

## BUS503: Law and AI

### Topic 1: Personalization vs. Privacy protection

**Question 1.** You are a junior data scientist at your country's e-Commerce giant, aiBay Inc. Since the onset of IT revolution, despite its rapid growth in size and volume, your company has hardly focused on profitability and budgeting, especially in marketing. aiBay's marketing strategies have been 1.lowest possible pricing and 2.out-sourcing for too technically difficult channels.

However, due to recent turn of events by the European GDPR and Californian CCPA, most of the technical marketing channels become less effective. Your data science team's boss, a long-time engineer without any mathematical training, a parachute by the aiBay's founder because of his close friendship but incompetence in software engineering, asks you if there is any "magical" way to solve the problem. The boss keeps saying that as a leader in e-Commerce, aiBay owns so much "1st-party" data, and his engineering expertises can further guarantee seamless log of user behavior.

Given that, unless you look for another job, you have to find a way to overcome rising concerns of privacy protection, and, at the same time, the solution has to be accepted to a group of bosses in your chain-of-command, whose understanding of data science is no better than average high school kids or software engineers, or even worse.

- 1 By a simple query on your database, you figured that the user behavior logs have four types of user IDs. aiBay ID, desktop-web cookie ID, mobile-web cookie ID, and mobile-device ID, the last one is logged as mobile-app ID. The reason for separate IDs is because most user do not log in until they purchase items. How would you argue that the IDs have to be integrated into a single ID? How would you persuade your boss, who believes every single log has to be as accurate as possible?
- 2 Thanks to your effort in 1), your boss understands the importance of cross-device matching, at least for data science purpose. However, the Chief Marketing Office (CMO) of your company claims that it is of little use despite your team's hard work. The reason being that Google, Meta, and Amazon like giants have far more 1st-party data, the walled garden of which has a lot more user-base and extensive user behavior log. Although you agree with the CMO in terms of amount of data, you still believe the chained user data within your company has important implications for marketing. List up your points, and argue why.
- 3 Out of your list, present how customer grouping is affected, if the user data is properly chained. Connect your conclusion in the context of customer relations management (CRM). The CMO is smart enough to understand your argument, but she thinks it can be done by junior marketer's some hours of manual work, which is cheaper than labor and system cost that your plan is proposing. Is yours better? In what way?
- 4 Instead of traditional marketing lines like CRM, you now turn your head to law and economics. You believe the new system can be used to estimate demand curve for each product, which then can be used for price discrimination. Describe detailed marketing strategy in terms of the 3rd-degree price discrimination and provide action plans with specific examples. Why are other degree price discrimination likely fail?
- 5 Your company's chief legal officer (CLO) concerns that your plan may work for more profitability, but it looks harmful for customers. Does it? Can you do a simple welfare analysis that disproves his point? In what way can you argue that it is a win-win for the e-Commerce and the customers?
- 6 Your CMO thinks the demand curve analysis and resulting price discrimination will only help losing more customers. Do you agree with her? If so, can you expect the magnitude of the loss? What is it to do with the demand curve? If not, how would you counter-argue her concern?
- 7 A miracle just happened. Your bosses agree to challenge your bold but theoretic argument to the market. Now is the time for test. First, you have to do the demand curve estimation. Your first target group is

the most sold products, which are apparels for female. Provide your strategy in detail. You can make your own assumptions and simulations, but your strategies are confined to your current sales data with female apparels.

- 8 Your estimation given in 7) does not work well. Some demand curves do not show downward slope. Although in theory you are aware that upward demand exists, you are suspicious that it is not the case in your data pool. Why do you have such a conclusion? If you are given data from elsewhere, what data do you need and how does it help?
- 9 How does the cross-device matched data from 1) help your demand curve strategy? You can make your own assumption, but the logic building has to be in detail.
- 10 One of the bosses confesses that they only understand that your data science "magically" worked. Instead of rather detailed data scientific scheme, he recommends you to provide a single page summary of your marketing & data science strategy. Your CEO wants to use that page in the upcoming shareholders meeting. In other words, the page must be non-technical and intuitive.

**Bonus** An internet troll, hired by your company's competitor, leaked your demand curve-pricing model to legal authority. The authority, in all of a sudden, barged into your office one day and takes all your data. Confronting with drastic fine, your CEO asks you to summarize your strategy in a single page presentation that shows it does not violate GDPR and/or CCPA. Your corporate life depends on it.