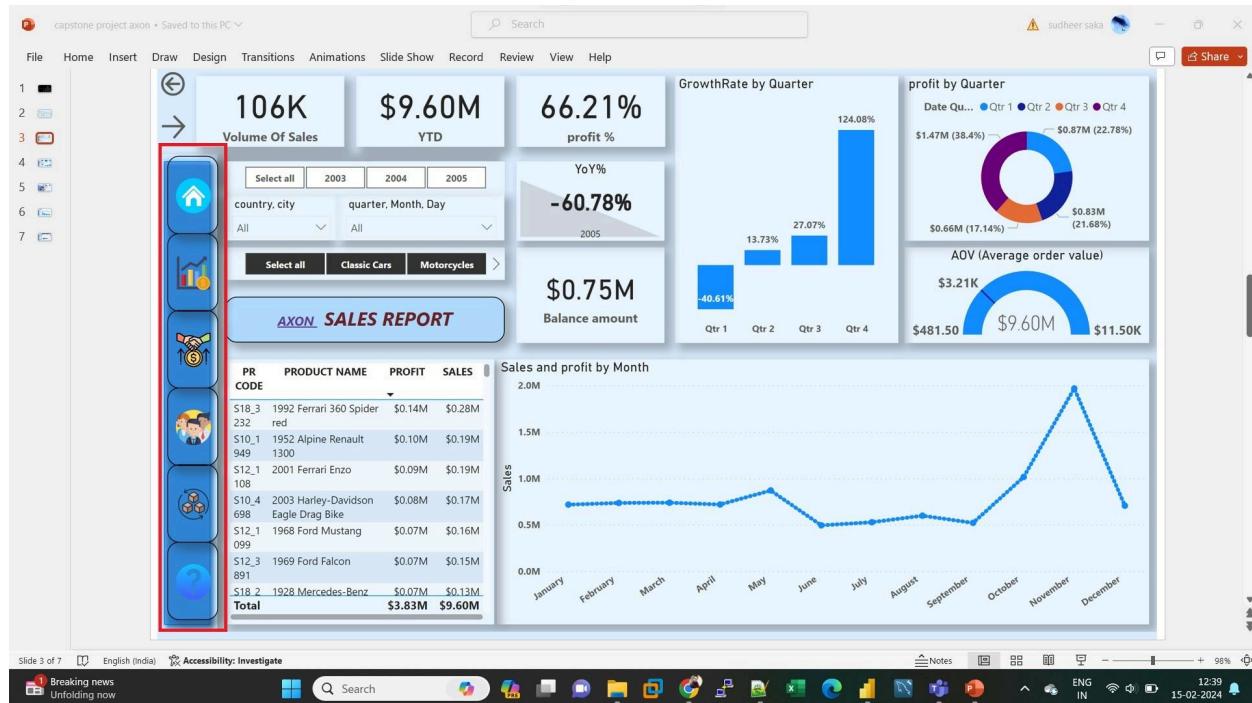
So axon need to reduce this kind of stocks and improve the small bubble kind of stocks

And also we provided Average fulfillment time which is difference between order date and shipping time which is good 4 days makes customers satisfaction reflects in sales

Success rate of shipping is also good 92.94% it means less cancellations are happened

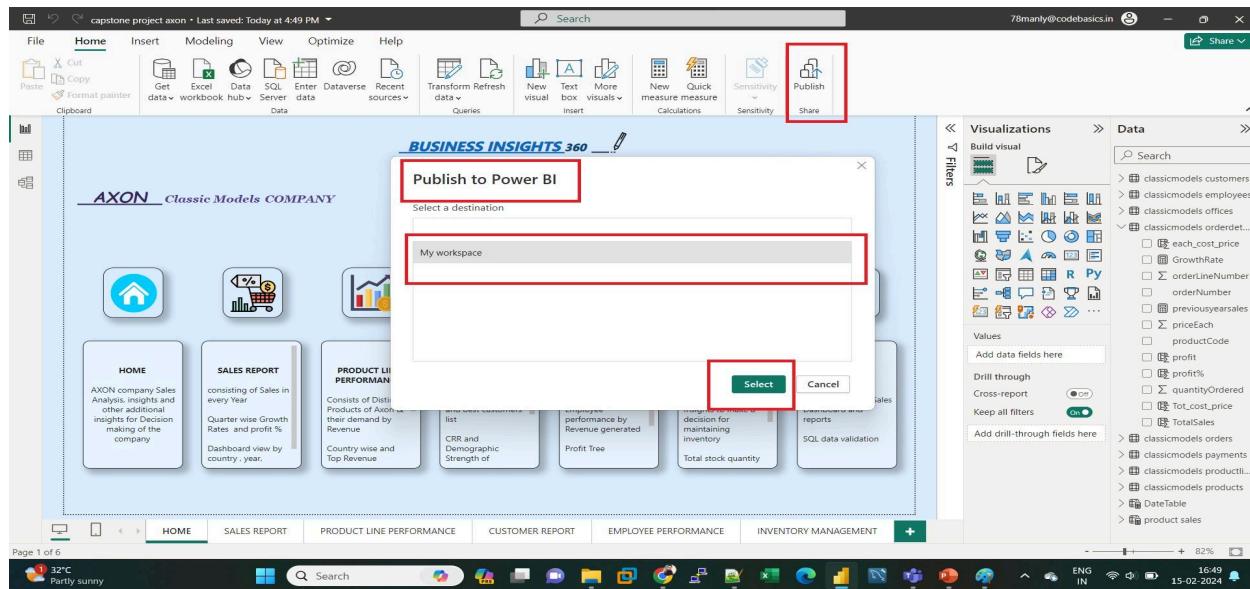
NAVIGATION:

For user friendly navigation i incorporated icons with page navigation action in visualization pane

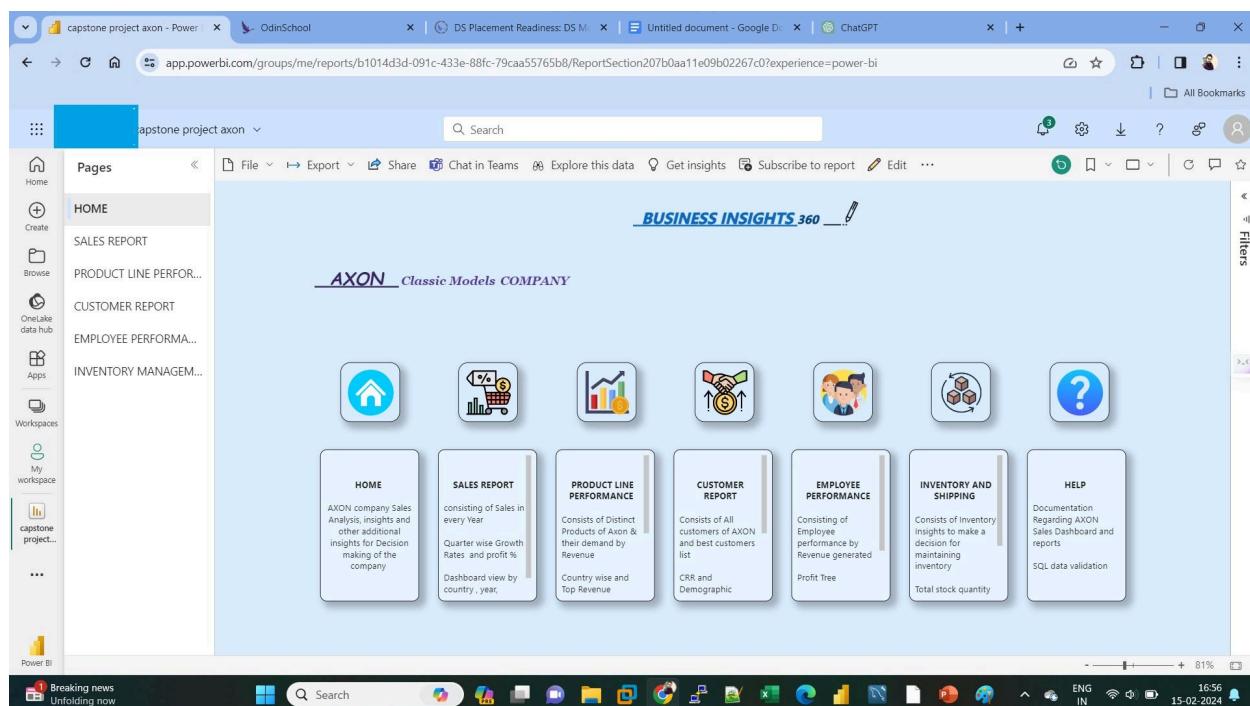


PUBLISHING:

To publish the report in workspace so that everyone or selected people depending on the privacy sharing settings there should be POWER BI service which is online platform like cloud



POWER BI SERVICE interface will be



From here we can create apps and provide sharing privacy settings and published and copying link and one can use it like application

ALL the above KPI key performance indices will helps axon to improve its sales and revenue factors mainly sales report and productline performance are paving way for clear picture of different products at different areas sales so axon can take decisions over by using this dashboard

This dashboard is created in away that dynamically changes and most interactive and user friendly for AXON

Power bi service file



DELIVERABLES:

POWER BI report file .pbix

SQL file two (one is database worked and other one is Data validated queries) .sql

Documentation and validation sql queries PDF total 2

Powerpoint user manual .ppt