**Analyzing the Impact of Online Advertising On Sales at PopRunner**

**PopRunner Project Report**

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Table of Contents

[1. EXECUTIVE SUMMARY 3](#_heading=h.gjdgxs)

[2. OBJECTIVE AND QUESTIONS 4](#_heading=h.30j0zll)

[2.1. Project purpose 4](#_heading=h.1fob9te)

[2.1.1. Objective of the project 4](#_heading=h.3znysh7)

[2.1.2. Questions 4](#_heading=h.2et92p0)

[2.1.3. Data 4](#_heading=h.tyjcwt)

[3. DATA ANALYSIS AND RESULTS 5](#_heading=h.3dy6vkm)

[3.1. Customer background (Query 5 and 6) 5](#_heading=h.1t3h5sf)

[3.2. Sample Size (Query 7 and 9) 5](#_heading=h.4d34og8)

[3.3. Sales (Query 8, 10 and 12) 6](#_heading=h.2s8eyo1)

[3.4. Use cases (Query 11 and 13) 7](#_heading=h.17dp8vu)

[4. RECOMMENDATIONS AND CONCLUSION 8](#_heading=h.3rdcrjn)

# EXECUTIVE SUMMARY

What follows is an analysis of a recent advertisement campaign by online retailer, PopRunner. The goal of the advertisement campaign, and the subsequent descriptive analysis found here, was to determine what effect, if any, online advertisements have on promoting sales - which was of special interest to the retailer as they had recently noted a decreased trend in traffic on their website. During the campaign, PopRunner captured various data points about customers in an attempt to better understand consumer behavior. The data collected, among other attributes, included age, gender, purchase history, loyalty status, as well as if a consumer was exposed to one or both of the two campaign advertisements. All customers received an email advertisement, while only a select number of those customers received a secondary, pop-up advertisement upon visiting PopRunner’s website.

In total, data from 9,032 customers was analyzed. It was determined that only 716 customers (7.9%) opened the email advertisement while 8,316 or 92.1% of customers did not. Similar success rates were seen in the pop-up advertisement where 4,516 customers (50%) were targeted with pop-ups, only roughly 16.4% of customers (1,487) applied the provided discount code to a purchase transaction. From the analysis it was determined that pop-up advertising may not have a significant impact on affecting sales. This is because the average sales and total sum of sales for customers who received a pop-up was lower than the same measures recorded by those customers who did not receive the pop-up advertisement ($131.74 vs. $138.68 average sales and $595,929 vs. $626,325 total sales). While coming to this conclusion it was noted that average and total sales for customers receiving the pop-up advertisement may be lower due to those customers applying a discount code at checkout. Further analysis would be needed to determine the exact efficacy of the advertisement campaign. However, it is the recommendation based on the data presented that PopRunner consider alternative mechanisms to attract and retain customer sales to supplement online advertisements.

*Disclaimer: For the purposes of this analysis it is assumed that the data provided by PopRunner coincides with the start and end-dates of the online advertisement campaign only. That is to say, that data represented, such as customer purchase history prior to the online campaign, is not present as this would skew the results of various metrics being examined.*

# OBJECTIVE AND QUESTIONS

## Project purpose

### Objective of the project

The objective of this project is to understand the impact of online advertising on sales at PopRunner website by analyzing the data provided by them.

### Questions

1. How did the pop-up advertisement impact sales?
2. Did the customers who opened the email blast spend relatively more money?
3. Did the highest spending customer open the email message?

### Data

The data that was made available to us consists of 4 tables. They are consumer, pop\_up, email and purchase.

* The first advertisement is conducted through a mass email blast campaign where the identical email blast is sent to all customers. The email table contains information about whether a customer has opened an email.
* The second advertisement offered a discount code to specific customers who visited the PopRunner website immediately upon their arrival. Information regarding this pop-up advertisement is stored in the pop-up table.

# DATA ANALYSIS AND RESULTS

## Customer background (Query 5 and 6)

There are 2129 males and 6903 females in the consumer table used in the project and their mean ages are 32.45 years and 30.61 years respectively. Hence there are more female customers compared to males and their age is also relatively lower compared to males.

The number of customers in the loyalty levels of 0, 1, 2, 3, 4 are 1529, 1740, 2612, 1385, 1766 and their average ages are 29.37, 30.10, 30.69, 31.59, 33.51 respectively. Majority of customers are present within the loyalty level of 2, hence most people are moderately loyal to PopRunner.

|  |  |  |  |
| --- | --- | --- | --- |
| **Gender distribution** | | | |
| **Variable** | | **Frequency distribution** | **Mean (Age in years)** |
| Gender: Male | | 2129 (23.6%) | 32.45 |
| Gender: Female | | 6903 (76.4%) | 30.61 |
| **Loyalty distribution** | | | |
| Loyalty level = 0 | 1529 (16.9%) | | 29.37 |
| Loyalty level = 1 | 1740 (19.3%) | | 30.10 |
| Loyalty level = 2 | 2612 (28.9%) | | 30.69 |
| Loyalty level = 3 | 1385 (15.3%) | | 31.59 |
| Loyalty level = 4 | 1766 (19.6%) | | 33.51 |

**Table 1: Customer background**

## Sample Size (Query 7 and 9)

There were 8,316 customers who did not open the email blast, while 716 customers opened it .

4,516 customers did not receive the pop-up message and did not save the discount in their cart, 3,029 customers received the pop-up, but they did not save the discount in their cart, while 1487 customers that received the pop-up message saved the discount in their cart.

|  |  |
| --- | --- |
| **Variable** | **Frequency distribution** |
| Pop-up = 0, discount code = 0 | 4516 (50%) |
| Pop-up = 1, discount code = 0 | 3029 (33.5%) |
| Pop-up = 1, discount code = 1 | 1487 (16.4%) |
| Opened email = 0 | 8316 (92.1%) |
| Opened email = 1 | 716 (7.9%) |

**Table 2: Sample distribution**

## Sales (Query 8, 10 and 12)

Statistics related to sales

* On average, customers spent $135.21 dollars and the sum of total sales value of all customers is $1,221,254 dollars.
* On average, the customers who did not receive a pop-up message spent $138.69 dollars and the sum of total sales value of this group of customers is $626,324.5 dollars.
* On average, the customers who received the pop-up message spent $131.73 dollars and the sum of total sales value of this group of customers is $626,324.50 dollars
* The pop-up message impacts the sales negatively as the average sales amount of customers who received the pop-up message is lower compared to those who did not receive it.
* On average, the customers who did not open the email blast spent $126.12 dollars, and the sum of total sales value of this group of customers is $1,048,822 dollars.
* Yes, the email blast impacts sales positively as the average sales amount of customers who received an email blast is higher compared to the group that did not open the email blast.

|  |  |  |
| --- | --- | --- |
| **Variable** | **Average (in $)** | **Total Sales (in $)** |
| Total sales | 135.2142 | 1,221,254 |
| Pop-up = 0 | 138.6901 | 626,324.5 |
| Pop-up = 1 | 131.7382 | 594,929.8 |
| Opened email = 0 | 126.1210 | 1,048,822 |
| Opened email = 1 | 240.8268 | 172,432 |

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

## Use cases (Query 11 and 13)

The consumer with the consumer id 5955534353 has spent the highest amount of $4,673.4 dollars has not received a pop-up message, but opened the email blast. However the consumer with the consumer id 5887286353 has spent the lowest amount of 0 dollars but has neither received the pop-up message nor opened the email blast.

# RECOMMENDATIONS AND CONCLUSION

The pop-up message impacts the sales negatively as the average sales amount spent by the customers who received the pop-up is lower compared to those who did not. The customers who opened the email blast spent relatively more money compared to those who did not open the email blast. I will recommend email advertising to the management as the impact of email advertising has a positive effect on sales, whereas pop-up messages have a negative effect on sales.

Actionable Recommendations

* Cancel the pop-up advertising as it affects sales negatively.
* Increase focus on customer retention by investing in loyalty programs.
* Focus more on advertising that attracts females attention as 76.4% of total customers are females.
* Promote email advertising by focusing on how to attract the customers attention to open the emails.