Customer Behaviour Analysis

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➢Introduction:

The purpose of this project is to study the customer behaviour.

Nowadays, online shopping has become an integral part of everyday life. Millions of people order products through the ecommerce platforms (Flipkart, Amazon, Meesho etc) Therefore it is essential for e-commerce platforms to understand their customers purchasing behaviour to recommend relevant products, improve user experience, and strengthen customer loyalty.

➢Problem Statement:

The dataset contained customer details, product information, orders and sales records. However, the raw data did not provide answers to important business questions such as:

1) who the high-spending customers are

2) most popular products

3) The customers who are repeated buyers

➢Objective:

To analyze the customer purchasing behaviour, product sales pattern and sales trends using SQL to derive actionable insights.

➢Methodology:

The analysis was done using SQL. Queries were wrtitten to join multiple tables and filter relevant information. we loaded the data from each Excel file in SQL using the following Query

```
◆ The following query creates the brands table and  loads data into it
create table brands
(brand_id int ,
brand_name varchar(50),
primary key(brand_id));
load data infile "C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/brands.csv"
into table brands
fields terminated by ',' enclosed by ""lines terminated by '\n'
ignore 1 rows;
```

Here, we created a table named brands and loaded the data from file name brands.csv. similarly ,we created the other tables and load their data using similar commands.

◆Key Buisness Questions Answered Using SQL:

1) Repeat Buyers: To identify customers who buy more than once and customers who buy only once

2) Customer spending groups: Partitioning customers according to their spending behaviours (High,Medium,Low)

3)Top products: products with highest sales

4) Product sales categories: Partitoning the products according to their demand (High,Average,Low) Using the count of no of times product orderd

5) Discount Analysis: Discount Availed by each customers

6)Average spending and No. of orders: Total purchase, No. of orders and

average spending per customer

7)Brand analysis: popular products for each brand

➢ Findings:

1)Top products:

◆Query:

◆This Query finds top 5 products with highest sales

```
with product_sales as (
select p.product_name,count(ot.product_id) as totall_sales
from orders o join order_item ot on o.order_id=ot.order_id
join products p on p.product_id=ot.product_id
group by p.product_name),
ranked_products as(
select product_name,
totall_sales,
rank() over(
order by totall_sales desc)
as product_rank
from product_sales)
select * from ranked_products
where product_rank<=5
order by product_rank asc;
```

◆Output:

product_name	total_sales	product_rank
Electra Townie Original 21D - 2016	193	1
Electra Cruiser 1 (24-Inch) - 2016	193	1
Electra Townie Original 7D EQ - 2016	185	3
Electra Girl's Hawaii 1 (16-inch) - 2015/2016	180	4
Surly Ice Cream Truck Frameset - 2016	110	5

◆Insights: A few products consistently generated the highest sales volume, showing a clear product preferance among customers.

2) Products Sales Categories:

◆Query:

◆Query divides product into 3 category according to demand(High, Avg, Low)

```
select p.product_name,
count(ot.product_id) as no_of_times_ordered,
case when count(ot.product_id)>=0 and count(ot.product_id)<40 then 'Low Demand'
when count(ot.product_id)>=40 and count(ot.product_id)<100 then 'Average Demand'
else 'High Demand'
end as product_demand
from orders o join order_item ot on o.order_id=ot.order_id
join products p on p.product_id=ot.product_id
group by p.product_id;
```

◆Output:

Product_name	No_of_time_orderd	Product_Demand
Ritchey Timberwolf Frameset - 2016	77	Average Demand
Surly Wednesday Frameset - 2016	86	Average Demand
Surly Troll Frameset - 2017	29	Low Demand
Surly Ice Cream Truck Frameset - 2016	110	High Demand
...	...	...

◆Insights: Products categorized as High Demand dominated the overall sales, while Low Demand products contributed minimally

3)Average Spending & Orders:

◆ Query:

◆This Query finds total purchase, no of orders placed and average purchase of each customer

```
select concat(c.first_name,' ',c.last_name) as customer_name,
sum(ot.quantity*ot.list_price*(1-ot.discount)) as totall_order_price,
count(ot.order_id) as order_count,
avg(ot.quantity*ot.list_price*(1-ot.discount)) as avg_order_price
from customer c join orders o on c.customer_id=o.customer_id
join order_item ot on o.order_id=ot.order_id
group by c.customer_id  order by avg_order_price desc;
```

◆Output:

Customer_name	Total_order_price	Order_count	Avg_order_price
Hae Ramirez	12090	1	12090
Marilyn Frank	9499.999993	1	9499.999993
Ester Acevedo	7999.99997	1	7999.99997
…	…	…	…

◆Insights: On average, each customer placed multiple orders, with total spending per customer varying across groups. Frequent buyers also had higher average order values

4)Repeat Buyers:

◆ Query:

◆This Query shows no. of orders placed by each customer and whether the customer is Repeat buyer or not

```
select concat(c.first_name,' ' ,c.last_name) as customer_name,
count(o.customer_id) as order_count,
case when count(o.customer_id)>1 then 'Repeat_Order'
when count(o.customer_id)=1 then 'Single_Buyer'
else 'NO_Purchase'
end as Buyer_Type
from customer c join orders o on c.customer_id=o.customer_id
group by c.customer_id;
```

◆Output:

Customer_name	orders_placed	Buyer_type
Debra Burks	3	Repeat_Buyer
Shae Hickman	1	Single_Buyer
Theo Reese	2	Repeat_Buyer
…	…	…

◆Insights: A significant share of revenue came from repeat buyers, while a smaller portion of customers purchased only once. This highlights the importance of customer retention.

➢**Conclusion:** This project unfolded like a journey into the minds of customers—revealing what they buy, how much they spends, and what truly drives their loyalty. The analysis showed that repeat customers and high spenders were the real backbone of revenue, while discounts often acted as the spark that encouraged bigger purchases. We also discovered how certain products naturally pulled more attention, becoming the “must-haves” of the store, while others faded quietly in the background. Popular brands continued to win trust, reminding us that brand value shapes customer choices as much as price. Together, these insights highlight a powerful story: with SQL, raw and scattered data can be transformed into a clear narrative of customer behavior. For businesses, it means focusing not just on sales, but on relationships-retaining loyal buyers, crafting smarter product strategies, and ultimately driving growth with purpose.