REPORT

Evaluating E-Commerce Platform Performance: A Statistical Analysis of Bounce and Conversion Rates

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June 7, 2025

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Introduction

In the highly competitive world of e-commerce, understanding how users behave on a website is key to improving performance. This analysis focuses on two essential metrics—bounce rate and conversion rate—to evaluate how effectively one platform engages and converts its visitors. Drawing on data from 12,330 user sessions, and using industry benchmarks from Mobiloud (2025) and Adobe (2023), the study aims to assess whether the platform outperforms typical e-commerce standards. In doing so, the report helps identify whether this platform delivers a stronger user experience and sales funnel than the average e-commerce platform, offering data-driven insights that can inform future optimization efforts.

To answer these questions, the analyst applies a one-sample left-tailed t-test to examine whether the bounce rate is significantly lower than the industry average, indicating stronger user retention. Additionally, a right-tailed binomial test is used to determine if the conversion rate is significantly higher, which would point to an efficient sales funnel. Together, these tests offer valuable insight into the platform's ability to capture attention and drive action.

Part 1: One-Sample t-Test for Bounce Rate

Purpose

According to Mobiloud (2025), the average bounce rate for e-commerce websites stands at 45.68% (0.4568), serving as a widely recognized industry benchmark. This study investigates whether the observed bounce rate on the platform under review is significantly lower than that average, signaling a more engaging and efficient user experience.

Analytical Question

Is the site's average bounce rate significantly lower than the e-commerce industry average of 45.68% (0.4568)?

Choice of one-sided test

To examine whether the platform's bounce rate is significantly lower than the industry average, a one-sample left-tailed t-test is used. This choice aligns with the directional nature of the research question, which is not concerned with any difference, but specifically seeks to confirm improvement—in this case, a reduction in bounce rate, which would indicate better user retention.

Using a one-tailed test provides greater statistical power than a two-tailed test when the direction of the effect is known in advance. In this context, it increases the sensitivity of the analysis to detect meaningful improvements in bounce rate relative to the benchmark. Because the objective is to determine whether the platform performs better than average, not merely differently, the one-sided test is a more precise and efficient tool for answering the research question.

Hypotheses

In this analysis, the null hypothesis value $\mu_0 = 0.4568$ is derived from the industry average bounce rate reported by Mobiloud (2025). This figure represents a widely accepted standard among major e-commerce platforms and serves as a credible benchmark for assessing how effectively a website engages users on their initial visit. The objective is to evaluate whether the website in question achieves a significantly lower bounce rate, which would indicate superior user retention and more compelling entry-page design.

- H_0 (Null Hypothesis): $\mu = 0.4568$ – The website's average bounce rate is equal to the industry standard.
- H_1 (Alternative Hypothesis): $\mu < 0.4568$ – The website's average bounce rate is lower than the industry standard, suggesting better performance in user engagement.

Test Results:

Name	Type	Value
test_bounce	list [10] (S3: htest)	List of length 10
statistic	double [1]	-995.2741
t	double [1]	-995.2741
parameter	double [1]	12329
df	double [1]	12329
p.value	double [1]	0
conf.int	double [2]	-Inf 0.0229
estimate	double [1]	0.02219138
mean of x	double [1]	0.02219138
null.value	double [1]	0.4568
mean	double [1]	0.4568
stderr	double [1]	0.0004366723
alternative	character [1]	'less'
method	character [1]	'One Sample t-test'
data.name	character [1]	'bounce'

test_bounce[["p.value"]]

Table 1. Summary Statistics and t-Test Output

Interpretation

The one-sample left-tailed t-test was conducted to evaluate whether the platform's average bounce rate is significantly lower than the industry benchmark of 45.68% (0.4568). The test was based on 12,330 user sessions, and the observed mean bounce rate was approximately 2.22% (0.02219).

The resulting t-statistic was –995.27, and the p-value was effectively 0, which is far below any common significance level (e.g., 0.05 or even 0.001). This provides overwhelming statistical evidence against the null hypothesis (H_0: $\mu = 0.4568$), allowing us to confidently reject it.

The 95% one-sided confidence interval for the true mean bounce rate is $(-\infty, 0.02229)$. This means we are 95% confident that the true bounce rate is less than 2.229%, which is drastically lower than the industry average.

Taken together, these results lead to a clear conclusion: the null hypothesis is rejected, and it is statistically confirmed that the website's bounce rate is significantly lower than the industry standard. This outcome suggests that the platform provides an exceptionally engaging user experience, where visitors are highly likely to remain on the site and explore further beyond the first page—indicating effective landing page design, intuitive navigation, and relevant content that successfully retains users' attention.

Conclusion and key insights

The website delivers a significantly more engaging first impression compared to industry standards, as evidenced by its exceptionally low bounce rate. This suggests that the platform's entry pages, navigation design, and user experience are highly effective at retaining visitors and encouraging them to continue exploring the site.

In other words, the platform greatly outperforms typical e-commerce sites in capturing and holding user attention from the moment they land on the site — a key indicator of strong UX, relevant content, and an efficient initial funnel.

Although the low bounce rate indicates that users are engaging beyond the landing page, several areas warrant further investigation. It remains unclear which specific factors—such as layout design, content quality, or call-to-action elements—are driving this strong performance. Additionally, it is important to examine whether the low bounce rate is consistent across different user segments, including device types and traffic sources.

Another key consideration is whether this low bounce rate reflects meaningful user engagement or simply quick clicks to other pages without deeper interaction. Understanding the relationship between bounce rate and actual conversion or revenue outcomes is also essential.

To gain clearer insights, future research could include A/B testing of landing page elements to isolate the features contributing most to user retention. Overall, while the findings are encouraging, deeper analysis is needed to fully understand and sustain the platform's performance.

Part 2: One-Sample Proportion Test for Conversion Rate

Purpose

Business Adobe (2023) reports that the average conversion rate across e-commerce platforms is 3.65% (0.0365), providing a reliable industry benchmark for evaluating purchase efficiency. This analysis aims to determine whether the website's actual conversion rate significantly exceeds this standard, suggesting superior performance in converting visitors into customers.

Analytical Question

Is the site's session-conversion rate significantly higher than the e-commerce industry benchmark of 3.65% (0.0365)?

Choice of one-sided test

To address the research question, a one-sample right-tailed binomial test is conducted. This method is appropriate given the directional focus of the hypothesis, which seeks to determine whether the platform's conversion rate is significantly higher than the industry benchmark of 3.65%. In this context, a one-sided test is preferred over a two-sided test because the goal is not to detect any difference, but a specific improvement—an increase in conversion efficiency.

Using a one-sided approach improves statistical power, meaning it increases the test's sensitivity to detect a positive deviation from the benchmark if one truly exists. This allows for more confident conclusions about whether the platform outperforms standard conversion rates, making the one-sided test a more targeted and efficient choice for this type of performance evaluation.

Hypotheses

The null hypothesis proportion $p_0 = 0.0365$ is based on Adobe's (2023) aggregated e-commerce conversion rate benchmark, reflecting a broad industry standard for purchase efficiency.

H_0: $p = 0.0365$

H_1: $p > 0.0365$

Test Results:

Name	Type	Value
conversion_test	list [9] (S3: htest)	List of length 9
statistic	double [1]	1908
number of successes	double [1]	1908
parameter	double [1]	12330
number of trials	double [1]	12330
p.value	double [1]	0
conf.int	double [2]	0.149 1.000
estimate	double [1]	0.1547445
probability of succ...	double [1]	0.1547445
null.value	double [1]	0.0365
probability of succ...	double [1]	0.0365
alternative	character [1]	'greater'
method	character [1]	'Exact binomial test'
data.name	character [1]	'successes and trials'

conversion_test

Table 2. Results of One-Sample Right-Tailed Binomial Test for Conversion Rate

Interpretation

A one-sample right-tailed exact binomial test was performed to evaluate whether the platform's conversion rate is significantly higher than the e-commerce industry benchmark of 3.65% ($p_0 = 0.0365$).

The analysis was conducted on 12,330 user sessions, with 1,908 conversions recorded. This results in an observed conversion rate of approximately 15.47% ($\hat{p} = 0.1547$).

The test returned a p-value of 0, indicating that the likelihood of observing such a high conversion rate under the null hypothesis (i.e., if the true conversion rate were only 3.65%) is extremely low. The 95% one-sided confidence interval for the true conversion rate is [0.149, 1.000], meaning that we are 95% confident the true conversion rate is at least 14.9%, which is more than four times the industry average.

Taken together, these results clearly show that the website's conversion rate is significantly above average. This suggests that the platform has done an excellent job optimizing the user experience—making it easier for visitors to find what they need, trust the offerings, and complete a purchase. Converting users at more than four times the typical rate is a strong sign of effective product presentation, user flow, and overall marketing strategy.

Conclusion and key insights

The results show that the platform achieves a conversion rate of 15.47%, which is more than four times higher than the industry benchmark of 3.65% (Adobe, 2023). This significant difference strongly indicates that the website has built a highly effective purchase funnel, likely supported by strong product presentation, smooth user

navigation, and compelling calls-to-action. The site is not only successful in attracting traffic but also in turning that traffic into paying customers, suggesting a solid product-market fit and thoughtful user experience design.

That said, several important questions remain. It's still unclear what exactly is driving this high conversion rate—whether it's the page layout, the checkout experience, personalized offers, or a successful marketing campaign. It’s also valuable to explore whether this performance is consistent across different user groups, such as new vs. returning visitors, or across mobile vs. desktop platforms.

Another key consideration is sustainability. Is this high conversion rate tied to a temporary promotion or event, or is it a result of long-term strategy? And beyond the initial purchase, do these customers return and contribute to long-term value, or are they mostly one-time buyers?

In short, while the platform’s current performance is clearly impressive, further research is needed to understand what’s working, why it’s working, and how to sustain or scale this success over time.

Summary

The results indicate that the platform significantly outperforms industry standards in both user engagement and conversion. With a bounce rate of 2.22%, much below the industry average of 45.68%, users are not only arriving on the site but actively exploring it—pointing to effective landing page design and intuitive navigation. Similarly, the conversion rate of 15.47% exceeds the industry benchmark of 3.65% by over four times, reflecting a highly efficient sales funnel and a strong match between user intent and the platform's offerings. This suggests a highly efficient sales funnel and a strong alignment between what the platform offers and what users are looking for. In essence, the platform stands out for its ability to both capture user interest and convert that interest into tangible outcomes, setting a high bar for digital performance. It presents a valuable model for other businesses aiming to create seamless, user-focused paths from entry to purchase.

That said, these impressive outcomes also raise important questions. What specific elements are driving such strong performance? Are certain pages, devices, or marketing campaigns playing a bigger role? And more importantly, is this success consistent across user groups and sustainable over time?

To gain a deeper understanding of the platform's strengths, future research should include A/B testing, user segmentation, and long-term performance monitoring. Overall, this analysis highlights a platform that excels not just in attracting users, but in converting them efficiently—underscoring the power of data-informed design in e-commerce.

References

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