MBA 546 Case Report, Week 1
Topic: Consultant Expenses
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Consultant Expenses

Executive Summary

I am an analyst in a large consulting firm in the internal analytics group and have been assigned to look after the consultant's expenses. We are also responsible for trying to find a way to get the expenses down by using behavioral nudges. The first part was to find out which consultant expenses belong to the top 10% and followed by examining the outcomes of a pilot trial my team conducted to reduce costs. The data was achieved by sending emails to the company's top expense-generating consultants alerting them they had the highest expenses. I also kept track of their day-to-day expenses; likewise, their expenses a month later, and three months later. In this report, I have explored whether the email caused the consultants expenses to be cut down instantly or over a time period. Before the experimental intervention, three consultants from New York and Chicago have their expenses in the top 10%. Also, we can also see that the mean and standard deviation of consultant expenses were higher in New York than in Chicago. However, after implementing the pilot experiment the situation improved in the short run. Furthermore, we also conducted experiments to figure out the degree of the experiment's impact on the expenses; hence, the paired t-test was conducted. The test was carried out in the first month and one month after the email was sent. This test revealed that the mean had changed significantly, reducing the expenses. Later, another t-test was conducted between the initial month and three months that revealed that it increased the expenses considerably. After completing the paired t-tests on both initial and three months; we find out that six consultants have expenditure in the top 10% in both New York and Chicago. Although the pilot experimental intervention has reduced the expenses initially; it failed to do the same in the long run. I believe that the intervention technique should be developed to keep the result of cost-reduction consistent even in the long run.

Introduction

A list of consulting firms from New York and Chicago with their expenses were provided to me. I have been asked to identify the consulting firms with daily expenses above 10% among the listed firms in both cities.

To figure out the impact of the intervention to increase the cost-effectiveness of the firms; I calculated z-scores, mean, standard deviation, and percentile to accomplish the first task and conducted a paired t-test to complete the second task.

Data

To complete the provided tasks, I was provided with charts of daily expenses and expenses of firms after implementing an intervention to reduce the costs. The given data highlights the situations of 155 consultants' firms from New York and Chicago. I used Microsoft Excel to do the required calculation, and found out the consultants with the most significant daily expenses were 797 (Burg Dorr from New York)

and 491 (Massimo Dippel from Chicago). They were above the approved threshold cut-off point and three consultants from each area's expenditures are also above the agreed threshold.

Analysis

Task 1:

To complete the first task to find out which consultants in New York and Chicago are among the top 10% of expense generators, the data were re-arranged in the ascending order. It helped to recognize the daily expenses which are above the threshold.

The threshold was set using the formula 'PERCENTILE.EXC' on the excel spreadsheet to get the threshold at 90% to get the expenses in the top 10%. It set the at 695.6 and 467.1 in cities New York and Chicago respectively.

To calculate the 90% threshold of the z-score, I used the formula z-score = (x-Mean)/SD, which are 1.367696 and 1.717987 for the New York and Chicago consultants. The table below also shows that consultants with a z-score and a daily expense above the threshold are Burg Dorr, Maggi Satterfield, and Yuri Gilliams from New York and Massimo Dippel, Karlyn Ouchark, and Matthaeus Crisp from Chicago. You can also check this out in the attached excel sheet.

Likewise, to calculate the mean and standard deviation I used the 'AVERAGE' and 'STDEV' formula respectively.

The following table shows the calculations of:

New York

Mean	498
Standard Deviation	144.4765264
Percentile	695.6
z score (top 10%)	1.367696227

Top 10% Consultants

Yuri Guilliams	696	1.370465
Maggi Satterfield	760	1.813443
Burg Dorr	797	2.06954

Chicago

Mean	345.21875
Standard Deviation	70.94420087
Percentile	421.7
z score (top 10%)	1.717987496

Top 10% Consultants

Karlyn Ouchark	486	1.984394
Matthaeus Crisp	486	1.984394
Massimo Dippel	491	2.054872

Task 2:

This task aims to analyze data from a pilot experiment whether an intervention lowered consultant expenses. To start the task, I calculated the mean for the costs of the initial, one month, and three months to find the mean (using the 'AVERAGE' formula) on the excel sheet.

Mean

Initial	One month	Three month
593.2812258	574.5160645	602.7446452

I have also calculated a paired two sample t-test to compare the initial one-month expenses and the initial three-month expenses. These two t-tests will allow us to identify whether the result is negative or positive.

The following t-tests charts represents that the initial month and one month expense data shows that the p value of 0.018 is less than the Alpha level of 0.05 that remains within the permissible range, which means the difference is statistically significant. On the other hand, the paired t-test conducted between the initial month and three-month expense data shows that the p-value is 0.24, which is greater than the Alpha level, which indicates it is statistically insignificant.

The following charts show the paired calculation of:

Initial and One Month Expenses

	431.44	586.05
Mean	593.2812258	574.5160645
Variance	18890.27751	29446.72949
Observations	155	155
Pearson Correlation	0.820532032	
Hypothesized Mean Difference	0	
df	154	
t Stat	2.380411573	
P(T<=t) one-tail	0.009258209	
t Critical one-tail	1.654808385	
P(T<=t) two-tail	0.018516418	
t Critical two-tail	1.975488058	

Initial and Three Months Expenses

	431.44	542.46
Mean	593.2812258	602.7446452
Variance	18890.27751	27141.53549
Observations	155	155
Pearson Correlation	0.792692891	
Hypothesized Mean Difference	0	
df	154	

t Stat	-1.170386779	
P(T<=t) one-tail	0.121826667	
t Critical one-tail	1.654808385	
P(T<=t) two-tail	0.243653334	
t Critical two-tail	1.975488058	

Conclusions/Recommendations

To conclude, we can see that a significant change in the mean of expenses, the intervention is cost effective for the consultant firms. Although the intervention decreased the cost in the short run, it failed to do in the long run, as, the mean for three months is much higher.

In my opinion, I recommend that the intervention strategy should be improved in a way that can cut down the firm's expenses in the long run as well.