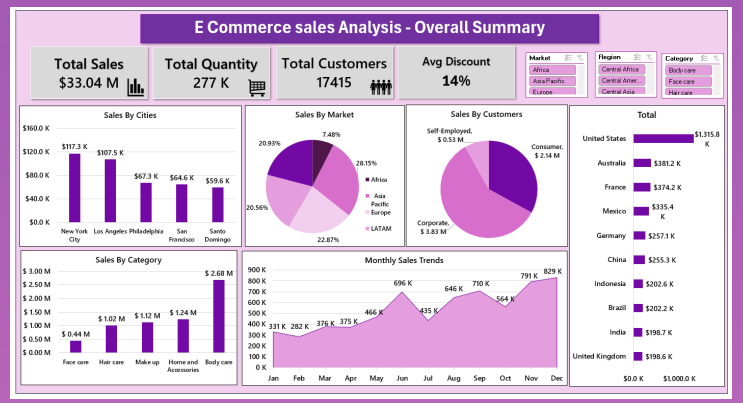
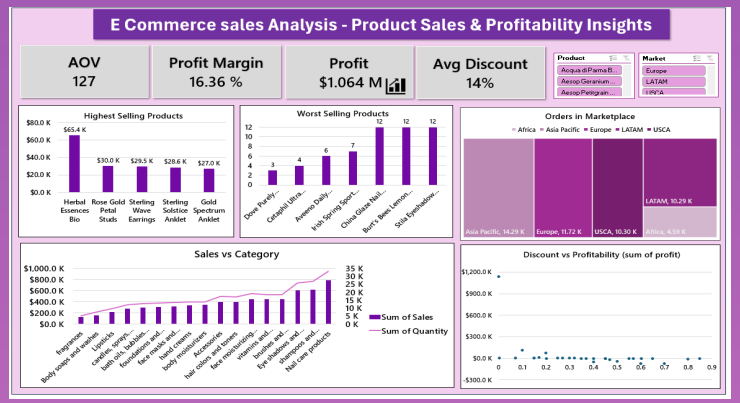
E-Commerce Sales Analysis





- Presented By
Neha Jade

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Project Goal

- **Analyze** e-commerce sales data across markets, regions, and product categories to understand business performance.
- **Uncover** actionable insights related to customer behavior, sales trends, and profitability drivers.
- **Recommend** strategic actions to boost revenue, improve profit margins, and strengthen market presence.

Business Problem Statement

- ✓ Clear insights into sales performance across products, cities, and customer segments are currently missing.
- ✓ There is limited understanding of how discounts affect overall profitability.
- ✓ Data-driven insights are required to identify top-performing categories and regions.
- ✓ A structured Excel-based analysis is essential to uncover key trends and support strategic decision-making.

Data Overview

The dataset contains e-commerce sales records, including details about orders, customers, products, and sales performance.

Column's Descriptions:

- **Row ID**: Unique record identifier.
- **Order ID**: Unique order identifier.
- **Order Date**: Date of purchase.
- **Customer ID**: Unique customer identifier.
- **Segment**: Customer type (Consumer, Corporate, Self-Employed).
- **City / State / Country**: Location details of the order.
- **Region / Market**: Broader geographical classification.
- **Category / Subcategory**: Product categories (e.g., Hair Care, Make Up).
- **Product**: Name of the product sold.
- **Quantity**: Units sold.
- **Sales**: Revenue from the sale.
- **Discount**: Discount given.
- **Profit**: Earnings from the sale.

Data Cleaning & Preparation

Prior to analysis, thorough data cleaning and preparation were conducted to ensure accuracy.

Remove Duplicate Entries

•Identified and eliminated duplicate rows to ensure accurate analysis.
•Removed Unwanted Column’s

Format Date Columns

•Standardized date formats across all records (e.g., DD-MM-YYYY).

Validate Numeric Fields

•Checked and corrected formatting for numeric fields:

- **Sales**
- **Discount**
- **Profit**

•Ensured no missing or invalid numeric values.

Business Problem & Key Questions

To support strategic decision-making, an analysis was conducted to identify sales performance trends, profitability drivers, and improvement areas. The following key business questions were formulated based on the dataset analysis.

1. What is the total sales revenue and profit?
2. What's the average discount and its impact on profit?
3. What's the average order value and customer spending?
4. Which products have the highest revenue?
5. Which products are low-selling, and what to do?
6. Which product category has the highest profit?
7. What is the total quantity sold and orders placed?
8. What's the profit margin, and is it on target?
9. Which products/categories should be restocked?
10. Which products/categories are losing, and how to improve?

Data Analysis with Essential Excel Functions

1. Calculate the total sales, total profit, and average discount

Total Sales: = SUM(Dataset!O2:O51189)

Total Sales
$ 6.50 M

Total Quantities = SUM(Dataset!N2:N51189)

Total Quantities
277213

Total Profit = SUM(Dataset!Q2:Q51189)

Total Profit
$1.06 M

Profit Margin % = ((D6/B6))

Profit Margin %
16.36%

D6 = Total Profit, B6 = Total Sales

Avg Discount = AVERAGE(Dataset!P2:P51189)

Avg Discount
14%

Avg Order Value = B6/B13

Avg Order Value
127

B6 = Sale,B13 = orders

2. Find the highest-selling and lowest-selling products

Highest Selling Product

Product = INDEX(I4:I3580, MATCH(LARGE(J4:J3580, ROW(A1)), J4:J3580, 0))

Sales = LARGE(J:J, ROW(A1))

Highest Selling Product	Sales
Herbal Essences Bio	$ 65360
Rose Gold Petal Studs	$ 29520
Sterling Wave Earrings	$ 28552
Sterling Solstice Anklet	$ 27004
Gold Spectrum Anklet	$ 26772

Lowest Selling Product

Product = INDEX(I5:I3580, MATCH(SMALL(J5:J3580, ROW(A1)), J5:J3580, 0))

Total Sales = SMALL(J5:J3580,ROW(A1))

Lowest Selling Product	Sales
Dove Purely Pampering Shea Butter with Warm Vanilla Body Wa	3
Cetaphil Ultra Gentle Refreshing Body Wash	4
Aveeno Daily Moisturizing Yogurt Body Wash	6
Irish Spring Sport Strength Antibacterial Body Wash	7
Stila Eyeshadow Sunset Shimmering Copper	12

Identify the most profitable product categories

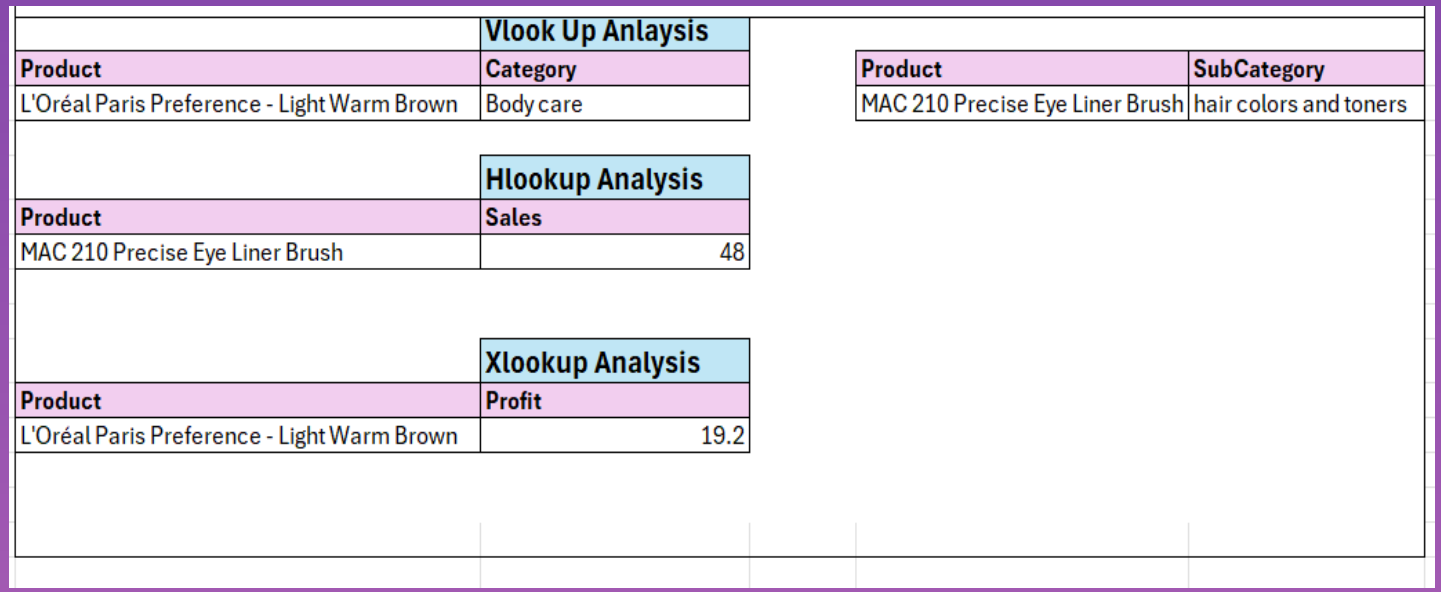
Products per Categories = COUNTIF(Dataset!L2:L51189, S3)

Total Profit = SUMIF(Dataset!L2:L51189, S3, Dataset!Q2:Q51189)

Category	NO. of Product Count per Category	Total profit
Body care	21027	590007.68
Hair care	8180	3822.58
Make up	9002	368097.18
Home and Accessories	9499	-56954.24
Face care	3480	158763.2

LookupAnalysis

Comparison of lookup functions used in Excel for data extraction



	Vlook Up Anlaysis
Product	**Category**
L'Oréal Paris Preference - Light Warm Brown	Body care

Product	**SubCategory**
MAC 210 Precise Eye Liner Brush	hair colors and toners

	Hlookup Analysis
Product	**Sales**
MAC 210 Precise Eye Liner Brush	48

	Xlookup Analysis
Product	**Profit**
L'Oréal Paris Preference - Light Warm Brown	19.2

Look Up	Formulae	Output
VLOOKUP	=VLOOKUP(I4, A3:G51183,3,FALSE)	Body care
VLOOKUP	=VLOOKUP(L4,A3:G51183,2,FALSE)	hair colors and toners
HLOOKUP	=HLOOKUP("Sales",A2:G51118,3,FALSE)	48 (Sales)
XLOOKUP	=XLOOKUP("L'Oréal Paris Preference - Light Warm Brown",A2:A51183,G2:G51183)	19.2 (Profit)

Findings

Top-Selling Products

- The product with the highest sales was **Herbal Essences Bio** generating **$653,800**.
- Other high performers included **Rose Gold Petal Studs** and **Sterling Wave Earrings**.

Lowest-Selling Products

- The product with the lowest sales was **Dove Purely Pampering Shea Butter with Warm Vanilla Body Wash**, with only **3 units sold**.
- Other low performers included **Cetaphil Ultra Gentle Refreshing Body Wash** and **Aveeno Daily Moisturizing Body Wash**.

Most Profitable Product Categories

- **Body Care** was the most profitable category, earning **$590,007.68** in total profit.
- **Face Care** and **Makeup** also performed well, contributing significantly to overall profitability.

Loss-Making Category

- **Home and Accessories** recorded a loss of **$56,594.24**, indicating a need for review or strategic changes.

Recommendations

- **Focus marketing efforts** on high-performing products and categories.
- **Review pricing or product strategies** for low-selling and loss-making items.
- **Maintain discounting strategy** to keep a balance between volume and profitability.

Dashboard Overview

- ✓ Provides a **comprehensive analysis** of e-commerce business performance.
- ✓ Key metrics include **total sales**, **customer count**, **quantity sold**, and **profit margins**.
- ✓ **Top-performing cities** and **product categories** are highlighted to identify key growth areas.
- ✓ **Monthly sales trends** are visualized to track performance over time.
- ✓ Identifies **highest and lowest selling products** for optimization opportunities.
- ✓ Orders from different markets (regions) were analyzed to gain insights into market-wise performance
- ✓ **Discounts and profitability** are analyzed to understand the impact of promotions on margins.

E Commerce sales Analysis - Overall Summary

Total Sales	Total Quantity	Total Customers	Avg Discount
$33.04 M	277 K	17415	14%

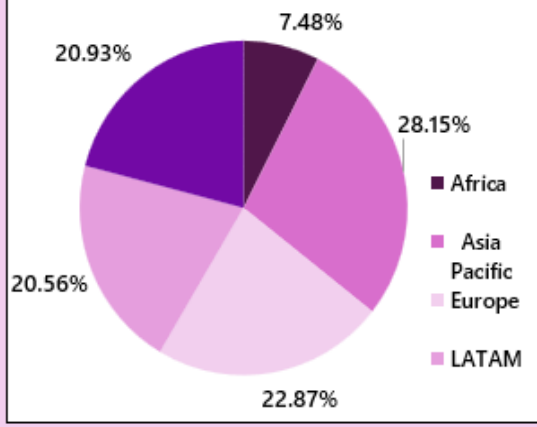
Market: Africa, Asia Pacific, Europe

Region: Central Africa, Central Amer..., Central Asia

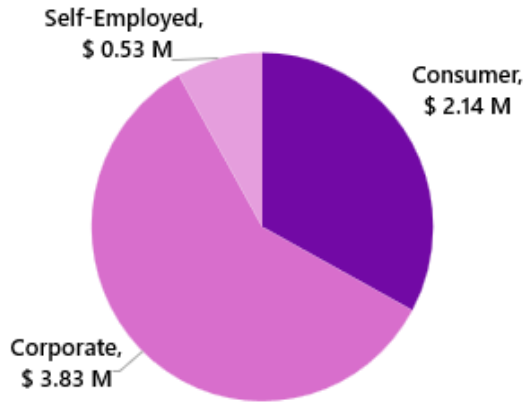
Category: Body care, Face care, Hair care

Sales By Cities

Sales By Market

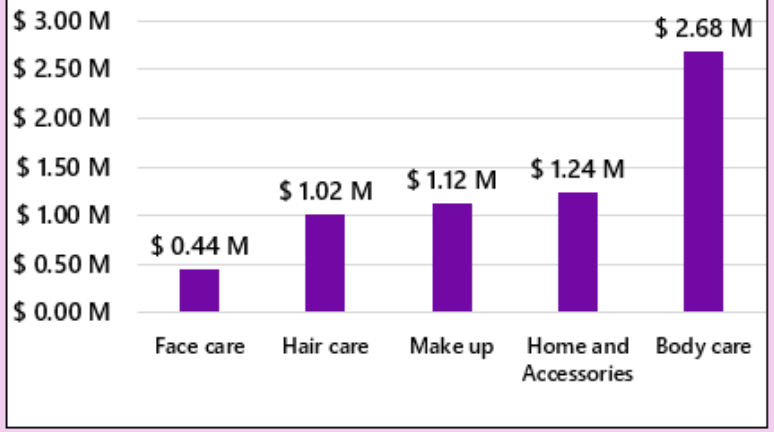


Sales By Customers

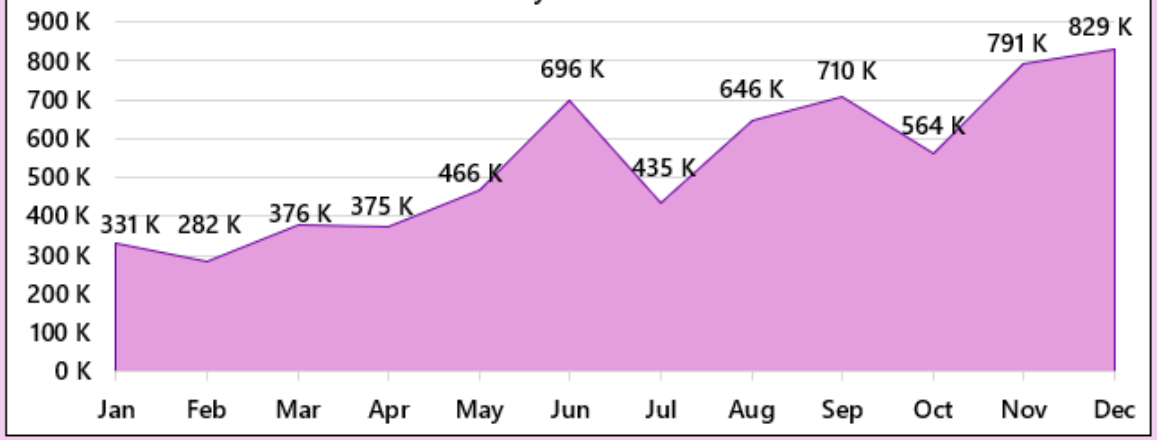


Total

Sales By Category



Monthly Sales Trends



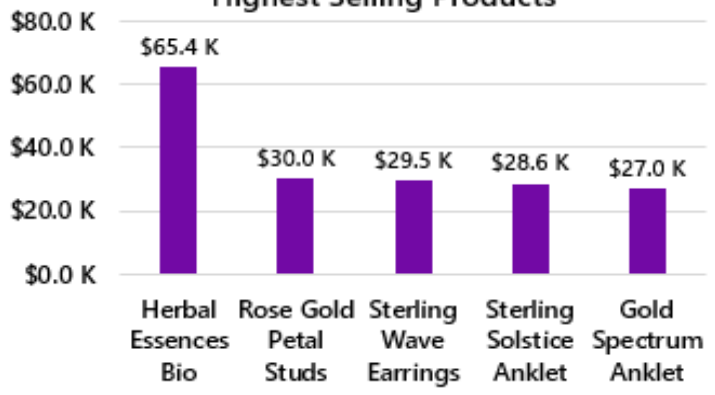
E Commerce sales Analysis - Product Sales & Profitability Insights

AOV	Profit Margin	Profit	Avg Discount
127	16.36 %	$1.064 M	14%

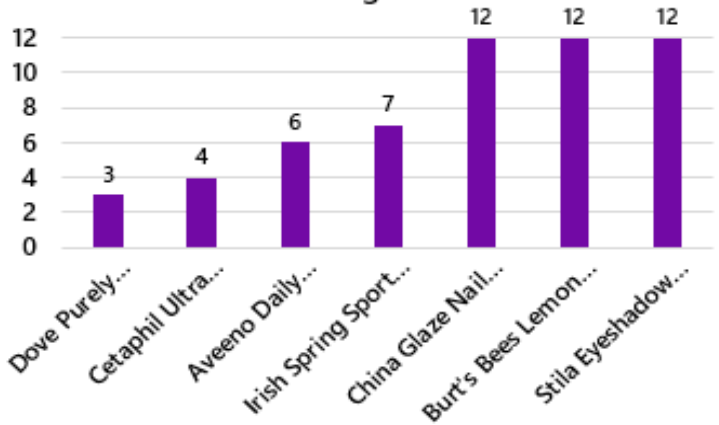
Product: Acqua di Parma B... | Aesop Geranium ... | Aesop Petitgrain ...

Market: Europe | LATAM | USCA

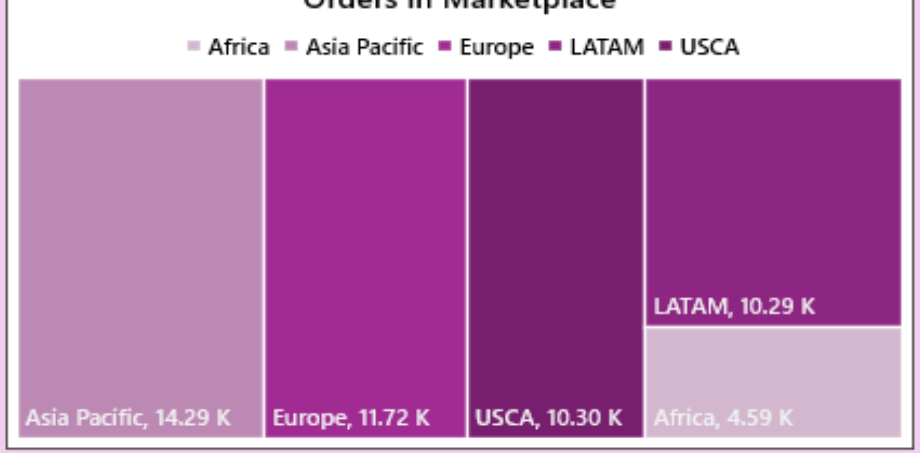
Highest Selling Products



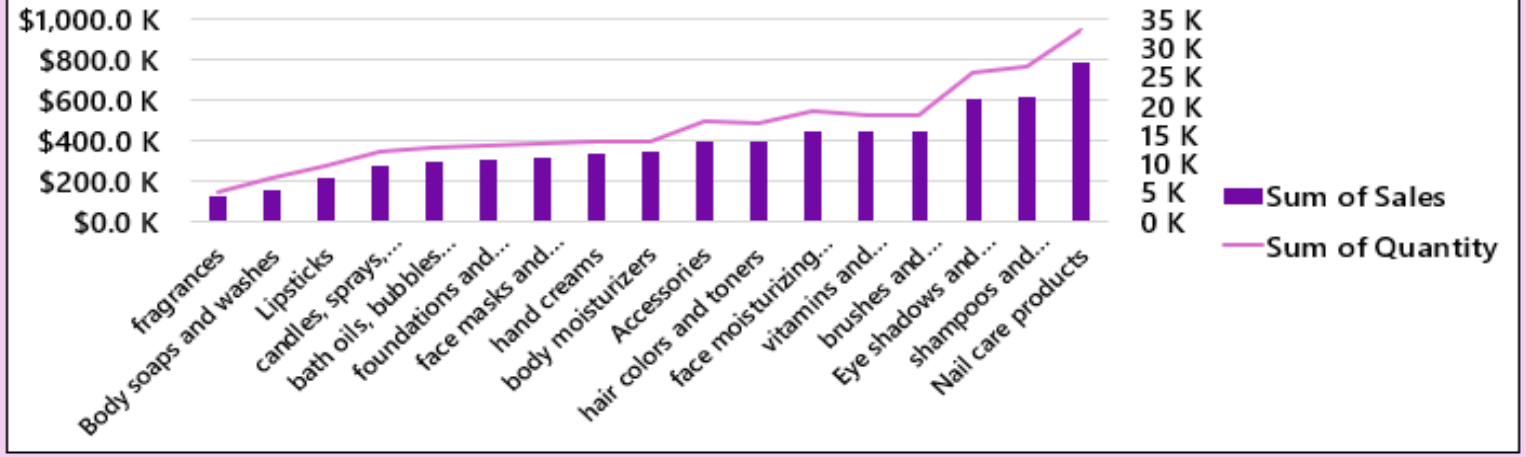
Worst Selling Products



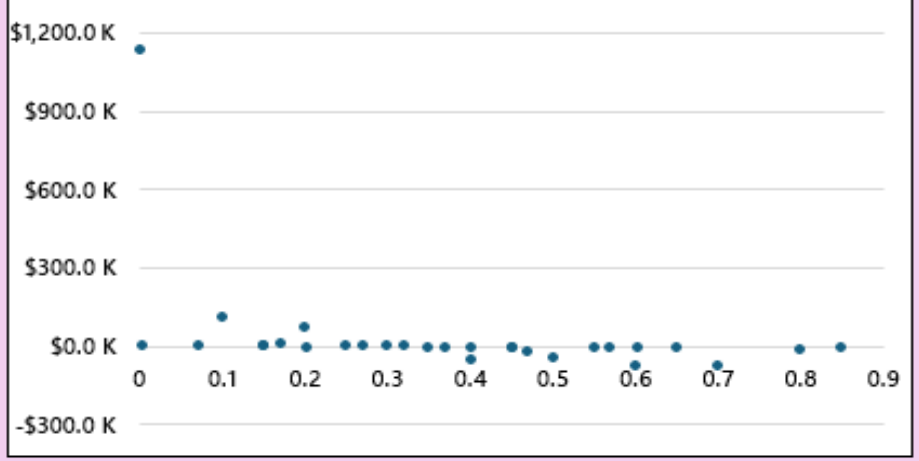
Orders in Marketplace



Sales vs Category



Discount vs Profitability (sum of profit)



Data-Driven Observations

Key Insights from Dashboard 1: General Performance & Market Overview

- **Total Sales** amount to **$33.04M** with **277K units sold** and **17,415 customers** served.
- **Top Cities by Sales**: **New York City** ($117.3K) and **Los Angeles** ($107.5K) lead in sales.
- **Market Share by Region**: **Africa (28.15%)** holds the largest market share, followed by **LATAM (22.87%)** and **Europe (20.56%)**.
- **Customer Segments**: **Corporate customers** contribute the highest revenue ($3.83M), while **Consumers** account for $2.14M.
- **Top-Selling Category**: **Body Care** products dominate with **$2.68M**, far ahead of others.
- **Sales Trends**: **December** shows the highest monthly sales (**$829K**), indicating a possible holiday season boost.
- **Country-Wise Sales**: **United States** is the top market (**$1.3M+**) followed by **Australia** and **France**

Key Insights from Dashboard 2: Product Performance & Profitability

- **Profit Overview**: Total **profit is $1.064M** with a **16.36% margin** and an **average order value (AOV) of $127**.
- **Top 5 Best-Selling Products**: **Herbal Essences Bio** leads with **$65.4K** in sales.
- **Top 5 Worst-Selling Products**: Items like **Stile Eyeshadow** and **Burt's Bees Lemon** show very low sales (~$12).
- **Sales vs Category : Nail care products** and **shampoos** are top contributors in both sales and quantity.
- **Orders by Marketplace**: **Asia Pacific** and **USCA** have the highest number of orders (~10K+ each).
- **Discount vs Profitability**: Minimal correlation is seen—higher discounts do **not consistently drive higher profits**.

Strategic Recommendations for Growth

❑ **Scale High-Performing Market**

1. Increase inventory and promotions in **Africa**, **LATAM**, and **US cities** like NYC and LA.
2. Expand partnerships with retailers in top regions.

❑ **Revamp or Phase Out Low-Selling Products**

1. Review poor performers (e.g., Stila Eyeshadow, Burt's Bees Lemon) for delisting or repositioning.
2. Focus R&D on expanding best-performing lines like **shampoos** and **body care**.

❑ **Segment-Based Targeting**

1. Design loyalty programs and bundles tailored to **Corporate** buyers.
2. Run targeted campaigns to uplift **Consumer** and **Home Office** segments.

❑ **Seasonal Promotion Planning**

1. Capitalize on **Q4 peak sales** with pre-planned campaigns from October onwards.
2. Launch holiday bundles and limited editions.

❑ **Optimize Discounting Strategy**

1. Avoid blanket discounts; test with A/B pricing.
2. Promote value-based pricing and loyalty rewards to improve profit margins.

Excel VBA Automation for Summary Report

As part of the e-commerce dashboard project, I used **Excel VBA** to automate the creation of a **one-page performance summary**.

This Excel-based report dynamically captures and displays all key business insights, including:

- **Sales Overview** – Total Sales, Quantity, Customers, and Discounts
- **Product Performance** – Profit, Profit Margin, AOV
- **Top & Worst-Selling Products**
- **Regional Sales Distribution**
- **Top Cities and Customer Segments**

The automation reduced manual effort, ensured consistency, and enabled quick report generation with a professional layout.

Link 🔗 ⟶ **View VBA Script**