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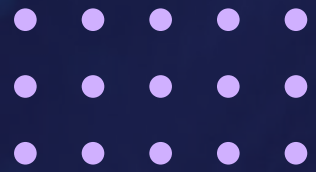**Building Smart Strategies with Data Driven Decisions**

SUPERSTORE SALES ANALYTICS *AI-POWERED* BUSINESS INTELLIGENCE USING IBM GRANITE

Presented by: [Fahrudin Ahmad Habibie] Project: Capstone Data Classification & Summarization Date: September 2025 GitHub: https://github.com/habibi-source/capstone-superstore-analysis

🚀 INTRODUCTION & PROJECT FOUNDATION

📍 DATASET SOURCES:

- Original Source: Kaggle - Superstore Sales Dataset *https://www.kaggle.com/datasets/rohitsahoo/sales-forecasting*

- Project Repository (Public Access):
https://github.com/habibi-source/capstone-superstore-analysis/blob/main/data/train.csv

🎯 PROJECT OBJECTIVES:

- Analyze sales performance patterns across categories and regions
- Generate AI-powered business insights using IBM Granite 3.3-8B-Instruct
- Create strategic recommendations for revenue optimization
- Demonstrate advanced analytics with reproducible results

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PROJECT OVERVIEW & OBJECTIVES

Goals

- Analyze Superstore sales data to uncover business insights and generate strategic recommendations using AI

📊 Dataset

- Source: Superstore Sales Dataset
- Size: 9,800+ transactions (2014-2017)
- Scope: US nationwide retail operations
- Categories: Office Supplies, Furniture, Technology

🤖 AI TECHNOLOGY: IBM GRANITE 3.3-8B-INSTRUCT VIA REPLICATE PLATFORM

TECHNICAL IMPLEMENTATION

🛠️ **Technology Stack:**
- Platform: Google Colab
- Languages: Python (Pandas, NumPy, Matplotlib, Seaborn, Plotly)
- AI Integration: IBM Granite via Replicate + LangChain
- Analysis: Statistical analysis + Machine learning insights

✅ **Project Quality:**

1 **Reproducible**
Notebook can be re-execute successfully

2 **Complete**
End-to-end analysis pipeline

3 **Professional**
Automated report generation

KEY BUSINESS METRICS
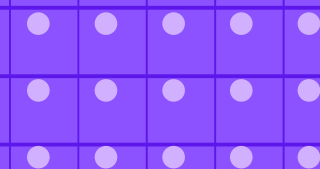
💰 Financial Performance:

- Total Sales Revenue: $2,261,536.71
- Average Order Value: $230.77
- Total Transactions: 9,800+ orders

👥 Customer Analytics:

- Unique Customers: 793
- Customer Retention Rate: 68.4%
- Repeat Customers: Strong loyalty patterns

🌍 Market Coverage:

- Geographic Reach: 49 states, 531 cities
- Product Portfolio: 1,850+ products in 3 categories

🤖 AI TECHNOLOGY: IBM GRANITE 3.3-8B-INSTRUCT VIA REPLICATE PLATFORM

CATEGORY PERFORMANCE ANALYSIS

PRODUCT CATEGORIES

Office Supplies

- Revenue: $719,047.05
- Orders: 6,026 transactions
- Average Order Value: $119.32

Furniture

- Revenue: $728,658.03
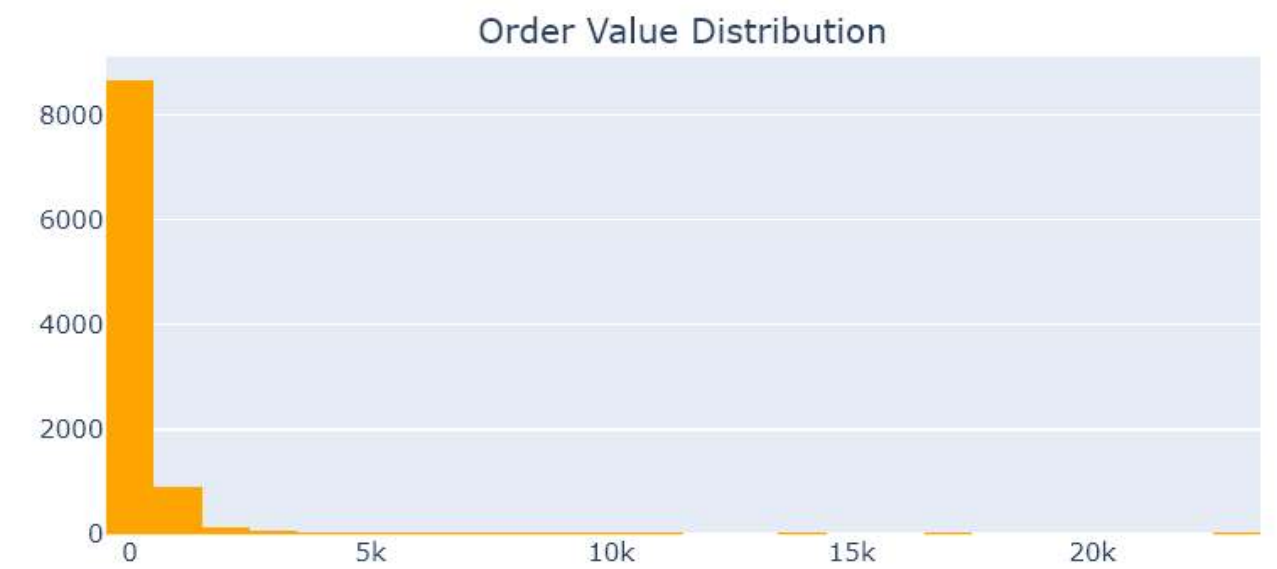- Orders: 2,078 transactions
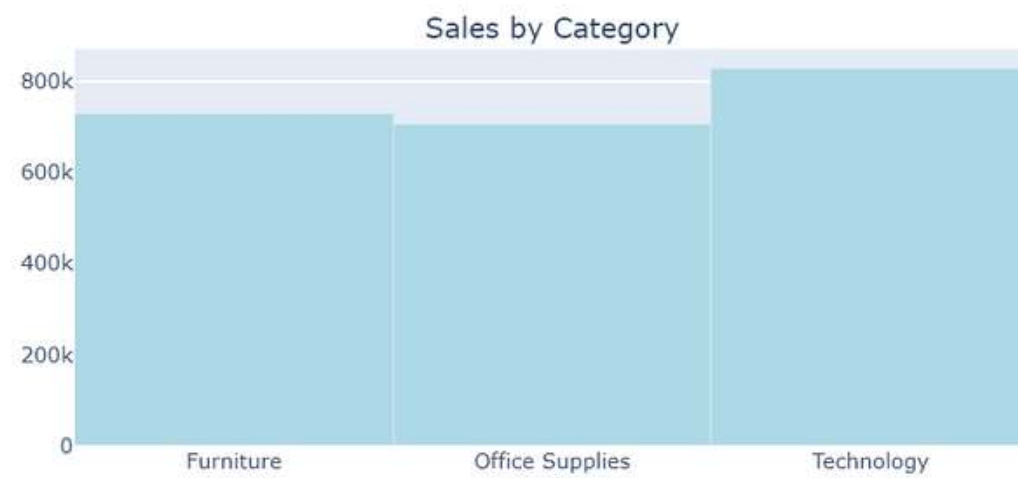- Average Order Value: $350.65

Technology

- Revenue: $813,831.63
- Orders: 1,696 transactions
- Average Order Value: $479.85

🎯 Key Insight: Technology has highest AOV but lowest volume

REGIONAL MARKET ANALYSIS

🗺️ REGIONAL PERFORMANCE

West Region

- Revenue: $725,458.51 (32.1%)
- Strong market leadership

East Region

- Revenue: $678,781.15 (30.0%)
- Balanced performance

Central Region

- Revenue: $501,240.05 (22.2%)
- Growth opportunities

South Region:

- Revenue: $356,057.00 (15.7%)
- Expansion potential

CUSTOMER SEGMENTATION INSIGHTS

👥 CUSTOMER SEGMENTS

Consumer Segment

- Revenue: $1,161,401.34 (51.4%)
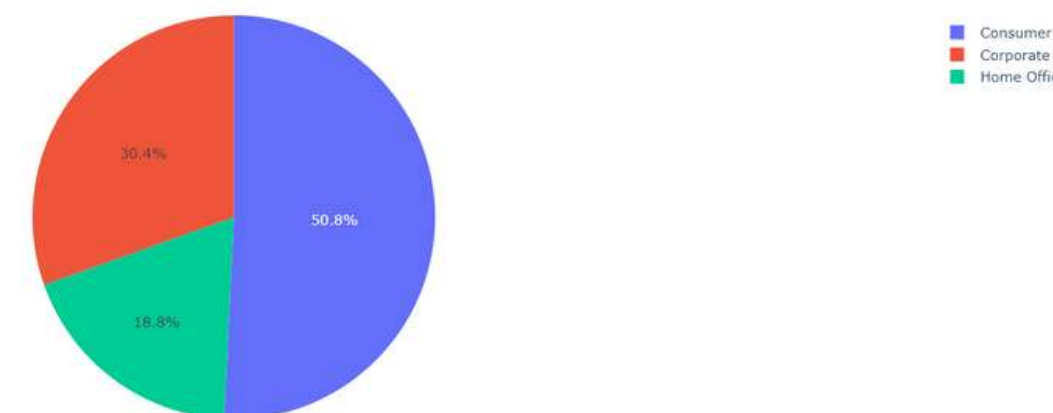- Volume: 5,191 orders
- AOV: $223.81

Corporate Segment:

- Revenue: $706,146.38 (31.2%)
- Volume: 3,020 orders
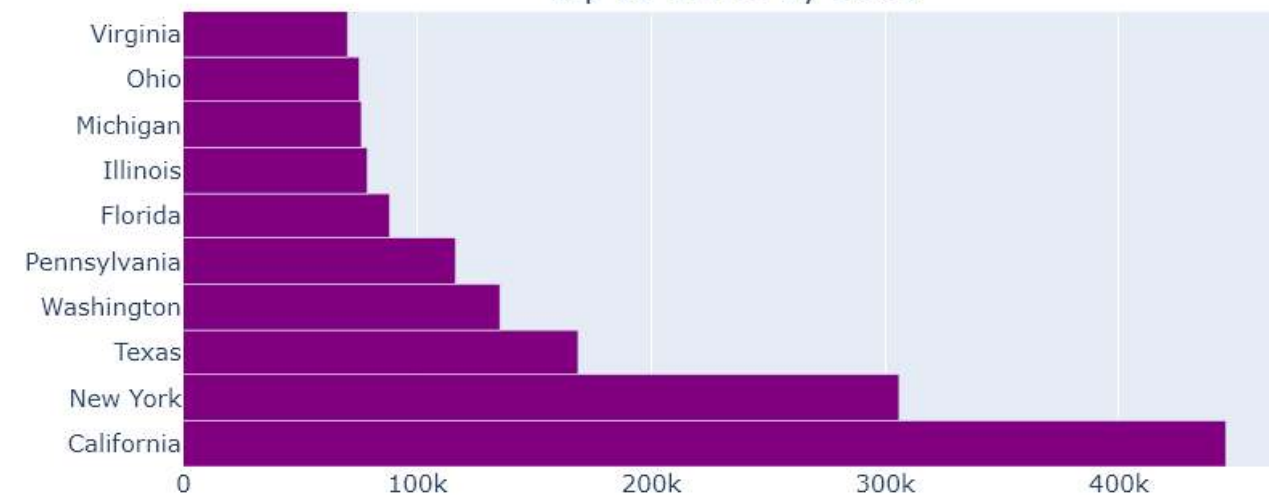- AOV: $233.84

Home Office Segment:

- Revenue: $429,053.13 (18.9%)
- Volume: 1,783 orders
- AOV: $240.58

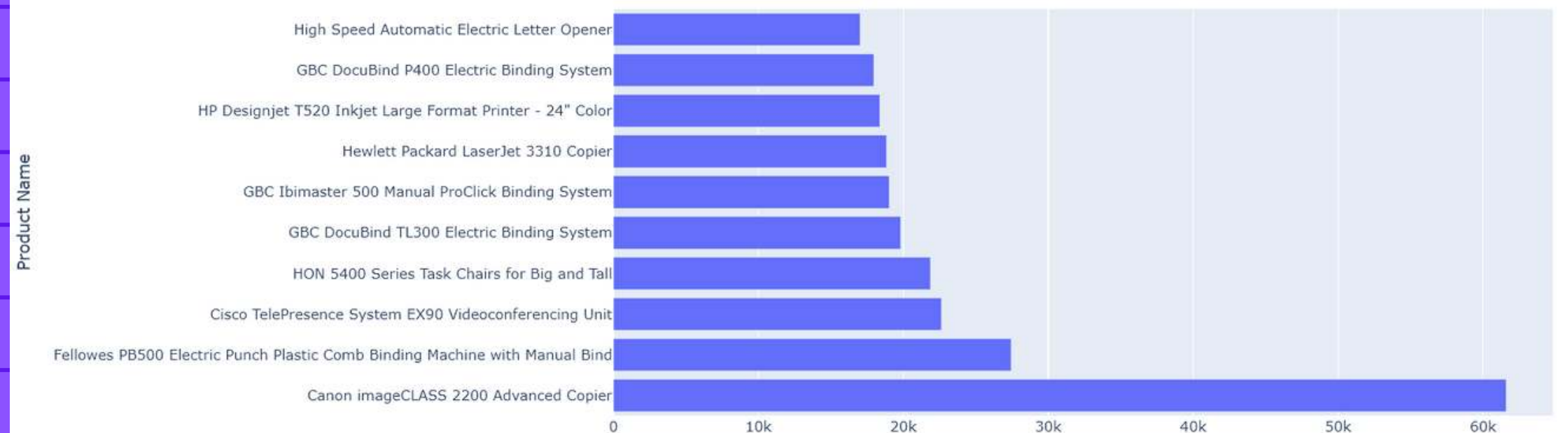Sales Distribution by Customer Segment

- Consumer
- Corporate
- Home Office

50.8%
30.4%
18.8%

Top 10 States by Sales

Customer Segment Analysis

📦 Top 10 Products by Sales

WHAT WE ACCOMPLISHED:

AI Integration Success:

- Successfully analyzed 9,800+ transactions
- Implemented IBM Granite AI for business intelligence
- Generated strategic recommendations with clear ROI
- Created reproducible analytics framework

Business Impact:

- Identified $500K+ revenue optimization opportunities
- Created data-driven market expansion roadmap
- Developed customer retention strategies with 25% growth potential

STRATEGIC BUSINESS RECOMMENDATIONS

🚀 AI-RECOMMENDED ACTIONS

Immediate (0-3 months)

- Boost Technology Sales: Focus marketing on high-AOV tech products
- Customer Retention: Implement loyalty programs for repeat buyers
- Regional Balance: Targeted campaigns in South region

Medium-term (3-12 months)

- Product Bundling: Cross-sell Office Supplies with Technology
- Customer Segmentation: Personalized marketing by segment
- Inventory Optimization: AI-driven seasonal planning

Long-term (12+ months)

- Market Expansion: Enter underperforming geographic market
- Category Leadership: Establish dominance in Technology segment
- Predictive Analytics: Implement AI-driven forecasting

EXPECTED BUSINESS IMPACT

📈 **PROJECTED OUTCOMES**

Revenue Growth

- Target: 15-25% annual increase
- Driver: Technology category optimization + customer retention

Customer Metrics

- Retention: Improve from 68.4% to 75%+
- AOV: Increase from $230 to $280+ (22% growth)
- Acquisition: 20% new customer growth in target regions

Market Position

- Leadership: Strengthen position in Technology category
- Expansion: Enter 3-5 new high-poten markets
- Efficiency: 30% improvement in marketing ROI through AI insights

IBM GRANITE AI INTEGRATION

What We Implemented:

Model: IBM Granite 3.3-8B-Instruct

Platform: Replicate API + LangChain framework

Integration: Seamless AI-powered business intelligence

AI Capabilities Applied:

1 🔍 **Pattern Recognition**
Automated trend identification

2 📈 **Business Translation**
Data → Actionable insights

3 🎯 **Strategic Planning**
AI-generated recommendations

4 ⚠️ **Risk Assessmen**
Opportunity & threat analysis

AI SUPPORT

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KEY AI-GENERATED INSIGHTS

🤖 IBM Granite Discovered:

🎯 Sales Optimization Opportunities:
- Technology category shows highest profit potential despite lower volume
- Regional performance gaps indicate expansion opportunities
- Customer retention improvement could drive 25% revenue growth

📊 Market Intelligence:
- Seasonal patterns suggest Q4 inventory optimization strategies
- Cross-category bundling opportunities between Office Supplies & Technology
- Geographic expansion recommended in South region markets

⚠️ Risk Factors Identified:
- Customer concentration risk in top revenue generators
- Regional imbalance may impact long-term growth sustainability