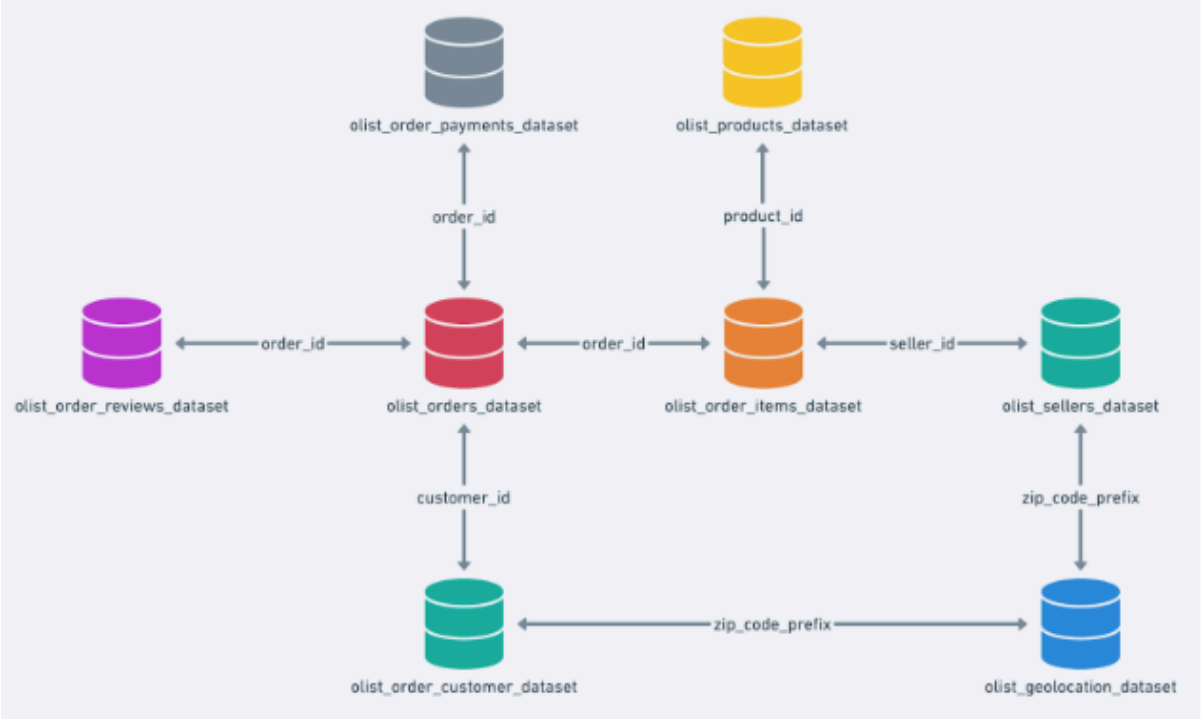
Business case : Target SQL

Dataset Schema :



The data is available in 8 csv files:

1. customers.csv
2. sellers.csv
3. order_items.csv
4. geolocation.csv
5. payments.csv
6. reviews.csv
7. orders.csv
8. products.csv

1.1 Data type of all columns in the "customers" table.

Approach :

Here we are displaying all the columns that are present in the customers table.

```
SELECT
   column_name,
   data_type
FROM
   `target_ecomm.INFORMATION_SCHEMA.COLUMNS`
WHERE
    TABLE_NAME = "customers"
```

column_name	data_type
customer_id	STRING
customer_unique_id	STRING
customer_zip_code_prefix	INT64
customer_city	STRING
customer_state	STRING

1.2 Get the time range between which the orders were placed.

Approach :

If we want to get the time range in which the orders were placed we need to get the first order date and last order date from the orders table.For getting the first and last order we will be using Min and Max aggregate functions.

```
SELECT
   MIN(order_purchase_timestamp) AS `First_order`,
   MAX(order_purchase_timestamp) AS `Last_order`
 FROM
   `target_ecomm.orders`
```

First_order	Last_order
2016-09-04 21:15:19 UTC	2018-10-17 17:30:18 UTC

1.3 Count the Cities & States of customers who ordered during the given period.

Approach :

If we want to get the cities and states of customers who ordered during the given time period some times customer may signup and may not order for this case we want Join the customers table with orders table using customer_id.Apply the filter for given time period , Get the customer state and customer city from the table and create a grouped table on the above two columns customer_state and customer _city. Use the aggregate COUNT function to count the number of orders in each city and state.

```
SELECT
   COUNT(DISTINCT c.customer_city) AS `Customer_city_count`,
   COUNT(DISTINCT c.customer_state) AS `Customer_state_count`
FROM
   target_ecomm.customers c INNER JOIN target_ecomm.orders o
   ON c.customer_id = o.customer_id
WHERE
   order_purchase_timestamp BETWEEN "2016-09-04" AND "2018-10-17";
```

Customer_city_count	Customer_state_count
4119	27

Insights :

São Paulo has the most orders by a significant margin.There are over 15,000 orders from São Paulo, while the next highest city (Rio de Janeiro) has only about 6,800 orders. This suggests that São Paulo is a major market for your business in Brazil. Several other cities have notable number of orders.

Recommendations :

Consider dedicating a larger portion of your marketing budget to cities like São Paulo, Rio de Janeiro, Belo Horizonte, Brasília, Curitiba, and Campinas. These areas have a higher customer base and potentially more opportunity for growth.

2.1 Is there a growing trend in the no. of orders placed over the past years?

Approach :

We want to see the No.of orders growth over the past years, Extract year from the order_purchase_timestamp, Group by year , Count the number of orders in that year using COUNT aggregate function , Applying line chart on the result.

```sql
SELECT
   EXTRACT(YEAR FROM order_purchase_timestamp) AS `Year`,
   COUNT(*) AS `No_of_orders_placed_in_the_Year`
FROM
   target_ecomm.orders
GROUP BY 1
ORDER BY year;
```

Year	No_of_orders_placed_in_the_Year
2016	329
2017	45101
2018	54011

Insights :

In 2016 we are having only 3 months of data and in 2017 and 2018 we are having all month's data when we see orders growth significantly increasing from year to year.

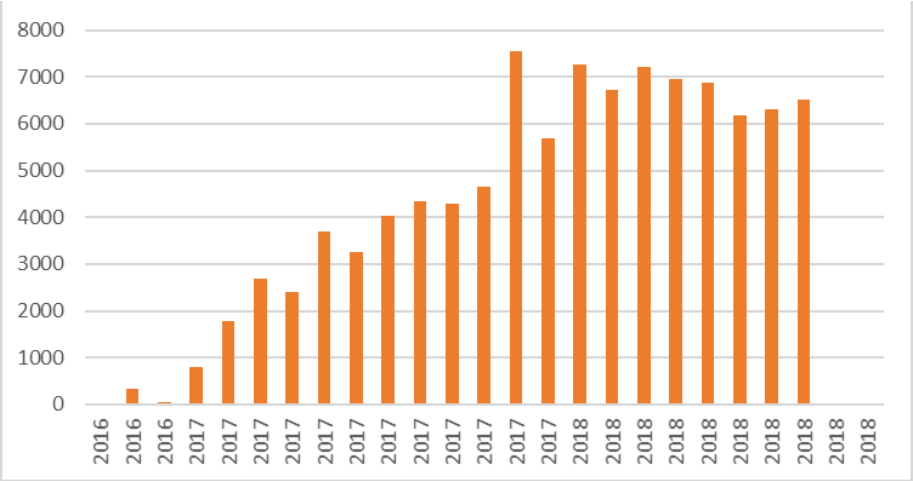
Recommendations :

The orders keep on increasing year over year.so , better to keep the same strategies and try to implement some kind of discounts to attract more new customers.

Another way to see the above growth is in terms of month in the every year

```
SELECT
   EXTRACT(YEAR FROM order_purchase_timestamp) AS `year`,
   EXTRACT(MONTH FROM order_purchase_timestamp) AS `month`,
   COUNT(*) AS `No_of_orders`
FROM
   target_ecomm.orders
GROUP BY
   1, 2
ORDER BY
   year , month;
```

year	month	No_of_orders
2016	9	4
2016	10	324
2016	12	1
2017	1	800
2017	2	1780
2017	3	2682
2017	4	2404
2017	5	3700
2017	6	3245
2017	7	4026



In this method we are analyzing the number of orders in the month over the past years. Here we can see that we are having only 3 months data in the year 2016 .

Insights :

Here we are having inconsistent dates we can not compare.And there appears to be a seasonal trend in the data with the number of orders consistently increasing from month 0 to month 7 then decreasing from month 8 to month 12. This could be due to a number of factors such as inconsistent data and the product being more popular in certain times of the year or other may be some offers or discounts may be provided in those months. However, the number of orders appears to be higher in the year 2018 than in the year 2017 .

Recommendations :

If the seasonal trend is real, the company could try to take advantage of it by increasing the marketing efforts during the months when sales are lower. For example, they could offer discounts or promotions during those months. If the increase in sales is due to better marketing, the company could continue to invest in marketing.

2.2 Can we see some kind of monthly seasonality in terms of the no. of orders being placed?

Approach :

If we want monthly seasonality in terms of no_of_orders placed in that Month Irrespective of the year we just want to see the no of orders in the Month and their growth. Extract month from the order_purchase_timestamp Group by month, Count the no of orders using COUNT aggregate function

```
SELECT
   EXTRACT(MONTH FROM order_purchase_timestamp) AS `Month`,
   COUNT(*) AS `No_of_orders_placed_in_month`
FROM
   target_ecomm.orders
GROUP BY 1
ORDER BY Month;
```

Month	No_of_orders_placed_in_month
1	8069
2	8508
3	9893
4	9343
5	10573
6	9412
7	10318
8	10843
9	4305
10	4959

Insights :

The data that we had provided is not equal for all the months in one year. Some years are missing and same with the other year as well .There appears to be an upward trend in the number of orders placed throughout the years. From month 1 to month 8 we can see the sales are increasing , but there is a slight dip in the number of orders in the months 9 and 10. It's possible there is a seasonal trend at play, with sales significantly lower in month 9 and 10 compared to the rest of the months.

Recommendations :

Look into what might have caused the significant drop in sales in the months 9 and 10 , were there any marketing promotions or changes in product availability during that time? Consider Promotions During Lower Sales Months: If there is a seasonal trend, then consider running promotions or discounts during months 9 and 10 to boost sales during that time.

2.3 During what time of the day, do the Brazilian customers mostly place their orders? (Dawn, Morning, Afternoon or Night).

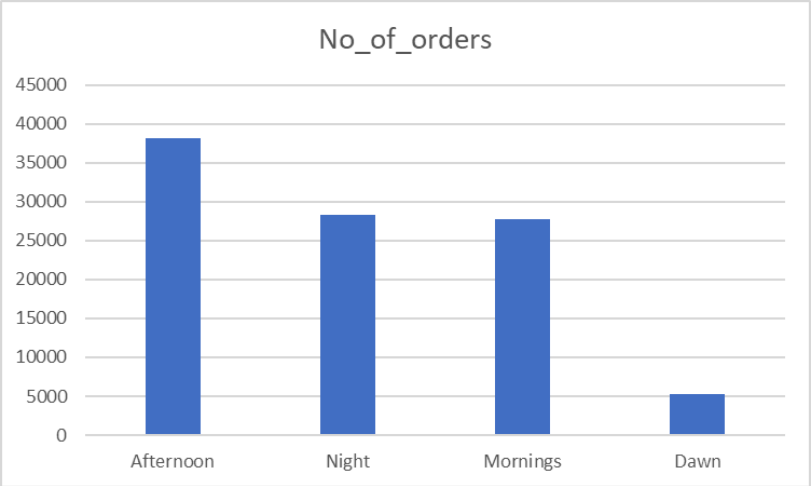
Approach :

Brazilian customers places their orders in different timings they are 0 - 6 - Dawn , 7 - 12 - Morning , 13 - 18 - Afternoon , 19 - 23 - Night Using Case When statements we will be giving the name like above one And we will be grouping them to get the count of orders in that time.

```
SELECT
  (
    CASE

    WHEN EXTRACT(HOUR FROM order_purchase_timestamp) BETWEEN 0 AND 6 THEN
"Dawn"
    WHEN EXTRACT(HOUR FROM order_purchase_timestamp) BETWEEN 7 AND 12 THEN
"Mornings"
    WHEN EXTRACT(HOUR FROM order_purchase_timestamp) BETWEEN 13 AND 18
THEN "Afternoon"
    WHEN EXTRACT(HOUR FROM order_purchase_timestamp) BETWEEN 19 AND 23
THEN "Night"

    END

  ) AS `time_of_ordering`,
```

```
  COUNT(order_id) AS `No_of_orders`
FROM
  target_ecomm.orders
GROUP BY 1
ORDER BY No_of_orders DESC;
```

time_of_ordering	No_of_orders
Afternoon	38135
Night	28331
Mornings	27733
Dawn	5242



Insights :

The highest number of orders were placed in the afternoon at 38,135. This suggests that a significant portion of Brazilian customers prefer to shop online in the afternoon, possibly during lunch breaks or after work. Night is the second most popular time for orders with 28,331 orders. This indicates that many Brazilian customers also shop online in the evening, which could be due to having more free time to browse and shop after work or other obligations. Then followed by morning and dawn.

Recommendations :

Focus marketing and advertising efforts on reaching Braziliancustomers during the afternoon and evening since these are the times when they are most likely to be shopping online. Explore offering special deals or discounts during afternoons and evenings to incentivize purchases during these peak periods.

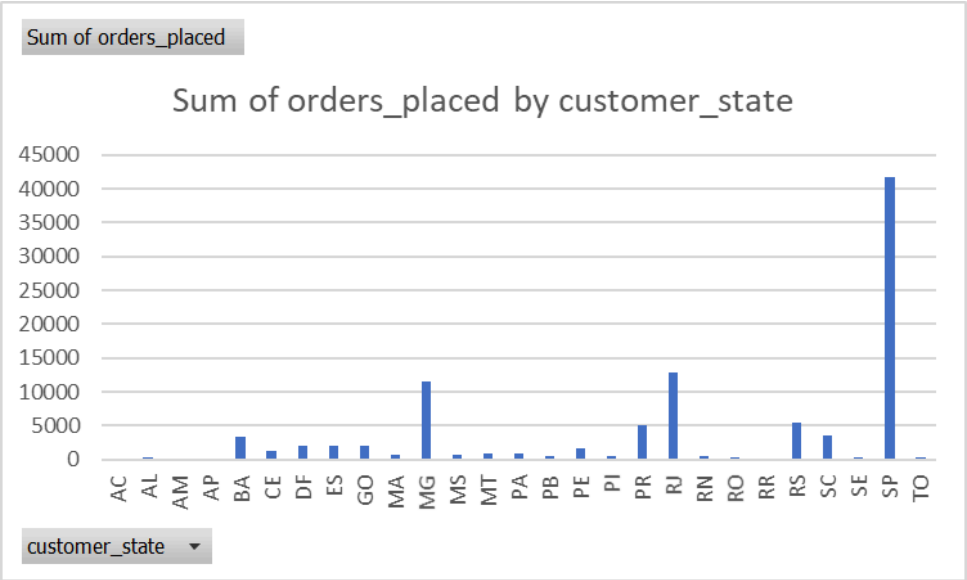
3.1 Get the month on month no. of orders placed in each state.

Approach :

We want to perform month on month analysis on no of orders placed in each state.Before starting we need to join the customers table with orders table using customer_id column and then Extract month from order_purchase_timestamp column form orders table. Get customer_state column from the customers table and Group by both the extracted month column and customer state column Use COUNT aggregate function to count the no of orders placed in each state.

```
SELECT
   EXTRACT(MONTH FROM order_purchase_timestamp) AS `Month`,
   customer_state,
   COUNT(*) AS `orders_placed`
FROM
   target_ecomm.customers c INNER JOIN target_ecomm.orders o
   ON c.customer_id = o.customer_id
GROUP BY 1,2
ORDER BY 1
```

Month	customer_state	orders_placed
1	RN	51
1	SP	3351
1	MG	971
1	BA	264
1	RJ	990
1	RS	427
1	MA	66
1	CE	99
1	PA	82
1	PB	33



Insights :

The above chart provides the insights of month on month number of orders placed in various states. SP , BA, MS stand out with the highest number of orders placed across multiple months.These states to be significant market. Some states such as RN and ES show relatively consistent numbers of orders.States like AM and SE display fluctuating order numbers , indicating variability in demand or external factors affecting order volumes. Several states like PB (Paraíba) and PI (Piauí) have consistently low order numbers.

Recommendations :

Focus on high activity states like SP, BA, MS should be primary targets for marketing.Strategies could include targeted promotions.For states with consistent but lower order volumes like RN and ES,consider strategies to incrementally increase orders. This could include partnership with local businesses, enhancing distribution channels, or improving product availability.

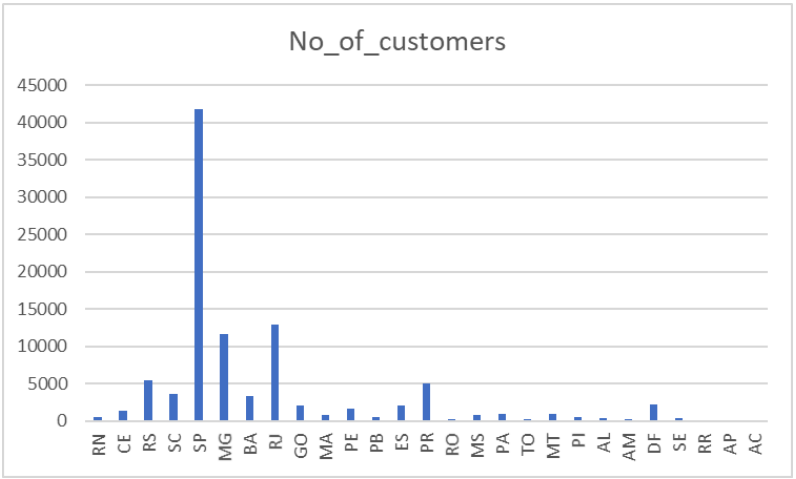
3.2 How are the customers distributed across all the states?

Approach :

Here in this case we want to get the number of customers distributed across the different states. Get the customer_state column from the customers tableGroup by customer_state to get the distinct states where customers are present. Use the COUNT aggregate function to get the count of Unique customers across different states.

```sql
SELECT
   customer_state,
   COUNT(DISTINCT customer_id) AS `No_of_customers`
FROM
target_ecomm.customers
GROUP BY
 customer_state
```

customer_state	No_of_customers
RN	485
CE	1336
RS	5466
SC	3637
SP	41746
MG	11635
BA	3380
RJ	12852
GO	2020
MA	747



Insights :

SP has an overwhelmingly higher number of customers compared to other states. Indicating It is a key market with significant customer base. We can say this is a dominated state. MG and RJ states also have substantial customer bases, though much smaller than SP.

Recommendations :

Given SP the most dominant customer base , continue to invest heavily in this state, and introduce premium offerings to capitalize on this large market. With significant customer numbers in MG and RJ, focus on expanding market share. Tailor marketing campaigns to regional preferences.

4.1 Get the % increase in the cost of orders from year 2017 to 2018 (include months between Jan to Aug only).

Approach :

We want to calculate the % increase in the cost of orders from 2017 to 2018 and the months between Jan to Aug only Cost of orders is known as payment_value which is present in the payments table. Join the orders table with payments table to extract year and month from the column order_purchase_timestamp and join the table using order_id. Filter out the orders that we placed between the months January and August in the years of 2017 and 2018. Group by year to get the 2 years and use an aggregated SUM function to calculate the total payment value of that year. Make the above query as CTE to calculate the percentage increase in cost of Orders. We can use LAG / LEAD functions to calculate the percentage increase. Create a new column named prev_year_payment_value using LAG function. Formula : percentage_increase = (total_value - prev_total_value) / prev_total_value × 100

```
WITH `result` AS (
    SELECT
        EXTRACT(YEAR FROM order_purchase_timestamp) AS `year`,
        SUM(payment_value) AS `total_payment_value`
    FROM
        target_ecomm.orders o
    INNER JOIN target_ecomm.payments p ON o.order_id = p.order_id
    WHERE
        EXTRACT(YEAR FROM order_purchase_timestamp) IN (2017, 2018)
        AND EXTRACT(MONTH FROM order_purchase_timestamp) BETWEEN 1 AND 8
    GROUP BY
        EXTRACT(YEAR FROM order_purchase_timestamp)
    ORDER BY year ASC

    )
```

```sql
SELECT
  *,
  ((total_payment_value - LAG(total_payment_value, 1) OVER (ORDER BY year
ASC)) / LAG(total_payment_value, 1) OVER (ORDER BY year ASC) * 100) AS
`Percentage_increase`
FROM
     result
ORDER BY year ASC
```

year	total_payment_value	Percentage_increase
2017	3669022.1199999228	*null*
2018	8694733.8399998639	136.97687164666226

Insights :

We have taken only 2017 and 2018 data from the month 1 to 8.The total payment value increased from 3,669,022.12 in 2017 to 8,694,733.84 in 2018, marking a substantial growth of approximately 137%.

Recommendations :

Invest in marketing and customer acquisition strategies to sustain and capitalize on the significant growth trend.

4.2 Calculate the Total & Average value of order price for each state.

Approach :

We want to calculate the Total and Average value of order price for each state. Price column is available in the order_items table. We want to get the state as well right so we want to join three tables: customers , orders and order_items. Fetch the customer_state column from customer table and group by state Use the aggregate SUM function to get the total order value and aggregate AVG function to get the average of total order value across the different states.

```sql
SELECT
   customer_state,
SUM(i.price) AS `Total_order_value`,
AVG(i.price) AS `Average_order_value`
```

```
FROM
   target_ecomm.customers c INNER JOIN target_ecomm.orders o
ON c.customer_id = o.customer_id
INNER JOIN target_ecomm.order_items i
ON o.order_id = i.order_id
GROUP BY 1
```

customer_state	Total_order_value	Average_order_value
RN	83034.979999999938	156.96593572778823
CE	227254.70999999723	153.75826116373463
RS	750304.02000002237	120.33745308740978
SC	520553.34000000858	124.65357758620731
SP	5202955.0500015272	109.65362915972935
MG	1585308.0299998657	120.74857414883128
BA	511349.99000000593	134.60120821268791
RJ	1824092.6699998074	125.11781809452005
GO	294591.94999999722	126.27173167595411
MA	119648.21999999988	145.20415048543691

Insights :

The data reveals trends in customer order value across various states.State SP has the highest total order value. This could be due to factors like large population , higher average income or wider availability of premium products and state SP having the most dominant customer base. State PB with the highest average order value,this suggests customers in PB tend to spend more per order compared to other states This might be due to various reasons one of them is a smaller number of total orders(which can inflate the average).

Recommendations :

Targeted marketing in the higher order value states ex: states like SP with high total order value represents a profitable market.Consider allocating more marketing budget to these states To improve sales in the lower average order value , consider promotional offers or discounts. These can attract new customers and exciting ones to increase their spending.

4.3 Calculate the Total & Average value of order freight for each state.

Approach :

We want to calculate the total and average freight value for each state freight _value is nothing but Price rate at which a product is delivered from one point to another.We want to join by three table customers, orders and order_items. Fetch the customer_state column from the customers table and group by the customer_state column. Use the aggregate SUM and AVG functions to calculate total and average freight value.

```
SELECT
   customer_state,
SUM(i.freight_value) AS `Total_freight_value`,
AVG(i.freight_value) AS `Average_freight_value`
FROM
target_ecomm.customers c INNER JOIN target_ecomm.orders o
ON c.customer_id = o.customer_id
INNER JOIN target_ecomm.order_items i
ON o.order_id = i.order_id
GROUP BY 1
```

customer_state	Total_freight_value	Average_freight_value
RN	18860.09999999...	35.652362948960317
CE	48351.58999999...	32.714201623816017
RS	135522.7400000...	21.735804330392845
SC	89660.26000000...	21.470368773946355
SP	718723.0699999...	15.147275390419265
MG	270853.4600000...	20.63016680630664
BA	100156.6799999...	26.363958936562188
RJ	305589.3100000...	20.960923931682579
GO	53114.97999999...	22.766815259322811
MA	31523.77000000...	38.257002427184418

Insights :

State SP has the highest total order freight value , suggesting a large volume of goods are shipped compared to other states. State RR has the highest average order freight value , indicating that orders in this state might contain heavier or bulk items on an average.

Recommendations :

For states with high total order freight value : we can negotiate bulk discounts with the carriers Given the large volume of shipments to SP, negotiate discounted rates with carriers based on your consistent business. This can significantly reduce your overall freight costs. Investigate the possibility of partnering with warehouses or fulfillment centers in SP. Storing inventory closer to customers reduces shipping distances and potentially lowers freight costs.

5.1 Find the no. of days taken to deliver each order from the order's purchase date as delivery time. Also, calculate the difference (in days) between the estimated & actual delivery date of an order.

Approach :

Here there are 2 cases where we want to find the delivery time of product delivered to initial order purchase time and another case is we want to find the difference in days between estimated delivery date and product delivered. Time_to_deliver_order = order_delivered_customer_date - order_purchase_timestamp , Difference_estimated_delivery = order_delivered_customer_date - order_estimated_delivery_date. Use the DATE_DIFF function to calculate the difference between 2 dates Fetch all those above things from the orders table.

```
SELECT
DISTINCT order_id,
DATE_DIFF(order_delivered_customer_date , order_purchase_timestamp, DAY)
AS `time_to_deliver`,
DATE_DIFF(order_estimated_delivery_date, order_delivered_customer_date ,
DAY) AS `diff_estimmated_delivery`
FROM
target_ecomm.orders;
```

order_id	time_to_deliver	diff_estimmated_delivery
1950d777989f6a877539f5379...	30	-12
2c45c33d2f9cb8ff8b1c86cc28...	30	28
65d1e226dfaeb8cdc42f66542...	35	16
635c894d068ac37e6e03dc54e...	30	1
3b97562c3aee8bdedcb5c2e45...	32	0
68f47f50f04c4cb6774570cfde...	29	1
276e9ec344d3bf029ff83a161c...	43	-4
54e1a3c2b97fb0809da548a59...	40	-4
fd04fa4105ee8045f6a0139ca5...	37	-1
302bb8109d097a9fc6e9cefc5...	33	-5

Insights :

The delivery time varies across the orders ranging from 1 day to 200 days. This could be due to factors like product availability , shipping distance and order fulfillment workload. We have some differences in between the order estimated delivery date and order delivered date for some orders, products are delivered earlier than the estimated delivery date and for some other orders were delayed than the estimated delivery date.

Recommendations :

Consider providing more accurate or conservative estimated delivery times to customers. This can help manage expectations and avoid potential dissatisfaction if deliveries take longer than anticipated.In cases where delivery delays are unavoidable, proactively communicate with customers to explain the reasons for the delay and keep them updated on the revised delivery timeframe. Transparency and clear communication can help maintain customer trust and satisfaction.

5.2 Find out the top 5 states with the highest & lowest average freight value.

Approach :

Here we want to calculate the top 5 states with highest and lowest average freight value.We want to join 3 table customers , orders and order_items to get all the required data. We want to fetch the customer_state column from the customers table and Group by the customer_state column to create a grouped table. Get the Average of freight value using AVG aggregate function. Make the above query as CTE From CTE we will fetch the top 5 and lowest states with average freight value.

```
WITH `result` AS (
          SELECT
               c.customer_state,
               AVG(i.freight_value) AS `Avg_freight_value`
           FROM
               target_ecomm.order_items i INNER JOIN target_ecomm.orders o
               ON i.order_id = o.order_id
               INNER JOIN target_ecomm.customers c
               ON o.customer_id = c.customer_id
           GROUP BY
                c.customer_state
                 )
```

This query is for getting the top 5 states with highest Average freight value

```
SELECT
   customer_state,
   Avg_freight_value
FROM
   result
ORDER BY
   Avg_freight_value DESC
LIMIT 5
```

customer_state	Avg_freight_value
RR	42.984423076923072
PB	42.723803986710969
RO	41.069712230215814
AC	40.073369565217362
PI	39.147970479704838

Now this query is for getting the top 5 states with lowest Average freight value

```
SELECT
   customer_state,
   Avg_freight_value
FROM
   result
ORDER BY Avg_freight_value ASC
```

```
LIMIT 5
```

customer_state	Avg_freight_value
SP	15.147275390419132
PR	20.531651567944269
MG	20.630166806306651
RJ	20.960923931682483
DF	21.041354945968422

Insights :

There are significant differences in average freight value across different states. This could be due to variations in , quantity of goods shipped. States with higher average freight value might have a larger volume of goods shipped on average , States with higher average freight value might have heavier or bulkier items being shipped on average.

Recommendations :

Are there specific product categories driving this, or is it due to other factors like customer demographics (e.g., a higher concentration of business customers ordering in bulk)? If feasible, consider collaborating with local fulfillment centers or carriers in states with high average freight value. This could potentially reduce shipping distances and freight costs.
Analyze product types and packaging practices in states with lower average freight value.

5.3 Find out the top 5 states with the highest & lowest average delivery time.

Approach :

We want to find the top 5 highest states with the highest and lowest average delivery time in terms of days. We want to join the customers table with the orders table to fetch the customer_state and Difference in date. After joining the tables get the customer_state column and group by using customer_state to get the grouped table. After this use AVG aggregate function and DATE_DIFF function to get the difference in days to get the average across different states. Make Order by Desc and limit 5 to get the top 5 highest average delivery time states. Order by Asc will give you the lowest average delivery time states

This query will give you the top 5 states with highest average delivery time

```
SELECT
   customer_state,
   AVG(DATETIME_DIFF(order_delivered_customer_date ,
       order_purchase_timestamp , DAY)) AS `Avg_time_to_deliver`
FROM
   target_ecomm.orders o INNER JOIN target_ecomm.customers c
   ON o.customer_id = c.customer_id
GROUP BY
   customer_state
ORDER BY
   Avg_time_to_deliver DESC
LIMIT 5
```

customer_state	Avg_time_to_deliver
RR	28.975609756097562
AP	26.731343283582085
AM	25.986206896551728
AL	24.040302267002513
PA	23.316067653276981

This query will give you the top 5 states with lowest average delivery time

```
SELECT
     customer_state,
     AVG(DATETIME_DIFF(order_delivered_customer_date ,
order_purchase_timestamp , DAY)) AS `Avg_time_to_deliver`
FROM
     target_ecomm.orders o INNER JOIN target_ecomm.customers c
     ON o.customer_id = c.customer_id
GROUP BY
     customer_state
ORDER BY
     Avg_time_to_deliver ASC
LIMIT 5
```

customer_state	Avg_time_to_deliver
SP	8.2980614890725874
PR	11.526711354864908
MG	11.543813298106569
DF	12.509134615384616
SC	14.479560191711331

Insights :

We are getting the date of the top 5 states with the highest average delivery time and lowest average delivery time. States with the highest average delivery time could be various reasons the goods they are ordering in bulk quantity or they might be ordering from faraway places for the premium products and there won't be any premium service delivery partners. States with lowest average delivery time indicates that there might be less products to deliver or there might be some inventory management stores near to their places to store the products which they regularly order and they might have some premium delivery services.

Recommendations :

Strategic Warehouse Network Design: Analyze your sales data and delivery time trends to identify potential gaps in your fulfillment network. Consider establishing or expanding fulfillment centers in states with high average delivery times to shorten shipping distances and improve delivery speed for those regions.

5.4 Find out the top 5 states where the order delivery is really fast as compared to the estimated date of delivery.

Approach :

We need to find the top 5 states where the order delivery is really fast as compared to the estimated delivery date. We need to join the orders table with customers table using customer_id Calculate the difference between two dates(order_delivered_customer_date - order_estimated_delivery_date) using DATE_DIFF function. Get the customer_state column and group by using the same column. Then find the average of diff_estimated_delivery using aggregate AVG Function. Now do order by diff_estimated_delivery in ASC to get the deliveries which are faster than the estimated delivery. To get the top 5 rows use LIMIT 5.

```sql
SELECT
    customer_state,
    AVG(DATE_DIFF(order_delivered_customer_date ,
order_estimated_delivery_date, DAY)) AS `diff_estimated_delivery`
FROM
    target_ecomm.orders o INNER JOIN target_ecomm.customers c
    ON o.customer_id = c.customer_id
GROUP BY
    customer_state
ORDER BY
    diff_estimated_delivery ASC
LIMIT 5
```

customer_state	diff_estimated_delivery
AC	-19.762500000000006
RO	-19.13168724279836
AP	-18.731343283582088
AM	-18.60689655172413
RR	-16.414634146341463

Insights :

Here we got the top 5 states where the order delivery is really fast as compared to the estimated date of delivery. Negative values indicate that orders are delivered faster than the expected Delivery. ex : if our estimated delivery date is 22-06-2024 but the order delivered on 20-06-2024 it delivered 5 days prior to the estimated delivery date so (-5). So for all the above states deliveries are delivered earlier than the estimated delivery date.

Recommendations :

Orders might be delayed in some situations and might deliver earlier than estimated delivery date in some situations this could be due to various reasons not providing order estimated delivery date and try to update the customer incase of delay in order delivery . If the same products are ordered from the same place try to keep inventory stores near to that place where we can deliver the products fast to the customer.

6.1 Find the month on month no. of orders placed using different payment types.

Approach :

Here we want to perform month on month analysis to count no of orders placed using different payment methods.Join the payments table with orders table using order_id
Get the payment_type column from the payments table and Extract month from the order_purchase_timestamp. Group by both payment_type column and extracted month.
Count the no of orders using the COUNT aggregate function.

```
SELECT
    payment_type,
    EXTRACT(MONTH FROM order_purchase_timestamp) AS `Month`,
    COUNT(*) AS `No_of_orders`
FROM
    target_ecomm.payments P INNER JOIN target_ecomm.orders o
    ON P.order_id = o.order_id
GROUP BY
    payment_type , 2
ORDER BY Month ASC
```

payment_type	Month	No_of_orders
voucher	1	477
credit_card	1	6103
debit_card	1	118
UPI	1	1715
credit_card	2	6609
voucher	2	424
UPI	2	1723
debit_card	2	82
voucher	3	591
credit_card	3	7707

Insights :

Credit cards consistently have the highest number of orders across all the months and the number of orders keep on increasing month over month.

Recommendations :

Since credit cards are seeing substantial month-on-month growth, it would be beneficial to continue promoting this payment method, possibly with additional rewards or cashback offers. Given the stable yet minimal growth, ensuring a seamless and secure UPI transaction experience could help in maintaining or even increasing the usage.

6.2 Find the no. of orders placed on the basis of the payment installments that have been paid.

Approach :

Here we want to get the number of orders placed on the basis of payment installments that have been paid. Fetch the payment_instalments column from the payments table Apply filter that if the installment has been paid it it should be greater than or equal to 1.Then group by the payment_instalments column. Apply COUNT aggregate function to get the no of orders.

```
SELECT
    payment_installments,
    COUNT(*) AS `No_of_orders`
FROM
    target_ecomm.payments
WHERE
    payment_installments >= 1
GROUP BY
    payment_installments
```

payment_installments	No_of_orders
1	52546
2	12413
3	10461
4	7098
5	5239
6	3920
7	1626
8	4268
9	644
10	5328

Insights :

Here we can observe that most of the payments paid in single instalments only.

Recommendations :

We recommend giving more offers if they pay bill in single instalments where they get the payment in the single instalment.

In this section, I present a comprehensive analysis based on the data provided. This analysis encompasses a detailed examination of the dataset, highlighting key patterns, trends, and insights.