

# E-Commerce Company Case Study Report

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## PROJECT OVERVIEW

This case study focuses on an e-commerce company that has encountered challenges in understanding its sales performance, customer engagement, and inventory management. Through a comprehensive data analysis approach, the company aims to identify high or low sales products, effectively segment its customer base, and analyze customer behavior to enhance marketing strategies, inventory decisions, and overall customer experience.

## BUSINESS PROBLEMS

The e-commerce company has observed stagnant growth and declining customer engagement metrics over the past quarters. Initial assessments indicate potential issues in product performance variability, ineffective customer segmentation, and lack of insights into customer purchasing behavior. The company seeks to leverage its sales transaction data, customer profiles, and product inventory information to address the following key business problems:

- **Product Performance Variability:** Identifying which products are performing well in terms of sales and which are not. This insight is crucial for inventory management and marketing focus.
- **Customer Segmentation:** The company lacks a clear understanding of its customer base segmentation. Effective segmentation is essential for target marketing and enhancing customer satisfaction.
- **Customer Behavior Analysis:** Understanding patterns in customer behavior, including repeat purchases and loyalty indicators, is critical for tailoring customer engagement strategies and improving retention rates.

## DATASET DESCRIPTIONS

There are four tables are given that are as follows

- **Orders:** Records of Orders placed, including Order ID, Order Date, customer ID and Total amount.
- **Customers:** Information on customers, including customer ID, Name and location.
- **Order Details:** Details of each Order, Contains Order ID, Product ID, Quantity and Price per unit.
- **Products:** Data on product inventory, including product ID, product name, category and price.

## EXPLORATORY DATA ANALYSIS (EDA) & DATA CLEANING

- Remove duplicate records in Customers, Products and Orders datasets.
- Correct any discrepancies in product prices between Products and Order Details datasets. Also correct any discrepancies in total amount of order between Orders and Order Details datasets.
- Check empty and null values across all data sets.
- Add Entity Relationship between Products, Customers, Orders and Order Details datasets to join tables.
- Check datatypes of attributes of each dataset and make them appropriate.

## ADVANCE ANALYSIS

- **Customer Distribution:** Examine the customer distribution based on locality to identify the most demanding area to inform regular restocking. And analyse the customers with categories such as One-time buyer, Occasional and Regular based on orders they placed.

- High or Low Sales Products: Identify products with the highest and lowest sales to inform inventory decisions. And analyze Product Category wise customer reach to get popular product category.
- Sales Trends: Find the sales trends and the m-o-m growth of sales from the dataset. Also find m-o-m change in average order value from dataset.
- Inventory and Stock Optimization: Identify products with turnover rate to get refresh rate of individual product. Also find low engagement product indicating potential mismatches between inventory and customer interest.
- Customer Acquisition Trends: Find m-o-m growth in new customer's acquisition with the products. Also examine m-o-m sales trend for peak sales period identification.
- Customer Behaviour Analysis: Identify the loyal customer based on loyalty indicators to improve customer retention and satisfaction.

## KEY INSIGHTS

- The top three cities with the highest customer density are Delhi, Chennai, and Jaipur.
- Occasional buyers formed the largest segment (45%).
- Digital SLR Camera is the highest-selling product.
- Smartphone 6" and Wireless Earbuds were identified as premium products with high revenue and low average order quantity.
- The electronics category has the highest unique customers enhancing sale performance.
- The months of peak sales are September, December, and July 2023.
- Declining in average order value in January, and February 2024.

- Customer acquisition was strongest from March to August 2023 and then declined in late 2023.
- Most loyal customer (ID 45 – Hunar Rout) showed longest engagement duration.

## RECOMMENDATIONS

- Occasional customers should be targeted with tailored marketing strategies as they are the largest customer segment.
- Delhi, Chennai, and Jaipur are the key focus areas for marketing and logistics.
- It is suggested that frequent restocking of products fall under the Electronics category as the category has the highest unique customer reach.
- Digital SLR is the product that requires frequent restocking due to high turnover.
- Upgrade pricing and promotional strategies to enhance order value for the months July 2023, October 2023, January 2024 and February 2024.
- September, December, and July are recommended to align inventory and promotions accordingly.
- Need more strategic plans to make Marketing campaigns and market expansion more effective in the later months (Nov 2023 to Feb 2024).