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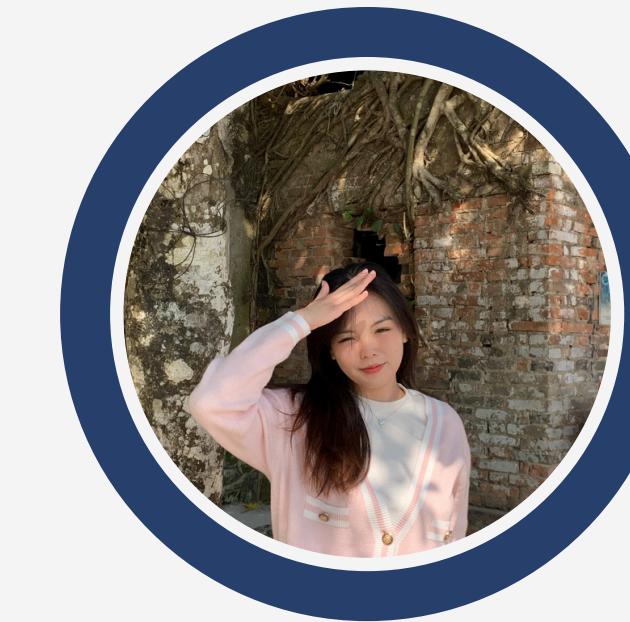
# DATA ANALYSIS & STRATEGIC MARKETING PLANNING

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# **ABOUT OUR TEAM**



**Nguyễn Thành Long**



**Nhàn Yên Trang**



**Nguyễn Lê Bình**



**Phạm Xuân Lộc**

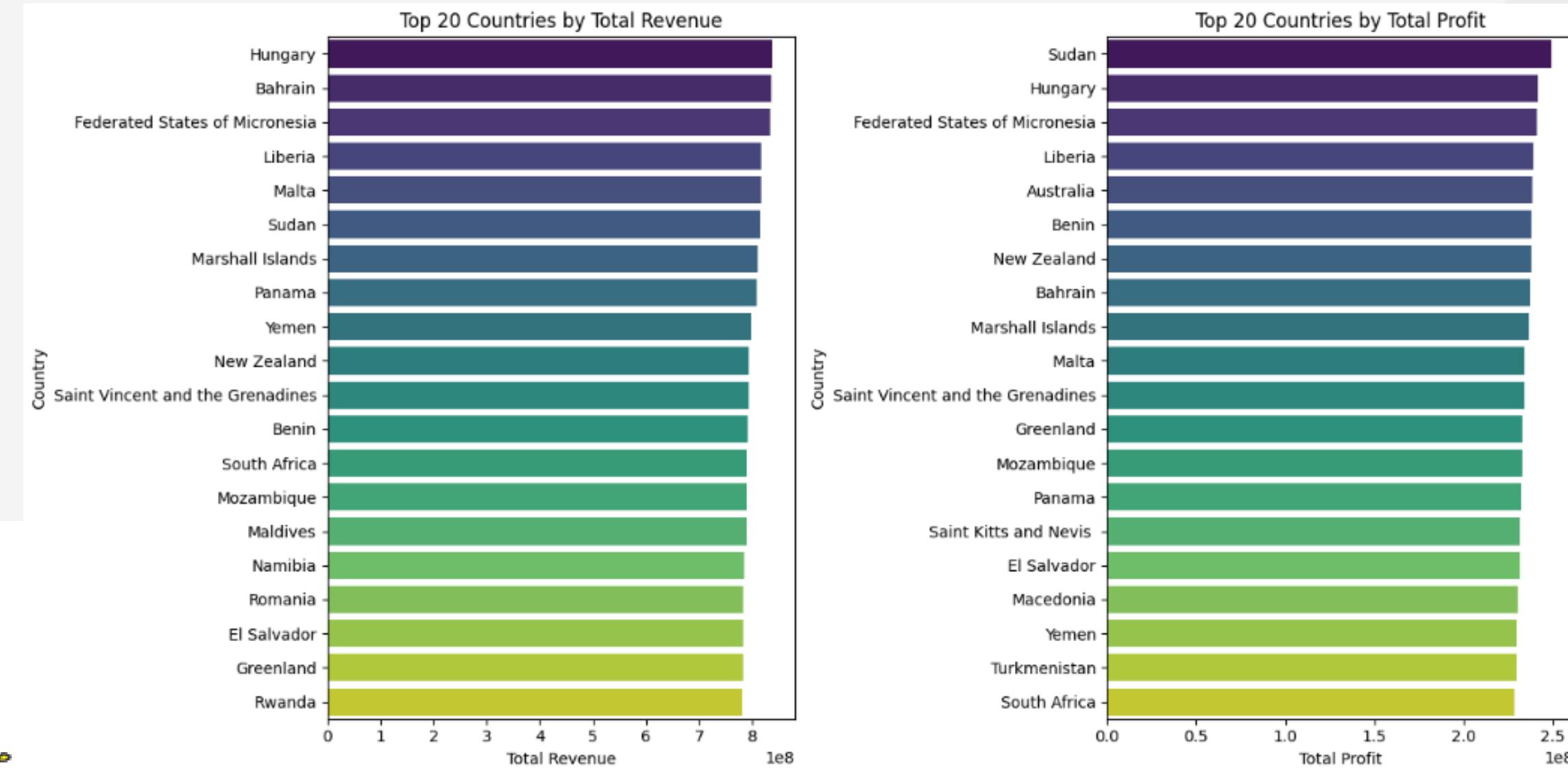
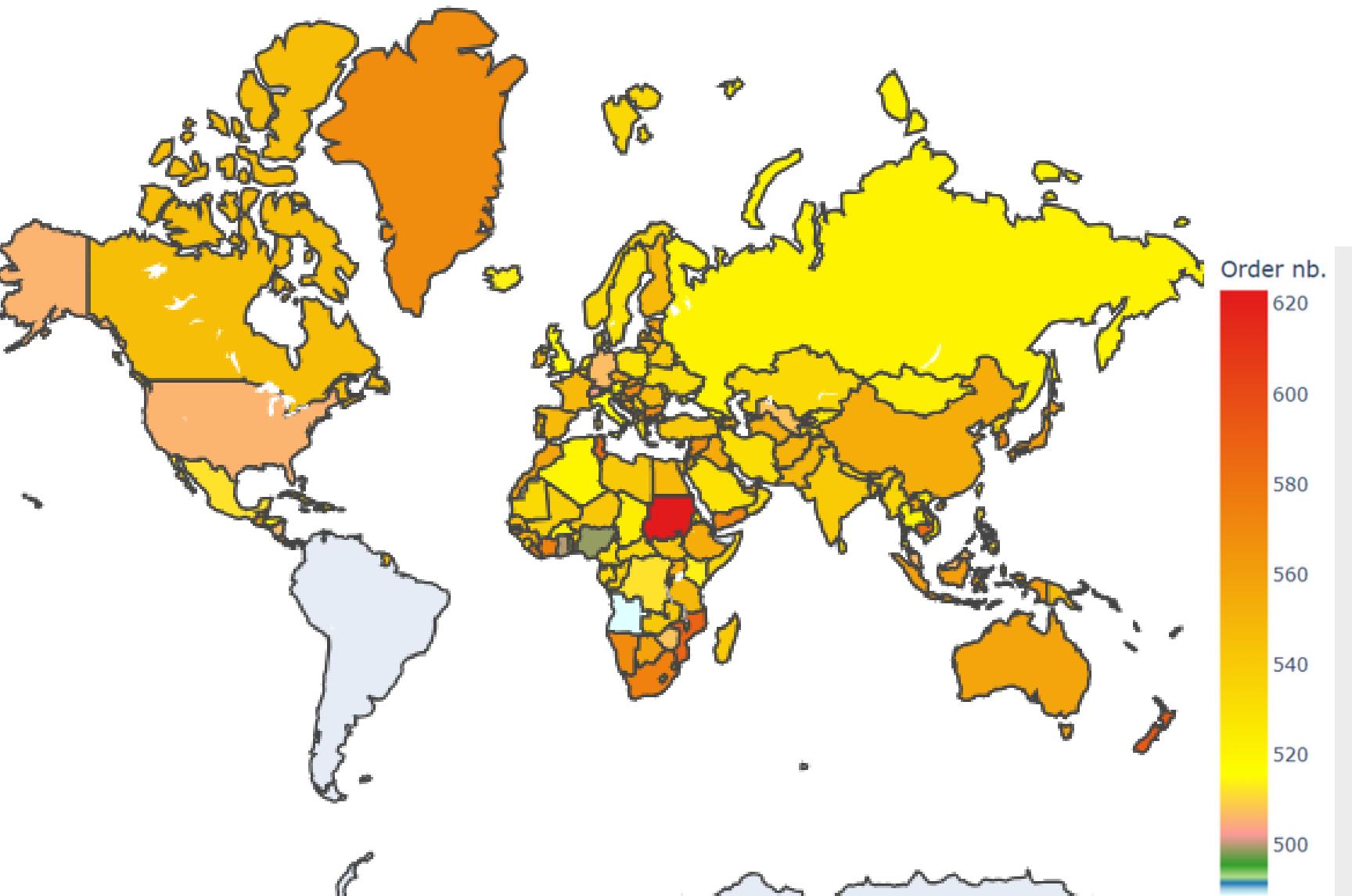
# EXECUTIVE SUMMARY

The objective of this analysis is to increase revenue by targeting high-performing regions, leveraging seasonal trends, and optimizing sales channels. Analyzing regions such as Sub-Saharan Africa, Europe, and Asia reveals significant market potential, while seasonal shopping trends indicate monthly demand fluctuations. The solution involves implementing tailored seasonal marketing campaigns, optimizing order fulfillment processes, and enhancing omnichannel sales integration. This approach is expected to result in sustainable revenue growth, improved customer satisfaction, and optimized business operational efficiency.



# *EDA &* Segmentation

# REGIONAL AND COUNTRY ANALYSIS



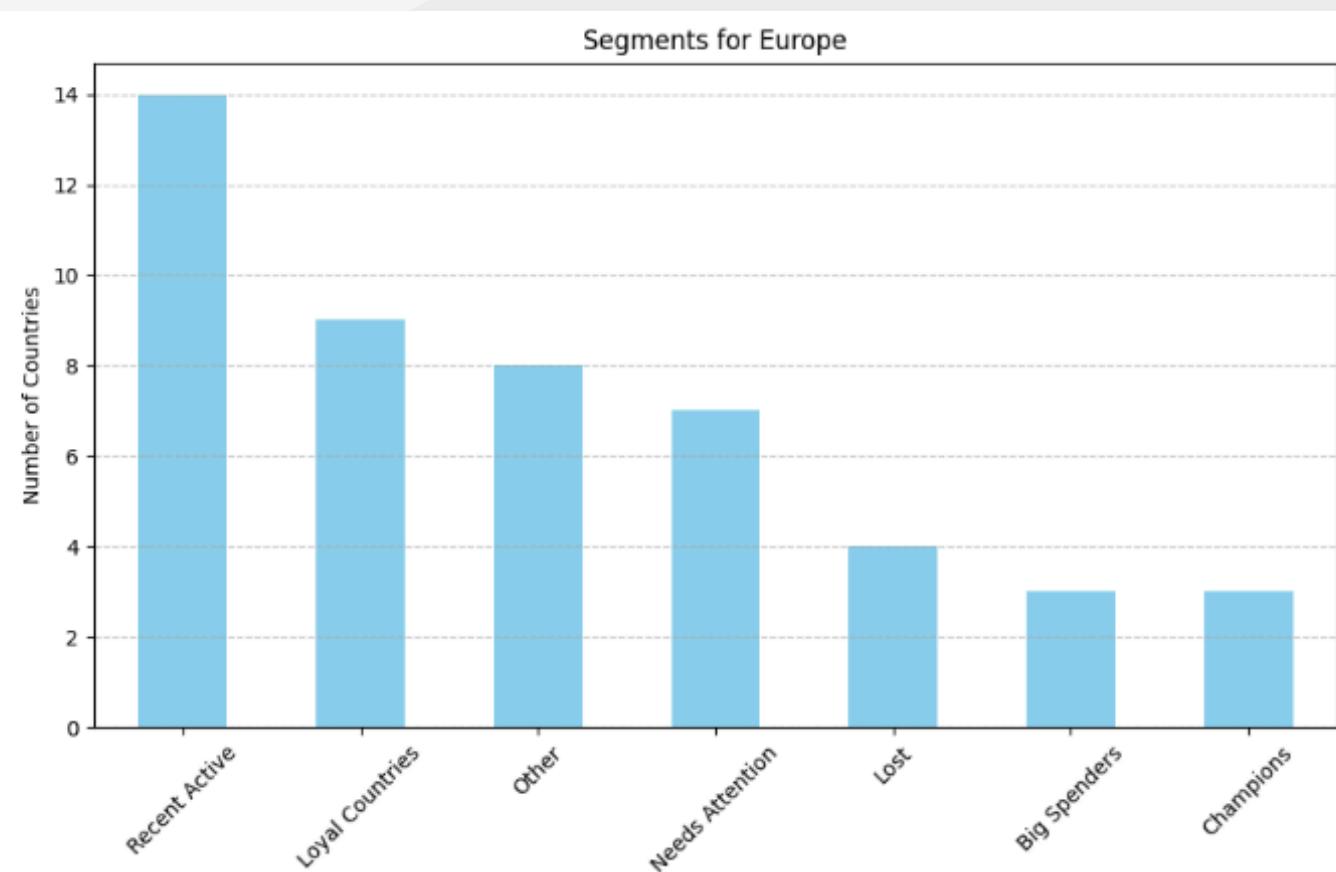
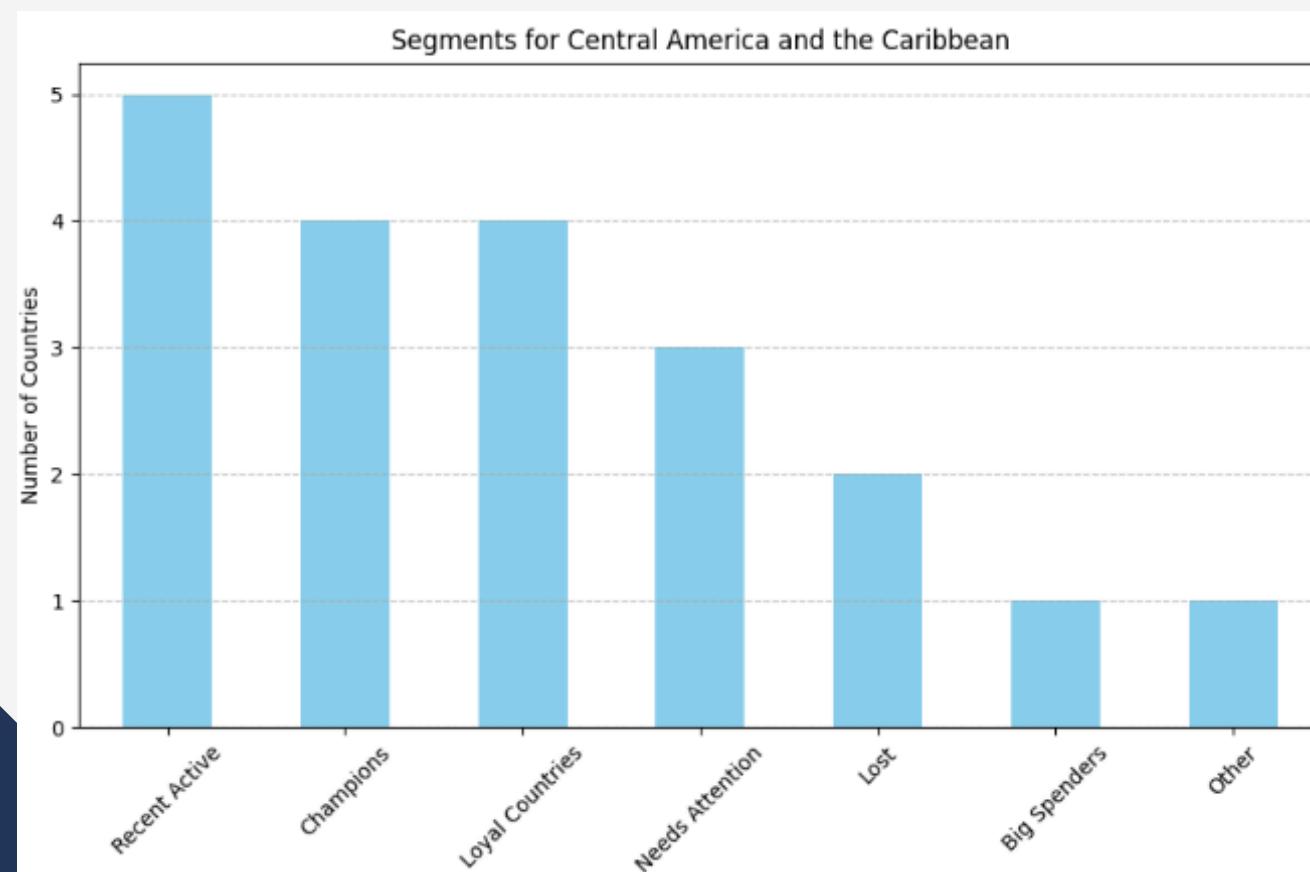
Sub-Saharan Africa leads in total revenue and profit, followed by Europe and Asia, highlighting high market potential in these regions.

Key countries like Sudan, Hungary, and the Federated States of Micronesia are significant revenue and profit contributors, making them prime targets for business expansion.

# RFM & CLV ANALYSIS

RFM score segmentation shows Asia with many "Recent Active" and "Loyal Countries," indicating high recent engagement and consistent loyalty. Europe also has a trend of "Recent Active" countries, suggesting opportunities to convert recent engagement into long-term loyalty.

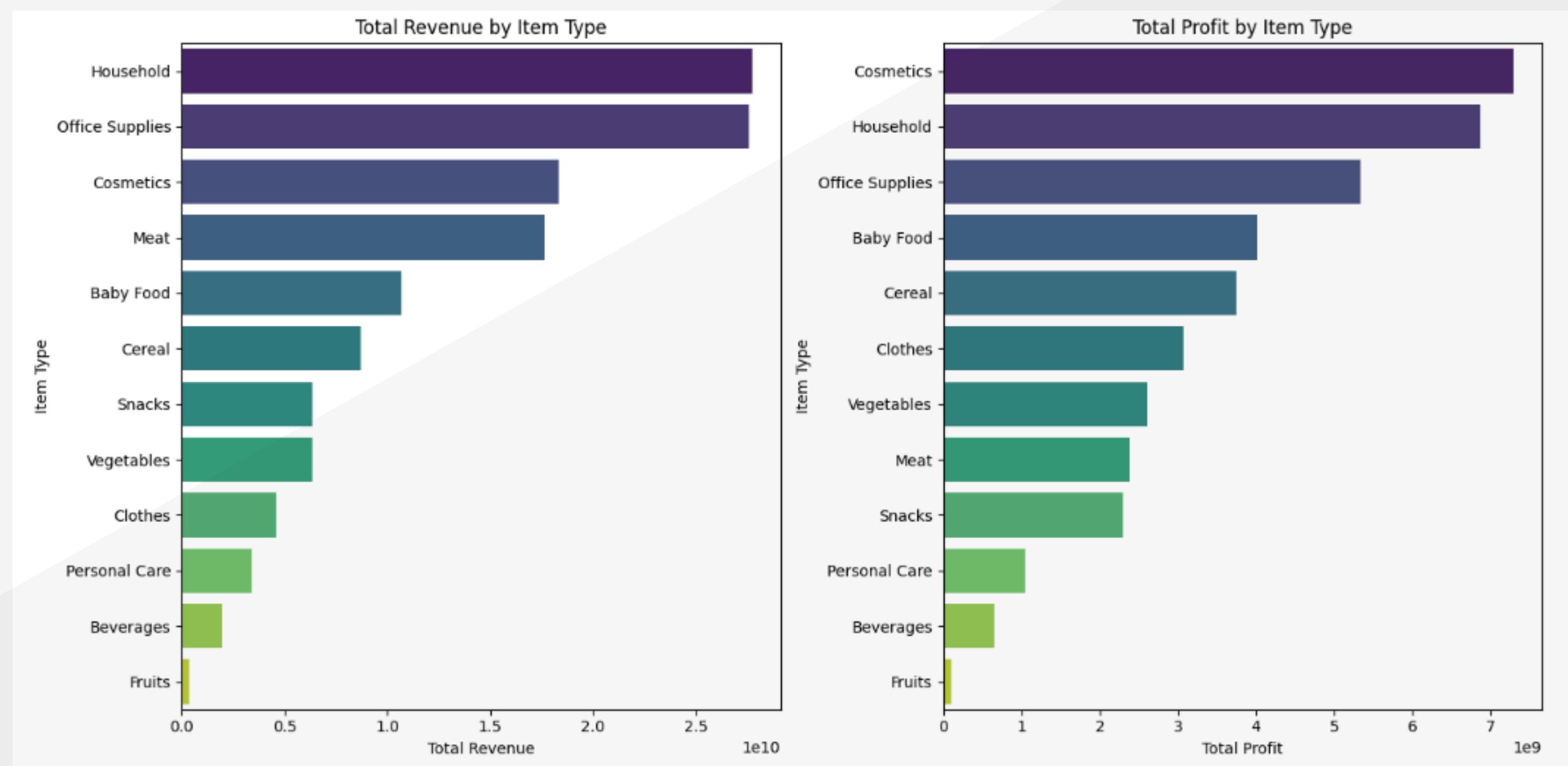
Countries with high Customer Lifetime Value (CLV) include Bahrain, the Federated States of Micronesia, and Hungary, pointing to significant long-term customer value.



| Country | CLV   |
|---------|---|
| 10      | Bahrain 6.733677e+07                          |
| 50      | Federated States of Micronesia 6.714881e+07   |
| 66      | Hungary 6.692131e+07                          |
| 88      | Liberia 6.593958e+07                          |
| 99      | Malta 6.577992e+07                            |
| 155     | Sudan 6.572636e+07                            |
| 100     | Marshall Islands 6.508050e+07                 |
| 124     | Panama 6.494082e+07                           |
| 182     | Yemen 6.421136e+07                            |
| 136     | Saint Vincent and the Grenadines 6.393804e+07 |

# ITEM TYPES INSIGHTS

Revenue and Profit Insights: Household items generate the highest revenue, indicating high sales or prices, while cosmetics yield the highest profit, suggesting a high-profit margin despite lower sales volume. Office supplies are strong in both revenue and profit, making them key to overall sales and profitability.



# ABC-XYZ ANALYSIS

Household items, office supplies, cosmetics, and meat are top revenue contributors (A), followed by cereal, snacks, and vegetables (B), and clothes, personal care, beverages, and fruits (C) while XYZ analysis indicates moderate demand variability for all items, suggesting predictable but fluctuating demand.

- Focus on household items for revenue, leverage cosmetics for profit margins and maintain office supplies for stability.
- Effectively manage meat due to its significant revenue contribution.
- Review Categories B and C for growth or cost-saving opportunities, and account for moderate demand fluctuations in inventory management.

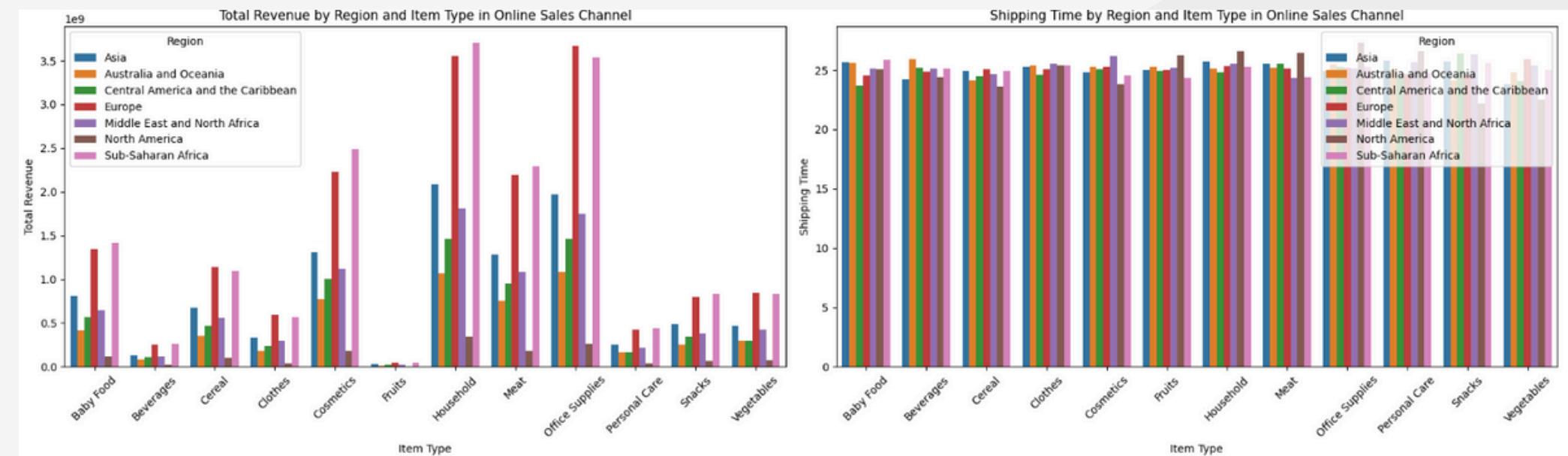
|    | Item Type       | ABC Category | XYZ Category |
|----|-----------------|--------------|--------------|
| 0  | Household       | A            | Y            |
| 1  | Office Supplies | A            | Y            |
| 2  | Cosmetics       | A            | Y            |
| 3  | Meat            | A            | Y            |
| 4  | Baby Food       | A            | Y            |
| 5  | Cereal          | B            | Y            |
| 6  | Snacks          | B            | Y            |
| 7  | Vegetables      | B            | Y            |
| 8  | Clothes         | C            | Y            |
| 9  | Personal Care   | C            | Y            |
| 10 | Beverages       | C            | Y            |
| 11 | Fruits          | C            | Y            |

# SALES CHANNELS

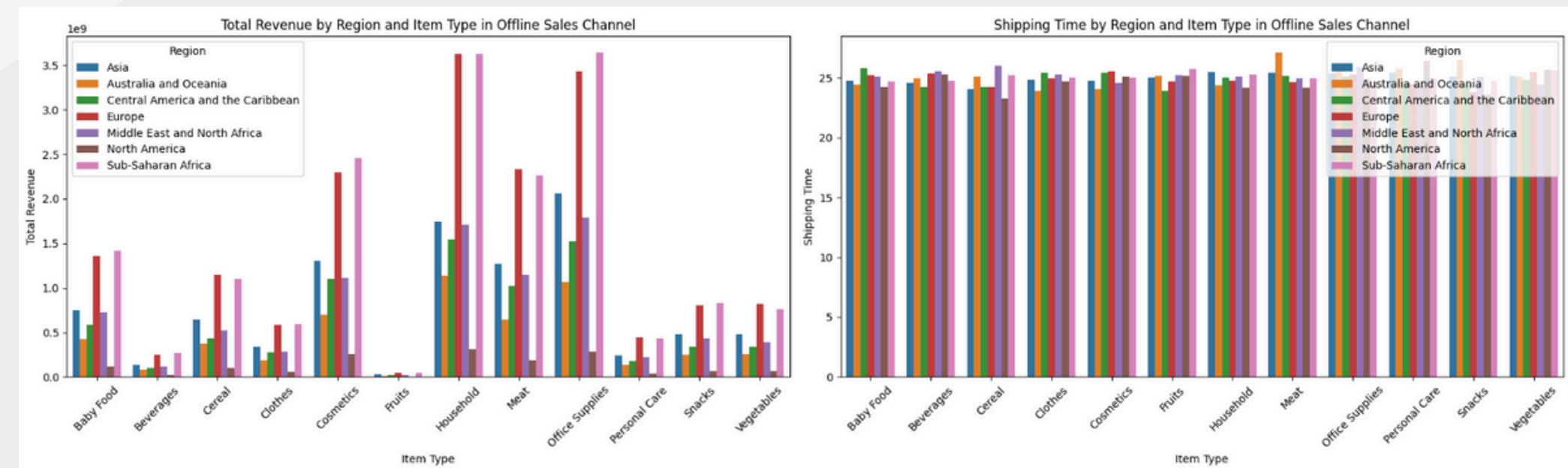
**Balanced Contribution:** Both channels contribute equally to total revenue and profit, making a dual-channel strategy advantageous. Investments in both are justified to maximize market reach and profitability.

**Regional and Item Insights:** Europe, Asia, and Sub-Saharan Africa show high revenue across item types, with household items and meat being particularly lucrative.

**Logistics Efficiency:** Consistent shipping times across regions and item types indicate an efficient logistics network, crucial for customer satisfaction and retention.



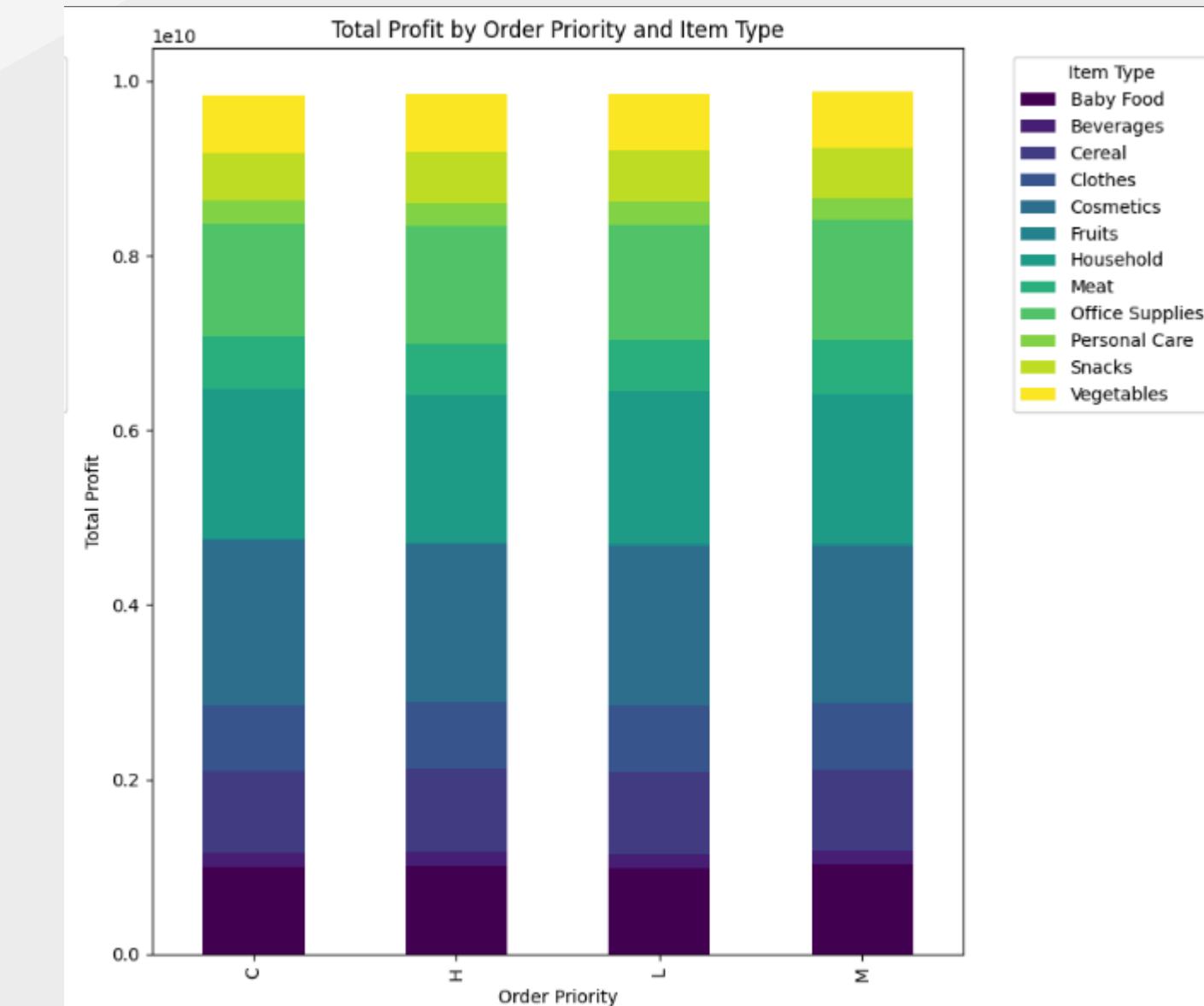
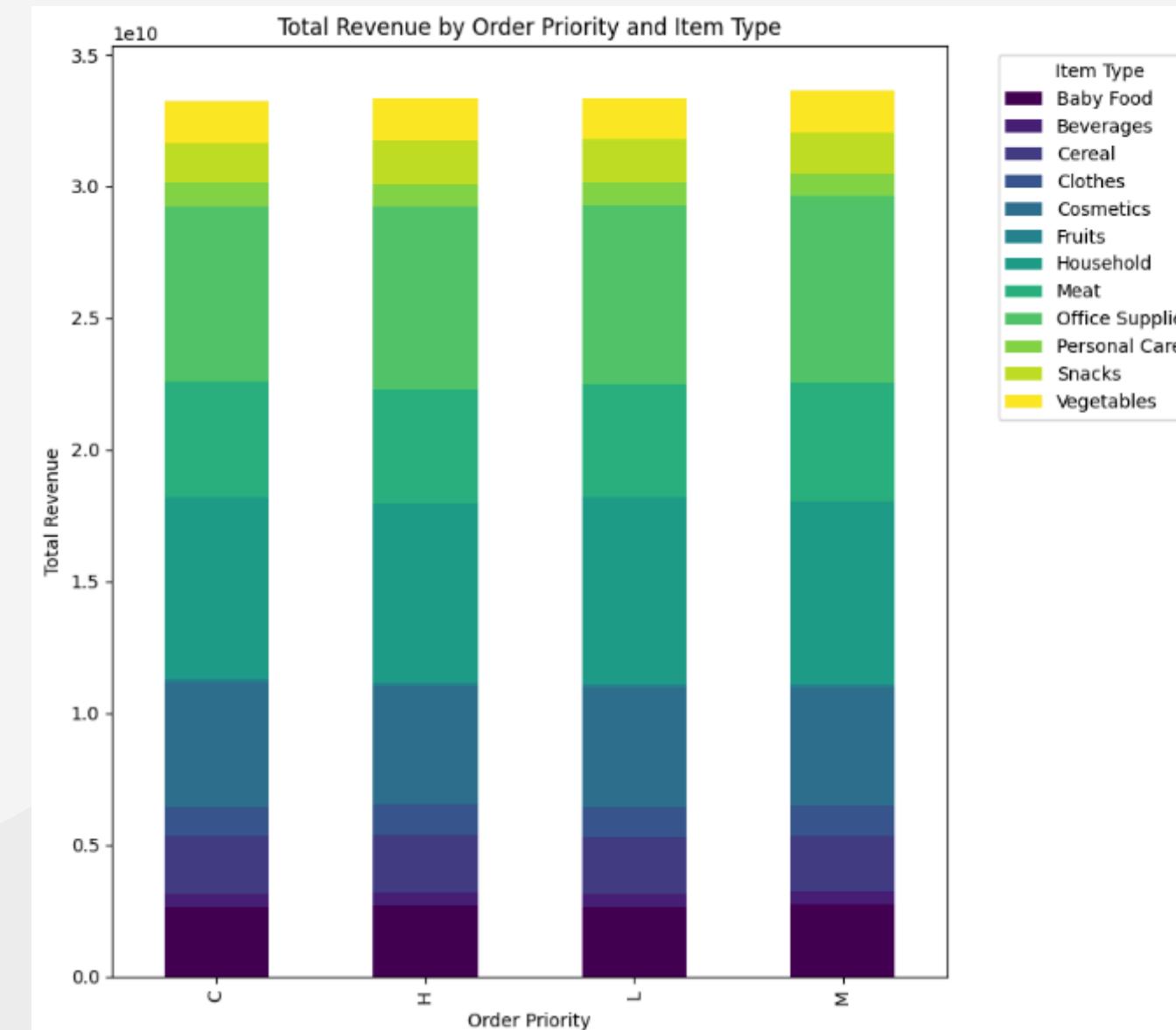
Total revenue and Shipping time among item types in Online Channel



Total revenue and Shipping time among item types in Offline Channel

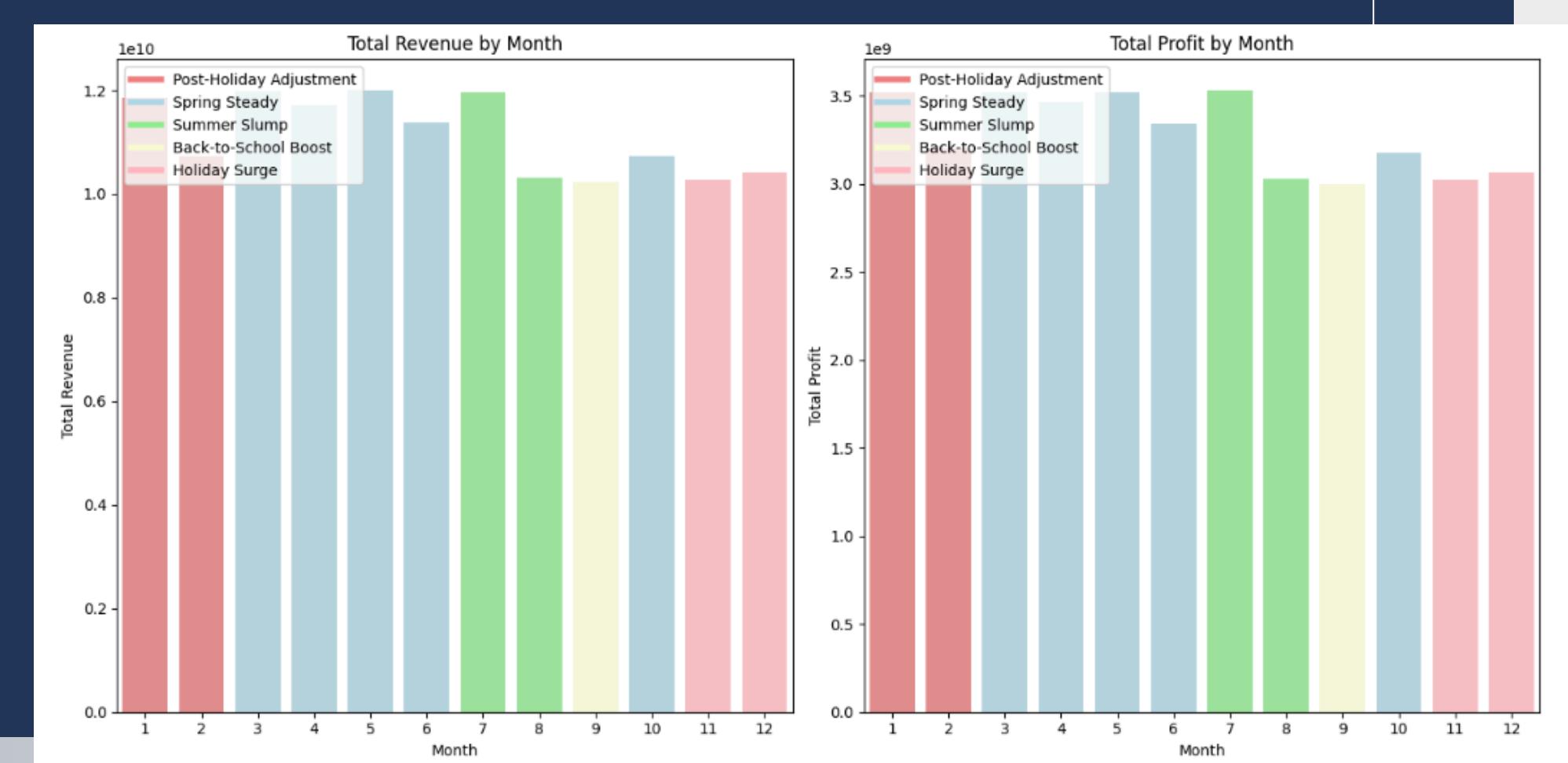
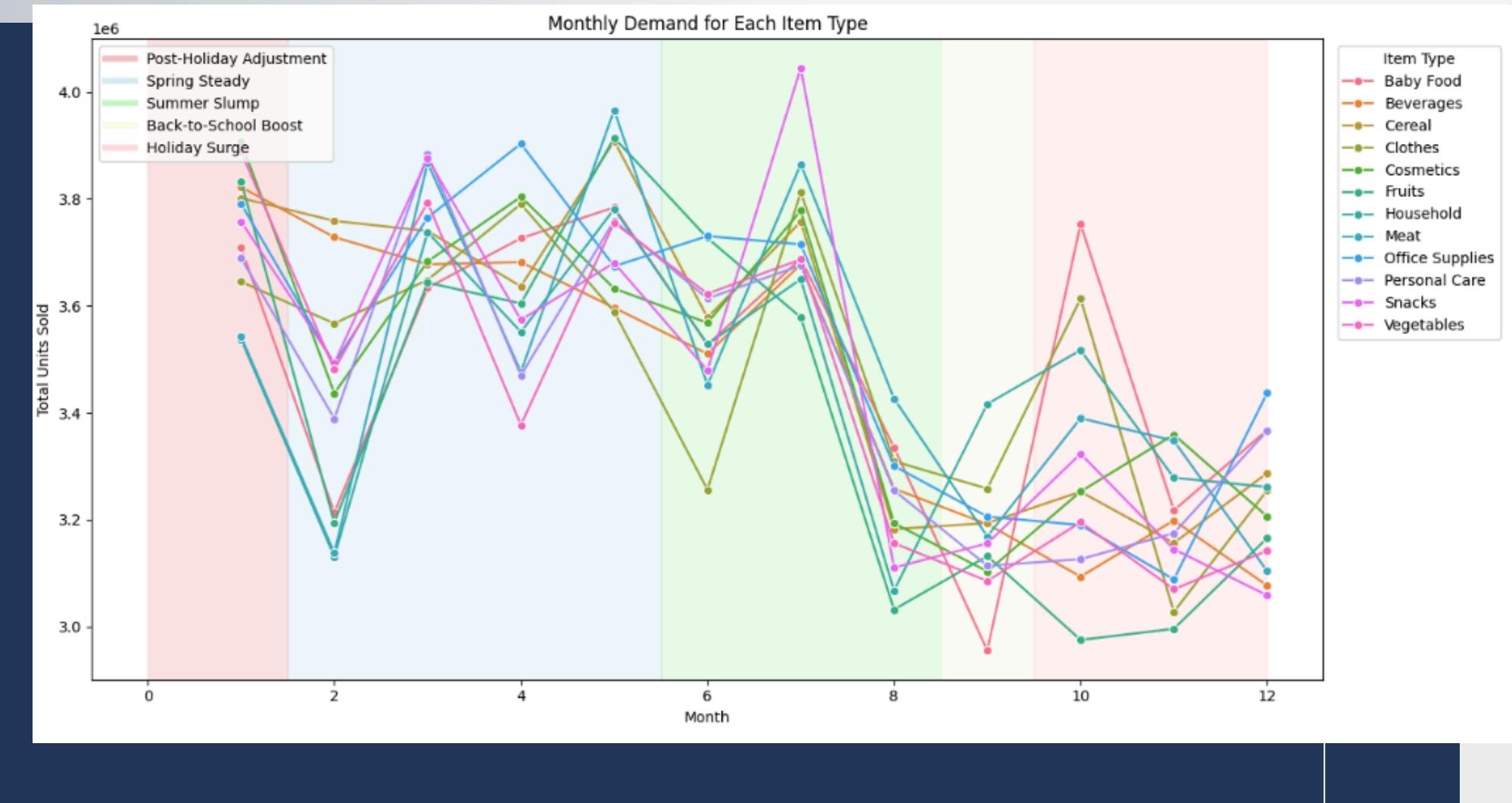
# **ORDER PRIORITY**

Most revenue and profit come from medium and lower-priority orders. Critical orders, though less frequent, cover a wide range of item types but contribute less to total revenue and profit. Moreover, household items, meat, and office supplies consistently generate revenue across all order priorities.



# SEASONAL TRENDS

- In January and February, demand drops due to post-holiday financial recovery. From March to June, demand stabilizes, reflecting some routine shopping behaviors.
- In July and August, demand dips significantly, likely due to vacations. September sees a notable growth thanks to back-to-school shopping along with preparation for the holiday season.
- The highest demand peaks occur from November to December, driven by the holiday season, including Black Friday, Cyber Monday, and Christmas shopping.

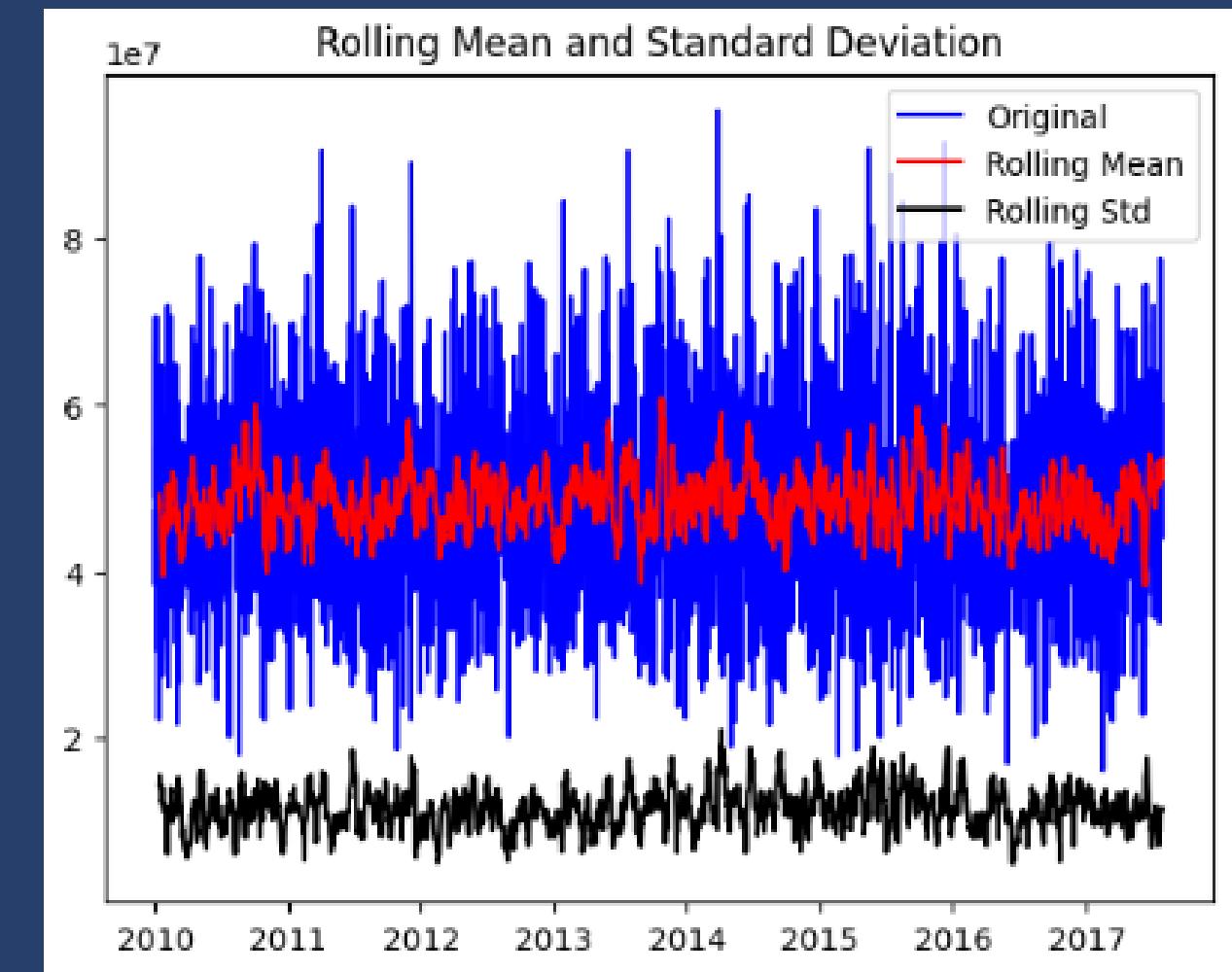
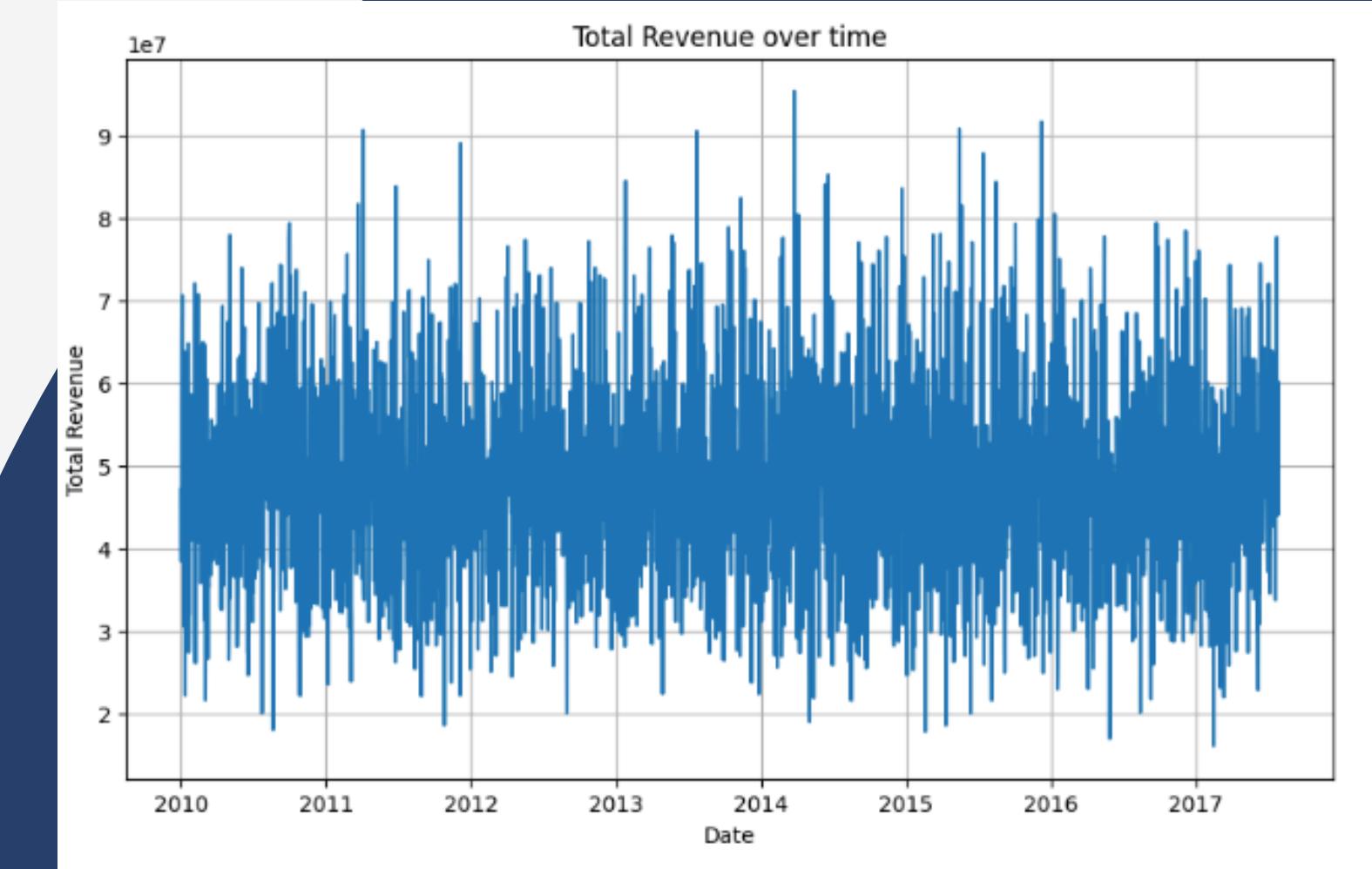


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# STATIONARY

The analysis of total revenue from 2010 to 2017 reveals day-to-day fluctuations within a consistent range, indicating stable revenue performance.

The rolling mean shows a steady average revenue, while the rolling standard deviation indicates consistent volatility. The Dickey-Fuller test confirms the stationarity of the revenue data, meaning its statistical properties remain constant over time.



# REVENUE PREDICTION



# ABOUT DATASET

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The dataset has been processed, and new features have been created, including daily revenue, number of orders, average shipping time, and on-time delivery rate. The data is also aggregated by region, country, product type, sales channel, and order priority level, providing a comprehensive view of sales activities.

| Order Date | Daily Total Revenue | Daily Order Count | Daily Units Sold | Daily Avg Price | Average Shipping Time | On Time Delivery Rate | Count_Asia | Count_Australia and Oceania | Count_Central America and the Caribbean | Count_Europe | ... |
|------------|---------------------|-------------------|------------------|-----------------|-----------------------|-----------------------|------------|-----------------------------|---|--------------|-----|
| 2010-01-01 | 47119220.30         | 35                | 187660           | 248.646571      | 27.371429             | 0.028571              | 7.0        | 1.0                         | 4.0                                     | 10.0         | ... |
| 2010-01-02 | 38397582.10         | 34                | 152706           | 249.351176      | 29.352941             | 0.029412              | 5.0        | 5.0                         | 1.0                                     | 7.0          | ... |
| 2010-01-03 | 65138561.36         | 43                | 214970           | 294.543023      | 25.906977             | 0.093023              | 12.0       | 3.0                         | 5.0                                     | 9.0          | ... |
| 2010-01-04 | 70553636.16         | 46                | 246684           | 287.126087      | 25.673913             | 0.021739              | 10.0       | 3.0                         | 3.0                                     | 12.0         | ... |
| 2010-01-05 | 48762396.14         | 32                | 164530           | 268.966250      | 25.531250             | 0.187500              | 6.0        | 3.0                         | 1.0                                     | 9.0          | ... |

5 rows × 426 columns

# Creating New Features

- Converting dates: Year, month, day, day of the week
- Calculating shipping times: **Shipping Time, On Time Delivery**

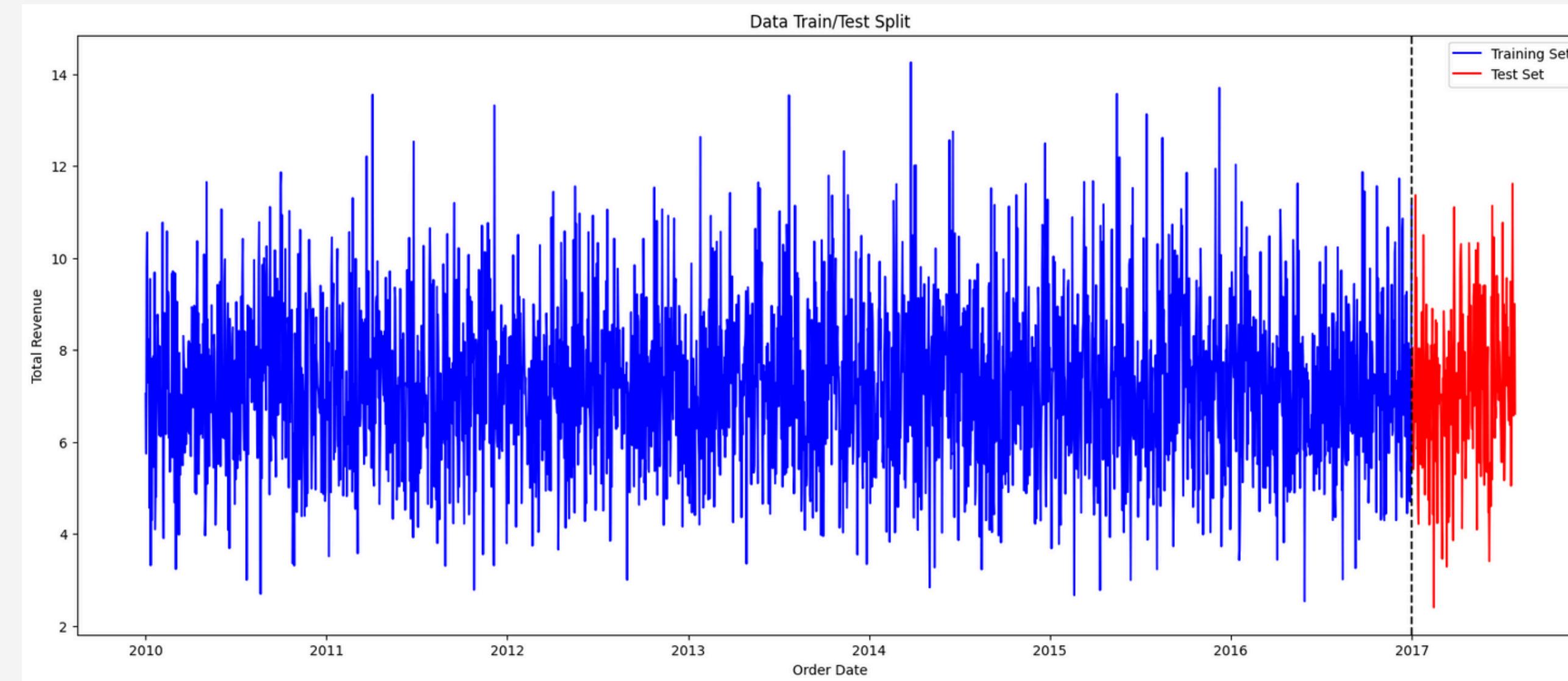
# Aggregating Daily Data

- Daily revenue, number of orders, number of products sold
- Average prices, shipping times, on-time delivery rate

# Categorical Variable

- Counting number of orders: **Region, Country, Item Type, Sales Channel, Order Priority**
- Total revenue by categorical variables

# MODEL DEVELOPMENT AND EVALUATION



## Training and Testing Set

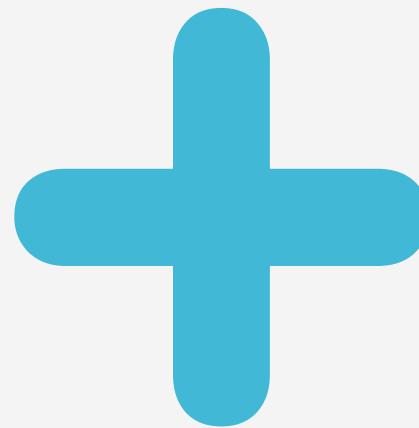
The data from 2010 to 2016 is used to train the model, while the data from 2017 is used to test the model. This helps to evaluate the model's performance on unseen data.

# **TOP 3 MODELS WITH THE BEST PERFORMANCE**

LightGBM showed the best performance in predicting revenue, with the lowest error metrics and the highest R<sup>2</sup>. CatBoost is also a good choice, with performance slightly behind LightGBM. XGBoost performed worse than the other two models but still achieved a fairly high R<sup>2</sup>. Therefore, LightGBM can be considered the most effective model for revenue prediction in this case.

| Model    | Metrics   |            |          |          |           |            |          |          |  |
|----------|-----------|------------|----------|----------|-----------|------------|----------|----------|--|
|          | MAE       |            | MSE      |          | RMSE      |            | R2       |          |  |
|          | Train     | Test       | Train    | Test     | Train     | Test       | Train    | Test     |  |
| LightGBM | 230064    | 625135.49  | 1.29E+11 | 6.99E+11 | 358991.48 | 835889.31  | 0.999073 | 0.994559 |  |
| CatBoost | 341582.64 | 555808.95  | 1.85E+11 | 5.39E+11 | 429721.85 | 733943.97  | 0.998672 | 0.995806 |  |
| XGBoost  | 437460.01 | 1071145.88 | 3.03E+11 | 2.01E+12 | 550265.87 | 1416484.57 | 0.997822 | 0.984377 |  |

# MARKETING STRATEGIES



Optimizing Order Fulfillment and Enhancing Omnichannel Sales

Expanding Profitable Item Categories and Maintaining Efficient Logistics

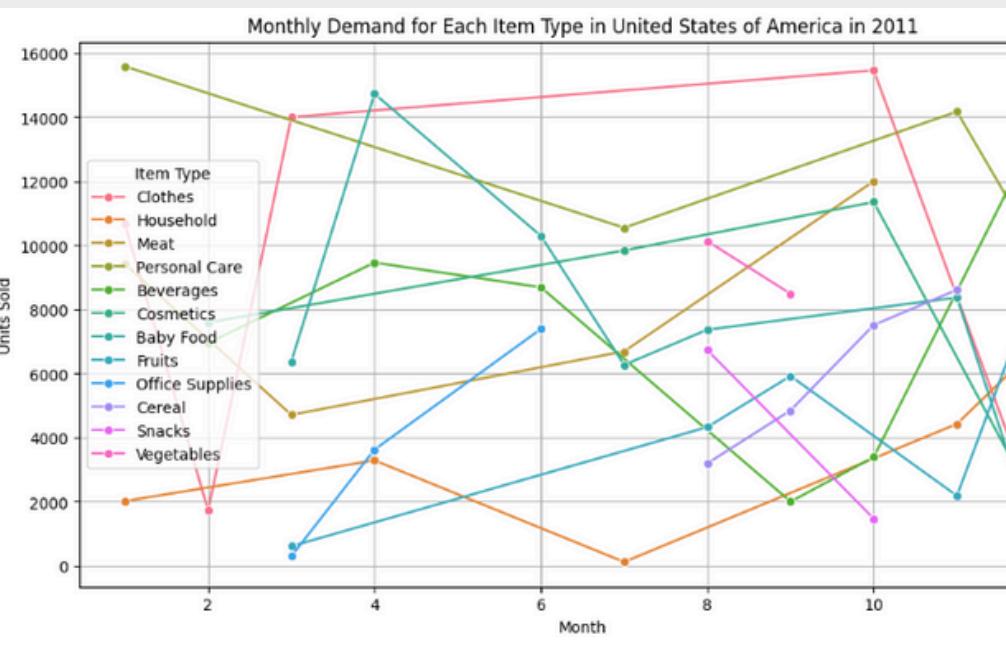
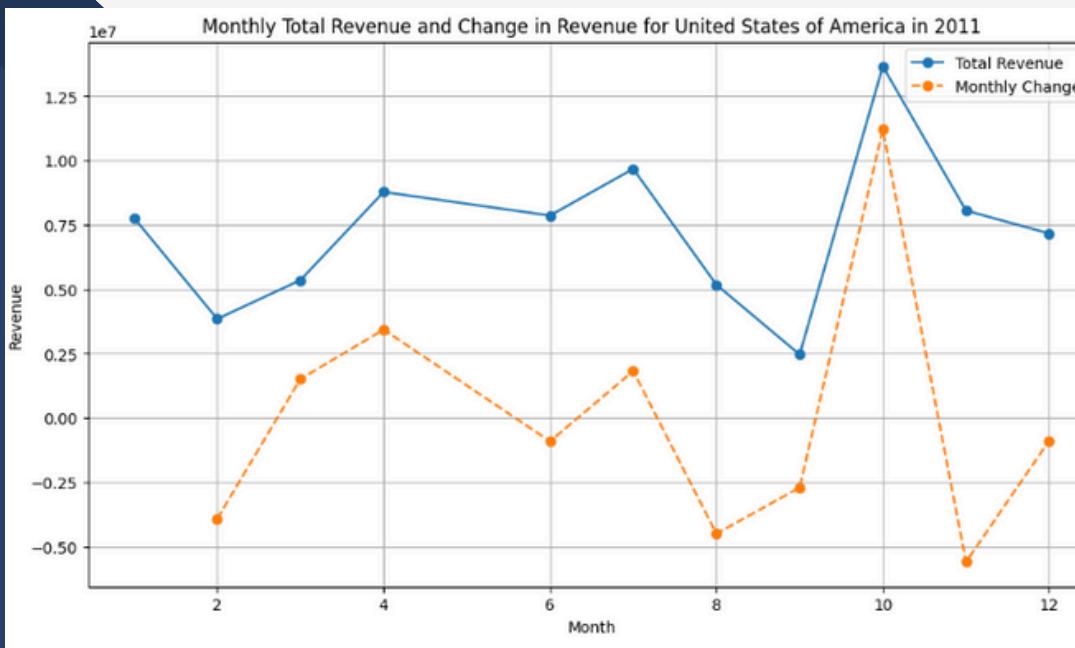
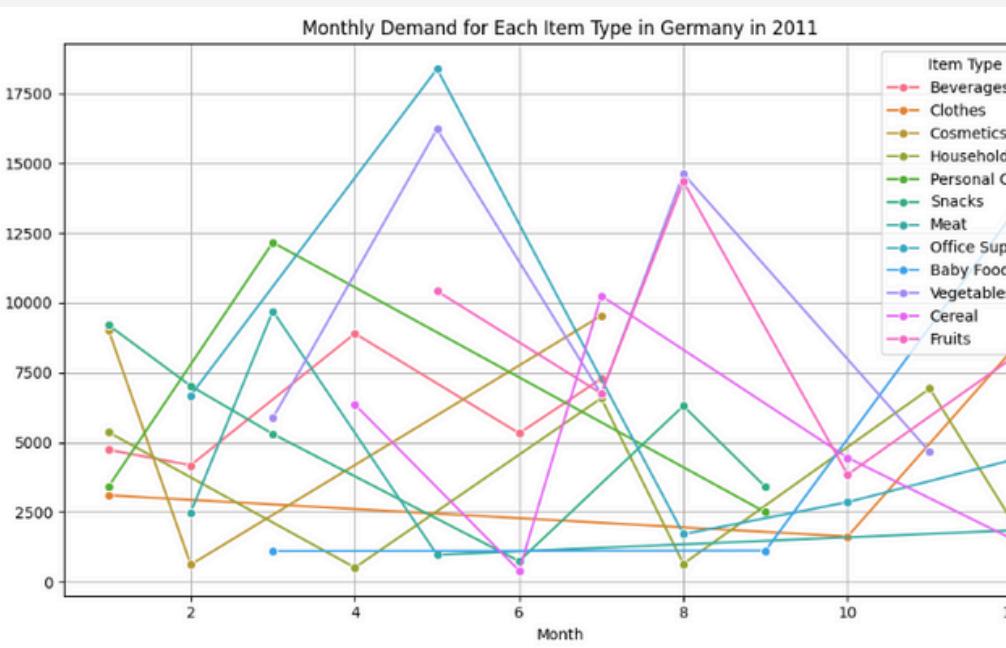
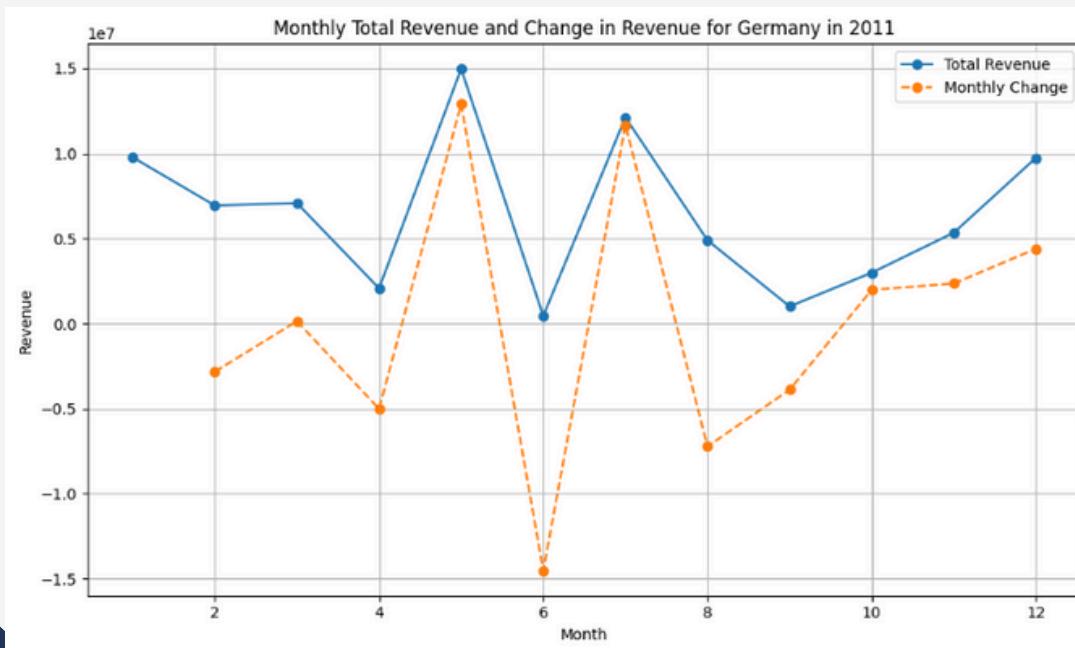
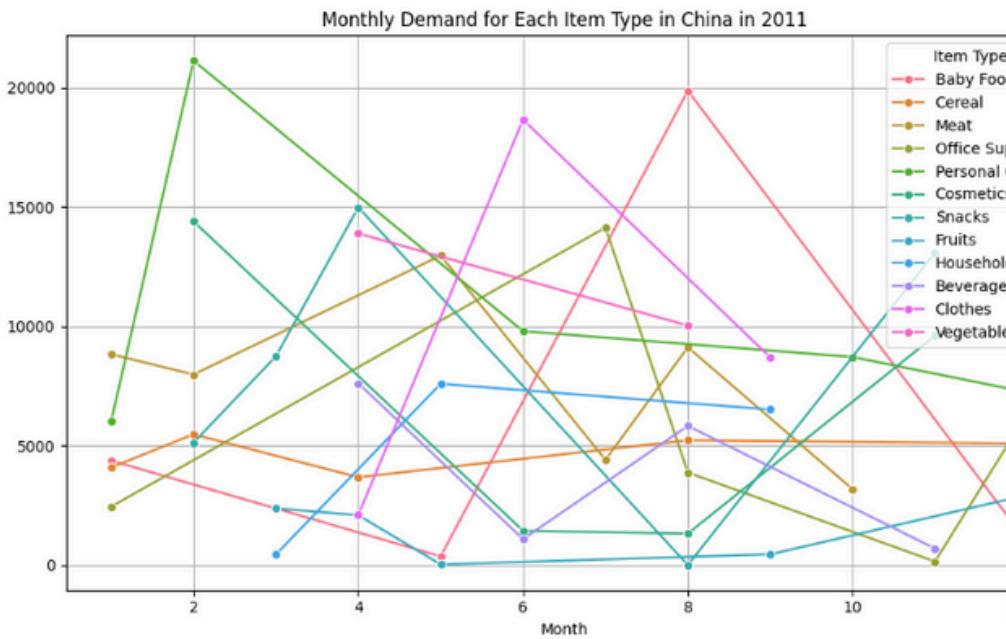
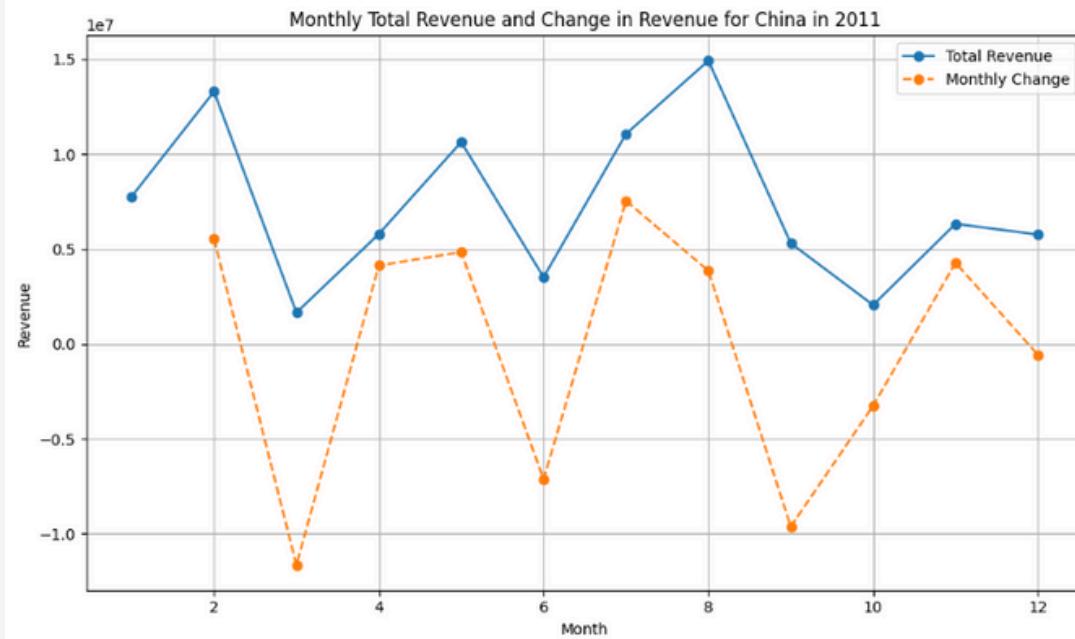
Targeting High-Performing Regions and Leveraging Seasonal Trends

Improving Customer Segmentation and Engagement

Utilizing Data-Driven Marketing and Predictive Analytics



# MONTHLY CHANGE ANALYSIS



- Pick one significant market from each continents to analyze:
- Asia: China
  - Europe: Germany
  - North America: USA



# CHINA

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## January:

- Chinese New Year campaign focusing on household items and baby food.
- TV ads, digital campaigns on WeChat and Weibo, and influencer promotions.
- Special New Year discounts and loyalty points.

## May:

- Labor Day campaign focusing on personal care products and baby food.
- Ads on Baidu and Alibaba, "Buy More, Save More" deals, and family-oriented events.
- Content marketing on family care and parenting tips.

## September:

- Back-to-school campaign highlighting personal care and household items.
- Digital ads on WeChat and TikTok, back-to-school discounts, and in-store promotions.
- Contests and giveaways to engage families.

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# GERMANY



## May:

- Spring and office setup campaign focusing on office supplies and personal care products.
- Online ads on Google, Facebook, and LinkedIn.
- Discounts with a “Spring Refresh” theme and collaboration with businesses for bulk discounts.

## August:

- Back-to-school and end-of-summer campaign.
- Social media and local TV ads, special deals on office supplies and personal care products.
- In-store events and targeted email campaigns.

## December:

- Holiday season campaign focusing on snacks and personal care products.
- Holiday-themed ads on social media, local TV, and Google.
- “Holiday Special” discounts, gift bundles, and festive in-store displays.



# UNITED STATES

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## March:

- Spring campaign focusing on household items and personal care products.
- Multi-channel advertising through TV, social media, and email marketing.
- Special discounts and bundle deals under "Spring Clean and Refresh."

## May:

- Mother's Day and Memorial Day sales.
- Targeted ads and special discounts on personal care gift sets and household items.
- In-store events with product demonstrations and giveaways.

## October:

- Fall and Halloween campaigns.
- Social media and local TV ads, Halloween-themed promotions, and in-store displays.
- Engagement through contests and giveaways.



# THANK YOU

*We look forward to working with you*

