NEXUS ANALYTICS
SOLUTION GUIDELINES

E-Commerce Sales Performance Analysis Project

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Project Ownership & Data Provenance Statement:

This project is fully conceived, designed, and developed by Shivansh Yadav. All data used within this solution was programmatically generated and collected using custom Python scripts, structured into CSV files, and utilized exclusively for educational, analytical, and professional portfolio purposes. No proprietary, third-party, or personally identifiable information is included.

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E-COMMERCE SALES PERFORMANCE ANALYSIS PROJECT

PROJECT OVERVIEW

This document provides comprehensive technical guidelines for analyzing the E-Commerce Sales Dataset using Excel. It covers data processing, KPI calculations, advanced Excel functions, Pivot Table configurations, and dashboard creation techniques suitable for industry-grade business intelligence reporting.

SECTION 1: DATA PREPARATION & CLEANING

1.1 DATA IMPORT & STRUCTURE

- Import CSV file into Excel (Data > Get Data > From File > From Text/CSV)
- Verify 15,000 rows and 20 columns loaded correctly
- Check data types:
    - Date: Date format (YYYY-MM-DD)
    - Numeric columns: Currency or Number format
    - Categorical columns: Text format

1.2 DATA VALIDATION CHECKS

- Check for missing values (Conditional Formatting > Highlight Cells > Blanks)
- Verify date range: 2022-01-01 to 2024-12-31
- Validate unique Transaction_IDs (Remove Duplicates if needed)
- Check for negative values in monetary columns
- Ensure Customer_Satisfaction is within 1-5 range

1.3 DATA TRANSFORMATION (Power Query)

Create calculated columns:

- Column Name: Revenue_Per_Unit
- Formula: =[@[Final_Unit_Price]]
- Column Name: Profit_Margin_Estimate
- Formula: =[@Total_Amount]*0.23 (assuming 23% avg margin)
- Column Name: Year_Month
- Formula: =TEXT([@Date],"YYYY-MM")
- Column Name: Season
- Formula: =IF(OR([@Month]=12,[@Month]=1,[@Month]=2),"Winter",
- IF(OR([@Month]=3,[@Month]=4,[@Month]=5),"Spring",

- IF(OR([@Month]=6,[@Month]=7,[@Month]=8),"Summer","Fall")))

SECTION 2: KEY PERFORMANCE INDICATORS (KPIs)

2.1 PRIMARY FINANCIAL KPIs

- **KPI 1: Total Revenue**

  Formula: =SUM(SalesData[Total_Amount])

  Target: Monitor monthly growth rate >5%

- **KPI 2: Average Order Value (AOV)**

  Formula: =AVERAGE(SalesData[Total_Amount])

  Alternative: =SUM(SalesData[Total_Amount])/COUNT(SalesData[Transaction_ID])

  Benchmark: Industry standard $85-120

- **KPI 3: Revenue Growth Rate (YoY)**

  Formula: =(Current_Year_Revenue - Previous_Year_Revenue)/Previous_Year_Revenue

  Excel: =(SUMIFS(Total_Amount,Year,2024)-SUMIFS(Total_Amount,Year,2023))

  /SUMIFS(Total_Amount,Year,2023)

- **KPI 4: Gross Merchandise Value (GMV)**

  Formula: =SUM(SalesData[Total_Amount]) + SUM(SalesData[Shipping_Cost])

  2.2 OPERATIONAL KPIs

- **KPI 5: Order Fulfillment Rate**

  Formula: =COUNTIFS(Order_Status,"Delivered")/COUNTA(Order_Status)

  Target: >95%

- **KPI 6: Cancellation Rate**

  Formula: =COUNTIFS(Order_Status,"Cancelled")/COUNTA(Order_Status)

  Alert Threshold: >3%

- **KPI 7: Return Rate**

  Formula: =COUNTIFS(Order_Status,"Returned")/COUNTA(Order_Status)

  Target: <2%

- **KPI 8: Average Shipping Cost**

  Formula: =AVERAGE(SalesData[Shipping_Cost])

Optimization Target: Reduce by 10% through free shipping thresholds

2.3 CUSTOMER KPIs

- **KPI 9: Customer Satisfaction Score (CSAT)**

  Formula: =AVERAGE(SalesData[Customer_Satisfaction])

  Target: >4.5/5.0

- **KPI 10: Net Promoter Score (NPS) - Estimated**

  Formula:
  =COUNTIFS(Customer_Satisfaction,">=4")/COUNT(Customer_Satisfaction)*100

  - COUNTIFS(Customer_Satisfaction,"<=2")/COUNT(Customer_Satisfaction)*100

- **KPI 11: Customer Acquisition by Segment**

  Formula: Use Pivot Table (see Section 3)

- **KPI 12: Repeat Purchase Rate**

  Formula: =COUNTIFS(Customer_Segment,"Returning Customer")/

  COUNTA(Customer_Segment)

2.4 MARKETING KPIs

- **KPI 13: Revenue by Marketing Channel**

  Formula: SUMIFS with Channel criteria

- **KPI 14: Channel Conversion Efficiency**

  Formula: =SUMIFS(Total_Amount,Marketing_Channel,"Organic Search")/

  COUNTIFS(Marketing_Channel,"Organic Search")

- **KPI 15: Customer Lifetime Value (CLV) - Segment Based**

  Formula: =AVERAGEIFS(Total_Amount,Customer_Segment,"VIP Customer")*

  COUNTIFS(Customer_Segment,"VIP Customer")

SECTION 3: PIVOT TABLE CONFIGURATIONS

3.1 REVENUE ANALYSIS PIVOT

- Insert > PivotTable
- Row Fields: Year, Quarter, Month
- Column Fields: Category
- Values:
  - Sum of Total_Amount (Format as Currency)
  - Count of Transaction_ID

- Filters: Region, Customer_Segment
- Calculated Field: Monthly_Growth
- Formula: =(Current_Month - Previous_Month)/Previous_Month

3.2 GEOGRAPHIC PERFORMANCE PIVOT

- Row Fields: Region, Country
- Values:
  - Sum of Total_Amount
  - Average of Total_Amount (AOV by region)
  - Count of Transaction_ID
  - Average of Customer_Satisfaction
- Conditional Formatting: Color scale on revenue (Green-Yellow-Red)

3.3 CUSTOMER SEGMENTATION PIVOT

- Row Fields: Customer_Segment
- Column Fields: Year
- Values:
  - Sum of Total_Amount
  - Average of Total_Amount
  - Sum of Discount_Amount
  - Average of Customer_Satisfaction
- Show Values As: % of Grand Total (for revenue distribution)

3.4 PRODUCT PERFORMANCE PIVOT

- Row Fields: Category, Subcategory
- Values:
  - Sum of Total_Amount
  - Sum of Quantity
  - Average of Final_Unit_Price
  - Count of Transaction_ID
- Sort: Largest to Smallest by Total_Amount

3.5 PAYMENT ANALYSIS PIVOT

- Row Fields: Payment_Method
- Column Fields: Order_Status
- Values:
  - Sum of Total_Amount
  - Count of Transaction_ID
  - Average of Total_Amount
- Filter: Exclude Cancelled for success rate analysis

SECTION 4: ADVANCED EXCEL FORMULAS

4.1 INDEX-MATCH FOR DYNAMIC LOOKUPS

- Retrieve revenue for specific category and month:

  =INDEX(SalesData[Total_Amount],

- MATCH(1,(SalesData[Category]="Electronics")*

  (SalesData[Month]=12),0))

- Note: Enter as array formula (Ctrl+Shift+Enter in older Excel versions)

4.2 SUMPRODUCT FOR WEIGHTED CALCULATIONS

- Weighted average satisfaction by revenue:

  =SUMPRODUCT((SalesData[Customer_Satisfaction]*SalesData[Total_Amount])/

- SUM(SalesData[Total_Amount]))

4.3 DATEDIF FOR COHORT ANALYSIS

- Customer age in months:

  =DATEDIF([@First_Purchase_Date],TODAY(),"M")

4.4 ARRAY FORMULAS FOR COMPLEX CONDITIONS

- Revenue from VIP customers in Q4 2024:

  {=SUM(IF((SalesData[Customer_Segment]="VIP Customer")*

  (SalesData[Quarter]="Q4")*

  (SalesData[Year]=2024),

  SalesData[Total_Amount],0))}

4.5 DYNAMIC RANGES WITH OFFSET

- Create dynamic named range for charts:

  =OFFSET(Sheet1!A1,0,0,COUNTA(Sheet1!$A:$A),COUNTA(Sheet1!$1:$1))

4.6 XLOOKUP (Excel 365)

- Find discount rate by customer segment:

  =XLOOKUP([@Customer_Segment],SegmentTable[Segment],

- SegmentTable[Avg_Discount],0)

SECTION 5: DASHBOARD CREATION TECHNIQUES

5.1 KPI CARDS (Top Section)

- Insert > Shapes > Rounded Rectangle
- Fill: Gradient (Dark Blue to Light Blue)
- Text Box for:
  - Title (e.g., "Total Revenue")
  - Value (Linked cell with formula)
  - Trend indicator (▲ +12.5% YoY)
- Formula for trend arrow:

  =IF(Current>Previous,"▲","▼") & TEXT(ABS((Current-Previous)/Previous),"0.0%")

5.2 CHART TYPES & BEST PRACTICES

REVENUE TREND:

- Chart Type: Line with Markers + Area fill
- Data: Monthly revenue over time
- Trendline: Linear (Add Trendline > Linear)
- Format: Smooth lines, data labels on peaks

CATEGORY BREAKDOWN:

- Chart Type: Horizontal Bar Chart
- Sort: Descending by revenue
- Data Labels: Inside end, show values
- Colors: Category-specific consistent palette

REGIONAL DISTRIBUTION:

- Chart Type: Pie or Donut Chart
- Data Labels: Category name + percentage
- Explode: Largest segment
- Legend: Right side

SEGMENT COMPARISON:

- Chart Type: Clustered Column
- Dual Axis: Revenue (primary) + AOV (secondary)
- Gap Width: 50%

5.3 SLICERS & TIMELINES

- Insert > Slicer: Region, Category, Customer_Segment
- Insert > Timeline: Date field
- Format: Match dashboard color scheme
- Connections: Link to all PivotTables

5.4 CONDITIONAL FORMATTING FOR HEAT MAPS

- Revenue by Region and Month:
- Create matrix with SUMIFS
- Select data range
- Home > Conditional Formatting > Color Scales
- Choose: Green - Yellow - Red (High to Low)

SECTION 6: INSIGHT GENERATION FRAMEWORK

6.1 DESCRIPTIVE ANALYSIS (What happened?)

- Calculate total revenue and growth rates
- Identify top performing categories and regions
- Determine peak sales periods
- Analyze customer segment distribution

6.2 DIAGNOSTIC ANALYSIS (Why did it happen?)

- Correlate discount rates with order volumes
- Analyze cancellation reasons by payment method
- Compare satisfaction scores across regions
- Identify seasonal patterns

6.3 PREDICTIVE INSIGHTS (What will happen?)

- Use TREND function for next quarter forecast
- Calculate moving averages (3-month, 6-month)
- Identify growth trajectories by segment
- Seasonal adjustment factors
- Example Forecast Formula:

  =FORECAST.ETS(Date_Future,Revenue_History,Date_History,12)

  (12 = seasonal pattern length in months)

6.4 PRESCRIPTIVE RECOMMENDATIONS (What should we do?)

- Optimize inventory based on category performance
- Adjust marketing spend by channel ROI
- Implement dynamic pricing by segment
- Improve shipping thresholds to reduce costs

SECTION 7: QUALITY ASSURANCE CHECKLIST

- All formulas reference correct table names
- PivotTables refresh automatically (Right-click > PivotTable Options > Data)
- Charts update with new data (Dynamic ranges configured)

- No hardcoded values in calculations
- Consistent number formatting (Currency: $#,##0.00)
- Dashboard fits on single screen (1920x1080 optimized)
- Color scheme accessible (colorblind-friendly palette)
- Print area configured for reports
- File size optimized (Remove unused styles)
- Password protection for sensitive sheets (if needed)

SECTION 8: ADVANCED TECHNIQUES

8.1 POWER PIVOT & DAX MEASURES

Create calculated measures for complex KPIs:

- Total Revenue Measure:

  =SUM(SalesData[Total_Amount])

- YoY Growth %:

  =VAR CurrentYear = [Total Revenue]

- VAR PreviousYear = CALCULATE([Total Revenue], SAMEPERIODLASTYEAR(DateTable[Date]))
- RETURN DIVIDE(CurrentYear - PreviousYear, PreviousYear, 0)

8.2 POWER QUERY AUTOMATION

- Set up automatic refresh on file open
- Create parameters for date filtering
- Merge queries for customer dimension table
- Append queries for historical data integration

8.3 MACRO AUTOMATION (VBA)

- Sub RefreshAllData()
- Application.ScreenUpdating = False
- ActiveWorkbook.Connections.RefreshAll
- ActiveWorkbook.RefreshAll
- Application.ScreenUpdating = True
- MsgBox "Dashboard Updated Successfully!"
- End Sub

EXPECTED OUTPUTS & DELIVERABLES

1. PROCESSED DATASET: Cleaned Excel file with calculated columns
2. PIVOT TABLES: 5+ configured PivotTables with slicers
3. DASHBOARD: Interactive 1-page executive dashboard

4. KPI SUMMARY: Automated KPI cards with trends
5. INSIGHTS REPORT: 2-3 page Word document with findings
6. CHARTS: 8+ professional charts (trend, comparison, distribution)

END OF SOLUTION GUIDELINES

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Prepared and Maintained By: Shivansh yadav

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