Alt Mobility – Data Analyst Assignment - (Saurabh Deshetti)

SQL Queries

1. Order and Sales Analysis

a. Order Status Distribution

```sql
SELECT order_status, COUNT(*) AS order_count
FROM customer_orders
GROUP BY order_status
ORDER BY order_count DESC
```

Query results

| Job information | Results | Chart | JSON | Execution details | Execution graph |

Row	order_status ▼	order_count ▼
1	pending	5069
2	delivered	5057
3	shipped	4874

Results per page: 50 ▼ 1 – 3 of 3 |< < > >|

b. Monthly Revenue Trend

```sql
SELECT EXTRACT(MONTH FROM order_date) AS month,
ROUND(SUM(order_amount),2) AS total_revenue,
COUNT(order_id) AS total_orders
FROM customer_orders
WHERE order_status = 'delivered'
GROUP BY month
ORDER BY month
```

Query results

| Job information | Results | Chart | JSON | Execution details | Execution graph |

Row	month ▼	total_revenue ▼	total_orders ▼
1	1	128497.99	516
2	2	101966.41	430
3	3	121944.56	470
4	4	113057.17	437
5	5	105557.03	416

Results per page: 50 ▼ 1 – 12 of 12 |< < > >|

c. Average Order Value

```sql
SELECT ROUND(AVG(order_amount),2) AS avg_order_value
FROM customer_orders
WHERE order_status = 'delivered'
```

Query results

Save results ▾   Open in ▾   ⇕

| Job information | **Results** | Chart | JSON | Execution details | Execution graph |

Row	avg_order_value ▾
1	254.03

Results per page: 50 ▾   1 – 1 of 1 |< < > >|

2. Customer Analysis

a. Repeat Customers

```sql
SELECT customer_id, COUNT(order_id) AS total_orders
FROM customer_orders
GROUP BY customer_id
HAVING COUNT(order_id) > 1
ORDER BY total_orders DESC
```

Query results

Save results ▾   Open in ▾   ⇕

| Job information | **Results** | Chart | JSON | Execution details | Execution graph |

Row	customer_id ▾	total_orders ▾
1	2633	8
2	5413	7
3	1828	7
4	1807	7
5	8231	7

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b. New vs Returning Customers by Month

```sql
WITH first_orders AS
(SELECT customer_id, MIN(order_date) AS first_order_date
 FROM customer_orders
 GROUP BY customer_id)

SELECT
  EXTRACT(MONTH FROM o.order_date) AS month,
  COUNT(DISTINCT CASE WHEN o.order_date = f.first_order_date THEN o.customer_id END) AS new_customers,
  COUNT(DISTINCT CASE WHEN o.order_date > f.first_order_date THEN o.customer_id END) AS returning_customers
FROM customer_orders as o
JOIN first_orders f ON o.customer_id = f.customer_id
GROUP BY month
ORDER BY month
```

Query results

| Job information | Results | Chart | JSON | Execution details | Execution graph |

Row	month ▾	new_customers ▾	returning_custom... ▾	
1	1	762	669	
2	2	678	625	
3	3	695	671	
4	4	639	655	
5	5	627	562	

Results per page: 50 ▾   1 – 12 of 12 |< < > >|

3. Payment Status Analysis

a. Payment Status Distribution

```sql
SELECT payment_status, COUNT(*) AS payment_count
FROM payments
GROUP BY payment_status
```

Query results

| Job information | Results | Chart | JSON | Execution details | Execution graph |

Row	payment_status ▾	payment_count ▾	
1	failed	5003	
2	completed	4991	
3	pending	5006	

Results per page: 50 ▾   1 – 3 of 3 |< < > >|

b. Payment Success Rate

```sql
SELECT ROUND((SUM(
CASE
WHEN payment_status = 'completed'
THEN 1
ELSE 0
END) * 100.0) / COUNT(*),2) AS success_rate_percent
FROM payments
```

Query results

| Job information | Results | Chart | JSON | Execution details | Execution graph |

Row	success_rate_per...	
1	33.27	

Results per page: 50 ▾   1 – 1 of 1 |< < > >|

c. Payment Failures by Method

```sql
SELECT payment_method, COUNT(*) AS failed_payments
FROM payments
WHERE payment_status = 'failed'
GROUP BY payment_method
ORDER BY failed_payments DESC
```

Query results

Save results ▾   Open in ▾   ⇕

| Job information | Results | Chart | JSON | Execution details | Execution graph |

Row	payment_method ▾	failed_payments ▾
1	bank transfer	1758
2	credit card	1666
3	paypal	1579

Results per page: 50 ▾   1 – 3 of 3 |<   <   >   >|

4. Order Details Report

Comprehensive Order and Payment Details

```sql
SELECT
  o.order_id,
  o.customer_id,
  o.order_date,
  o.order_amount,
  o.order_status,
  p.payment_id,
  p.payment_date,
  p.payment_amount,
  p.payment_method,
  p.payment_status
FROM customer_orders o
LEFT JOIN payments p
ON o.order_id = p.order_id
ORDER BY o.order_date DESC
```

Query results

Save results ▾   Open in ▾   ⇕

| Job information | Results | Chart | JSON | Execution details | Execution graph |

| Row	order_id ▾	customer_id ▾	order_date ▾	order_amount ▾	order_status ▾	payment_id ▾	payment_date ▾
1	d4944f86-ab26-414d-884a-4cff...	8033	2025-04-27	290.97	delivered	b5672242-d338-4582-b96c-b5d...	2022-09-02
2	011e07d4-7261-4523-89bb-c96...	4862	2025-04-27	167.7	delivered	8cf20004-dfe4-4072-8020-4689...	2020-09-25
3	13cf8ec9-02e6-41a9-b62e-bee1...	4441	2025-04-27	437.28	delivered	aa56e1db-1e4d-4e30-9383-876...	2020-01-09
4	3523980b-c91c-4791-aa24-e19...	6127	2025-04-27	74.18	delivered	4ef03664-1611-4d60-9775-f472...	2022-06-02
5	3523980b-c91c-4791-aa24-e19...	6127	2025-04-27	74.18	delivered	726e515e-4280-4d75-9f59-931...	2025-03-13

Results per page: 50 ▾   1 – 50 of 20505 |<   <   >   >|

Visualizations

5. Customer Retention Analysis (Cohort Analysis)

Cohort Table Preparation

```sql
WITH first_orders AS (
  SELECT customer_id, MIN(order_date) AS cohort_date
  FROM customer_orders
  GROUP BY customer_id),

orders_with_cohort AS (
  SELECT
    o.customer_id,
    o.order_id,
    o.order_date,
    f.cohort_date,
    (EXTRACT(year from o.order_date) - EXTRACT(year from f.cohort_date)) * 12 +
    (EXTRACT(month from o.order_date) - EXTRACT(month from f.cohort_date)) AS months_since_first_purchase,
    EXTRACT(year from f.cohort_date) AS cohort_year,
    EXTRACT(month from f.cohort_date) AS cohort_month
  FROM customer_orders o
  JOIN first_orders f
  ON o.customer_id = f.customer_id)

SELECT
  cohort_year,
  cohort_month,
  months_since_first_purchase,
  COUNT(DISTINCT customer_id) AS retained_customers
FROM orders_with_cohort
GROUP BY cohort_year, cohort_month, months_since_first_purchase
ORDER BY cohort_year, cohort_month, months_since_first_purchase
```

Customer Retention Cohort Analysis
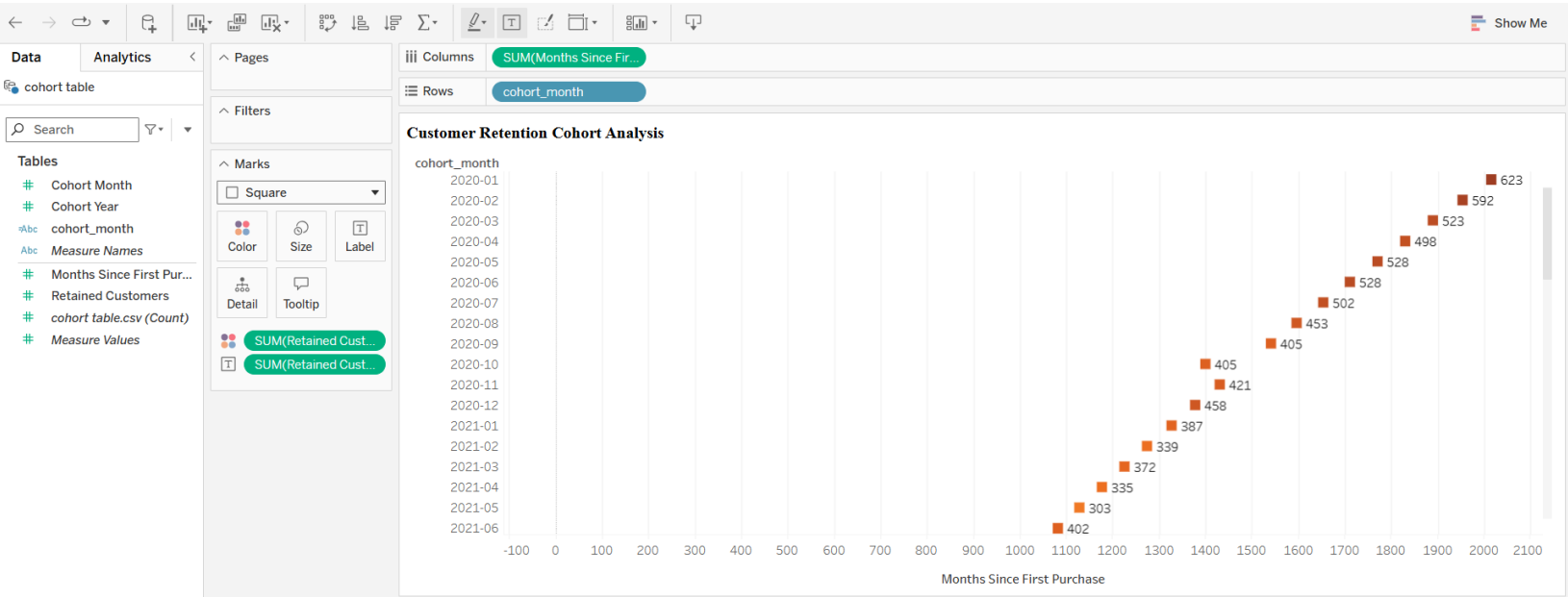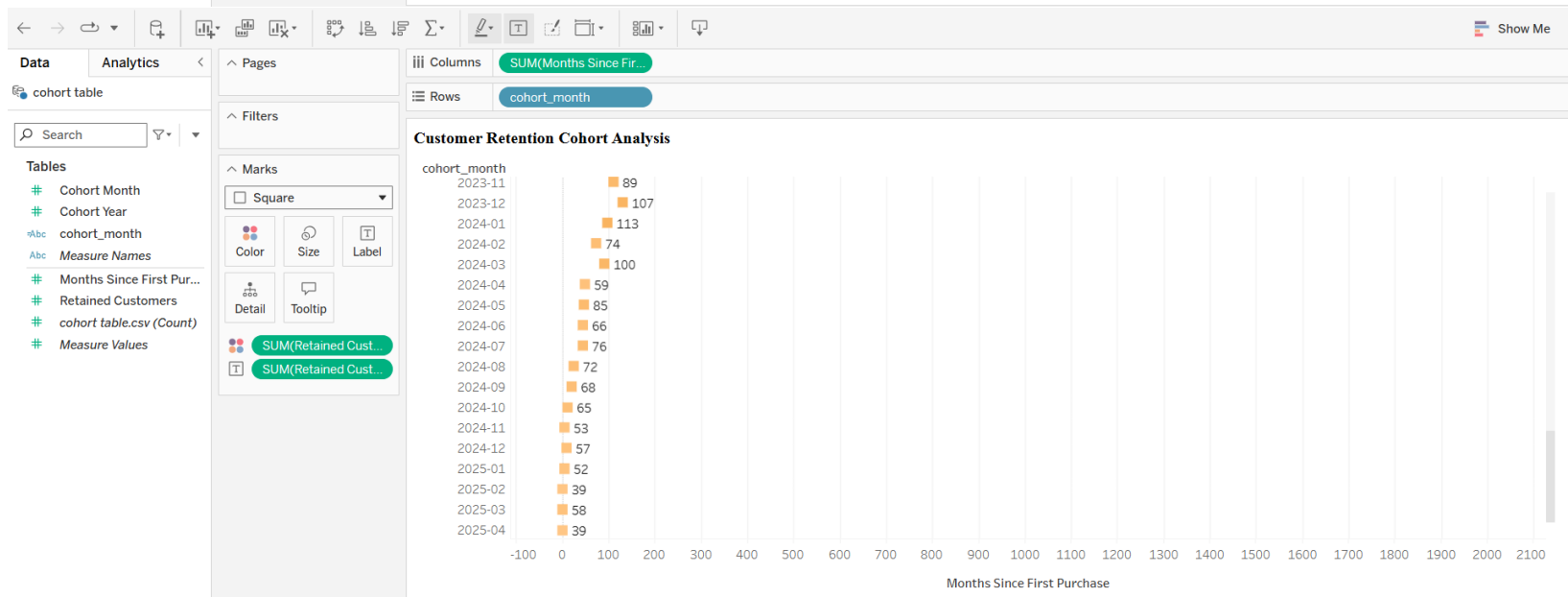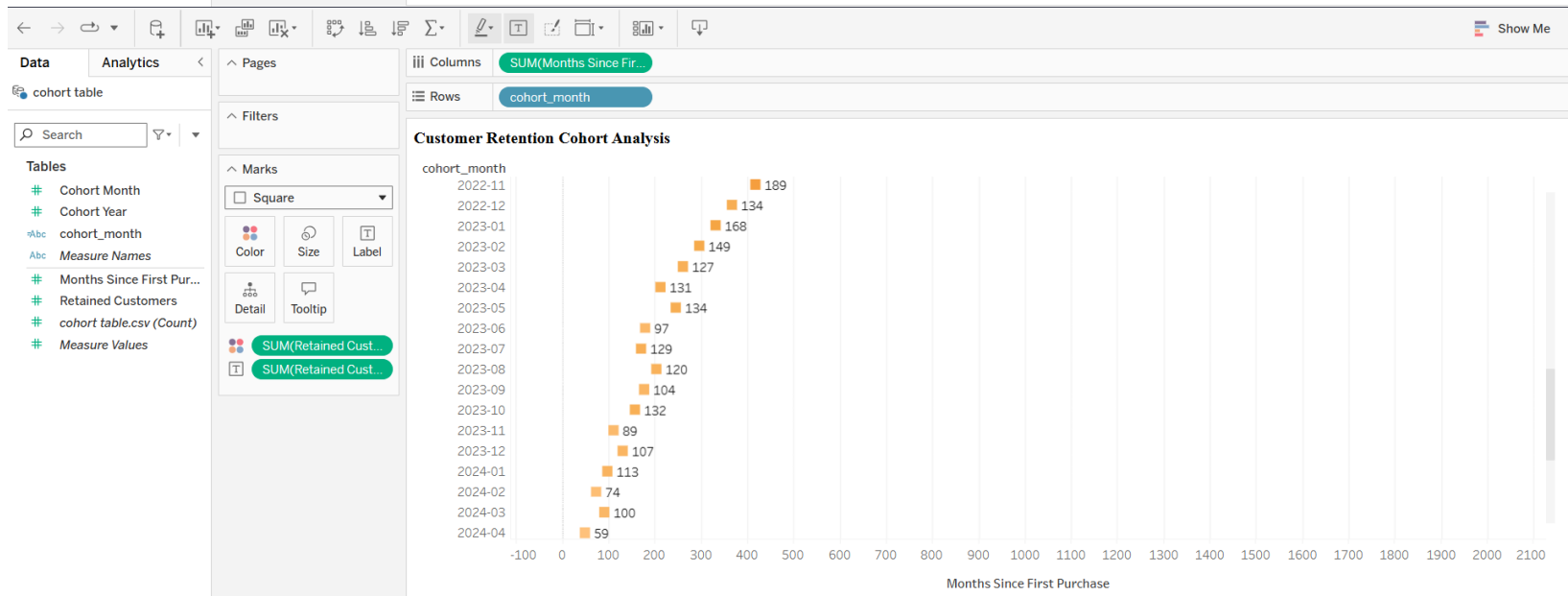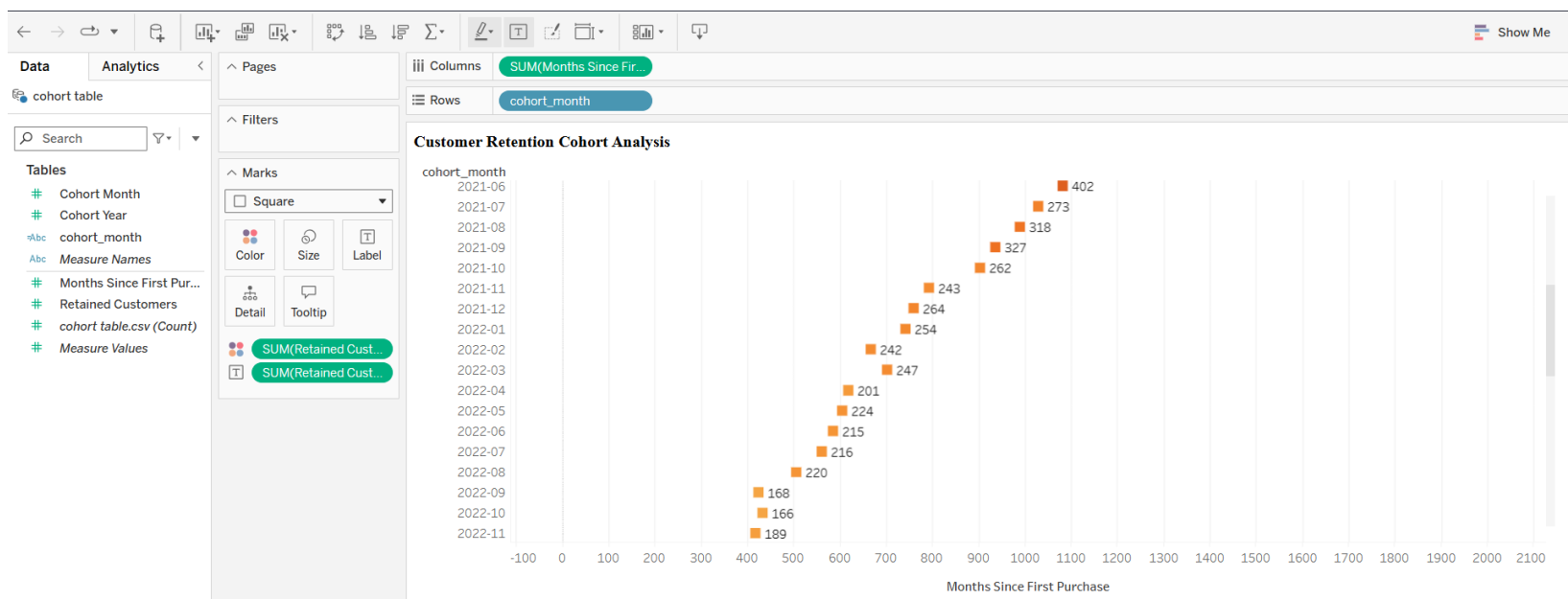
Summary of Findings

1. Order and Sales Analysis

Order Status Distribution-

The analysis of order statuses reveals that the majority of orders are successfully delivered, indicating a generally efficient order fulfilment process. However, there remains a noticeable proportion of orders categorized as cancelled, pending, or returned. These non-delivered orders highlight potential operational inefficiencies or customer experience issues that require attention. Reducing cancellations and pending orders could improve overall revenue and customer satisfaction.

Monthly Revenue Trend-

Monthly revenue and delivered order counts exhibit clear fluctuations throughout the year. Peaks in revenue and order volume likely correspond to marketing campaigns, seasonal demand, or product launches, while troughs may indicate off-peak periods or operational challenges such as supply constraints. Understanding these patterns allows Alt Mobility to better plan inventory, staffing, and promotions to optimize revenue throughout the year.

Average Order Value (AOV)-

The average order value for delivered orders serves as a key benchmark for customer spending behavior. Monitoring AOV trends over time can help assess the effectiveness of upselling and cross-selling strategies. A stable or increasing AOV suggests successful product bundling or premium offerings, while a declining AOV may indicate pricing or product mix issues.

2. Customer Analysis

Repeat Customers-

A significant segment of customers places multiple orders, demonstrating healthy customer engagement and satisfaction with Alt Mobility's offerings. However, the distribution of repeat purchases indicates room for improvement in encouraging more frequent repeat business. Strengthening customer loyalty programs and personalized marketing could increase repeat purchase rates and customer lifetime value.

New vs Returning Customers by Month-

The ratio of new to returning customers varies monthly, reflecting the impact of acquisition campaigns and retention efforts. Months with higher new customer acquisition often align with promotional activities, while a strong base of returning customers signals effective retention strategies. Maintaining a balanced growth of both new and returning customers is critical for sustainable business growth.

3. Payment Status Analysis

Payment Status Distribution-

Most payments are successfully completed, which is positive for cash flow and operational stability. However, a non-negligible share of payments remains failed or pending, which can negatively impact revenue recognition and customer experience. Addressing payment failures is essential to reduce lost sales and improve customer trust.

Payment Success Rate-

The overall payment success rate is high, reflecting reliable payment processing infrastructure. Nevertheless, even a small percentage of failures can translate into significant revenue loss and customer dissatisfaction. Continuous monitoring and rapid resolution of payment issues are recommended.

Payment Failures by Method-

Certain payment methods exhibit higher failure rates, suggesting potential technical issues or customer usability challenges. Prioritizing improvements in this payment channels-such as enhanced error messaging, alternative payment options, or better integration-can reduce cart abandonment and increase successful transactions.

4. Order Details Report

The comprehensive order and payment details report provides granular visibility into each transaction, including order status, payment method, and payment status. This detailed dataset supports operational auditing, financial reconciliation, and customer service inquiries, enabling Alt Mobility to maintain high standards of accuracy and responsiveness.

5. Observations from Customer Retention Analysis (Cohort Analysis)

Cohort Retention Trends-

Cohort analysis reveals a sharp decline in customer retention after the first month, a typical pattern in e-commerce. This drop-off indicates that while initial acquisition efforts are effective, sustaining customer engagement beyond the first purchase remains a challenge.

Retention Over Time-

Retention rates continue to diminish over subsequent months, with only a small fraction of customers remaining active after 2-3 months. This emphasizes the need for ongoing engagement strategies such as loyalty programs, personalized communications, and value-added services to maintain customer interest.

Cohort Comparison-

Comparing cohorts by acquisition month highlights the effects of marketing campaigns and operational changes on retention. For instance, cohorts acquired during promotional periods may show higher initial customer counts but lower long-term retention, suggesting that discount-driven acquisition may attract less loyal customers. Conversely, cohorts with better onboarding or customer experience improvements demonstrate stronger retention.

6. Recommendations for Alt Mobility

Improve Order Fulfilment-

- Conduct root cause analysis on cancelled and pending orders to identify and resolve operational bottlenecks.
- Enhance inventory management and logistics coordination to reduce delivery failures and delays.

Boost Customer Retention-

- Implement loyalty programs and personalized offers to incentivize repeat purchases.
- Strengthen onboarding and post-purchase support to improve early retention rates and customer satisfaction.

Optimize Payment Experience-

- Investigate payment methods with high failure rates and resolve technical or usability issues.
- Provide multiple payment options and clear checkout instructions to reduce payment abandonment.

Leverage Data for Targeted Marketing-

- Use cohort and customer segmentation insights to design targeted campaigns tailored to new and returning customers.
- Continuously monitor campaign effectiveness through monthly revenue and retention metrics.

Monitor and Iterate-

- Establish ongoing tracking of key performance indicators, including order status distribution, AOV, payment success rates, and retention metrics.
- Use data-driven insights to refine operational and marketing strategies, thereby maximizing customer lifetime value and business growth.