

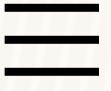
E-COMMERCE BUSINESS ANALYSIS

The objective of this project is to analyze historical e-commerce transaction data to uncover actionable insights related to sales performance, customer purchasing patterns, product demand, and operational efficiency

Presented by Blessing Laweh

Getting Started





MARKET EXCHANGES

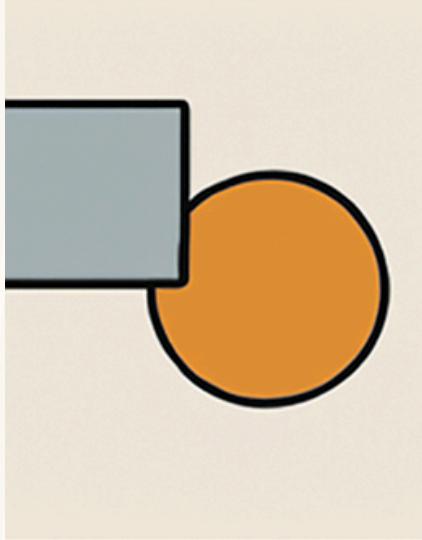
Objective

- Analyze sales and return transactions to understand their impact on revenue
- Detect anomalies (returns and pricing) that may negatively affect business performance
- Provide actionable insights to support data-driven decision-making

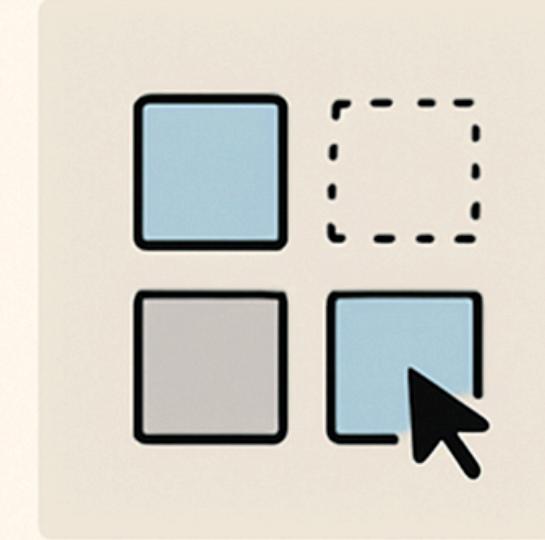
Scope

- Sales transactions
- Returned goods
- Unit price behavior
- Customer purchase patterns

DATA PREPARATION & METHODOLOGY



Removing
Duplicates



Handling
Missing Values



Standardizin
Data

01

02

03

04

05

Separated returned transactions from completed sales for clearer analysis

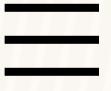
Conducted descriptive, comparative, and revenue-impact analyses

Applied statistical methods (IQR) for outlier detection

Retained zero unit price items for volume-based analysis

Created two datasets:
Sales Dataset (completed transactions)
Returns Dataset (returned goods)





RETURNS ANALYSIS

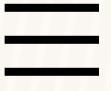
```
#calculate good returns rate
count_return_rate = (df[df['Quantity'] < 0].shape[0] / len(df)) * 100
count_return_rate

2.1850222423744805
```

- Calculated:
 - Return transaction count
 - Returned quantity
 - Revenue impact of returns
- Analyzed return patterns across products and volumes

Key Insight

- Returned items contribute approximately **3.8% of total revenue**, indicating a manageable return rate



IMPACT OF RETURNS ON REVENUE

- Returns do not pose a significant financial risk at an aggregate level
- High returns are primarily driven by sales volume, not abnormal behavior

Business Interpretation

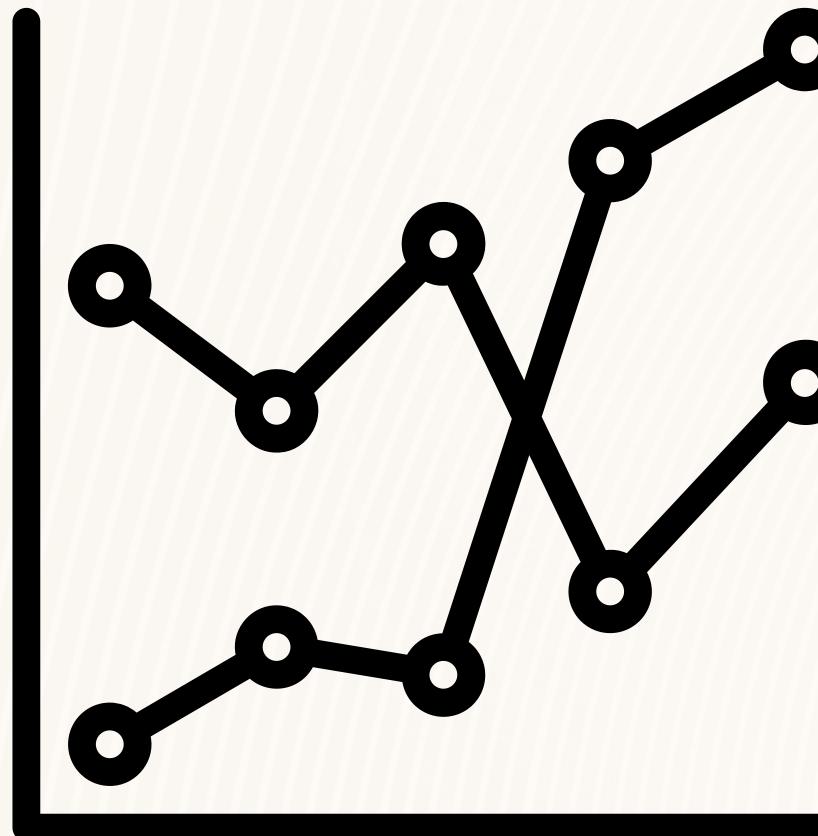
- No immediate need for aggressive return-reduction strategies
- Targeted monitoring is more effective than broad interventions

```
#calculate return rate based on quantity
quantity_return_rate = abs(df[df['Quantity'] < 0]['Quantity'].sum()) / df[df['Quantity'] > 0]['Quantity'].sum() * 100
quantity_return_rate
np.float64(2.612095491245306)

#calculate revenue impact of returns
returns_revenue = (df[df['Quantity'] < 0]['Quantity'] * df[df['Quantity'] < 0]['UnitPrice']).sum()
total_revenue = (df[df['Quantity'] > 0]['Quantity'] * df[df['Quantity'] > 0]['UnitPrice']).sum()

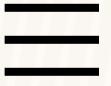
revenue_impact = (abs(returns_revenue) / total_revenue) * 100
revenue_impact
np.float64(3.892914962464552)
```

PRICING & ANOMALY DETECTION



Decision

- Pricing outliers were retained after validation, as they likely represent:
 - a.Premium products
 - b.Bulk or special pricing
 - c.Legitimate business scenarios
- Conducted outlier analysis on unit prices using the Interquartile Range (IQR) method
- Identified extremely high-price values



ZERO UNIT PRICE ITEMS ANALYSIS

Identify zero prices								
	InvoiceNo	StockCode	Description	Quantity	UnitPrice	CustomerID	Country	Date
54	575579	22089	PAPER BUNTING VINTAGE PAISLEY	24	0.0	13081	United Kingdom	2011-11-10
072	568158	PADS	PADS TO MATCH ALL CUSHIONS	1	0.0	16133	United Kingdom	2011-09-25
360	562973	23157	SET OF 6 NATIVITY MAGNETS	240	0.0	14911	EIRE	2011-08-11
335	561284	22167	OVAL WALL MIRROR DIAMANTE	1	0.0	16818	United Kingdom	2011-07-26
666	571035	M	Manual	1	0.0	12446	RSA	2011-10-13
404	569716	22778	GLASS CLOCHE SMALL	2	0.0	15804	United Kingdom	2011-10-06
937	564651	22955	36 FOIL STAR CAKE CASES	144	0.0	14646	Netherlands	2011-08-26
441	539263	22580	ADVENT CALENDAR GINGHAM SACK	4	0.0	16560	United Kingdom	2010-12-16
193	572893	21208	PASTEL COLOUR HONEYCOMB FAN	5	0.0	18059	United Kingdom	2011-10-26
665	577314	23407	SET OF 2 TRAYS HOME SWEET HOME	2	0.0	12444	Norway	2011-11-18

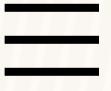
Insight:

- Large quantities of zero-priced items could impact perceived profitability if not tracked properly

- Zero-priced items retained intentionally

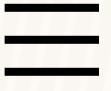
Purpose:

- Enable volume-based analysis
- Identify potential promotional giveaways
- Detect possible data entry errors



KEY FINDINGS SUMMARY

- Returns account for a small portion (3.8%) of total revenue
- No strong evidence of revenue leakage due to abnormal returns
- Pricing anomalies exist but are not errors
- Current sales and pricing structure appears stable



BUSINESS RECOMMENDATIONS

Operational

- Monitor high-volume products with elevated return rates
- Investigate potential quality or fulfillment issues where applicable

Analytical

- Track return rates at the product level rather than total volume
- Define acceptable return thresholds to flag anomalies early

Strategic

- Combine return analysis with customer behavior metrics (e.g., repeat purchases, CLV)
- Use insights to refine inventory and promotional strategies

CONCLUSION

The analysis prioritized business impact over excessive metrics, ensuring insights directly supported actionable decisions.

- The business demonstrates healthy revenue performance
- Returns and anomalies are present but do not significantly threaten profitability
- Focus should shift from detection to continuous monitoring and optimization

Time to Recharge





THANK YOU FOR YOUR ATTENTION

Thank you for reading this presentation on the E-commerce store analysis. Your interest and feedbacks are truly appreciated.

[EDA Notebook](#)

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[Case Study Document](#)