Evaluating Digital Ads: Pop-Ups vs. Email Blasts in Driving Customer Spending

PopRunner Project Report

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1. EXECUTIVE SUMMARY

This report analyzes the impact of email blasts and website pop-up advertisements on consumer purchases at PopRunner. The objective is to determine which marketing strategy is more effective and how customer demographics influence ad effectiveness.

The analysis is based on data from PopRunner's consumer records, email interactions, pop-up engagement, and sales transactions. SQL queries were used to extract insights from these datasets, identifying key trends and correlations. The findings reveal that email advertisements significantly influence sales, with customers who opened emails spending an average of $240.83—nearly double the $126.12 spent by those who did not open emails. Conversely, pop-up advertisements, while engaging, did not lead to increased sales. Consumers who did not receive a pop-up had a higher average purchase value ($138.69) compared to those who did ($131.74), suggesting that pop-ups may not be an effective sales driver.

Additionally, demographic insights show that PopRunner's customer base is predominantly female (76.43%), but male customers tend to spend more on average. Older customers and those with higher loyalty levels also exhibit higher spending behavior.

Limitations of this research include potential external factors influencing sales, such as competitor activity, seasonal demand fluctuations, and consumer preferences outside the available dataset. Additionally, engagement metrics (such as why some consumers ignored emails or pop-ups) were not explored.

To maximize sales impact, this report recommends focusing on email marketing optimization to increase engagement rates, leveraging pop-ups strategically as a supporting tool rather than a primary driver, and tailoring marketing strategies based on age and gender. A/B testing different email formats and personalized discount offers could further refine PopRunner's marketing approach.

2. OBJECTIVE AND QUESTIONS

2.1. Project purpose

2.1.1. Objective of the project

The objective is to analyze whether email blasts and website pop-ups impact consumer purchases on PopRunner's website.

2.1.2. Questions

How do email and pop-up advertisements influence sales on PopRunner's website? Which type of advertisement is more effective in driving customer purchases? How do customer demographics (age, gender, and loyalty status) impact the effectiveness of these advertisement campaigns?

2.1.3. Data

PopRunner has provided four datasets. First, the Consumer Table. This contains consumer demographics (age, gender) and loyalty status. Next, the Email Table, which tracks whether a consumer opened an email blast. Following the Email Table is the Pop-Up Table identifying whether a consumer received and saved a pop-up advertisement. Lastly, the Purchase Table, which records each consumer's total sales amount.

PopRunner conducted two types of advertisement campaigns, email blast and pop-up advertisements. The email blast was a standard email sent to all customers, and their engagement was tracked based on whether they opened the email. The pop-up advertisement was a discount code pop-up that appeared for selected customers when they visited the website. Any time a consumer saved the discount code in their cart, it was recorded.

3. DATA ANALYSIS AND RESULTS

3.1. Customer background

The customer base consists of 2129 males (23.57%) and 6903 females (76.43%), indicating a higher proportion of female shoppers. The average age of male customers is 32.45 years, while female customers have a slightly lower average age of 30.61 years.

Regarding loyalty status, customers are distributed across five loyalty levels. Level 1 (1,529 customers) has the youngest average age of 29.37 years, while Level 5 (1,766 customers) has the oldest average age of 33.51 years. The age gradually increases with loyalty levels, suggesting that older customers may be more engaged or have been shopping with PopRunner for a longer time.

Most customers fall into Level 3 (2,612 customers), followed by Level 5 (1,766) and Level 2 (1,740), showing a diverse mix of shopping frequency and engagement levels.

Gender distribution		
Variable	**Frequency distribution**	**Mean (Age)**
Gender: Male	2129	32.45186
Gender: Female	6903	30.61394
Loyalty distribution		
Loyalty level = 1	1529	29.37345
Loyalty level = 2	1740	30.10345
Loyalty level = 3	2612	30.69908
Loyalty level = 4	1385	31.59278
Loyalty level = 5	1766	33.51302

Table 1: Customer background

3.2. Sample Size (Query 7 and 9)

Out of all customers, 8,316 did not open the email, while only 716 opened it, indicating a low engagement rate with email marketing.

Regarding pop-up advertisements, 4,516 customers did not receive a pop-up or a discount code, while 3,029 received a pop-up but did not save the discount code. Additionally, 1,487 customers received a pop-up and saved the discount code, suggesting that only a small portion of users found the pop-up offer compelling enough to save.

Variable	Frequency distribution
Pop-up = 0, discount code = 0	4516
Pop-up = 1, discount code = 0	3029
Pop-up = 1, discount code = 1	1487
Opened email = 0	8316
Opened email = 1	716

Table 2: Sample distribution

3.3. Sales (Query 8, 10 and 12)

The average sales at PopRunner are $135.21, with total sales amounting to $1,221,254.

For pop-up advertisements, it appears that they do not significantly increase sales. Consumers who did not receive a pop-up had a higher average sale ($138.69) compared to those who did ($131.74). This suggests that pop-up advertisements may not have a strong positive impact on sales, possibly due to user annoyance or ineffectiveness in influencing purchasing behavior.

However, email marketing seems more effective. Consumers who opened emails had a much higher average sale of $240.83, compared to $126.12 for those who did not, indicating that emails may be a more influential marketing tool than pop-ups.

Table 3: Sales data by advertisement (pop-up and email)

Variable	Average (in $)	Total Sales (in $)
Total sales	135.2142	1221254
Pop-up = 0	138.6901	626324.5
Pop-up = 1	131.7382	594929.8
Opened email = 0	126.1210	1048822
Opened email = 1	240.8268	172432

3.4. Use cases (Query 11 and 13)

The consumer with consumer_id 5955534353, who spent the highest at PopRunner, opened the email message.

The consumer with consumer_id 5887286353, who spent the least at PopRunner, did not receive a pop-up message on the website.

4. RECOMMENDATIONS AND CONCLUSION

Our analysis found that different forms of advertising have varying impacts on consumer purchases on PopRunner's website. Email advertisements were found to be significantly more effective in driving sales. Consumers who opened the email blast advertisement had an average purchase of $240.83 - nearly double the $126.12 average of those who did not open the email.

While pop-up advertisements had a much higher engagement rate - nearly 33% of consumers who received a pop-up saved the discount code—this did not translate into higher spending. In contrast, only about 8% of consumers opened the email blast, yet it led to higher spending.

We also found that PopRunner's customer base is primarily female (6903 to 2129 male), but men tend to spend more on average (Female average is $122.22 and male is $177.35). We also observed that average spending tends to increase with age.

Based on these findings, PopRunner should prioritize email advertising while exploring ways to enhance engagement. To improve advertising effectiveness and increase revenue, we propose the following recommendations:

1. Boost Email Engagement – Since successful email drives result in higher spending, PopRunner should focus on increasing open rates with better subject lines, optimized timing, and targeted messaging.
2. Use Pop-Ups to Support Emails – Pop-ups grab attention but don't drive purchases. Instead, they could use popups to compliment email blast advertising, like offering a pop-up discount to those who didn't open the email blast.
3. Target Ads by Age and gender – Older customers and men spend more, so PopRunner should tailor email and pop-up strategies to different demographics.
4. Personalize Discounts – Customizing offers based on purchase history or loyalty status may encourage more spending.
5. Keep Testing & Improving – Small experiments with email styles, pop-ups, and discounts through A/B testing will help identify what works best and refine strategies accordingly.

In conclusion, our analysis finds that email advertising is the most effective strategy for increasing consumer spending, while pop-up ads would be better utilized for complimentary

engagement. By implementing the recommendations above, PopRunner can optimize its advertising efforts and drive higher sales.