

E-COMMERCE SALES INSIGHTS REPORT

PROBLEM STATEMENT

In the rapidly expanding e-commerce industry, businesses generate huge volumes of sales and customer data. However, this data is often inconsistent, unstructured, duplicated, making it difficult to analyze and extract meaningful insights. Such data complexity limits the ability to track performance, identify trends, and understand customer behavior. As a result, companies struggle to make informed, data-driven decisions and miss potential growth opportunities, leading to inefficiencies in marketing, inventory management, and overall strategic planning.

To address this challenge, this project uses a **Kaggle/GitHub e-commerce dataset** and implements a complete **data analytics workflow** integrating **Python, SQL, and Excel**. Python is used for data cleaning and key performance aggregations, SQL for analyzing sales performance through structured queries, and Excel for building an interactive dashboard that visually represents major sales trends and insights.

The aim of this project is to demonstrate how a unified and structured analytical process can transform raw e-commerce data into clear, visual, and insight-driven business intelligence, enabling more informed and effective business decisions.

Build an Interactive Dashboard that should contain the following:

KPI's:

1. Total Revenue
2. Total Orders
3. Total Units Sold
4. Average Order Value
5. Average Quantity Per Order

Visualizations:

1. Display **Orders and Sales by Month**
2. Build a chart for **Top 5 States by Sales Revenue**
3. Display **Sales by Gender**
4. Display **Orders by Age Group and Gender**
5. Display **Orders Distribution by Order Status (%)**
6. Display **Order Distribution by Channel (%)**

Interactive Filters (Slicers):

- Month
- Channel
- Product Category

Dataset Details:

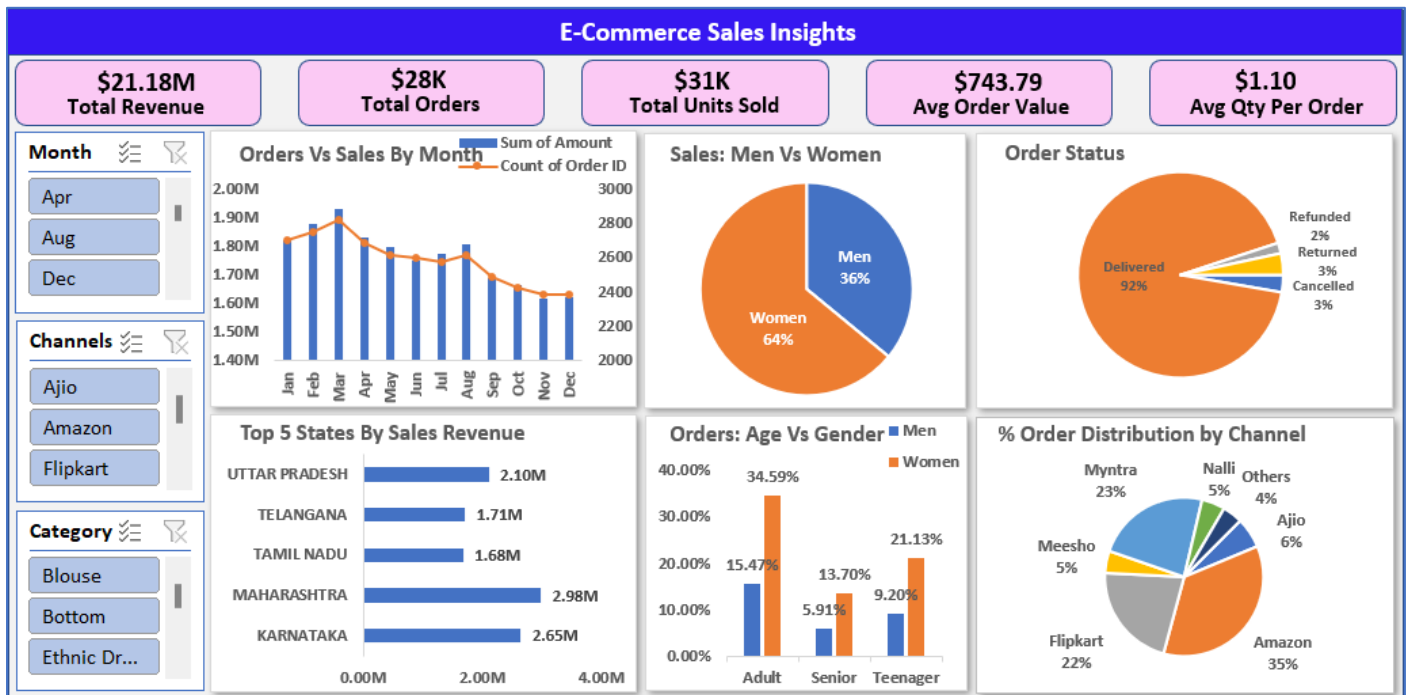
- **Dataset Source:** Public Dataset (Kaggle/GitHub)
- **Dataset Name:** Ecommerce Sales Performance
- **Raw Data Size:** 31048 Rows and 19 Columns
- **Cleaned Data Size:** 31048 Rows and 15 Columns

Tools and Technologies Used:

- **Excel:** Dashboards, Power Query, Power Pivot, Pivot Charts, Slicers.
- **SQL:** COUNT, GROUP BY, ORDER BY, Subqueries for data extraction and aggregation.
- **Python (Jupyter Notebook):** Pandas, NumPy, Seaborn.
- **MS Word:** Report preparation and documentation of findings.

Methodology:

- **Data Collection:** Gathered public datasets from **Kaggle** and **GitHub**.
- **Data Cleaning:** Removed duplicates, corrected inconsistencies, and standardized formats using Python libraries **Pandas** and **NumPy**.
- **Data Preparation:** Created calculated columns for business metrics in **Excel**.
- **Data Aggregation:** Computed key performance indicators (**KPIs**) in **Python Jupyter Notebook**.
- **Data Analysis:** Applied SQL functions such as **GROUP BY**, **ORDER BY**, and **subqueries** to analyze sales performance and trends.
- **Visualization:** Developed interactive dashboards in **Excel** with charts, KPIs, and slicers.
 1. **Charts:**
 - **Combo Chart:** Orders and Sales by Month
 - **Clustered Column Chart:** Orders by Age Group and Gender
 - **Pie Chart:** Sales by Gender, Orders Status, and Order Distribution by Channel
 - **Bar Chart:** Top 5 States by Sales Revenue
 2. **KPI's:**
 - Total Revenue
 - Total Orders
 - Total Units Sold
 - Average Order Value
 - Average Quantity Per Order
 3. **Slicers:** Month, Channel, and Product Category
- **Insights & Reporting:** Identified sales patterns and provided actionable recommendations.

Ecommerce Sales Insights Dashboard:

Stakeholders needed a way to translate complex, raw e-commerce sales data into actionable business insights. They lacked a centralized, clear view of performance, making it difficult to track revenue trends, understand customer demographics, or assess operational efficiency. My task was to design and develop a comprehensive, single-page dashboard that would consolidate key metrics and empower leadership with a tool for strategic, data-driven decision-making.

To achieve this, I developed a consolidated analytical hub in Power BI. I began by implementing five high-level KPI cards (Total Revenue, Total Orders, etc.) at the top for an immediate snapshot of business health. I then created a series of targeted visual modules to answer specific stakeholder questions: a dual-axis chart to analyze Orders vs Sales by Month, a bar chart to identify Top 5 States by Sales Revenue, and pie charts to break down Sales by Gender and Order Distribution by Channel. To provide deeper operational insight, I included a visual for Order Status to track fulfillment efficiency. Finally, I integrated interactive slicers for Month, Channel, and Category to transform the dashboard from a static report into a dynamic, self-service analytical tool.

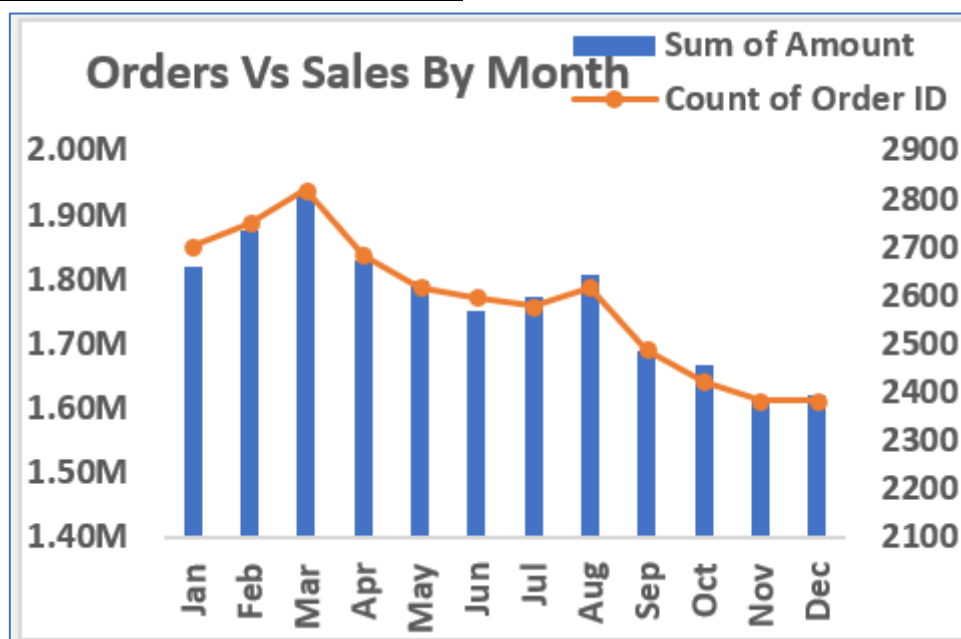
The resulting dashboard successfully delivered a cohesive and structured analytical journey. It provided stakeholders with both high-level orientation and granular control, enabling them to explore sales data with ease and precision. By transforming complex data into clear visualizations, the tool empowered the team to identify growth opportunities, optimize marketing strategies based on channel and demographic performance, and address operational inefficiencies flagged by the order status metrics.

KPI's:

The business achieved a **Total Revenue of \$21.18M** from **\$28K orders** and **\$31K units sold**, reflecting strong sales performance and customer demand. The **Average Order Value of \$743.79** and **Average Quantity per Order of \$1.10** highlight profitable transactions and slightly higher-than-single-item purchases. Together, these KPIs provide a clear snapshot of revenue generation, customer behavior, and operational efficiency.

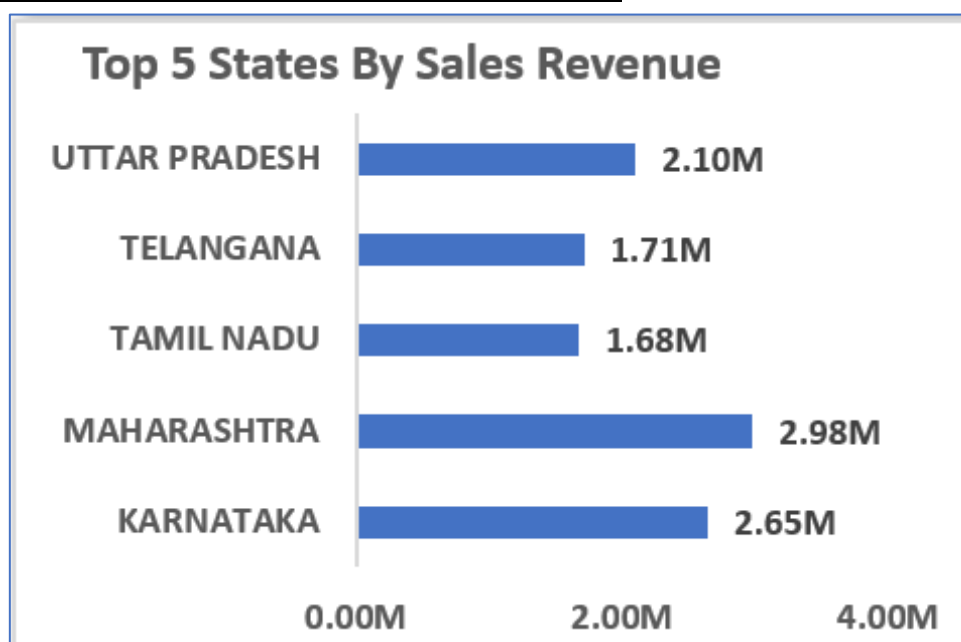
Visualizations:

1. Orders and Sales By Month: Combo Chart



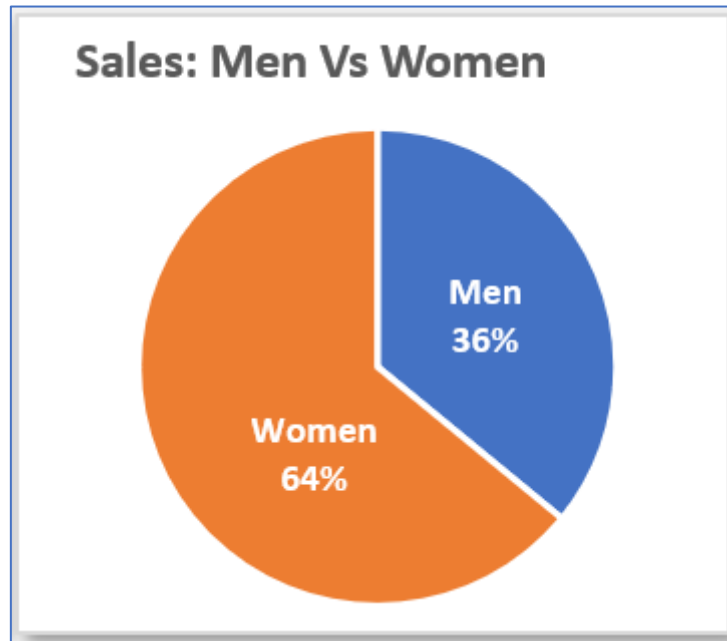
The dual-axis combination chart illustrates the relationship between order volume and total sales over time. Monthly sales (blue bars) are overlaid with order counts (orange line) from January to December. Sales peak in March at 1.95 million, coinciding with the highest number of orders, reflecting strong customer engagement in Q1. After March, both metrics gradually decline, with a small increase in August, reaching the lowest point in December at 1.62 million. This trend indicates clear seasonality and highlights the need for targeted strategies in Q2–Q4 to stabilize revenue.

2. Top 5 States By Sales Revenue: Horizontal Bar Chart



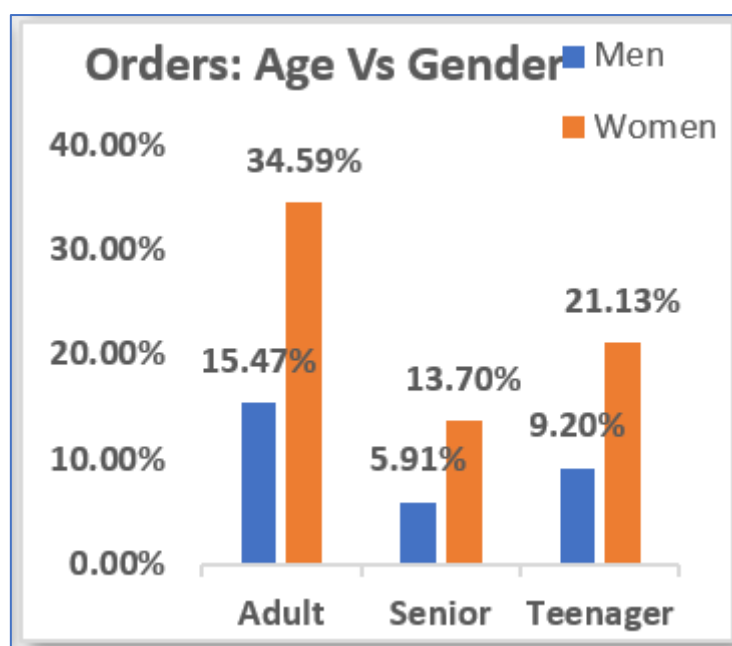
A horizontal bar chart ranks the top five states by total sales, with Maharashtra and Karnataka leading geographically, together accounting for over 50% of top-state sales. Maharashtra tops at 2.98 million (26%), followed by Karnataka at 2.65 million (24%). Uttar Pradesh contributes significantly as well, with 2.10 million (20%), while Telangana (1.71 million) and Tamil Nadu (1.68 million) make up the remaining share. The dominance of the top two states indicates mature markets, whereas the lower-performing states share. The dominance of the top two states indicates present potential opportunities for strategic expansion.

3. Sales Performance By Gender: Pie Chart



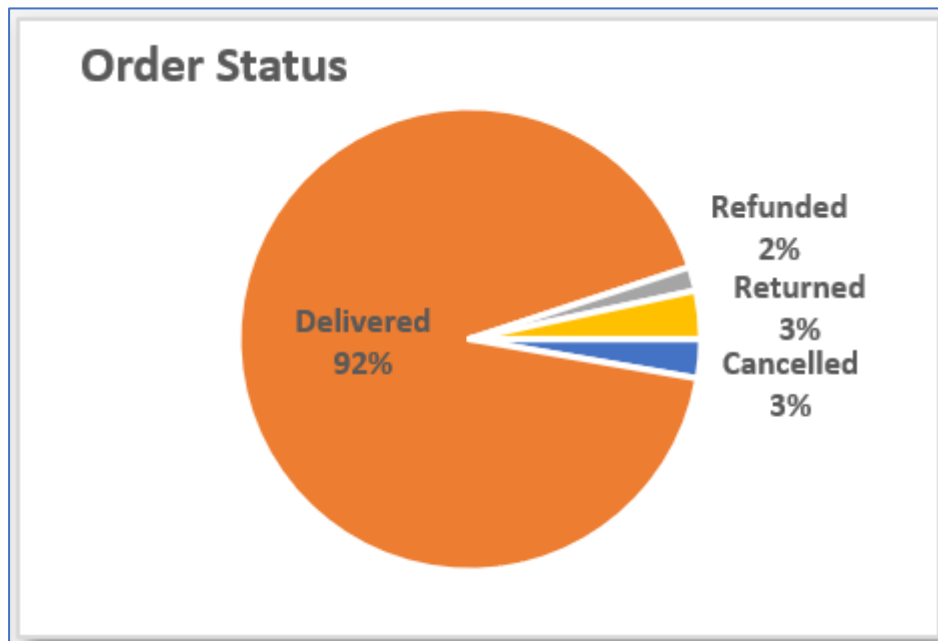
- **These pie chart shows** that Women account for 64% of total sales, compared to 36% by men, indicating that female customers are the dominant buyers in this dataset.
- The **28-percentage-point sales gap** highlights a significant gender-driven purchasing trend, suggesting that women represent the primary target audience for marketing and product strategies.
- The company can leverage this insight by **tailoring promotions, product designs**, and communication styles to better engage female customers, while also exploring opportunities to boost male engagement through category-specific offers or targeted campaigns.

4. Orders By Age Group and Gender: Clustered Column Chart



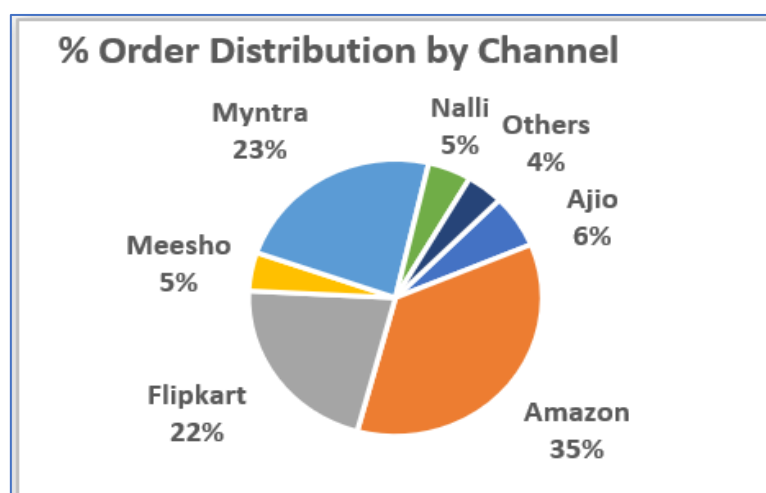
- **This grouped bar chart** breaks down the proportion of sales by age group (Adult, Senior, Teenager) for men and women.
- Adult women lead at 34%, more than double adult men at 15%, establishing them as the core market. Teenage women (21%) and teenage men (9%) form the secondary segment, while seniors represent the smallest combined share (20%).
- The consistent female dominance across all age brackets underscores brand affinity among women and signals potential growth by expanding male and senior engagement.

5. Order Status: Pie chart



The Order Status pie chart shows that an overwhelming 92% of all orders are successfully delivered, while only 3% are cancelled, 3% are returned, and 2% percent are refunded. This distribution indicates an exceptionally reliable fulfillment process, with very few orders failing to reach the customer or requiring post-delivery remediation. The low cancellation and return rates suggest that product descriptions and customer expectations are closely aligned, minimizing order errors and dissatisfaction. Likewise, the minimal refund percentage implies that charge-back disputes and payment issues are rare, reflecting both secure payment processing and effective customer service resolution when issues do arise.

6. Order Distribution By Channel (%): Pie Chart



The above pie chart illustrates the distribution of orders across different sales channels. Amazon leads with a 35% share, driven by its wide product selection, competitive pricing, and reliable delivery. Myntra holds the second-largest portion at 23%, focusing on fashion and frequent promotional sales. Flipkart closely follows with a 22% share. Smaller platforms—Ajio (6%), Nalli (5%), Meesho (5%), and other channels (4%)—collectively account for nearly one-fifth of total orders. These smaller channels present opportunities for strategic partnerships and targeted promotional campaigns.

Key Insights:

1. Sales peaked in March at 1.95 million, followed by a steady 16.9% decline to December, indicating strong seasonality.
2. **Women dominate** the customer base, contributing **around 64-65% of sales, with adult women (especially aged 30-39)** as the core segment representing about **one-third of total sales**.
3. **Maharashtra and Karnataka** leading **top-state sales** accounts over **50% combined**, followed by Uttar Pradesh, Telangana, and Tamil Nadu contributing the remaining share.
4. Order fulfillment is highly efficient, with **92% of orders successfully delivered** and minimal cancellations, returns, or refunds.
5. **Amazon, Flipkart, and Myntra dominate** sales channels, collectively driving **approximately 80% of orders**, while **niche platforms** contribute nearly **20%**.

Suggestions:

1. Implement **targeted promotions** and **special offers from Q2 to Q4 to reduce seasonal sales fluctuations**.
2. Develop **marketing campaigns** to increase male customer engagement.
3. Focus **retention strategies** on adult and teenage female segments to boost loyalty.
4. **Expand marketing and distribution** in Uttar Pradesh, Telangana, and Tamil Nadu.
5. **Maintain high fulfillment standards** and optimize return, cancellation, and refund processes.
6. **Strengthen partnerships** with niche platforms and **explore emerging sales channels**.
7. **Target women aged 30-39 in Maharashtra, Karnataka, and Uttar Pradesh** with focused **advertising, offers, and coupons** on Amazon, Flipkart, and Myntra platforms.

Conclusion:

The analysis highlights strong seasonal sales trends, a dominant female customer base, and geographic concentration in key states. Efficient order fulfillment and diverse sales channels support stable operations and growth potential. **Targeted marketing and regional expansion strategies will be crucial for sustaining and enhancing business performance.**
