Recommendation Algorithm Requirements

Overview

Kurashu (kurashu.jp) aims to be the novel way to discover the sake ("Nihonshu") that the customers really want, and to help them to understand the sake itself as well as their own taste/pallet. The English online webshop for sake targets foreign residents of Japan and is planned to be extended to Japanese customers in the future.

In order to support the selecting process of sake every registered user has a "recommendations for you" section, where she/he can confirm their taste profile analysis and based on that information the sake that they most likely like (=buy). The solution is going to be key to separate ourselves from the competition and to have customers continue buying from us.

Personal sake recommendations for registered users who already participated in the onboarding questionnaire. The most relevant sake bottles shall be displayed to the user based on the user's preference:

1. On the product page below the product description in the "You may also like" section
2. On a special personal recommendations page with more detailed information about the "liked" sake profile and selection of recommendations
3. Further the recommendations could also be used in mailing campaigns messaging directly the customers with their recommended product

The recommendations include the whole sake bottle catalog, but when the system exposes the recommendations to the user it excludes out-of-stock and end-of-lifetime products.

Background

Kurashu.jp will be running on the shop-as-a-service platform Shopify, which also offers an integrated recommendation algorithm. The product recommendation algorithm is based on data about products that were purchased together and products with similar descriptions. It utilizes this data to give a couple of those related products as recommendations for a specific product. When no product description or purchase history data are available for a specific product, products from related collections are proposed.

Limitations to Shopify's algorithm are the following:

- Plus plan (starting from 2000$/month) with <7000 products published and English storefront gives access to an algorithm that is based on purchase history and product descriptions. In the case of a non-English storefront the algorithm is only based on purchase history.
- Non-Plus plan (current plan) with <7000 products published gives access to an algorithm that is based only on the purchase history with additional reference to the collections if not enough data points are available.
- The algorithm cannot directly be customized to exclude certain products (work-around via JavaScript customization to non-display certain products). The algorithm automatically excludes out-of-stock products or non-related items like gift cards.

Shopify's algorithm seems to be not sufficient for the sake recommendation application:

- Various product attributes like alcohol content, seimaibuai etc. are not considered. Other metadata than the description has to be included in the input data set.
- The purchase alone does not indicate the preference of the consumer in the case of sake. The rating of the user after consuming the sake can possibly be a better indicator.
- In order to onboard customers, an onboarding questionnaire is to be filled out, which gives a first indication of the customer's taste preferences. As the Shopify algorithm does not allow customization (i.e. addition of extra data points) the results of the taste profile quiz cannot be utilized.
- Besides the high price point for the Shopify Plus Plan, the limitation regarding language compatibility is another limiting factor considering the future application for a Japanese storefront.

Development plan

The lack of customer and product data make it difficult to develop a suitable algorithm from the get-go. In order to validate the feasibility of an algorithm for recommending sake on the customer's preference, the approach might be split into two phases:

- Phase 1
    - Scope: using quiz as initial preference and recommending based on preference profile similarity to the sake profile. Updating preference when product was purchased and rated.

    - Release: end of Q3 FY21, August/September 2021
- Phase 2
    - Scope: updating recommendation algorithm with other considerations like seasonality and novelty as well as adding collaborative aspects (e.g. similar users would also buy also this product)
    - Release: somewhere in 2022-23, after feasibility in phase 1 is proven and enough data is available

Requirements

Phase 1

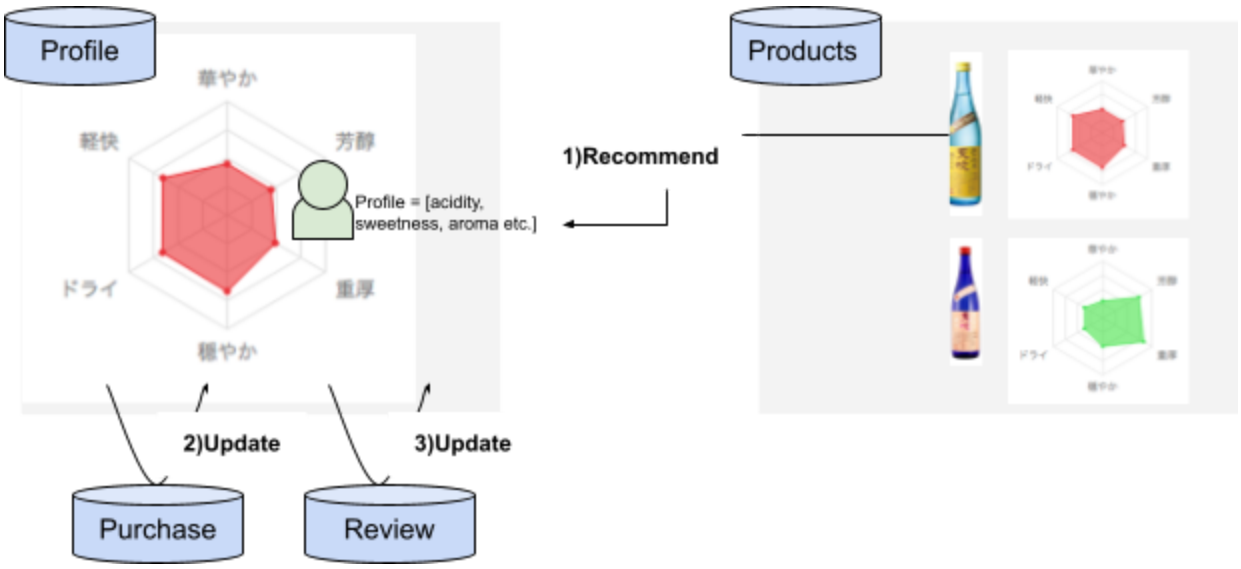
Input

The sake recommendation algorithm might use the following the data points:

- Sake taste profile indicators:
    - UI exposed attributes:
        - Subjective/qualitative: category, aroma, taste profiles, which defined by sake experts before publishing to the store
        - Objective/quantitative: alcohol content, seimaibuai etc. which are released by the brewers themselves
    - Backend-only attributes: label/bottle design etc.; metadata that is not relevant for the user but should be considered by the algorithm
- Customer data:
    - Customer's taste profile indicators based of onboarding quiz and/or personal profile settings
    - Customer's sake recommendation indicators like rating of previously purchased sake (weighted depending on rating)
    - Customer's purchase data

Process

The algorithm shall primarily be based on content based (similar product data) to give a recommendation output as a prediction of which product might be most relevant to the customer at a certain time, on a certain website engagement point.



Further, the following requirements have to be considered in the application of sake:

- Recommend the closest sake: compare the taste profile with the sake profile and decide on the "closest" recommendation proposals
- Only recommend sake items: exclude non-sake products from the scope of the recommendation algorithm
- Only recommend items for sale: do not recommend archived or out-of-stock products
- If with the above no available products are available to recommend, use the Shopify default recommendation API or other measure to fill the recommended section on the website, in order to have never no recommendation results exposed.

The taste profile might be updated over the time based on the following information:

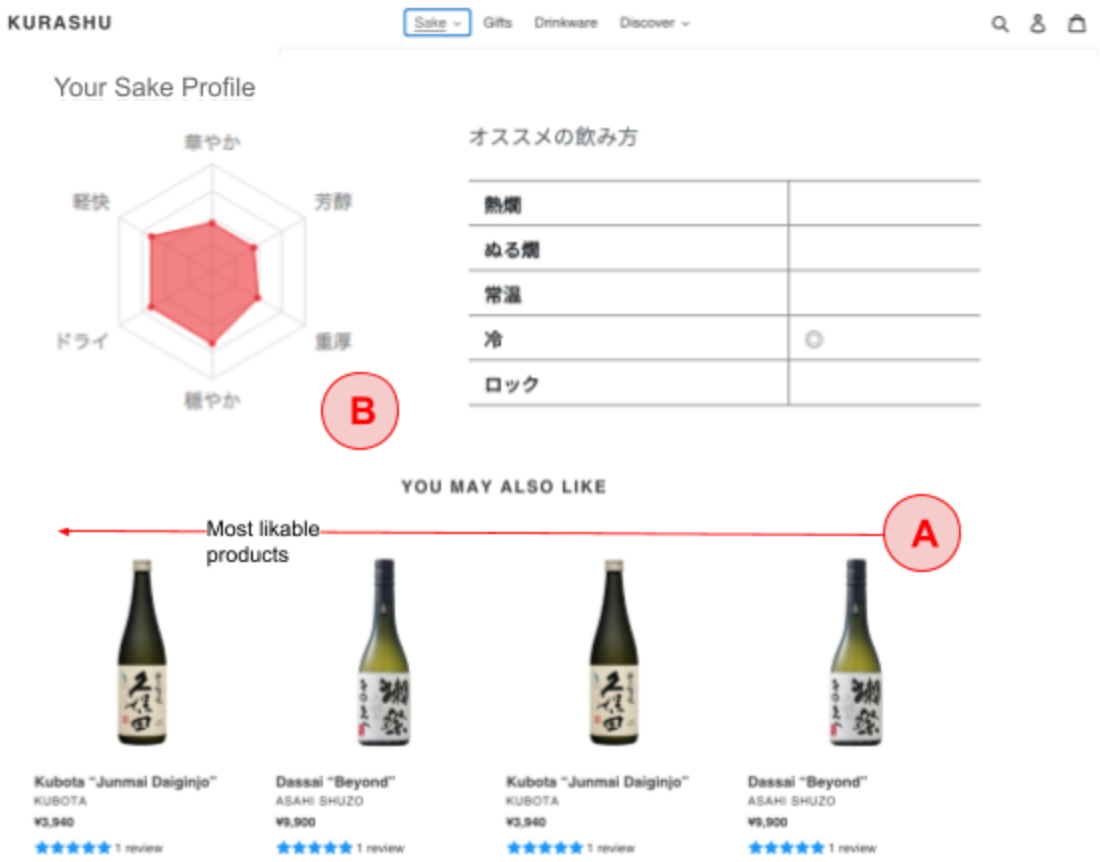
- When the sake product was bought, update the customer's taste profile towards the bought sake taste profile
- When the customer then finally rates (product review) the product, again update the customer's taste profile depending on the rating input (1-star rating least weigth, 2-star rating greatest weigth):
    - 1-2 stars: grade down (weaken) the update done when the purchase was made
    - 3 stars: do nothing as it is the middle
    - 4-5 stars: grade up (amplify) the update done when the purchase was made

Output

The output on the frontend might look something like the illustration below:

A) Most recommended product candidates for "You might also like" section etc.

B) Your personal taste profile insights



The prediction results shall be retrieved via an API. The results represent the most likable sake for the customer based on the above-mentioned inputs and process. Maximal the 10 most probable products shall be returned. The maximal displayed results will be further restricted in the frontend.

The taste profile data for the current customer might be also retrieved through API, in order to expose the taste profile to the user when logged in to the account and visiting the "personal recommendation" or "my taste profile" page.