E-Commerce Customer Behavior Analysis

MD. SANAUL ISLAM SIYAM

(DS & ML – 2504)

8th August 2025

Problem Statement

We aim to understand **customer behavior**, particularly focusing on **return customers**, their **satisfaction levels**, and the **average purchase amounts**.

Hypothesis

Customer satisfaction and purchase behavior are positively correlated, meaning that customers who are more satisfied with the service will likely spend more and return more frequently."

We believe that satisfied customers tend to have higher repeat purchase behavior and higher spending. By analyzing customer reviews, return behavior, and purchase amount, we will test whether this hypothesis holds true.

Customer Overview

- Average review of customers

- Satisfied and returned customers

- The number of satisfied customer

What are the top three product categories based on the number of purchases?
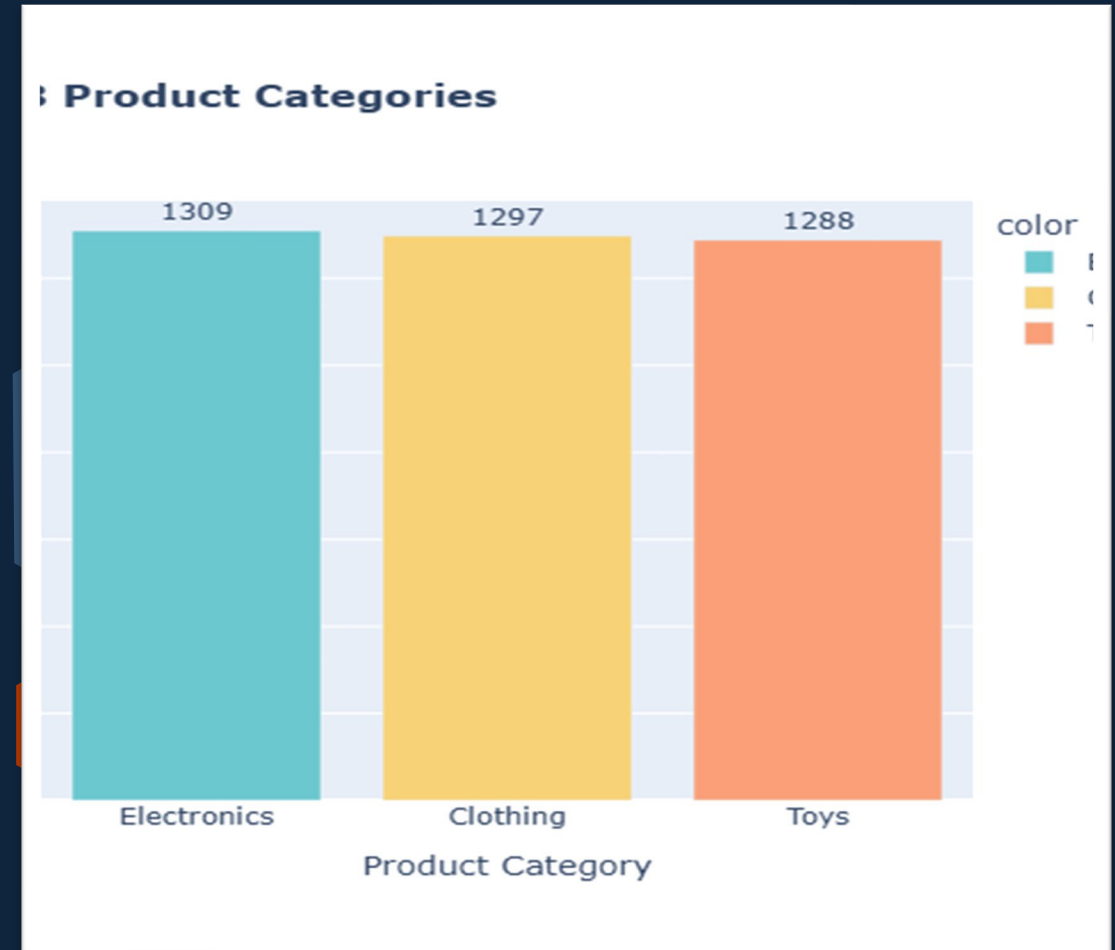
Interpretation

The bar chart shows the top three product categories by purchase frequency:

The highest purchased category is Electronics, with a total of 1309 purchases.

The second highest category is Clothing. The third highest category is Toys.

Business Insight

· **Clothing** and **Toys** are also strong categories and can be targeted for seasonal campaigns or **special offers** to further boost sales.

· **Electronics** dominates sales, suggesting that **electronics-related promotions** or **product bundles** could drive more purchases.

· Focusing marketing and inventory management on these top categories will help align with customer demand and optimize sales efforts.

Product Categories

| | 1309 | 1297 | 1288 | color |
| Electronics | Clothing | Toys | |

Product Category

Interpretation

The device usage is almost evenly distributed :

Mobile: 33.7% Desktop: 33.5% Tablet: 32.8%

Mobile has a slight edge, but all three platforms are actively used.

Business Insight

All device platforms are equally important for your customers.

Recommendation: Ensure your website offers a seamless user experience across all devices — especially optimizing for mobile and tablet responsiveness.

Device Usage Distribution

Desktop 3348 (33.5%)
Mobile 3374 (33.7%)
Tablet 3278 (32.8%)
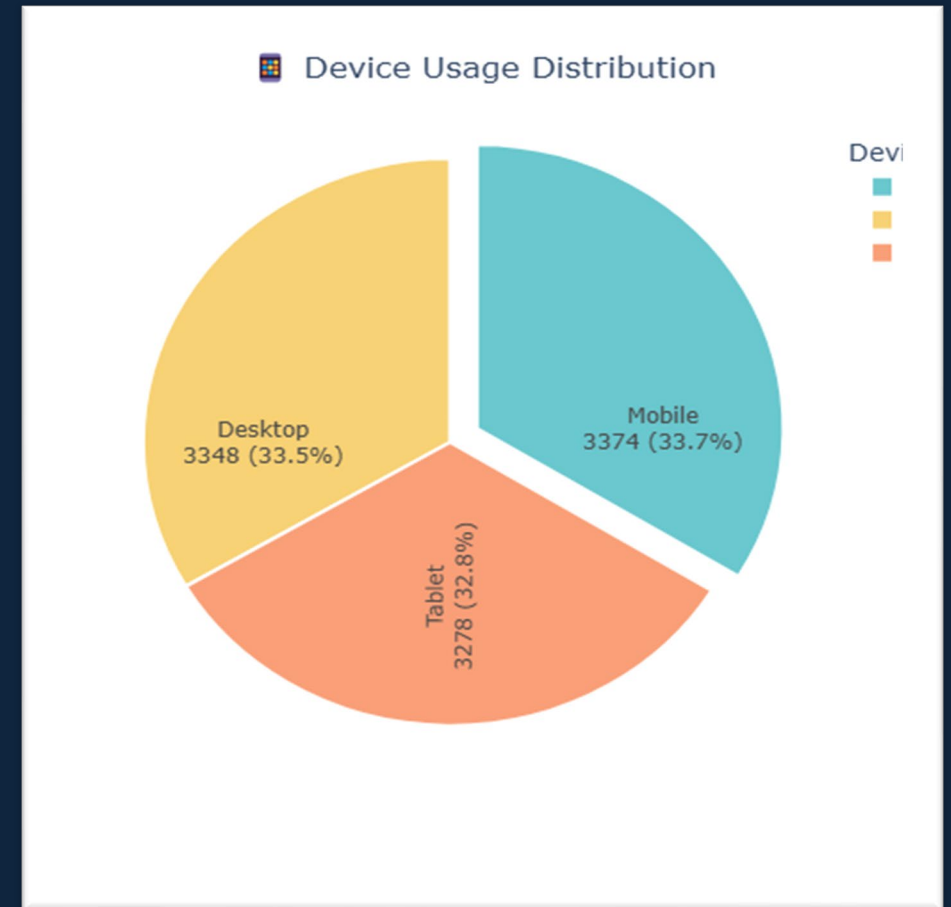
## What is the average review score given by customers?

Interpretation

Review scores are evenly spread, with a slight peak at 4 stars.

The average rating is **3.0**, reflecting **neutral customer sentiment** and a mix of experiences.

Business Insight

The platform meets basic expectations but lacks excellence.

Focus on improving customer experience and encouraging more 5-star reviews to boost satisfaction and loyalty..

Review Score Distribution (Average Rating: 3.00)
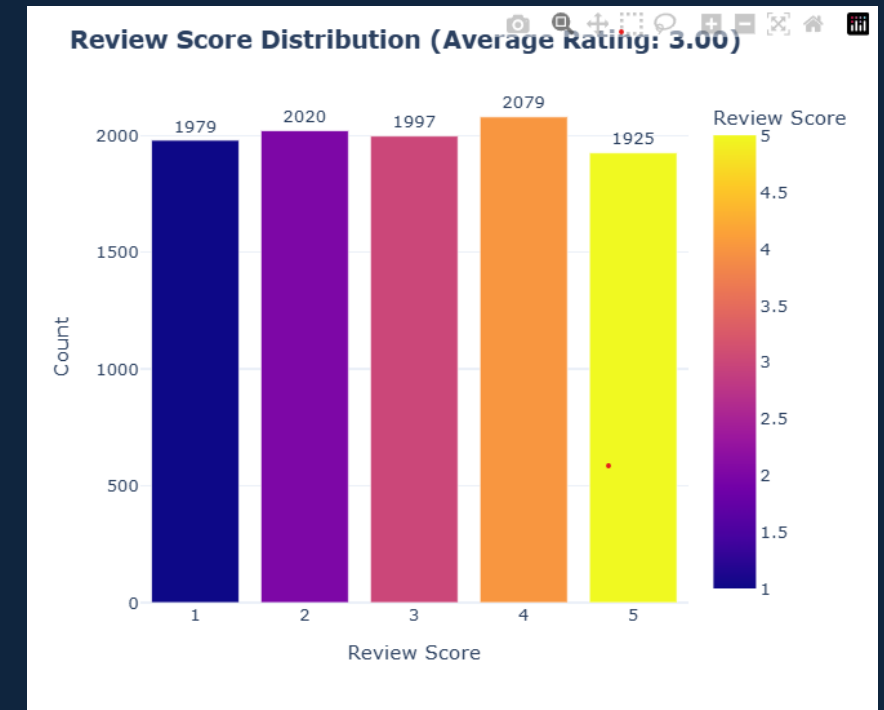
What is the correlation between time spent on the website and purchase amount? Do customers who spend more time on the website purchase more items?

Interpretation

The correlation between time spent on the website and purchase amount is extremely low (≈ 0.01).

The red trend line in the scatter plot is nearly flat, confirming no meaningful relationship between time spent and purchase value.

Business Insight

Customers who spend more time browsing the website do not necessarily spend more money.

 This indicates that website duration is not a reliable predictor of purchase amount.

Recommendation: Focus on improving product targeting and personalized recommendations, rather than just increasing time on site.

Relationship Between Time on Website and Purchase Amount
Correlation = 0.01
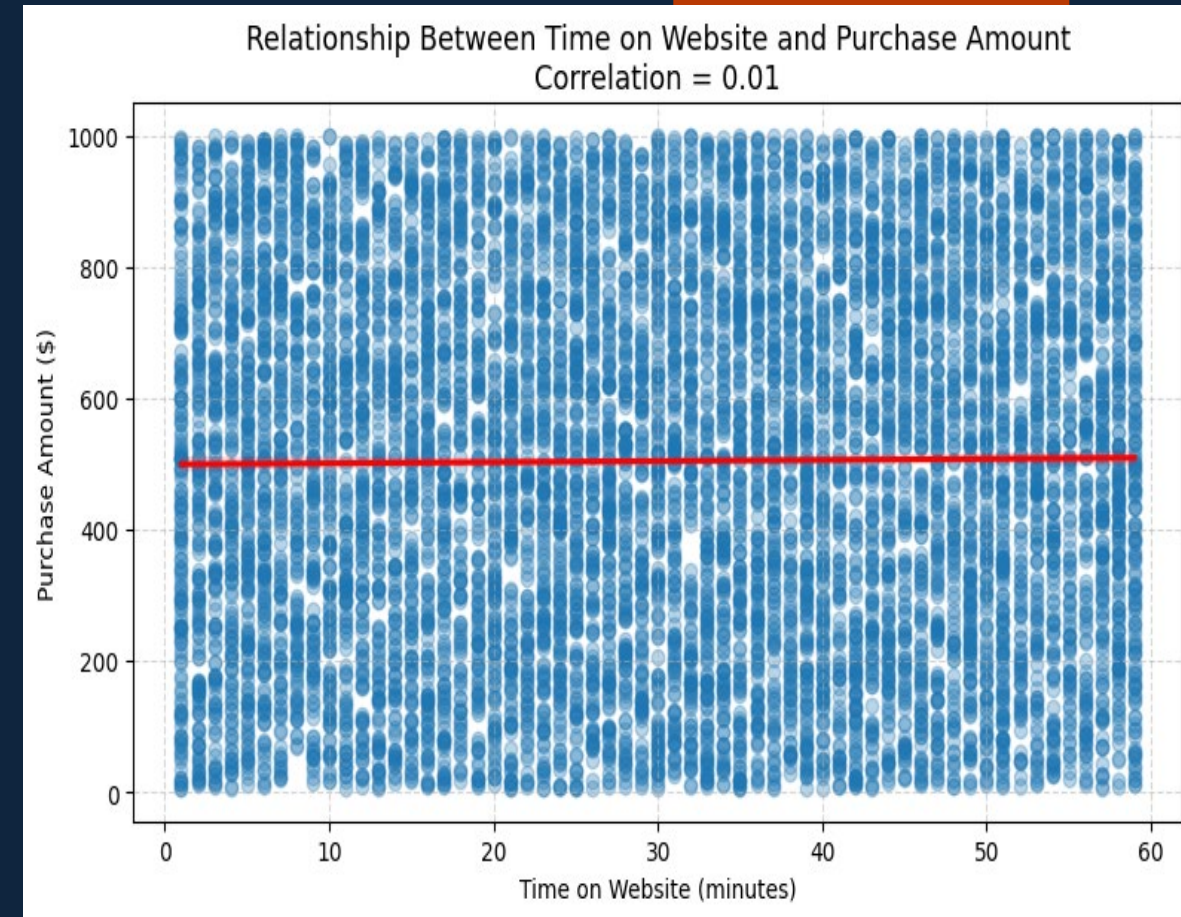
Interpretation

Highest average purchase amount is seen in Barisal ($513.67) and Khulna ($513.94).

Rajshahi has the longest delivery time (7.11 days) despite relatively high purchase amount.

Dhaka, the capital, shows lower delivery time (6.34 days) and a moderate purchase amount.

Business Insight

Purchase behavior and delivery times vary significantly across regions.

Recommendation: Improve logistics in areas like Rajshahi to reduce delivery delays.

Consider region-based promotions to encourage high-value buyers in cities like Khulna and Barisal.

Avg Purchase Amount & Delivery Time by Location

Conclusion

The analysis reveals several valuable insights into customer behavior on the ecommerce platform. Firstly, there is no significant correlation between the time spent on the website and the purchase amount, indicating that simply increasing browsing time does not directly impact revenue. Device usage is almost evenly split among mobile, desktop, and tablet users, highlighting the importance of providing a seamless and optimized experience across all platforms. Additionally, regional trends show that locations like Khulna and Barisal have higher average purchase values, while areas like Rajshahi suffer from longer delivery times, potentially affecting customer satisfaction. These findings emphasize the need for strategic improvements in product recommendation systems, responsive website design, and region-specific logistics to enhance overall customer experience and business performance.

Thank you