E-commerce Return Rate Reduction Analysis

Introduction / Objective: The goal is to uncover key operational and behavioral factors influencing returns, enabling data-driven strategies to reduce return rates and improve customer satisfaction.

- **Tools Used: Power BI**
- **Steps Involved in Building the Project:**

1. Download datasets from kaggle.
2. Upload data in Power BI.
3. Clean and order dataset:
    a) In transform data check whether all the datasets have correct datatype.
    b) If there is any missing value In return status their was return and null. So I replaced “Null” with “Not Returned”.
4. Close and Apply. Data will be uploaded in power BI ready to make dashboard and give useful insight The key columns needed to analyze return behavior are:
Product Category, User_Location (Geography)
Return_Status ("Returned" / "Not Returned"), Return_Reason , Order_ID (to count total orders).
5. Select Canvas background and size.
6. Go to insert tab in shapes select rounded rectangle and set title as “Return Risk Score Dashboard”Set color and size.
7. **Create Measures in Power BI DAX**
    a) Total Orders = COUNTROWS(‘ecommerce_returns_synthetic_data’)
    b) Returned Orders =
    CALCULATE(COUNTROWS(‘ecommerce_returns_synthetic_data’),
    ‘ecommerce_returns_synthetic_data’[Return_Status]=”Returned”)
    c) Return % = DIVIDE([Returned Orders],[Total Orders],0)
8. **Select Card(new) and select Total Orders, Returned Orders, Return %**
Visual will give clear picture of how much total order was made, percentage of Returned Orders and Return%
9. **Analyze return % per product category**
    Visual: Stacked bar chart
    y- axis : Product_Category
    x- axis : Return%
    Analysis:
    a) Which product category has highest return rate and which has lowest return rate.
    b) What percentage of product are getting returned.
    c) Comparing which category is more profitable than other.

    Insight: Clothing and Electronics have the highest return rates — often common in e-commerce due to size/fit issues or product expectation mismatch.

10. **Return % by Geography /((User_location(city))for region analysis**
    Filter Top 10 Cities in descending order of return%
    Analysis: City 87 has the maximum Return % of 61.11% following City74 57.29%
    Lowest City 10 with Return% 59.80%

Insight : Certain cities (87,74,71) have much higher return activity, possibly due to delivery issues, customer expectations, or product availability mismatch.

11. Return Reasons (Why Customers Return)

Visual Donut Chart

Analysis:

This give insight about the top reason why customer returned the product.
From chart we can infer 26.27% of the item return were defective.
24.9% were wrong item send to customer, 24.8 % customer changed their mind and 23.9 % was item not as described.

Insight:

Most returns are due to defects or wrong items shipped, followed closely by buyer's remorse ("Changed mind").
This indicates both quality control and fulfillment accuracy need attention.

12. Return % with Online Payment Method

Visual: Table

Analysis:

a) Payment purchase done with gift card are more likely to be returnable compare to debit card , credit card and paypal.
b) More than half of the product purchased by gift card and debit card are returned.
c) Payment done with Paypal has lowest return rate.
d) Gift card and debit card return % is almost same.
e) Almost 50 % or more product purchased online are returned.

Insight:

Gift card users show a slightly higher return rate, potentially indicating lower purchase commitment.

13. Return Rate by Shipping Method

Visual: Piechart

Analysis:

a) Shipping Next-Day has higher return % of 51.09% and express shipping method has the lowest.

Insight:

Return rates are slightly higher for Next-Day deliveries, possibly because of impulse purchases or rushed fulfillment errors.

- **Conclusion -**

Over half of all e-commerce orders in key categories like Clothing and Electronics are being returned, primarily due to product defects and wrong shipments. Certain cities show disproportionately high return rates, indicating operational inefficiencies. Focused improvements in product quality, logistics consistency, and customer communication could significantly reduce overall return percentages.