



Artea's Algorithmic Bias Analysis

THE BACKGROUND

Artea ran A/B testing in 2 months:

- The size of test 5,000 users visited website in the last two months but not convert to buying customers.
- Apply coupon promotion (20% for next purchase)
- Marketing variables and channel acquisition.

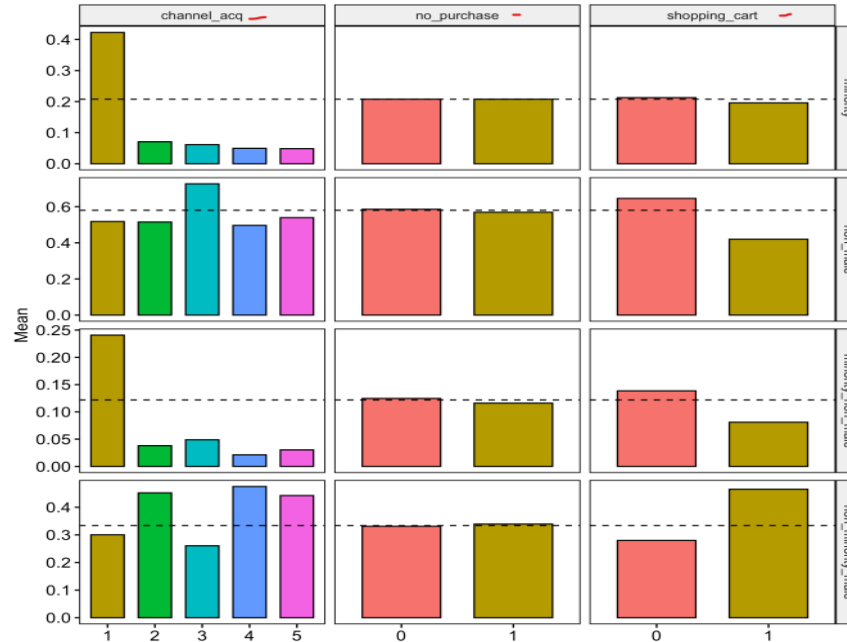


CUSTOMER ANALYSIS

After conducting an analysis based on 6,000 customers' demographic information, the team has found strong differences across customer segments, such as female users being more likely to be acquired through social media:

- The past consumption revealed that non-male customers spent less time for website and leaving products in the shopping cart, while the channel acquisition pointed out that these customers and majority of non-minority male customers more likely acquired via social media.
- More than 40% of the minority customer base was acquired by Google. However, for our customer journey, we may also compare whether the customer was acquired through organic search vs. paid acquisition channels.

Exhibit 2 Proportion of customers in each category



Channel acquisition -
Column 1, as follow:
1=Google, 2=Facebook,
3=Instagram, 4=Referral,
5=Others

Purchase indicator -
Column 2, 0= customers
w/o any previous purchase,
1= customers with at least
one previous purchase

Shopping cart indicator -
Column 3, 0=customers w/o
abandoned shopping cart,
1=customers who
abandoned their shopping
cart previously.

THE BIAS

- Algorithmic bias can occur in marketing in several ways. Marketers use bias to refine their models and improve customer acquisition by channels. In channel acquisition, Google's search engine gives more weight to its own paid results, thus placing customers further up in search rankings.
- Algorithms perpetuate existing biases (or introduce new ones) due to the fact that the data upon which they are trained is based on historical data that contains gender, age, or racial differences. It will end up with artificial intelligence reproducing these problems. Therefore, we need to keep monitoring the model results and change the model if necessary.
- As the data patterns are volatile in nature and depends on the variety of features for analysis. Marketers use this pattern to make targeted decisions which are followed by their end goal achievement. For digital ranking-based systems, they use a conceptualize method to cluster the segment of customers into portions to further divide them according to likeliness towards the product. As per our data most minority of the customer are acquired by the digital channel method.

THE DECISION



- Based on the patterns that we found in the analysis that were different from the past assumption, our team recommend that Campbel should treat new customers and customers with previous purchase equally in their campaign because the patterns from channel acquisition analysis showed that non-organic and organic customers contribute for Artea's revenue.
- If Artea targeted their promotions based on channel of acquisition, they should not be discriminating if they are acquiring customers through channel acquisition because as an online mode of delivery Artea can analyze the customer demands and need to improve the supply, quality ,brand and overall each aspects of its own by knowing the variety of customers' demands in the different demographic locations which can further help to know the region and culture based on gender, race ethnicity etc. in details.
- The bound between unethical and ethical marketing based on channel acquisition is fragile. Therefore, Artea should aware their target policy can hurt their target customers if they ran ads and promotions in unethical ways. Our team recommend that Artea should treat their customer in equal way and avoid ads with racist and sexist contents. The policy should protect customers from their vulnerable problems.

PREDICTION

- According to the analysis of the pattern, the team found that most minority customers who abandoned their shopping carts previously were not able to proceed. This is why the team predicted that 15% coupon giveaways would occur with those same customer behaviors (ie, customers who left the items in their shopping carts and who have been acquired via social media).
- As a result, the company should run its next marketing campaign in which they send the coupon to specific users in order to increase its customer base.

