







E-commerce Analytics Dashboard Design

EXECUTIVE SUMMARY DASHBOARD (Main Overview)

Key Performance Indicators (KPIs)

 Total Revenue ...  Total Orders ...  Active Customers
 Average Order ...  Growth Rate ...  Avg Rating
Value (AOV) ... (MoM/YoY) ... Score

Real-Time Metrics Cards

- **Today's Sales:** Current day revenue vs yesterday
- **Orders in Progress:** Processing, shipped, delivered counts
- **Customer Satisfaction:** Average review score with trend
- **Top Performing State:** Highest revenue state today

SALES & REVENUE ANALYTICS

1. Revenue Performance

- **Monthly Revenue Trend** (Line chart with YoY comparison)
- **Revenue by State** (Choropleth map)
- **Top 10 Product Categories** (Bar chart with % contribution)
- **Payment Method Distribution** (Pie chart with revenue breakdown)

2. Order Analytics

- **Order Status Distribution** (Funnel chart)
- **Orders by Hour of Day** (Heatmap)
- **Seasonal Trends** (Line chart by month across years)
- **Average Order Value Trends** (Line chart with moving average)

CUSTOMER ANALYTICS

3. Customer Insights

- **Customer Distribution by State** (Map visualization)
- **Customer Lifetime Value Segments** (Scatter plot)
- **New vs Returning Customers** (Stacked area chart)
- **Customer Acquisition by Month** (Bar chart)

4. Customer Behavior

- **RFM Analysis Matrix** (Bubble chart)
- **Purchase Frequency Distribution** (Histogram)
- **Average Days Between Orders** (Box plot by customer segment)
- **Customer Satisfaction by State** (Heatmap)



SELLER & PRODUCT PERFORMANCE

5. Seller Analytics

- **Top 20 Sellers by Revenue** (Horizontal bar chart)
- **Seller Performance Matrix** (Revenue vs Rating scatter)
- **Geographic Distribution of Sellers** (Map with size by revenue)
- **Seller Growth Trends** (Line chart of top sellers)

6. Product Intelligence

- **Best Selling Products** (Table with images if available)
- **Product Category Performance** (Treemap)
- **Price vs Rating Correlation** (Scatter plot)
- **Product Weight vs Shipping Cost Analysis** (Bubble chart)



LOGISTICS & OPERATIONS

7. Shipping & Delivery

- **Average Delivery Time by State** (Heatmap)
- **Shipping Performance Metrics** (Gauge charts)
 - On-time delivery rate
- **Freight Cost Analysis** (Box plot by distance ranges)
- **Delivery Time vs Customer Satisfaction** (Correlation chart)

8. Geographic Analysis

- **Customer-Seller Distance Distribution** (Histogram)
- **Most Popular Shipping Routes** (Sankey diagram)
- **Regional Performance Comparison** (Multi-metric comparison)



FINANCIAL ANALYTICS

9. Payment Analysis

- **Payment Method Trends** (Stacked area chart over time)
- **Installment Analysis** (Bar chart of installment patterns)
- **Payment Value Distribution** (Box plot by payment type)
- **Failed Payment Analysis** (If available in your data)

10. Revenue Deep Dive

- **Revenue Contribution by Segment** (Waterfall chart)
- **Profit Margins by Category** (If cost data available)
- **Refund/Return Analysis** (If return data available)

ADVANCED ANALYTICS

11. Predictive Insights









- **Sales Forecasting** (Time series forecast chart)
- **Customer Churn Risk** (Risk matrix)
- **Inventory Recommendations** (Table with alerts)
- **Seasonal Demand Patterns** (Heatmap by month/category)

12. Market Intelligence

- **Market Share by Category** (Pie charts)
- **Competitive Pricing Analysis** (Line charts)
- **Emerging Product Trends** (Growth rate charts)
- **Customer Sentiment Analysis** (Word cloud from reviews)

INTERACTIVE DASHBOARD FEATURES

Filters & Controls

- | | |
|---|---|
|  Date Range Picker |  State/Region Filter |
|  Product Category |  Payment Method |
|  Rating Range |  Order Status |
|  Customer Segment |  Seller Filter |

Drill-Down Capabilities

- Click on any chart to drill down to detailed data
- Geographic maps with zoom and pan functionality
- Time series with zoom to specific periods
- Cross-filtering between all visualizations

DASHBOARD LAYOUT RECOMMENDATIONS

Page 1: Executive Overview

[KPI Cards Row]
[Revenue Trend] [Geographic Revenue Map]
[Order Status] [Top Categories]

Page 2: Sales Deep Dive

[Sales Metrics] [Monthly Trends]
[Category Performance] [Payment Analysis]
[Regional Comparison] [Time-based Patterns]

Page 3: Customer Analytics

[Customer Metrics] [Customer Map]
[RFM Analysis] [Behavior Patterns]
[Satisfaction Trends] [Lifetime Value]

Page 4: Operations Dashboard

[Logistics KPIs] [Delivery Performance]
[Seller Analytics] [Product Performance]
[Shipping Routes] [Cost Analysis]

RECOMMENDED TECH STACK

For Python/PySpark Integration:

1. **Dash by Plotly** - Native Python, great for ML integration
2. **Streamlit** - Rapid prototyping, easy deployment
3. **Panel (HoloViz)** - Advanced interactivity
4. **Bokeh** - High-performance visualizations

For Web-based Dashboards:

1. **Tableau** - Enterprise-grade analytics
2. **Power BI** - Microsoft ecosystem integration
3. **Grafana** - Real-time monitoring focus
4. **Apache Superset** - Open-source BI platform

SPECIFIC CHART RECOMMENDATIONS

High-Impact Visualizations:

1. **Revenue Heatmap:** Month vs Year with color intensity
2. **Geographic Bubble Map:** Revenue by state with customer count
3. **Customer Journey Funnel:** From order to delivery
4. **Product Performance Matrix:** Price vs Rating vs Sales
5. **Seller Network Graph:** Connections between sellers and regions
6. **Time Series Decomposition:** Trend, seasonality, residual
7. **Cohort Analysis:** Customer retention over time
8. **Market Basket Analysis:** Product association rules

DASHBOARD SUCCESS METRICS

Track These KPIs:

- Dashboard usage frequency
- Time to insight (how quickly users find answers)
- Action items generated from dashboard insights
- Business decisions influenced by dashboard data
- User satisfaction with dashboard experience

IMPLEMENTATION PHASES

Phase 1: Core Metrics (Week 1-2)

- Basic KPIs and revenue trends
- Simple filtering and date ranges

Phase 2: Advanced Analytics (Week 3-4)

- Geographic visualizations
- Customer segmentation
- Predictive insights

Phase 3: Real-time Features (Week 5-6)

- Live data updates
- Alert systems
- Mobile responsiveness

Phase 4: AI Integration (Week 7-8)

- Automated insights
- Anomaly detection
- Natural language queries

PRO TIPS FOR SUCCESS

1. **Start Simple:** Begin with key metrics that matter most to stakeholders
2. **User-Centric Design:** Interview end-users to understand their needs
3. **Performance First:** Optimize queries for fast dashboard loading
4. **Mobile-First:** Ensure dashboard works on all device types
5. **Storytelling:** Organize metrics to tell a coherent business story
6. **Actionable Insights:** Every chart should lead to a potential action
7. **Regular Updates:** Keep dashboard fresh with new insights and features

This dashboard design will transform your PySpark analysis into a powerful business intelligence tool that drives data-driven decisions across your organization! 🚀