

**Project:**

# **CUSTOMER LIFETIME VALUE ANALYSIS USING SQL**

**Project Objectives:**

1. Calculate Customer Lifetime Value (CLV).
2. Evaluate the effectiveness of marketing campaigns (offline vs. online).
3. Identify customer segments based on their purchase behavior.

**Key Business Questions:**

1. How much revenue does each customer contribute over their lifetime?
2. What is the ROI of offline and online marketing campaigns?
3. Which customer segments (high, medium, low value) should we focus on to maximize growth?

# How much revenue does each customer contribute over their lifetime?

**Goal:** *Compute the total revenue contributed by each customer, considering discounts and taxes.*

## UPDATE column GST

```
UPDATE Tax_amount
SET GST = CAST(REPLACE(GST, '%', '') AS FLOAT) / 100;
SELECT *
FROM Tax_amount
```

	Product_Category	GST
1	Nest-USA	0.001
2	Office	0.001
3	Apparel	0.0018
4	Bags	0.0018
5	Drinkware	0.0018
6	Lifestyle	0.0018
7	Notebooks & Journals	0.0005
8	Headgear	0.0005
9	Waze	0.0018
10	Fun	0.0018
11	Nest-Canada	0.001
12	Backpacks	0.001
13	Google	0.001
14	Bottles	0.0005
15	Gift Cards	0.0005
16	More Bags	0.0018

## Calculate Total Revenue per Customer

```
WITH RevenueData AS (
    SELECT
        o.CustomerID,
        SUM(o.Quantity * o.Avg_Price) AS GrossRevenue,
        SUM(o.Quantity * o.Avg_Price * d.Discount_pct / 100.0) AS
TotalDiscount,
        SUM((o.Quantity * o.Avg_Price + o.Delivery_Charges) * t.GST ) AS
TotalTax,
```

```

        SUM(o.Delivery_Charges) AS TotalDeliveryCharges
FROM
    Online_Sales o
LEFT JOIN
    Discount_Coupon d
    ON o.Product_Category = d.Product_Category
LEFT JOIN
    Tax_Amount t
    ON o.Product_Category = t.Product_Category
GROUP BY
    o.CustomerID
)
SELECT
    CustomerID,
    ROUND((GrossRevenue - TotalDiscount + TotalTax + TotalDeliveryCharges),4)
AS TotalRevenue
FROM
    RevenueData
ORDER BY TotalRevenue DESC

```

Results		Messages
	CustomerID	TotalRevenue
1	12748	797889.457
2	15311	779985.6637
3	14606	630180.3435
4	14911	554192.08
5	17841	535312.7275
6	17337	373066.5518
7	17850	368548.6248
8	15039	301875.3691
9	13089	298607.4389
10	15808	274331.4941
11	14667	268601.8066
12	13174	240642.822
13	15194	239984.1457
14	18118	230096.2877
15	14646	225123.143
16	14180	221258.0932
17	12081	218022.2602

## Evaluate Marketing ROI (Offline and Online)

**Goal:** Compare the return on investment (ROI) for offline and online marketing channels.

```

WITH DailyRevenue AS (
    SELECT
        Transaction_Date,
        SUM(o.Quantity * o.Avg_Price - o.Quantity * o.Avg_Price *
d.Discount_pct / 100.0) AS NetRevenue
    FROM
        Online_Sales o
    LEFT JOIN
        Discount_Coupon d
        ON o.Product_Category = d.Product_Category
    GROUP BY
        Transaction_Date
),
MarketingEffectiveness AS (
    SELECT
        r.Transaction_Date,
        r.NetRevenue,
        m.Offline_Spend,
        m.Online_Spend
    FROM
        DailyRevenue r
    LEFT JOIN
        Marketing_Spend m
        ON r.Transaction_Date = m.Date
)
SELECT
    AVG(NetRevenue / Offline_Spend) AS Offline_ROI,
    AVG(NetRevenue / Online_Spend) AS Online_ROI
FROM
    MarketingEffectiveness;

```

	Offline_ROI	Online_ROI
1	51.1056587582426	78.876566661035

## Identify High-Value Customers

**Goal:** Segment customers into High, Medium, and Low value groups based on their CLV.

```
WITH CustomerMetrics AS (  
    SELECT  
        o.CustomerID,  
        COUNT(o.Transaction_ID) AS Frequency,  
        MAX(o.Transaction_Date) AS LastPurchase,  
        SUM(o.Quantity * o.Avg_Price - o.Quantity * o.Avg_Price *  
d.Discount_pct / 100.0) AS Monetary  
    FROM  
        Online_Sales o  
    LEFT JOIN  
        Discount_Coupon d  
        ON o.Product_Category = d.Product_Category  
    GROUP BY  
        o.CustomerID  
)  
SELECT  
    CustomerID,  
    Monetary,  
    Frequency,  
    DATEDIFF(DAY, LastPurchase, GETDATE()) AS Recency,  
    CASE  
        WHEN Monetary > 5000 THEN 'High Value'  
        WHEN Monetary BETWEEN 2000 AND 5000 THEN 'Medium Value'  
        ELSE 'Low Value'  
    END AS CustomerSegment  
FROM  
    CustomerMetrics
```

Results Messages					
	CustomerID	Monetary	Frequency	Recency	CustomerSegment
1	17905	15030.6243061066	336	1960	High Value
2	15984	6414.43200988769	204	1952	High Value
3	15581	24386.111939621	566	1963	High Value
4	16316	22246.1760040283	252	1952	High Value
5	12664	7353.50397949219	60	1880	High Value
6	13328	22595.6160043716	204	1838	High Value
7	14679	1475.61606445313	12	2124	Low Value
8	17218	68677.5358520507	1406	1932	High Value
9	16554	4768.4158996582	24	1920	Medium Value
10	16222	107262.143997002	1644	1856	High Value
11	15226	8064.76817092895	96	1809	High Value
12	13777	65452.4168323516	804	1808	High Value
13	17690	64868.5445960997	901	1901	High Value
14	17026	1332.28799743652	36	2104	Low Value
15	15867	114106.559894943	1645	1848	High Value
16	16863	11192.1599761963	120	2013	High Value
17	12112	184216.702101252	722	1707	High Value

Query executed successfully.

## Analyze Coupon Effectiveness

**Goal:** Analyze revenue generated from orders using discount coupons vs. those without coupons.

```
SELECT
    CASE
        WHEN o.Coupon_Status = 'Used' THEN 'With Coupon (Used)'
        WHEN o.Coupon_Status = 'Not Used' THEN 'Without Coupon'
        WHEN o.Coupon_Status = 'Clicked' THEN 'With Coupon (Clicked)'
        ELSE 'Unknown Coupon Status'
    END AS CouponType,
    SUM(o.Quantity * o.Avg_Price - o.Quantity * o.Avg_Price * d.Discount_pct
/ 100.0) AS Revenue,
    COUNT(DISTINCT o.Transaction_ID) AS TotalTransactions
FROM
    Online_Sales o
LEFT JOIN
    Discount_Coupon d
    ON o.Product_Category = d.Product_Category
GROUP BY
    o.Coupon_Status
```

Results		Messages	
	CouponType	Revenue	TotalTransactions
1	Without Coupon	6984344.35884884	6565
2	With Coupon (Used)	14903080.1483932	12258
3	With Coupon (Clicked)	22691380.2456143	16371

## How These Queries Solve Business Problems

1. **Customer Revenue (Requirement 1):** Helps identify which customers are most valuable in terms of monetary contribution.
2. **Marketing ROI (Requirement 2):** Provides insights into where to allocate marketing budgets for maximum efficiency.
3. **Customer Segmentation (Requirement 3):** Aids in targeting specific groups with tailored marketing campaigns.
4. **Coupon Effectiveness (Requirement 4):** Evaluates the impact of discount strategies on sales and customer engagement.