Revenue and Profitability Analysis with Operational Efficiency Metrics

Value to the Business:

- **Strategic Decision-Making**: Identifies areas for revenue growth, operational improvements, and cost optimization.
- **Customer Retention**: Focuses on retaining high-value customers and reducing churn.
- **Product and Region Insights**: Highlights top-performing products and regions for targeted marketing and resource allocation.
- **Operational Efficiency**: Tracks fulfillment time, shipping cost impact, and cost-to-serve efficiency.

Technical Highlights:

- **Dataset**: Synthetic dataset of 10,000 sales transactions, including product, customer, and regional information.
- **Tools Used**: Power BI for visualization, DAX for advanced metrics, and Python for data preparation.
- **KPI Design**: A mix of basic metrics (e.g., Revenue, AOV) and advanced metrics (e.g., Profit Leakage, Time Decay Revenue) ensures a holistic view.

Key Features:

A. Revenue and Profitability Analysis:
- **Total Revenue**: Measures overall business performance.
- **Profit Margin**: Highlights profitability levels across categories and regions.
- **Top-Performing Product**: Identifies the best-selling product by revenue.

B. Customer Insights:
- **Customer Lifetime Value (CLV)**: Reveals high-value customers contributing the most to revenue.
- **Customer Churn Rate**: Tracks customers who make only one purchase to focus on retention strategies.
- **Repeat Purchase Rate**: Measures customer loyalty and repeat buying patterns.

C. Operational Metrics:
- **Average Fulfillment Time**: Monitors order processing efficiency.
- **Shipping Cost Impact**: Quantifies the impact of shipping on revenue.

D. Advanced Risk and Trend Analysis:
- **Revenue-Weighted Profitability by Region**: Balances profitability with revenue contribution for each region.
- **Inventory Risk by Subcategory**: Highlights potential stock shortages or overstock issues.
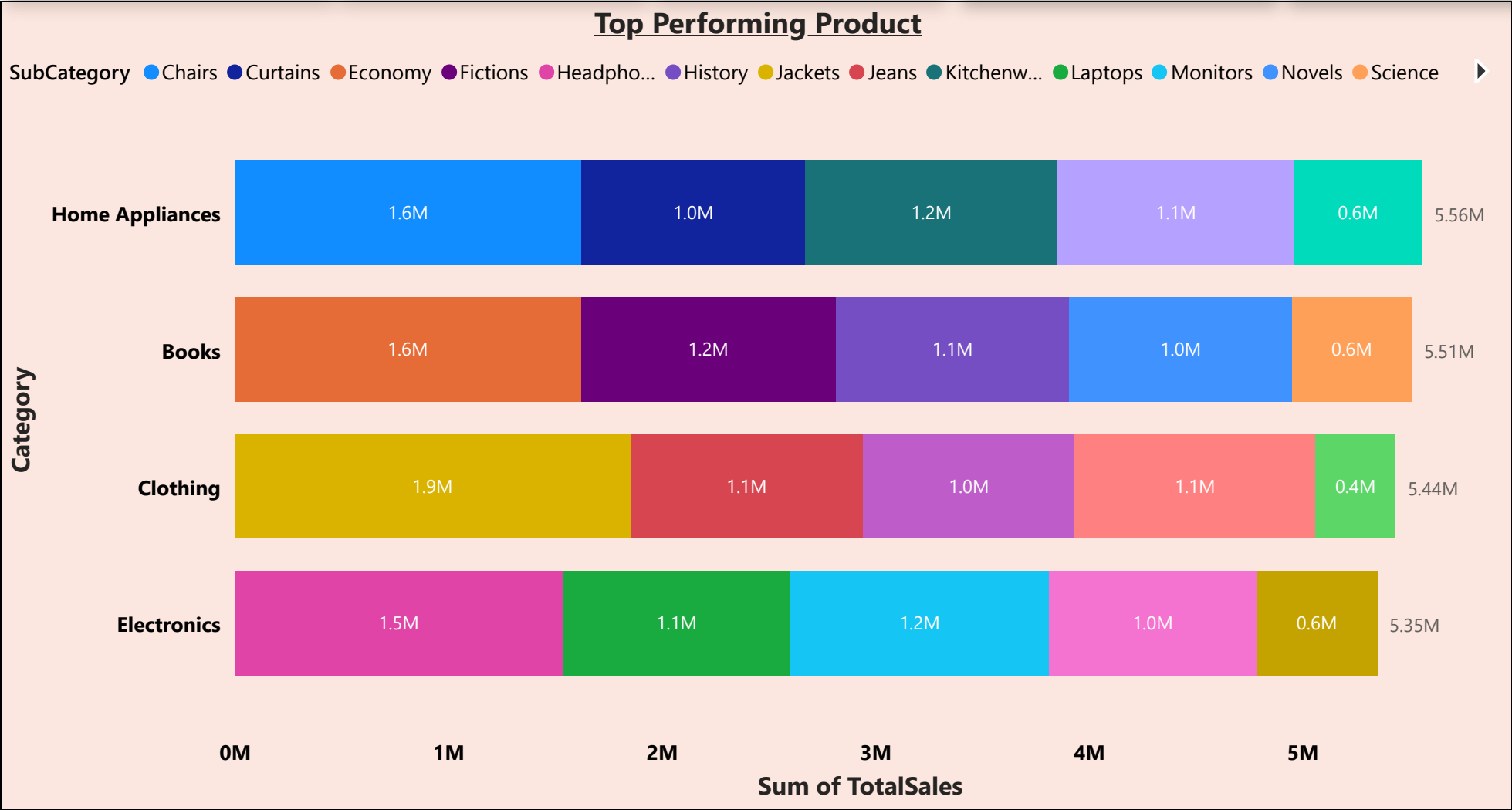- **Seasonal Sales Sensitivity**: Tracks monthly sales trends across product categories.

E. Discount and Cross-Selling Opportunities:
- **Discount Effectiveness**: Evaluates how discounts drive sales volume.
- **Cross-Sell Opportunity Score**: Identifies potential for encouraging customers to explore multiple product categories.

Business KPIs

Total Revenue	Average Order Value	Profit Margin	Shipping Cost Impact	Customer Dependency Risk	Cross Sell Opportunity
21.86M	2.19K	28.22	1.26	0.12	2.86

Top Performing Product

SubCategory: ● Chairs ● Curtains ● Economy ● Fictions ● Headpho... ● History ● Jackets ● Jeans ● Kitchenw... ● Laptops ● Monitors ● Novels ● Science ▶

Category						Total
Home Appliances	1.6M	1.0M	1.2M	1.1M	0.6M	5.56M
Books	1.6M	1.2M	1.1M	1.0M	0.6M	5.51M
Clothing	1.9M	1.1M	1.0M	1.1M	0.4M	5.44M
Electronics	1.5M	1.1M	1.2M	1.0M	0.6M	5.35M

Sum of TotalSales — axis: 0M, 1M, 2M, 3M, 4M, 5M

Customer Lifetime Value

CustomerID	Total Sales
CUST-1800	39,104.84
CUST-685	34,176.90
CUST-1257	33,221.90
CUST-1261	32,742.02
CUST-1953	32,361.54
CUST-973	32,228.82
CUST-1388	31,791.31
CUST-130	31,513.10
CUST-1637	31,128.18
CUST-714	30,824.44
CUST-1083	30,762.05
CUST-363	30,603.37
CUST-781	30,390.76
CUST-610	30,380.62
CUST-936	30,297.54
CUST-1580	30,125.51
CUST-917	30,059.13
CUST-881	29,988.78
CUST-187	29,979.53
Total	**631,636.82**

Business KPIs

Category Revenue Distribution

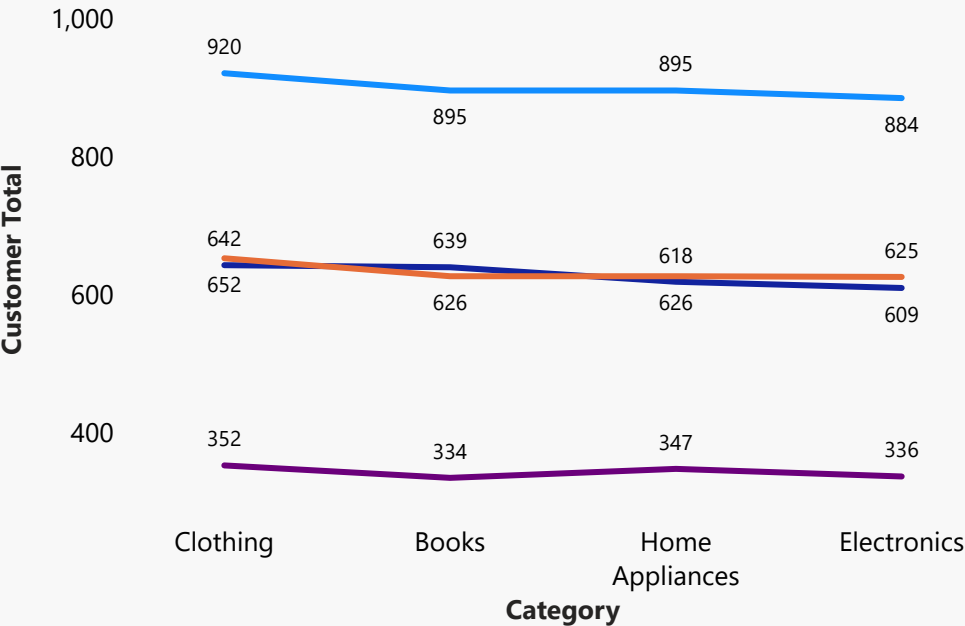Category ● Home Appliances ● Books ● Clothing ● Electronics

- 5.35M (24.48%)
- 5.56M (25.44%)
- 5.44M (24.87%)
- 5.51M (25.22%)
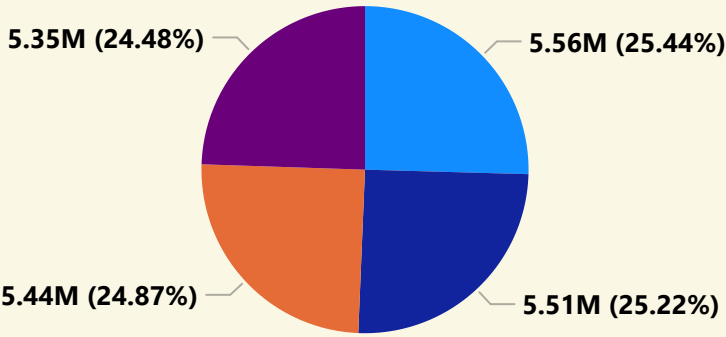
Region Performance

● Total Sales ● Profit

Profit and Sales (y-axis): 0M, 2M, 4M, 6M, 8M

- Asia: 7.8M / 2.2M
- Europe: 5.5M / 1.6M
- North America: 5.5M / 1.6M
- South America: 3.0M / 0.9M

Region (x-axis)
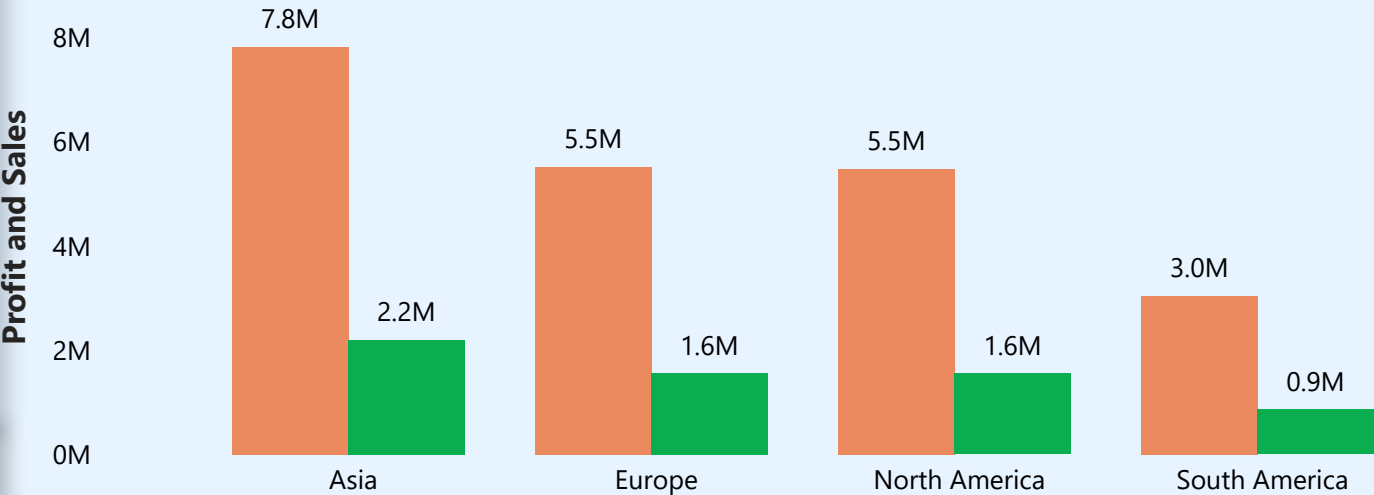
Customers Pool across Category and Region

Region ● Asia ● Europe ● North America ● South America

Customer Total (y-axis): 400, 600, 800, 1,000

Category	Asia	North America / Europe	South America
Clothing	920	642 / 652	352
Books	895	639 / 626	334
Home Appliances	895	618 / 626	347
Electronics	884	625 / 609	336

Time Decay Revenue by Month

Time Decay Revenue (y-axis): 0.0M, 0.2M, 0.4M, 0.6M

Values along line: 3.1E-10, 3.4E-6, 0.0M, 0.0M, 0.5M

Month (x-axis): 0, 5, 10

Discount Effectiveness

Quantity (y-axis): 24800, 25000, 25200, 25400

- Clothing
- Home Appliances
- Electronics
- Books

Discount (x-axis): 36K, 38K, 40K
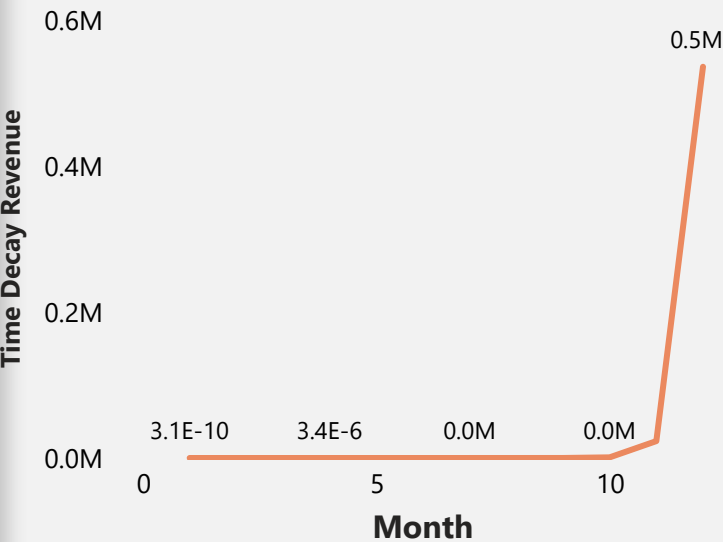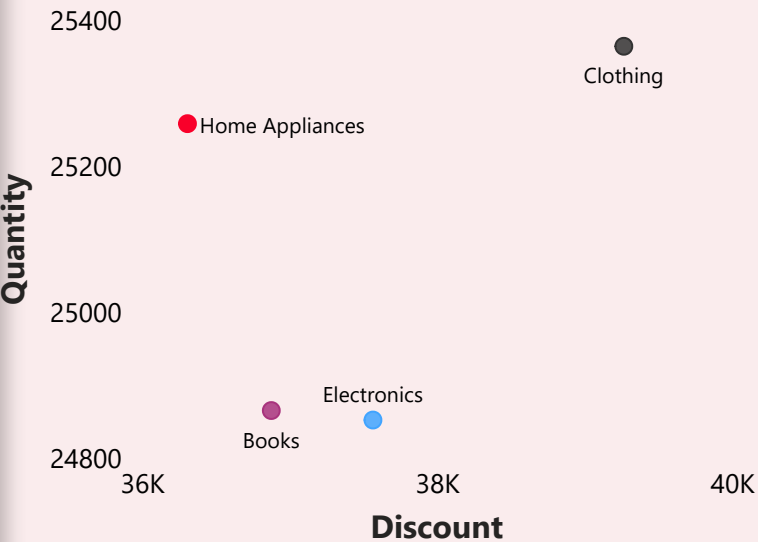
Customer and Sales Insights

Repeat Purchase Rate

0.96

Customer Churn Rate

0.000   0.037   0.074

Profit Leakage

4.11M

Seasonal Sales Activity

Month	Books	Clothing	Electronics	Home Appliances
1	517,738.54	406,832.51	470,013.21	481,606.59
2	443,941.70	411,949.71	435,174.88	417,128.15
3	441,536.17	486,005.11	493,101.77	481,256.84
4	424,375.60	387,701.69	445,353.59	442,714.61
5	519,235.58	440,744.62	467,604.87	489,573.87
6	449,500.99	480,010.47	381,611.32	433,401.99
7	446,162.25	561,190.35	486,347.05	439,591.89
8	443,458.06	500,007.61	492,502.46	499,756.04
9	437,129.94	431,425.59	434,195.60	439,056.64
10	462,703.87	393,290.07	428,343.61	495,307.73
11	497,590.18	449,365.14	421,287.55	439,196.65
12	429,067.69	488,055.14	395,149.76	502,614.70
Total	**5,512,440.57**	**5,436,578.01**	**5,350,685.67**	**5,561,205.70**

Weighted Profitability by Region

Region	Weighted Probability
Asia	9.0
Europe	8.1
North America	7.1
South America	5.2
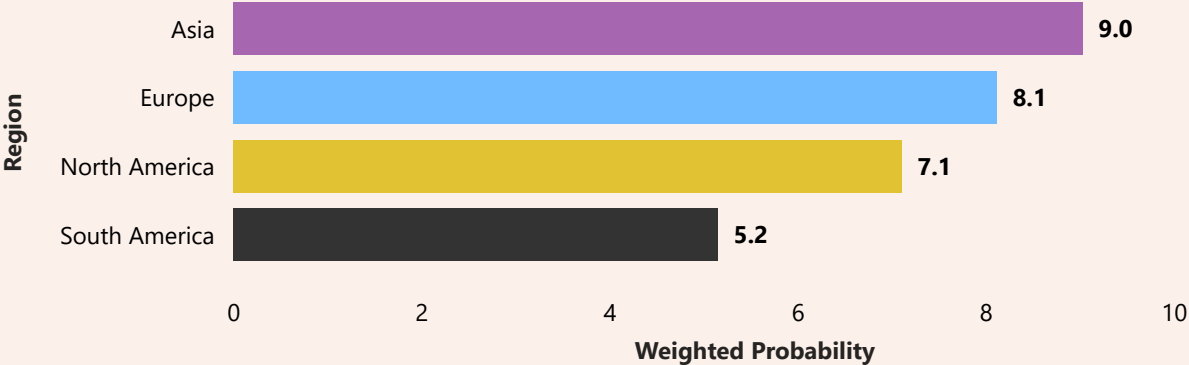
Cost-to-Serve Index by Region

Region	Cost to Serve Index
Asia	27.1
Europe	23.8
North America	18.6
South America	15.7

Inventory Risk by Sub-Category

SubCategory	Inventory Risk
Shirts	-18.6K
Smartphones	-18.9K
Novels	-19.1K
Laptops	-20.2K
Kitchenware	-21.1K