Technical Exercise Question 3: Statistical Analysis

To start this analysis, we are going to have to make some assumptions to make this experiment valid. There are so many factors that could affect the outcome of this experiment and things that could radically change our conclusion.

Assumptions:

1. We need to know the composition of the service providers responding to the request. Was it an even spread of vendors? Or for example, was there far more plumbing requests then catering requests? Because of the amount of information we are given, it is impossible to know. For the sake of this analysis, we will assume there was an equal amount of vendors for every industry responding to each of the four variations.
2. The price of each request is not given. The amount that the quote would be worth would no doubt have an effect on the vendors decision to quote the job or not. For example, if one vendor got a request that could return $200 while another vendor got a request that could return $20, there is a much higher chance that the vendor that could get $200 would accept the request. For this reason, we will assume that all of the prices are very similar.
3. It is said that a split test was used to create this data set. We will assume that each variation is based on the baseline form and only one thing was changed in each variation.
4. The region in which a request was submitted has great relevance to the volume of workload a business has. We would assume a plumber in New York city is going to have a much higher workload than a plumber in Glenwood Springs, thus making some vendors more likely to take a request than others. For the sake of this analysis, we will assume that the workload of each vendor is the same.
5. We have to also assume that the number of viewers is correlated with the number of quotes. If these two things were not correlated, then the few computations that we could run on the data would not be meaningful.
6. What are you trying to accomplish by doing this test? I will assume you are doing this to get the most quotes filled as possible.

Now that we have established the assumptions we are going to make, my analysis of the data is as follows:

Analysis:

Clearly, Variation 3 had the highest success rate, 8.4%. Variation 2 had the lowest success rate, 2.9%. With the context that we are given, the most meaningful statistic is the success rate for each variation because we just don't have enough information about the other factors affecting the data.

The success rates are:

Baseline: 5.4%

Variation 1: 5%

Variation 2: 2.9%

Variation 3: 8.4%

Variation 4: 6.6%

Mean Success Rate: 5.7%

Median Success Rate: 5.4%

Standard Deviation(σ): ±1.8%

As stated above, we can see that the standard deviation is ±1.8%. All of the variations are within 2 standard deviations of the mean. Since every data point is within 2 standard deviations, I think that it is fair to say that this data set has no clear outliers.

Now let's look at the correlation between quotes and views.

Using Desmos.com for the regression:

Where x = (595, 622, 606, 578) and y = (32, 30, 18, 51, 38)

$r^2 = 0.1755$

The regression shows that a high number of viewers, does not necessarily correlate with having more quotes. This is the case for Variation 2. Variation 2 has the highest number of viewers, however it has the least number of quotes. Clearly, the changes that were made to these forms were major enough to cause people to notice whatever the change was; with the r^2 being just 0.1755. This weakens the case for Variation 2 even further. For that reason, it is not valid variation.

<u>Conclusions and Comments:</u>

Based on the statistics that we found in this analysis, I would draw the conclusion that Variation 3 was the most successful at encouraging vendors to send a quote. Variation 3 has the highest success rate, and the most quotes. I would recommend that Acme Corp replace the baseline form with Variation 3.

This conclusion is not as concrete as it could be. With this particular data set, there was not enough information or data to get a good gauge of what the best choice was. If I were to run this experiment again, I would do it for specific industries in specific places.