

CAPSTONE PROJECT

RETAIL ANALYSIS

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INTRODUCTION

“Unlocking Insights of Retail Dynamics”

Welcome to the presentation on unlocking insights through a data-driven exploration of retail dynamics. In today's rapidly evolving retail landscape, data analytics has become an indispensable tool for understanding market trends, consumer behavior, and competitive dynamics.

Join us as we delve into the world of retail through the lens of data analytics, uncovering valuable insights to drive strategic decision-making and foster innovation.

Let's embark on this transformative journey together as we unlock the power of data in shaping the future of retail.

OBJECTIVE

AIM: To extract actionable insights from data using Excel and Power BI to optimize operations, enhance customer experience, and drive revenue growth, ultimately securing a competitive advantage and fostering sustainable success in the retail landscape

Objective:

- Consolidate data from multiple tables for a comprehensive view of operations.
- Analyze sales trends and metrics to understand performance.
- Evaluate product performance, profitability, vendors performance and consumer preferences.
- Understand customer behavior and purchasing patterns through segmentation and enhance retention.
- Streamline inventory management, marketing efforts, and pricing strategies to maximize profitability and efficiency.
- Evaluate employee performance and identify opportunities for improvement.
- Identify opportunities for revenue maximization through upselling, cross-selling, and strategic planning.
- Deliver actionable insights through intuitive dashboards.
- Enhance business competitiveness by leveraging data insights.

SIGNIFICANCE

- **Data-Driven Decision Making:** Empowers informed decision-making by leveraging consumer insights and market trends.
- **Operational Efficiency:** Optimizes inventory management and marketing efforts, leading to streamlined operations and reduced cost
- **Enhanced Customer Experience:** Understanding preferences enables personalized experiences, fostering loyalty and satisfaction.
- **Competitive Advantage:** By benchmarking against rivals and seizing emerging opportunities, it ensures sustained competitiveness.
- **Profitability Boost:** Through improved operations and customer engagement, it drives revenue growth and profitability.
- **Risk Mitigation:** Analysis helps anticipate and mitigate risks, safeguarding against potential losses.
- **Strategic Planning:** It informs long-term strategies, guiding expansion, diversification, and innovation for future success.

METHODOLOGY

Data Acquisition and Preparation: Imported data from SQL scripts and cleaned using SQL queries to fill missing values and convert datatypes.

Excel: Import data into Excel and establish connections between tables through relationships and Utilize Excel's pivot table and charting options for creating visualizations.

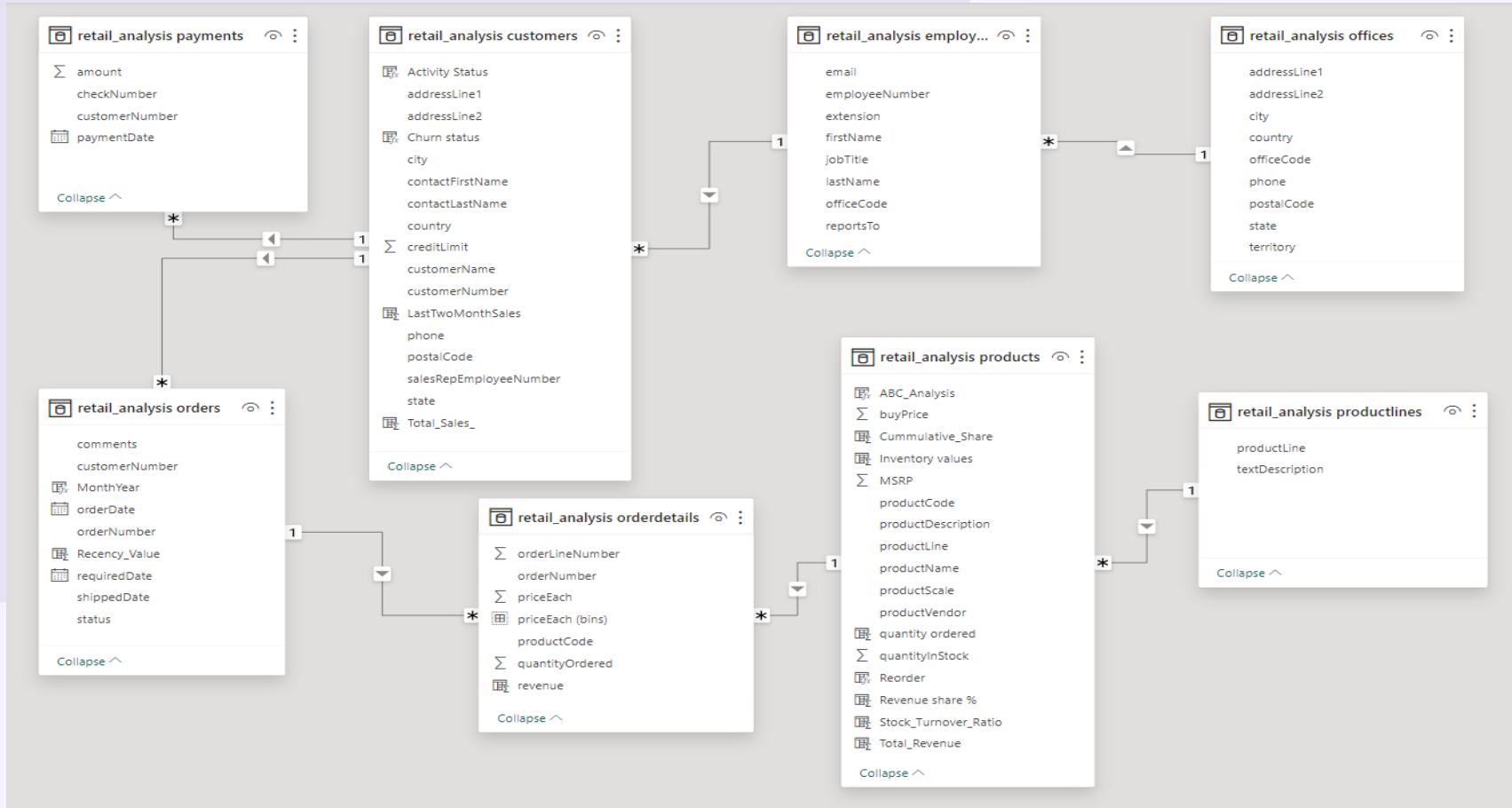
Power BI:

- Import transformed data into Power BI and perform data modelling to establish relationships between fact tables and dimension tables.
- Using DAX measures to perform calculations.
- Create dashboards with interactive visualizations.

Data Interpretation and Insights:

- Analyze visualizations to identify key trends and patterns.
- Interpret findings considering business context and domain knowledge.
- Translate interpretations into actionable insights for stakeholders.

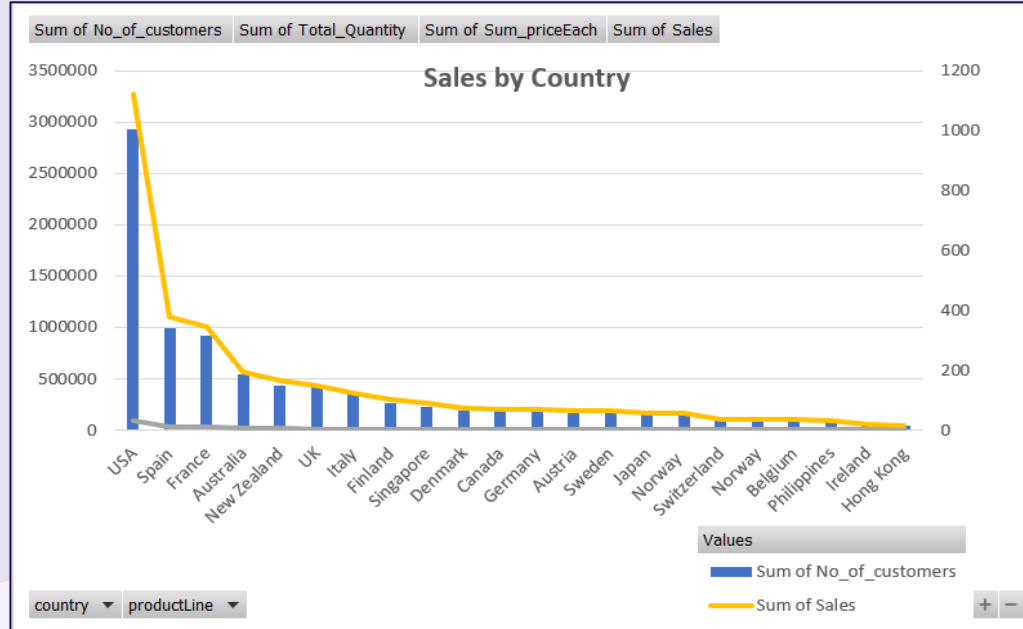
ER DIAGRAM



EDA PROBLEM STATEMENTS



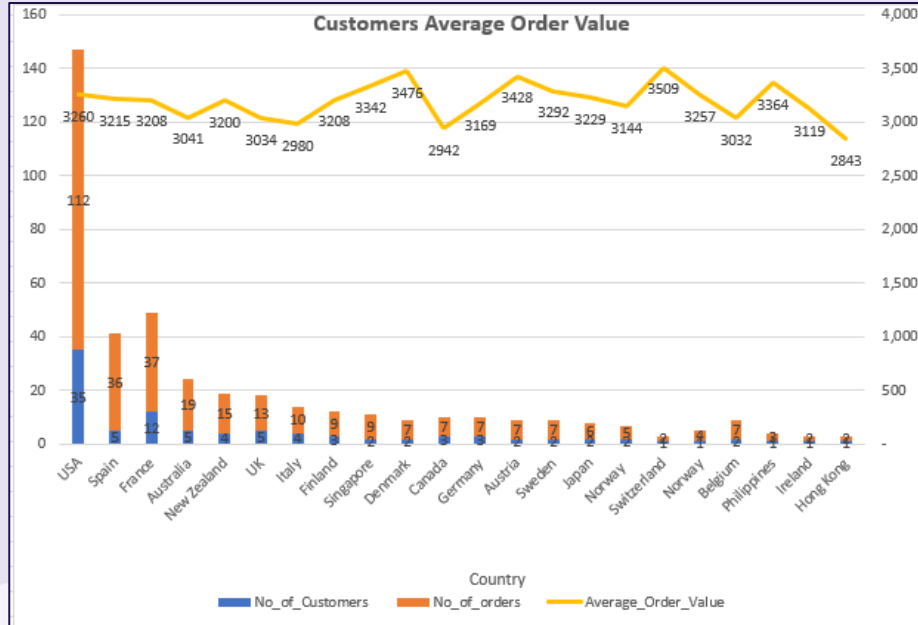
1. Which factors contribute to the highest sales in a particular region?



Factors:

- Almost **one third of the total sales** is recorded in **USA**.
- Factors contributes to high sales is **high interest in classic cars** category and no of customers in that particular region.

2. How can customer purchasing patterns be influenced to increase average order value?



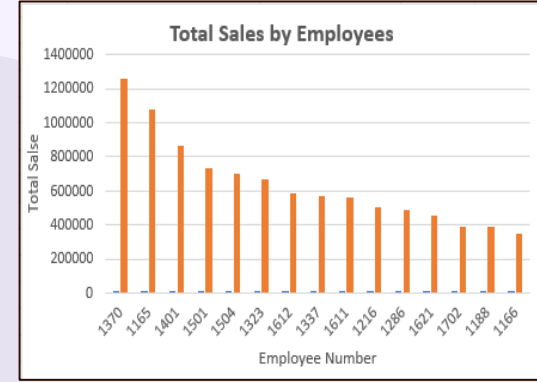
- More no of customers in USA hence by giving discounts we can increase Average order Value.
- Focusing on countries with lower no of customers to increase Customers & Average Order value

3. What are the key drivers of sales growth, and how can they be leveraged for future success?



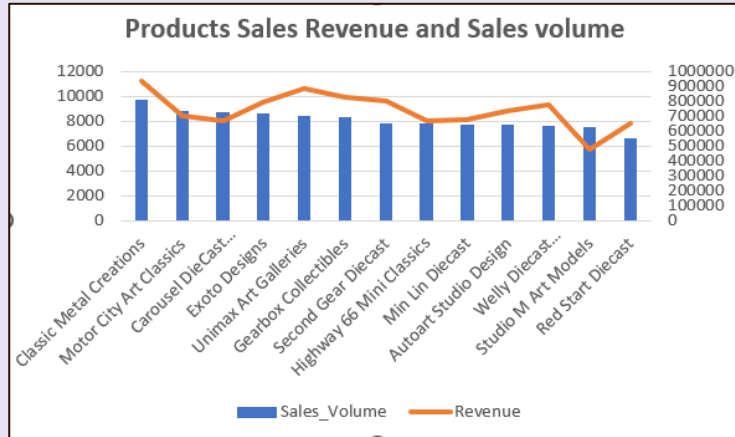
customerName	Total_Sales
Euro+ Shopping Channel	820690
Mini Gifts Distributors Ltd	591829
Australian Collectors, Co.	180584
Muscle Machine Inc	177918
La Rochelle Gifts	158571
Dragon Souvenirs, Ltd	156252
Down Under Souvenirs	154619
Land of Toys Inc.	149087
AV Stores, Co.	148413
The Sharp Gifts Warehouse	143538

productLine	productName	Total_sales
Classic Cars	1992 Ferrari 360 Spider red	276842
Motorcycles	2003 Harley-Davidson Eagle Drag	170687
Planes	1980s Black Hawk Helicopter	144960
Ships	18th century schooner	112430
Trains	Collectable Wooden Train	82617
Trucks and Buses	1958 Setra Bus	119084
Vintage Cars	1917 Grand Touring Sedan	140538



- Customer retention program to retain the top customers
- Promote best-selling products and optimize inventory based on high-demand products.
- Promote best-selling products in each product category
- Invest in employee training, encourage positive customer interactions, and foster a customer-centric culture.

4. Which product features or attributes are most appealing to customers?



productLine	productName	Difference	productVendor	salesvolume
Classic Cars	1952 Alpine Renault 1300	116	Classic Metal Creations	961
Classic Cars	2001 Ferrari Enzo	112	Second Gear Diecast	1019
Motorcycles	2003 Harley-Davidson Electra	103	Red Start Diecast	985
Classic Cars	1968 Ford Mustang	99	Autoart Studio Design	933
Vintage Cars	1928 Mercedes-Benz SSK	96	Gearbox Collectibles	880
Classic Cars	1992 Ferrari 360 Spider roadster	91	Unimax Art Galleries	1808
Classic Cars	1969 Ford Falcon	90	Second Gear Diecast	965
Motorcycles	2002 Suzuki XREO	84	Unimax Art Galleries	1028
Vintage Cars	1917 Grand Touring Sedan	83	Welly Diecast Products	918
Planes	1980s Black Hawk Helicopter	80	Red Start Diecast	1040

- Attributes Appealing to customers include Vendors
- Difference in BuyPrice and MSRP

- Products with High difference in Buyprice and MSRP & Product Vendor is **Classic Cars Category and Unimax Art Galleries**

5. How can the product mix be optimized to cater to changing market demands?



productName	No_of_orders	Total_Sales	Average_order_value
1992 Ferrari 360 Spider red	53	276842	5223
1928 Ford Phaeton Deluxe	28	60492	2160
18th Century Vintage Horse Carriage	28	85328	3047

productName	TotalQuantitySold	Revenue	Profit	Profit_Percentage
1961 Chevrolet Impala	941	69121	38698	56
1937 Horch 930V Limousine	884	52804	29555	56
1970 Plymouth Hemi Cuda	900	63490	34762	55
1926 Ford Fire Engine	998	55835	30965	55
1950's Chicago Surface Lines Streetcar	934	53792	28836	54



- Identifying top sellers helps balance the product portfolio.
- By ensuring a mix of staple products and trendy items to cater to diverse customer needs.
- Products with higher contribution margins may be given more focus in the product mix .
- Adjusting prices based on profit margins can help maximize revenue without sacrificing profitability.
- Adjust the product mix based on seasonal variations in customer preferences

6. Are there any specific market segments where a particular product is underperforming, and how can it be improved?

country	city	productCode	Total_Sales	No of orders	Under
Austria	Salzburg	S24_2972	482	1	Yes
Australia	Chatswo	S24_3969	529	1	Yes
USA	Nashua	S24_1937	531	1	Yes
USA	San Jose	S18_4409	547	1	Yes
France	Nantes	S32_2509	554	1	Yes
France	Marseille	S24_1937	558	1	Yes
Italy	Torino	S24_1937	597	1	Yes

- Identify segments where the product is underperforming compared to others and encourage additional purchases by bundling the underperforming product.

7. What are the main factors that influence customer loyalty and repeat purchases?



customerNum	productCod	count	productVendor	differe	country	creditLi	city
141	S18_3232	8	Unimax Art Galleries	91	Spain	227600	Madrid
141	S24_1444	6	Highway 66 Mini Classics	25	Spain	227600	Madrid
141	S24_2840	6	Carousel DieCast Legends	19	Spain	227600	Madrid
141	S24_4048	5	Exoto Designs	48	Spain	227600	Madrid
141	S18_2319	5	Unimax Art Galleries	48	Spain	227600	Madrid
141	S50_1392	5	Highway 66 Mini Classics	47	Spain	227600	Madrid
141	S32_2509	5	Classic Metal Creations	28	Spain	227600	Madrid
141	S18_3140	4	Unimax Art Galleries	68	Spain	227600	Madrid
141	S12_4473	4	Exoto Designs	63	Spain	227600	Madrid
141	S18_2238	4	Gearbox Collectibles	62	Spain	227600	Madrid
141	S18_4027	4	Min Lin Diecast	52	Spain	227600	Madrid
141	S24_3432	4	Gearbox Collectibles	45	Spain	227600	Madrid
141	S24_2766	4	Classic Metal Creations	44	Spain	227600	Madrid
141	S24_3856	4	Classic Metal Creations	42	Spain	227600	Madrid
141	S32_3207	4	Gearbox Collectibles	35	Spain	227600	Madrid
141	S24_3191	4	Exoto Designs	35	Spain	227600	Madrid
141	S18_4522	4	Exoto Designs	35	Spain	227600	Madrid
141	S18_3259	4	Carousel DieCast Legends	33	Spain	227600	Madrid
141	S24_1046	4	Unimax Art Galleries	24	Spain	227600	Madrid
141	S24_2972	4	Second Gear Diecast	22	Spain	227600	Madrid
141	S50_1514	4	Classic Metal Creations	21	Spain	227600	Madrid
124	S12_1108	4	Second Gear Diecast	112	USA	210500	San Rafael
124	S18_2795	4	Gearbox Collectibles	96	USA	210500	San Rafael
124	S12_3891	4	Second Gear Diecast	90	USA	210500	San Rafael
124	S24_2300	4	Autoart Studio Design	66	USA	210500	San Rafael
124	S12_4473	4	Exoto Designs	63	USA	210500	San Rafael
124	S18_2238	4	Gearbox Collectibles	62	USA	210500	San Rafael
124	S32_1268	4	Motor City Art Classics	42	USA	210500	San Rafael
124	S18_3320	4	Exoto Designs	42	USA	210500	San Rafael
124	S32_2509	4	Classic Metal Creations	28	USA	210500	San Rafael
124	S18_4668	4	Studio M Art Models	27	USA	210500	San Rafael
124	S24_2840	4	Carousel DieCast Legends	19	USA	210500	San Rafael

Factors influencing customer loyalty include and repeat purchases include:

- Customers from Spain & USA
- High credit limit

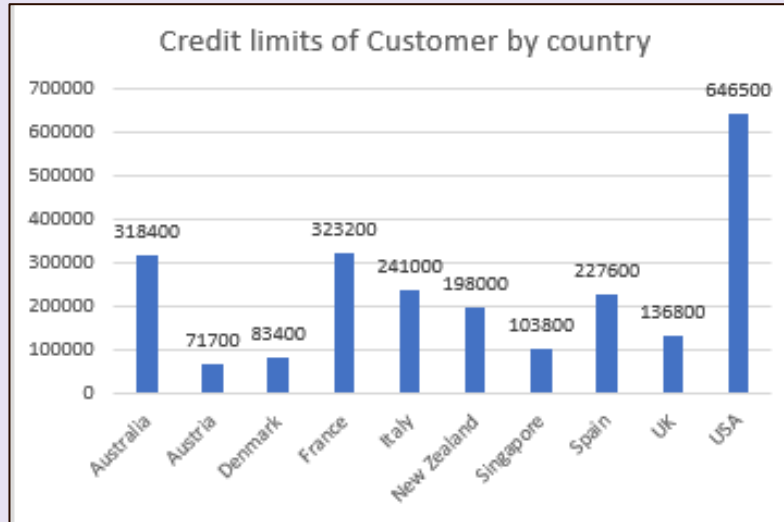
8. How do customer preferences differ based on geographic location, and how can marketing campaigns be customized accordingly?



Count of No_of_products		Column Labels						
Row Labels	Classic Cars	Motorcycles	Planes	Ships	Trains	Trucks and Buses	Vintage Cars	Grand Total
USA	329	149	95	70	25	112	224	1004
Spain	120	19	30	39	14	46	74	342
France	98	68	32	21	7	30	58	314
Australia	53	26	25	2	1	20	58	185
New Zealand	42	26	14	11	4	6	46	149
UK	46	9	15	23	4	8	39	144
Italy	29	3	35	6	3	3	42	121
Finland	38	13	12	9	2	11	7	92
Singapore	32	1		4	5	23	14	79
Canada	14	1	10	14		16	15	70
Denmark	34		2	14	4	2	7	63
Germany	36	3	8	2	2	2	9	62
Sweden	17	3	3	10	1	11	12	57
Austria	25	5	6	4		5	10	55
Norway	28	7	11				7	53
Japan	8	9	16	5	2	3	9	52
Belgium	4		1	11	3		14	33
Norway	7	7			2	9	7	32
Switzerland	31							31
Philippines	13	7	5				1	26
Ireland	6	2	4		2	1	1	16
Hong Kong		1	12				3	16
Grand Total	1010	359	336	245	81	308	657	2996

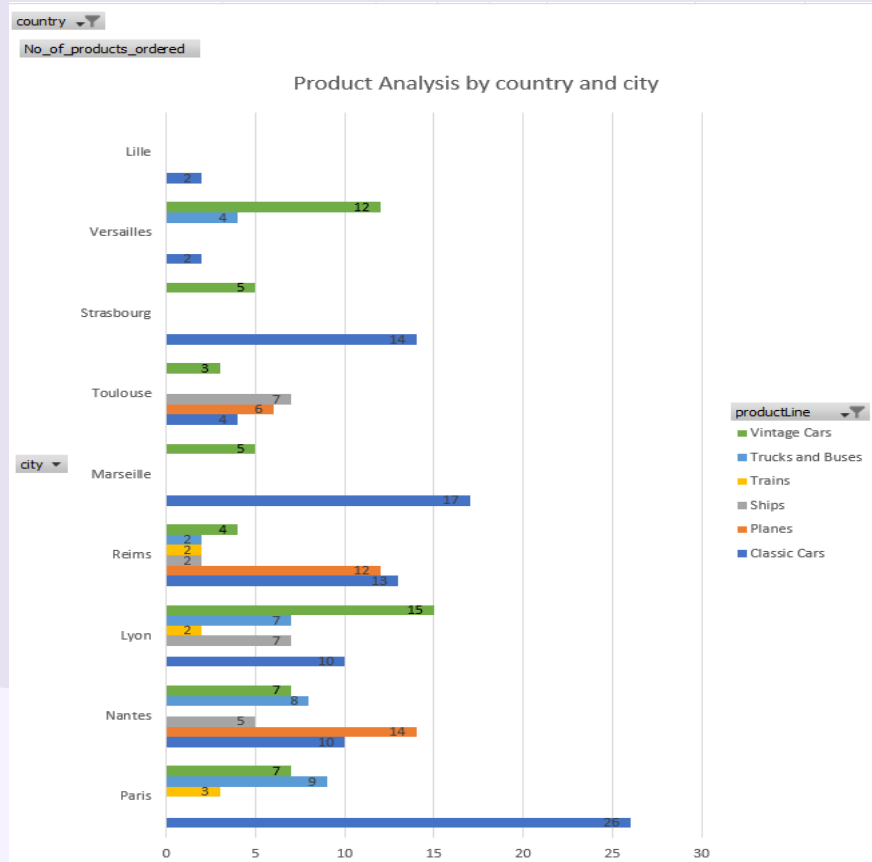
- One third of the total orders are from classic cars category.
- Low level interest is found on ships and trains.
- More no of orders is from USA
- So we can Customize online advertisements based on the user's location.

9. What are the characteristics of high-value customers, and how can similar customers be targeted for acquisition?



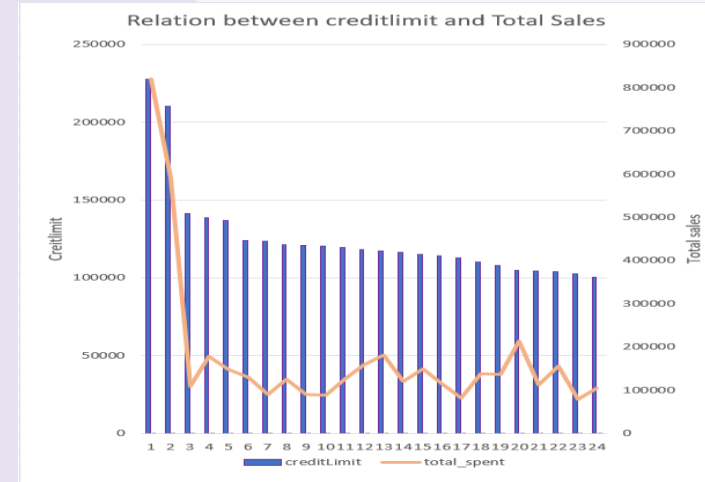
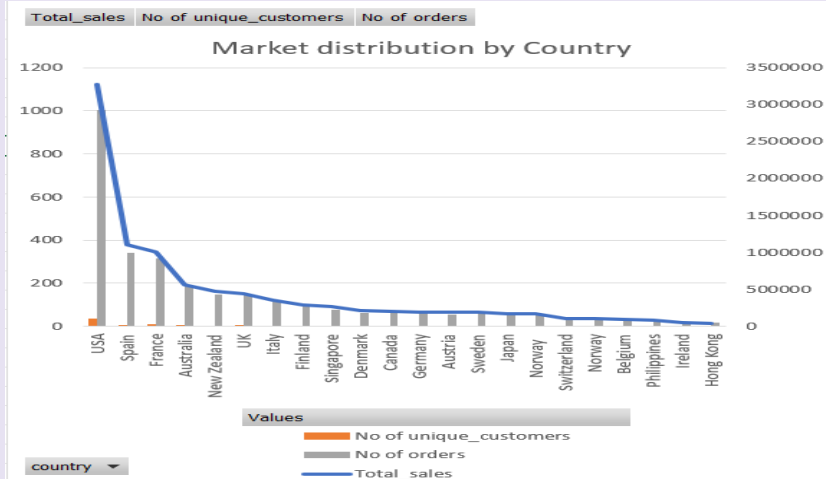
- Characteristics of high value customers include high credit limit and they belong to countries such as Spain, USA, New Zealand, Australia, France, Singapore, Denmark, Italy
- Hence, we can focus on customers with high credit limit who belong to the above mentioned countries.

10. How can marketing strategies be tailored to target specific demographic segments in different regions?



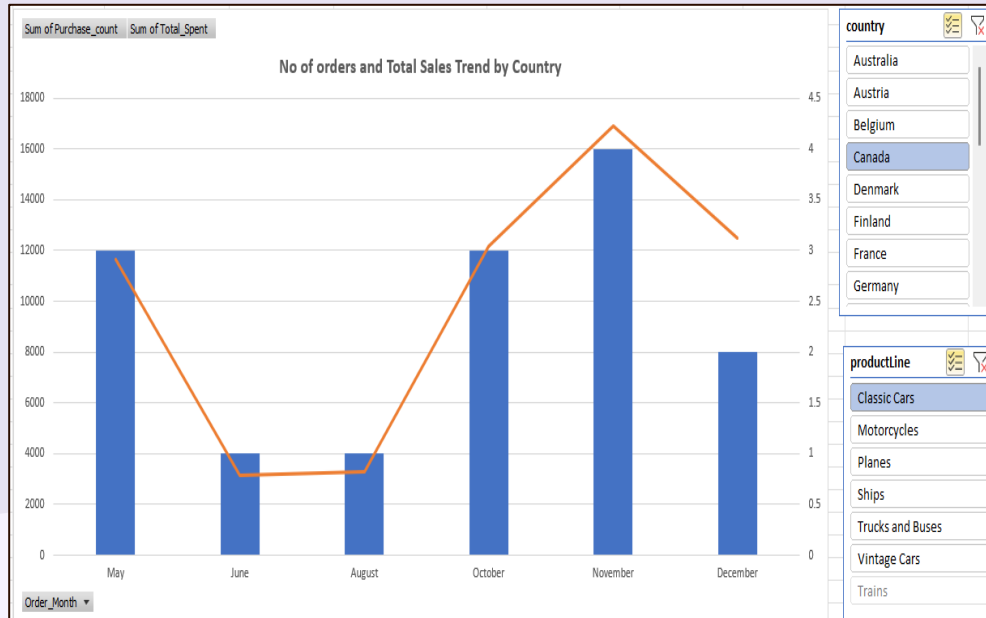
- By Identifying regions where specific demographic segments are more concentrated we can customize product offerings based on the preferences of different demographic groups.
- By offering promotions and discounts tailored to the buying patterns of specific demographic segments in different regions.
- And through social media marketing we can reach the target customers.

11. What are the potential untapped markets based on demographic indicators, and how can market penetration be increased?



- Potentially untapped countries include Spain, France, Australia and New Zealand
- There market penetration can be done through social media marketing and by introducing limited -period offers
- Target on customers whose credit limit is greater than 1,00,000 as they have the potential to increase the total sales

12. How do customer preferences and behaviour differ based on demographic factors, and how can they be leveraged for personalized marketing campaigns?

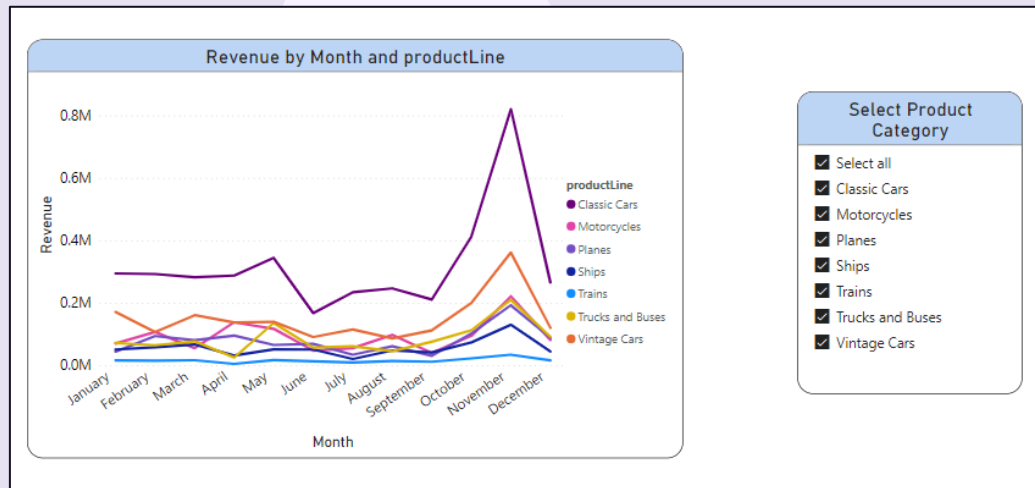


- By offering promotions that align with the preferences and purchasing behaviours of different demographic segments
- By Collecting customer feedback and conducting surveys to understand preferences, expectations, and areas for improvement
- Tailor marketing messages to the interests and preferences of specific demographics.

POWER BI PROBLEM STATEMENTS

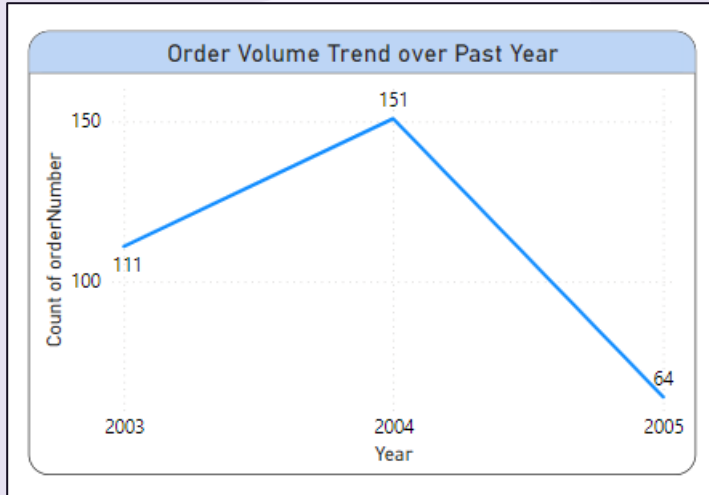


1. How does monthly revenue vary across different product categories? (Visual: Monthly revenue by product category)

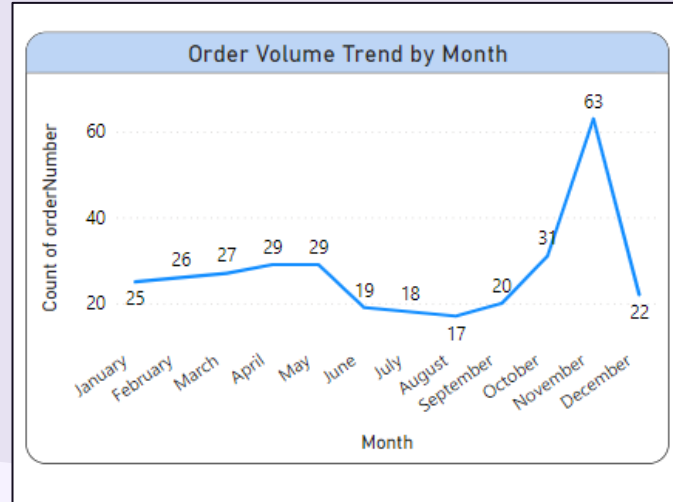


- The monthly revenue is particularly high in November for all product categories

2. What is the trend in customer order volume over the past year? (Visual: Monthly order volume trend)

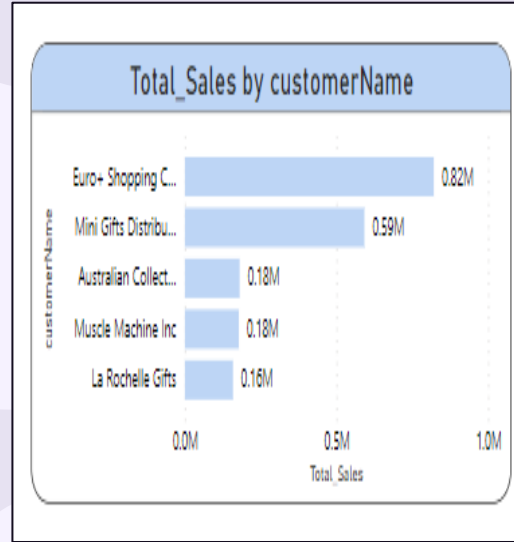
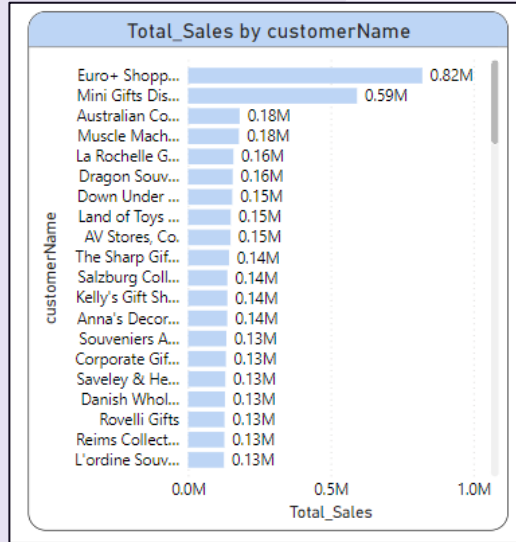


- There is a significant increase in order volume during the year 2004 when compared to the adjacent years.



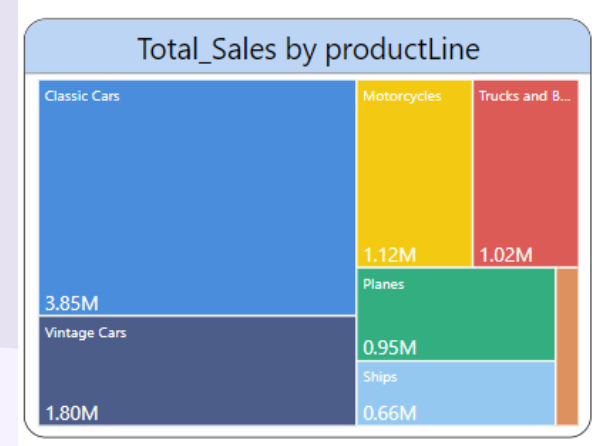
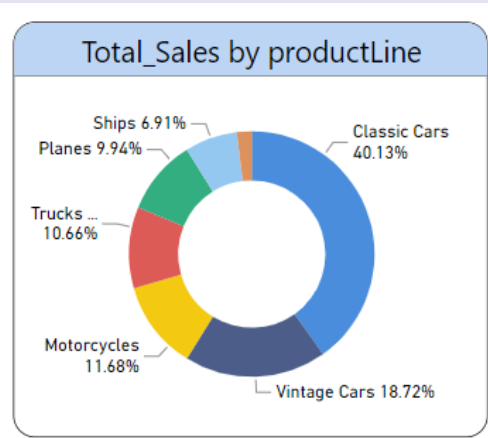
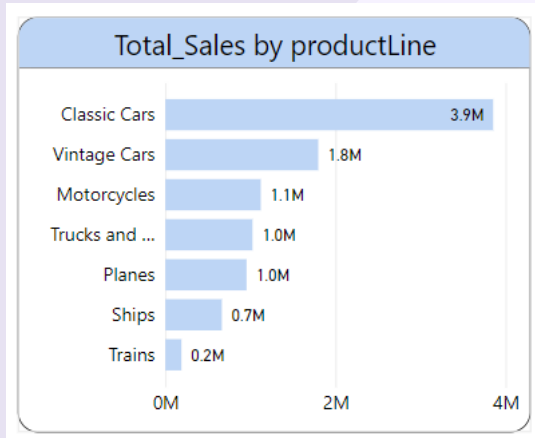
- The Order Volume is particularly high in November.

3. How does the sales performance of top customers compare to the rest? (Visual: Sales contribution by top customers vs. others)



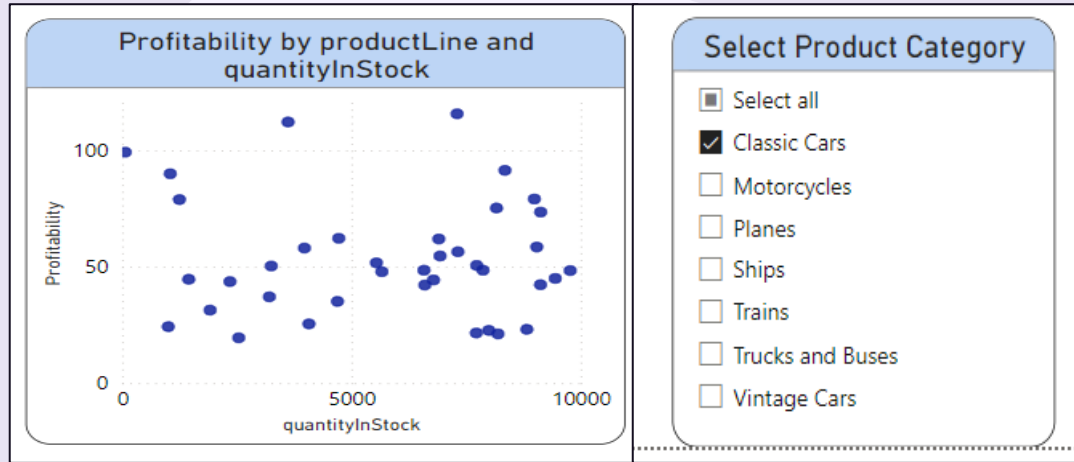
➤ The top customers contribute more than three times as much as the other customers.

4. What is the distribution of product sales across different product lines? (Visual: Product sales by product line)



- The product sales is comparatively high in Classic Cars

5. How does the profitability of different products compare based on their quantity in stock? (Visual: Profitability vs. quantity in stock)



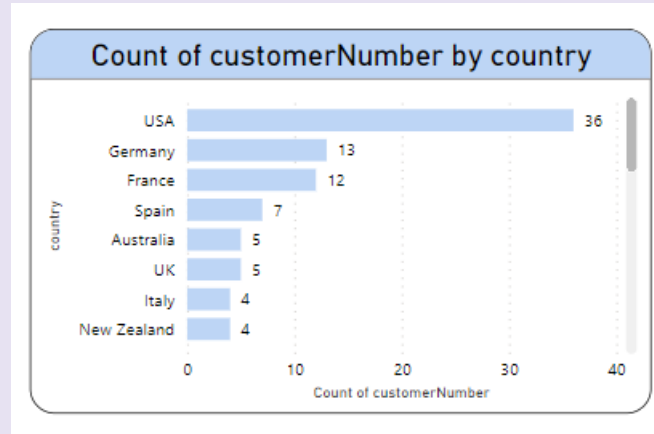
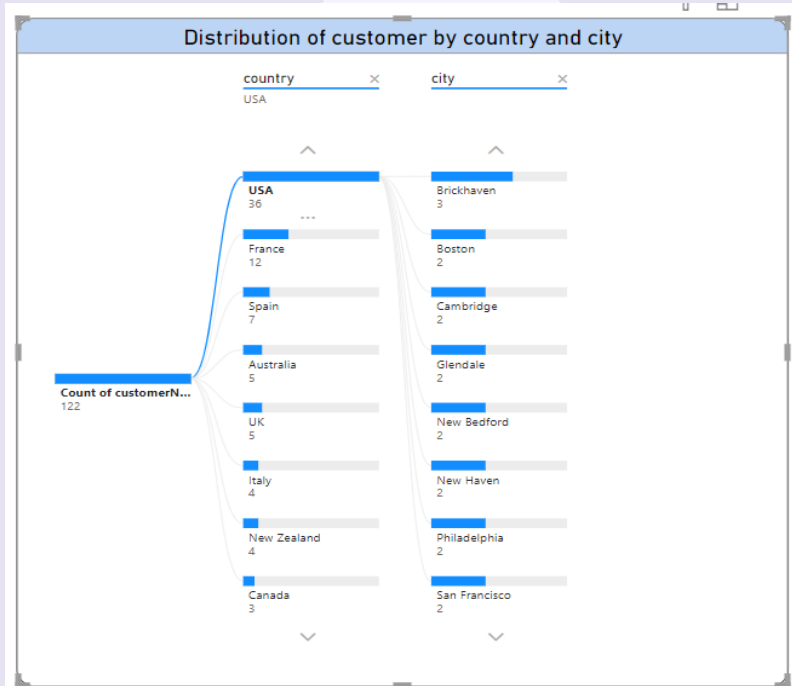
- The data points on the scatterplot are more dispersed, suggesting a weaker correlation.

6. How does product pricing impact sales volume? (Visual: Product price vs. sales volume)



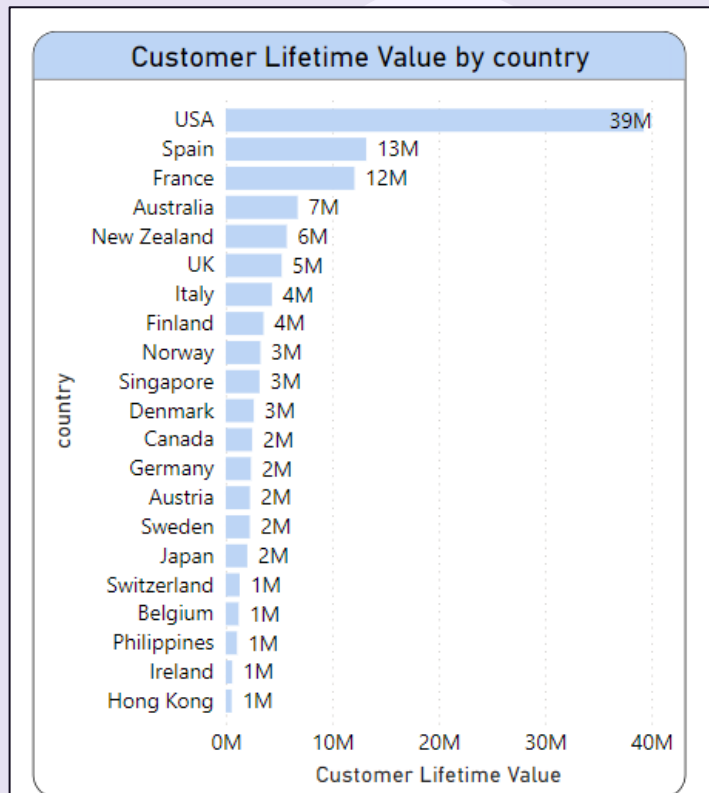
- No correlation was found and the price range is 20 to 50 for most quantity ordered.

7. What is the distribution of customers across different demographic segments? (Visual: Customer segmentation by demographics)



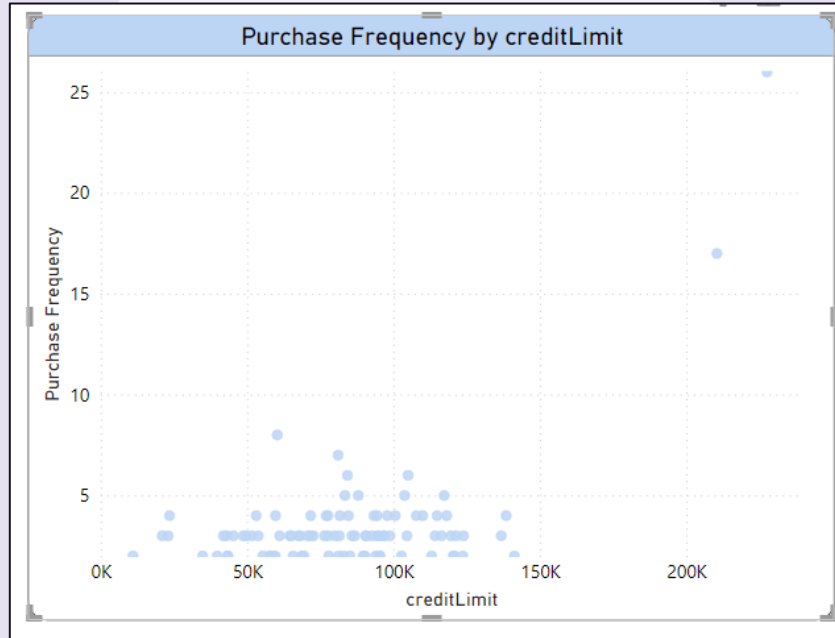
- The USA boasts the largest number of customers.

8. How does customer lifetime value vary for across different country?



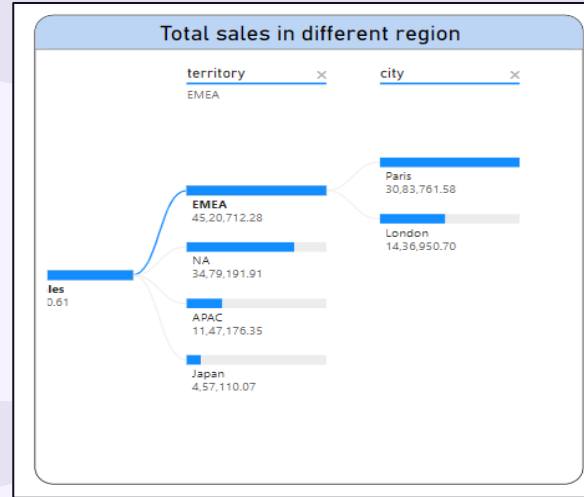
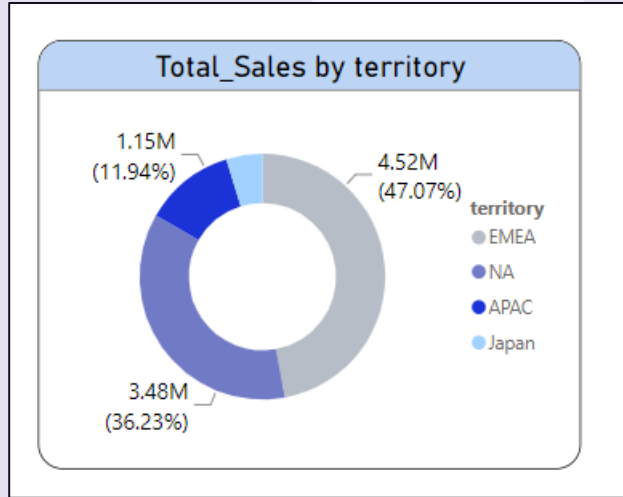
- Countries such as the USA, Spain, and France have high customer lifetime value.

9. What is the correlation between credit limit and purchase frequency?



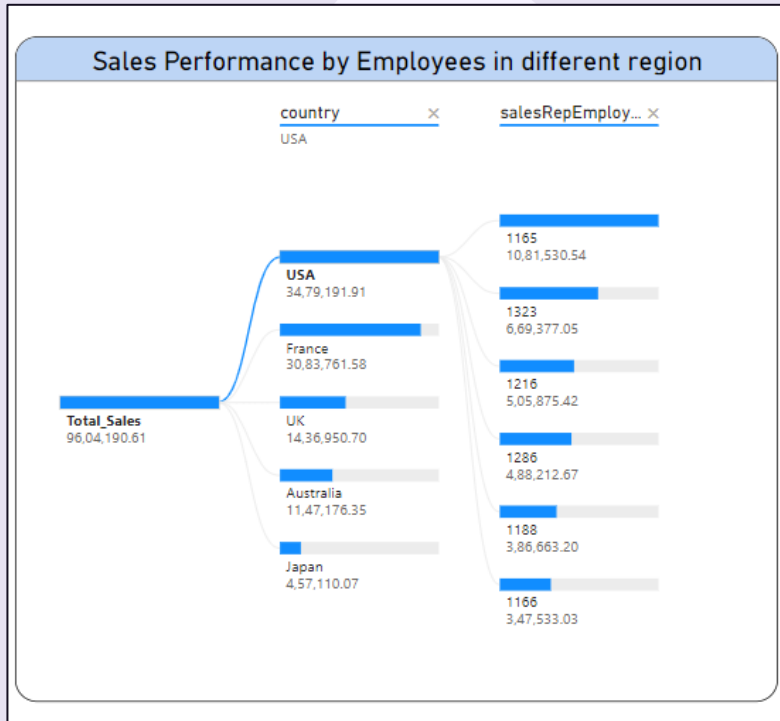
- Purchase Frequency remains low for every credit limit.

10. What are the top regions in terms of sales revenue? (Visual: Sales revenue by region)



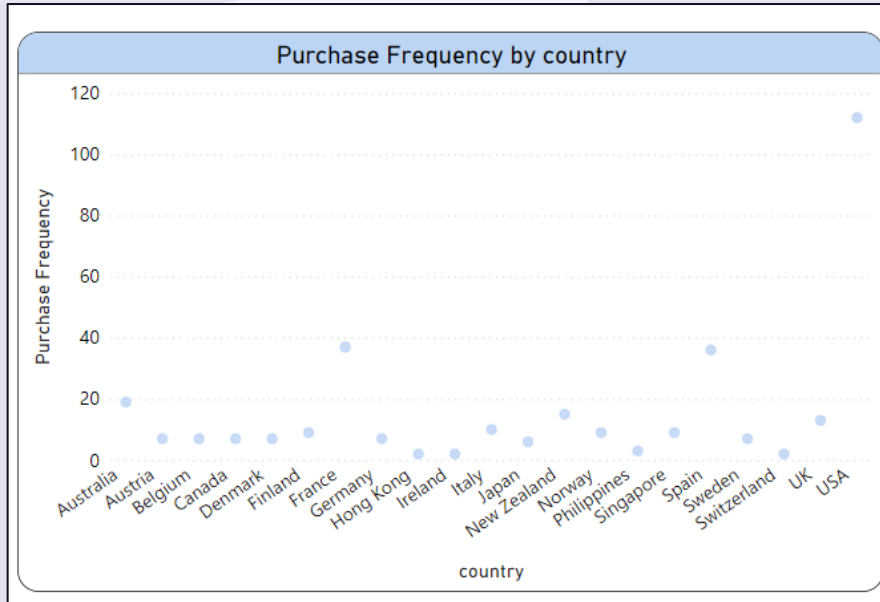
- The EMEA territory generates the highest sales revenue.

11. How does the performance of sales employees vary across different regions? (Visual: Employee performance by region)



- Employees in the USA and France produce higher sales.

12. What is the correlation between customer demographics and purchase frequency? (Visual: Customer demographics vs. purchase frequency)



➤ No correlation found.

POWER BI DASHBOARD



RETAIL ANALYSIS

TOTAL SALES

9.60M

NO OF PRODUCTS

110

NO OF CUSTOMERS

122

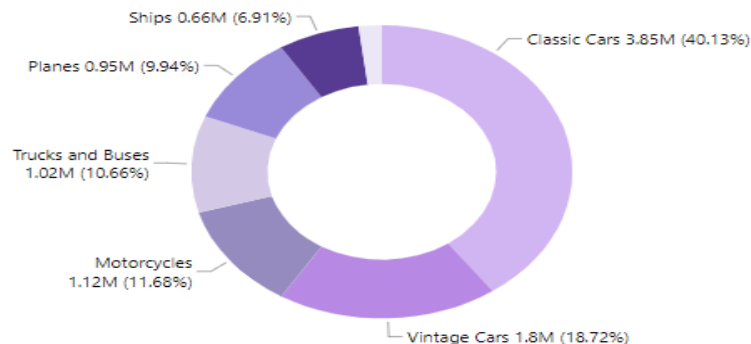
TOTAL ORDERS

326

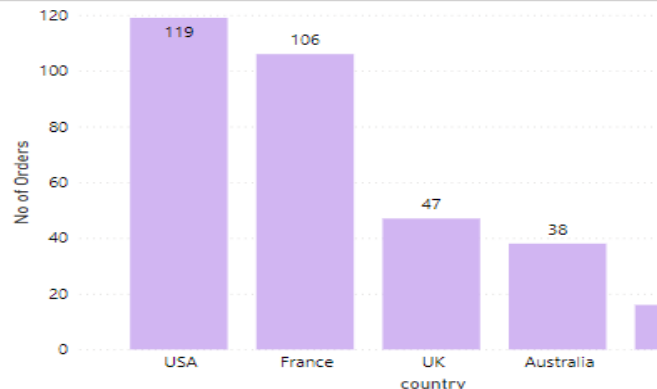
TOTAL IN VA

30.1

Total_Sales by productLine



No of Orders by Country



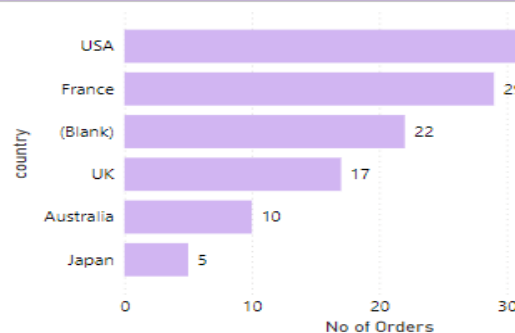
Top 10 Products by Sales

productName	Total_Sales
1992 Ferrari 360 Spider red	2,76,839.98
2001 Ferrari Enzo	1,90,755.86
1952 Alpine Renault 1300	1,90,017.96
2003 Harley-Davidson Eagle Drag Bike	1,70,686.00
1968 Ford Mustang	1,61,531.48
1969 Ford Falcon	1,52,543.02
1980s Black Hawk Helicopter	1,44,959.91
1998 Chrysler Plymouth Prowler	1,42,530.63
1917 Grand Touring Sedan	1,40,535.60
2002 Suzuki XREO	1,35,767.03

Top 10 Customers by Sales

customerName	Total_Sales
Euro+ Shopping Channel	8,20,689.54
Mini Gifts Distributors Ltd.	5,91,827.34
Australian Collectors, Co.	1,80,585.07
Muscle Machine Inc	1,77,913.95
La Rochelle Gifts	1,58,573.12
Dragon Souveniers, Ltd.	1,56,251.03
Down Under Souveniers, Inc	1,54,622.08
Land of Toys Inc.	1,49,085.15
AV Stores, Co.	1,48,410.09
The Sharp Gifts Warehouse	1,43,536.27

No of Customers by Country



MENU



Dashboard



Sales Analysis



Product Analysis



Customer Analysis



Demographic Analysis



Inventory Analysis

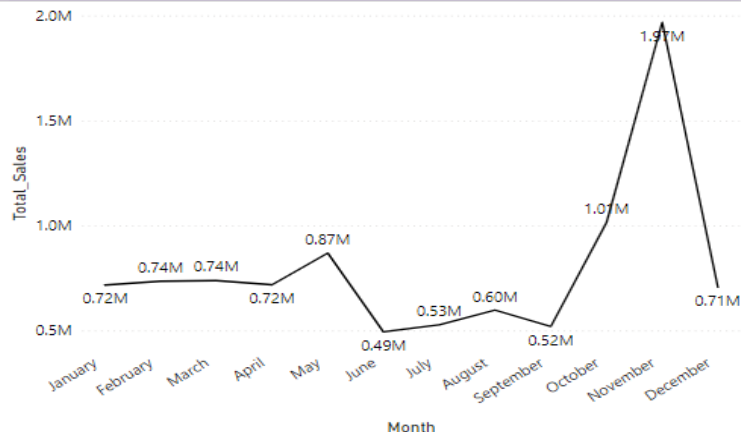


Employee Analysis

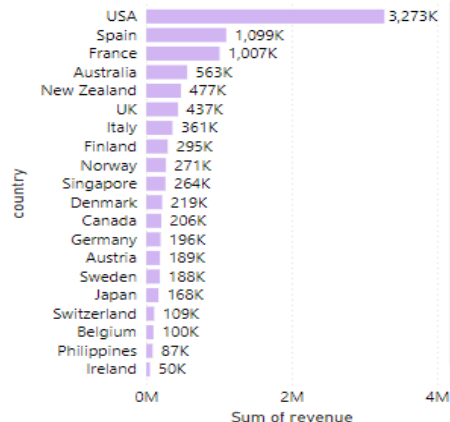


SALES ANALYSIS

Sales Trend by Month



Sales by country



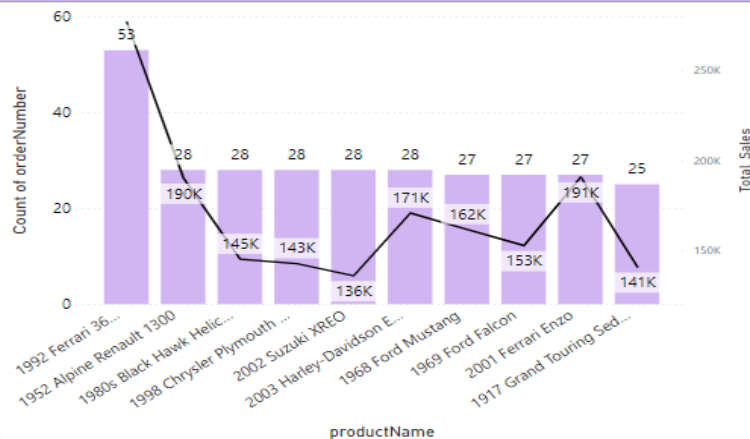
TOTAL SALES

9.60M

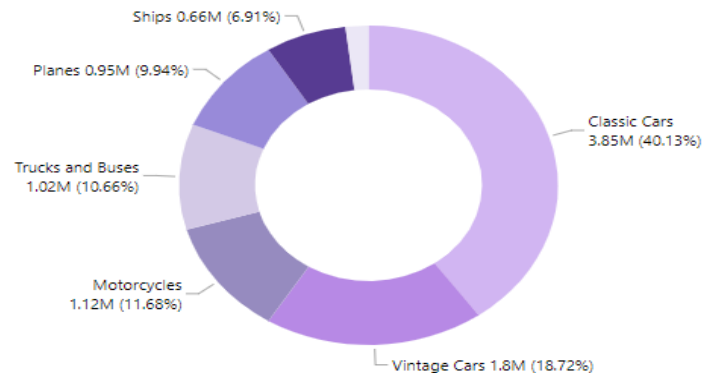
Choose product Category

- ☒ Select all
- ☒ Classic Cars
- ☒ Motorcycles
- ☒ Planes
- ☒ Ships
- ☒ Trains
- ☒ Trucks and Buses
- ☒ Vintage Cars

Top 10 Products by Sales



Total_Sales by productLine



MENU



Dashboard



Sales Analysis



Product Analysis



Customer Analysis



Demographic Analysis



Inventory Analysis

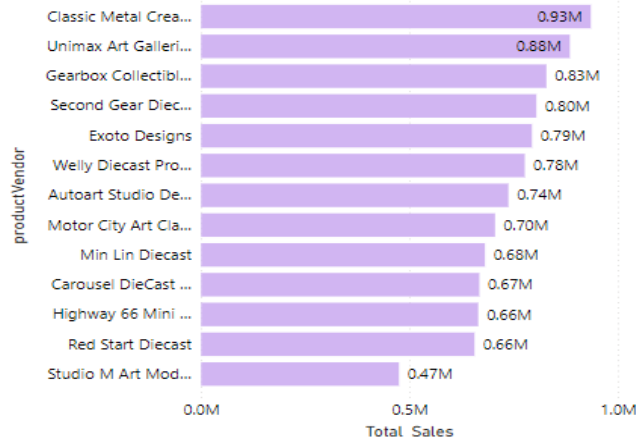


Employee Analysis

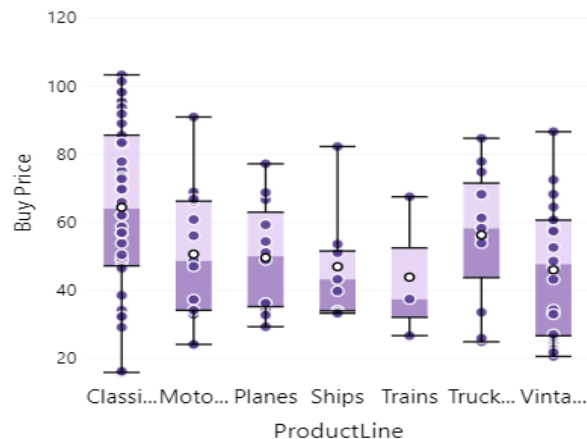


PRODUCT ANALYSIS

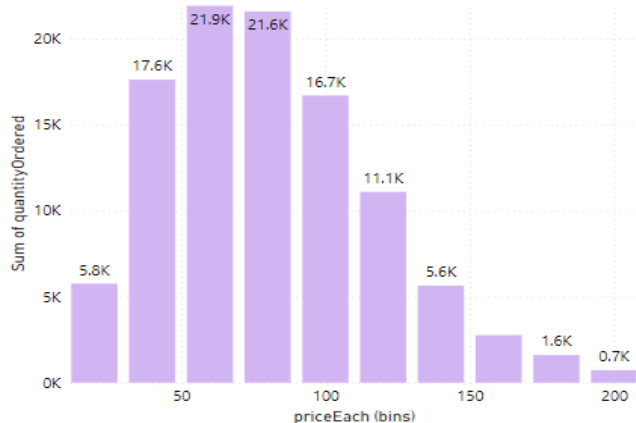
Sales Performance of vendors



Average of buyPrice by productCode and productLine



Sum of quantityOrdered by priceEach (bins)



Top 5 Products by Total_Sales

productName	Total_Sales
1992 Ferrari 360 Spider red	2,76,839.98
2001 Ferrari Enzo	1,90,755.86
1952 Alpine Renault 1300	1,90,017.96
2003 Harley-Davidson Eagle Drag Bike	1,70,686.00
1968 Ford Mustang	1,61,531.48

Bottom 5 Products by Total_Sales

productName	Total_Sales
1939 Chevrolet Deluxe Coupe	28,052.94
1936 Mercedes Benz 500k Roadster	29,763.39
1982 Lamborghini Diablo	30,972.87
1958 Chevy Corvette Limited Edition	31,627.96
1982 Ducati 996 R	33,268.76

TOTAL ORDERS

326

TOTAL QUANTITY
ORDERED

106K

TOTAL NO OF
PRODUCTS

110

TOTAL QUANTITY
IN STOCK

555K

Choose Product
Category

- ☐ Select all
- ☐ Classic Cars
- ☐ Motorcycles
- ☐ Planes
- ☐ Ships
- ☐ Trains
- ☐ Trucks and Buses
- ☐ Vintage Cars

MENU



Dashboard



Sales Analysis



Product Analysis



Customer Analysis



Demographic Analysis



Inventory Analysis

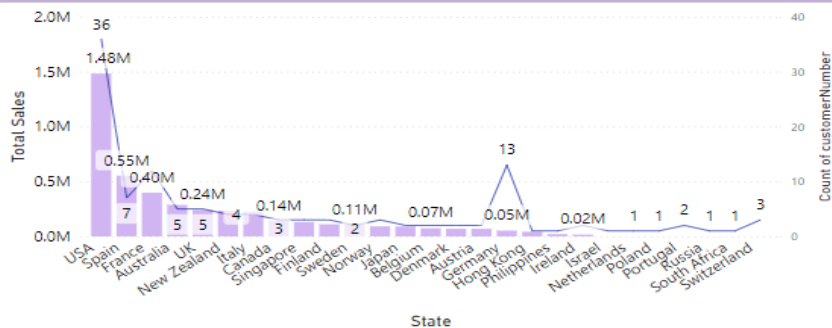


Employee Analysis

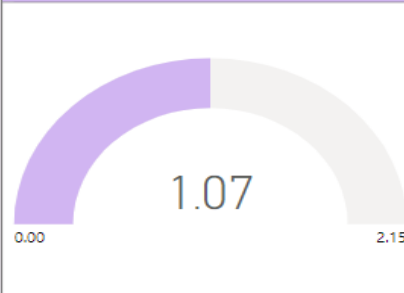


CUSTOMER ANALYSIS

Total Sales by country



Credit Utilization Against Credits Available



NO OF CUSTOMERS

122

AVERAGE ORDER VALUE

29.46K

CUSTOMER RETENTION RATE

80.33%

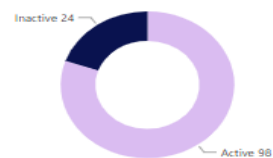
AVERAGE PURCHASE FREQUENCY

2.67

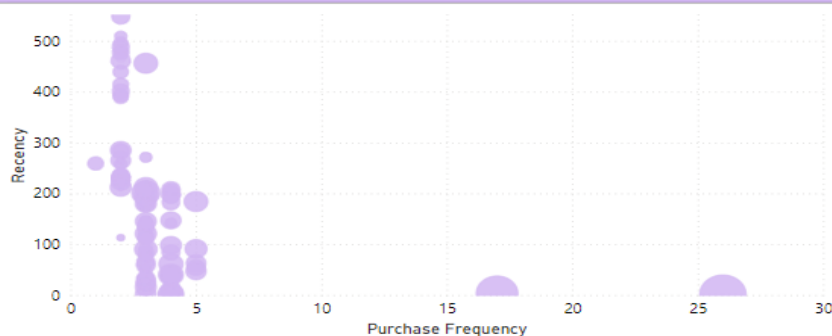
Customer Acquisition Trend



Total customers by Activity Status



RFM Analysis



Customers Contribution

customerName	Purchase Frequency
Alpha Cognac	3
Amica Models & Co.	2
Anna's Decorations, Ltd	4
Atelier graphique	3
Australian Collectables, Ltd	3
Australian Collectors, Co.	5
Australian Gift Network, Co	3
Auto AssociÃfÃs & Cie.	2
Auto Canal+ Petit	3
Auto-Moto Classics Inc.	3
AV Stores, Co.	3

Sliders for Customers Contribution

- ☒ Select all
- ☐ Average Order Value
- ☒ Purchase Frequency
- ☐ Total_Sales

Select Product Category

- ☒ Select all
- ☐ Classic Cars
- ☐ Motorcycles
- ☒ Planes
- ☒ Ships
- ☐ Trains
- ☒ Trucks and Buses
- ☒ Vintage Cars

MENU



Dashboard



Sales Analysis



Product Analysis



Customer Analysis



Demographic Analysis



Inventory Analysis

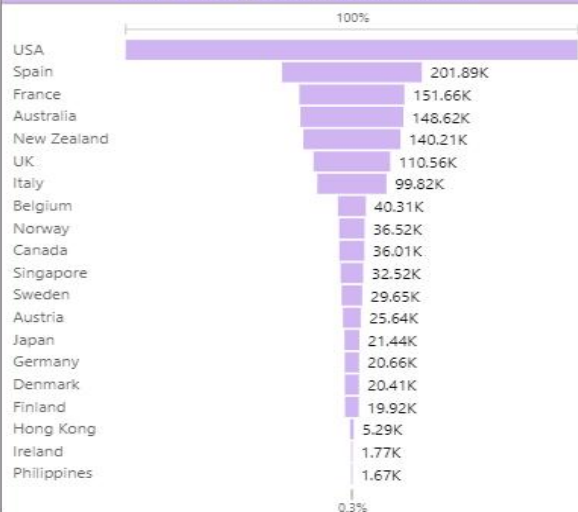


Employee Analysis

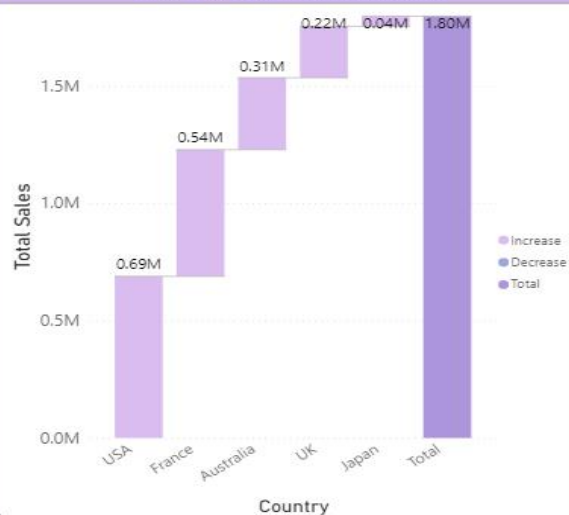


DEMOGRAPHIC ANALYSIS

Total_Sales by Customers Distribution



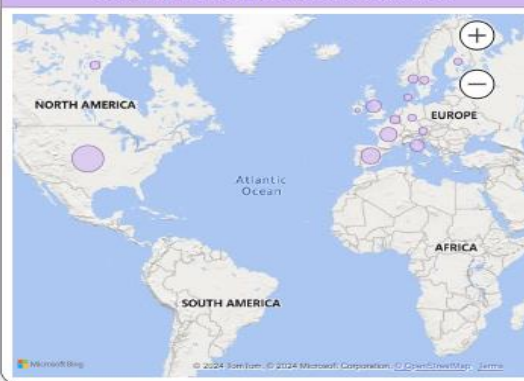
Total_Sales by Office distribution

TOTAL SALES
1.80M

Select Product Category

- ☒ Select all
- ☐ Classic Cars
- ☐ Motorcycles
- ☐ Planes
- ☐ Ships
- ☐ Trains
- ☐ Trucks and Buses
- ☒ Vintage Cars

Geographic Distribution of Customers



Geographic Distribution of Offices



Geographic Distribution of Employees



MENU



Dashboard



Sales Analysis



Product Analysis



Customer Analysis



Demographic Analysis



Inventory Analysis

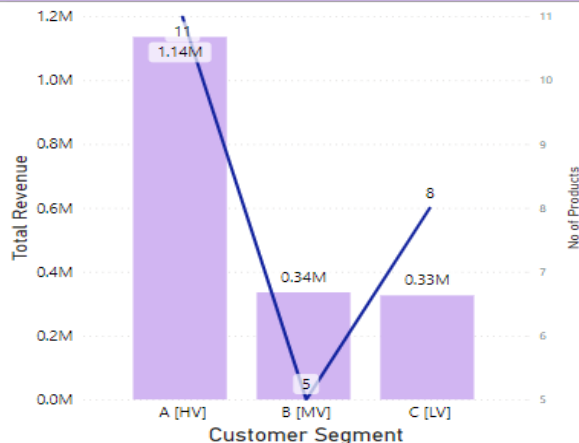


Employee Analysis

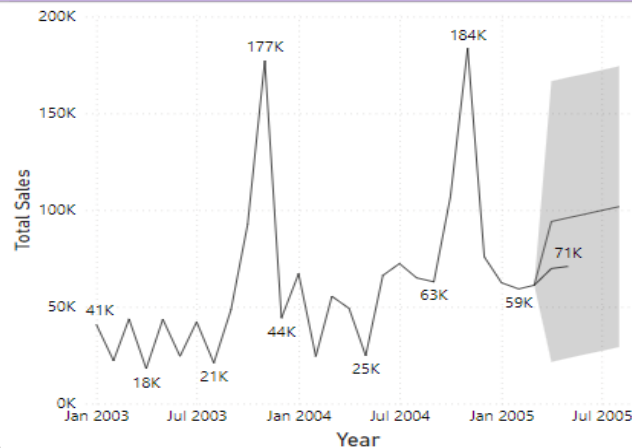


INVENTORY ANALYSIS

ABC_Analysis



Sales Trend



TOTAL INVENTORY
VALUE
5.70M

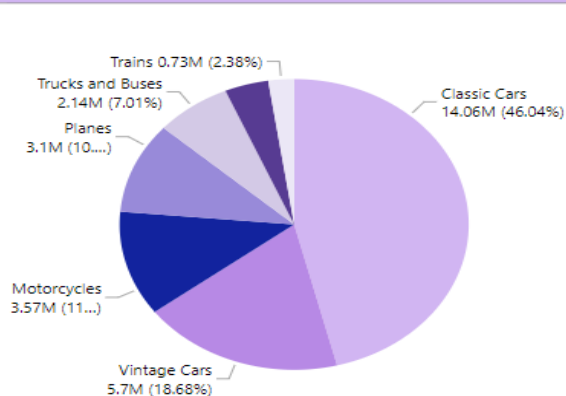
TOTAL QUANTITY IN
STOCK
125K

StockOut Analysis

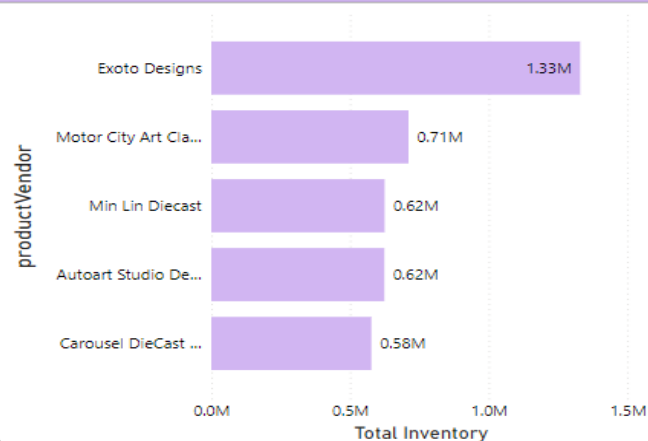
No_of Products to be Reordered



Total Inventory Value by productLine



Top 5 vendors and Top 5 productts



Select Product Category

- ☒ Select all
- ☐ Classic Cars
- ☐ Motorcycles
- ☐ Planes
- ☐ Ships
- ☐ Trains
- ☐ Trucks and Buses
- ☒ Vintage Cars

MENU



Dashboard



Sales Analysis



Product Analysis



Customer Analysis



Demographic Analysis



Inventory Analysis

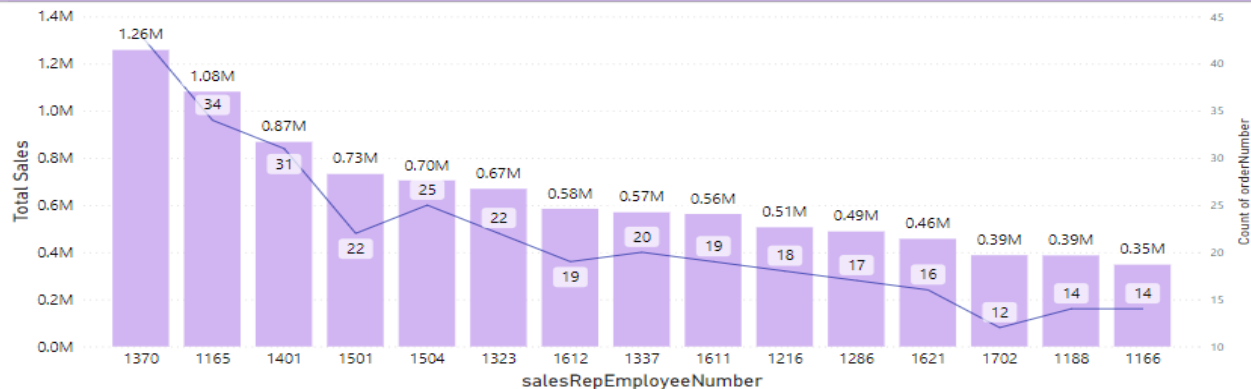


Employee Analysis



EMPLOYEE ANALYSIS

Sales by Sales Representative



NO OF EMPLOYEES

23

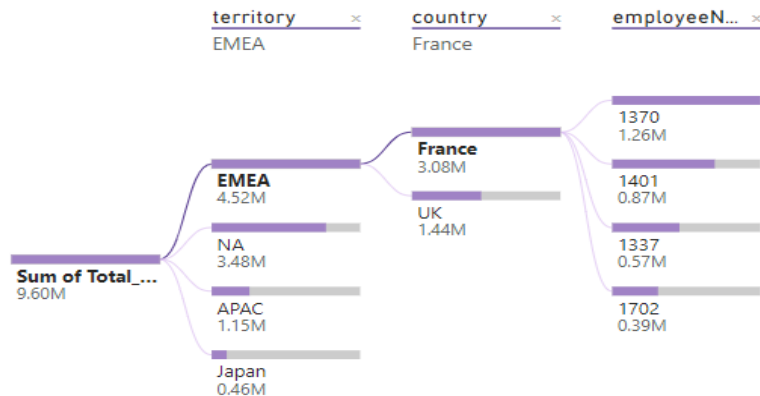
NO OF SALES REPRESENTAIVES

16

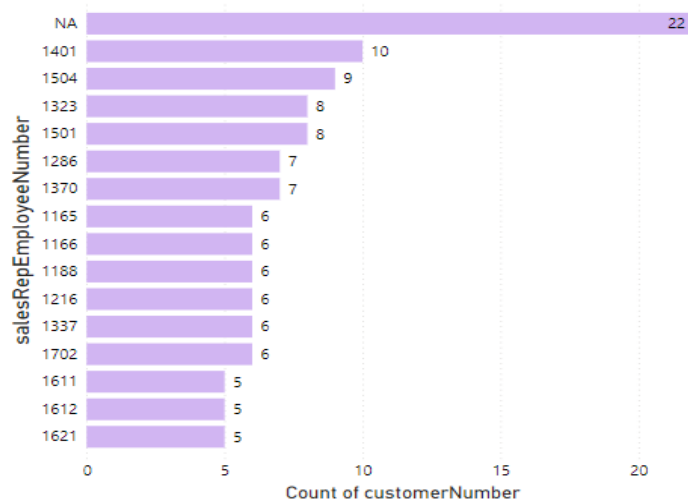
NO OF SALES MANAGERS

3

Employees Sales Contribution



No of Customers by Employee



CONCLUSION

The comprehensive analysis conducted on the retail dataset has provided valuable insights across various facets of the business. Through sales analysis, we've gained a deeper understanding of revenue trends, identifying peak periods and areas for improvement. Product analysis has enabled us to optimize our product offerings, highlighting top-performing items and areas for potential expansion or refinement.

Customer analysis has shed light on consumer behavior, allowing us to tailor marketing strategies and enhance customer satisfaction. Demographic analysis has provided valuable segmentation insights, enabling targeted approaches to different customer groups. Inventory analysis has facilitated efficient inventory management, ensuring optimal stock levels and reducing the risk of overstock or stockouts. Employee analysis has allowed us to assess staff performance, identify training needs, and enhance workforce productivity.

Overall, these analyses have empowered informed decision-making, driving profitability, and enhancing operational efficiency within the retail business.

THANK YOU