Part 2 - Experiment and metrics design

The neighboring cities of Gotham and Metropolis have complementary circadian rhythms: on

weekdays, Ultimate Gotham is most active at night, and Ultimate Metropolis is most active

during the day. On weekends, there is reasonable activity in both cities.

However, a toll bridge, with a two way

toll, between the two cities causes driver partners to tend

to be exclusive to each city. The Ultimate managers of city operations for the two cities have

proposed an experiment to encourage driver partners to be available in both cities, by

reimbursing all toll costs.

1. What would you choose as the key measure of success of this experiment in

encouraging driver partners to serve both cities, and why would you choose this metric?

[Answer]

I think idea behind reimbursing toll costs is to encourage travel between two cities, there by have the active members in both day and night, Hence there will more revenue generation.

Metrics can be measured on before and after encouraging driver partners then the difference as the success indicator is obtained.

increased revenue: revenue (costs of toll reimbursement should be deducted) in both cities

In the aspects of the servicing both cities, we can measure the following metrics that can be regarded to as successful indicators.

increased number of available drivers: average number of available drivers when calling for the pickup,

decreased wait time: average wait time when calling for the pickup, and

increased number of trips: number of trips across the bridges.

2. Describe a practical experiment you would design to compare the effectiveness of the

proposed change in relation to the key measure of success. Please provide details on:

   a. how you will implement the experiment
      [Answer]
      I would perform A/B testing.
      To investigate the effectiveness of the proposed change, I would compare two groups of drivers with/without reimbursements and measure the key measures mentioned above. I would recommend dividing the drivers at random by 50% and 50% for each group, one for the drivers offered reimbursement and the other for remaining drivers continuing to operate without being reimbursed for tolls.

b. what statistical test(s) you will conduct to verify the significance of the

observation

[Answer]

To verify the significance of the observation, I perform the A/B test on those two groups. I perform the t-test with a confidence level of 95 %, where the null hypothesis is the reimbursing drivers for tolls does not have a statistically significant impact on Ultimate's net profits.

c. how you would interpret the results and provide recommendations to the city

operations team along with any caveats.

[Answer]

If the increased revenue is positive, then it is effective to encourage driver partners by reimbursing toll costs. If the increased revenue is negative, they should not adopt the toll cost reimbursement. Even it is revealed the increased revenue is positive, the drivers have randomly chosen, and it may not be effective in all cases. We need more rigorous experiments by different variables (e.g., selecting other drivers, different portions, different days, etc.)