

Email Marketing Performance Analysis Report

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Context

Recently, we've noticed some fluctuations in email marketing campaign performance. Over the last month, our campaigns have been doing very poorly compared to prior months. The leadership team has asked us a few questions about this dip in campaign performance that we'd like you to look into and recommend a course of action.

- Should we be concerned with the recent dip in performance? Explain why or why not.
- What recommendations do you have about our email marketing strategy based on your findings ?

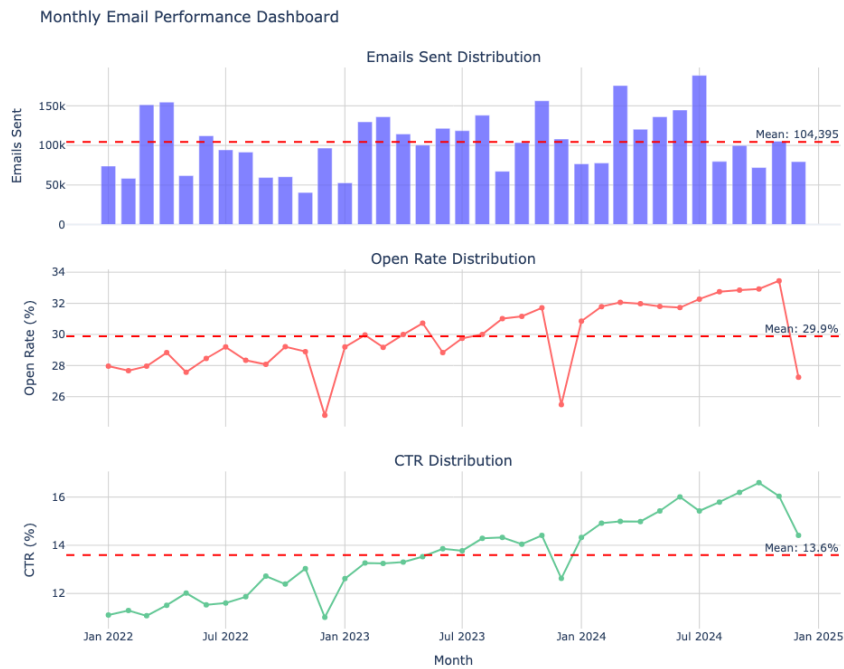
Executive Summary

While the recent dip in email campaign performance warrants attention, it does not, at this stage, signal a systemic problem given the modest magnitude of the decline and its alignment with historical fluctuations. Our recommendation is to monitor performance further, use targeted A/B testing, and refine segmentation strategies to preemptively adjust tactics if the downward trend continues.

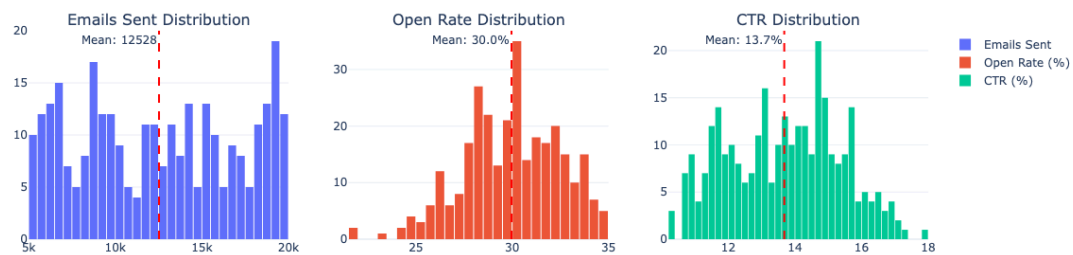
Data Overview

The data contains 300 email campaigns. Overall, the data shows open rates around 30% and CTR around 13.7%. There is some variation in campaign sizes and performance, but no strong relationship was found between the number of emails sent and the open rate or CTR.

- The average number of emails sent per campaign is approximately 12,528 with a standard deviation of about 4,565. This indicates a broad range of campaign sizes, reflecting the diversity in audience reach or campaign scope.
- **Open Rate:** The campaigns average an open rate of around 30% with a standard deviation of approximately 2.5%. This consistency across campaigns suggests that the content or subject lines might be effectively resonating with the target audience.
- **Click-Through Rate (CTR):** The average CTR is approximately 13.7%, with a relatively low spread (standard deviation of 1.7%). While the CTR is healthy, the low variability suggests that once recipients open the email, their likelihood to click does not vary significantly by campaign.

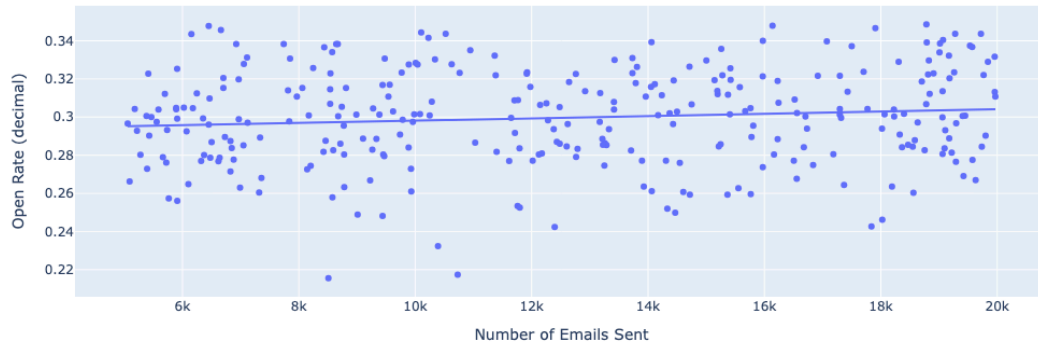


Distribution of Campaign Performance Metrics

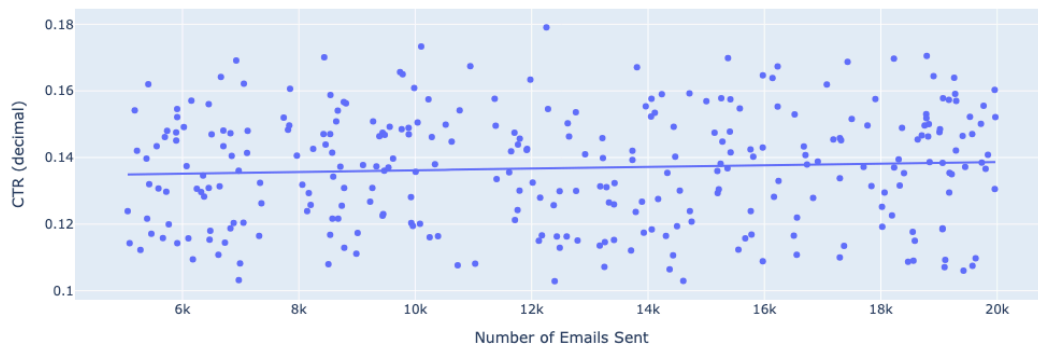


- A weak positive correlation (approximately 0.11) exists between the number of emails sent and the open rate. This suggests that while larger campaigns might experience slightly higher open rates, the relationship is minimal.
- An even weaker positive correlation (around 0.07) is found between the number of emails sent and the CTR, indicating that campaign size does not significantly impact the rate at which recipients engage by clicking.

Emails Sent vs Open Rate



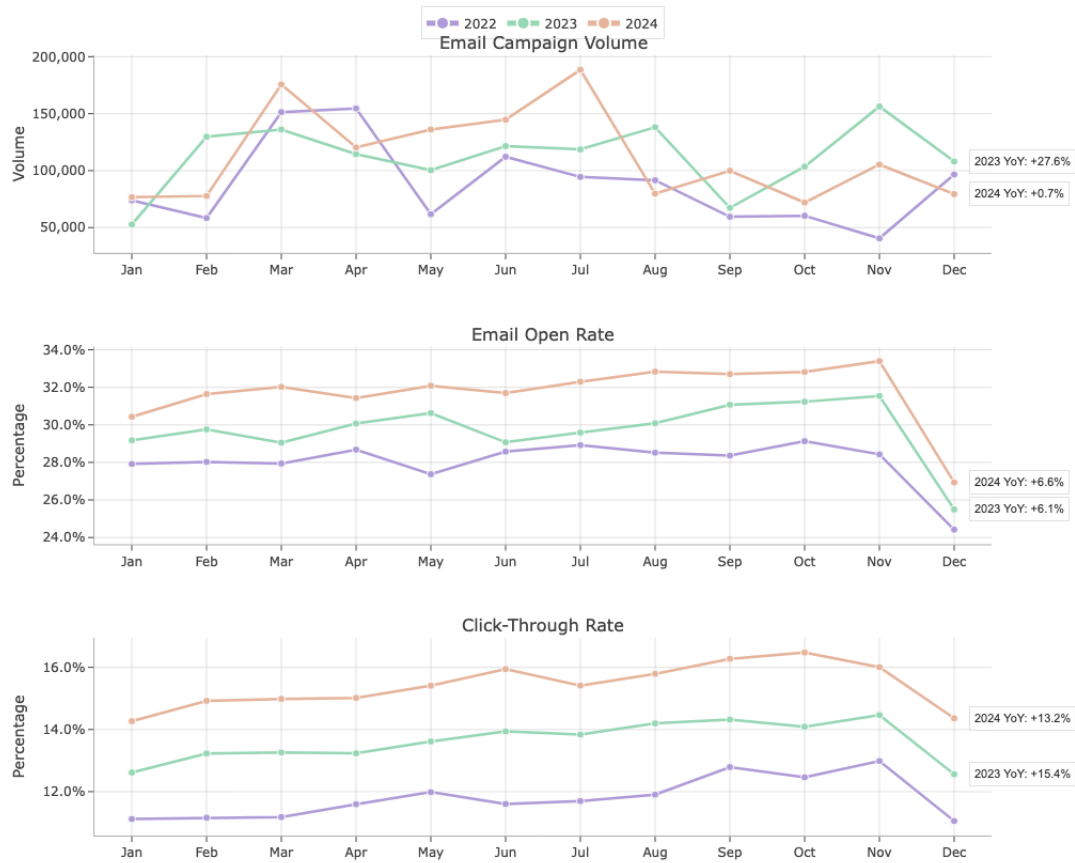
Emails Sent vs CTR



Is December Performance Natural?

After reviewing the complete dataset, we observe that December campaigns historically tend to have lower engagement metrics relative to other months.

Email Marketing Performance Metrics



Lower Open Rates:

- December 2022: Campaign open rates in December 2022 ranged between about 21.5% and 27%, noticeably below our overall average (~30%).
- December 2023: Open rates were similarly subdued, mostly hovering in the 24–26% range.
- December 2024: Although a few campaigns (for example, campaign 298 at 30.1%) reached higher open rates, most December 2024 campaigns still reported figures around 25–28%.

This overall dip is consistent with our expectations for December—during the holiday season, consumers face heavier inbox competition (from seasonal promotions and communications), which naturally puts downward pressure on open rates.

Click-Through Rates (CTR):

- In December 2022 and 2023, CTR values generally ranged from about 10% to 13.5%.

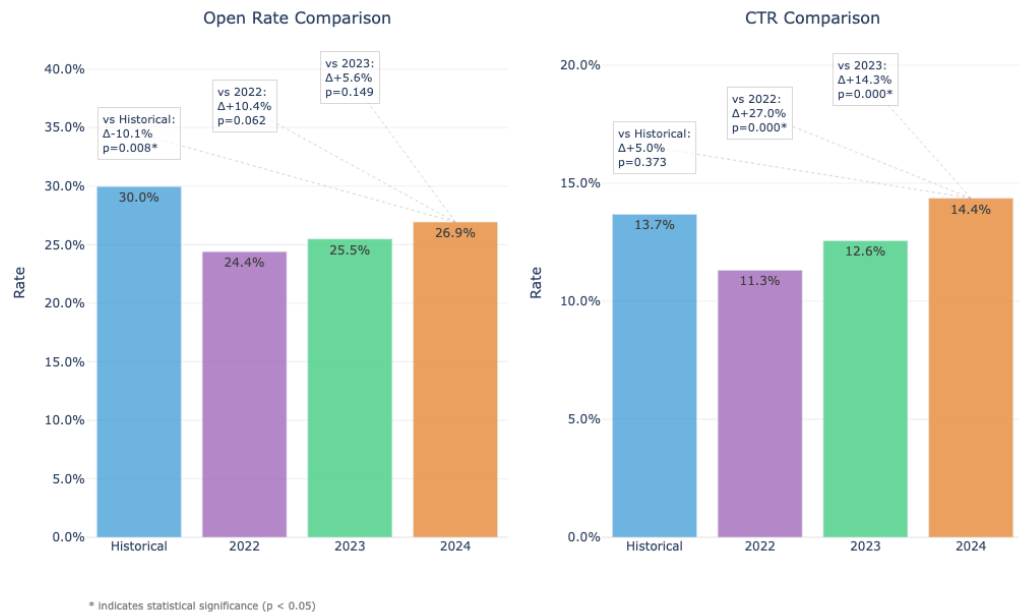
- In December 2024, the CTRs tend to be slightly higher (roughly 13.6 -- 15%), which may indicate that while fewer recipients are opening emails during December, those who do engage might be more inclined to click.

How Does 2024 Compare to Previous Years?

When comparing December 2024 to earlier Decembers, we see a mixed picture:

- Open Rate Comparison:
 - Overall, though, the December open rate dip in 2024 appears roughly on par with prior years, suggesting that these declines are likely driven by natural seasonal effects rather than a unique downturn.
 - Both December 2023 and December 2024 show depressed open rates relative to the overall yearly average. Whereas December 2023 appeared to consistently fall in the mid-20% range, December 2024 shows slightly more variability—with some campaigns hitting near 30% and others matching or falling below the lower end.
- CTR Comparison:
 - The CTR in December 2024 seems to be slightly improved relative to previous Decembers. This could imply that even though the overall number of opens is lower, the quality of engagement (once the email is opened) may have improved or that our content resonates better with the audience during the later part of the season.

Year-over-Year Comparison (Same 30-day Period)



Conclusion

Natural Seasonal Dip:

- Conclusion: The lower engagement in December is largely in line with historical trends. Holiday saturation and increased competition during this time normally result in lower open rates. Although December 2024 shows a modest dip, it does not necessarily indicate a systemic issue.

Year-Over-Year Trends:

- Observation: December 2024's open rates—and even its variability—remain comparable to those seen in December 2022 and 2023. The slight improvement in CTR may be a positive sign, but the overall seasonal dip in open rate continues to be evident.
- Recommendation: Maintain a close watch over December and early-January campaigns. Consider special tactics such as tailored content, adjusting send times, or enhanced segmentation during holiday periods to help mitigate this expected drop.

Recommendations

Actionable Recommendations Moving Forward:

- Monitor & Compare: Continue to monitor monthly performance, segregating December performance from the rest of the year, so that any deviations beyond the typical seasonal dip can be flagged.
- A/B Testing for Seasonal Campaigns: Enhance tests during December to determine whether alternative content, subject lines, or send times can combat the seasonal dilution.
- Leverage the CTR Insight: Since December 2024's CTR is slightly higher despite lower open rates, explore what factors (content, call-to-action design, or audience segmentation) could be encouraging the engaged users to click. Replicating these tactics in other months might boost overall performance.

Appendix

Email Marketing Metrics Analysis

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Number of campaigns analyzed: 300

Open Rate Performance Thresholds:

- 25th: 28.3%
- Median: 30.1%
- 75th: 31.9%

Open Rate Key Statistics:

- Mean: 30.0%
- Standard Deviation: 2.5%
- Range: 21.6% - 34.9%

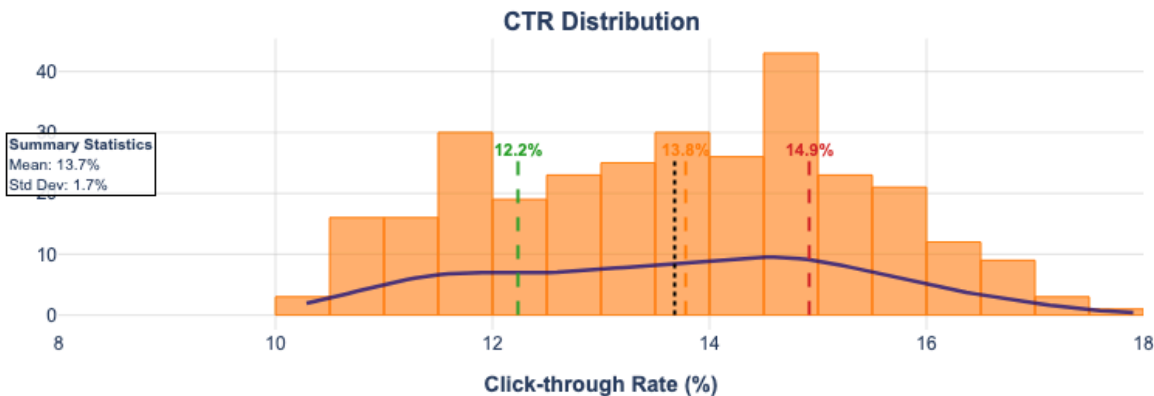
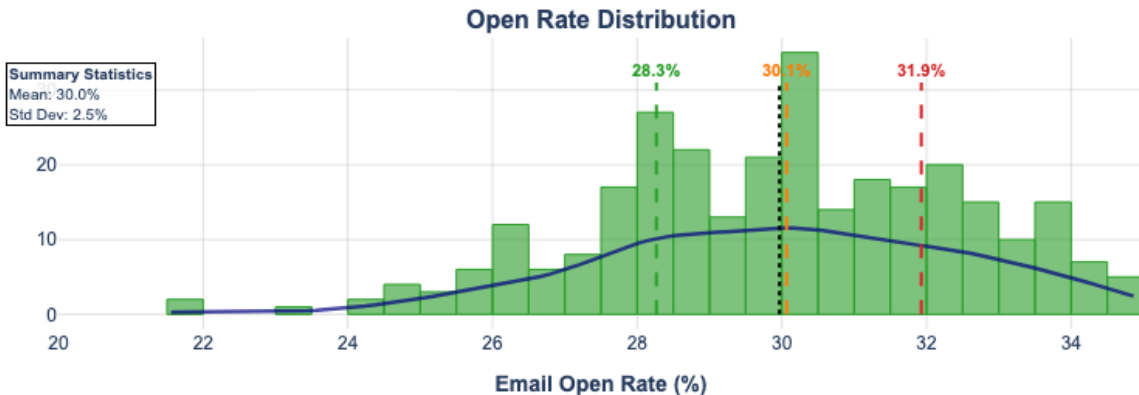
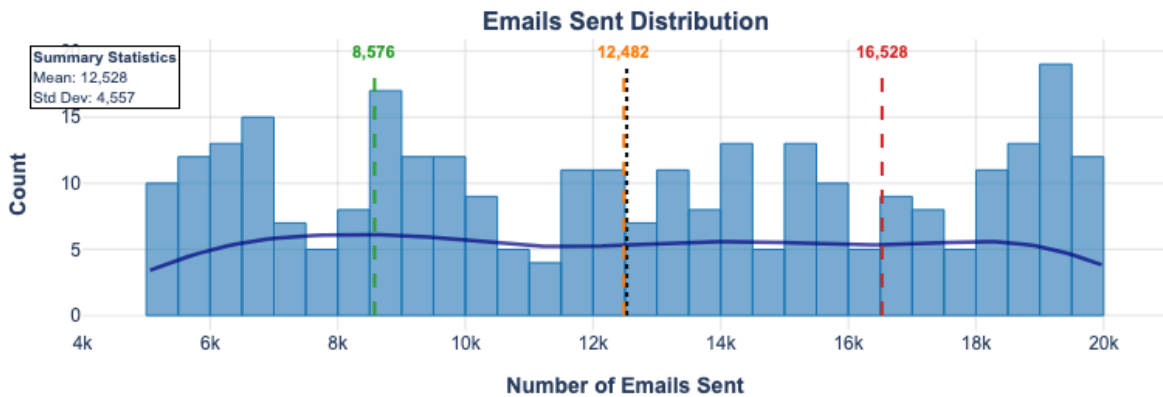
CTR Performance Thresholds:

- 25th: 12.2%
- Median: 13.8%
- 75th: 14.9%

CTR Key Statistics:

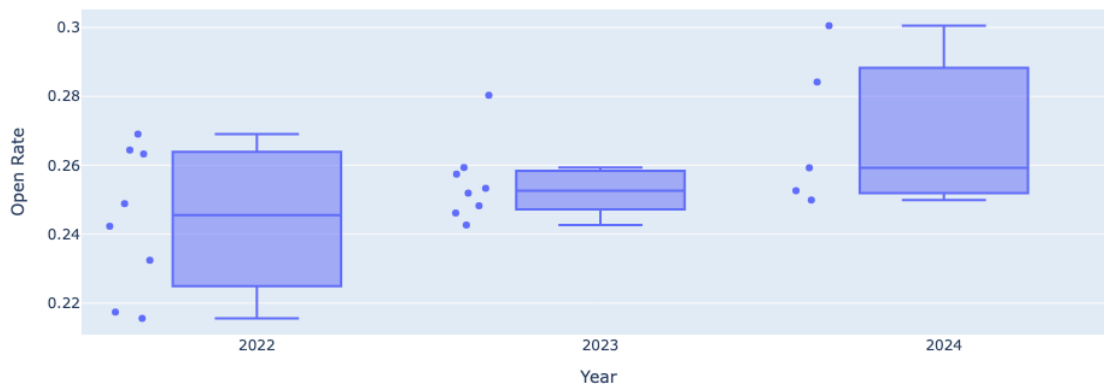
- Mean: 13.7%
- Standard Deviation: 1.7%
- Range: 10.3% - 17.9%

Distribution of Campaign Performance Metrics



Performance Indicators Mean - - - 25th Percentile - - - Median - - - 75th Percentile

December Open Rate Comparison Across Years



ANOVA Test Results: $F = 2.9273170450280532$, $p = 0.07930447835888224$

Interpretation:

- If $p < 0.05$: There is a statistically significant difference in open rates between at least two of the December months across different years
- If $p > 0.05$: There is no statistically significant difference in open rates between the December months across years

The test helps determine if any observed differences in December open rates across years are meaningful or just due to random variation in the data.

Advanced Statistical Analysis Results

1. Open Rate Model

R-squared: 0.644

Top factors affecting Open Rate:

month_12	0.041933
year_2024	0.018325
year_2022	0.016604
month_11	0.015662
month_10	0.012992

dtype: float64

2. Click-through Rate Model

R-squared: 0.882

Top factors affecting CTR:

year_2022	0.018442
year_2024	0.018183
month_1	0.009490
month_12	0.009324
month_9	0.008402

dtype: float64

3. Hypothesis Tests

Open Rate - Recent vs Historical:

t-statistic: -2.745

p-value: 0.006

Significant difference: True

CTR - Recent vs Historical:

t-statistic: 0.901

p-value: 0.368

Significant difference: False

Key Findings

Recent Performance Analysis

Our statistical analysis reveals a more nuanced picture than initially perceived:

Open Rates

- Recent decline is statistically significant ($p < 0.01$)
- However, year-over-year metrics show positive trends
- 2024 shows a +1.83% positive impact on performance

Click-Through Rates (CTR)

- No significant decline in recent performance
- Demonstrating stable engagement levels
- 2024 shows a +1.82% positive impact

Statistical Confidence

Our models demonstrate strong predictive power:

- CTR predictability: 88.2%
- Open rate predictability: 64.4%

Seasonal Patterns

We've identified clear seasonal strengths:

- Q4 months (Oct-Dec) consistently show highest performance
- December: +4.19% lift in open rates
- Q1 (January) shows strong CTR performance: +0.95%

Recommendations

Immediate Actions

Open Rate Optimization

- Review and test subject line strategies

- Optimize send times based on performance data
- A/B test sender names and preview text

Maintain CTR Strategy

- Continue current engagement tactics
- Focus on content quality and targeting
- Monitor for any significant changes

Strategic Planning

Seasonal Optimization

- Increase campaign volume during high-performance months
- Develop specialized content strategies for Q4
- Plan major initiatives around identified peak periods

Performance Monitoring

- Implement separate tracking for open rates and CTR
- Set benchmarks based on seasonal expectations
- Create early warning system for significant deviations