

**Final exam, 200 points\*\***

**DNSC 6290– Fall 2021**

**Customer Analytics**

**Time: Thursday Oct 21 th7:30 pm- 9:30 PM EST**

**Deadline: 9:30 pm EST, submission via Blackboard under ‘Final exam’**

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**\*Please write your Final answers in BLUE Color**

**Your name:**

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**Question1 [25 points]**

Find one example for each below business with different types of retention and frequency:

**1.1 [15 points]**

|  |  |
| --- | --- |
|  | **A business example (or name of the company)** |
| High Frequency, Low retention | Streaming Music (Apple Music), Dating (Tinder), Social Networking (Instagram, Facebook, LinkedIn) |
| Low Frequency, High retention | Navigation (Google Map, Waze), Travel (Expedia, Airbnb), Books, Sports Scores |
| High Frequency, High retention | Communication (WhatsApp), News (WSJ, Bloomberg) |

**1.2.** Which of these 3 models you choose for Airbnb? And why? **[10 points]**

I would say “Low Frequency, High retention” because we do not use Airbnb every day, but we use it when we are planning to travel and usually, we use it through long time until another good business model come out. It would be similar as Weather App because we do not check the weather a lot however, we check when the sky looks dark or cloudy and we use it for entire life.

**Question2 [90 points]**

**2**. Suppose that an online Media company (e.g., local news website) makes money from different revenue models (e.g., sponsorship, display ads, pay-per-click, affiliate). The site has 500,000 monthly sessions coming from 50,000 unique visitors. On average each time a visitor visits the site, she visits 19 pages per visit while spending 12 minutes on the site.

* The site has a display-ad contract with advertisers which pays the Media site $3 for every thousand times visitors seeing a banner on the site. There is only 1 banner per page.
* Also, the company has pay-per-click revenue from inserting ads relevant to the visitor by offering different kinds of content. Suppose that there is only 1 ad per page with the ad click through rate of 0.8% (conversion rate or the odds someone click on the ad). The average revenue per click is $0.50 as well.

1. How much is the***total monthly revenue per unique visitor*** in the site from above two advertisement revenue models? **[30 points]**

Firstly, I had to think about there are two different advertisement revenue existed. (Ad display cost and Pay per click).

Unique visitors vied pages would be Unique visitors (50,000) \* Average page per visit (19) = 950,000 and need to think it divided by thousand = 950.

We multiply 950 \* ad display cost ($3.00) = $2,850. This is revenue for ad display.

For calculating Pay per Click, we need to multiply Unique visitors viewed pages (950,000) \* Pay per Click Rate (0.8%) \* the average revenue per click ($0.5) = $3,800

Total monthly revenue per visitor is

(2,850 + 3800) / 50,000 = 0.133

Therefore, total monthly revenue per unique visitor would be 0.133

1. Assuming the total monthly revenue per unique visitor calculated from part *a)* is all profit, if the media site would like to make 300% ROI in their marketing spend, **how much should be the MAX of CAC** (customer Acquisition cost)? **[30 points]**

Since we said 0.133 is the profit, and 300% ROI, we need to understand the equation of CAC calculation

CAC = (Total Expense) / Number of New Customer

X’s 300% ROI = 6650.00

X = 6650.00 / 300%

X = 2216.667

2216.667 / 50,000 = 0.044333334

1. How the media company can improve the monthly revenue advertisement per unique visitor? **[30 points]** *(be creative)*

To increase the revenue, the media company need to boost up the value of number of customers. To increase the number of customers, advertisements need to be uncliched advertisements therefore, the company can make customers to click the banners from banners or hold more time on each advertisement. A lot of customer tired of showing Ad on their pages that is why people are willing to use adblockers on their internet. So, we need to make customer to eye-catch on each of our advertisement based on their interest without cliché text, or images.

Also need to make A/B test for where the advertisements located at, since the media company are locating only one at a page, we need to think carefully where customer see and get the attention the most from. On top of that, each customer 19 pages per visit with 12 minutes, it means that customer is reading or scanning fast. Customer does not even take a minute to go different page. Therefore, it would be good idea to make stay longer on each page about a minute so that it may have higher time per each advertisement to be shown.

**Question 3 [85 points]**

Below is a snapshot of Quarterly Buyer engagement for an ecommerce company.

**3.1** what we can learn from this business by looking to the new buyer behavior? **[25 points]**

Since the number of buyers are increased over each quarter, the percentage of new buyers is also increased. Once the number of buyers and % of new buyers got increased over each quarter, it is very good circumstance for the business, however. last quarter (Q4) had 2100 people with purchased from the business and about 70% of number of buyers which is about 1470 people are new buyers. This e-Commerce company does not have high number of retention rate. Since there are not enough retention buyers were existed, we need to improve the customer experience in the busines so that we make sure retention rate to be increased.

On the other hand, this e-commerce business may not have enough products that people can purchase over and over. For example, this e-commerce business only selling chairs which people may not purchase over a time or renting party materials. If the business itself have the business model like that, then it would be good idea to upload, many products that may have connections with original selling products. For example, Furniture cleaners if we are selling the chairs and sending the remind email or sending special coupons to increase the retention rate. Also, should sell many different products related to current busines models (selling desk, lamp, lights, floor mat, etc.)

**3.2.** From below table, can we calculate the total revenue in **Q4**? **[30 points]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Q1** | **Q2** | **Q3** | **Q4** |
| **Number of buyers** | 1000 | 1300 | 1700 | 2100 |
| **Avg order value $ (AOV)** | $150 | $200 | $220 | $220 |
| **Avg Order by Buyer** | 1.3 | 1.5 | 2.0 | 2.2 |
| **Total Revenue** |  |  |  | **?** |

Calculation for Total revenue of Q4 would be Number of buyers \* AOV \* Avg. order by buyers.

From the above charts, Q4 would be 2100\*220\*2.2 = 1,016,400

**3.3.** From above table, how much is **Avg Quarterly NET growth in Buyers Revenue (Revenuer Per buyer)** for the last 3 quarters given the Quarterly changes in AOV? **[30 points]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Q1** | **Q2** | **Q3** | **Q4** |
| **Number of buyers** | 1000 | 1300 | 1700 | 2100 |
| **Avg order value $ (AOV)** | $150 | $200 | $220 | $220 |
| **Avg Order by Buyer** | 1.3 | 1.5 | 2.0 | 2.2 |
| **Total Revenue** | $195,000 | $390,000 | $748,000 | $1,016,400 |
| **Avg. Revenue per buyer**  **= Total Revenue / Number of Buyers** | $195 | $300 | $440 | $484 |

Month of Month growth calculation is Total of previous / total of current -1

However we are Quarter of Quarter :

Q2-Q1 (300/195 -1) 🡪 0.5384🡪 54%

Q3-Q2 (440/300-1) 🡪 0.4667 🡪 47%

Q4-Q3(484/440-1) 🡪 0.1 🡪 10%

Avg of (54%,47%,10%) would be 0.37 which is 37 percent