NEXUS COMMERCE INC.
GLOBAL E-COMMERCE PERFORMANCE ANALYSIS

Professional Business Intelligence & Analytics Portfolio Project

Author: Shivansh Yadav
GitHub: **www.github.com/Venom-Shivu**
LinkedIn: **https://www.linkedin.com/in/the-venom/**
Email: **mrshivusinghyadav@gmail.com**

Project Ownership Declaration:

This project is fully conceived, designed, and developed by **Shivansh Yadav**. All data used in this analysis was **programmatically generated and collected using custom Python scripts**, structured into **CSV files**, and utilized exclusively for **educational, analytical, and professional portfolio purposes**. No third-party, proprietary, or personally identifiable data has been used in any phase of this project.

NEXUS COMMERCE INC.
GLOBAL E-COMMERCE PERFORMANCE ANALYSIS PROJECT

PROBLEM STATEMENT

Document Classification: Professional Portfolio Project

Industry Sector: E-Commerce & Retail Analytics

Project Duration: 3 Years Historical Analysis (2022-2024)

Data Volume: 15,000 Transactions | 20 Dimensions

Last Updated: January 2025

1. EXECUTIVE SUMMARY

Nexus Commerce Inc., a multinational e-commerce corporation operating across four major regions (North America, Europe, Asia Pacific, Latin America), requires a comprehensive business intelligence solution to analyze sales performance, customer behavior, and operational efficiency. The company has accumulated 15,000 transaction records spanning January 2022 to December 2024, encompassing multiple product categories, customer segments, and marketing channels.

This project aims to transform raw transactional data into actionable strategic insights through advanced data analysis, KPI monitoring, and interactive dashboarding using Microsoft Excel and business intelligence methodologies.

2. BUSINESS CONTEXT & BACKGROUND

2.1 COMPANY PROFILE

- Business Model: B2C and B2B E-Commerce Platform
- Product Portfolio: Electronics, Fashion, Home & Living, Sports Equipment
- Geographic Presence: 12 Countries across 4 Regions
- Customer Base: 4 Distinct Segments (New, Returning, VIP, Corporate)

- Annual Revenue: $13.33M (3-year cumulative)
- Order Volume: 15,000 transactions analyzed

2.2 CURRENT CHALLENGES

- Fragmented data across multiple regions and categories
- Lack of unified performance visibility for executives
- Inconsistent customer experience metrics across segments
- Suboptimal marketing spend allocation
- Operational inefficiencies in order fulfillment (9.6% non-delivered)
- Seasonal demand fluctuations not properly analyzed
- Limited predictive capabilities for inventory planning

2.3 STRATEGIC OBJECTIVES
----

1. **Achieve 15% year-over-year revenue growth**

2. **Improve customer satisfaction score to 4.5/5.0**

3. **Reduce order cancellation rate below 2%**

4. **Optimize marketing ROI by 20%**

5. **Expand VIP customer segment by 25%**

3. PROJECT OBJECTIVES

3.1 PRIMARY OBJECTIVES

OBJECTIVE 1: COMPREHENSIVE PERFORMANCE ANALYSIS
- Analyze $13.33M revenue across all business dimensions
- Identify top-performing product categories and regions
- Calculate and monitor 15+ critical business KPIs
- Establish baseline metrics for future growth measurement

OBJECTIVE 2: CUSTOMER INTELLIGENCE & SEGMENTATION
- Profile 4 distinct customer segments by behavior and value
- Calculate Customer Lifetime Value (CLV) by segment

- Analyze satisfaction drivers and detractors
- Identify high-value customer acquisition channels

OBJECTIVE 3: OPERATIONAL EXCELLENCE ASSESSMENT

- Evaluate order fulfillment efficiency (Current: 90.4% delivered)
- Analyze payment method preferences and success rates
- Assess shipping cost optimization opportunities
- Monitor return and cancellation patterns

OBJECTIVE 4: MARKETING EFFECTIVENESS OPTIMIZATION

- Measure revenue attribution across 6 marketing channels
- Calculate channel-specific conversion rates and AOV
- Identify highest ROI marketing investments
- Optimize budget allocation recommendations

3.2 SECONDARY OBJECTIVES

OBJECTIVE 5: PREDICTIVE INSIGHTS DEVELOPMENT

• Forecast Q1 2025 revenue based on historical trends

• Identify seasonal patterns for inventory planning

• Predict customer churn risk indicators

• Model discount impact on volume and profitability

OBJECTIVE 6: COMPETITIVE BENCHMARKING

• Compare regional performance against industry standards

• Analyze price positioning by category

• Evaluate customer satisfaction against competitors

• Assess market share trends

4. PROJECT SCOPE & DELIVERABLES

4.1 IN-SCOPE

- ✓ Data cleaning and validation of 15,000 transaction records
- ✓ Creation of 8+ interactive PivotTables for multidimensional analysis
- ✓ Development of executive dashboard with 8+ visualization types
- ✓ Calculation and monitoring of 15+ financial and operational KPIs

- ✓ Customer segmentation analysis and profiling
- ✓ Geographic performance comparison across 4 regions
- ✓ Product category performance evaluation
- ✓ Marketing channel ROI assessment
- ✓ Trend analysis and forecasting (3-year historical + 1-quarter forward)

4.2 OUT-OF-SCOPE

- ✗ Real-time data integration (analysis based on historical snapshot)
- ✗ Individual customer PII analysis (aggregated segments only)
- ✗ Competitor pricing intelligence (internal data only)
- ✗ Supply chain and inventory management optimization
- ✗ Website UX/UI analytics (transactional data only)

4.3 DELIVERABLES

DELIVERABLE 1: PROCESSED DATASET
- File: ecommerce_sales_data_processed.xlsx
- Content: Cleaned data with 5+ calculated columns
- Format: Excel Table with structured references
- Size: ~2.5 MB

DELIVERABLE 2: ANALYTICS WORKBOOK
- File: Nexus_Analytics_Workbook.xlsx
- Content: 5+ PivotTables, 15+ KPI calculations
- Features: Slicers, timelines, conditional formatting
- Sheets: Data, Pivots, KPIs, Analysis

DELIVERABLE 3: EXECUTIVE DASHBOARD
- File: Nexus_Executive_Dashboard.xlsx
- Layout: Single-page interactive dashboard
- Components: 4 KPI cards, 8 charts, 3 slicers
- Refresh: Automated data connections

DELIVERABLE 4: INSIGHTS REPORT
- File: Nexus_Analytics_Insights_Report.docx
- Length: 10-15 pages
- Sections: Executive Summary, Findings, Recommendations
- Appendices: Methodology, Data Dictionary

DELIVERABLE 5: TECHNICAL DOCUMENTATION
- File: Solution_Guidelines.txt
- Content: Formulas, KPI definitions, Pivot configurations
- Audience: Technical reviewers and auditors

5. DATA SPECIFICATIONS

5.1 DATASET OVERVIEW

- Dataset Name: Global E-Commerce Transactions 2022-2024
- Total Records: 15,000 transactions
- Time Period: January 1, 2022 - December 31, 2024 (1,096 days)
- File Format: CSV (UTF-8 encoding)
- File Size: ~2.3 MB
- Update Frequency: Static dataset (historical analysis)

5.2 DATA DICTIONARY

DIMENSIONS (Categorical Variables):

Transaction_ID	: Unique identifier (Format: TXN_#####)
Date	: Transaction date (YYYY-MM-DD)
Year	: Fiscal year (2022, 2023, 2024)
Month	: Month number (1-12)
Quarter	: Fiscal quarter (Q1, Q2, Q3, Q4)
Category	: Product category (Electronics, Fashion, Home & Living, Sports)
Subcategory	: Product subcategory (17 distinct values)
Region	: Geographic region (North America, Europe, Asia Pacific, Latin America)
Country	: Specific country (12 countries)
Customer_Segment	: Customer type (New, Returning, VIP, Corporate)
Payment_Method	: Payment type (Credit Card, PayPal, Bank Transfer, Digital Wallet, COD)

Order_Status	: Fulfillment status (Delivered, Shipped, Processing, Cancelled, Returned)
Marketing_Channel	: Acquisition source (Organic Search, Paid Ads, Social Media, Email, Direct, Referral)

MEASURES (Numerical Variables):

Quantity	: Items per transaction (Integer, 1-5)
Unit_Price	: Original price per unit (Currency, $20-$2,000)
Discount_Amount	: Discount applied (Currency, $0-$600)
Final_Unit_Price	: Price after discount (Currency)
Total_Amount	: Transaction revenue (Currency, calculated)
Shipping_Cost	: Shipping fee (Currency, $0-$25)
Customer_Satisfaction	: Rating 1-5 (Only for delivered orders)

5.3 DATA QUALITY METRICS

- Completeness: 99.1% (13,565/15,000 satisfaction scores present)
- Uniqueness: 100% (No duplicate Transaction_IDs)
- Validity: 100% (All dates within range, no negative prices)
- Consistency: 100% (Standardized categorical values)
- Accuracy: High (Simulated realistic business data)

6. ANALYTICAL REQUIREMENTS

6.1 REQUIRED ANALYSES

ANALYSIS 1: TEMPORAL TREND ANALYSIS
- Monthly revenue trends with seasonality identification
- Year-over-year growth calculations
- Quarter-over-quarter performance comparison
- Peak sales period identification (Holiday, Summer sales)

ANALYSIS 2: MULTIDIMENSIONAL PERFORMANCE
- Revenue by Category × Region matrix

- Customer Segment × Payment Method preferences
- Marketing Channel × Order Status success rates
- Country-level deep dives with drill-down capability

ANALYSIS 3: CUSTOMER BEHAVIOR ANALYTICS

- Segment-wise Average Order Value (AOV) comparison
- Satisfaction correlation with discount levels
- Repeat purchase pattern analysis
- VIP customer value concentration (Pareto analysis)

ANALYSIS 4: OPERATIONAL EFFICIENCY

- Order status distribution and bottleneck identification
- Shipping cost analysis by region and order value
- Payment method failure/cancellation correlation
- Return rate analysis by category

ANALYSIS 5: MARKETING INTELLIGENCE

- Channel attribution revenue analysis
- Cost per acquisition estimation by channel
- Conversion funnel analysis (impression to delivery)
- ROI ranking of marketing investments

6.2 KPI REQUIREMENTS

FINANCIAL KPIs:

- Total Revenue: $13.33M target validation
- Average Order Value (AOV): Current $888.49
- Revenue Growth Rate: YoY calculation
- Gross Merchandise Value (GMV): Include shipping
- Discount Impact: Revenue vs. volume trade-off

CUSTOMER KPIs:

- Customer Satisfaction Score (CSAT): 4.2/5.0 current
- Net Promoter Score (NPS): Estimated from ratings
- Segment Distribution: % mix by value
- Customer Lifetime Value: Segment-based calculation

OPERATIONAL KPIs:

- Order Fulfillment Rate: 90.4% delivered target
- Cancellation Rate: Current 2.0%
- Return Rate: Current 1.0%
- Average Shipping Cost: $11.24 per order

MARKETING KPIs:

- Channel Revenue Share: % attribution
- Channel Efficiency: Revenue per order by source
- Conversion Rate: By channel and segment
- Marketing ROI: Estimated based on attribution

7. TECHNICAL REQUIREMENTS

7.1 SOFTWARE SPECIFICATIONS

Primary Tool: Microsoft Excel 2019/365 Professional

Alternative: Excel 2016 with Power Query add-in

Required Excel Features:

- Power Query (Get & Transform) for data import
- PivotTables and PivotCharts (Standard and Data Model)
- Power Pivot for advanced calculations (optional)
- Slicers and Timelines for interactivity
- Conditional Formatting for heat maps
- Advanced formulas (INDEX-MATCH, SUMIFS, array formulas)

7.2 HARDWARE REQUIREMENTS

- Processor: Intel i5 or equivalent (for large dataset handling)
- RAM: 8GB minimum, 16GB recommended
- Storage: 500MB free space for workbook and temp files
- Display: 1920x1080 resolution for dashboard viewing

7.3 FILE STRUCTURE

/Nexus_Analytics_Project/

├── **01_Data/**

│   └── ecommerce_sales_data.csv

```
├── 02_Workbooks/
│   ├── Nexus_Data_Model.xlsx
│   ├── Nexus_Pivot_Analysis.xlsx
│   └── Nexus_Dashboard.xlsx
├── 03_Deliverables/
│   ├── Nexus_Executive_Summary.pdf
│   ├── Nexus_Technical_Documentation.pdf
│   └── Solution_Guidelines.txt
└── 04_Resources/
    ├── Data_Dictionary.xlsx
    └── KPI_Calculations.xlsx
```

8. SUCCESS CRITERIA & EVALUATION

8.1 QUANTITATIVE METRICS

- Dashboard Load Time: <3 seconds
- Data Accuracy: 100% (verified against source)
- KPI Coverage: 15+ metrics calculated
- Visualization Count: 8+ chart types
- PivotTable Count: 5+ analytical views

8.2 QUALITATIVE CRITERIA

- Executive Readability: Dashboard understandable in 30 seconds
- Insight Depth: Minimum 10 actionable business insights
- Technical Rigor: Industry-standard formulas and methodologies
- Visual Appeal: Professional, color-blind accessible design
- Interactivity: Dynamic filtering and drill-down capability

8.3 VALIDATION CHECKPOINTS

- Data integrity verified (no formula errors)
- All KPIs reconcile with source data totals
- Charts update correctly with slicer selections
- Dashboard prints correctly (optional requirement)
- File size optimized (<5MB for email sharing)

9. RISK MANAGEMENT

9.1 IDENTIFIED RISKS

RISK 1: DATA QUALITY ISSUES
Probability: Low | Impact: High

Mitigation: Comprehensive validation rules in Power Query

RISK 2: PERFORMANCE DEGRADATION
Probability: Medium | Impact: Medium

Mitigation: PivotTable optimization, disable automatic refresh

RISK 3: FORMULA COMPLEXITY
Probability: Medium | Impact: Low

Mitigation: Document all formulas, use structured references

RISK 4: VERSION COMPATIBILITY
Probability: Low | Impact: Medium

Mitigation: Save in .xlsx format, avoid 365-exclusive features

9.2 CONTINGENCY PLANS

- **Backup strategy:** Version control with dated filenames
- **Recovery:** Original CSV preserved for reconstruction
- **Alternative tools:** Power BI or Tableau if Excel limitations reached

10. PROJECT TIMELINE

PHASE 1: DATA PREPARATION (Week 1)

- Import and validate dataset

- Create calculated columns
- Build data model relationships

PHASE 2: ANALYTICS DEVELOPMENT (Week 2)

- Configure PivotTables
- Calculate KPIs
- Develop insights framework

PHASE 3: DASHBOARD CREATION (Week 3)

- Design layout and wireframe
- Create visualizations
- Implement interactivity

PHASE 4: DOCUMENTATION & DELIVERY (Week 4)

- Write technical documentation
- Prepare insights report
- Final review and GitHub upload

11. STAKEHOLDER INFORMATION

INTENDED AUDIENCE:
- **Primary:** Hiring Managers, Technical Recruiters
- **Secondary:** Data Analytics Professionals
- **Tertiary:** Academic Evaluators, Portfolio Reviewers

REVIEW CRITERIA:
- Technical proficiency in Excel
- Business acumen and insight generation
- Data storytelling and visualization skills
- Attention to detail and data integrity
- Professional documentation standards

12. ETHICAL CONSIDERATIONS & DATA PRIVACY

- All data is synthetically generated for portfolio purposes
- No real customer PII included
- Business metrics represent realistic but fictional scenarios
- Dataset suitable for public GitHub repository
- No proprietary or confidential information present

13. APPENDICES

APPENDIX A: GLOSSARY OF TERMS

- **AOV: Average Order Value**
- **CLV: Customer Lifetime Value**
- **COD: Cash on Delivery**
- **CSAT: Customer Satisfaction Score**
- **GMV: Gross Merchandise Value**
- **KPI: Key Performance Indicator**
- **NPS: Net Promoter Score**
- **PII: Personally Identifiable Information**
- **ROI: Return on Investment**
- **YoY: Year-over-Year**

APPENDIX B: REFERENCE STANDARDS

- **Data visualization: Stephen Few, "Information Dashboard Design"**
- **Excel best practices: Microsoft Official Academic Course**
- **KPI frameworks: Klipfolio, Geckoboard industry standards**
- **Color theory: ColorBrewer 2.0 for accessible palettes**

END OF PROBLEM STATEMENT

Document Control:

Version: 1.0

Author: Nexus Analytics Portfolio Project (Shivansh Yadav)

Review Date: Quarterly

Next Update: Upon dataset expansion or methodology enhancement

For Technical Queries: Refer to Solution_Guidelines.pdf

For Project Files: Visit https://github.com/Venom-Shivu/nexus-analytics