A/B Testing

Agenda

1
Problem statement

2
A/B Testing

3
Evaluation Metrics

4
Impact

5
Future Scope

Problem Statement

RadiantGlow Skincare faces increasing supply chain costs that are impacting profit margins. To address these rising expenses, the company is considering implementing a $35 minimum order threshold for free shipping. This initiative aims to encourage customers to increase their order size, which could offset shipping costs.

Objective

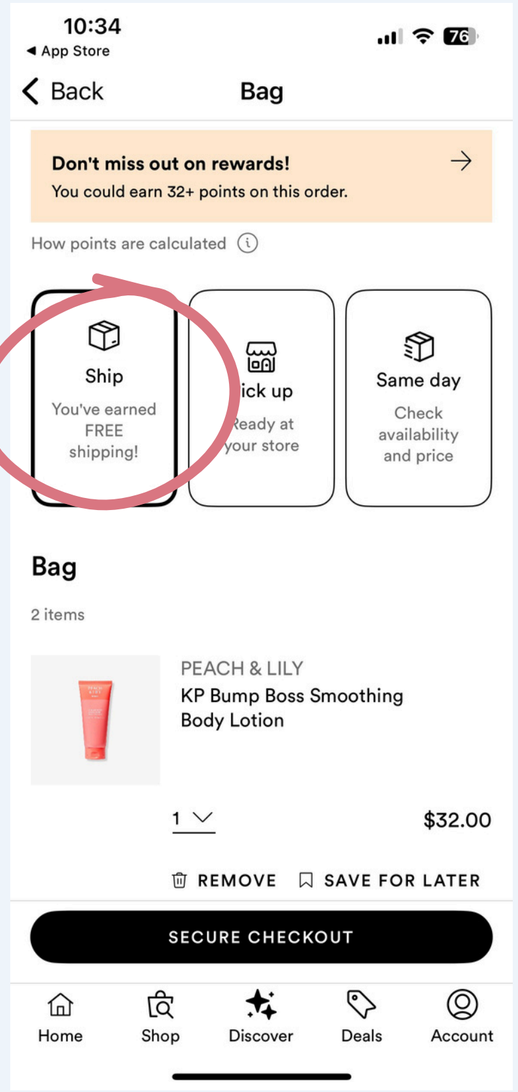
To evaluate the impact of introducing a $35 minimum order threshold for free shipping.

Hypothesis

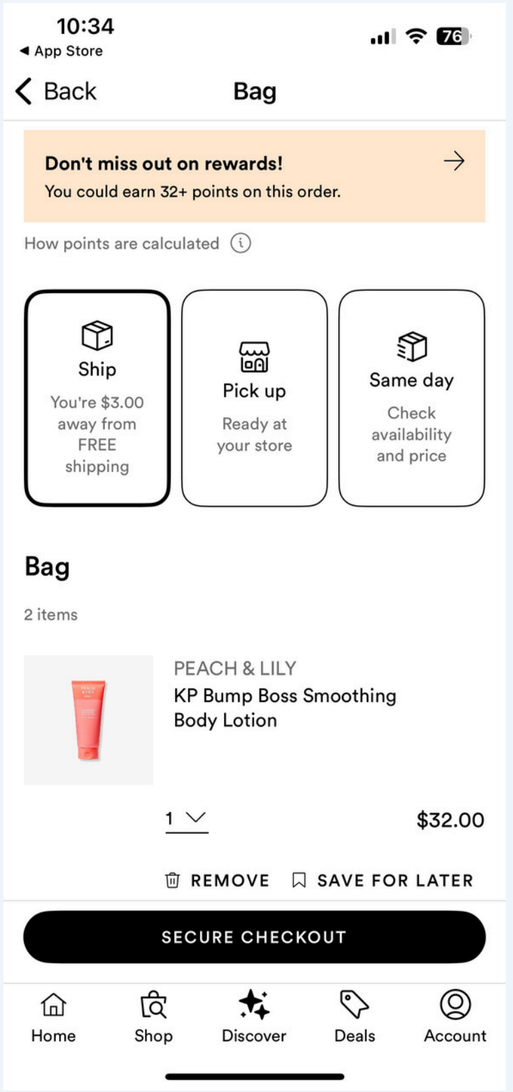
If we introduce a $35 minimum order threshold for free shipping (the element being tested) instead of offering free shipping on all orders (current approach), it will increase the average order amount (the defined measurement) from $20 to above $35.

The hypothesis focuses on customers' average spending per order, which directly impacts revenue.

Customer Journey



no minimum purchase amount



minimum purchase amount

Key Metrics

Average Order Amount (AOV)	Assesses if customers are spending more per transaction
Shipping Cost Impact	Measures additional shipping revenue in the treatment group
Cart Abandonment Rate	Tracks if customers abandon their carts more frequently due to shipping costs
Session Duration	Checks if session duration is affected by the new threshold

A/B Testing

Control Group (A)

No minimum order value for free shipping

Experiment Group (B)

$35 minimum order value for free shipping

Success Metric

Average Order Amount (AOV)

Duration

2 months

to gather enough data while accounting for any weekly sales cycles and variability in customer shopping behavior

Assumptions

- **Consistent Customer Behavior:** Customer behavior remains stable, unaffected by external factors.
- **Random Assignment:** Customers are randomly assigned to control and treatment groups.
- **Adequate Sample Size:** Each group has enough customers to detect meaningful changes.
- **Independent Observations:** Each customer’s actions are independent of others.
- **Comparable Segments:** Control and treatment groups have similar customer characteristics.
- **Accurate Data Collection:** Metrics are accurately recorded, minimizing data errors.
- **Short-Term Impact:** Observed behaviors are assumed not to affect long-term loyalty.

Evaluation

Null Hypothesis (H_0)

Introducing a $35 minimum order threshold for free shipping does not result in a significant increase in the Average Order Amount (AOV).

Alternative Hypothesis (H_1)

Introducing a $35 minimum order threshold for free shipping results in a significant increase in the Average Order Amount (AOV).

Statistical Test

The two-sample t-test compares the means of two independent groups (control and treatment) to determine if there is a statistically significant difference in AOV.

Evaluation

If the p-value from the t-test is below 0.05, we reject the null hypothesis and conclude that the $35 minimum threshold has a statistically significant effect on AOV.

Results

Data Summary

January 1 to February 28, 2024
duration

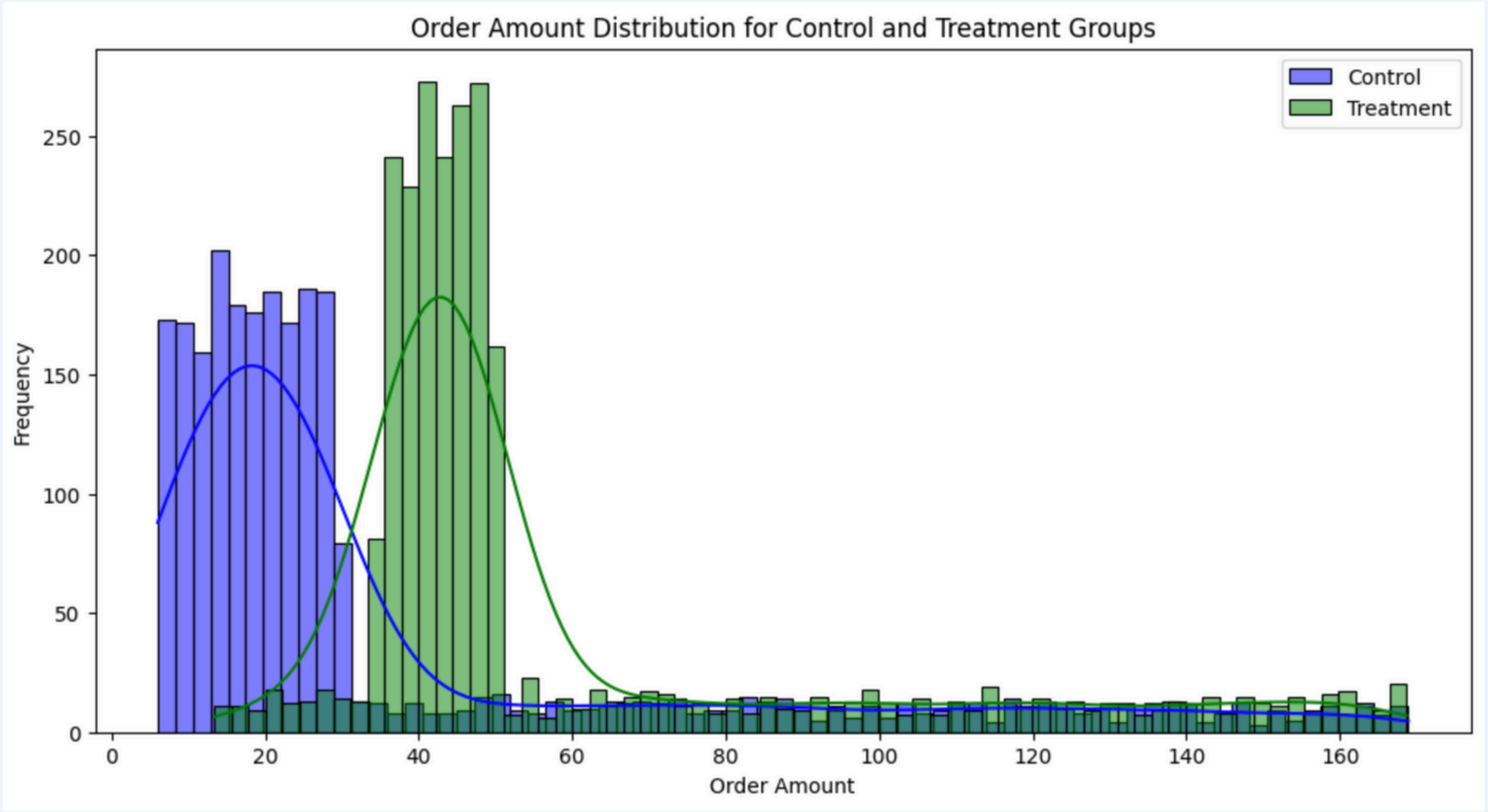
10,000 entries
sample size

Metric	Control Group	Treatment Group
Average Order Amount	$37.20	$59.21
Shipping Revenue	$0.00	$866.76
Cart Abandonment Rate	51.05%	71.37%
Session Duration (avg)	7.53 mins	7.58 mins

Average Order Amount (AOV)

- Control Group: $37.20
- Treatment Group: $59.21
- Increase: 59.19%

The test showed a substantial increase in average order amount in the treatment group. A 59.19% lift demonstrates that customers, on average, are spending more in the treatment group, likely to meet the free shipping threshold.



The graph shows that the treatment group has a higher concentration of orders around and above the $35 threshold compared to the control group, indicating that the free shipping minimum may have encouraged customers to increase their order amounts.

Shipping Cost Impact

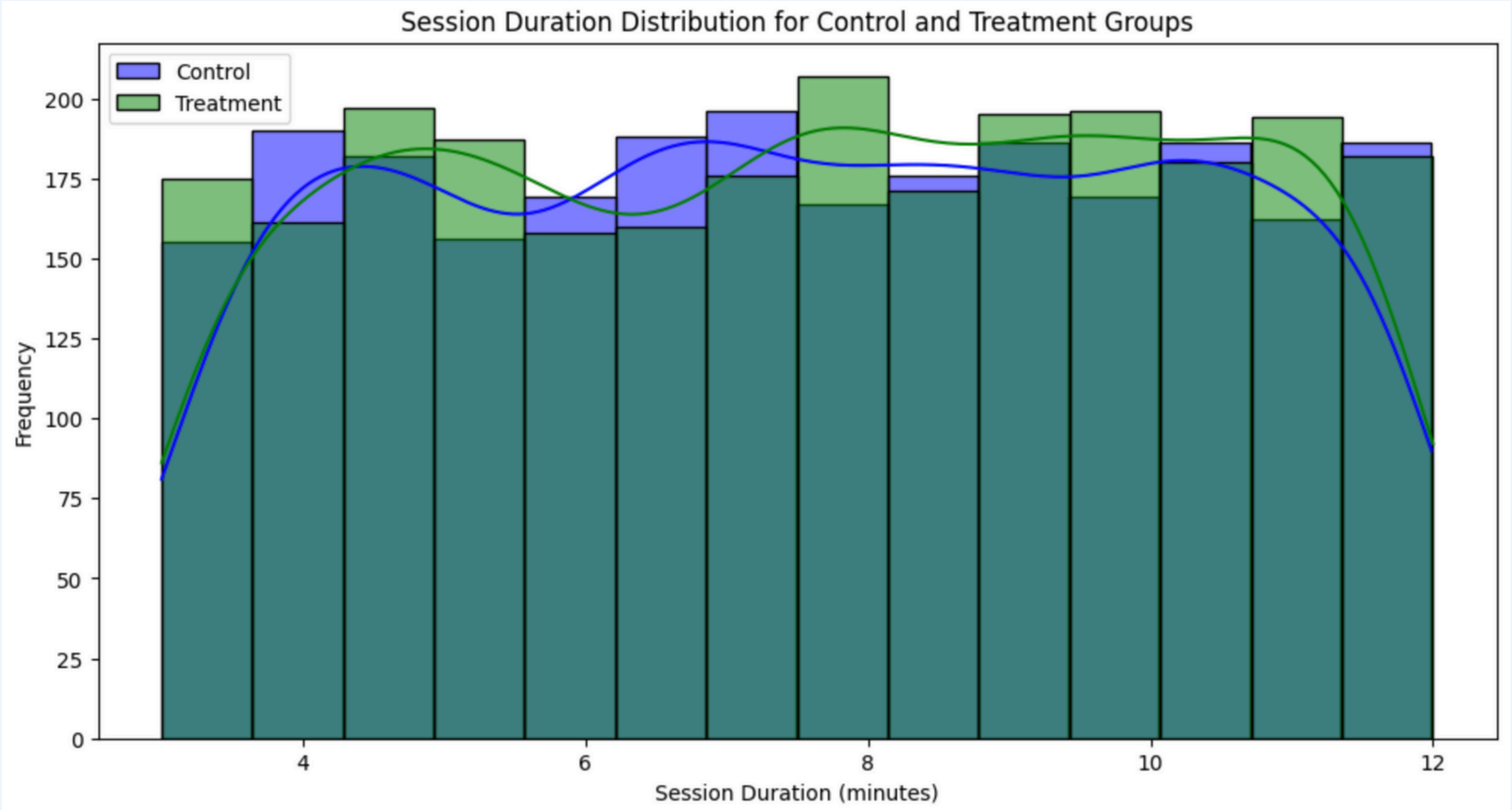
- Control Group Shipping Revenue: $0.00
  (free shipping on all orders)
- Treatment Group Shipping Revenue: $866.76
  (additional revenue from orders below $35)

This revenue from shipping costs in the treatment group contributes to covering logistics expenses.

Cart Abandonment Rate

- Control Group: 51.05%
- Treatment Group: 71.37%

The implementation of a minimum order quantity for free shipping has led to an increase in cart abandonment. While the threshold encourages higher order values, it also discourages some customers from completing their purchases when they don’t meet the minimum. Addressing this increase in abandonment will be crucial to ensure that the policy enhances profitability without negatively impacting the customer experience.



There is no significant difference in session time between the control and treatment groups, indicating that the new free shipping threshold did not impact the duration of customer visits.

Results.

T-TEST RESULT

T-statistic: -20.87
P-Value: 7.58e-93 (significant at $p < 0.05$)

RESULT

The significant p-value indicates that the increase in AOV is not due to random chance. We reject the null hypothesis and accept that the $35 minimum order threshold leads to a significant increase in AOV.

Conclusion

The A/B test results demonstrate that introducing a $35 minimum order threshold for free shipping can significantly boost the average order amount, contributing positively to offsetting rising supply chain costs.

However, the accompanying increase in cart abandonment cannot be overlooked. By implementing targeted strategies to mitigate abandonment and continually monitoring customer behavior, RadiantGlow Skincare can optimize its shipping policy to enhance profitability while maintaining a positive customer experience.

Quality checks

Checkout Success Rate Monitoring

Regularly compare the rate of successful checkouts before and after implementing the new design. A significant increase in failed attempts may indicate usability issues with the new layout.

Performance Metrics

Monitor the performance speeds of the checkout process to ensure that the new changes do not negatively impact page load times, which can deter customers from completing purchases.

User Experience Surveys

After checkout, ask users to complete a quick survey about their experience. This direct feedback can highlight areas for improvement.

Recommendations

Proceed with Caution

The increase in AOV and additional shipping revenue are promising; however, the increase in cart abandonment is a concern. To mitigate this:

- Consider A/B testing a lower threshold (e.g., $25) to see if it reduces cart abandonment while still achieving a lift in AOV.
- Explore personalized promotions for users who abandon carts, such as reminders or discounts for meeting the threshold.

Monitor Long-Term Customer Behavior

The initial test indicates an increase in order values. However, monitor repeat purchase behavior in the treatment group to ensure customer loyalty is maintained.

Increase Sample Size or Adjust Parameters

: Given the low power, a larger sample or adjustments to the experiment design could improve reliability. This is particularly important if more granular segment analysis (e.g., new vs. returning customers) is desired.

Impact

Increase in Average Order Value

Formula:
AOV Increase=(Treatment AOV−Control AOV)×Total Orders in Treatment Group

Calculation:
Treatment AOV = $59.21
Control AOV = $37.20
Total Orders in Treatment Group = 5,000

AOV Increase=(59.21−37.20)×5000=110,050

The increase in AOV contributes an additional $110,050 in revenue.

Additional Shipping Revenue

Formula:
Additional Shipping Revenue=Sum of Shipping Costs Paid in Treatment Group

Calculation:
From data: Additional shipping revenue in the treatment group = $866.76

The additional shipping revenue generated is $866.76.

Lost Revenue Due to Increased Cart Abandonment

Formula:

Lost Revenue=(Treatment Cart Abandonment Rate−Control Cart Abandonment Rate)×Average Order Value×Total Treatment Group Size

Calculation:

Control Cart Abandonment Rate = 51.05%

Treatment Cart Abandonment Rate = 71.37%

Average Order Value = $59.21

Total Treatment Group Size = 5,000

Lost Revenue=(0.7137−0.5105)×59.21×5000=60,530.64

The potential revenue lost due is approximately $60,530.64.

Summary of Calculations

Metric	Value
AOV Increase	$110,050
Additional Shipping Revenue	$866
Lost Revenue Due to Abandonment	($60,530)
Net Revenue Impact	**$50,386**

Future Scope

Customer Segmentation

Conduct deeper analyses by segmenting customers based on their purchasing behavior, demographics, or past interaction with non-medication products to tailor the checkout experience more effectively.

Pricing Strategy A/B Tests

Test different pricing strategies, such as discounts, dynamic pricing, or bundling options, to understand which approaches increase overall sales or conversion rates.

Tests for reducing cart abandonment

Test offering incentives such as discounts or free shipping during checkout when customers are about to leave. To measure whether providing extra value encourages more customers to complete their purchases,

Thank you.