



Food Company Marketing Analysis

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Business Problem and Description

A food company conducted a direct marketing campaign targeting 2,240 customers at a cost of 6,720MU, resulting in a **15% success rate and a loss of 3,046MU.**

Objective

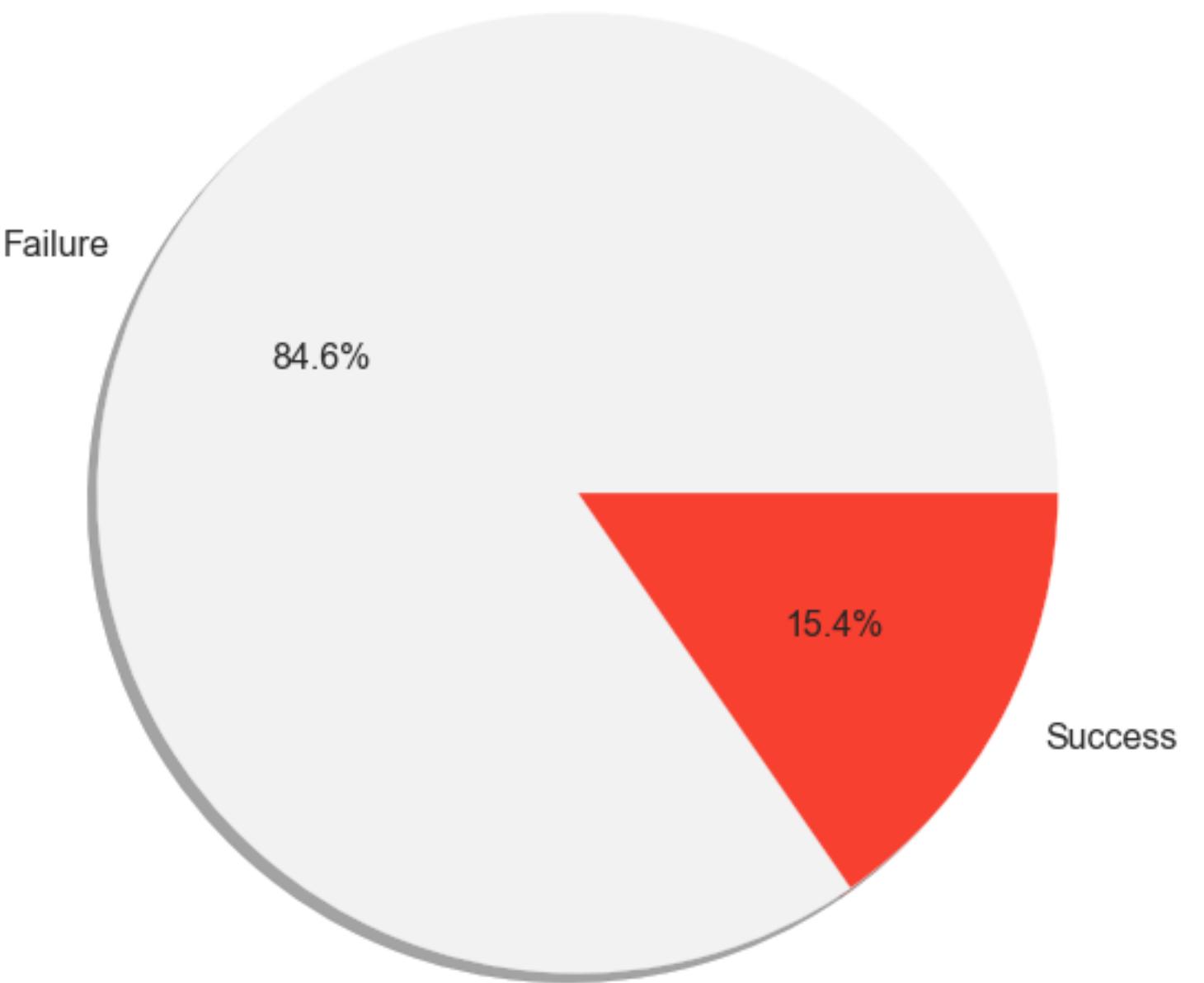
Predict and apply customer behavior to the rest of the customer base and identify characteristics of likely product purchasers to **maximize campaign profits.** The plan includes data exploration, segmentation, and building a classification model.

Is It True That The Campaign Has Only 15% of Success Rate?

Unfortunately, yes.

Out of 2.240 customers, **only 345 customers responded to the marketing campaign**. From this analysis, the success rate of the direct marketing campaign is around 15,4%

To improve the success rate of future campaigns, it may be helpful to **analyze the data** from this campaign to **identify any trends or patterns**.

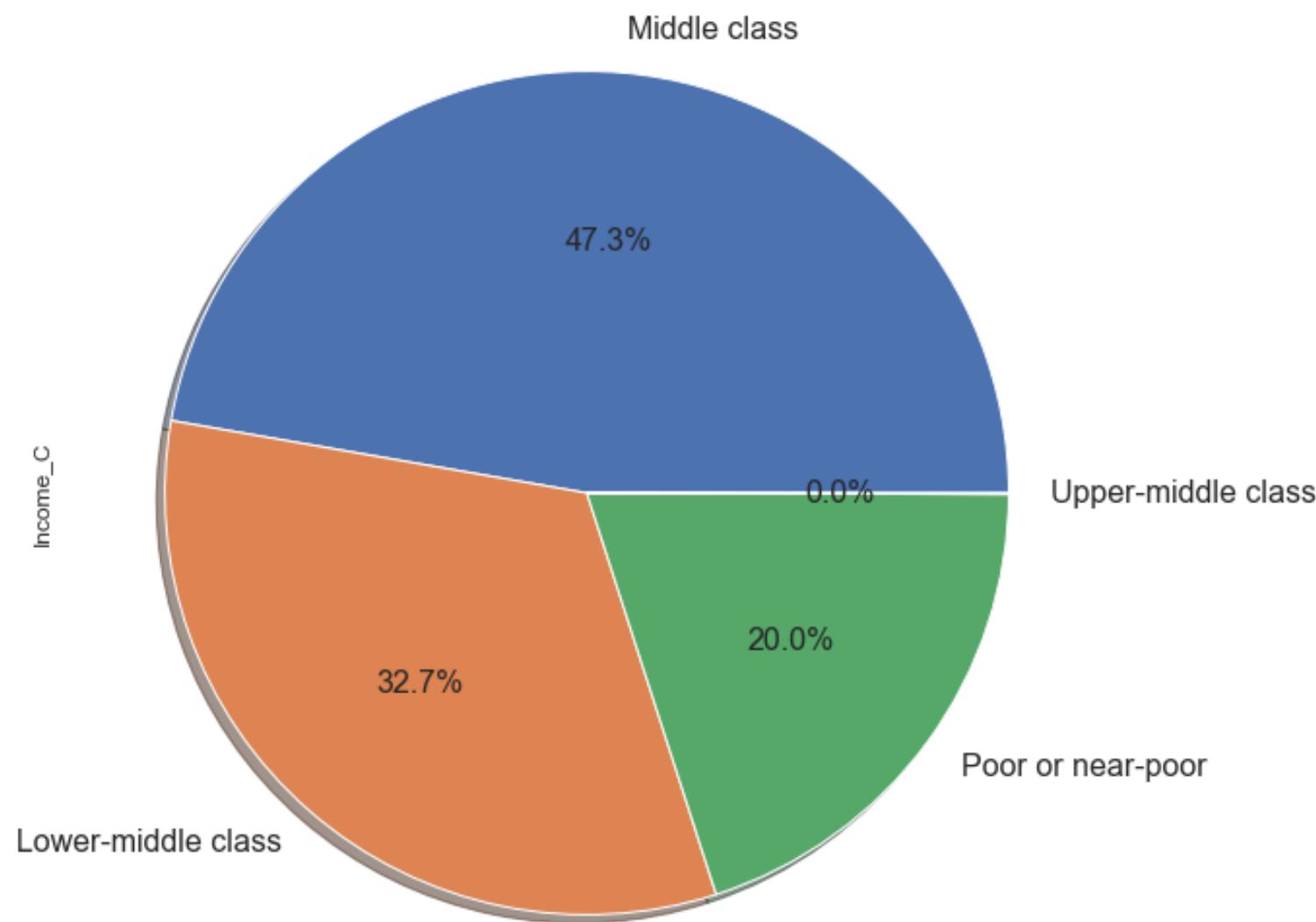




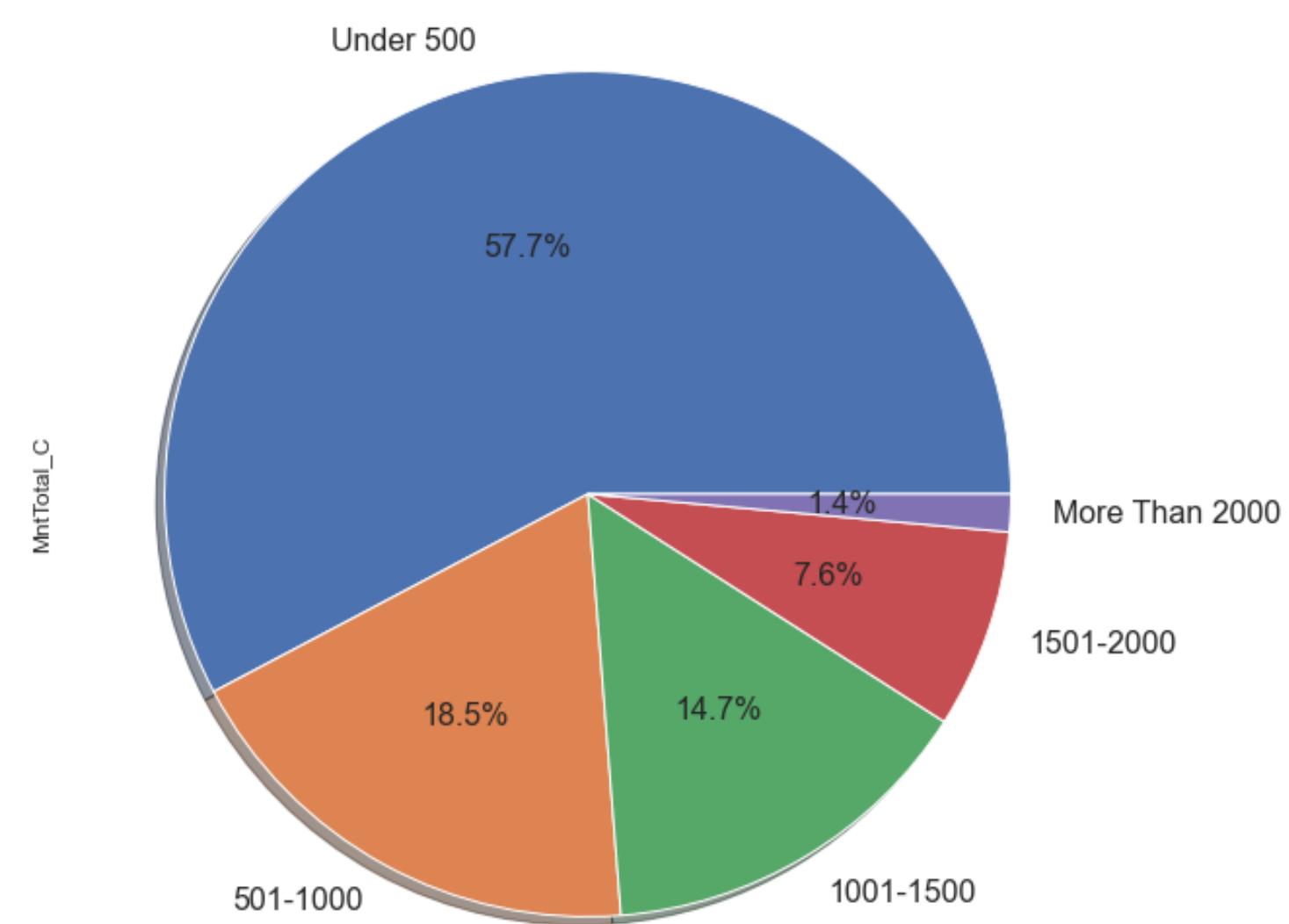
Data Exploration

Customers Distribution - Money and Spending

Most customers are middle-income and have spent less than \$500 in the last 2 years



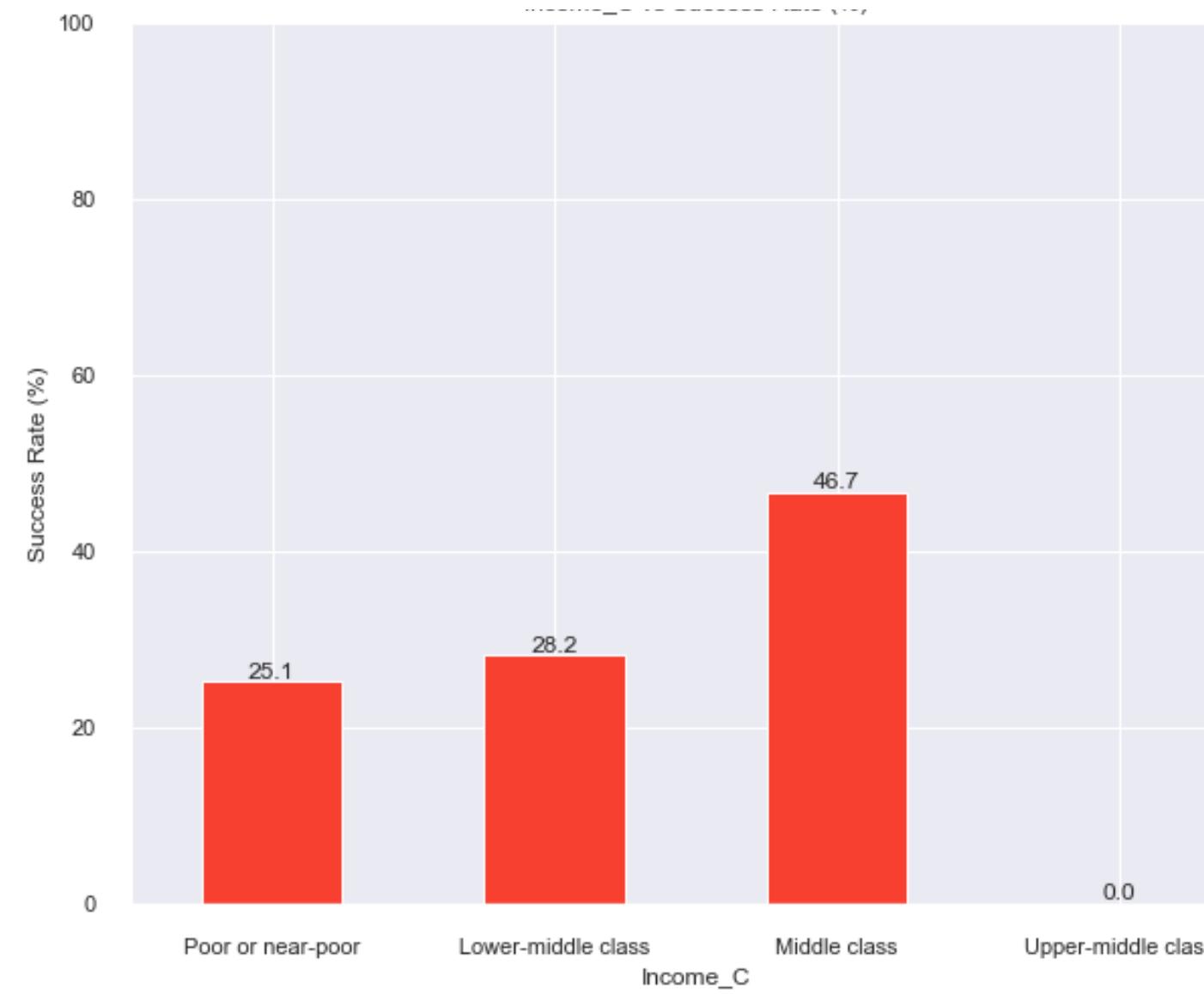
Customers Income Distribution



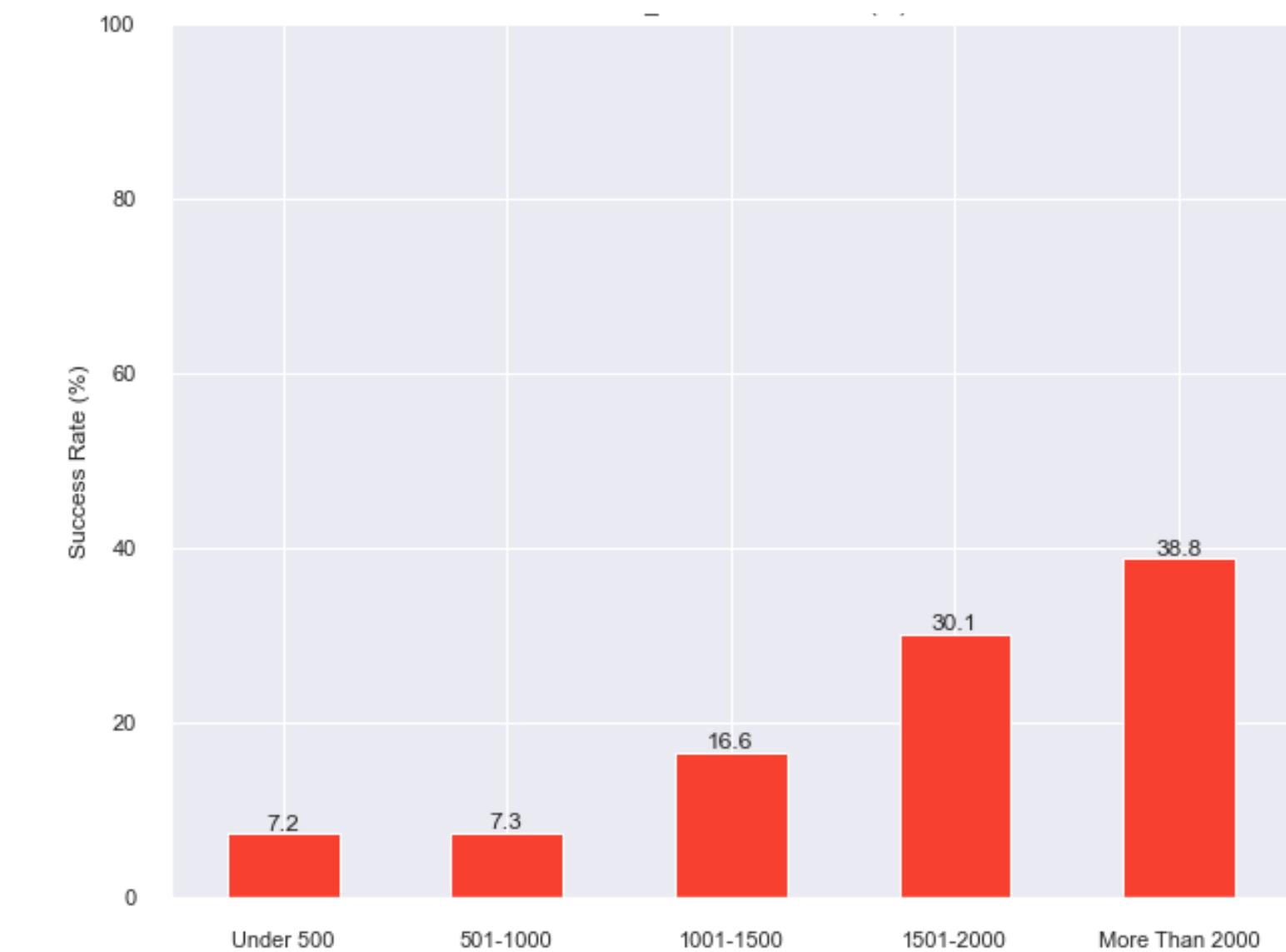
Customers last 2 year spending Distribution

Cash is King, or Is It?....

Middle class and big spender (spend more than \$2000 for the last 2 years) customers responded well to the marketing campaign.



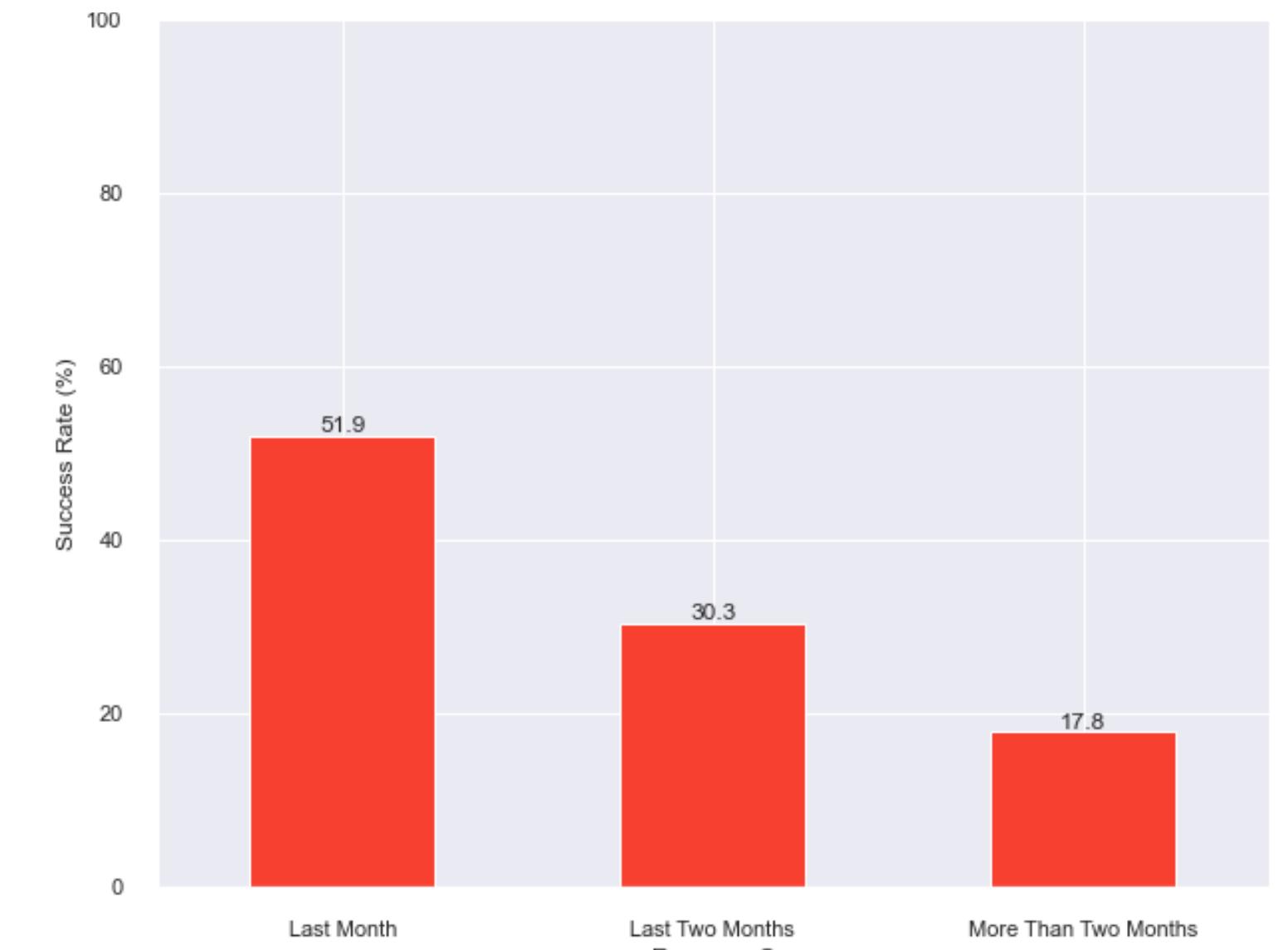
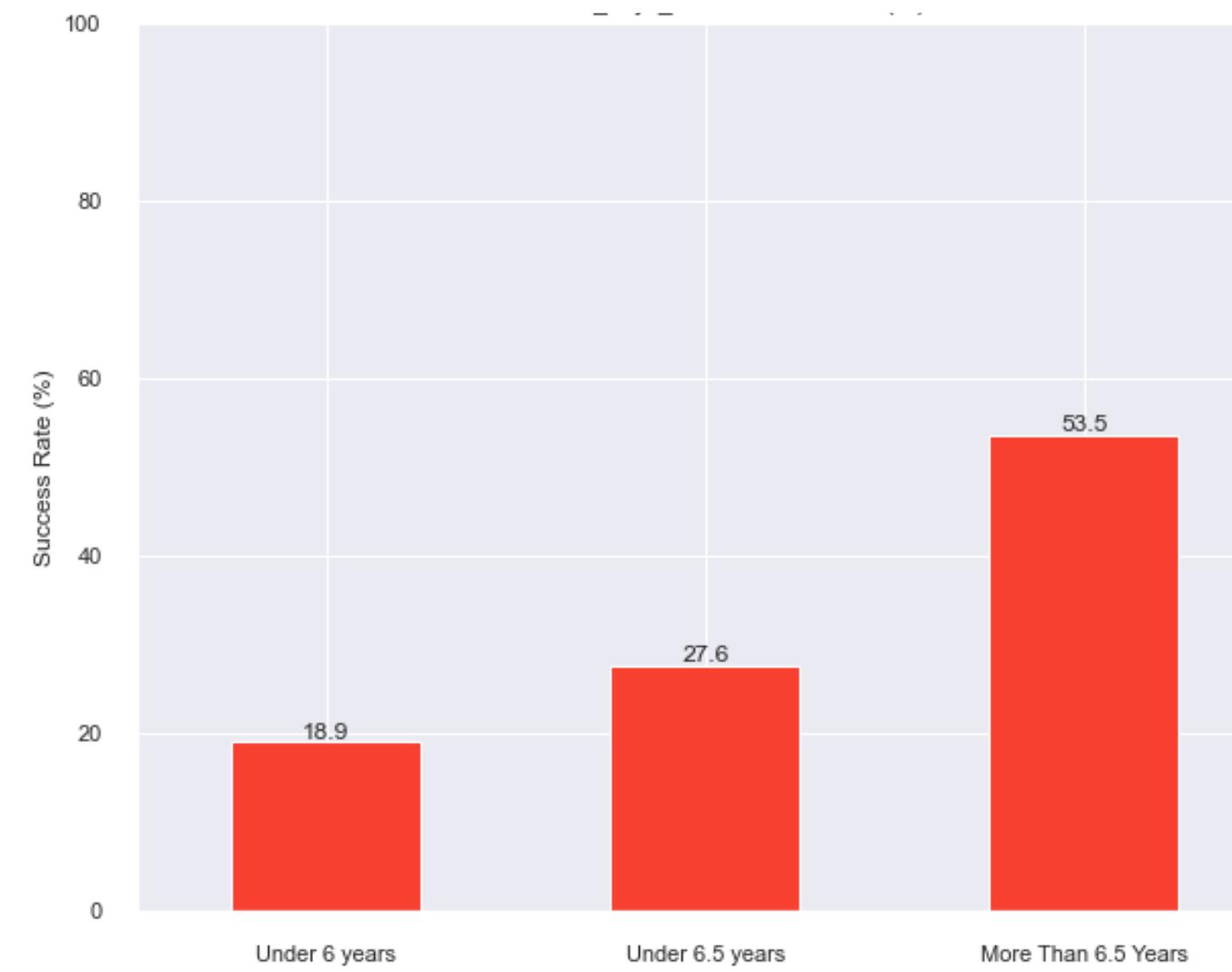
Income vs Campaign Success Rate



Total Spending vs Campaign Success Rate

Time Goes By....

Recent purchasers (Last month and under) and long-time loyal customers (6,5 years) had high campaign success rates.

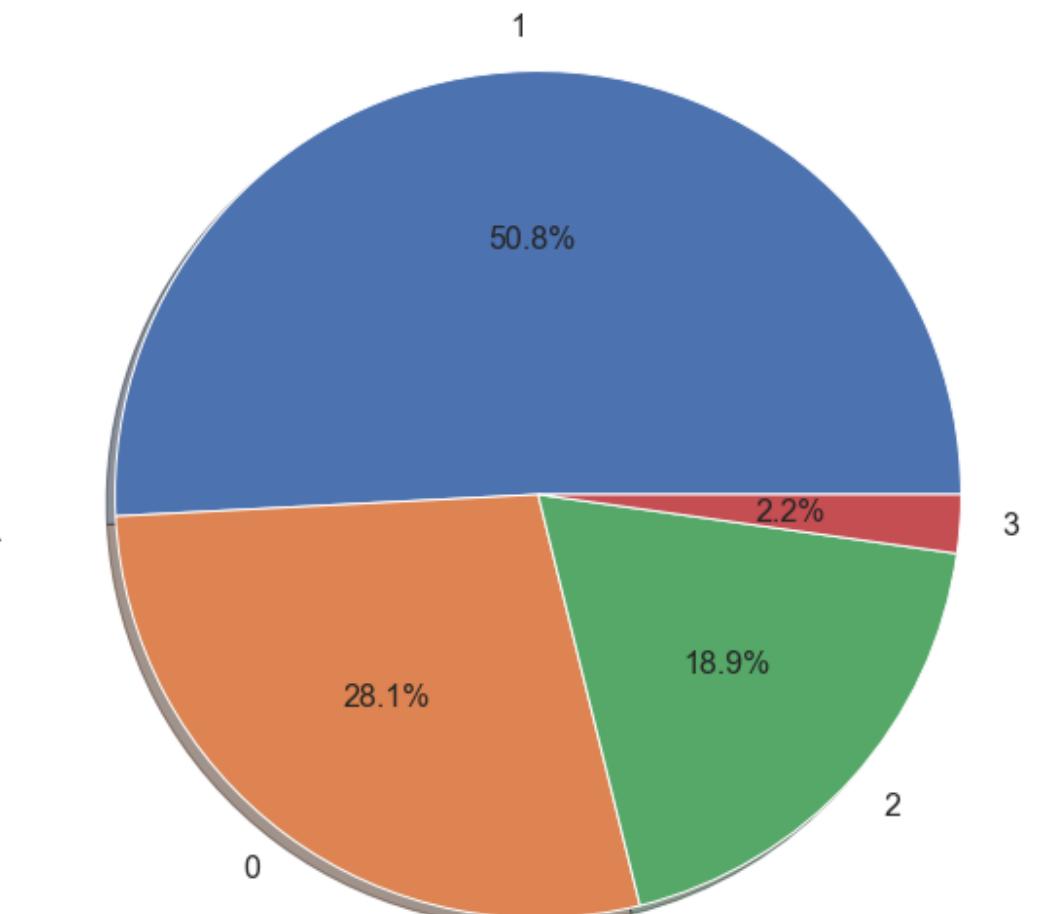
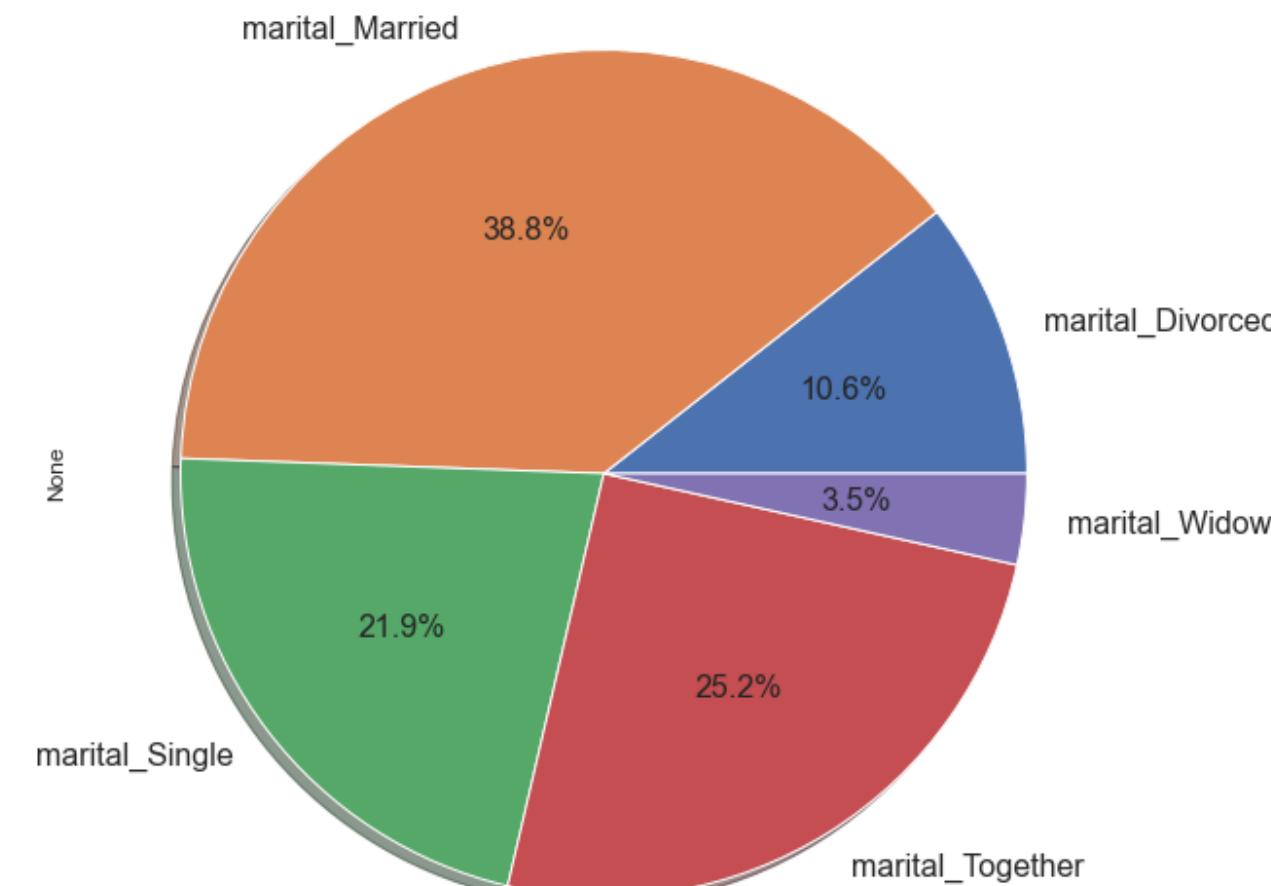
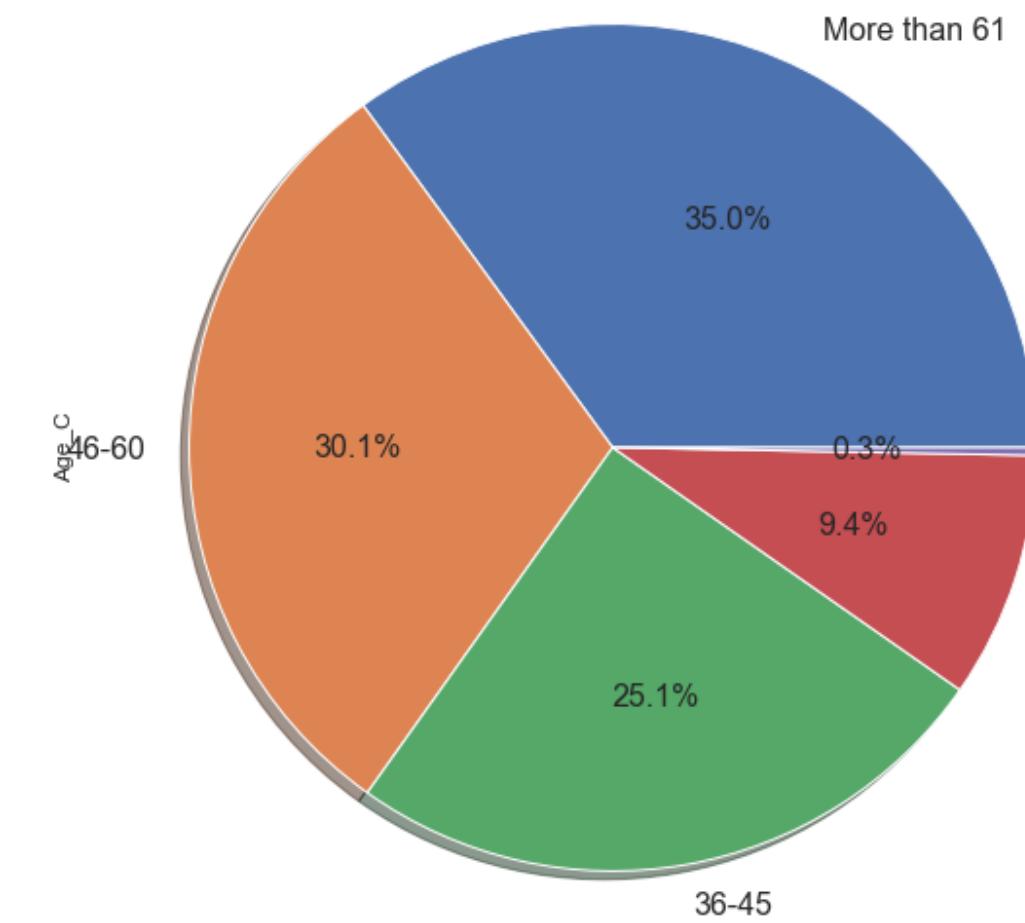


Enrollment Date vs Campaign Success Rate

Recent Purchases vs Campaign Success Rate

Customers Distribution - Personal

Most customers are elderly, married, and have one dependent in their household.



Customers Age Distribution

Customers Marital Status Distribution

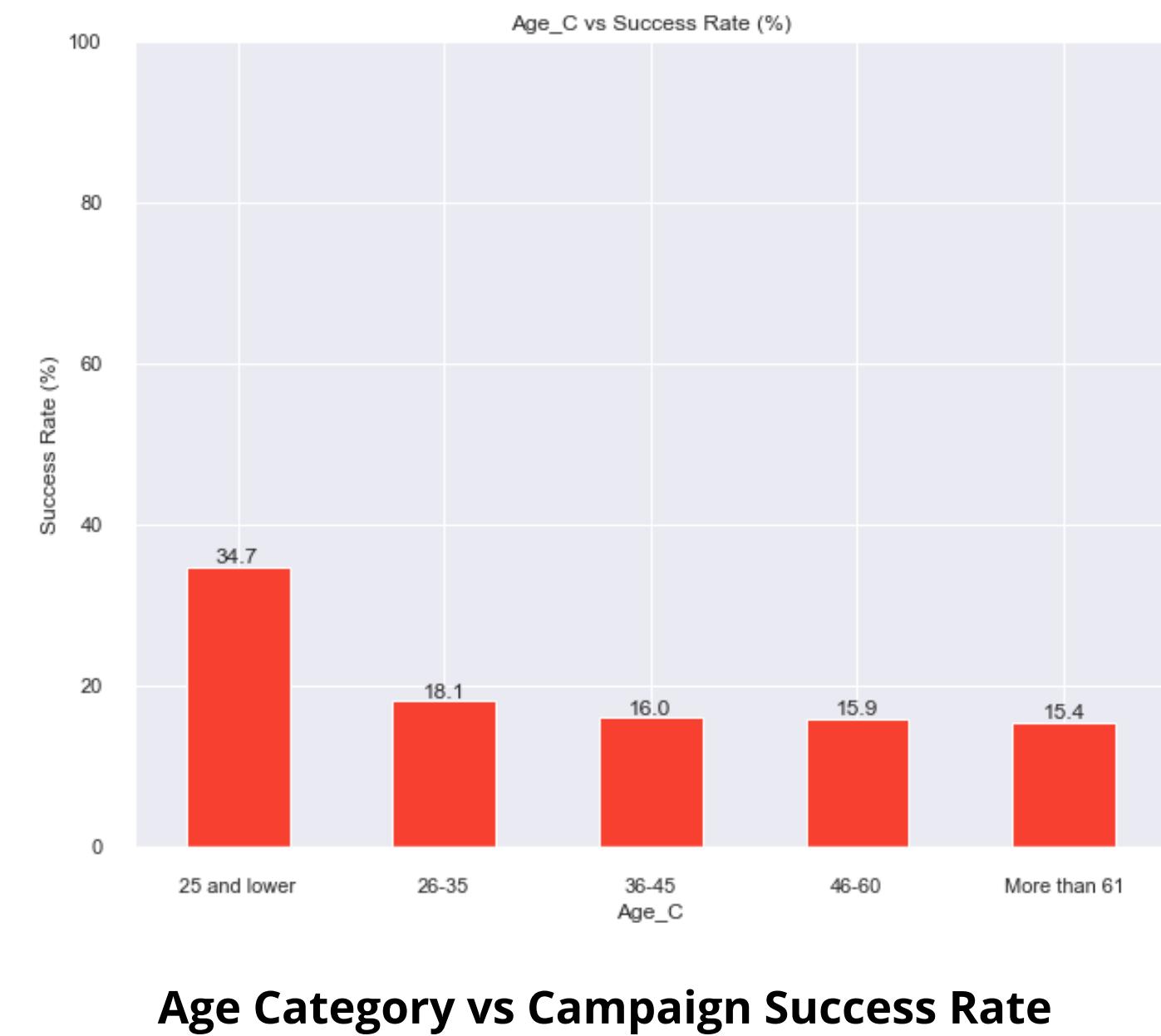
Customers Dependencies Distribution

Age is Just a Number.

Did the campaign's success depend on the age of the customer?

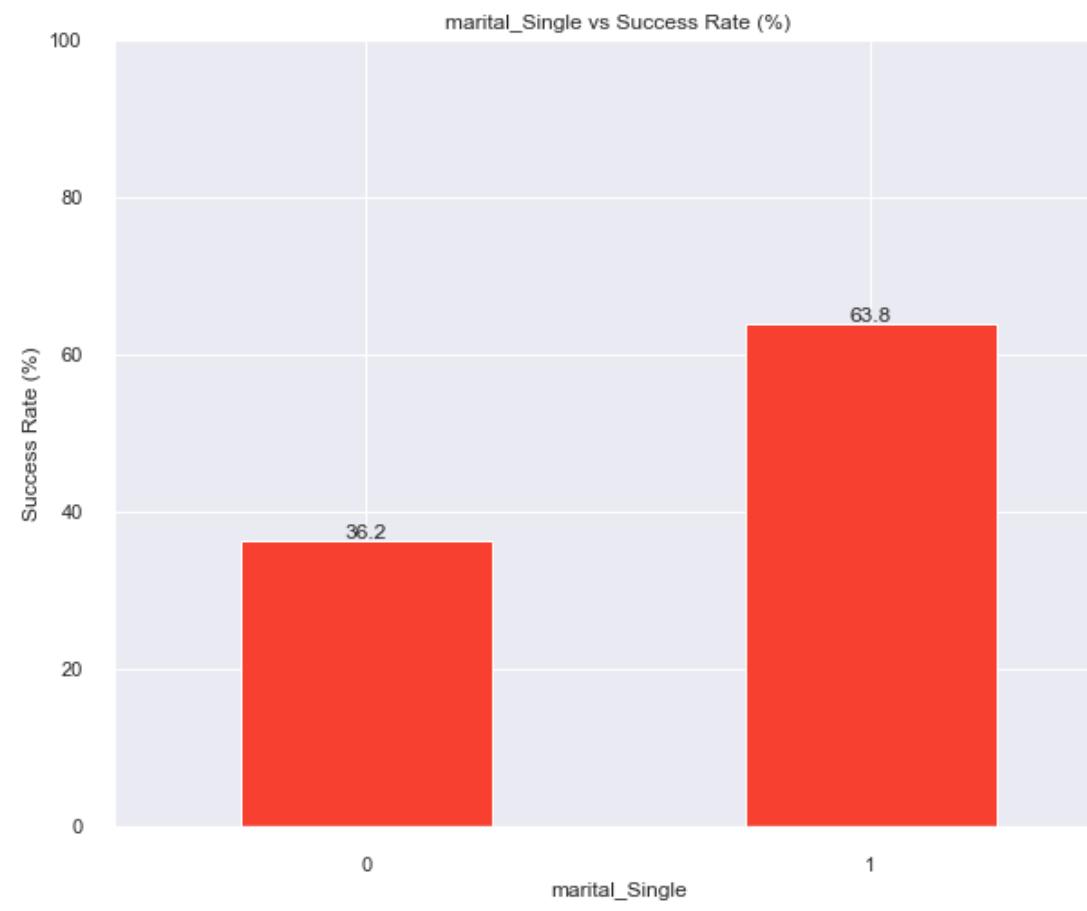
Yes, the campaign's success did depend on the age of the customer. The campaign was **most effective for an audience of customers aged 25 or younger**.

To improve the success of future campaigns, the marketing team could either target this age group specifically or **create a more compelling campaign that resonates with a wider age range**.

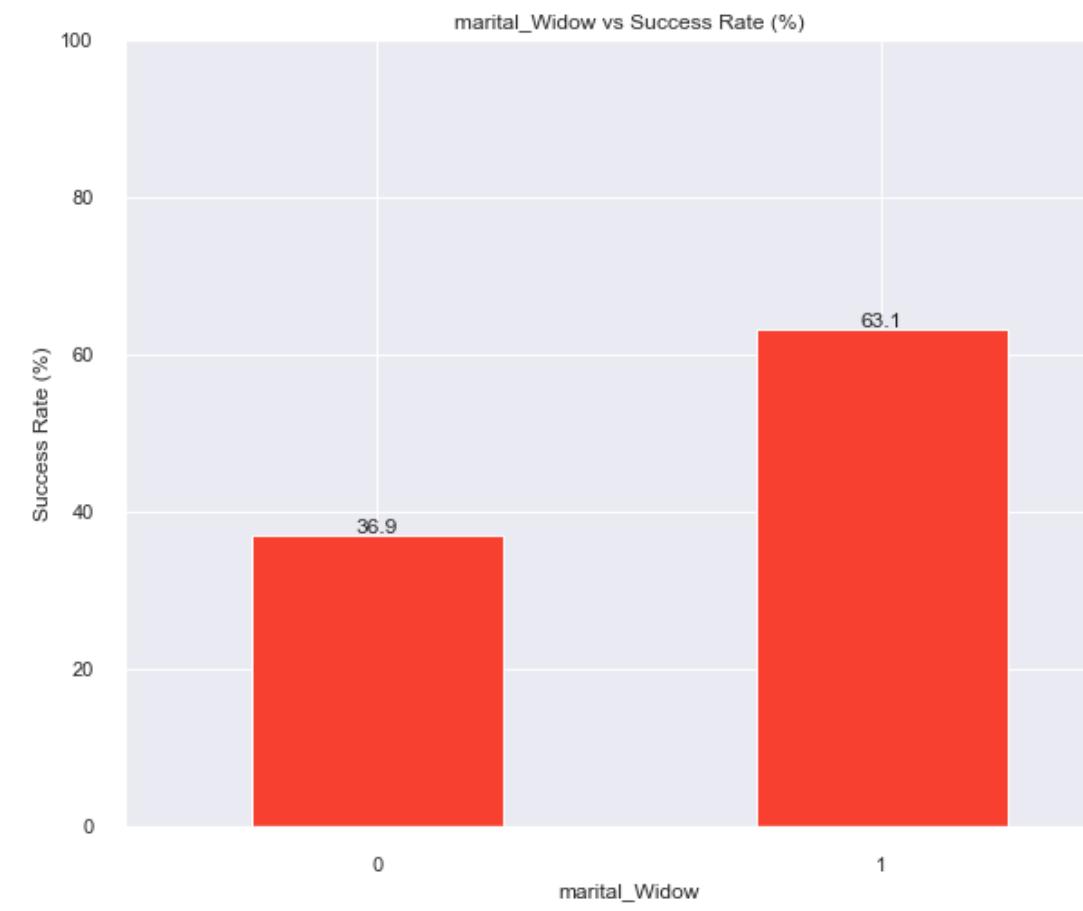


Being Alone is a Luxury That Not Many People Can Afford.

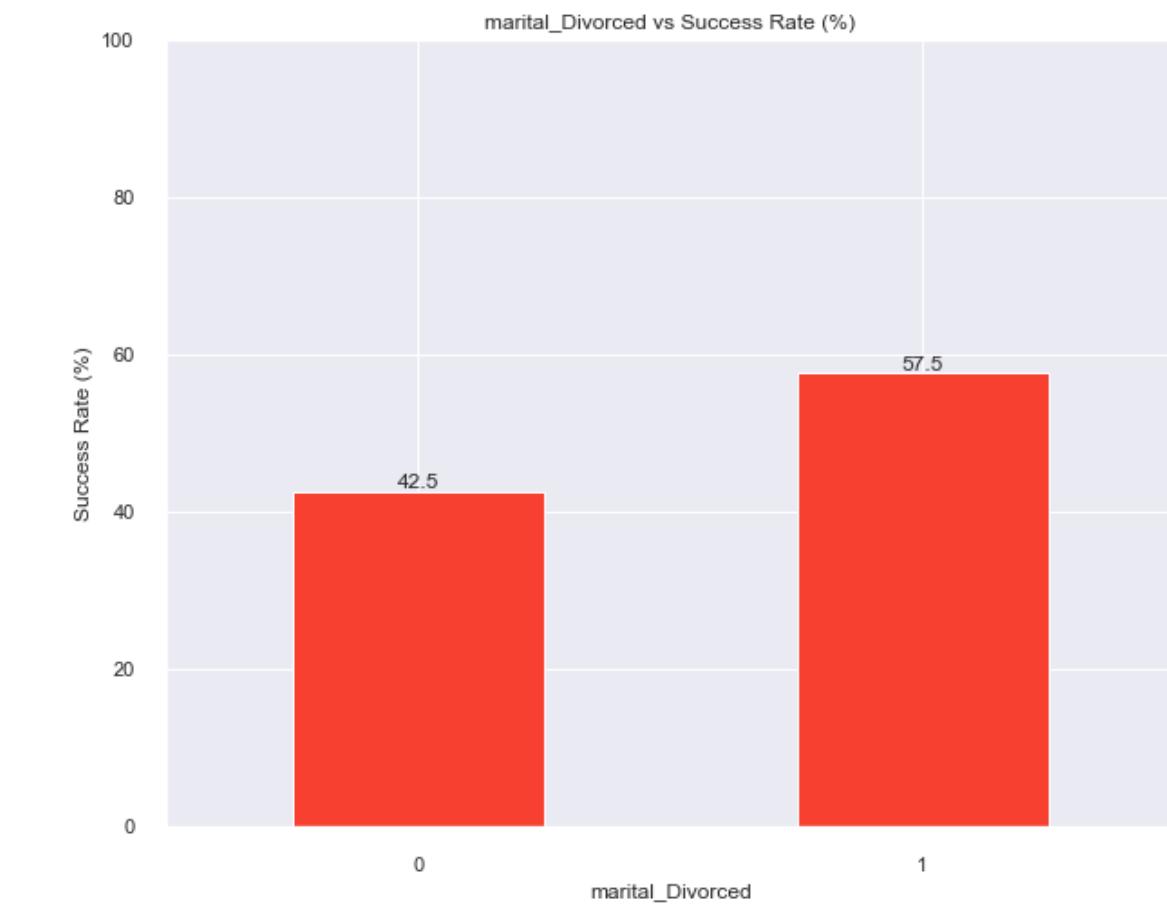
Assuming that all customers are living alone, the marketing campaign had the highest response rate from customers who were single, widowed, or divorced



Single



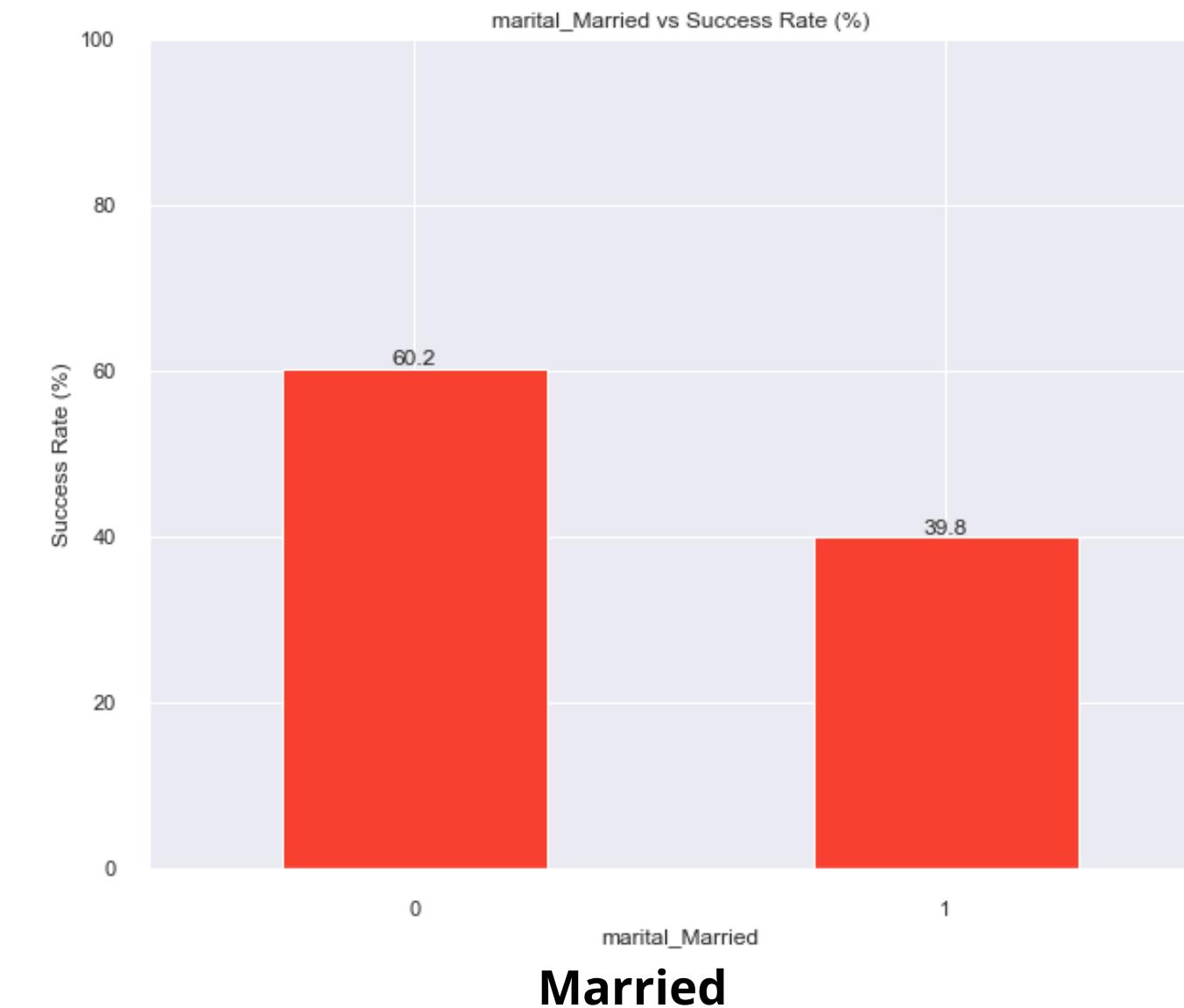
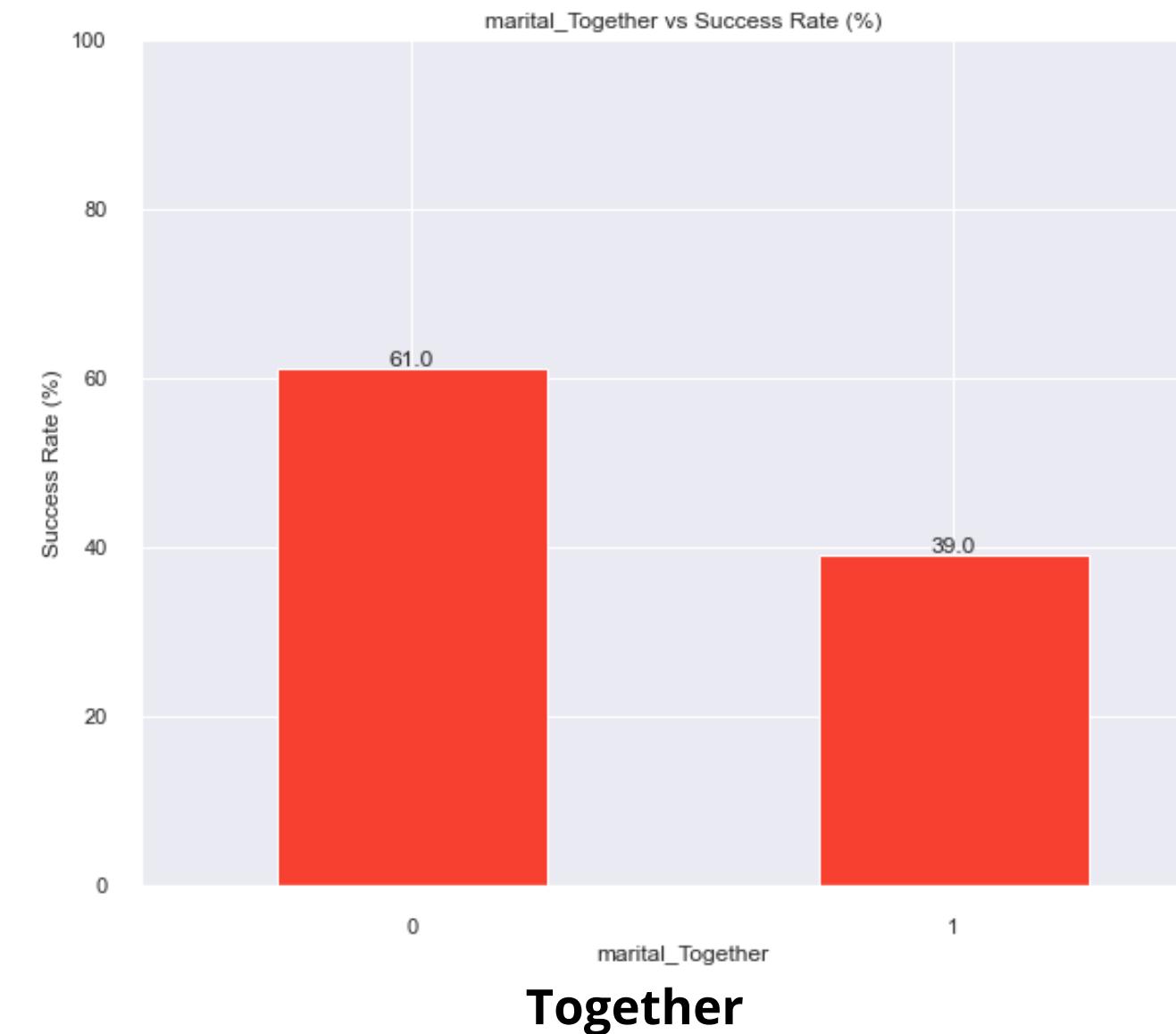
Widow



Divorced

What About The Ones Who Find Luxury in Others?

Married and cohabiting customers had a low response rate to the marketing campaign.

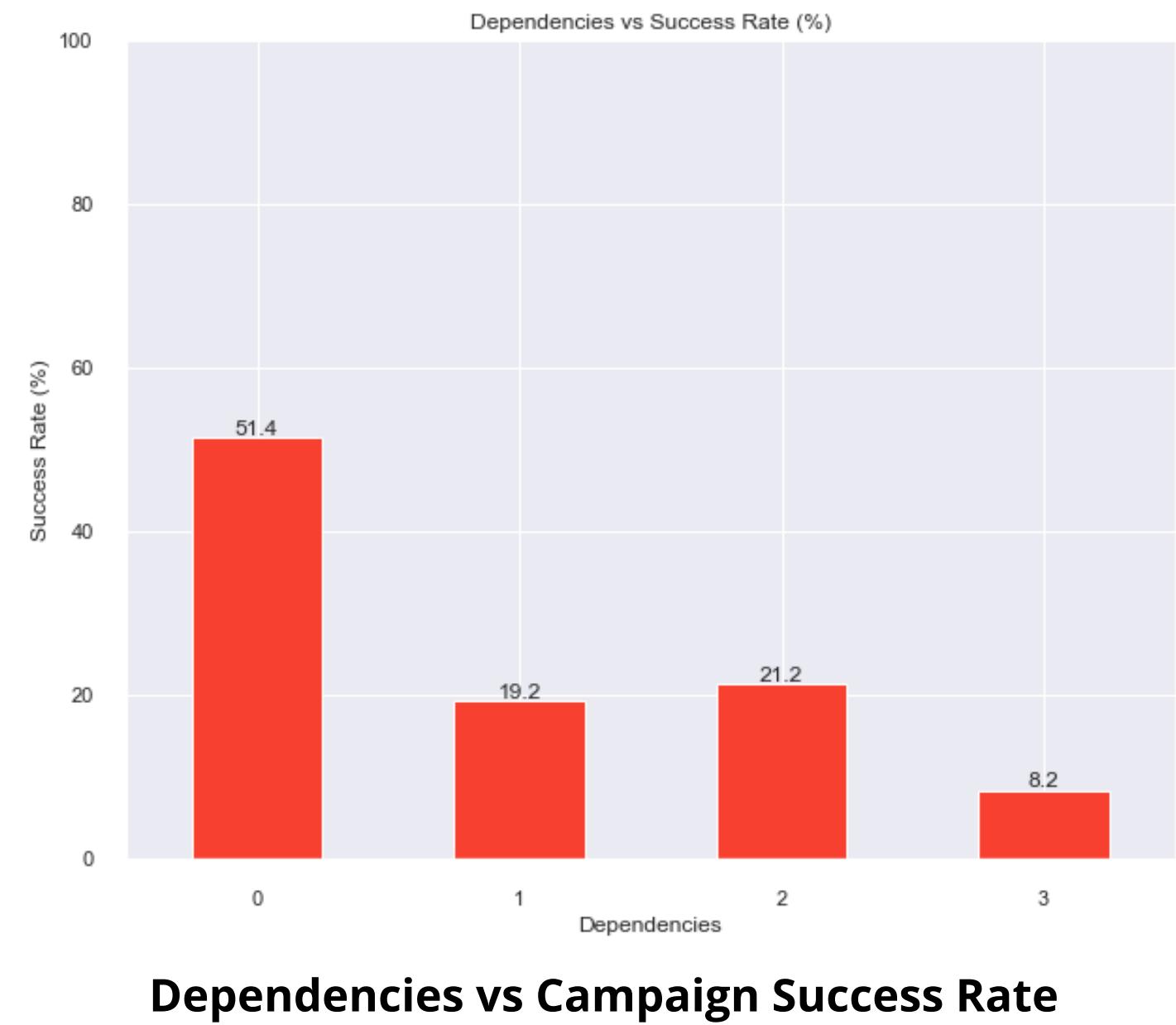


The more kids you have, the more wealth you accumulate - in memories.

Number of dependents in customers' households.

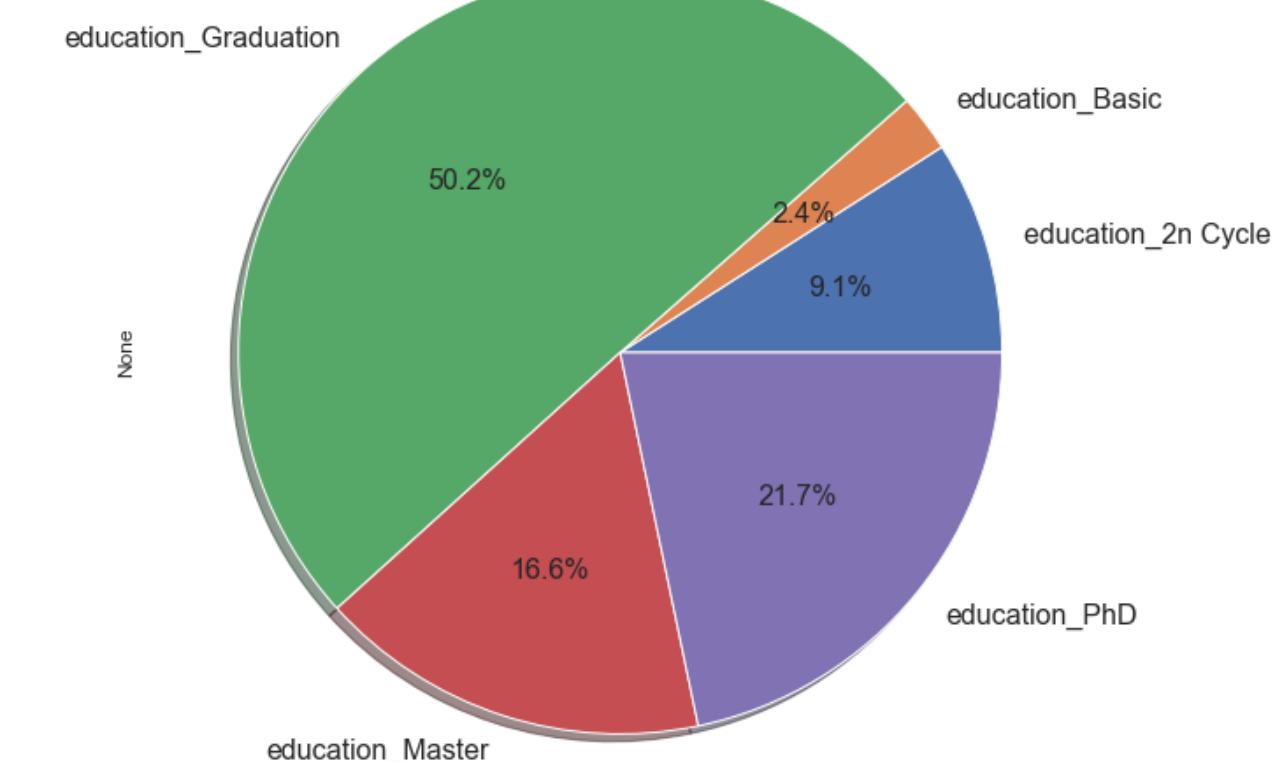
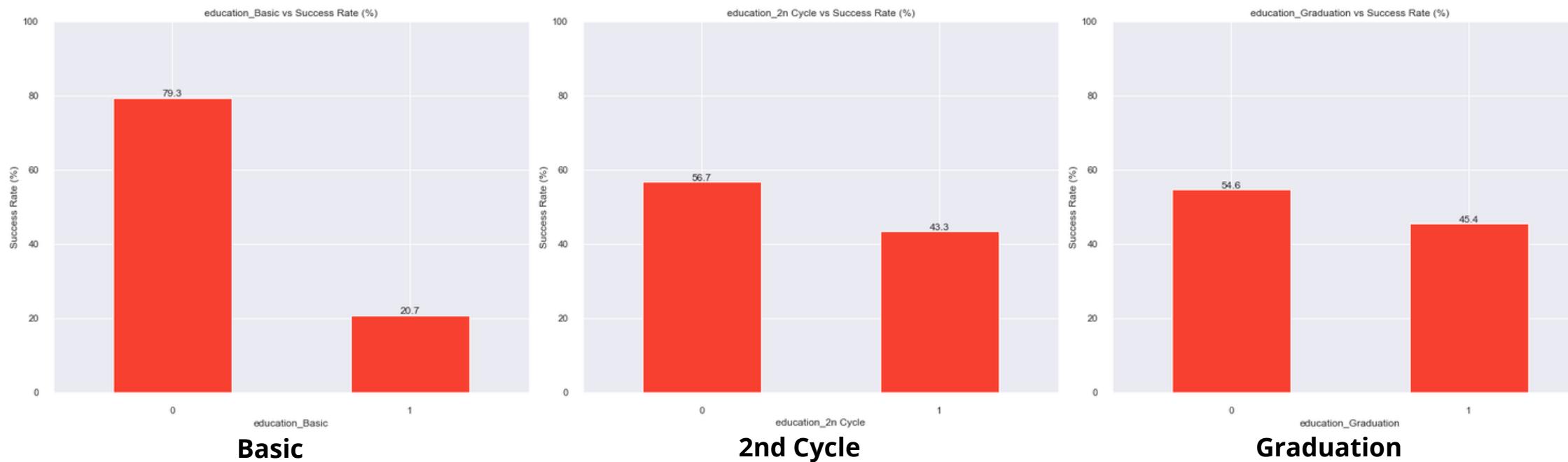
Customers without dependents had the highest response rate to the marketing campaign. This may be correlated with the fact that single customers also had a high response rate.

To improve the campaign's results, the marketing team could consider **targeting customers without dependents**.



Knowledge is Power.

Higher education level correlated with higher campaign effectiveness



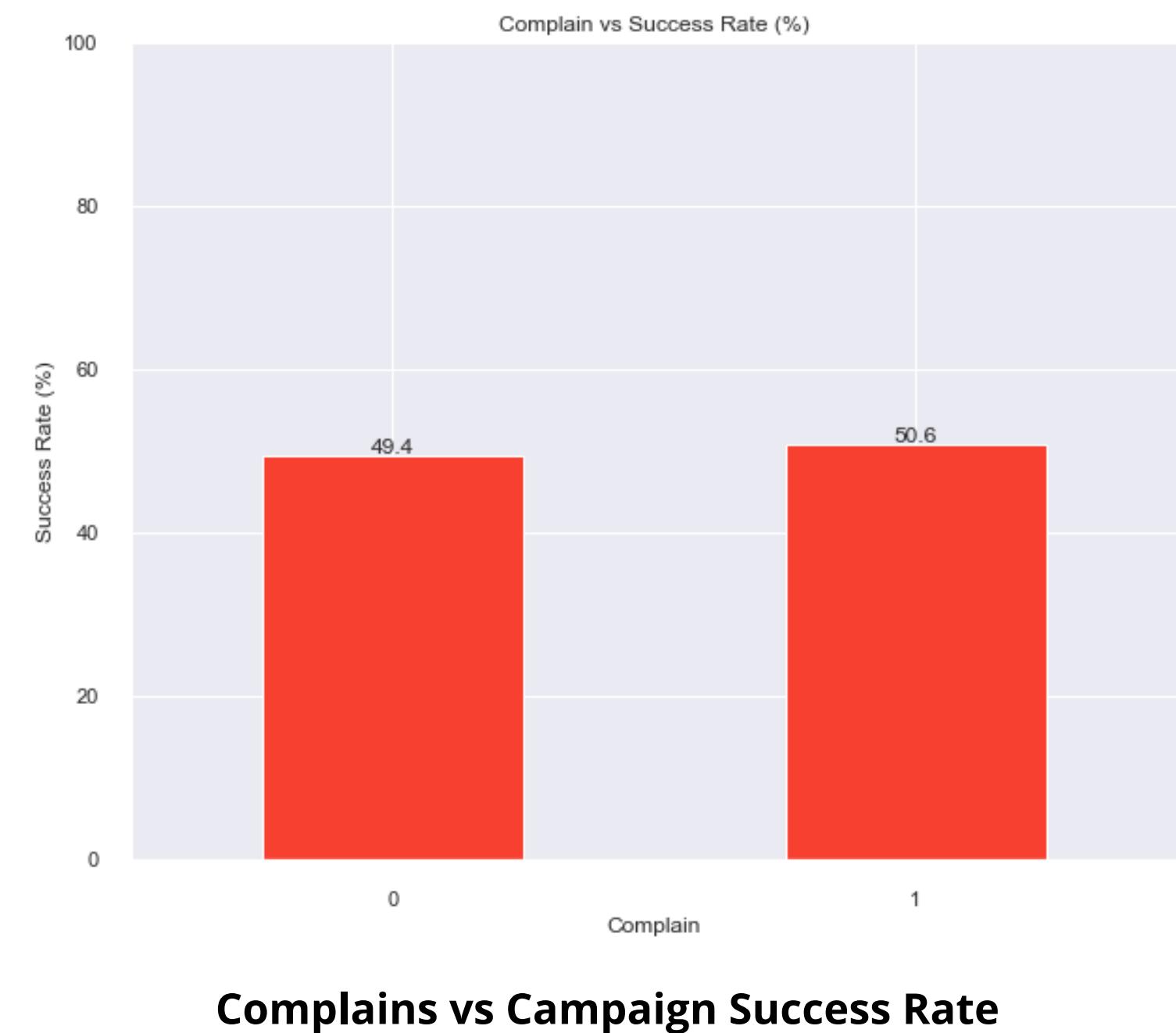
Education Level Distribution

The customer is always right.

Is there a correlation between customers who complained in the last 2 years and campaign effectiveness?

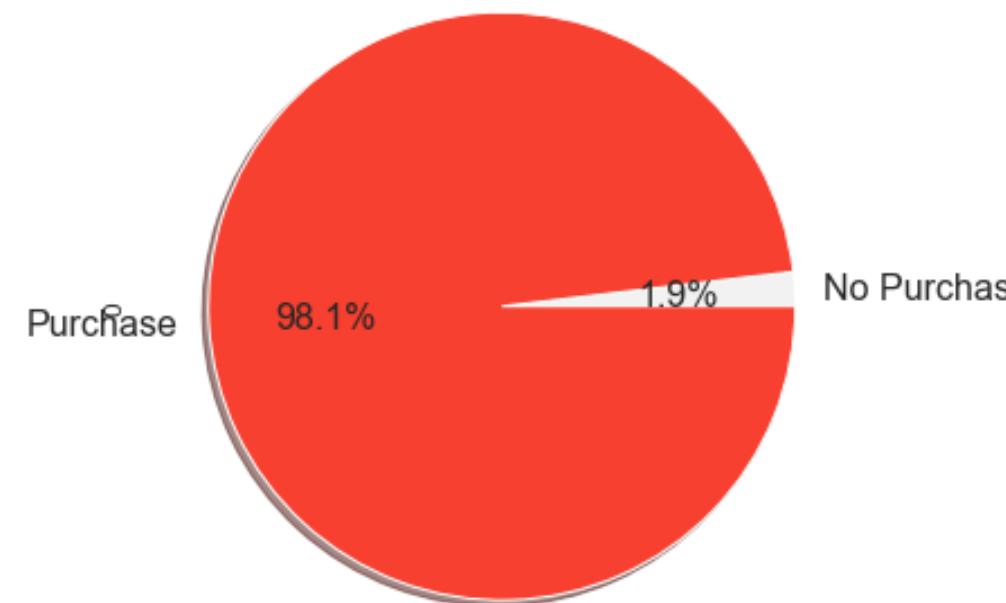
According to the plot on the left, **there does not seem to be a significant correlation between customers who complained** in the last 2 years and the effectiveness of the campaign.

Therefore, we can conclude that **customers who complained did not significantly affect their perception of the campaign or the company.**

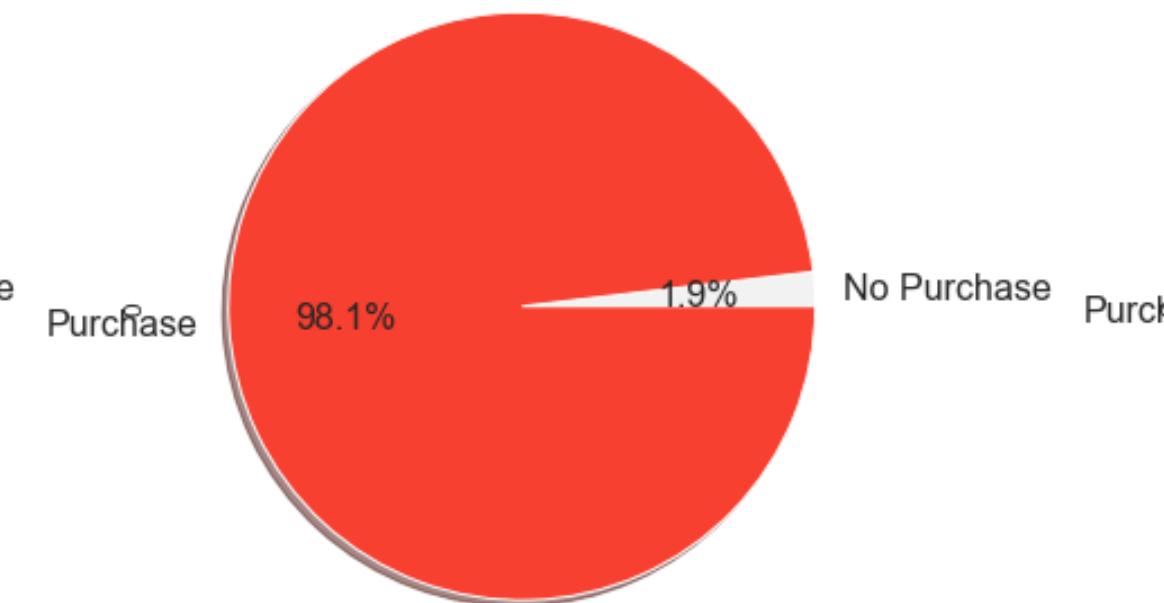


Purchases and Web Visits Distribution

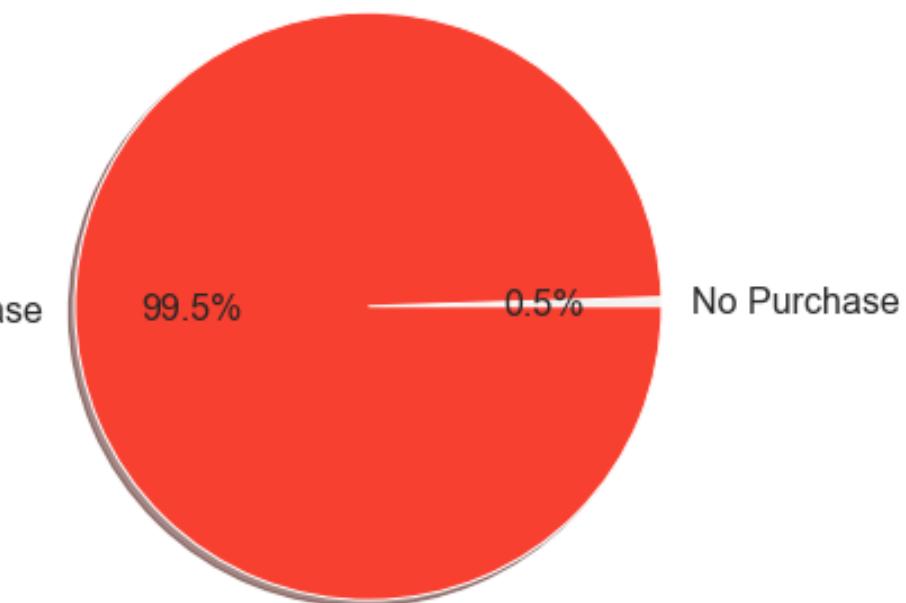
NumWebPurchases



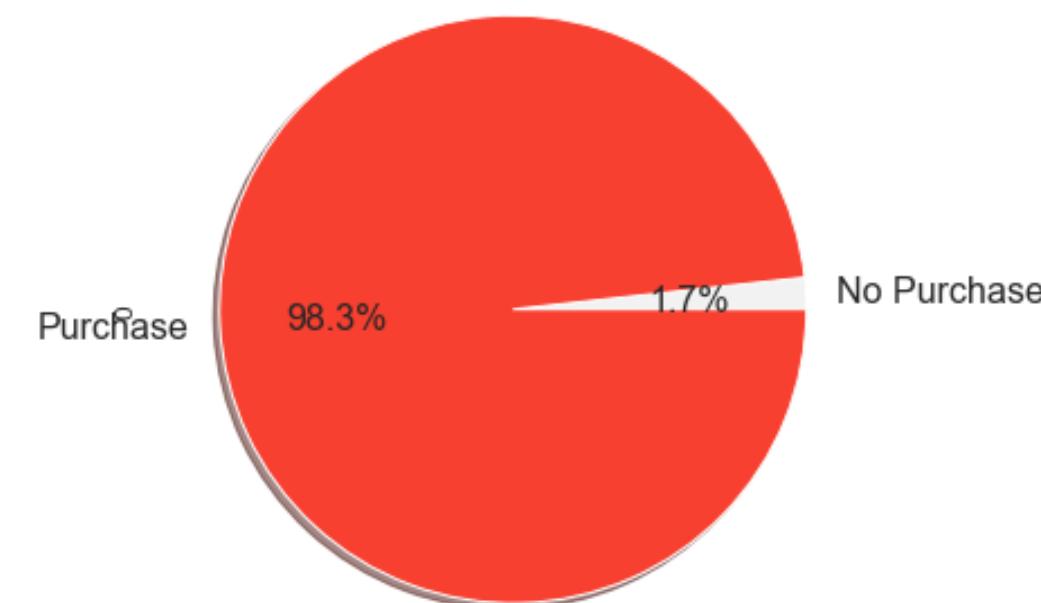
NumWebPurchases



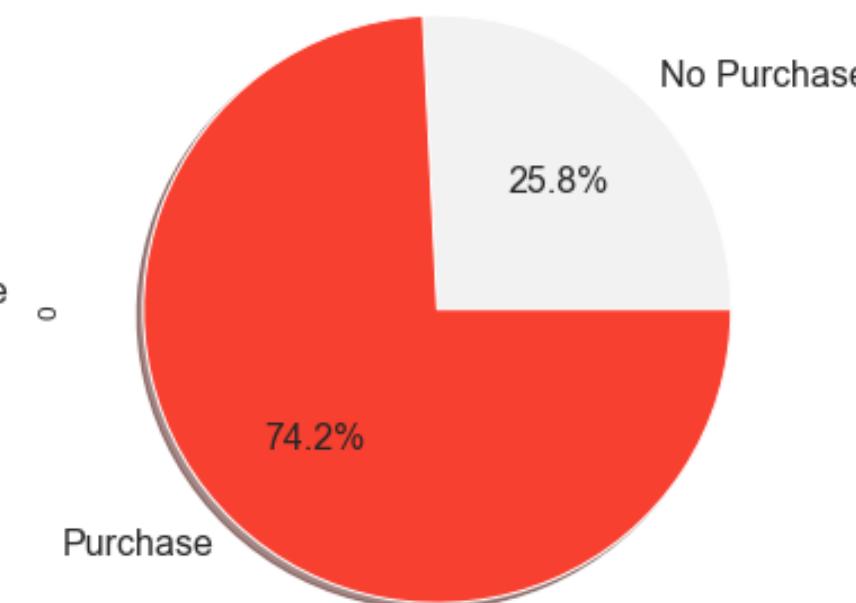
NumStorePurchases



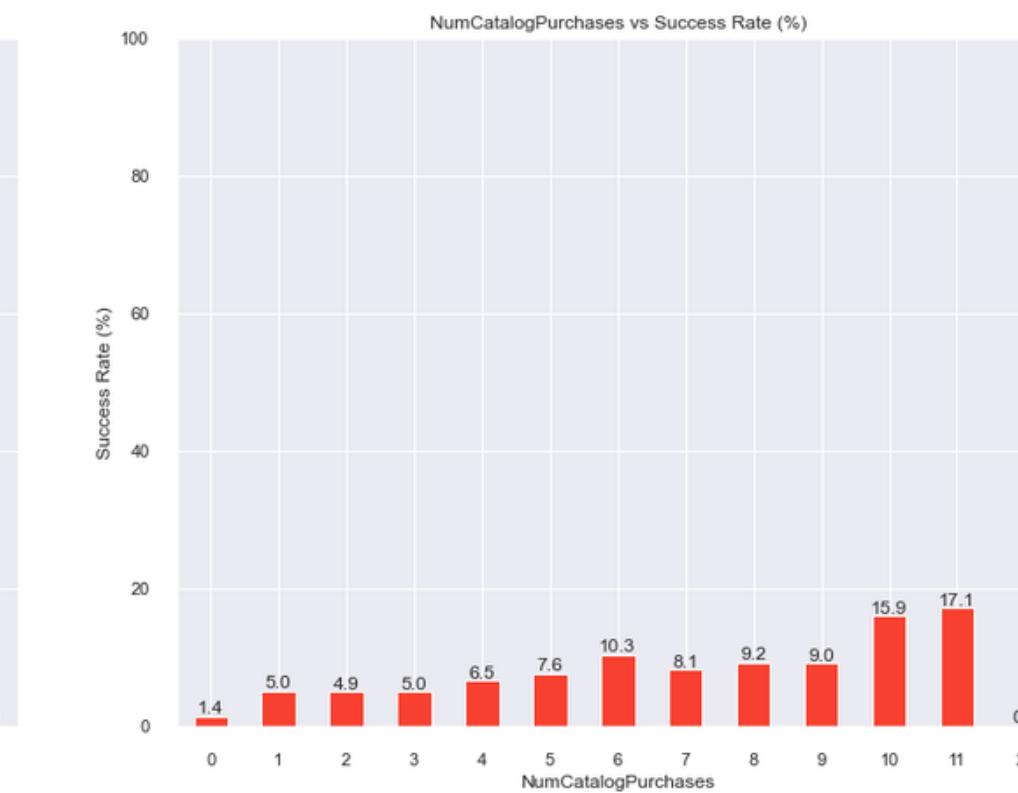
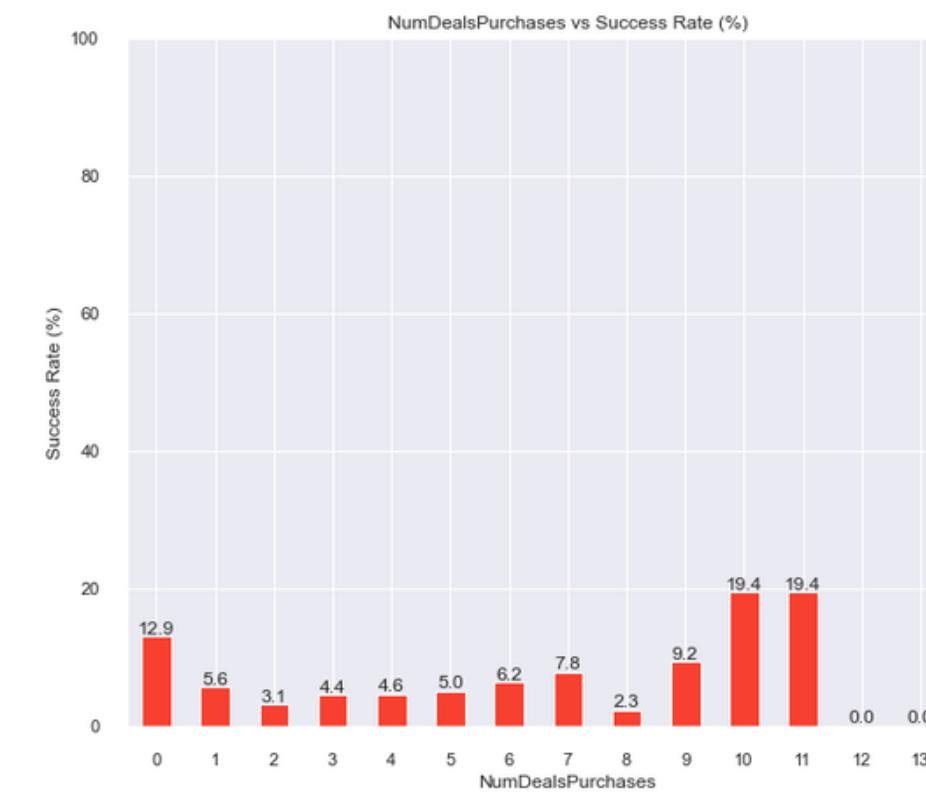
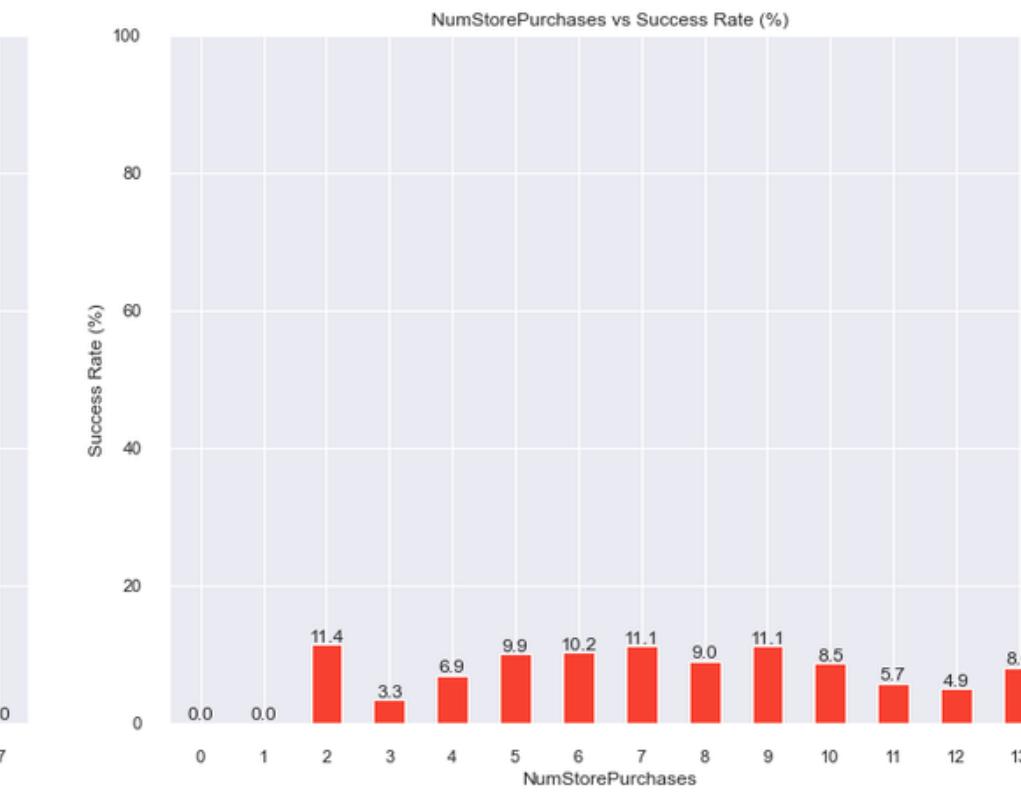
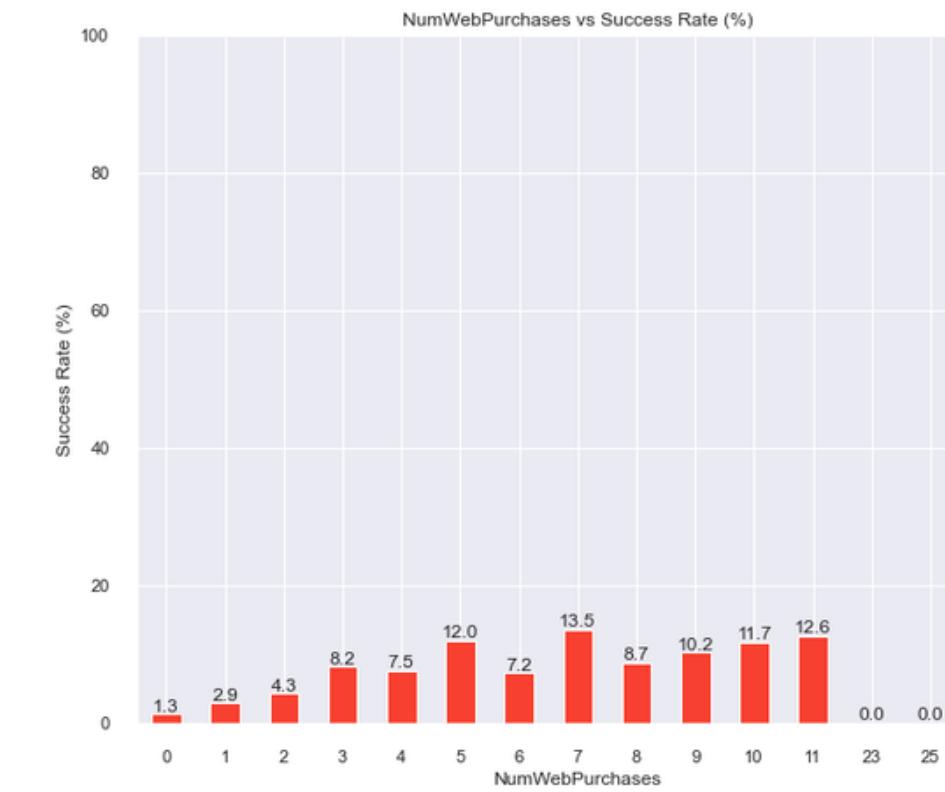
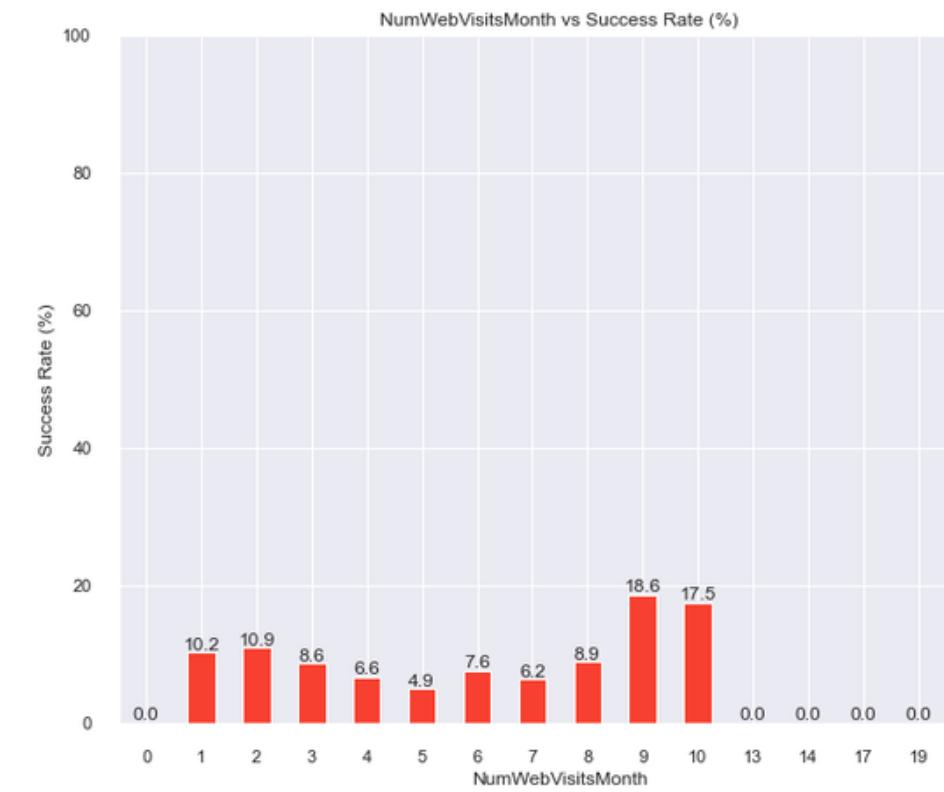
NumDealsPurchases



NumCataloguePurchases



Purchases and Web Visits vs Success Rate



Web shopping is the new normal.

Based on the distribution of purchases and web visits, what can we conclude about the correlation to the success rate of the campaign?

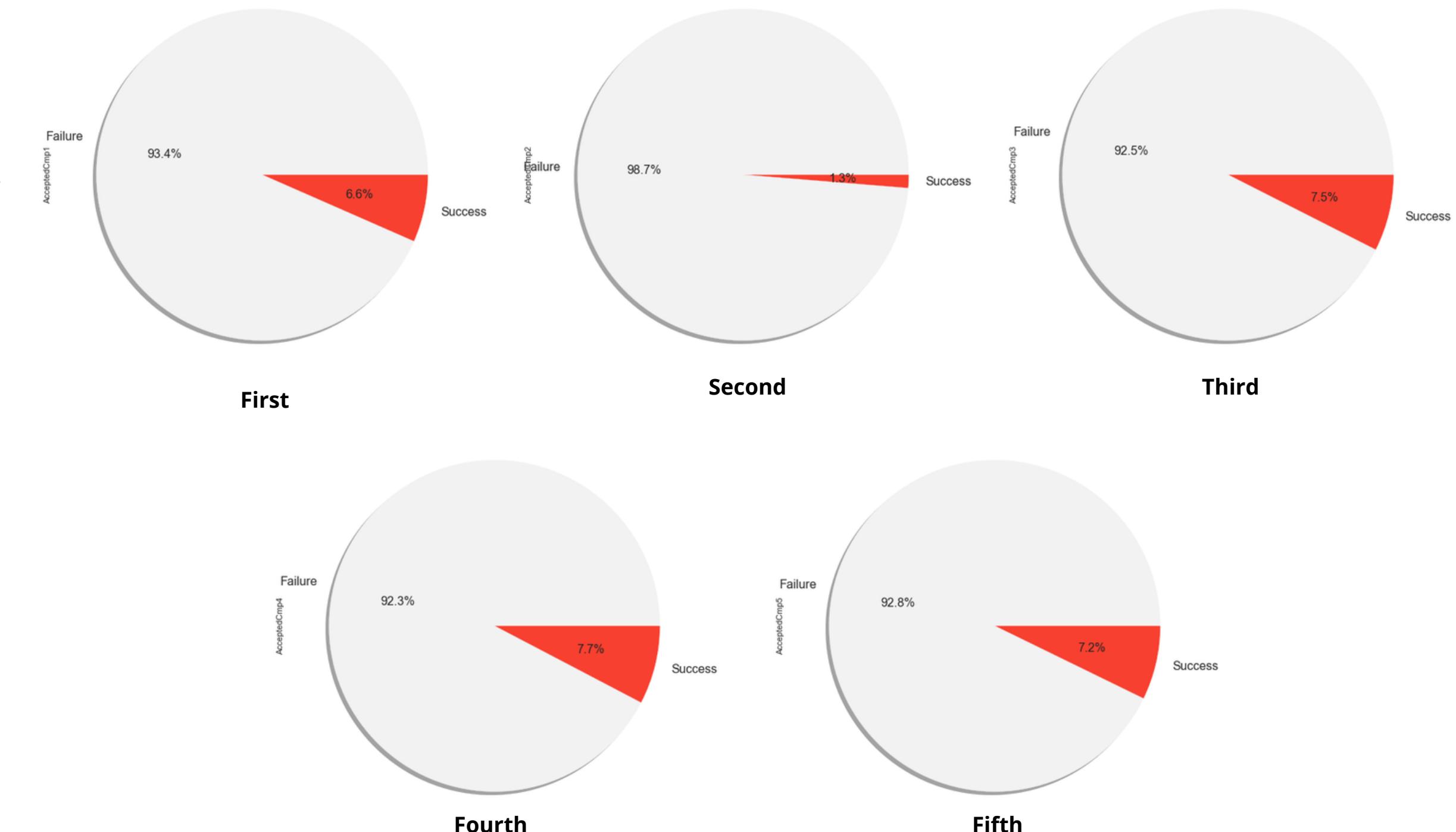
The marketing campaign appears to be **more successful with customers who spend more time on the web and make more purchases through web and catalog channels**. While the number of in-store purchases and deals may not have as strong a correlation with campaign success, there is still a relationship present.

To reach a younger audience (based on the analysis where younger audience give the best success rate), **web-based marketing campaigns may be effective**, while **utilizing traditional methods like catalogs can help appeal to a wider range of customers, including the elderly** (who is the biggest customer group) who may be more familiar with these mediums. By targeting both groups, it may be possible to increase the effectiveness of the campaign and expand the age range of customers reached.

Which message will appeal to Customers?

Campaign that is mostly accepted by the customers and most effective

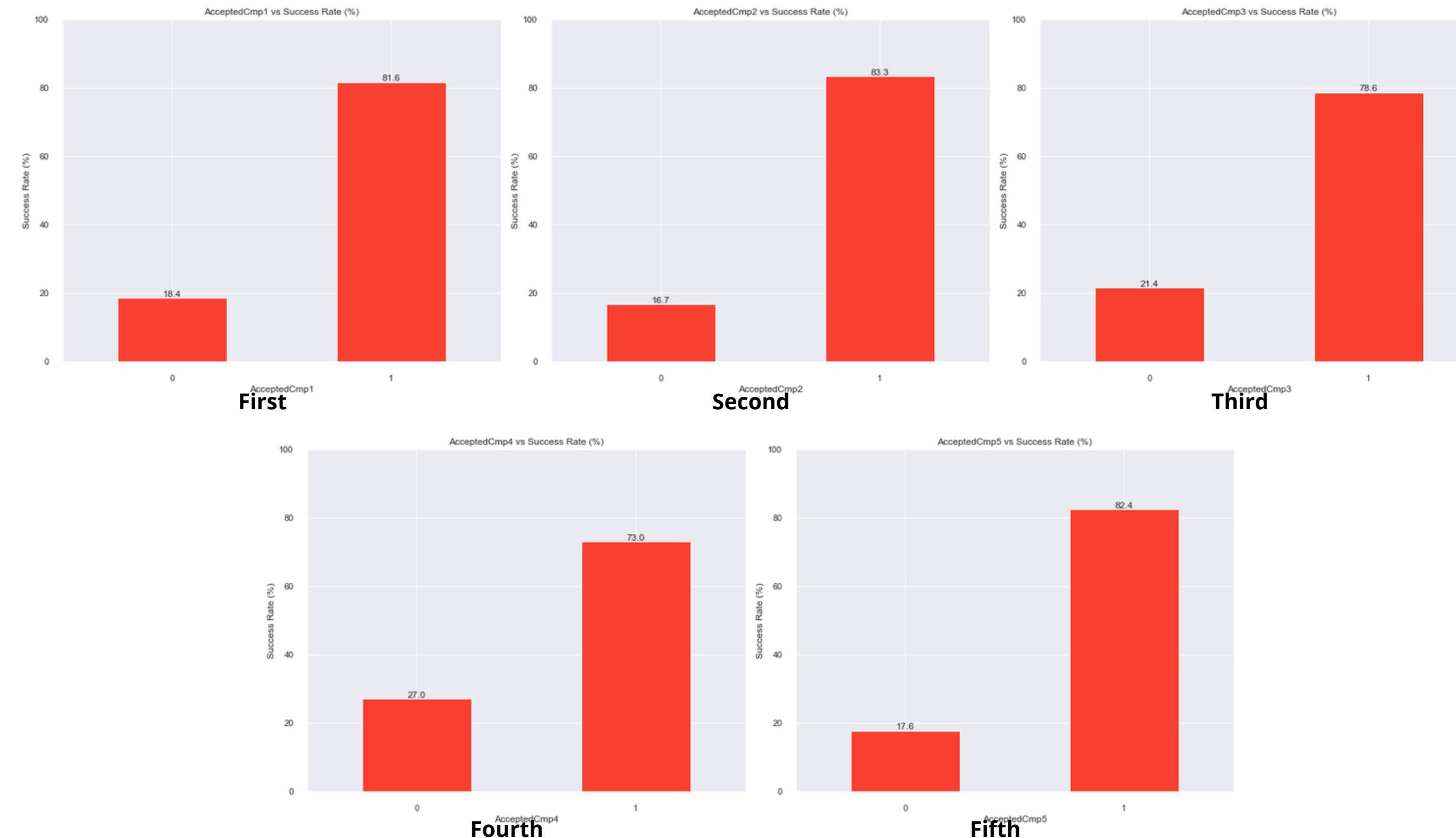
The fourth campaign had the highest success rate, followed by the third and fifth campaigns. The second campaign was the lowest performing.



To maximize the success of the next campaign, it may be helpful to **use the high-performing campaigns as models** and consider what elements made them successful.

Which Campaign is The One?

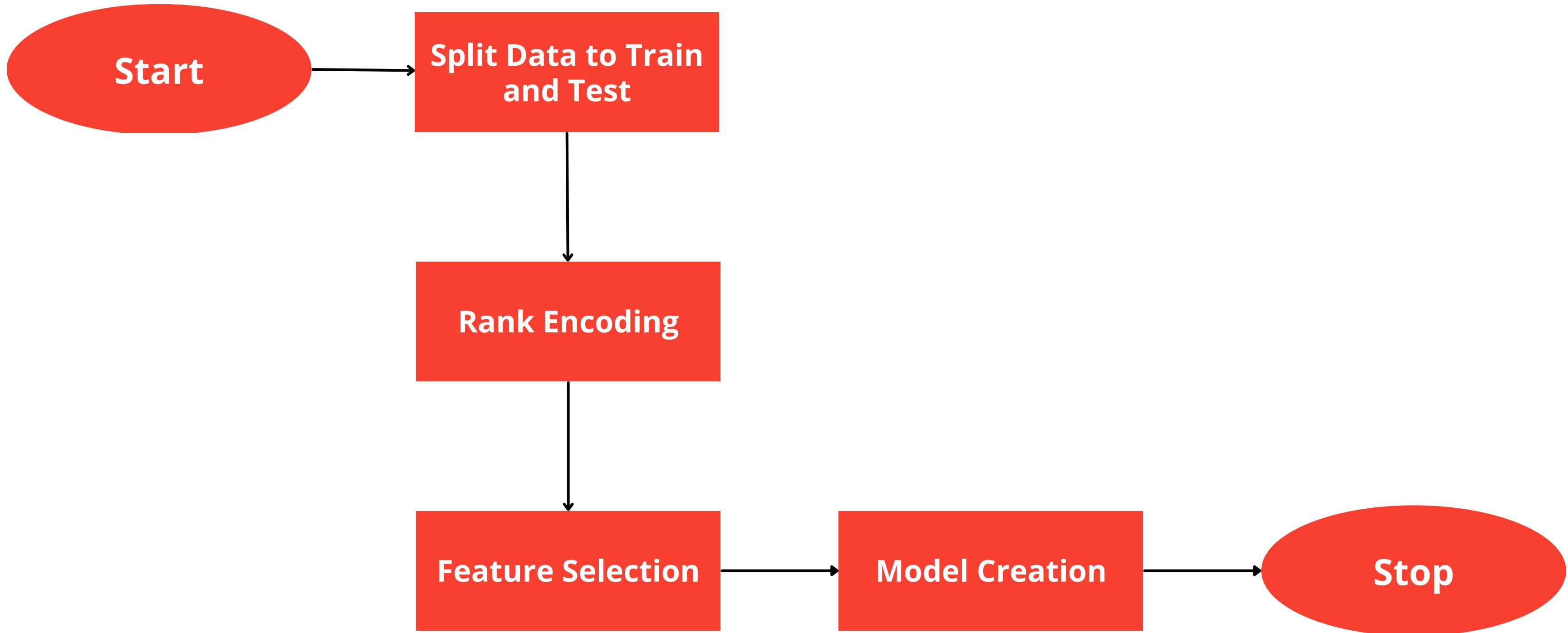
Customers who accepted previous campaigns tend to accept the last campaign.





Data Preprocessing

Straight to The Flow....





Model Evaluation

Decision Tree Model

Implementing Decision Tree Classifier

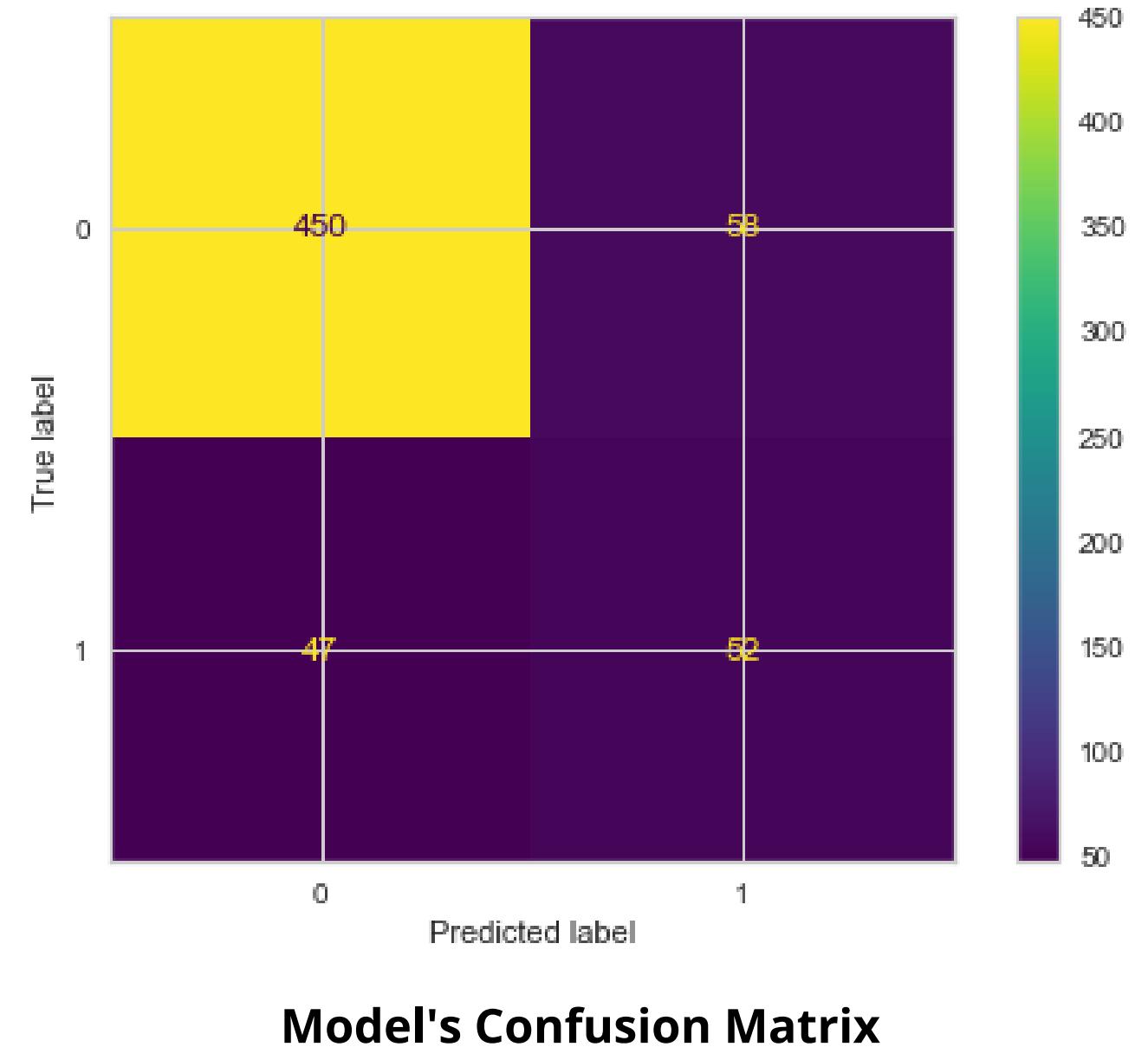
The Decision Tree model has **a relatively high F1 score and recall score**, indicating that it may be a strong performer in terms of both precision and recall.

Recall Score: 0.5252525252525253

Precision Score: 0.4727272727272727

F1 Score: 0.4976076555023924

ROC-AUC Score: 0.7036705639067844



Naive Bayes Model

Implementing Naive Bayes Classifier

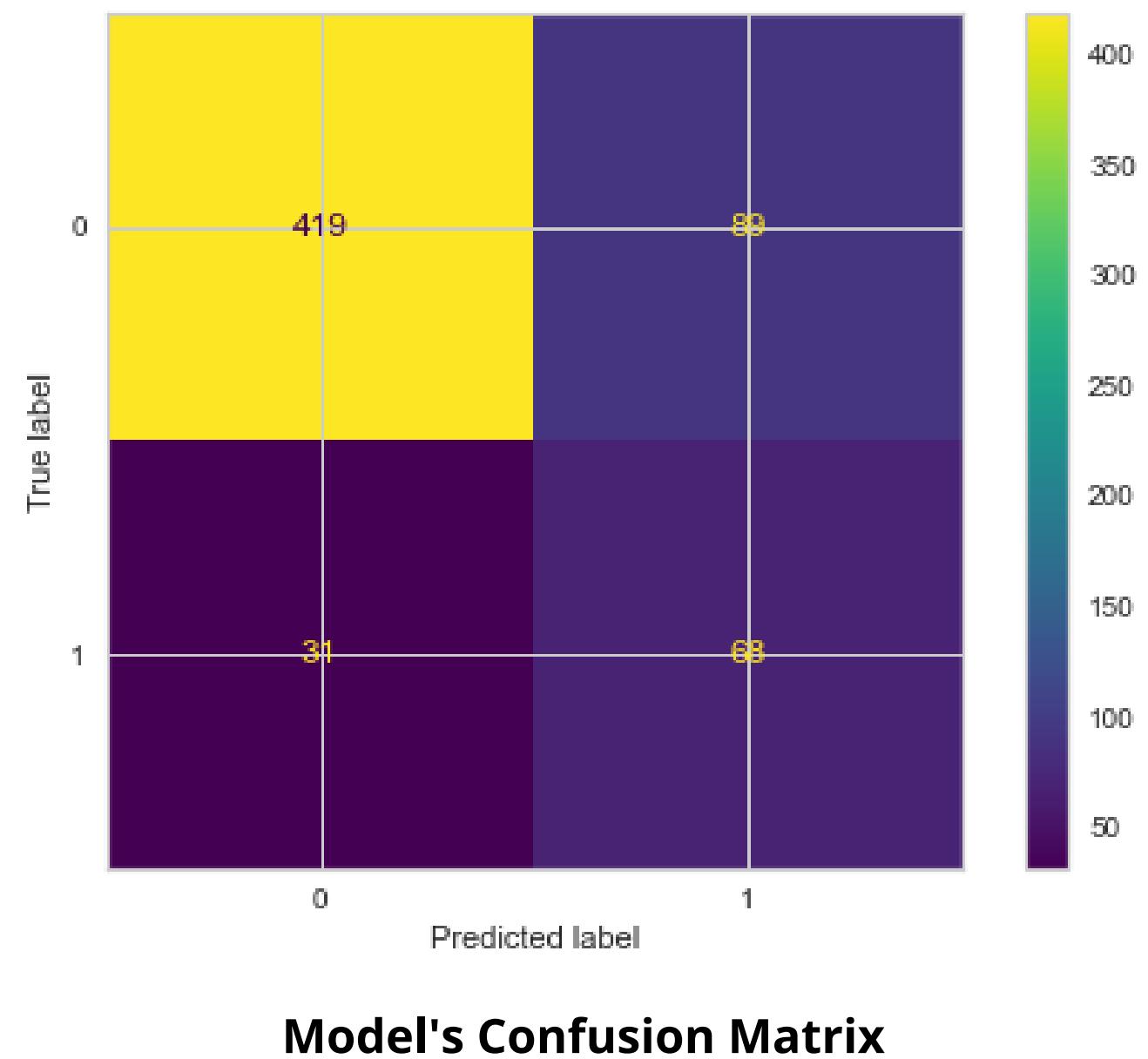
The Naive Bayes model has **the highest F1 score and the second highest recall score**, indicating that it may be a strong performer in terms of both precision and recall. It also has a relatively high ROC-AUC score, indicating that it is able to distinguish between positive and negative cases well.

Recall Score: 0.6868686868686869

Precision Score: 0.43312101910828027

F1 Score: 0.5312500000000001

ROC-AUC Score: 0.8133202099737532



Random Forest Model

Implementing Random Forest Classifier

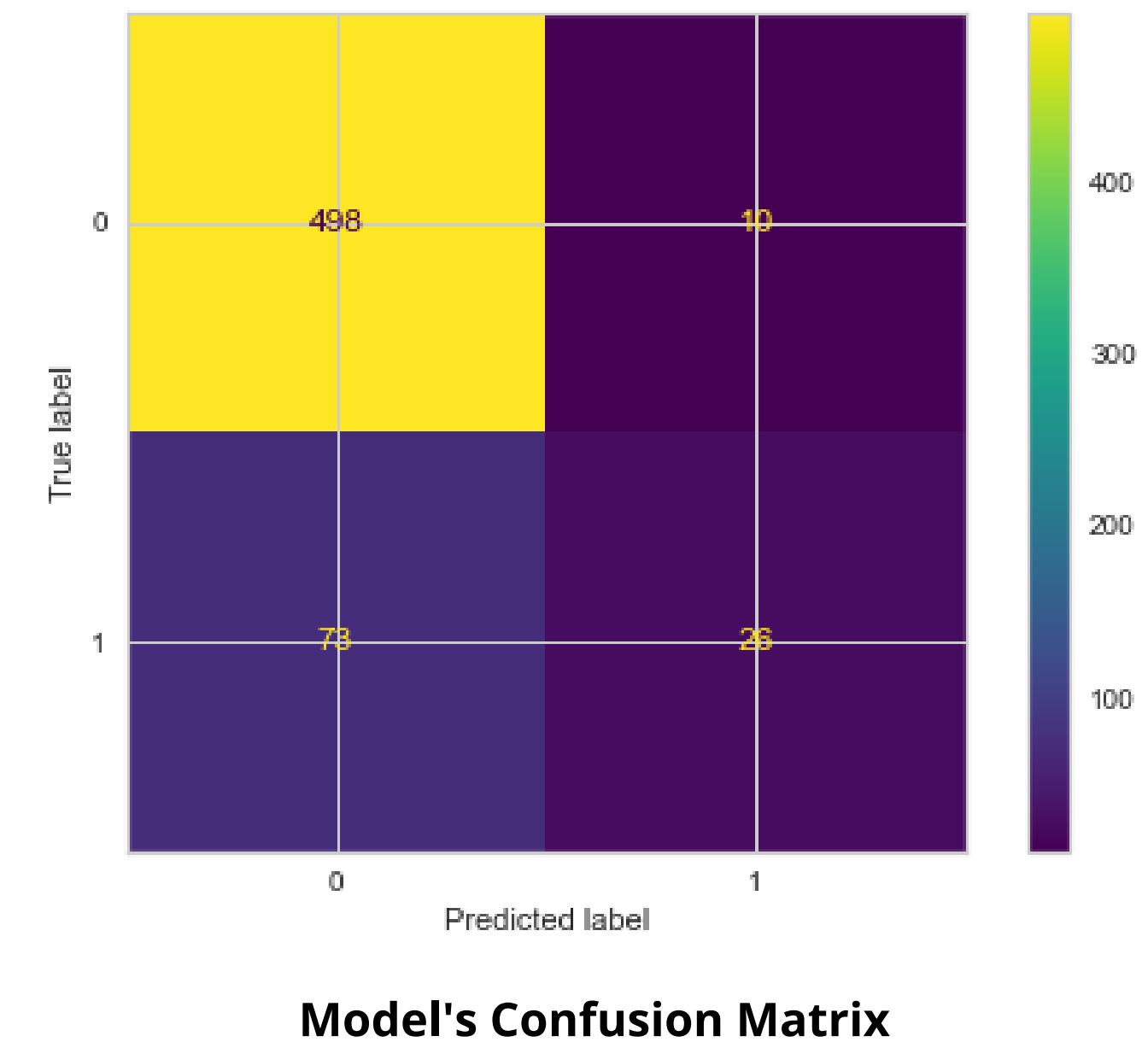
The Random Forest model **has the highest ROC-AUC score and a relatively high precision score**, indicating that it may be a strong performer in terms of distinguishing between positive and negative cases and minimizing false positive predictions.

Recall Score: 0.26262626262626265

Precision Score: 0.7222222222222222

F1 Score: 0.38518518518518524

ROC-AUC Score: 0.8524218563588644





Marketing Campaign Recommendations

Marketing Campaign Targets

The more precisely you can define your target market, the more likely you are to succeed in reaching and selling to them.

- Target middle class customers, recent buyers, loyal and long-lasting customers, younger customers, and those with no dependencies.
- Focus on higher spenders with total purchases of over \$2,000.
- Utilize web-based and catalog-based marketing campaigns.
- Target single, divorced, and widow customers, and those who responded well to previous campaigns.
- Avoid targeting married customers and those with low education levels.

Marketing Campaign Steps

1. Identify the target audience for the campaign: middle class, recent buyers, loyal customers, younger customers, customers with no dependencies, and high spenders.
2. Determine the channels to be used for the campaign: web and catalog.
3. Create targeted marketing materials and campaigns for the identified audience and channels.
4. Monitor and adjust campaigns as needed.
5. Analyze results and identify areas for improvement.
6. Repeat the campaign process with any necessary adjustments.

Campaign Success Rate Calculation

	Baseline Data Without Model	Test Data With Model (Random Forest)
Total Customer	2.240	672
Total Customer That Responded to The Marketing Campaign	345	485
Total Customer That Did Not Responded to The Marketing Campaign	1895	187
Campaign Success Rate	15,4%	72,17%
Success Rate Improvement		56,77%

Profit Calculation

	Baseline Data Without Model	Test Data With Model (Random Forest)
Contact Cost/Customer (\$)	3	3
Total Contact Cost of The Campaign (\$)	6720	2016
Gross Profit/Customer (\$)	11	11
Total Gross Profit	3795	5335
Total Net Profit	-2925	3319
Net Profit Increase		6244



**Thank You for
Reading My
Marketing
Analysis**