Marketing Innovation, Spring 2020
Marketing Analytics Self-Learning Exercise
Due before Class on April 22

This exercise helps you practice funnel analytics. Analyzing the customer purchase funnel helps you diagnose bottlenecks, calculate the cost of customer acquisition and, when combined with data on customer value, allocate marketing budget across media. Keep your answers informative but succinct.

Background

You are the brand manager of an automobile loan company. You are interested in acquiring customers from the internet.

You have been approached by two banner advertising networks, and two search engines. Each media company shared with you how many prospects (i.e., potential consumers) they can possibly reach and how much they will charge. The companion spreadsheet, "S19s Marketing Analytics Exercise Spring 2020.xlsx," summarizes these numbers.[1]

For example, Banner Network A promises to reach a maximum of 300 million prospects, and quotes a rate of $0.001 per impression. We focus on the simplified setting of one-time ad exposure, such that one impression means one prospect exposed to your ad on the media platform. In other words, if you spend a dollar on Banner Network A, a thousand prospects on this platform will be exposed to your ad.

The costs of designing ads were taken care of by your company. Your mission is to find the optimal allocation of your marketing budget across these four media outlets.

Customer Purchase Funnel

As brand manager of your company, you are aware that any prospect from the internet must go through the following stages before he/she becomes your loan customer:

> Ad exposure → Ad click-through → Begin loan application → Complete loan application → Obtain loan application approval → Sign up for a loan.

You are also able to quantify the funnel by obtaining the transition probabilities along the funnel from each media company. These metrics are summarized in the companion spreadsheet.

[1] We greatly simplified search-engine costs by assuming the search engine charges per impression. In reality, Google AdWords and other search advertising platforms are based on an auction system in which you pay on a cost-per-click basis. This auction mechanism rewards businesses with high-quality campaigns and products that consumers are likely to want.

Customer Acquisition Cost

For now, assume that each medium reaches an independent set of prospects. (We will relax this assumption later.)

Question 1. Which medium yields the highest hit rate? Hint: hit rate measures the percentage of prospects who eventually sign up for a loan.

Question 2. What is the acquisition cost per customer for each of the four media outlets?

Customer Value

You expect to earn an annual profit (revenue minus servicing cost) of $200 from each customer you acquire. Hopefully, these customers stay with you for multiple years. From experience, you estimate a retention rate of 80% per year. The annual discount rate of your company is 10%.

Question 3. What is the customer lifetime value (CLV) of each customer you acquire? Feel free to use either the Customer Lifetime Value Simulator "S18 CLV Simulator Spring 2020.xlsx" available on Canvas or the formula introduced in class and in the pricing self-learning exercise.

Budget Allocation

Having calculated customer acquisition cost and customer lifetime value for each medium, you are ready to make your budget allocation decision. Keep in mind the principle – allocate first to the medium that gives you the biggest bang for the buck.

Question 4. In the ideal world of no budget constraint, how much would you spend on each of the four media outlets?

Question 5. Realistically though, you often have to work within a budget. For the rest of the exercise, suppose that you have a marketing budget of $600,000. How would you allocate this budget across the four media outlets?

Different Media Attract Different Customers

Each media outlet tends to attract a specific demographic. To see how this affects your budget allocation, assume customers acquired through Banner Network B have greater need for your loan, such that their retention rate is 90% as opposed to 80% for the other three media outlets. Everything else stays the same.

Question 6. How would you allocate your $600,000 budget across the four media outlets?

Spillover across Media

So far, we assumed that the four media outlets are independent from each other. This is not always true. For example, banner ads often create awareness and raise interest. As a result, potential customers who have seen a banner ad may be more likely to click through the search ad of the same product. There are generally two cross-media spillover effects: overlapping reach, and altered hit rate.

1. Overlapping reach. For this exercise, assume that Banner Network A and Search Engine 1 reach partially overlapping audiences – they serve 10 million prospects in common (out of their total audience size of 300 million and 20 million, respectively).

2. Altered hit rate. When a prospect is reached by both Banner Network A and Search Engine 1, hit rate is increased to 0.02%. For prospects reached by either medium alone, hit rate remains the same as what you calculated in question 1.

Due to privacy protection, Banner Network A and Search Engine 1 do not know which 10 million customers they serve in common. As a result, you cannot target your ads towards these overlapped audiences. In other words, if you buy 20 million impressions from Search Engine 1, all you know is that 10 million of these prospects are served by Banner Network A as well. If you buy 10 million impressions from Search Engine 1, you know 5 million of these prospects are also served by Banner Network A.

To keep things simple, let's assume that retention rate is 80% for all media. Everything else stays the same.

Question 7 (very challenging). Considering cross-media spillover, how would you allocate your $600,000 budget across the four media outlets?