



## **PROJECT REPORT**

### **CUSTOMER SHOPPING TRENDS DASHBOARD**

**Course Name: DATA\*6200 DATA MANIPULATION & VISUALIZATION**

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**Link of the Dashboard:**

<https://lookerstudio.google.com/reporting/a91040d3-8e66-420e-9d51-6553271e1d93>

**Abstract:**

Customer shopping trends dashboard provides a user-friendly interface for exploring customer behavior and purchasing patterns, which helps businesses to make decisions to align with the customer preferences. The dashboard provides an in-depth overview, including product category analysis, regional analysis, age group based analysis, subscription status based analysis, seasonal purchasing behavior analysis, promotional offers and ratings analysis , payment method and shipping type preferences analysis, in order to understand how different factors impact the purchasing behavior of the customers. Each visualization graph in this dashboard addresses some crucial business questions that provide some significant insights reflecting the customer preference and purchasing patterns. The dashboard also provides gender based comparison of customer preferences, which helps businesses to understand the gender specific behavior and enables businesses to adjust their strategy to meet the specific demands.

**Introduction:**

The selected dataset for this project is the customer shopping trends dataset, which has been obtained from Kaggle. The dataset contains a range of features, including demographics, frequency of purchases , preferred shipping and payment methods, size and colors preferences across different product categories and customer engagement to subscription service.

The dataset comprises 19 columns with various types of customer attributes which can be categorized as follows:

**Numeric Variables:** Age, Purchase Amount(USD), Review Rating, Previous Purchases

**Categorical Variables:** Gender, Category, Location, Size, Color, Season, Shipping Type, Payment Method, Frequency of Purchases

**Binary Variables:** Subscription Status (Yes/No), Discount Applied (Yes/No), Promo Code Used (Yes/No)

The main purpose of the dashboard is to detect patterns and obtain insights in customer purchasing habits, which may help in the growth of business .

So, the objectives of the dashboard is given below:

- To Understand the preferences of customers by investigating trends of various factors
- To improve customer shopping experience by gaining insights and modifying marketing strategies.

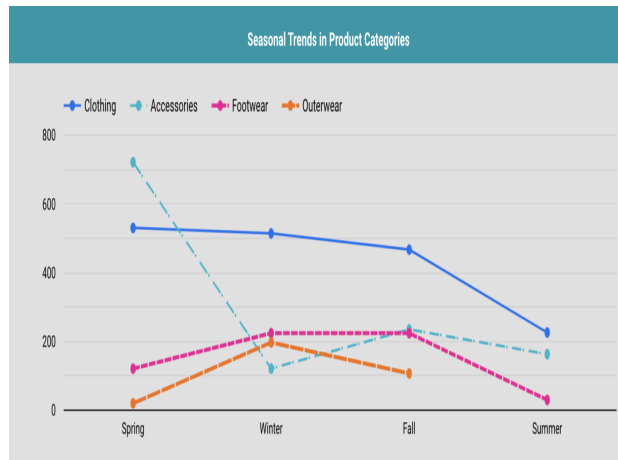
### **Design:**

The upper section of the dashboard provides a concise overview which highlights key indicators including the total number of customers, count of subscribed customers, average rating, total product category and overall sales. In the dashboard, filters based on date, age group, gender, product category, location, season, rating and subscription status have been employed to perform a comprehensive analysis of different factors. By addressing important business questions, I have conducted in-depth analysis to investigate different aspects influencing purchasing patterns of customers.

- **Product Category Analysis:**

**\*\* Business Question: How do customer preferences change across different seasons for different product categories ?**

This business question aims to uncover any seasonal patterns that impact inventory management and influence promotional activities for product categories. A line chart is used to visually illustrate the changing pattern of preferences in response to the seasonal change.

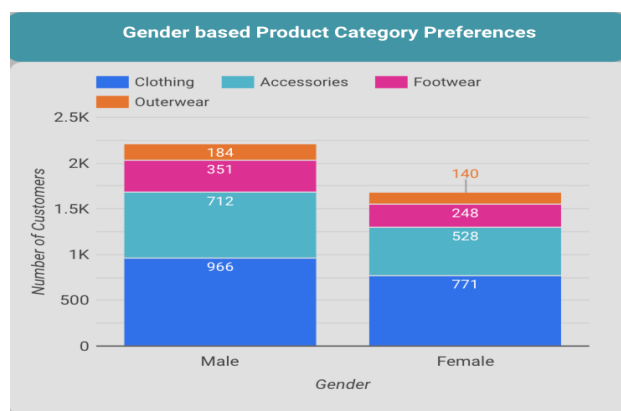


### Key Findings:

Footwear and outerwear are most popular in the winter, while outerwear has minimal popularity in winter. Sales of accessories increase in the fall and spring season, but decrease in winter and summer. The appeal of clothing stays consistent in spring, winter and fall, but decreases significantly in summer.

### \*\* \*\* Business Question: What are the most popular product categories among male and female customers?

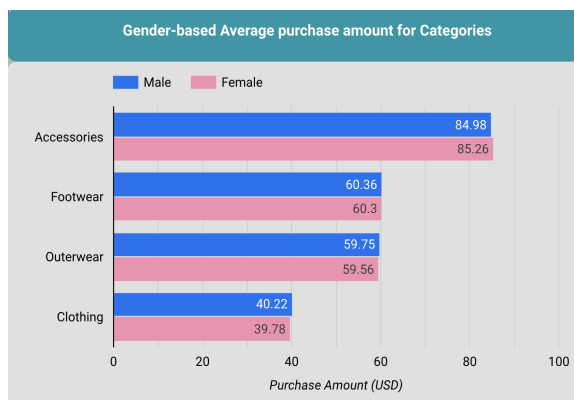
The purpose of this business question is to figure out whether certain categories of products are more popular among male or female customers. A stacked column chart is employed to visually demonstrate the differences in product category preferences between male and female customers, which provides insights to improve marketing tactics.



**Key Findings:** According to the visualization, clothing and accessories are more popular among both genders.

**\*\* Business Question: How does the average purchase amount vary across product categories between male and female customers?**

A bar chart is used to explore any potential disparities in the purchasing habits of male and female customers across a range of product categories, which provides insights for refining strategies to specific gender preferences.

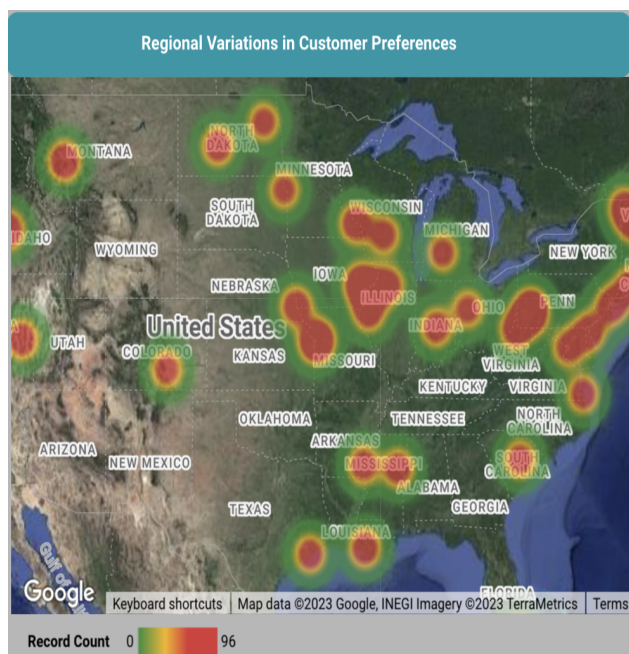


### Key Findings:

The average purchase quantities across product categories varies significantly, with accessories having the highest average. However, gender-based variations in average purchase amounts are insignificant.

- **Location based Analysis:**

**\*\* Business Question: How do customer purchasing habits differ across different locations?**



To provide insights into purchasing habits across different locations, a geographic heatmap is employed.

**Key Findings:** The purchasing behavior of customers vary by region, and Montana, California, Idaho and Illinois are locations with high amounts of sales.

**\*\* Business Question: What are the most popular product categories in the top 5 locations? How does the popularity of product categories differ across these regions?**

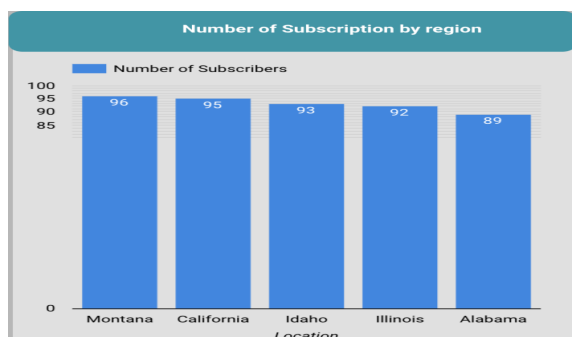
To assess the popularity of various categories of products in the top 5 locations, a pivot table with heatmap is used. Understanding this insight may help businesses in adjusting their inventory and maintaining sufficient supply for popular products to meet the regional demand.

| Product Category popularity by region |                                |             |          |           |             |
|---------------------------------------|--------------------------------|-------------|----------|-----------|-------------|
|                                       | Category / Number of Customers |             |          |           |             |
| Top 5 - Locati...                     | Clothing                       | Accessories | Footwear | Outerwear | Grand total |
| Montana                               | 45                             | 28          | 12       | 11        | 96          |
| California                            | 47                             | 31          | 11       | 6         | 95          |
| Idaho                                 | 42                             | 29          | 12       | 10        | 93          |
| Illinois                              | 46                             | 27          | 11       | 8         | 92          |
| Alabama                               | 41                             | 25          | 15       | 8         | 89          |

**Key finding:** The table shows that clothing and accessories are consistently popular across the top 5 locations.

**\*\* Business Question: In which regions do subscription services demonstrate the highest popularity among customers?**

To illustrate customer interest and engagement, a column chart is used to display the regions with a large number of subscribers. This visualization may help businesses to modify their marketing strategy to enhance customer satisfaction.

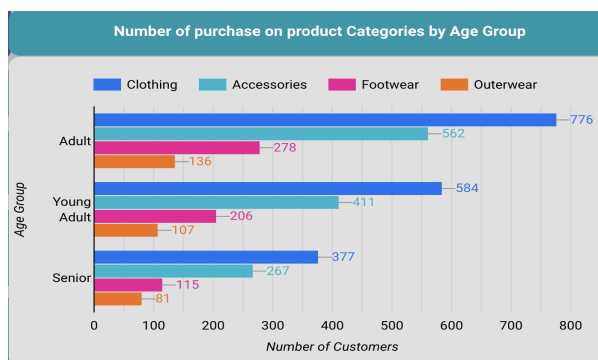


**Key finding:** Subscription services are extremely popular among customers in Montana, California and Idaho.

- **Age-Group Analysis:**

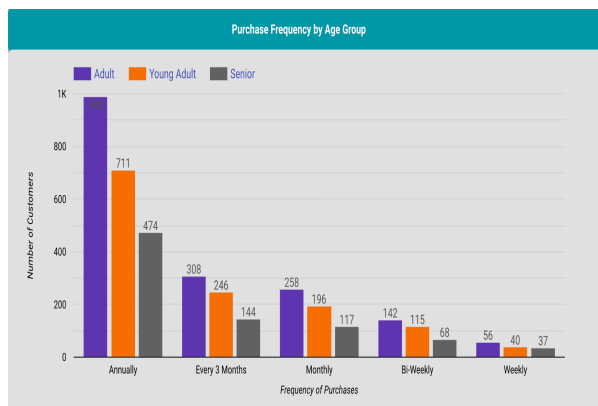
**\*\* Business Question: How does the quantity of purchases vary among different age groups across various product categories?**

A bar chart is used to investigate whether any specific age groups show unique purchasing habits or preferences for any particular product categories.



**Key Findings:** Adults consistently make the highest number of purchases across all categories of products, followed by young adults and seniors.

**\*\* Business Question: What is the purchase frequency distribution among different age groups?**



The purpose of using a column chart to visualize the purchase frequency is to give an overview of how frequently customers in different age groups make purchases.

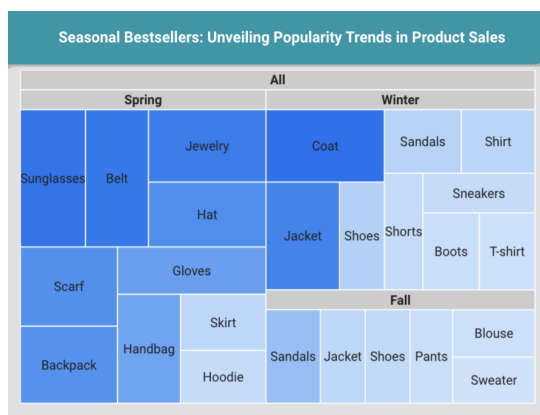
**Key Findings:** In comparison to young adults and seniors, adults consistently lead in terms of purchase frequency across all intervals (e.g.

annually, every 3 months, monthly, bi-weekly and weekly).

- **Seasonal Purchase Analysis:**

**\*\* Business Question: Which specific products demonstrate notable popularity during different seasons?**

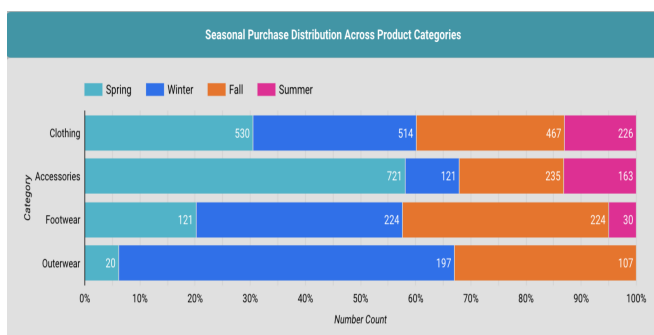
The question seeks to identify specific goods that show a significant amount of sales during a specific season. To address this business question, a tree map is employed to provide a visually comprehensible summary of seasonal popularity trends.



**Key Findings:** According to the visualization in the tree map, coats and jackets are best selling items in the winter, shoes and sandals are in great demand in the fall, and the spring bestsellers include sunglasses and belts.

**\*\* Business Question: What is the seasonal distribution of purchases across different product categories?**

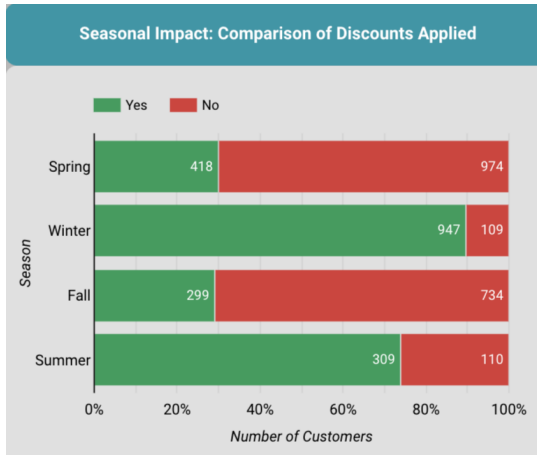
To investigate how the distribution of purchases varies across the seasons, a stacked bar chart is employed in the dashboard.



**Key Findings:** Sales of accessories peak in the spring while sales of clothing are consistent across the seasons. Footwear sales increase noticeably in winter and fall and outerwears are mostly sold in winter.



**\*\* Business Question: Which season exhibits a high usage of discount?**

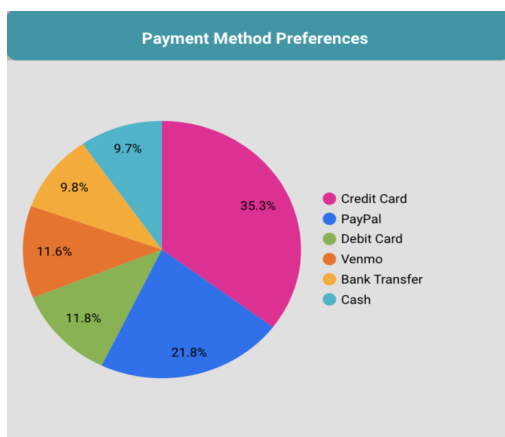


This business question focuses on the influence of discounts across different seasons. To answer this, a stacked bar chart is used to show trends and provide insights into the effectiveness of discounts.

**Key Findings:** Discount usage fluctuates significantly across seasons, with the highest amount of discounts being used in winter ,followed by summer.

- **Payment & Shipping Method Analysis:**

**\*\* Business Question: What payment option do customers mostly prefer while making the purchases?**



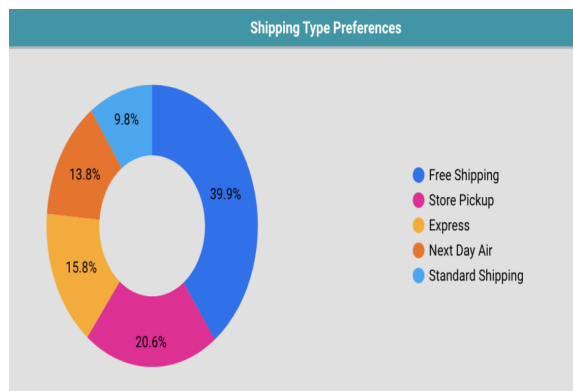
To address the question of investigating customer preferences for payment methods, a pie chart is used to represent the percentage breakdown of various payment methods.

**Key Findings:** Credit cards are the most popular payment method among the customer, accounting for 35.3%, followed by Paypal at 21.8%.

**\*\* Business Question: Which shipping type is most frequently selected by customers?**

A donut chart is used to provide a clear overview of the distribution of the preferences for shipping type. The insights gained from visualization can be helpful for making strategic

decisions to improve logistics management and customer service.

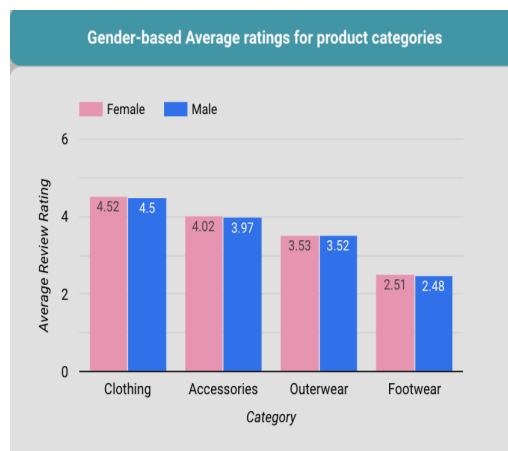


**Key Findings:** Free shipping is the most preferred shipping type among the customers, followed by store pick up, express and next day air shipping.

- **Rating and Promotional Analysis:**

**\*\* Business Question: How do average ratings vary across different product categories based on gender?**

The differences in average ratings between male and female customers for various product categories are shown visually using a column chart. The insights from this visualization may



help businesses to adjust product offerings to better correspond with the preference of male and female customers.

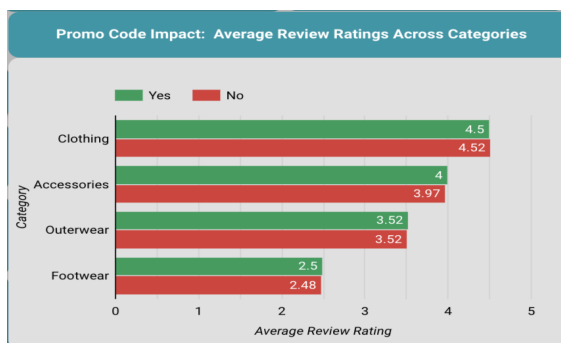
**Key Findings:**

From the visualization across different product categories, men rate products slightly higher than women. The average ratings fluctuate for each category of products, with clothing having the highest

average rating, followed by accessories, outerwear and footwear.

**\*\* Business Question: What is the impact of promo codes usage on average review ratings across different product categories?**

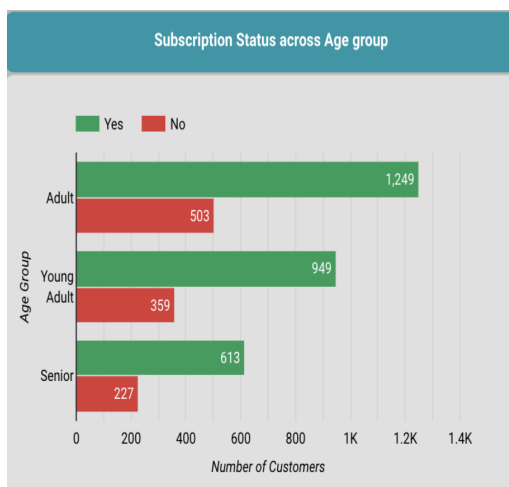
The association between the use of promo code and customer satisfaction level, as indicated by average review ratings for various product categories is visually illustrated by a bar chart. The insights gained from visualization might help businesses in taking strategic steps to improve customer satisfaction.



**Key Finding:** From the visualization, it is evident that the ratings are almost the same with or without promo codes in various product categories. So, promo codes may not have a significant impact on review ratings.

- **Subscription Analysis:**

**\*\* Business Question: Which specific age group are engaged more in subscription service?**

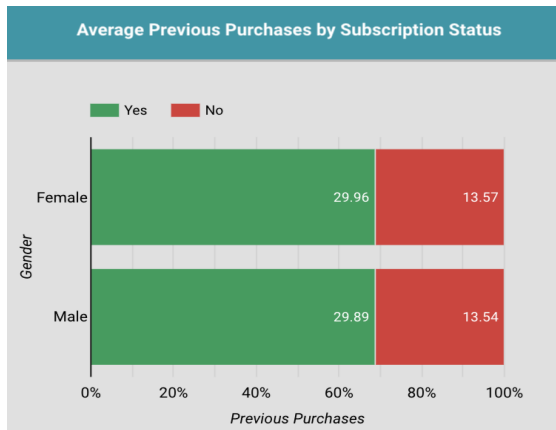


To examine trends in the adoption of subscription services among customers across different age groups, a bar chart is employed.

**Key finding:** The bar chart demonstrates adults have a higher number of subscription involvement than young adults and seniors.

**\*\* Business Question: Is there any notable difference in average previous purchasing trends between subscribed and non-subscribed customers?**

To determine whether customers with subscriptions have different purchasing trends compared to the non-subscriber, a stacked bar chart is used. By taking both gender and subscription

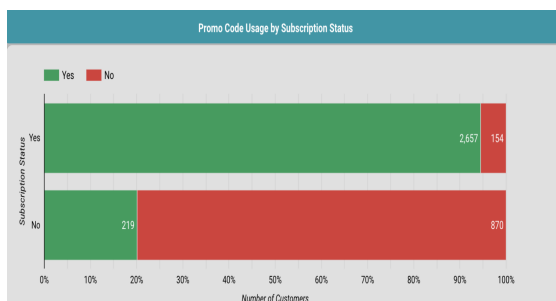


status into account, the insights from visualization may help businesses to understand the customer purchasing behavior.

**Key finding:** In comparison to non-subscribers, both male and female subscribers have significantly higher amounts of past purchases.

**\*\* Business Question: What is the distribution of promo code usage across subscription status?**

A stacked bar chart is used to reveal the breakdown of promo code usage among the subscribed and non-subscribed customers.



**Key Finding:** Based on subscription status, there is a notable difference in the use of promo codes, with 90% of the subscribers using promo codes compared to 20% of non-subscribers.

## **Appendix**

### **Dataset Reference:**

<https://www.kaggle.com/datasets/iamsouravbanerjee/customer-shopping-trends-dataset/>

The author of this dataset mentioned that the above dataset is synthetic creation, and I did not find any patterns to perform comparative analysis on this dataset. So I introduced some imputed values in the above kaggle dataset.

The link of final dataset that I have worked on is given below:

<https://drive.google.com/file/d/1kwTe5xH7dkqM0iDNCHrt1kJIPkf3deAQ/view?usp=sharing>

The link of the dashboard:

<https://lookerstudio.google.com/reporting/a91040d3-8e66-420e-9d51-6553271e1d93>