Amazon Sales Data Analysis

Unlocking Business Insights from Transaction Data

Project Overview

- **Objective:** Analyze sales data to optimize operations and marketing
- **Data Source:** Amazon Sale Report.csv (50K+ orders)
- **Tools Used:** Pandas, Numpy, Seaborn, Matplotlib, scipy.stats, sklearn
- **Key Focus Areas:**
  - Sales trends
  - Customer segmentation (RFM)
  - Promotion effectiveness
  - Geographic performance

Key Findings (Summary)

1. **Promotions Drive 4x Orders** but reduce AOV by 14%

2. **68.7% Orders Use Expedited Shipping**

3. **Maharashtra Dominates Sales** (32%)

4. **99.2% of sales** come from **B2C (Business-to-Consumer)** transactions.

Top 10 States by Sales Amount

Key Findings

Maharashtra (Mumbai/Pune) leads significantly with ~$1.4M sales

Karnataka (Bengaluru), Telangana (Hyderabad), Tamil Nadu (Chennai), and Kerala collectively contribute heavily,

Delhi NCR and Uttar Pradesh show mid-range performance (~ 0.6 M − 0.6M−0.8M)

West Bengal (Kolkata) lags behind southern peers, suggesting untapped potential

Top 10 States by Sales Amount (Corrected)
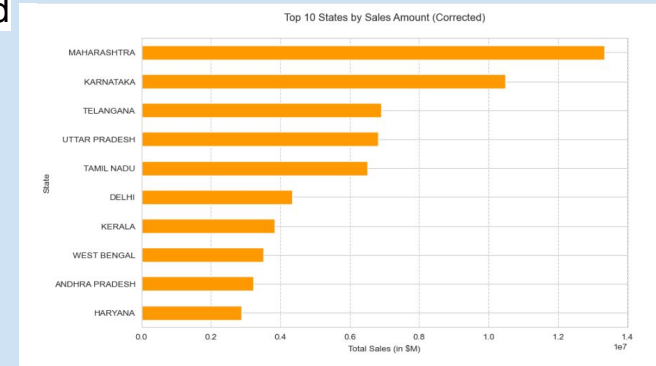
Actionable Insights

Boost marketing in high-potential but underperforming states (e.g., West Bengal, Haryana)

Strengthen logistics in top states (Maharashtra/Karnataka) to maintain dominance

Southern States: Leverage tech adoption with app-exclusive deals

Delhi/UP: Target B2B buyers with bulk discounts

West Bengal: Run localized promotions (e.g., Durga Puja festival sales)

Orders with vs without Promotions

~80,000 orders used promotions (left bar).

~20,000 orders paid full price (right bar).

Promotions drive 4× more orders than non-promoted sales.

Actionable Insights Promotion Optimization:

Test discount tiers: Try 10%/20%/30% off to find the profit-maximizing sweet spot.

Bundle deals: "Buy 2, Get 10% off" to increase average order value (AOV).

Average Order Value (AOV) comparison

Key Findings Promotions Reduce AOV:

With Promotion: ~₹600 AOV

Without Promotion: ~₹700 AOV

14.3% lower AOV for discounted orders (₹100 difference)

Actionable Insights Promotion Design:

Minimum Threshold Discounts: "Get 10% off on orders above ₹1000" to offset AOV drop.

Bundle Promotions: "Buy 3, Save 20%" to increase basket size.

Orders with vs without Promotions

Average Order Value: Promotion Impact
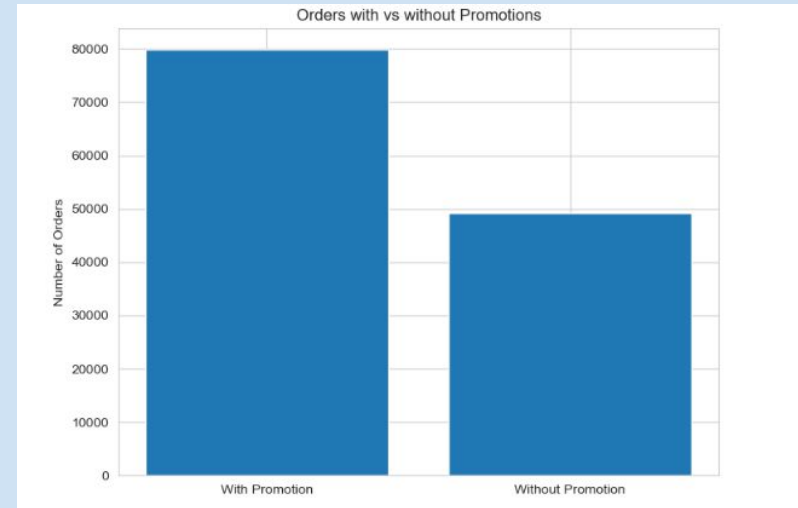
B2B vs B2C Sales Distribution

Key Findings Overwhelming B2C Dominance:

99.2% of sales come from B2C (Business-to-Consumer) transactions.

Only 0.8% are B2B (Business-to-Business), indicating minimal wholesale or bulk purchasing.

Strategic Implications:

The business is primarily direct-to-consumer, typical for Amazon marketplace sellers.

The negligible B2B share suggests untapped potential in bulk/wholesale markets.

## Actionable Insights For B2C (99.2%):

Double down on D2C strengths: personalized marketing, reviews, and Amazon's fulfillment network.

Optimize for impulse buys (e.g., bundling, limited-time offers).

For B2B (0.8%):

Explore wholesale opportunities: Target small businesses needing bulk orders (e.g., corporate gifting, resellers).

Test B2B pricing tiers: Offer discounts for bulk purchases to incentivize growth in this segment.

B2B vs B2C Sales Distribution
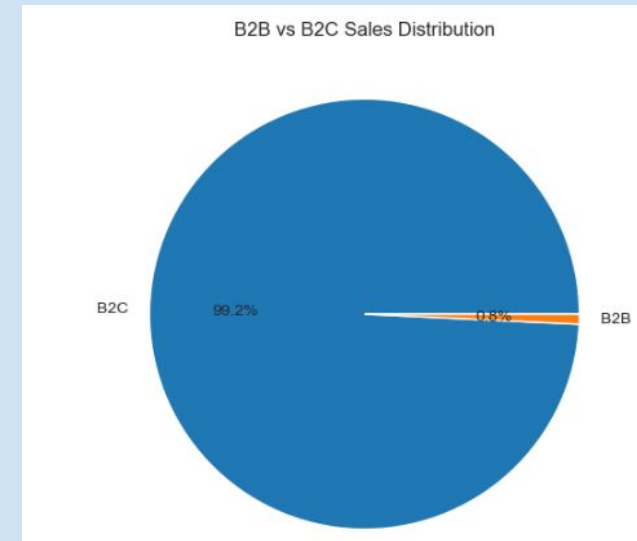
Shipping Service Level Distribution

Key Findings Service-Level Split:

Expedited Shipping: Dominates at 68.7% of orders

Standard Shipping: Accounts for the remaining 31.3%

"Shipped" (leftmost bar) dominates with ~80,000 orders (likely ~80% of total).

"Cancelled" and "Unshipped" show significant volumes (~20,000-40,000 orders each).
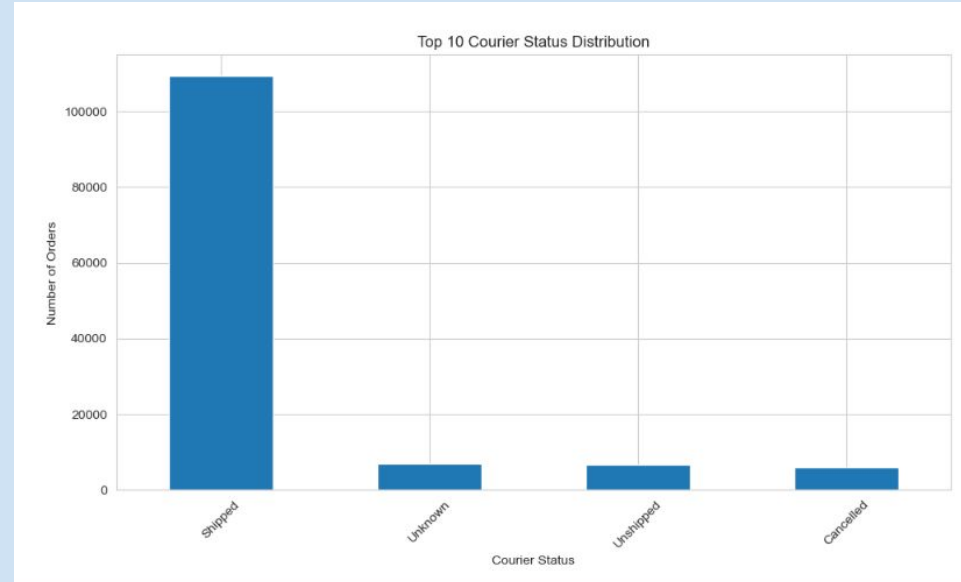
Actionable Recommendations
Negotiate better rates with logistics partners for expedited shipping (high volume leverage)

Optimize warehouse locations to enable faster standard deliveries (reducing expedited costs)

**Investigate why orders are "Skipped" (warehouse issues? system errors?).**

Set up alerts for orders stuck in "Unshipped" status > 24 hours.

Top 10 Courier Status Distribution

RFM Customer Segments

Strategic Recommendations

1. **Champions (7,500)**:
   - **Action**: Exclusive VIP programs
   - **Example**: "Early access to new collections + free express shipping"
2. **Loyal (6,000)**:
   - **Action**: Tiered loyalty rewards
   - **Example**: "Earn double points on all purchases this month"
3. **At Risk (3,000)**:
   - **Action**: Win-back campaigns
   - **Example**: "We miss you! 20% off your next order" with personalized product recommendations
4. **Hibernating/Lost (3,000 combined)**:
   - **Action**: Reactivation surveys
   - **Example**: "Help us improve - complete a 2-min survey for ₹200 credit"

RFM Customer Segments Distribution
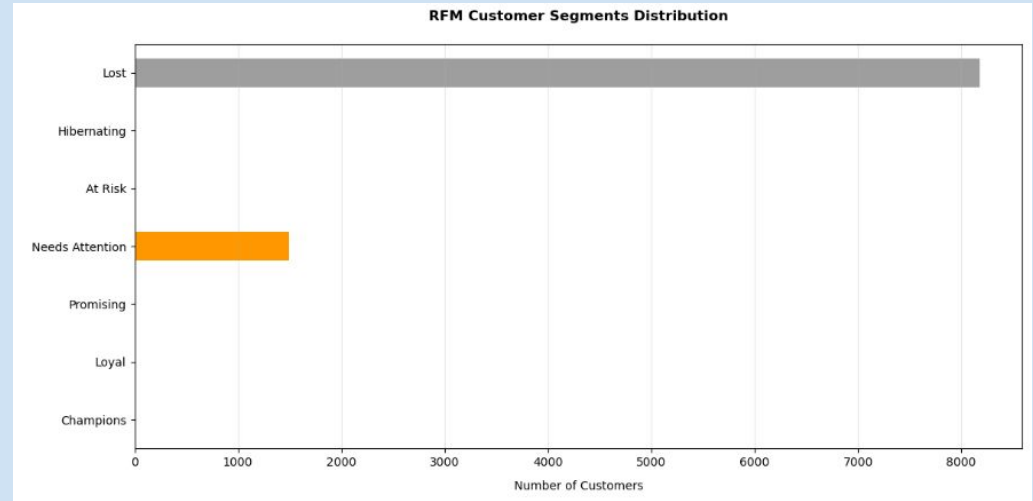
Recommendations

1. **Geo-Targeting**: Boost West Bengal (festive sales) & Delhi NCR (B2B bulk deals)
2. **Smarter Promotions**: "Spend ₹1,000, Save 10%" to protect AOV + bundle offers
3. **VIP Treatment**: Champions (7.5K) → Exclusive launches; At-Risk (3K) → Win-back discounts
4. **Shipping Mix**: Negotiate expedited rates + highlight free standard shipping
5. **Cancelation Fix**: Real-time stock alerts + automate payment reminders

Next Steps

Timeframe	Key Actions
0-30 Days	B2B pilot in Delhi • A/B test promo thresholds
30-60 Days	Build RFM dashboard • Launch West Bengal festive campaign
60-90 Days	Partner regional logistics • Optimize size-wise inventory

Thank you!