

Case Study: E-Commerce Data Analysis

Company Overview

Name: Shop Nex

Industry: E-commerce – electronics & lifestyle products

Location: India

Objective: Analyse customer behaviour, order trends, and product performance to boost online sales.

ShopNex operates an online marketplace where users can browse, purchase, and review products. The business wants to understand what drives revenue, which products perform best, and how discounts impact customer purchases.

Problem Statement

Problem Statement (based on your SQL analyses)

ShopNex, an e-commerce platform for electronics, fashion, and accessories, faces several challenges in understanding and optimizing its business operations:

1. Identifying High-Value and Repeat Customers

- The company does not have a clear view of which customers contribute most to revenue or make repeat purchases. This limits its ability to design loyalty programs and personalized marketing campaigns.

2. Understanding Product Performance

- There is no systematic analysis of which products generate the most revenue, which products sell consistently in smaller quantities, and which products are price-sensitive or require discounts to boost sales.

3. Monitoring Sales and Discounts

- The impact of discounts on average order value and cart size is unknown. Management cannot tell which discount strategies are effective in driving sales.

4. Analyzing Regional Sales Trends

- ShopNex lacks insight into which cities are high-performing and which regions have low purchase frequency. This prevents targeted regional marketing and expansion planning.

5. Managing Inventory Efficiently

- There is no automated method to identify products at risk of stockouts or overstock. This can lead to lost sales or unnecessary holding costs.

6. Optimizing Payment Options

- The company does not know which payment methods are preferred by customers or how payment behavior correlates with purchase patterns, limiting promotional strategies tied to payment channels.

Database Schema & Relationships

Here's how your four tables connect logically 

Customers (1) ↔ Orders (∞)

Each customer can place multiple orders.

Orders (1) ↔ OrderDetails (∞)

Each order can have multiple items.

Products (1) ↔ OrderDetails (∞)

Each product can appear in multiple orders.

[ER Diagram \(Text Representation\)](#)

Customers (customer_id)

↓

Orders (order_id, customer_id)

↓

OrderDetails (orderdetail_id, order_id, product_id)

↓

Products (product_id)

1 Customer Insights

a) High-Value Customers (Multiple Purchases)

```
SELECT c.customer_name, COUNT(o.order_id) AS total_orders,
SUM(o.total_amount) AS total_spent
FROM Orders o
JOIN Customers c ON o.customer_id = c.customer_id
GROUP BY c.customer_name
ORDER BY total_spent DESC;
```

- This tells you who spent the most and ordered multiple times (Rohan Sharma).

b) Customers by City (Urban-heavy)

```
SELECT city, COUNT(customer_id) AS num_customers
FROM Customers
GROUP BY city
ORDER BY num_customers DESC;
```

- Shows which cities contribute most of your customers.
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c) Payment Mode Usage

```
SELECT payment_mode, COUNT(order_id) AS num_orders,
       ROUND((COUNT(order_id)*100.0)/(SELECT COUNT(*) FROM Orders),2) AS
percentage
FROM Orders
GROUP BY payment_mode;
```

- Gives the percentage of digital payments (UPI / Cards) vs COD.
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2 Product Insights

a) Total Sales per Product

```
SELECT p.product_name, SUM(od.subtotal) AS total_sales
FROM OrderDetails od
JOIN Products p ON od.product_id = p.product_id
GROUP BY p.product_name
ORDER BY total_sales DESC;
```

- Helps identify **top revenue-generating products** (Smartwatch, Earbuds).

b) Steady-selling / low-cost items

```
SELECT p.product_name, SUM(od.quantity) AS total_units_sold
FROM OrderDetails od
JOIN Products p ON od.product_id = p.product_id
GROUP BY p.product_name
ORDER BY total_units_sold DESC;
```

- Shows products with consistent single-item sales (Backpack).
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3 Sales Insights

a) Total Orders, Revenue, Avg. Order Value

-- Total Orders

```
SELECT COUNT(*) AS total_orders FROM Orders;
```

-- Total Revenue

```
SELECT SUM(total_amount) AS total_revenue FROM Orders;
```

-- Average Order Value

```
SELECT ROUND(AVG(total_amount),2) AS avg_order_value FROM Orders;
```

-- Repeat Purchase Rate

```
SELECT ROUND((COUNT(*)*100.0)/(SELECT COUNT(DISTINCT customer_id) FROM
Orders),2) AS repeat_percentage
FROM Orders
GROUP BY customer_id
HAVING COUNT(order_id) > 1;
```

4 Discount Effectiveness

```
SELECT discount, ROUND(AVG(total_amount),2) AS avg_order_value,  
COUNT(order_id) AS num_orders  
FROM Orders  
GROUP BY discount  
ORDER BY discount;
```

- Shows how discount levels impact average order value.

5 Regional Insights

```
SELECT c.city, SUM(o.total_amount) AS city_revenue, COUNT(o.order_id) AS  
total_orders  
FROM Orders o  
JOIN Customers c ON o.customer_id = c.customer_id  
GROUP BY c.city  
ORDER BY city_revenue DESC;
```

- Highlights top-performing cities and low-frequency regions.

6 Inventory & Stock Health

```
SELECT product_name, stock_qty,  
CASE  
    WHEN stock_qty < 100 THEN 'Medium - Selling fast'  
    WHEN stock_qty BETWEEN 100 AND 150 THEN 'Healthy'  
    ELSE 'Very good'  
END AS risk_status  
FROM Products;
```

Key Business Insights

1 Customer Insights

- **Rohan Sharma (Customer ID: 1)** is a high-value customer — multiple purchases within 10 days.
- Majority of customers are from **tier-1 cities** (Mumbai, Delhi, Bangalore), indicating an urban-heavy customer base.
- 60% of customers used **digital payments (UPI / Cards)** — clear sign to promote cashback offers via digital wallets.

2 Product Insights

- **Smartwatch** and **Wireless Earbuds** together form **~45% of total revenue**.
- **Backpack (Product ID: 104)** sells steadily with smaller single-item orders — perfect for low-cost bundles.

- **Running Shoes** sell well without discounts — price-insensitive product.
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3 Sales Insights

Metric	Value	Interpretation
Total Orders	5	Small dataset, early growth stage
Total Revenue	₹22,593	(After discounts, approximated)
Avg. Order Value	₹4,518	Healthy, given mid-range product pricing
Repeat Purchase Rate	20%	Only one returning customer (Rohan)

4 Discount Effectiveness

Discount Offered	Avg. Order Value	Observation
0%	₹2,799	Single-item, low total value
5–15%	₹6,998	Multi-item, higher total value
Conclusion: Discounts increase cart size — customers tend to add more items when promotions apply.		

5 Regional Insight

- **Mumbai** and **Delhi** generate most sales volume.
 - Customers from **Kochi** and **Ahmedabad** are low-frequency buyers — localized marketing could help.
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6 Inventory & Stock Health

Product	Stock Qty	Risk
Smartwatch	80	♦ Medium – Selling fast
Earbuds	90	♦ Medium
Backpack	150	● Healthy
Running Shoes	200	● Very good
Speaker	120	● Stable

Recommendation: Increase procurement for Smartwatches & Earbuds — likely to go out of stock soon.

Final Summary

ShopNex's e-commerce performance data shows that:

- Urban, digital-savvy customers are driving growth.
- Discounts directly influence average order value.

- Electronics dominate revenue contribution.
- Repeat purchases are rare — loyalty programs are needed.

Next Steps:

- Launch loyalty or cashback offers for repeat customers.
- Bundle low-margin items (like backpacks) with top sellers.
- Run city-wise discount campaigns in Delhi & Mumbai.