

Objective Questions:

1. What is the total number of attributes in the customer table?

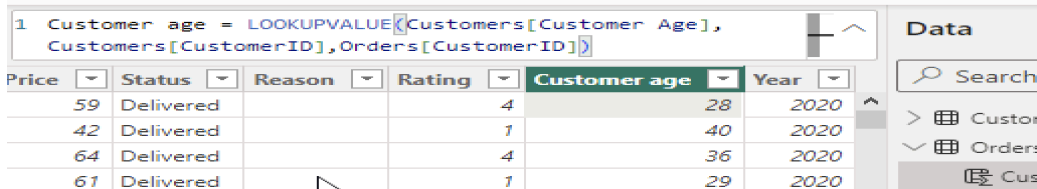


CustomerID	Customer Age	Customer Gender
230459775	34	M

Number of attributes in customer table is **3**

Customer_id , Customer_age, Customer_dob

2. How will you get the “Customer’s” ages in the “Order” tables according to customer IDs?



Price	Status	Reason	Rating	Customer age	Year
59	Delivered		4	28	2020
42	Delivered		1	40	2020
64	Delivered		4	36	2020
61	Delivered		1	29	2020

In Order’s table added new column Customer Age and get data using below dax function

Customerage=LOOKUPVALUE(Customers[Customer Age],Customers[CustomerID],Orders[CustomerID])

This formula will search for the "CustomerID" value from the "Orders" table in the "Customers" table. Once it finds a matching "CustomerID", it will return the corresponding "Customer Age" from the "Customers" table. If no match is found, it will return a blank value.

3. In analyzing the dataset with Power BI, ensure data cleaning to address inconsistencies and missing values before further analysis.

1. First I removed all empty columns with names column18, column19, ... column22 which have no significance in data set.
2. Empty columns were randomly found (count 199) which were deleted as they were meaningless. The corrected total rows now were 1,12,992.

3. I seen null values in “Product Categories ” column and that replaced with correct value by matching sub category and product name and found it belongs to “Health and Beauty”
4. Additionally, I removed null values from the "Unit Price" column to maintain meaningful sales data, considering that missing prices would impact the accuracy of sales calculations.
5. The Reasons column had about 83k null values where proper reasons weren't mentioned. Which were instead replaced with “not mentioned”.
6. For products whose status is marked as 'delivered', I replaced blank values with ‘-’ in the 'reasons' column as they indicate non-returns. Additionally, I addressed null values in reason column specifically for returned items.

4. How can we calculate the total revenue generated by all the sales?

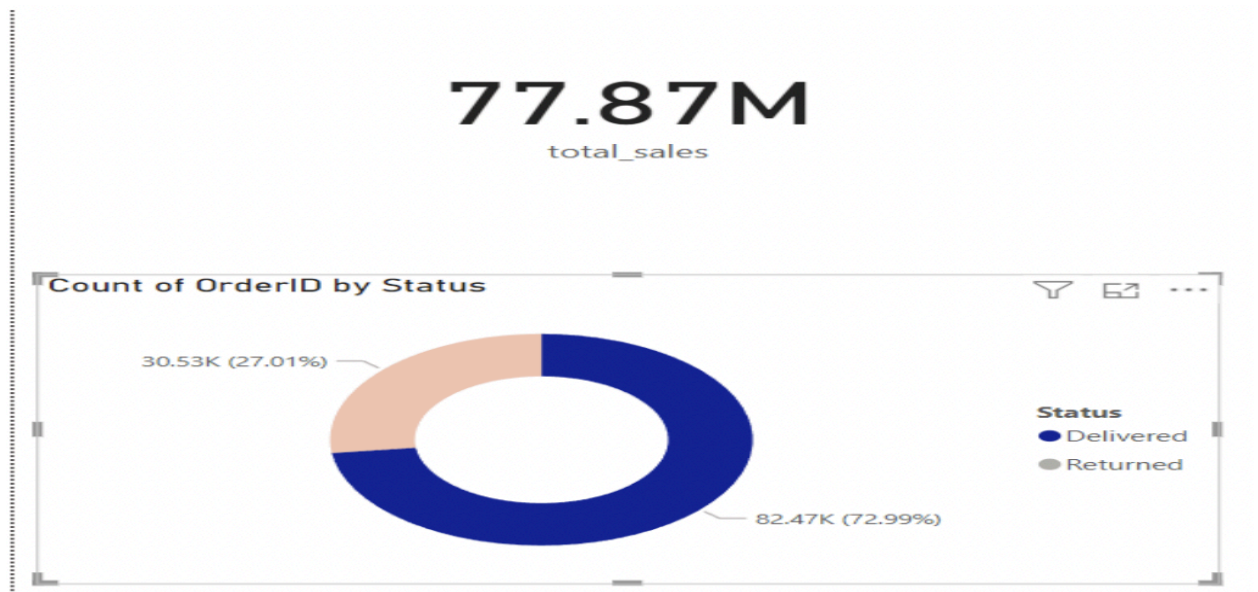


Created a measure TotalSales and selected in card

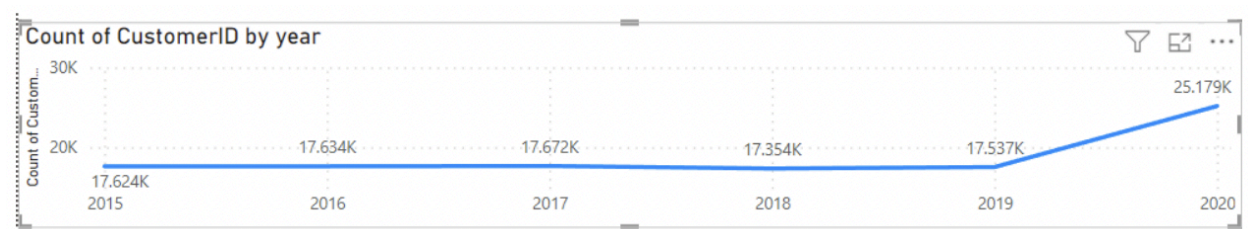
I used DAX function(mentioned below) for creating measure

Total sales = SUM(Orders[Sale Price])

Total revenue generate by delivered product



5. What is the total number of unique customers who made purchases each year? Is there any increase in the number over the years?



In the options panel, the count of distinct values was chosen following the extraction of the year column from the order date, leading to visualization. The chart clearly illustrates the overall growth trend of unique customers each year.

6. How can we determine the total number of unique products available in the company?

44
 Total Distinct Product

Created measure to get total number of distinct products below is the DAX function value is 44

Distict product = DISTINCTCOUNT(Orders[Product])

7. What is the average number of days it takes for products to be delivered, get the metric for only the delivered orders.



Created one measure for average days of delivery by using below DAX function

Average Delivery Days = AVERAGEX(Orders,DATEDIFF(Orders[OrderDate], Orders[Delivery Date], DAY))

For delivered status:



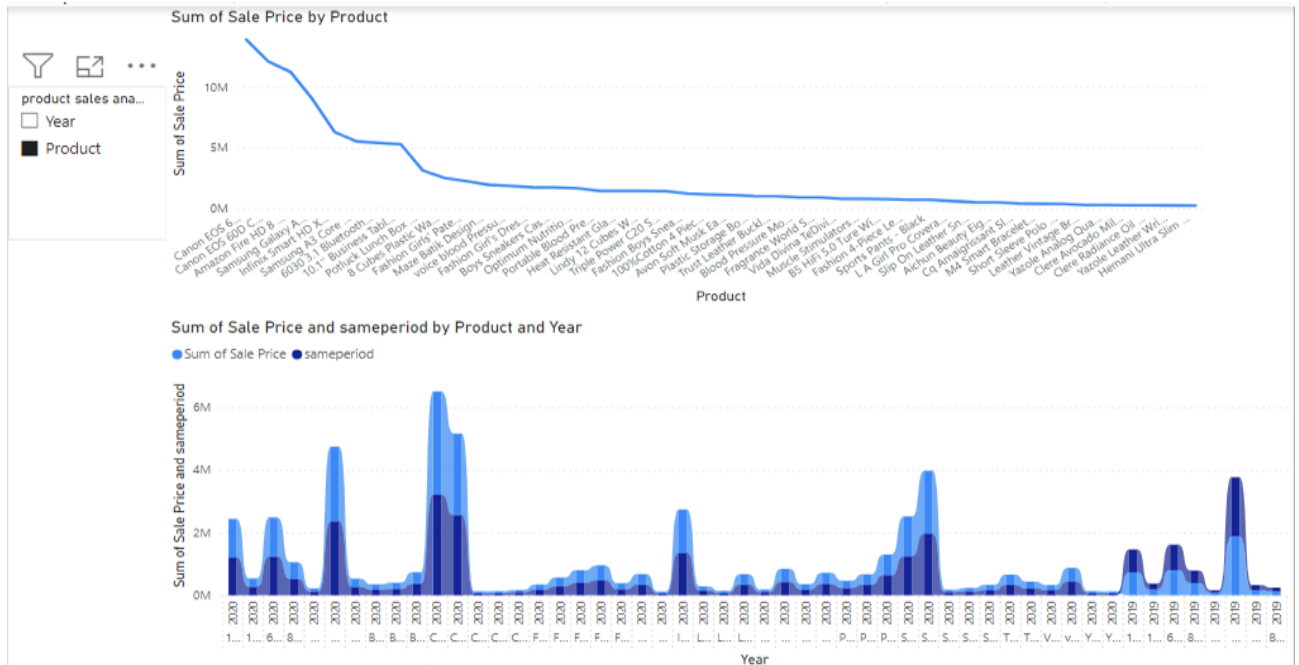
8. Which products, categories, and subcategories are the most popular?

Considering all pertinent columns within the same table, the output showcases the most favored category, subcategory, and product.

Fashion Boys Sneakers Children Outdoor Shoes-Black	Fashion	Boy's fashion	
Short Sleeve Polo Shirt - Royal Blue	Fashion	Boy's fashion	
Slip On Leather Sneakers - Black	Fashion	Men's fashion	

This selection is made with the filter status = delivered, as it is logical to count only those products as popular if they have not been returned.

9. Which products have seen an increase or decrease in sales over the year?





Products which have seen increase sales over the year are

Product	2015	2016	2017	2018	2019	2020
Canon EOS 600D 18MP CMOS DSLR Camera - Black	21,72,535.00	19,65,264.00	22,40,221.00	20,82,640.00	20,85,344.00	32,57,274.00
Canon EOS 60D CMOS DSLR Camera Bundle - 18 - 55mm Lens - Black	19,55,179.00	17,95,068.00	18,56,338.00	18,51,557.00	20,07,008.00	25,86,825.00
Amazon Fire HD 8 Kids Tablet 32GB HDD - 2GB RAM - 8" Blue	17,07,458.00	16,97,232.00	18,22,827.00	17,10,381.00	18,91,602.00	23,86,397.00
Samsung Galaxy A02 - 64GB HDD - 3GB RAM Smartphone - Black	14,61,276.00	13,89,073.00	14,03,550.00	13,00,241.00	14,19,782.00	19,79,675.00
Infinix Smart HD X612 (2021) - 32GB HDD - 2GB RAM - Black	9,73,688.40	9,90,380.20	9,96,614.80	9,64,196.00	9,67,971.20	13,71,274.80

- Canon EOS 60D CMOS DSLR Camera Bundle - 18 - 55mm Lens – Black
- Canon EOS 600D 18MP CMOS DSLR Camera – Black
- Amazon Fire HD 8 Kids Tablet 32GB HDD - 2GB RAM - 8" Blue
- Samsung Galaxy A02 - 64GB HDD - 3GB RAM Smartphone – Black
- Infinix Smart HD X612 (2021) - 32GB HDD - 2GB RAM – Black

These above mentioned are top 5 products experienced year-over-year sales growth from 2015 to 2020, significantly contributing to overall revenue generation.

Products which have seen decrease sales over the year are

	Clipboard	Data		Queries		Insert		Calculations	
	Product	2015	2016	2017	2018	2019	2020		
 	Hemani Ultra Slim Tea - 10 Bags	40,588.00	35,862.00	36,402.00	37,252.00	37,805.00	55,058.00		
	Yazole Leather Wrist Watch - Black	39,398.00	41,057.00	39,722.00	40,550.00	39,467.00	58,477.00		
	Clere Radiance Oil Control Toner - 100ml	38,972.00	39,720.00	43,164.00	43,567.00	40,368.00	62,523.00		
	Clere Avocado Milk Body Lotion With Vitamins E+A - 400ml	40,728.00	41,410.00	44,289.00	41,745.00	43,287.00	60,079.00		
	Yazole Analog Quartz Wrist Watch - Black	47,714.00	50,878.00	43,194.00	47,290.00	42,856.00	64,901.00		

The sales performance of the aforementioned products is unimpressive, exhibiting alternating decreases in sales over the years. Consequently, these products do not demonstrate favorable trends and have not significantly contributed to revenue generation.

10. While modeling the data relationships, what will be the type of relationship between the customer ID of Orders and customer tables?

The association between the customer ID in the orders table and the customer's table represents a many-to-one relationship. This implies that multiple orders can be linked to the same customer ID, suggesting that a single customer can initiate multiple orders.

11. How have you handled the null values in the data?

The data was refined by excluding all null values across all columns, resulting in 199 records. Subsequently, a null value in the product category column was substituted with "Health and Beauty" to maintain consistency with the remaining metrics. Similarly, a null entry in the "Reasons" column, depicted by an image, was substituted with "not mentioned."

12. Were there any data format issues in the data, and if there were/are how you would handle them?

	OrderDate	OrderID	Delivery Date	CustomerID	Customer Age	Location	Zone
1	31-05-2020	5136486	04-06-2020	230569424	57	Western	Zone 3
2	24-10-2015	5037765	08-11-2015	230459067	38	Weija	Zone 2
3	31-05-2020	5136457	12-06-2020	230568182	24	Western	Zone 3
4	23-06-2017	5067117	25-06-2017	230459068	38	Weija	Zone 2
5	31-05-2020	5136465	10-06-2020	230567584	31	Weija	Zone 2
6	23-04-2018	5081655	26-04-2018	230459069	38	Weija	Zone 2
7	31-05-2020	5136488	05-06-2020	230563788	62	Greater Accra	Zone 1
8	11-01-2020	5111842	14-01-2020	230459072	38	Weija	Zone 2
9	31-05-2020	5136449	10-06-2020	230563726	18	Weija	Zone 2
10	17-10-2020	5125369	29-10-2020	230459073	38	Weija	Zone 2
11	31-05-2020	5136471	20-06-2020	230555144	35	Western	Zone 3
12	31-01-2020	5130568	02-02-2020	230459074	38	Weija	Zone 2
13	31-05-2020	5136478	20-06-2020	230552632	43	Ashanti	Zone 3
14	16-05-2015	5029893	18-05-2015	230459075	38	Western	Zone 3
15	31-05-2020	5136477	19-06-2020	230550422	42	Ashanti	Zone 3
16	09-08-2017	5069386	14-08-2017	230459076	38	Western	Zone 3
17	31-05-2020	5136463	13-06-2020	230548834	28	Greater Accra	Zone 1
18	18-12-2015	5040418	30-12-2015	230459077	37	Volta	Zone 3
19	31-05-2020	5136459	05-06-2020	230544248	26	Greater Accra	Zone 1
20	05-01-2017	5058959	14-01-2017	230459078	37	Volta	Zone 3
21	31-05-2020	5136458	05-06-2020	230542962	25	Greater Accra	Zone 1
22	14-02-2017	5060941	19-02-2017	230459079	37	Volta	Zone 3

All format inconsistencies were resolved. Nonetheless, numerous columns

exhibited null values, necessitating corrective actions. These null values were meticulously managed and rectified as part of the data processing phase. By addressing these null values, data integrity and completeness were upheld, thereby guaranteeing precise analysis and insights.

13. When we add a column in Power Query what's the code that comes in M language in the formula bar? What do you know about M-query?

What is M-query?

M-query is a powerful language used for data transformation within Power Query, offering a comprehensive set of functions and operators. It enables users to perform various tasks such as filtering, sorting, grouping, merging, and pivoting to shape data according to their requirements.

Functional Approach:

M-query is a functional language, treating data transformations as function applications. This approach allows users to define custom functions and apply them to datasets, enhancing flexibility and facilitating reusability in data processing tasks.

Formula Bar Usage:

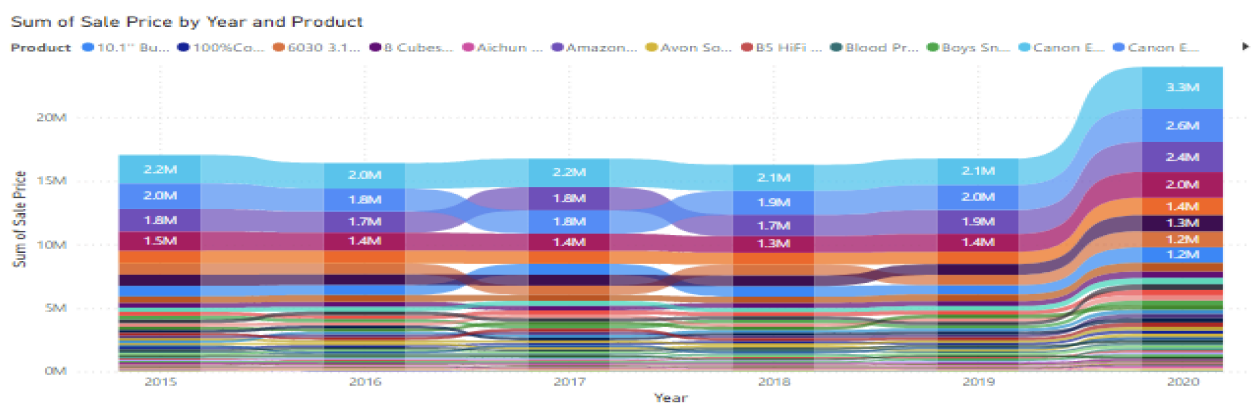
In the Power Query Editor, users can directly view and edit M-query code in the formula bar. This feature provides precise control over data transformation processes, empowering advanced users to execute complex transformations beyond the capabilities of the graphical user interface (GUI).

Subjective Question:

1. Explain the revenue breakdown by year and by-product. Evaluate how different products contribute to annual revenue and come up with suggestions to increase the sales of the low-selling items.

Product	2015	2016	2017
10.1" Business Tablet with MT6582 Quad-Core Processor	8,36,749.00	7,92,777.00	8,69,582
100%Cotton 4 Piece Short Sleeve T-Shirts - Multicolour	1,60,406.00	1,80,193.00	1,82,816
6030 3.1 Bluetooth Home Theatre With Remote Control - Black + Free Smartwatch	8,85,807.00	8,74,344.00	7,36,239
8 Cubes Plastic Wardrobe - Blue/White	3,85,142.00	4,12,416.00	3,67,311
Aichun Beauty Eight Pack Essential Oil - 30ml	84,420.00	78,250.00	83,474
Amazon Fire HD 8 Kids Tablet 32GB HDD - 2GB RAM - 8" Blue	17,82,396.00	16,68,531.00	18,34,784
Avon Soft Musk Eau de Toilette Spray - 50ml	1,68,358.00	1,89,125.00	1,64,367
B5 HiFi 5.0 Tune Wireless Headsets Auto Pair Touch - Black	1,18,868.00	1,19,047.00	1,12,991
Blood Pressure Monitor Digital Wrist BP Pulse Monitor Meter Heart Rate Measure	1,51,898.60	1,38,978.20	1,44,907
Boys Sneakers Casual Kids Sports Shoes-Gold	3,00,693.00	2,70,326.00	2,65,641
Canon EOS 600D 18MP CMOS DSLR Camera - Black			
Total	1,70,43,052.35	1,64,09,788.15	1,67,55,086

Firstly created a matrix with year in column and products in rows and sum of sales in values



And to visualise matrix i used ribbon chart placed year in axis and sum of sales in y axis and products in legend to show increase or decrease in sales breakdown with year for each product.

Yazole Leather Wrist Watch - Black	0,726.00	33,747.00	31,525.00	45,594.00	2,07,028.00
Leather Vintage Bracelet Watch - Black	0,283.00	33,335.00	28,799.00	45,948.00	2,02,625.00
Yazole Analog Quartz Wrist Watch - Black	1,002.00	33,192.00	29,749.00	43,074.00	2,00,376.00
Hemani Ultra Slim Tea - 10 Bags	9,010.00	29,123.00	30,491.00	42,935.00	1,93,012.00
Clere Avocado Milk Body Lotion With Vitamins E+A - 400ml	0,416.00	27,932.00	27,305.00	39,745.00	1,80,782.00
Total	3,613.60	1,18,76,822.50	1,20,84,116.55	1,73,85,321.05	7,78,72,725.40

And above picture showing top 5 sales product with lowest total sales as you can see product name is "yazole black watch", "Braclet watch","ultra slim tea bags",vitamins

The aforementioned product contributed 0.23%,0.24%,0.25%,0.25% and 0.28% respectively to revenue generation.

Product	2018	2019	2020	Total	
Canon EOS 600D 18MP CMOS DSLR Camera - Black	6,962.00	16,95,472.00	16,90,093.00	25,65,013.00	1,10,14,781.00
Canon EOS 60D CMOS DSLR Camera Bundle - 18 - 55mm Lens - Black	6,868.00	12,86,085.00	12,76,775.00	17,15,078.00	81,31,868.00
Amazon Fire HD 8 Kids Tablet 32GB HDD - 2GB RAM - 8" Blue	4,276.00	11,94,678.00	12,24,346.00	16,17,291.00	75,99,489.00
Samsung Galaxy A02 - 64GB HDD - 3GB RAM Smartphone - Black	7,529.00	8,53,259.00	9,74,925.00	12,49,074.00	59,49,751.00
Infinix Smart HD X612 (2021) - 32GB HDD - 2GB RAM - Black	3,842.00	7,11,334.40	7,30,707.60	11,35,347.40	49,56,671.40

Here above picture showing top 5 with highest sale product like camera, lens, tablet, smartphone and HDD to justify products

The aforementioned product contributed 12.95%, 11.28%, 10.48%, 8.39% and 5.87% respectively to revenue generation.

Suggestions for least selling products to increase sales

- Improve marketing efforts increase campaigns.
- Explore opportunities to bundle with high higher selling products and cross selling
- Gather feedback from customers and consider making improvements or modifications to low selling items based on their preferences and suggestions.
- Give discount on low selling product

2. How many products were returned? Use a DAX function to get this metric. Examine the possible reasons for returns and consider how this metric could indicate improvements in product descriptions or quality control.

31K
Returned Products

Total returned products is 31K by using below DAX function created measure

ReturnedProducts = CALCULATE(

Count('Orders'[status]),

'Orders'[status] = "Returned"

)

Reasons for Returns:

Product Defects: Items returned due to defects or quality issues.

Missing Items/Parts: Returns resulting from incomplete deliveries or missing components.

Unmet Expectations: Products returned when they fail to meet customer expectations.

Incorrect Deliveries: Returns initiated due to the receipt of wrong or inaccurate items.

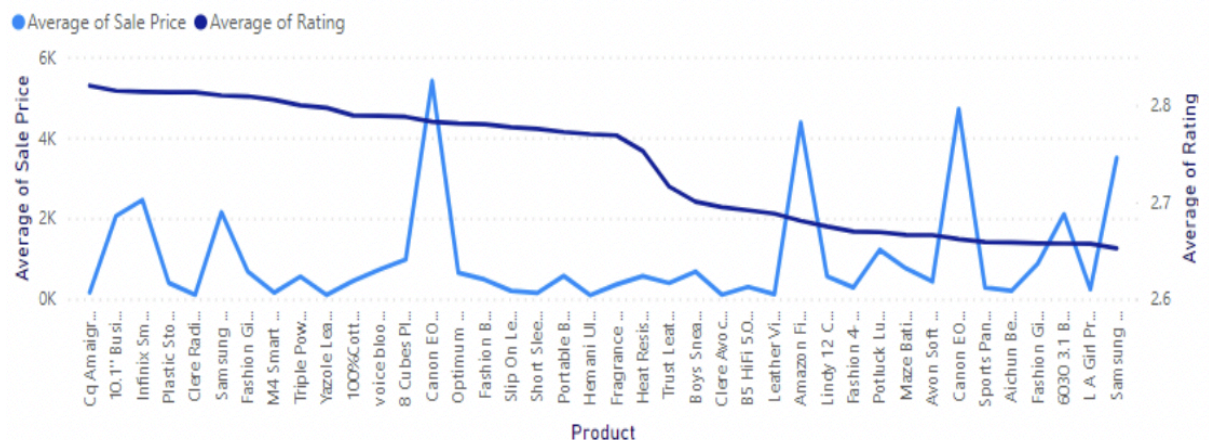
Analysis:

- Returned products often receive low ratings due to the aforementioned reasons, indicating customer dissatisfaction.
- Addressing these reasons can lead to enhancements in product quality and overall customer satisfaction.
- Implementing stringent quality checks during product dispatch can ensure accurate deliveries and minimize the occurrence of incorrect items being sent.

By resolving these issues, we anticipate a reduction in the rate of product returns, resulting in increased revenue generation and heightened customer satisfaction.

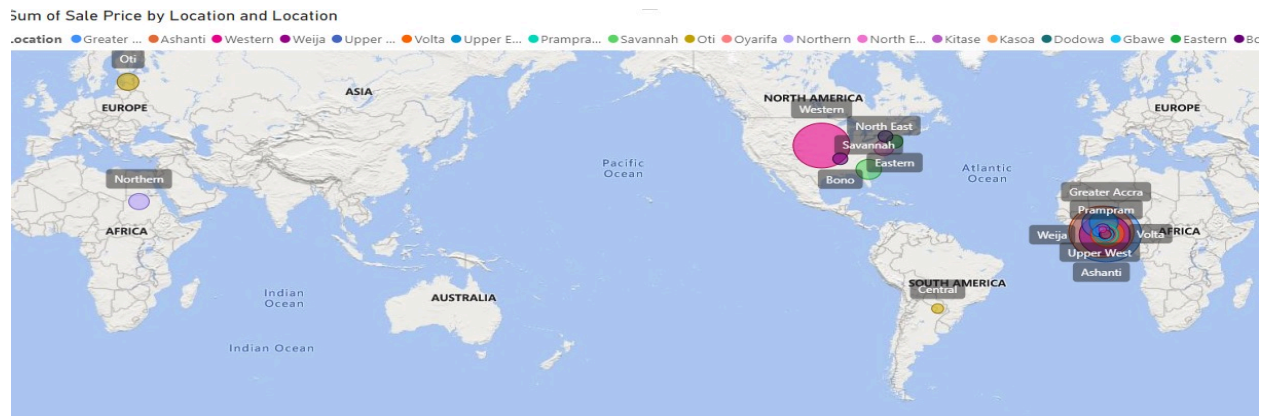
3. Whenever a customer goes to Amazon, they'll filter the most rated products to buy the better category. Can you verify this using any visualization or table that the ratings of products impact their sales value?

Average of Sale Price and Average of Rating by Product



- No correlation between the rating of products and their sales value.
- High ratings do not necessarily result in high sales values, and reverse, low ratings do not lead to low sales values.
- Despite the perception that higher-rated products would have higher sales and vice versa, this is not observed in the data.
- Contrary to expectations, products with high ratings may not always perform better in terms of sales, and products with low ratings may still achieve significant sales volumes.

4. Investigate how revenue distribution varies across different locations. Explore which geographical areas contribute most to sales and consider the strategic implications for regional marketing and distribution efforts. How might location-based trends inform the company's market segmentation and resource allocation approach?



Location	2015	2016	2017	2018	2019	2020	2021	Total
Greater Accra	39,59,681.20	41,50,648.70	42,28,950.30	42,30,753.40	43,41,090.90	60,48,375.45	1,13,876.25	2,70,73,376.20
Ashanti	36,57,531.15	35,03,512.85	35,88,953.75	33,50,924.85	34,32,961.35	49,93,917.05	84,814.25	2,26,12,615.25
Western	24,36,010.70	25,36,786.65	26,25,017.55	25,68,368.70	26,23,074.25	37,80,255.20	71,690.80	1,66,41,203.85
Weija	21,12,992.00	18,96,024.50	20,65,913.45	20,13,648.65	19,95,256.30	28,21,959.85	69,082.80	1,29,74,877.55
Upper West	8,27,085.85	8,31,498.30	8,32,492.70	8,52,055.85	8,19,389.00	11,72,672.10	35,795.00	53,70,988.80
Volta	7,45,043.90	7,11,626.85	7,60,866.45	6,84,231.30	8,20,811.50	10,75,995.40	16,358.25	48,14,933.65
Upper East	5,44,622.20	4,88,752.35	5,10,757.20	4,60,381.70	5,05,523.05	6,66,623.65	21,992.00	31,98,652.15
Prampram	3,63,070.95	3,48,891.60	3,55,703.35	3,24,250.60	3,71,468.25	4,97,097.15	6,517.00	22,66,998.90
Savannah	3,68,459.35	3,89,793.55	3,04,325.15	3,37,355.05	3,95,243.55	4,37,278.65	8,731.50	22,41,186.80
Oti	2,07,408.60	2,34,251.25	2,21,715.05	2,04,843.15	2,30,350.55	3,14,239.00	4,429.20	14,17,236.80
Oyarifa	2,19,537.35	1,64,769.35	1,67,519.60	1,91,093.10	2,01,194.65	3,35,414.40	6,248.05	12,85,776.50
Northern	1,93,799.85	1,53,737.50	1,94,849.10	1,71,091.30	1,71,688.90	3,03,569.45	1,698.00	11,90,434.10
North East	1,33,233.40	1,91,151.20	1,41,294.10	1,59,945.60	1,89,569.95	2,37,340.45	1,387.50	10,53,922.20
Kitase	1,27,026.20	1,31,626.15	1,20,110.40	1,17,081.35	1,47,936.80	2,17,775.20	306.00	8,61,862.10
Kasoa	1,32,757.80	1,09,654.20	89,209.75	1,27,812.60	1,14,005.95	1,16,534.95	8,735.00	6,98,710.25
Dodowa	56,926.50	1,07,213.05	87,600.95	1,22,932.85	1,02,277.15	1,31,810.90	1,485.00	6,10,246.40
Gbawe	1,06,709.60	86,189.50	1,00,955.90	92,545.20	79,054.70	1,38,088.65	3,618.00	6,07,161.55
Eastern	93,896.60	84,834.70	1,14,950.60	77,297.70	81,304.65	1,51,334.30	497.00	6,04,115.55
Bono	47,422.55	56,983.10	78,945.50	60,201.20	65,787.60	91,794.15	1,111.00	4,02,245.10
Western North	77,302.40	70,806.40	50,940.80	53,727.30	53,194.60	77,039.80	4,842.00	3,87,853.30
Brong-Ahafo	47,625.10	60,126.85	53,400.00	39,005.45	48,806.10	1,17,347.20	403.00	3,66,713.70
Ahafo	27,913.60	28,907.00	38,196.00	12,255.00	41,998.50	36,455.40		1,85,725.50
Central	22,283.25	11,958.20	17,240.00	17,980.00	40,362.20	40,087.40	2,262.00	1,52,173.05
Amasaman	27,573.00	19,165.40	21,526.80	30,677.75	13,921.75	18,288.45	1,551.00	1,32,704.15
Dawhenya	10,621.00	9,647.00	6,957.00	18,849.60	8,534.00	30,812.20		85,420.80
Bono East	448.00		1,375.00	132.00				1,955.00
Total	1,65,46,982.10	1,63,78,556.20	1,67,79,766.45	1,63,19,441.25	1,68,94,806.20	2,38,52,106.40	4,67,430.60	10,72,39,089.20

Mapped sales data to visualize sales by location, with the legend representing each location and bubble size indicating sales price. Larger bubbles represent higher sales in the respective country.

Top Sales-Contributing Locations:

- Greater Accra, Ashanti, Western, Weija, and Upper West are the top-performing locations with the highest sales.

Least Sales-Contributing Locations:

- Central, Amasaman, Dawhenya, and Bono East are the locations with the lowest sales contribution.

Strategic Implications for Regional Marketing:

For High-Performing Locations:

Targeted Marketing: Invest in targeted marketing campaigns tailored to high-performing regions using data-driven insights to develop personalized advertising strategies.

Localized Product Assortment: Customize product offerings to align with the preferences of customers in high-performing areas.

Enhanced Distribution Networks: Optimize distribution networks by strategically

locating warehouses closer to high-performing regions to reduce delivery times and shipping costs.

For Low-Performing Locations:

Market Research: Conduct thorough market research to understand the underlying reasons for low sales and devise targeted strategies for improvement.

Targeted Marketing Campaigns: Develop focused marketing campaigns to raise awareness and stimulate demand in low-performing areas.

Local Partnerships: Collaborate with local businesses or influencers to increase brand visibility and credibility in low-performing regions.

Market Segmentation and Resource Allocation:

Regional Preferences Drive Targeted Marketing: Tailor marketing campaigns based on regional differences in consumer preferences to improve sales.

Efficient Resource Allocation: Focus resources such as advertising budgets and sales teams on regions with high market potential to maximize sales opportunities.

Customized Offerings Enhance Customer Satisfaction: Customize products or services to align with local tastes, fostering stronger customer loyalty and satisfaction.

5. Determine which month could benefit from enhanced promotional offers to boost sales. Can you suggest some targeted marketing strategies here?

Sum of Sale Price by Month



Sales exhibit a significant drop from August to December, contrasting with an upward trend observed from January to May, with June and July maintaining steady sales levels. To address the decline in sales during the latter months, implementing promotional offers could prove highly beneficial.

Strategies for Targeted Marketing:

Introduce Special Discounts: Offer time-limited discounts such as Lightning Deals and Daily Deals to create a sense of urgency, motivating customers to make immediate purchases and thereby boosting sales during slower periods.

Bundle Deals: Create bundled offers where customers receive discounts for purchasing multiple items or complementary products together, encouraging increased spending and driving sales.

Social Media Advertising: Allocate funds for targeted advertisements on social media platforms to reach specific audience segments likely to be interested in your products, maximizing the effectiveness of ad expenditures.

Leverage Amazon Prime Day: Capitalize on events like Amazon Prime Day to generate sales spikes by offering exclusive deals and discounts for Prime members, incentivizing sign-ups and driving sales.

Referral Incentives: Encourage satisfied customers to refer friends and family by providing rewards or discounts for successful referrals, leveraging word-of-mouth marketing to attract new customers and increase sales volumes.

6. Identify which products may require increased marketing efforts. Which items have high prices yet underperform in sales?

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Leather Vintage Bracelet Watch - Black	0,283.00	33,335.00	28,799.00	45,948.00	2,02,625.00
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Hemani Ultra Slim Tea - 10 Bags	9,010.00	29,123.00	30,491.00	42,935.00	1,93,012.00
Clere Avocado Milk Body Lotion With Vitamins E+A - 400ml	0,416.00	27,932.00	27,305.00	39,745.00	1,80,782.00
Total	3,613.60	1,18,76,822.50	1,20,84,116.55	1,73,85,321.05	7,78,72,725.40

Question one graph , For these products require marketing effort to increase sales as they low sales .

Distinguish items that underform in sales and high price, %sum of sale price is also see below.

Fashion Girls' Patent Leather Stitching Shoes - Black	156.00	2.22%
Maze Batik Designed 3D Wallpaper - 10M - White/Black	135.00	1.80%
voice blood Pressure Monitor Digital BP Pulse Health Vascular Heartbeat Test	129.00	1.62%
Fashion Girl's Dress Kids Children Newborn Baby Dinner Party Princess Dress Ball Gown	125.00	1.62%
Boys Sneakers Casual Kids Sports Shoes-Gold	120.00	1.53%
Optimum Nutrition Creatine Sports - 5000mg per Daily Serve Powder	115.00	1.73%

These list of products which sold 120 or more unit still below 2.23% sale , These products price higher then average still underperform.

Solution- Discount, Marketing effort,quality feedback etc.

7. Assess which products should have discounts. How can targeted incentives drive sales and customer loyalty for specific products?

Product which have low sales what expected, on that product we should give discount in any form.

Product with low trends:

Yazole Leather Wrist Watch - Black	0,726.00	33,747.00	31,525.00	45,594.00	2,07,028.00
Leather Vintage Bracelet Watch - Black	0,283.00	33,335.00	28,799.00	45,948.00	2,02,625.00
Yazole Analog Quartz Wrist Watch - Black	1,002.00	33,192.00	29,749.00	43,074.00	2,00,376.00
Hemani Ultra Slim Tea - 10 Bags	9,010.00	29,123.00	30,491.00	42,935.00	1,93,012.00
Clere Avocado Milk Body Lotion With Vitamins E+A - 400ml	0,416.00	27,932.00	27,305.00	39,745.00	1,80,782.00
Total	3,613.60	1,18,76,822.50	1,20,84,116.55	1,73,85,321.05	7,78,72,725.40

Product with High trends:

Product		2018	2019	2020	Total
Canon EOS 600D 18MP CMOS DSLR Camera - Black		6,962.00	16,95,472.00	16,90,093.00	25,65,013.00
Canon EOS 60D CMOS DSLR Camera Bundle - 18 - 55mm Lens - Black		6,868.00	12,86,085.00	12,76,775.00	17,15,078.00
Amazon Fire HD 8 Kids Tablet 32GB HDD - 2GB RAM - 8" Blue		4,276.00	11,94,678.00	12,24,346.00	16,17,291.00
Samsung Galaxy A02 - 64GB HDD - 3GB RAM Smartphone - Black		7,529.00	8,53,259.00	9,74,925.00	12,49,074.00
Infinix Smart HD X612 (2021) - 32GB HDD - 2GB RAM - Black		3,842.00	7,11,334.40	7,30,707.60	11,35,347.40

It can be special offer , limited period offer, or loyalty reward. These discount attract customer to buy the product if value for money.

Using targeted incentives is an effective strategy to both reward and maintain current customers, ultimately cultivating loyalty. By providing exclusive discounts or rewards to those who have shown loyalty, companies can encourage repeat purchases and strengthen their connections with their customer base. These incentives can be customized to cater to particular customer segments, taking into account their preferences, purchase history, or behavior. Personalized incentives are particularly impactful as they resonate more with customers and are more likely to drive engagement and loyalty compared to generic promotions.

8. Come up with a loyalty program to benefit the company's customers. From the available lot of customers come up with strategies to bucket them and provide benefits under different loyalty programs.

Amazon Loyalty Program:

Tier 1: Iron

1. Receive a 3% discount on all purchases.
2. Enjoy early access to seasonal sales and promotions.

3. Receive a 10% birthday discount.

Tier 2: Bronze

1. Get a 10% discount on all purchases.
2. Benefit from free standard shipping on all orders.
3. Gain exclusive access to limited-edition collections.
4. Earn quarterly bonus rewards points equivalent to 5% of your total spend.

Tier 3: Silver

1. Enjoy a 15% discount on all purchases.
2. Receive complimentary expedited shipping on all orders.
3. Gain VIP access to Amazon events and fashion shows.
4. Participate in personalized styling sessions with FashionForward experts.
5. Receive an anniversary gift of a \$50 gift card.

Tier 4: Gold

1. Receive a 20% discount on all purchases.
2. Gain early access to new arrivals.
3. Receive exclusive seasonal gifts from Amazon designers.
4. Enjoy priority customer service and dedicated support channels.

Tier 5: Platinum

1. Enjoy a 25% discount on all purchases.
2. Receive customized fashion recommendations based on your style preferences.
3. Receive invitations to exclusive fashion events hosted by top designers.
4. Gain access to limited-edition designer collaborations.
5. Participate in an annual fashion consultation with an Amazon stylist.

Tier 6: Diamond

1. Enjoy a 30% discount on all purchases.
2. Gain access to private shopping experiences at Amazon flagship stores.
3. Get the opportunity to pre-order upcoming collections before they launch.
4. Benefit from personalized fashion concierge service available 24/7.
5. Receive an invitation to join the Amazon advisory panel for product

feedback and development.

Tier 7: Ascendant

1. Receive a 35% discount on all purchases.
2. Receive quarterly surprise luxury gifts curated by Amazon directors.
3. Gain exclusive invitations to global fashion weeks with all expenses paid.
4. Get a dedicated account manager for personalized assistance.
5. Enjoy priority access to limited-edition luxury collaborations.

Tier 8: Immortal

1. Enjoy a 40% discount on all purchases.
2. Participate in an annual fashion retreat to exotic locations with other Immortal members.
3. Gain VIP access to private fashion shows and after-parties.
4. Receive a lifetime membership to the Amazon elite club.

9. Using the DAX functions **Calculate** and a row iteration DAX function calculate the total sales for the Product Category "Fashion" and delivery type "Shipped from Abroad". What are the other types of DAX functions you have used in the project?

4.14M
revenueonfashion

Dax function used:

```
revenue_on_fashion = CALCULATE(  
    SUMX(Customers, [total_sales]),  
    Orders[Product Category] = "fashion",  
    Orders[Delivery Type] = "Shipped from Abroad"
```

)

Other dax functions used:

Returned Products Count: Counts the number of returned products.

returned_products = CALCULATE(

COUNT(Orders[Product]),

Orders[Status] = "Returned"

)

To extract date from order date and format it in “January, February..” etc.

Month = FORMAT(Orders[OrderDate].[Date], "MMM")

Delivery Duration: Calculates the number of days it took for the product to get delivered.

Date_dif = DATEDIFF(Orders[OrderDate], Orders[Delivery Date], DAY)

Calculation for previous month for the same year.

previous_year_sale = CALCULATE(

SUM(Orders[Sale Price]),

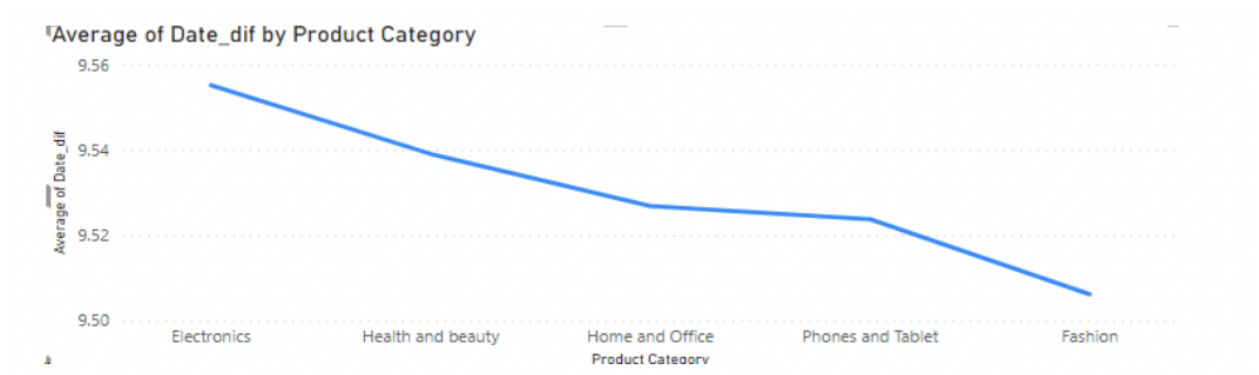
SAMEPERIODLASTYEAR(Orders[Delivery Date]),

ALLEXCEPT(Orders, Orders[Delivery Date])

)

10. Wait Times Correlated with Demographics and Care: Explore how average wait times vary across different product categories to optimize scheduling and staffing.

Product Category	Average of Date_dif
Electronics	9.56
Fashion	9.51
Health and beauty	9.54
Home and Office	9.53
Total	9.53

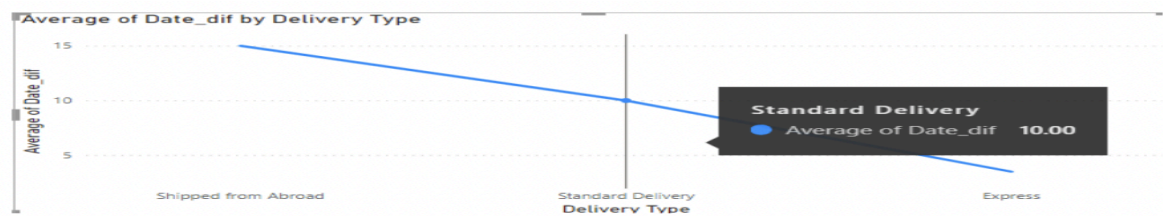


Analysis of the provided chart and table reveals that the Fashion category experiences the shortest waiting period, whereas the Electronics category exhibits the longest waiting period.

Optimization and Scheduling Strategies:

- Allocate additional staff resources to the Electronics department, which encounters the highest average wait times, while reducing staffing levels in the Fashion department.
- Implement cross-training programs for staff members to enable them to manage various product categories effectively, thereby addressing staffing shortfalls in high-wait categories.
- Implement workforce management systems that leverage demand forecasts and historical data to optimize staff scheduling.
- Incorporate a feedback section to gather insights on staffing needs across different product categories.
- Continuously monitor the implemented changes and their impact on a daily basis, adjusting strategies based on evolving demand patterns.

11. Explore if there is any relationship between the Delivery type and waiting time between ordering and receiving an item.

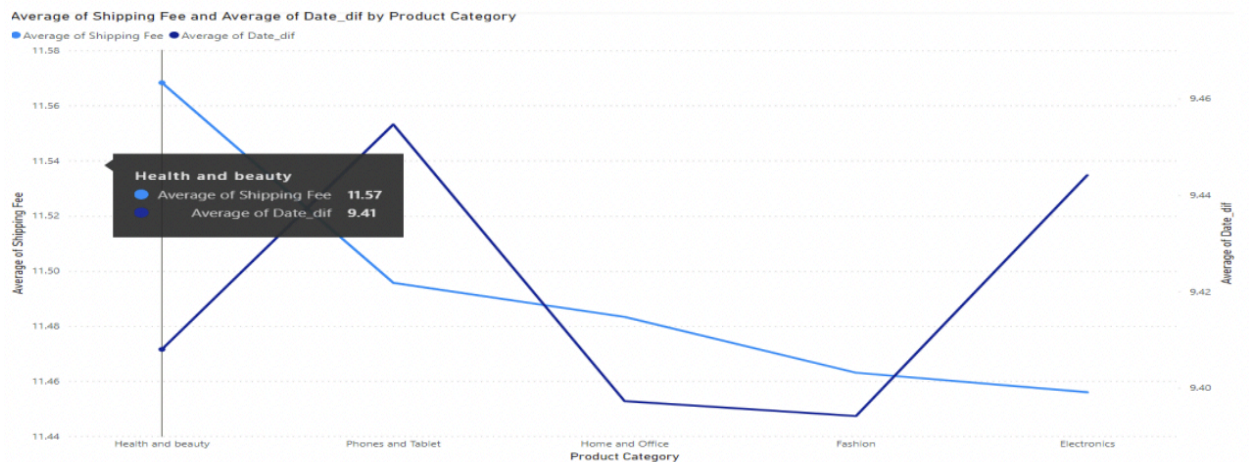


The average waiting periods for standard, express, and abroad delivery are 10, 3, and 15 days, respectively.

This demonstrates a correlation between delivery type and waiting period, with the order being express < standard < abroad shipping.

12. Is there any relationship between shipping charges and product type?

To analyze this, we can visualize the data by plotting the average shipping fee, average delivery time, and product category.



Health and beauty rank highest, followed by phones and tablets, home and office, fashion, and electronics.

In some product categories, higher shipping fees may result in faster delivery times, while in others, lower shipping fees may lead to shorter delivery times. However, there is no clear-cut correlation between these factors.

Health and beauty, along with home and office and fashion categories, exhibit

shorter waiting periods despite higher shipping fees. Conversely, phone and tablets, as well as electronics categories, show longer waiting periods despite lower shipping costs.

This trend suggests that lower shipping fees may drive higher average sales, while higher shipping fees may contribute to lower average sales, indicating that customers may be more inclined to purchase items with lower shipping costs, ultimately resulting in increased sales volume.

13. Come up with strategies to decrease the low rating orders after analyzing different factors like waiting time, shipping type, unit price, etc.

Enhance Shipping Experience:

- Ensure customers receive accurate shipment tracking updates to stay informed about their order statuses.
- Offer diverse shipping options such as standard, express, and same-day delivery to accommodate various customer preferences.

Elevate Product Quality and Packaging:

- Invest in durable and visually appealing packaging to safeguard products during transit and enrich the unboxing experience for customers.

Encourage Positive Feedback:

- Provide incentives like discounts or loyalty points to customers who share positive feedback or reviews following their purchases.

Implement Quality Assurance:

- Regularly audit inventory, shipping protocols, and customer interactions to uphold consistency and reliability.

Educate Customers:

- Furnish transparent details regarding shipping durations, return policies, and product specifications to effectively manage customer expectations.

- Offer informative resources or tutorials on your platform to empower customers with knowledge for making informed buying decisions and mitigate dissatisfaction stemming from misunderstandings.

14. Using the time intelligence DAX function, create a table to compare each month's sales with the previous year's same month's total sales. So there will be four columns in the output year, month, total sales, previous_years_sales.

Year	Month	total Sales	Previous_Year_Sales
2015	January	10,13,632.00	
2015	February	13,70,029.15	
2015	March	13,64,197.70	
2015	April	13,81,906.70	
2015	May	15,44,233.40	
2015	June	13,19,334.20	
2015	July	14,29,492.15	
2015	August	14,56,104.80	
2015	September	14,12,766.20	
2015	October	14,29,082.90	
2015	November	13,78,345.50	
2015	December	14,47,857.40	
2016	January	13,53,210.95	10,13,632.00
2016	February	13,20,079.15	13,70,029.15
2016	March	14,14,888.50	13,64,197.70
2016	April	13,93,467.95	13,81,906.70
2016	May	13,09,492.25	15,44,233.40
2016	June	14,03,992.85	13,19,334.20
2016	July	13,72,262.50	14,29,492.15
2016	August	13,64,834.25	14,56,104.80
2016	September	13,35,898.25	14,12,766.20
2016	October	13,90,821.65	14,29,082.90
2016	November	13,63,162.05	13,78,345.50
2016	December	13,56,445.85	14,47,857.40
2017	January	15,28,407.30	13,53,210.95
Total		10,72,39,089.20	8,53,77,252.60

The calculation for previous_year_sale is formulated as follows:
previous_year_sale=CALCULATE(sum(Orders[Sale Price]),SAMEPERIODLASTYEAR(Orders[Delivery Date]),ALLEXCEPT(Orders,Orders[Delivery Date]))

This expression aggregates the sales prices from the previous year within the same timeframe. It employs the SAMEPERIODLASTYEAR function to filter data for the equivalent period in the prior year. The ALLEXCEPT function preserves the filter on the delivery date column, ensuring precise year-over-year comparison.

15. What do you understand by PowerBI gateway? What are its use cases?

The Power BI Gateway, an integral component of Microsoft Power BI, facilitates secure data transmission between on-premises data sources and the cloud-based Power BI services. Acting as a conduit between your organization's network and the Power BI platform, it enables data refreshes from on-premises sources, scheduling of data updates, and maintenance of reports and dashboards with the latest information.

Data Refresh:

- Power BI Gateway enables scheduled data refreshes for datasets stored in on-premises databases such as SQL Server, Oracle, MySQL, and SharePoint.
- It ensures that Power BI reports and dashboards remain updated with the latest data from on-premises sources, eliminating manual updates.

Direct Query:

- Power BI Gateway supports Direct Query mode, allowing real-time connections to on-premises data sources.
- Users can interact with live data from on-premises sources directly within Power BI reports and dashboards, gaining up-to-the-minute insights.

Personal Gateway vs. Enterprise Gateway:

- Power BI Gateway offers two versions: Personal Gateway and Enterprise Gateway.
- The Personal Gateway suits individual users or small teams and can be installed on a desktop for connecting to data sources for personal use.
- The Enterprise Gateway caters to organizations with multiple users and large-scale deployments, providing centralized management, high availability, and scalability features.

Hybrid Deployments:

- Power BI Gateway supports hybrid deployments, enabling organizations to leverage both cloud-based and on-premises data sources seamlessly.

Security and Compliance:

- Power BI Gateway ensures secure data transmission between on-premises data sources and Power BI services through encryption and authentication protocols.

Use Cases:

- Enterprise Reporting: Organizations utilize Power BI Gateway to connect to

on-premises databases and create enterprise-level reports and dashboards.

- Real-time Analytics: Power BI Gateway facilitates real-time analytics by enabling direct connections to on-premises data sources using Direct Query mode.
- Scheduled Data Refreshes: Power BI Gateway automates data refreshes from on-premises sources, ensuring that reports and dashboards are consistently updated.

16. How would you approach this problem, if the objective and subjective questions weren't given?

If the questions, both objective and subjective, were not provided, our approach would be limited to the standard process of analyzing existing data to uncover its insights and drawbacks.

Exploration and Analysis of Data:

- Begin by delving into the dataset provided, which contains details about customers and their orders.
- Analyze customer demographics, including age, gender, and location, to gain insights into the composition of the customer base.
- Investigate order data to understand purchasing patterns, popular product categories, average order values, and more.

Customer Segmentation:

- Utilize the customer data to segment the customer base into distinct groups based on demographics, purchasing behavior, or other relevant criteria.
- Common segmentation parameters may include age brackets, gender, geographical regions, purchase frequency, total expenditure, etc.
- Segmentation aids in identifying varied customer needs and preferences, facilitating targeted marketing efforts and rewards initiatives.

Identification of Reward and Enhancement Opportunities:

- Based on the analysis findings, pinpoint areas where offering rewards or enhancing the shopping experience could benefit customers.
- For instance, identify loyal customers who frequently make purchases and extend exclusive discounts or rewards to them.
- Observe purchasing behavior patterns to determine popular products or categories among customers and consider implementing promotions or incentives in those areas.

Development of Reward Programs:

- Devise reward programs tailored to different customer segments identified during the segmentation process.
- Reward options might encompass discounts, loyalty points, access to exclusive deals or events, complimentary shipping, or personalized product recommendations.
- Consider adopting a tiered rewards structure where customers unlock additional benefits as they increase their spending or reach specific milestones.

Enhancement of Shopping Experience:

- Identify opportunities to elevate the overall shopping journey for customers.
- This could involve enhancing website usability, streamlining the checkout process, offering diverse payment methods, delivering responsive customer support, etc.
- Harness data analytics to personalize the shopping experience by suggesting relevant products based on past purchases or browsing histories.

Measurement and Iteration:

- Implement the proposed strategies and monitor their effectiveness over time.
- Employ metrics such as customer retention rates, average order values, satisfaction scores, and revenue growth to assess the impact of reward programs and enhancements.
- Continuously gather feedback from customers and refine strategies to accommodate their evolving preferences and requirements.