PURCHASE VALUE ANALYSIS FOR E-COMMERCE THROUGH PAYMENT TYPES

Exploring the Relationship Between Payment Methods and Purchase Value

Contents

Study Context

- ➔ The competitive e-commerce landscape requires understanding customer behavior and maximizing revenue for sustainable growth.
- ➔ This study explores patterns in purchase value based on payment methods (credit card and PayPal).
- ➔ The goal is to leverage data-driven insights to optimize strategies for enhancing revenue.
- ➔ By analyzing customer purchase data, we investigate how payment methods impact total purchase value.
- ➔ Actionable recommendations aim to improve revenue while maintaining a positive customer experience.

Objectives

The primary goal of this project is to analyze the relationship between total purchase value and payment method using descriptive statistics and hypothesis testing (A/B test) in Python.

- ➔ Determine if there is a significant difference in purchase value for customers using credit cards compared to those using PayPal.
- ➔ Provide actionable insights to guide e-commerce platforms in tailoring payment strategies to maximize revenue generation without compromising user satisfaction.

Driving Questions

- ➔ Is there a relationship between total purchase value and payment method?
- ➔ Can we influence customer preferences towards payment methods that result in higher purchase values while ensuring a seamless and satisfying customer experience?

Data Context

Preprocessing Steps: Loaded and cleaned the dataset by selecting relevant columns, converting 'date' to datetime, removing nulls/duplicates, filtering outliers (beyond 90th percentile), and resetting the index for seamless analysis.

Features:

- ➔ date
- ➔ payment_method
- ➔ value [USD]
- ➔ time_on_site [Minutes]
- ➔ clicks_in_site

date	payment_method	value [USD]	time_on_site [Minutes]	clicks_in_site
20/11/2018	credit	49.53	12.0	8
20/11/2018	paypal	50.61	25.9	8
20/11/2018	credit	85.99	34.9	11
20/11/2018	credit	34.60	16.5	9
20/11/2018	paypal	266.27	43.1	30

Workflow

1. Descriptive Analysis

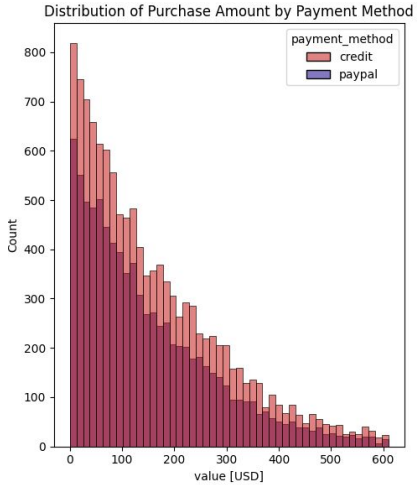
- ➔ Conducted a detailed exploration of the dataset to understand key patterns and trends.
- ➔ Visualized the distributions of purchase value, time on site, and clicks in site using histograms and box plots.
- ➔ Analyzed purchase value trends and behaviors based on payment methods (credit card and PayPal) using line plots and bar charts.

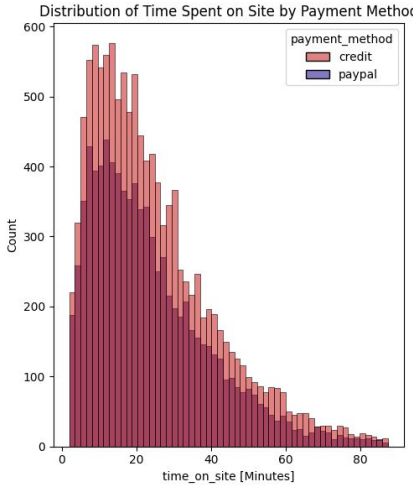
2. Hypothesis Testing

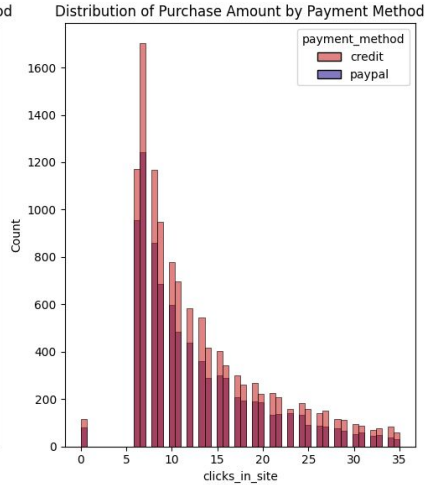
- ➔ Formulated null and alternative hypotheses to assess the relationship between payment methods and purchase value.
- ➔ Verified assumptions for statistical tests, including normality checks using Q-Q plots.
- ➔ Performed the Mann-Whitney U Test to evaluate if there is a significant difference in purchase values between credit card and PayPal users, as the data did not meet the assumptions of parametric tests.

Insights

- ➔ Credit payments show a slightly higher frequency of larger purchases compared to PayPal, indicating that credit card users might be inclined toward higher-value transactions.
- ➔ Credit users exhibit a wider range of time spent on the site compared to PayPal users, suggesting that credit card users might explore more before completing their purchase.
- ➔ Credit payments show a broader range of clicks, indicating more varied interaction levels, which could reflect different browsing or decision-making behaviors among credit card users.



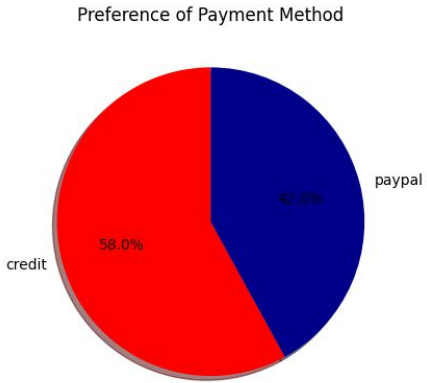




Insights (Cont.)

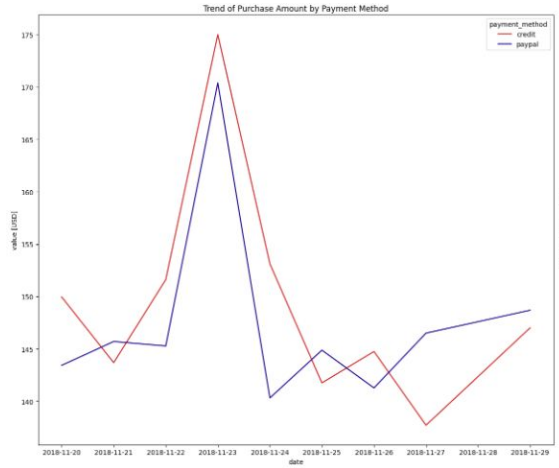
- ➔ **Credit:** 58% of transactions were made using credit cards.
- ➔ **PayPal:** 42% of transactions were made using PayPal.
- ➔ **Overall:** Credit cards are slightly more popular than PayPal for transactions in this dataset.

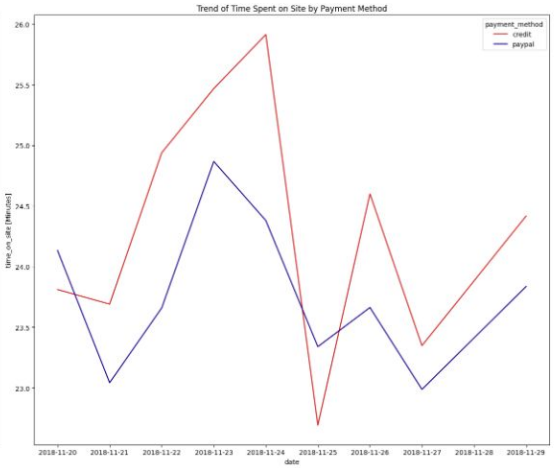
The higher popularity of credit cards suggests that they might offer features or incentives that appeal more to customers, potentially influencing purchase behavior.

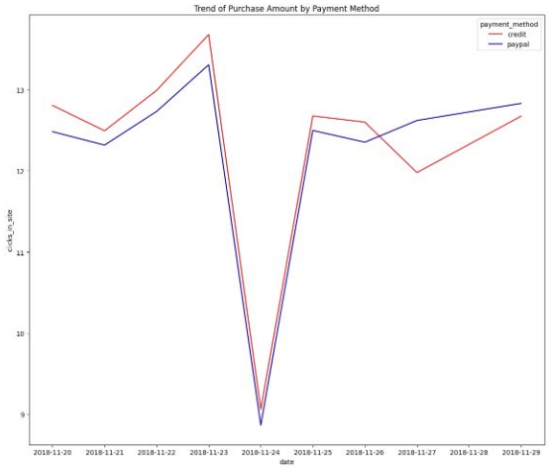


Insights (Cont.)

- ➔ Credit payments exhibited a more dynamic trend, with a sharp increase followed by a steep decline, suggesting higher volatility in purchase amounts.
- ➔ Credit users also showed a more volatile trend in time spent on site, with a sharp increase and subsequent decrease.
- ➔ Similarly, credit users demonstrated greater fluctuation in clicks on site, with a sharp increase followed by a decline.
- ➔ Overall, these trends suggest that credit card transactions are associated with more dynamic behavior compared to PayPal transactions across these key metrics.







Hypothesis Testing

- **Null Hypothesis (H_0):** There is no difference in the average purchase amount between customers who use Credit Cards and those who use PayPal for payment.
- **Alternative Hypothesis (H_1):** There is a significant difference in the average purchase amount between customers who use Credit Cards and those who use PayPal for payment.

Result:

U-statistics: 52352696.0 and P-value: 0.00016607072746184842

Given that $P < 0.05$, we reject the null hypothesis. There is a significant difference in average purchase amount between two payment methods.

Business Implications

- ➔ Focus on enhancing credit card payment options with exclusive features and promotions, as credit card users exhibit higher average purchase values.
- ➔ Offer targeted incentives like discounts or cash-back programs to encourage higher spending among PayPal users.
- ➔ Conduct deeper analysis to understand why credit card users tend to make higher-value purchases, using these insights to refine payment strategies.
- ➔ Utilize site engagement data to create personalized marketing campaigns, improving conversion rates for both payment methods.
- ➔ Leverage distribution trends to craft payment-method-specific promotions, focusing on maximizing purchase values and user satisfaction.

THANK YOU