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Master's Thesis
Academic Year 2021

SAKETALE: Introducing Japanese Sake-Based
Cocktails to Chinese Market

Keio University
Graduate School of Media Design

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Abstract of Master's Thesis of Academic Year 2021

SAKETALE: Introducing Japanese Sake-Based Cocktails to Chinese Market

Category: Design

Summary

Sake is a traditional Japanese alcoholic beverage with a history longer than 1700 years. It is associated with traditions, craftsmanship, and of course, the pride of the country. In the modern world, sake however, is somehow considered as an old-fashioned drink. In fact, the sales of sake domestically is reducing every year, not only because of the decreasing domestic population , but also the fact that young generations nowadays consume other alcoholic drinks rather than sake more often. On the other hand, sake has received enormous attention globally, especially from China, where citizens hold a positive attitude towards "made in Japan" products. This research focuses on the service design of SAKETALE, introducing a brand new way of enjoying sake, that is making sake-based cocktails (saketale) at home. The design of SAKETALE has included four essential functions, [What is Your SAKETALE], [Through Ingredients], [Community] and [Sake]. Meanwhile, the design of SAKE incorporates machine learning to understand users' preferences to provide personal recipes. This paper demonstrates users' engagement with SAKETALE service, showing that Chinese consumers, no matter frequent drinkers or not, are able to find their connections with SAKETALE, and would like to use the service. By analyzing consumer insights, this paper also concludes the future market potentials of SAKETALE.

Keywords:

Japanese sake, Chinese market, service design, home bar, cocktails

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Chapter 1
Introduction

1.1. Background of the Study

Sake, which is also referred to as Nihonshu, the Japanese wine, is the alcoholic beverage brewed from rice. Also, it is the national beverage of Japan, with a history of over 1700 years. The alcohol percentage of sake is usually around 15%-18% [2]. It is such a unique beverage both in its taste and its way of production. Unlike the simple fermentation process of wine making, the distillation of whiskey nor the directional fermentation of beer, making sake undergoes the process called "multiple parallel fermentation", where the transformation of starch-to-sugar (rice to sugar), and sugar-to-alcohol take place simultaneously with the existence of koji mold, and yeast starter (moto). Therefore, the type of rice, the processing of rice (mashing), the type of koji involved in fermentation take significant roles in the development of sake, largely influencing how the sake tastes.

Tasting sake is an extremely subjective topic. Overall, what one enjoys drinking does not mean that everyone else holds the same opinion. However, in order to build up the system of sake for tasting, there is an elementary two-dimension framework involving flavor and aroma [2]. Flavor can refer to sweetness, acidity, astringency, bitterness, and most importantly, umami of the sake. Therefore, in the aspect of flavor, there is sake with rich, full-bodied taste (*nōjun*), and others with light and refined texture (*tanrei*). On the other hand, aroma can be divided into highly fragrant type (*hanayaka*), and the lessly fragrant, subdued smell (*odayaka*) [3]. However, in tasting, aroma of sake can be more complex. For example, there is the type of sake, usually Ginjo, with topical fruits smell, and we refer its as fragrant (*hanayaka*), while there is also "undiluted sake" with ripe fruits smell, and we can also refer its as fragrant (*hanayaka*). However, these two types of smells are certainly different for the drinkers.

Absolutely, sake is a complex topic. Not only the process of making sake involves craftsmanship, the selection and procession of raw materials, research, and new technology applied into production, but also the consumption of sake is associated with seasonal affairs, food pairing, cultural appreciation, and expansion. However, this wide topic is not receiving as much attention as it deserves. In fact, in Japan, the production of sake is decreasing year by year. In 1992, the gross production of sake was around 1.4 billion liters [4]. However, 28 years later, the overall production of sake shrank by more than 2 times. In 2018, the gross production is less than 60 million liters. One of the most significant reasons for this shrinking industry is contributed to the fast-changing condition in the domestic market. Not to mention the aging population and the decrease in the overall population problem in Japan. These days, young people tend to consume less alcohol and show a preference of western alcoholic drinks than Nihonshu. On the other hand, the 40-to-60-year-old group, which used to be the prominent consumer of sake, shows a higher consciousness of health, and as a result, is consuming less sake at the moment [4, 5].

Therefore, a great number of Japanese local brewers have shifted their attention towards the overseas market, especially with support from the government. In terms of Abenomics proposed by the former prime minister of Japan, Abe Shinzo, the primary goal to boost the Japanese economy is by increasing the demand. Sake, along with other agricultural products like seafood, is considered as one of the most important goods for export. The amount of sake exported is also increasing with an expansionary speed. The United States of America is the number one sake imported country, followed by Hongkong, mainland China (refer as China below), Korea, and Taiwan in the year 2018 [4]. Noticeably, China has an increasing demand for sake. In the year 2019, China has exceeded Hongkong, becoming the second-largest country of sake importing, with an expansionary increasing rate of 139.4% [6]. Also the latest report released in March 2021 [7] shows that in year 2020, Hongkong has an exponentially increased in sake import and becomes the top region for sake import, while China stayed as the second, with an 15.8% increase in the amount of money spent on sake, especially in the category of the premium sake because of the increase in the middle class, and people's interest towards Japanese fine cuisine as well as drinks. It is highly

expected that China is going to be the largest sake importer in the near future.

In addition to the rising attention towards Japanese sake, the overall alcohol market in China is full of opportunities. First of all, people tend to drink more recently. Not only is the number of frequent users of alcohol increasing, but also the number of young drinkers. This can be attributed to the exposure of wider availability of alcoholic drinks for Chinese consumers because of the rapid economic development and westernization in China [8]. Moreover, Foreign brands alcohol and low alcoholic drinks are extremely popular among the 20-39 years old age group. Also, drinking alcohol is not only limited to gentlemen. Ladies show a strong consuming power in alcoholic drinks, pushing the market into a brand new phase [9]. Meanwhile, the places for alcohol consumption are developing as well. It is a Chinese tradition to have alcohol with meals. While nowadays, people drink in a more diverse condition. Besides parties and gathering around in a large group to have some alcohol and fun, young consumers also drink with a small circle, or just drink by themselves for chill and relax.

Considering the current sake market as well as the future opportunities in both Japan and China, it is hard to oversee the opportunities of foreign alcohol, and low alcoholic beverages aka. cocktails in China. Therefore, the author aims to design a brand new service, SAKETALE, which helps Chinese consumers to not only understand the culture of sake, but also provides them with personalized sake based cocktail menus to spread sake in a wider consuming condition, and thus further increasing the market demand for sake in China. This paper services as an initial step for understanding the market conditions and potentials in Japan and China for SAKETALE.

1.2. Aims and Objectives

This research intends to answer the research question: to what extent can the creation of SAKETALE increase Chinese consumers' interests, understanding, and consumption towards Japanese sake?

The aim of the research is divided into two aspects. (i) in the service design aspect, this research hopes to develop a service, SAKETALE that enables Chinese consumers to understand not only about sake but also their own tastes, letting

consumers be more familiar with sake and themselves. (ii) in the market potential aspect, this research focuses on the segment that consumers developing the SAKETALE/cocktail by themselves in a more private setting, and therefore, hoping to spread this new style of enjoying sake among Chinese consumers.

The research objectives are as follows. (i) to understand the current sake/cocktail market in Japan and the opportunities for overseas; (ii) further help consumers to understand sake and the kind of sake they would enjoy; (iii) to develop a new way of appreciating sake, that is mingling sake into cocktails and in a hope of expanding the existing sake consumers. (iv) to explore the field of making your own SAKETALE/cocktail/drinks at home, and therefore to test the new market opportunity in the field.

1.3. Proposal

Sake is a profoundly be-loved alcoholic drink that originated in Japan. However, the domestic alcoholic market is changing at a rapid speed, and this traditional drink industry is facing a lot of problems. One of the challenges is that sake is always associated with the image of parents' drink, and therefore is a lack of youth and youthfulness. In addition, there are few revolutions in this market, and therefore it is hard for sake to expand its market with young consumers. On the other hand, brewers, the government, and marketers are trying hard to push forward the industry. Not to mention that brewers are corporating new technology into production, developing new products to fit the new generations' demand, the Japanese government is extremely supportive to enlarge sake market overseas, and marketers have already developed some kinds of tasting kits for consumers to understand sake in a more comprehensive way.

By developing SAKETALE, the author's goal is to break the current stereotype of sake for Chinese consumers. For example, sake is consumed at a decent Japanese restaurant. Moreover, the author hopes to increase the endless possibilities of sake-based cocktail recipes by creating a community of learning, using, and sharing through SAKETALE.

1.4. Thesis Outline

This thesis is organized as follows:

Chapter 1 is the introduction of the whole research where it discusses about the background of the study, illustrating current sake market in both Japan and China. Also it follows by the aim of this study that is to understand whether the service design of SAKETALE can help to facilitate the interests towards sake, home drinking and home bar in China.

Chapter 2 focuses on the background review of the study. There are mainly 3 parts in this chapter, sake in Japan, alcohol market in China, and usage of machine learning in recipe development. In the first part, sake in Japan, this paper detailed discusses about the tasting standard of sake, its current business mode that focuses on innovation, and sake's production and export. The following part about Chinese market analyzes the overall consumers' needs in alcohol, especially foreign brands and sake, as well as the trends in home-drinking and home-cooking and DIY. The finall part introduces the possibilities of incorporating machine learning to create recipes.

Chapter 3 reviews two pre-study in the research, a real Business case, Deli-bar that targets home-drinking and cocktails in Japanese market. The product is a delivered cocktail kit. Learning from the business case, the first prototype of SAKETALE, a kit, and the user tests are also evaluated in this chapter.

Chapter 4 concentrated on the design of SAKETALE. The final prototype is an mobile application for users to learn about sake-based cocktail, saketale and other knowledges about Japanese sake. There are major 4 functions in this application.

Chapter 5 is the proof of the design, where in total 33 participants involved in the research. The comprehensive analysis is demonstrated in the chapter.

Chapter 6 includes the findings of the research as well as limitations and future directions.

Chapter 2
Literature Review

2.1. Sake: From Past Till Present

2.1.1 Factors Influence Taste of Sake

Sake is a Japanese word that usually refers to alcoholic beverages in general. It is also called Nihonshu in Japanese, which is known as the "Japanese alcohol" in English, and therefore, sake is always considered as the national drink of Japan. The depth of sake is an overwhelming topic as the process of making sake is sophisticated. The sake making process is detailed explained in Appendix A. In addition, the taste of sake is a complex yet personal topic as well. The type of yeast involved in the fermentation could play a significant role in the taste of sake. The graph refers to how some types of yeast can contribute to distinctive characteristics (Figure 2.1).

Number	Source	Characteristics
6	Aramasa shuzo (Akita), 1935	Strong fermentation, mellow flavor, suitable for creating light taste
7	Miyasaka jozo (Nagano), 1946	Vivacious flavor, suitable for ginjo and futsu-shu
9	Kumamoto-ken shuzo kenkyujo (Kumamoto), 1953	Vivacious flavor and characteristic aroma of ginjo
10	Tohoku area, 1952	Low acidity and characteristic aroma of ginjo
14	Hokuriku area, 1991	Low acidity, suitable for producing ginjo
601-1401	#6, #7, #9, #10, #14	Non-foaming yeast strains
1501	Akita, 1990	Low acidity and characteristic aroma of ginjo
1801	Breeding, 2006	Low acidity and notably fruity aroma of ginjo

Figure 2.1 Sake Yeast Varieties

Besides, the proportion of rice being polished also makes the sake taste differently. In short conclusion, the smaller proportion of the core of the rice remains,

the more refined the taste of sake would be. This is because the core of rice is where starch is concentrated. And the outside of the grain is full of proteins, fats. minerals and vitamins. These nutrients are pivotal for the reaction with koji fungi and yeast. Yet an overabundance of them could speed up the fermentation process in general, and result in an imbalanced fermentation. Therefore, aroma, color, and taste of sake are negatively being influenced [10]. The word *seimai-buai* means polishing ratio in English. A *seimai-buai* 30% means that only 30% of the rice remaining is used for sake production. This ratio also contributes to the grading standard of sake. *Junmai*, is sake with a less than 70% *seimai-buai* ratio, *Junmai-ginjo* is with a ratio less than 60%, and when over 50% of rice is polished, this sake can be referred as *Junmai-daiginjo*. Moreover, there is sake also in the premium realm without the word "*Junmai*". For example, *honjo* (<70% polishing ratio), *ginjo* (<60%), and *daiginjo* (<50%). This is because some distilled alcohol is added at the end of the brewing process to increase extra aromas and flavors. Figure 2.2 illustrates how sake is categorized in the term of *seimai-buai*, the rice polishing rate. It is unfair to say that sake without "*Junmai*" tastes worse than the *Junmai* ones. It is only the adding up materials that make the sake taste different from each other.
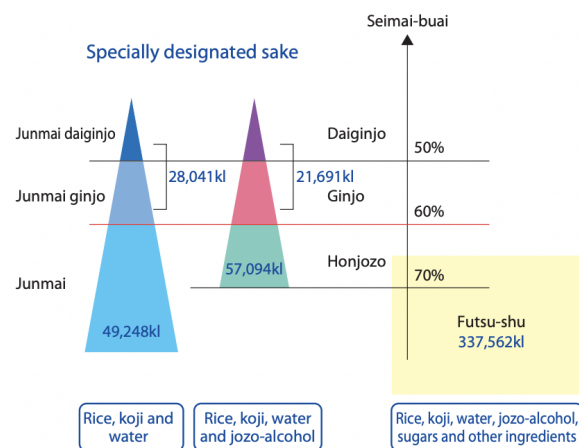
Figure 2.2 Sake Types

2.1.2 Sake's Tasting Standard

One of the common tasting standards of sake is to differentiate sake into 2 characteristics, flavor and aroma [2]. Aroma again, is largely influenced by the kind of yeast involved in brewing. *Ginjo*, for example, usually has a tropical fruit kind aroma, and aged sake can have a honey or roasted nuts style aroma. Flavor can refer to the taste of sake. Sweetness, acidity, astringency, bitterness, and umami are often used to describe sake. The aroma and flavor system is a simple but easy-to-use way for categorizing sake for people to have a brief overview, and is therefore widely used. Sake brewers put the information on the home page and sometimes, the label of the product, helping consumers to understand the product better (Figure 2.3).
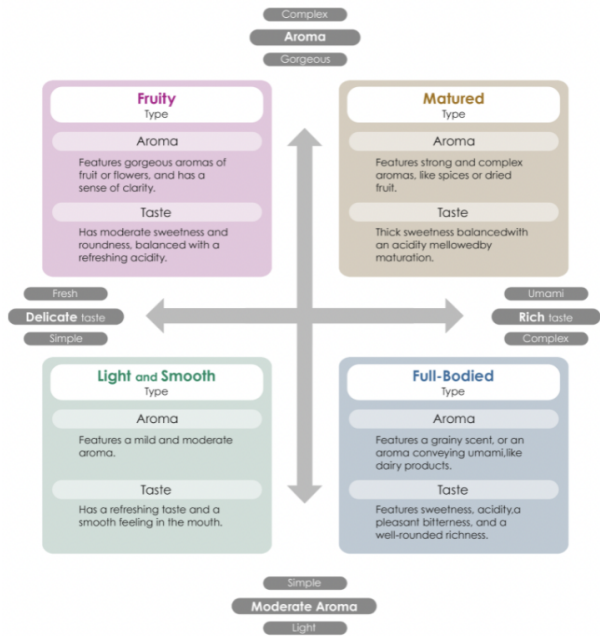
Figure 2.3 Flavor and Aroma Table

Moreover, a more complex and professional tasting mechanism, aroma wheel, has been developed to describe the taste of sake. There is a wine aroma wheel to describe the various types of aroma of grapes that can give. Similarly, both the Japan Sake & Shochu Makers Association [10] has developed a sake aroma wheel

for tasting sake (Figure 2.4). It is split into two large parts: taste and odor which is similar to the idea of flavor and aroma. However, this flavor wheel gives out specific adjectives to describe the exact feelings of sake tasting.
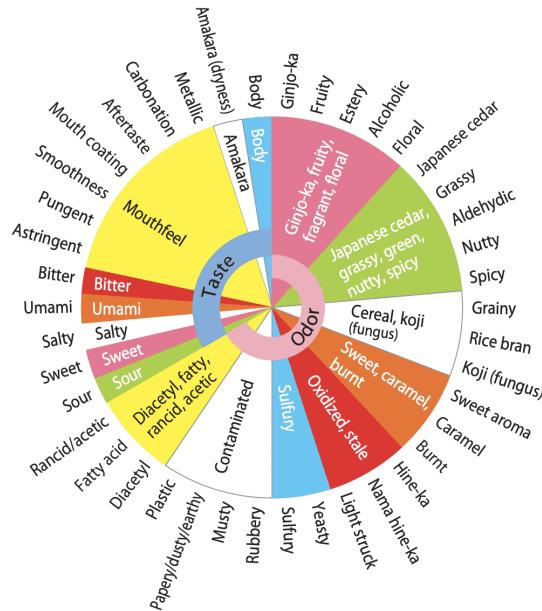
Figure 2.4 Sake Flavor Wheel

Also, there are some more simplified aroma wheels also called flavor charts, which only depict some of the main characteristics of sake (Figure 2.5,2.6,2.7).It is straightforward to notice that aroma, acidity, sweetness, rich, and umami are among the most important descriptors of sake.

2.1.3 Business Mode

Currently, in Japan and all over the world, the most common way for people to learn their favorite types of sake is through tasting by oneself. It is easy to imagine that besides selling a single bottle of sake, sellers create a special package for consumers to taste the difference from one product to the other in order to develop one's own tasting system. Appendix B refers to the tasting and rating sheet developed by the Comprehensive Guide to Japanese Sake [10].
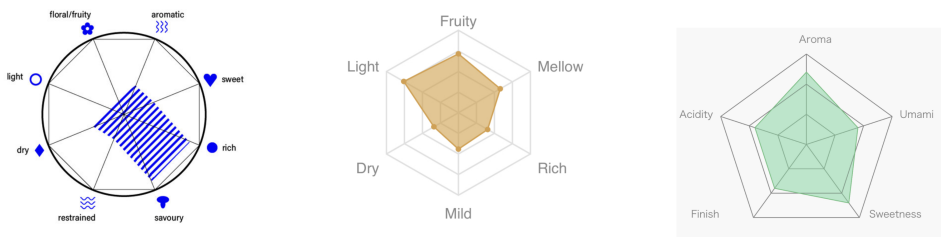
Figure 2.5 Sake Flavor Figure 2.6 Sake Flavor Figure 2.7 Sake Flavor
Chart 1   Chart 2   Chart 3

These days, technology no doubt plays a critical role in business to re-define the traditional market and service. Companies start to incorporate AI into the world of sake to help consumers to make a choice. The online community and application Sakenomy[1] is not only an application for users to search sake and record sake, but also is able to learn from users' tastes to make recommendations within the data analysis tool[2]. On the other hand, Yummy Sake [3] is a service that combines tasting and AI analysis. Through tasting 10 different sake and rating them with one's first insight, AI system is going to analyze the score for each sake and conclude the type of sake the user would enjoy the most (Fig 2.8).

Figure 2.8 Yummy Sake Set

1   Sakenomy https://www.sakenomy.jp/en

2   Sakenomy X AI https://japan.cnet.com/article/35055413/

3   Yummy Sake https://yummysake.jp/

Moreover, the service called KAORIUM for Sake [4] maximizes the usage of sensory in sake matching. The service first visualizes sensory perception by verbalizing words to describe a feeling, for example, "green apple", "warm". According to the vocabularies selected by the user for the certain type of sense (smell), AI can make the recommendation of the type of sake the user would enjoy. By utilizing the power of words to help users to fulfill the tasting and comparing experience, KAORIUM for Sake broadens the horizon of the endless possibilities that technology can drive through the market. (Fig 2.9).

Figure 2.9 KAORIUM for Sake

2.1.4 Sake Market

"From tradition to innovation", "from local to global, from global to local", are two major trends that are happening in the Japanese sake market. First, from tradition to innovation, can be divided into 2 parts, the sake brewing process, and the type of sake these days. As mentioned in Appendix A, sake-making involves basic steps including polishing rice, washing, steaming, fermentation, mash filtering, pasteurization, and packaging. In the past, all the steps were done

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4 KAORIUM for Sake `https://scentmatic.co.jp/kaorium/sake/`

by brewers manually, and therefore, sake producing is a process that highly relies on craftsmanship. Nowadays, the process has undergone industrialization, and incorporated with new technology [11]. For example, Asahi Shuzo [5],one of the leading sake breweries in Japan has been working with Fujitsu Laboratories since the year 2018 to develop the AI prediction system in the brewing process. Utilizing machine learning to understand the past data from the company, the prediction system can control the brewing process to facilitate production [12]. Moving the focus towards the type of sake produced these days, besides the traditional sake, brewers are trying hard on innovation to make this industry on-trend and especially appealing to young potential consumers. For example, the brewery Yamanokotobuki [6]'s new series, Freak, contains an original component called [4MMP] to make this sake taste like white wine. The Freak series is extremely popular among young consumers. Also, low alcohol, fruity sake, and sparklings are other trends these years in the industry. These new types of sake have obtained a great amount of attention not only among young consumers domestically but also global-wise. In 2020, [Mizubasho Pure], the sparkling produced by Nagai Brewery [7] won the first prize from sake sparkling category and has gradually receiving attention domestically [13].

"From local to global, global to local" is what Japanese brewers are trying hard. In the year 2020, the size of Japanese sake is around 446 million liters, 1/4 of the peak in 1973. However, from the fig it is clear that the ratio of premium sake, namely *ginjo*, *junmai-ginjo* , and *junmai-dai-ginjo* has been increasing. One of the reasons contributing to this trend could be that premium sake is more valued internationally. The Robert Parker Group, the world professional wine rater group that subsidies to the Michelin Group, has evaluated more than 800 different sake in 2016, and 78 of which received ¿ 90 points, which is equivalent to the scores received by deluxe Bordeaux wines, one of the top wines from France [14, 15].

The global market for wine is huge. The market size is around USD 364.25 billion in 2019 [16]. The market size for sake is around USD 40 million [6], which

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5   Asahi Shuzo https://www.asahishuzo.ne.jp/

6   Yamanokotobuki http://yamanokotobuki.com/

7   Nagai Brewery http://www.nagai-sake.co.jp/en/

is only 1/1000 of the wine market (Figure2.9). Thus, even sake can grab 1/5 of the wine's global share, the profit is incredibly significant to this industry. Therefore, sake Brewers have put a large amount of effort into the global market, hoping to build up the reputation of sake global-wise. It is not only about to make "local to global", but also from "global to local", in a sense drinking sake can become a fashionable trend globally, and therefore, influence people back in sake's home country to pay more attention back in their national alcoholic beverage. The sake [Mizubasho Pure] mentioned above is a perfect case. The Head of Nagai Brewery wishes that he hope sake can sink into people's daily life where people can have sake sparkling to start the meal, pair *daiginjo* with foods, and enjoy dessert type sake after meal, and he hopes that when people in Europe consider drinking sake is trendy and fancy, this attitude is going to influence the domestic market as well. Considering these two major trend in nowadays sake industry, "from tradition to innovation", and "from local to global, from global to local", the author's project SAKETALE aims to revitalize sake not in the home market, but in its raising market, China, in terms of sake based cocktails, and is looking forwards to also bring this trend and drinking style back to its domestic market.
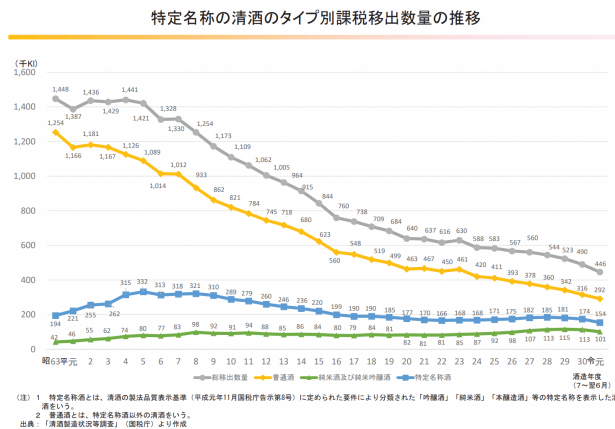
Figure 2.10 Sake Export in 2019

2.2. Chinese Market

2.2.1 Market for Alcoholic Drinks

The report by Canadean [17] shows that Asia has become the fastest-growing alcohol market, with more than 30% of global alcohol sales in 2014 and an estimated increase of 176% from 2000 to 2019. While the growing market in China definitely plays a non-negligible role in the play. China has an unparalleled opportunity in the alcoholic drink market because of the welcoming attitude of Chinese consumers in alcohol, especially the foreign ones among young consumers. Despite the fact that people all around in general are behaving more constrain on drinking, Chinese people do still enjoy drinking as drinking alcohol is considered as an important part of social activity, especially in celebrations, rituals, and the business world. Pek Kei Im et al.(2019) [8]'s report on the behalf of the China Kadoorie Biobank has suggested that among the current regular drinkers in China, the proportion engaging in heavy episodic drinking (i.e., >60 g/session) increased (30% baseline vs. 35% re-survey) in both rural (29% vs. 33%) and urban (31% vs. 36%) areas, particularly among younger men born in the 1970s (41% vs. 47%). A different approach, estimate urban alcohol users through wastewater-based epidemiology by Gao et.al, 2020 [18], also implies that in major cities in China, alcohol consumption has increased significantly from 2014 to 2016. Although the elder male is always the heaviest group of drinkers in China, Mtwsei et al. [19] indicates that young consumers, aged from 18 to 34, have shown a salient alcohol dependence. CBNData [8], the data analysis agency associated with China Business Network and Alibaba Group, published a report on Chinese consumers' online shopping behavior on alcoholic drinks. The report suggests that the proportion of alcoholic drinks consumed by people from 22 to 28 years old has been increased significantly from the year 2017 to 2018. Also, the amount of money this group of people spends on alcoholic drinks has remarkably increased [9](Figure 2.11).

There are several reasons that contribute to this overall market tendency. First and foremost, the increasing exposure of Chinese consumers, especially young people to alcohol, along with the fact that Chinese young people are extremely

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8 CBNData https://www.cbndata.com/home
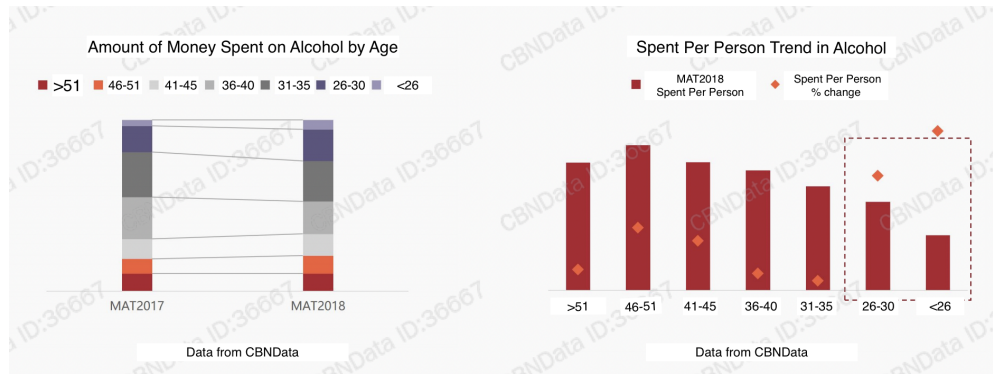
Figure 2.11 CBNData 2018 on Chinese Consumers' Spending on Alcohol

open to new trends. Unlike those Muslim-majority countries in Asia like Malaysia,
Indonesia, and Iran where alcohol advertisement and sales promotion are totally
prohibited, China only has a partial ban on alcohol. Extensive marketing, espe-
cially viral marketing to promote the brand through social media, and sponsors
for activities that young people participate like music festivals have spreaded the
chic lifestyle of drinking among Chinese youth [20]. For example, after Jay Chou,
the Chinese popular singer, released his new song "Mojito" in 2020, the sales of
mojito suddenly increased to the second of overall alcoholic drinks in Alibaba,
the Chinese largest online shopping platform. The second reason is that sellers
realize the young purchasing power and design products that fit young people's
needs. Similar to the Japanese alcoholic market where young people tend to enjoy
low alcoholic drinks, Chinese consumers behave the exact same way. Noticeably,
these low alcoholic, fruity, elegant designed products have opened the potential for
female consumers to purchase alcoholic products, where female consumers spend
more money on average in alcoholic drinks than male consumers [9, 21]. As a
result, brands have started products targeting female consumers. For example,
China's biggest local beer company, Tsingtao, released fruity beer in 2015, and
the local winemaker, Zhangyu, has also started a fruity wine line targeting the
ladies. In brief, the market for alcoholic drinks in China is promising, notably
with the potential of young consumers, and female consumers.

Another important trend that should be noticed is that Chinese consumers
tend to purchase online. The figure from CBNData [9] (Figure 2.12)indicates

an exponential growth in online alcoholic beverage purchasing. Young people no doubt prefer the online experience; while surprisingly, the high-income group of people in China also show the tendency of online shopping. The report by Hurun [22] has interviewed 300 participants from the high-income group, and the result shows that 66% of them claim that they still prefer to purchase alcohol in-store, and the rest 34% indicates that online shopping for alcoholic products is now their main way of shopping.

Figure 2.12 Online Alcoholic Beverage Spending

The third trend is from social to private. Usually, Chinese people drink alcohol in social gatherings and business cases, and Chinese *baijiu* and beer would be considered as the drink for these situations. These years, however, Chinese consumers start to enjoy drinking by themselves. Drinking now gradually becomes a daily habit instead of a big event. Market data shows that in 2017, the sales for alcoholic drinks that suit self-drinking have an increasing rate of 126%, compared with those drinks for a business setting only have a raise around 28% [23]. Another report shows that 58% of interviewees had spirits with family or friends in the year 2018, and 48% of them also claimed that they drank at home at other times of the year [24].

Lastly, the awareness of cocktails is rising significantly. In 2018, the most popular word associated with alcohol is "cocktail", where the frequency of searching

is 21% in Alibaba EC site, which is the highest among all other keywords like
"baijiu", "beer", "whisky" and etc. [23]. Consumers are in the learning period
where they have shown a great interest in different liquors. Also the raw mate-
rial for cocktails, the spirits are also high-frequency keywords searched by Chinese
consumers. Here we can see female consumers are more interested in rum, liquors,
fruity alcoholic products, and males show their attention in gin, tequila, vodka.
Young people aged from 25 to 35 years old are the main driving force behind this
phenomenon [23]. To put everything into a nutshell for this section, there are
mainly four trends in the Chinese alcoholic market, young people are gradually
leading and driving the market, the purchasing place shifts from offline to online,
the consuming situation moves from social to private, and the popular products
are cocktails, and low-alcoholic beverages.

2.2.2 Japanese Sake in China

In this era of the alcoholic boom in China, consumers' attitude towards foreign
brands is highly positive. The sale of alcoholic drinks from Japan is the fourth
in China, ranking after France, the United Kingdom, and the United States.
However, the growth rate of sales of Japanese products in the Chinese market is
the highest in 2018 [9]. Among all types of Japanese export, Japanese whisky
enjoys the highest growth rate in sales, the second is plum wine, and the third
and the last is *nihonshu* and *shochu*. Despite the fact that Japan is yet the
first country that China imports alcoholic drinks from, nor *nihonshu* and *shochu*
enjoy the fastest growth rate in sales among other Japanese products, the Chinese
market itself is still full of possibilities for Japanese brewers. In fact, in 2018,
China is the third biggest country for Japanese alcohol exports, just behind the
United States of America and Korea. Also, China is the third biggest country for
nihonshu export, falling after the United States of America and Hongkong, with
an export amount of 3.6 billion yen. Nevertheless, the market share of *nihonshu*
in China is with a high growth speed but yet negligible (Fig 2.13)

Noticeably, in 2020, China has surpassed the US and ranked as the second
biggest country of *nihonshu* exports with an amount equals to 5.8 billion, enjoying
a 161% increase compared with 2018. Here, Hongkong remains as the biggest
country of importing *nihonshu*. Moreover, China is now the number 1 country for

Figure 2.13 Foreign Brands Alcohol Market Performance in China in Year 2018

Japanese alcohol exports overall.

Japanese sake is still not a major alcohol Chinese consumers would go to in their daily life. In Alimama's report on drinking behaviors among Chinese [23], sake is associated with "boredness", "tiredness" for Chinese consumers. While the Chinese *baijiu*, on the other hand, is often associated with celebrations and big events. These emotions linked with sake may sound a bit negative in the first slight, but it is these boring and tired moments one wants to drink alone. Therefore, the market recognition and association with sake fit perfectly with the future alcoholic industry's opportunities, where drinks for oneself, drink for daily, drink for accompanying and relief can become significant themes.

Currently, however, the most frequent place Chinese consumers would enjoy sake is at Japanese restaurants. Chinese consumers have a positive attitude towards Japanese cuisine and regard Japanese cuisine as "safe" and "healthy". Along with the tourism boom, where more and more Chinese come to visit Japan, Chinese consumers' recognition of Japanese cuisine, culture, and experience is rising. According to the China Hospitality Association [25]'s report, Japanese restaurants occupy about 7% of the Chinese market, which is much higher than other foreign cuisine restaurants (around 3%). Chinese consumers would like to try out Japanese sake at the restaurants and around 15% of consumers actually order sake at the Japanese restaurants [26, 27].

Who are the major sake lovers in China? The age group of sake lovers is around

25 to 40 years old, the range is slightly wider compared with the cocktail's major consumers. One of the reasons could be that sake in China is always associated with a premium image and the market price of sake is also slightly higher than other foreign liquors. Therefore, those consumers with high income can purchase sake. Moreover, there are more females than males who would like to purchase sake. Also, there are more female new drinkers of sake than male ones. To sum up, sake is gradually winning Chinese consumers' attention, and the market potential is unparalleled since sake is a beloved product with a wide age group in China.

2.2.3 Other Market Trends and Related Opportunities

The other things that should not be forgotten about Chinese consumers are that people are craving for tasty, convenient, nutritious DIY experiences, and the engagement of social media and online communities is high. China is a nation with a distinctive food culture, and different food for festivals, home meals are a large part of Chinese life [28]. According to the study released by Kitchen Stories [29], in 2019, 31.1% of Chinese citizens cook for their families every day. However, since young people are out-working, 23.92% of Chinese citizens said they rarely cook. The break-out of covid 19 in the beginning of 2020 certainly re-writes the situation. During the pandemic, Chinese people have a chance to think about health, and cooking. The in-home cooking experiences have been reset, and the trend could be going even for the post-covid period. The DIY, home-cooking experience in China is not limited to daily necessities. Consumers even purchase milk tea raw materials and try to recreate the milk tea experience at home. Also, the trend of using materials from the convenience store to make cocktails is also a hit on Chinese social media, showing that convenient, tasty, and good-for-social-media are the crucial parts in the market. Therefore, the opportunity for SAKETALE, the home sake-based cocktail-making experience is no wonder going to hit the market.

2.3. Machine Learning to Create Menu

2.3.1 Case-based Reasoning

The idea of applying machine learning and AI to build up the menu is totally not novel. One of the most frequently used mechanisms is case-based reasoning (CBR). It is a problem-solving framework that finds new solutions through retrieval and adoption of similar past cases [30]. CBR has wide applications. For example, Henriet and Greffier [31] introduced AI-VT, a tutoring system based on CBR to personalize training systems for learners, and Park et al. [32] developed a genetic algorithm used for medical diagnosis. In the field of menu construction, as early as 1990, Hammond [33] has developed a CBR-based planner CHEF, to create and debug plains in Szechuan cooking to fit users' requests. For CHEF, the inputs can include different tastes, textures, ingredients, and types of dishes. With the request, the output is a single recipe that satisfies all the requirements. Then there comes CAMPER for diet prescription [34], and JULIA for meal design [35]. Despite all these early works, recent works have expanded the horizon. Ores˘kovic, Kljusuric, and S˘atalice [36] have established a weekly vegan menu. EARL even has a website for sandwich lovers in public and the recipes created by EARL are comparative with human-authorized sandwiches [37]. One of the merits of CBR is that it fully utilized "the flavor compounds in thousands of ingredients, and a great deal of psychological data on human perception" to generate receipts that are hard for human beings to come up with. For example, in Chief Watson, the IBM developed application to design culinary recipes, Chief Watson often comes up with interesting combinations like adding Indonesian food flavors into an American stylied dish [38](Figure2.14).

2.3.2 AI creation in Business Applications

Not only in the academic field, in the real world, but companies have also taken full use of AI in the food and beverage industry. In 2019, the Swedish Whisky company, Mackmyra [9] has launched the first AI-created whisky named the Intelli-

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9   Mackmyra `https://mackmyra.com/products/intelligens`

$$S(R, \mathcal{B}) = D\left(P_{B|R} || P_B\right)$$
$$= \int\limits_{\mathcal{B}} P_{B|R} \log \frac{P_{B|R}}{P_B} \, dB$$
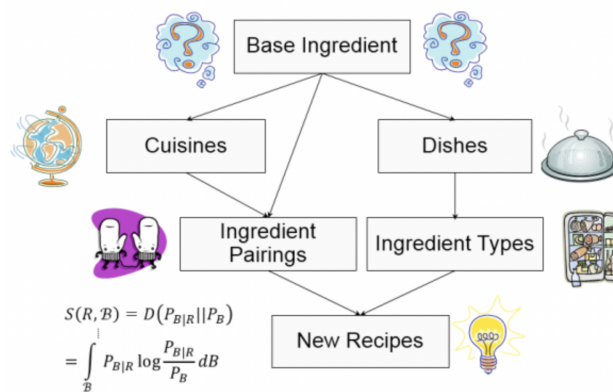
Figure 2.14 IBM Chef Watson

gens. The project is a partnership with Fourkind, the Finish technology company, and Microsoft. With the technology side of the Microsoft Azure platform, and Mackmyra's 75th whisky recipes with reviews, ratings, and awards data over 20 years, AI developed the final recipe of the Intelligens. Also, there is an application, plant jammer[10], which encourages people to reduce food waste through giving AI menu ideas about the remaining recipes in their fridge.

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10 plantjammer `https://www.plantjammer.com/`

Chapter 3

Related Fieldwork (Prestudy)

3.1. Real Business Project: Deli-bar

The author has participated in the cocktail delivery service, Deli-bar, launched in Tokyo, Japan in April 2021. It is a service to use food deliver service to deliver cocktail kits to home. The project is in cooperation with Bacardi Japan, SG Club, and Chompy. Bacardi is one of the world's largest privately held, family-owned spirit companies, with more than 200 brands and labels these days. The B2C area is only one of Bacardi's strengths. The company also owns its B2B channel where Bacardi liquors are widely used in bars and restaurants all over the world. Here in Japan, the SG club is one of the good partners of Bacardi Japan. SG Club is the bar named after its founder bartender Shingo Gokan, and the bar has been announced as number 3 in the 2021 Asia's 50 Best Bars. The other partner, Chompy is the online food ordering and delivery platform launched in 2019. With the fierce competition in the online food delivery platform, Chompy has won its market share by emphasizing the connection between restaurant owners, the delivery man, and customers. The co-operating project, Deli-bar, presents the homemade cocktail kit to the Japanese market. The following part contributes to analyzing the 4P matrix of this business model, and the takeaways for introducing the cocktail home-made experience in the market where cocktails are still underdeveloped.

Products To make everything simple, the products of Deli-bar are cocktail kits for homemade cocktails. Understanding the fact that even the sophisticated market as Japan, consumers are not really familiar with cocktails as the dominant drinks here are beer, and Japanese style cocktail (highball, sour), the products for the launch stage are mojito and gin tonic, the classic cocktails that consumers

should at least heard of its names. At the same time, in order to maximize the potential of the cooperation between 3 companies, and to differentiate from other ready-to-drink (RTD), coffee tonic from the SG Club is also on the menu, where it is the specialized recipe that comes from bartenders in the SG Club.

As for the self cocktail-making kit, the package includes almost everything that one needs to make a cocktail. For example, as for mojito, not to mention Bacardi rum and tonic water, there are also special syrup from the SG Club, mints, lime, and a detailed booklet of how to make a mojito. The only things consumers need to prepare by themselves are the cup and ice (Figure 3.1).

Figure 3.1 Deli-bar Product

Place In cooperation with Chompy, the online delivery service, Deli-bar kits can be ordered from the Chompy mobile application. In the brainstorming stage, the team has thought through a huge range of possibilities like selling the kit in convenience stores. However, since there are fresh products within the kits (mint and lime), and the fact that the entry-level for convenience stores in Japan is pretty high, the project finally settled its gear to insist on the door-to-door delivery service of professional cocktails, pairing up with the food delivery platform. One of the limitations of this business model is that there are only a small number of consumers in the delivery area, in the case 3 kilometers from SG Club, are able to order the kit. However, since the delivery areas include Shibuya, some parts of

Meguro, and Shinjuku, it is expected that these areas are crowded up with young people with a relatively reasonable income, which fits the target consumers' image well. In addition, in the case of the covid 19 pandemics, the need for food delivery increases at an unexpected speed, especially with the young folks. It is hoped that the door-to-door delivery kit would break the door of consumers with the world of cocktails.

Promotion Promotions are largely divided into 2 parts, social media promotion, and mobile application promotion. For social media promotion, the information of Deli-bar is posted on the SG Club's Instagram story. Since the SG Club has 12.7-thousand followers who have already developed a deep relationship with the bar and cocktails, the extensive exposure could no doubt increase these followers' interests in the kit and therefore lead to purchase. Also, as for a promotion strategy, the promotion messages are frequently posted on Friday nights and weekends, when most people are using social media and when they are craving for a drink. On the other hand, the mobile application promotion is largely involved with Chompy. The banner of Deli-bar is always at the top as users open the application, where again to increase the mere exposure of the product.

Price For the first 3 products, mojito, gin tonic, and coffee tonic, the price is 3480 yen, 2980 yen, and 3980 yen separately. Considering the fact that the kit is for 6 cups of cocktails, the price is for one cup of a cocktail is around 500 yen to 700 yen, which is around the average of what Japanese consumers can get from restaurants, despite the fact that the cocktail is supervised by the SG Club, where one cocktail there normally costs more than 1000 yen.

Consumer Journey and Feedback towards the Deli-bar kit

The author conducted a deep interview with U, a 23-year-old male, living with his parents about his journey with Deli-bar's mojito. Here is Mr. U's journey analysis by the Consumer Adoption Process Model from Philip Kotler[1] (Figure 3.2).

From the Consumer Adoption Process Model, there are 2 key important points that are worth attention. Firstly, exposure. It is important that consumers see the same information multiple times from different channels to develop interest towards the field. Second, the positive experience in the trial. During the focus

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1 The Consumer Adoption Process https://www.onceadaymarketing.com/the-consumer-adoption-process/

Awareness	Interest	Evaluation	Trial	Adoption
The first time U got to know Deli-bar is from his friend's Instagram story about the product.	Then he followed the SG Club's Instagram account tagged in his friend's post, and also had looked over the account.	In the next few days, he has randomly searched up information regarding cocktail and the SG Club.	Until a Friday afternoon, U saw the Instagram story from the SG Club, he decided to make the order through Chompy. That night, he enjoyed the set with his dad and mom.	U and his family has a satisfied experience with the kit. He is also considering to purchase Bacardi gin for a trial.

Figure 3.2 Deli-bar Product

interview, U explained that not only himself, but also his parents enjoy the mojito set, saying it's easy to follow the instructions and the cocktail does taste more premium than what they used to have. Also the kit serves as a chance for U to understand more about cocktails and brands, and this is the reason that he wants to buy the Bacardi gin by himself even though he said that he was not a big fan of gin tonic before. Another point U clarified was that since covid 19, the chance for he and his family to dine and drink at home increases. But he has never thought of making a cocktail at home before, and the Deli-bar kit has definitely expanded his understanding of having a home bar, and enjoying cocktails.

The Deli-bar project lays a great foundation to SAKETALE. Even though the product and target between two projects are totally different, where Deli-bar provides cocktail-kit targeting the young Japanese segment, and SAKETALE focuses on Japanese sake based cocktail's home making experience targeting the Chinese consumers, Deli-bar actually provides great insights for SAKETALE. It is important to know that young people are always craving for something new. Since the cocktail market is under-developed in both Japan and China, and therefore going to a bar is not a casual hobby for people in both markets, the home-kit can serve as a good way to lead consumers into the world of cocktails.

3.2. SAKETALE: the Cocktail Kit

3.2.1 Design of SAKETALE, the Cocktail Kit

Taking the cocktail-kit insight from Deli-bar, the first step that the author conducts is to produce the SAKETALE version kit and test out the market reaction as shown in Figure 3.3. The recipes that involve Japanese sake are pretty limited. The author refers to the site, kiku-masaume Sake Brewing Co., Ltd[2], and selected 4 recipes in this stage.

Samurai Rock

  One of the most classic sake cocktail recipes with only 2 ingredients, sake and lime juice in a 3-to-1 proportion.

Tanpopo

  This recipe includes soda water and calpis, one of the most signature Japanese drinks that is extremely popular among females. Also, Figure 3.3 is the kit for *Tanpopo*.

Kiku Kir Royal

  This recipe has soda water and cassis liquor.

Sake Mojito

  This recipe is similar to mojito, but the only difference is that gin is substituted by sake.

  The criteria are straightforward. First, the recipes need to be easy to make at home. There are definitely fancy cocktails involving stirring egg white or using more than 5 or 6 ingredients. These complicated steps are not beginner-friendly, and therefore in the SAKETALE kits, the recipes are simple. For example, the mixing step should only involve stirring and shaking, and ideally only require less than 4 raw ingredients. Secondly, consumers need to be some-how familiar with the ingredients to make them interested in them. For example, calpis to Chinese consumers is associated with Japan, and tasty; mojito is associated with the classic cocktail.

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2   kiku-masaume Sake Brewing Co.
    `https://www.rakuten.ne.jp/gold/kikumasa/cocktail/index.html`

Figure 3.3 SAKETALE Kit

SAKETALE kit (Figure 3.3) not only include the essential liquors, for the first-timer welcome kit, it also comes with essential tools for mixing cocktails, that are, a 340ml cobbler shaker, 1 mixing spoon, 2 double jiggers, 1 liquor pourer and a glass ware. Ideally, the glass wares should be varied in size and design to correspond with different types of saketales. The cocktail-making-tools is an optional option in the SAKETALE kit. Also, each kit has a video instruction of making the saketale. Users can learn from how to make the saketales by watching video tutorial.

3.2.2 Workshop of SAKETALE, the Cocktail Kit

A workshop had been conducted in November 2020 where 4 participants received the SAKETALE kit. 2 of them are males ,and 2 of them are females. The average age of the participants is 26.5, and all of the participants are Chinese and have lived in China for more than 20 years. Each participant got 1 different kit by random distribution, and they are asked to make the same recipe twice. Therefore, each participant in total have made 2 drinks. In addition, their behaviors were filmed by camera for future analysis. (Fig 3.4) After the workshop, participants joined a one-hour focus group interview to access their drinking behaviors. The focus interview was conducted according to the outline made by Professor Krueger of

University of Minnesota [39]. The guidelines and sample questions of the focus interview are as below.

Accessing drinking behavior:

- What kind of alcoholic drink do you drink often, and why?

- What is your drinking frequency?

- Who do you usually drink with?

- Where do you often drink? In what circumstance makes you drink?

Accessing cocktails:

- How many kinds of cocktails do you know?

- What are your favorite cocktails, and why?

- What is your cocktail drinking frequency?

- If you want to drink, in what circumstance makes you drink cocktails?

- Where do you usually have cocktails?

- Do you make cocktails by yourself?

Accessing bars:

- How often do you go to bars?

- What are the things you appreciate about going to a bar? What are the things you do not like about bars?

Accessing sake:

- What is your attitude towards sake?

- Have you drunk sake before?

- Where do you usually have sake?

Figure 3.4 User Test with SAKETALE Kit

Findings   There are several interesting insights the author got from the SAKE-TALE kit.

i) Personalization in personal saketale making

By analyzing participants' behaviors through video clip, it is found that 20% of participants did not follow the exact instructions (video of how to make SAKE-TALE), and 80% of them did not follow the instructions exactly when they were making the second drink. During the interview, the participant who did not even follow the instruction in the first run insisted that since she is a cocktail lover, she knows that she would want to have something more fruity, therefore, she put more cassis juice than what the recipe suggests. While for the second run, most participants claimed that as they have had their first drink, they start to know what kind of taste they would like to have, as a result, they started to add some adjustments for the second drink. Personalization is one of the keys in cocktail making. Although making cocktails does have its own mixology, as the saying goes,*one man's meat, another man's poison*, following the precise instructions does not make the cocktail much better than the other, and not to mention the fact that even the same cocktail has slightly different recipes in different sites or by different bartenders. Therefore, the most crucial factor is helping each individual

to develop his own cocktail according to his personal taste.

ii) Social & Personal needs in drinking for young people
Drinking for young people needs to be social and personal, just echoing from the
overall trend in China discussed in Chapter2.2.1. Social needs often refer to chill
with friends. In this situation, the difficulties involved in home bar is that it
is hard for the host to clearly understand everyone's needs and make drinks to
satisfy every person. Therefore, participants usually buy RTD (ready-to-drink)
in the market to chill at home. For personal drinking, participants would more
willing to try and learn to make stuffs by oneself, but there is a question of lack
of knowledge that will be discussed next.

iii) Lack of knowledge
Lack of adequate knowledge is the key reason that keep participants away from
having a home bar. Although the idea of cocktails is now prevent in China, a ma-
jority of participants would associate it with "bar" and "RTD", and only a few
participants would associate cocktails with something they can make at home.
Considering sake, participants claimed that they are not that familiar with the
category as sake is rarely served in China. The only few chances they can have
sake is at Japanese restaurants, but often, they would have no idea of what are
on the list. They think the field of sake is "deep" and need "professional train-
ing" to understand more of it. Despite the fact of little knowledge, all of them
have positive impressions associated with sake where words like premium, easy-
to-drink, delicious come up in the interview. Participants would really appreciate
the chance of understanding sake and cocktails more in the process of engaging
with SAKETALE kit.

To conclude, the key learning in the pre-study of SAKETALE kit is that instead
of simply developing a kit of SAKETALE where the menu is decided, SAKETALE
should be an educate process, a gateway for users to understand sake and cock-
tails, a tool to learn self and others' preferences, and also, a facilitator in social
gathering. Ideally, my SAKETALE type/my cocktail preference should be as an
identity of a person just as what blood type or horoscope is.

Considering the takeaways from the SAKETALE kit, the author re-considered the design of SAKETALE, and aimed to emphasize on personalization, education, and communication in sake, cocktails and especially, saketales.

Chapter 4
Design

This chapter covers the design process of SAKETALE mobile application. Based on the cocktail delivery project, Deli-bar, in Japan, and the first SAKETALE rough prototype, the SAKETALE kit, the author has understood that bringing personalization into home-cocktail-making experience and information of the unknown field to users are two keys to raise people's interests and attachments towards SAKETALE. After the fieldwork of observing and analyzing people's behavior, especially interactions between the bartender, the final prototype of SAKETALE tries the best to create an interesting and informative home-bar experience for users (Figure 4.1).

Fieldwork	SAKETALE	Cocktail Recipe Apps
Bartender *introduces* the menu	*Questions* to access consumers needs	Search by <u>cocktail's name</u> or <u>liquors and ingredients in hand</u>
Bartender *serves* the drink	*Recommends* the recipes	*Recommends* the recipes
Bartender observes the needs, and makes adjustment/ makes recommendation	*AI Learning of consumers' needs and develop personalized* the recipes	
Bartender starts the *conversation*	A <u>community</u> of sharing	

Figure 4.1 Fieldwork Insights

4.1. Fieldwork

This author visited the Bar Tram[1] in Ebisu, Tokyo. Bar Tram is specialized in the medical herbal liquor and absinthe, an alcoholic spirit that is delivered from plants and with a unique taste. It is one of the very few opportunities the author went to a bar at the time, and she has absolutely no idea of what the absinthe is. Despite the fact that the menu has explanations of different types of drinks, and Bar Tram provides both menus in Japanese and English, the author was still confused about the difference between each one (Figure 4.2). Seeing the author had a hard time making the decision, the bartender came to introduce the menu, and make the recommendation. The author ordered the house speciality, absinthe drip Clandestine (Figure 4.3). The cocktail itself is really special with several ways to enjoy it. First, adjust the drip by yourself to serve the drink. Also there is a piece of sugar that one can use to adjust the taste. The bartender had of course introduced how to use the drip to the author. Here, also little conversation began with the author and the bartender about cocktails, lives and work. Absinthe is a strong alcohol. Observing that the author had a hard time with the drink, the bartender offered the option of neutralizing the drink by adding soda water. The new drink was still too strong, and a second customerization happened where the bartender added more soda and sweetener to the old drink. It was absolutely an amazing fieldwork experience, and has provided a great amount of insights in the users' journey of using SAKETALE. In the way of effective communication going back and forth with customers and the bartender, customers can finally develop and elaborate their own tastes, and at the same time, understand more about the field.

Figure 4.1 refers to the follows of SAKETALE mobile application that maximizes the bar experience for its users. With more details introduced in 4.3 Prototype Chapter.

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1   Bar Tram `http://small-axe.net/`

Figure 4.2 Bar Tram Menu   Figure 4.3 Bar Tram Absinthe

4.2. Component

Before getting into the prototype, this chapter introduces four important components and their rationales.

4.2.1 The Taste Components

As introduced in Chapter 2.1.2 Sake Tasting Standard, the tasting system can be complicated, and yet truly subjective to oneself. However, flavor and aroma are two large categories to differentiate different sake, and can be divided in some sub-categories like sweetness, lightness, richness for flavor, and floral and fruity for aroma. By consulting with Mrs. S, the store manager of Mirai Sake, who has been in the sake industry for more than 2 years, along with the tasting system currently existed in the field, the author finally limited the taste components for SAKE-TALE to five. They are sweet, dry, acidic, rich, and fruity/ floral (Figure 4.4) in a three-grade-style and this paper is going to use this system to qualify different cocktails as well. The reason to develop this three-grade analytical strategy, ie. several rating scales for both flavor and aroma, instead of a synthetic strategy, ie. A single rating scale is that it is better for people to separate different components from each other, and therefore to make the most objective decision [40].
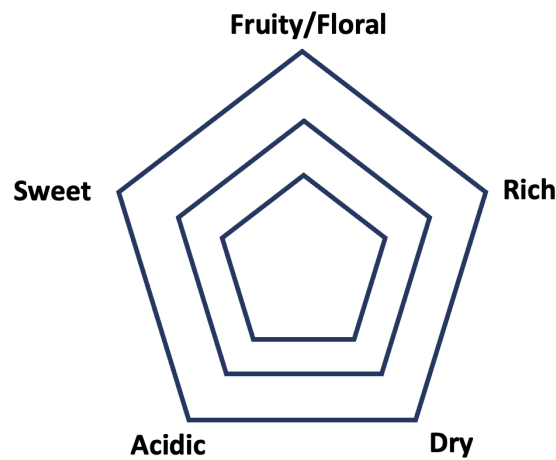
Figure 4.4 SAKETALE's Taste Components

Sweet belongs to one of the five senses. In the world of sake, the opposite of sweet is not sour or acidic but dry. That is, sake can be sweet and acidic at the same time. While most sake has a good balance between sweet and dry. In cocktails, sweetness can come from syrup, sugar, some kinds of fruits, and chocolate, and etc.

Dry In the world of sake, dry is the opposite to sweet. Dry can also be referred to as restrained, and at times the sake that is dry is also more light and clear. Honzo sake usually tastes drier because of the added alcohol in the process of production. In cocktails, it is defined as the flashy style ones that are not very powerful or intense.

Rich can be also referred to as full-body or round, and in SAKETALE's system, also umami. It is the magic "fifth taste". Sake's full-bodyness or umami often comes from rice, and that is why junmai, and futsushu, the sake with less polishing rate contains more rice part, and therefore contributes to the taste of umami. Moreover, in cocktails here in SAKETALE, it can mean

that the existence of sake is strong or it is that ingredients that have umami are added, for example tomato, carrot, soymilk, and ginger ale [2].

Fruity/ floral one of the classic steps of tasting sake is checking its smell, as sake gets its unique aroma. It can be fruity, smelling like tropical fruits or floral like rose. The rice itself does not contribute to sake's aroma, but the different types of yeast and the combination of them make sake smells unique. Ginjo and daiginjo are the usual types that are famous for their fruity/ floral aroma. Here again, in cocktails, it can be completed by adding tropical fruits such as mango and banana, orchard fruits like apple and pear, citrus fruits like grapefruits, and dry fruits like raisins.

4.2.2 Cocktail Components

It is true that there are a great number of ways to classify cocktails, while in SAKE-TALE system, cocktails are divided into 4 large categories: sour, fizz/ collines, old fashioned/ lowball, and three parens with a reference from chicagotribune [41].

Sour contains citrus juice, and fresh squeezed juice is critical in this category. Cosmopolitans and margaritas, for example, belong to this group.

Fizz/Collins everything that has bubbles belongs into the Fizz/Collins category. Soda and tonic water are frequently involved.

Old fashioned/lowball in this category, the ingredients are balanced between sweet and bitter. It can be something originally tastes bittersweet like Fernet Branca or a sweetened liquor paired up with something bitter. The sweet can come from syrup or sweet liquor like maraschino. And drinks are served in lowball/rocks glasses.

Three-partners there are usually 3 parts in the recipe, liquor/liquors, lower-alcohol modifier like vermouth, and a bitter or syrup. The classic combination that can apply to any type of glass.

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2 Umami Information Center `https://www.umamiinfo.com/richfood/`

4.2.3 Developing the Menu Through AI

Currently, there are only a limited number of Japanese sake-based cocktail recipes even on the internet. The author has checked Japanese bartenders and sake makers, and sake bloggers websites to gather 48 sake-based cocktail recipes (Figure 4.5). Utilizing the machine learning algorithm, the case-based reasoning (CBR) discussed in Chapter 2.3.1, and recurrent neural network (RNN), to combine 108 other cocktail menus from the github, cbr cocktail [3], the author has successfully generated new recipes from the system. The tool the author used is the Textgenrnn [4] developed by data scientist Max Woolf, 2018. Combining the current existing 48 sake-based cocktail recipes with 10 AI generated recipes, there are initially 58 recipes in the SAKETALE system (C). For each recipe, the author has made an initial SAKETALE base rate (Figure 4.6). Ideally, with more users in the system to submit their feedback and their originally made SAKETALE into the system, the system will have more data to learn, and therefore come up with more creative and interesting recipes that are hard for human beings to think of. During the AI learning stage, by importing the idea of CBR, where analyzing the user's tastes through the five taste components in Chapter 4.2.1, and 4 cocktail components in Chapter 4.2.2, the system is trying to keep developing the user's profile.

```
[Inspiration] sake 60ml, sakura liquor  20ml, pineapple juice 10ml
[sakerinya] sake 40ml, strawberry juice 100ml, syrup 5ml
[yogurt pine] sake40ml, pineapple juice 20ml, yogurt 30ml
[orange prince] sake 45ml, orange juice 60ml, tonic water
[sake orangina] sake 20ml, orangina 150ml, yogurt 40ml, honey 2ml, milk 10ml
[salty grapefruit] sake 60ml, grapefruit juice 75ml, salt around the glass
[purple lady] sake 20ml, Violet liquor 10ml, blue liquor 5ml, syrup, 1-2 strawberries,
[sake bloomson] sake 20ml, Kimia 20ml, orange juice150ml, syrup
[Hareha] sake 45ml, milk 90ml, cocoa power 5ml
[sake acerola] sake 30ml, acerola juice 120ml
[snowhite] sake 30ml, yogurt liquor 15ml, lemon 15ml
[spring snow] sake 30ml, gin 20ml, macha liquor 10ml, lemon juice 5ml, syrup
[sake mojito] sake 40ml, syrup 5ml, lime juice 15ml, mint leaves
[sake tonic] sake 60ml, tonic water 30ml, soda 30ml, orange slice
[sake sour] sake 45ml, lemon juice 15ml, sugar 5ml, soda, lemon slice
[peach ring] sake 140ml, peach liquor 60ml, mint leaves
[sake cassis tonic] sake 60ml, tonic water 60ml, cassis liquor 5ml, lemon slice
[sake cola] sake 80ml, coke 80ml, lemon slice
```

Figure 4.5 Some Examples of the Existing Menu

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3   jforjohn, cbr_cocktails `https://github.com/jforjohn/cbrcocktails`

4   Textgenrnn by Max Woolf `https://minimaxir.com/2018/05/text-neural-networks/`
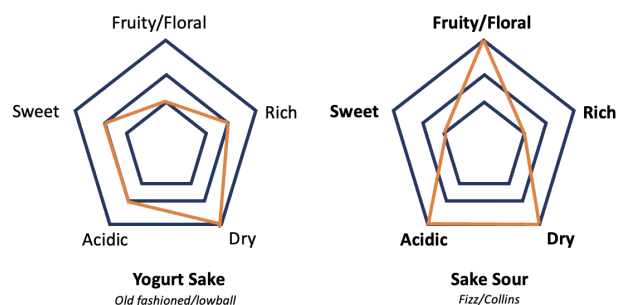
Figure 4.6   The Initial SAKETALE Rate

4.3.   Prototype

This chapter introduces the 4 major functions SAKETALE mobile application has that assists users in discovering their own preference and developing interests towards sake and cocktails. (Figure 4.7)

4.3.1   What is Your SAKETALE

The first and most unique function of SAKETALE is to access users' preference through 8 questions [What is Your SAKETALE]. This step tries to bring back the experience of visiting a bar, when the bartender is trying to ask the customer questions to make recommendations or a personal, special drink. Also, the question is trying to understand users' drinking preference, and serve as the fundamental frame for personal reference. The more engaging the users are with the application, for example, to adjust their cocktail recipes, explore the [community], and [sake], the more sophisticated the personal profile is going to develop. However, one other important point to be noticed is that the [What is Your SAKETALE] function is not a one-time function, but aims as a communicator to give users suggestions when they have no idea what they want to drink. Figure 4.8 lists the questions and the rationale behind each question.

Noticeably, the answer to each question is not "yes" or "no" all the time. Instead, the wording is more colloquial, allowing users to feel more engaged in the situation. Take Question 5 for example, the answers are "no, thanks", "I don't

Figure 4.7 SAKETALE's Opening Pages

Questions

Q1: What is your mood?
want something strong   just wanna feel a little tipsy. :)

Q2: How do you like your cocktail?
Sweeter the better   something clean & fresh

Q3: soda?
no, thanks   I don't mind   yes, please

Q4: mojito?
Yes, please   something else with gin is better   mint is not for me

Q5: Chocolates?
It's only for dessert   no idea   willing to try

Q6: Choose from oranges, strawberry, apple, mango

Q7: tomato?
Yes, please   I don't mind   no, thank you next

Q7: How about…
Milk   soy milk   calpis   not for this time

SAKETALE

Access the type of cocktails
Strong= sake+liquor :others≥ 2:1   tipsy= sake+liquor :others< 2:1

Determine the sweet and dry score
Sweet= sweet ≥2 ∪ dry≤2   clean= dry ≥2 ∪ sweet≤2

Decide whether to add soda or tonic water into the drink.
It is also one of the most common questions by bartenders.

Understand to what extent the user likes gin, mint and soda.

Another question to access sweet level, and the user's preference
over chocolate specifically.

Understand the type of fruits the user likes.

Get to know the user's preference of having vegetables in drinks
and specially tomatoes.

Learn about the user's preference over milk and the similarities.
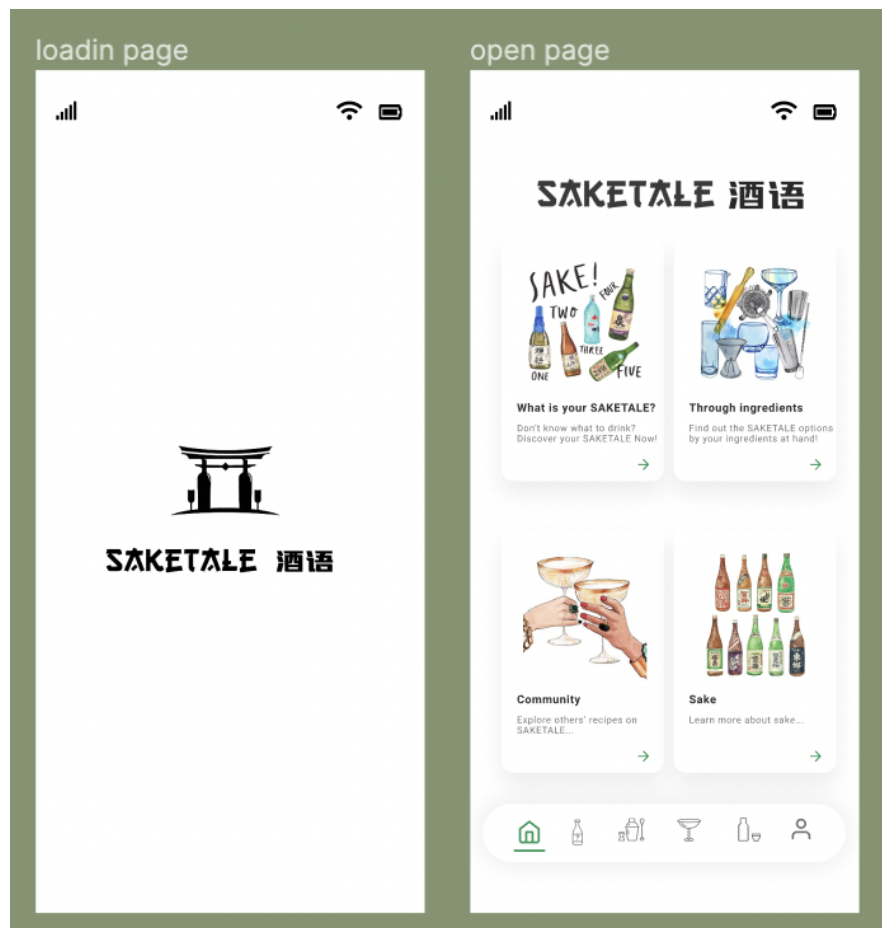
Figure 4.8 List of Questions and the Rationale

mind" and "put it in my drink", which emphasizes the situation that users are in the bars/restaurants to make a conversation with professionals who would help them to find out the drink for the moment. Another feature of the question is that the answers are trying to drive users to think. For example in Question 7 asking about users' preference over milk or other similar yet different ingredients like "calpis" and "soy milk". Instead of phrasing the question in "do you like milk? -yes -no -maybe", the question style gives users options to help broaden users' horizons in the issue and to drive deep into their own preferences. Also one other point that needs to be mention is the order of the answer. Instead of arranging the positive answer, "yes" in one side, and the negative answer,"no" in the other, the questions in [What is Your SAKETALE] is placed in a random order (for example, Question 5 and Question 7). Therefore, users' need to highly engage themselves to get the best result.

Figure 4.9 demonstrates some examples of interface of the function [What is Your SAKETALE] in the SAKETALE mobile application. The questions are distributed in a random order to avoid any learning effect, especially for long-time users. Figure 4.10 is the result page users' would get after answering all the questions. The users' preferences are analyzed by the taste components mentioned in Chapter 4.2.1, and below there are several recipes recommended to the users. The recommendations are made when the taste components of the SAKETALE drink match exactly with the users' tasting preference for the moment. By clicking "View Recipe", the users are going to the exact making steps and the kinds of ingredients needed for the cocktail. One of the special points here is that by further clicking the "sake" button in the page, the system has analyzed the kinds of sake that are recommended for making this SAKETALE. Again, the sake recommended matches the users' taste components to a large extent (>70%). Also, by tapping the "Rate this Recipe" button, users can rate and save the recipe to different lists created by themselves. Before saving, the accommodation page comes up, where users are able to adjust the recipe with their own tastes, and add some hashtags for future referral. Users are asked to rate in 4 different aspects, sweetness (acidity), freshness, amount of alcohol (dryness), and fruity/floral, which are corresponding to the Tasting Component in Chapter 4.2.1. After rating the recipe, a new recipe pops up where often the ratio of sake and other ingredients

is adjusted with other potential ingredients suggested to the recipe. When users finish the accommodation, they can freely add hashtags to the recipe for their personal record, and share the recipe with the community.
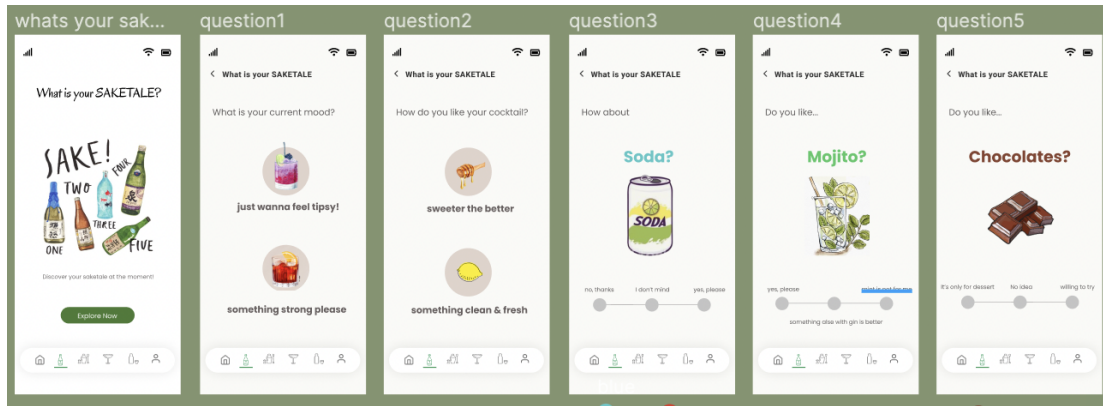
Figure 4.9 Interfaces of [What is Your SAKETALE]

4.3.2 Through Ingredients

This function (Figure 4.11) enables users to search for the recipe through ingredients. A lot of times users have sake and some other liquors at hand, but do not know how to use these ingredients at hand to make cocktails. The function "Through Ingredients" would be an easy tool to assist users to explore the endless possibilities with what is already at hand. There are two mechanisms behind. Aside from sorting from the database to sorting the potential recipes with the input information about the ingredients users already have, the output, "SAKETALE" users can make is also recommended according to the specific user's drinking preference.

4.3.3 Community

Another significant feature of the SAKETALE mobile application is the "community" function (Figure 4.11). As discussed in Chapter 2.2.1, Chinese people, no matter their ages, enjoy browsing over online communities and share their own

Figure 4.10 Result Demonstrations of [What is Your SAKETALE]

Figure 4.11 Interfaces of functions

stories in online communities. In fact, users are really used to the community-style applications. There are more general communities like *weibo*, which is the Chinese version of twitter and *douyin* , the Chinese version tiktok, where there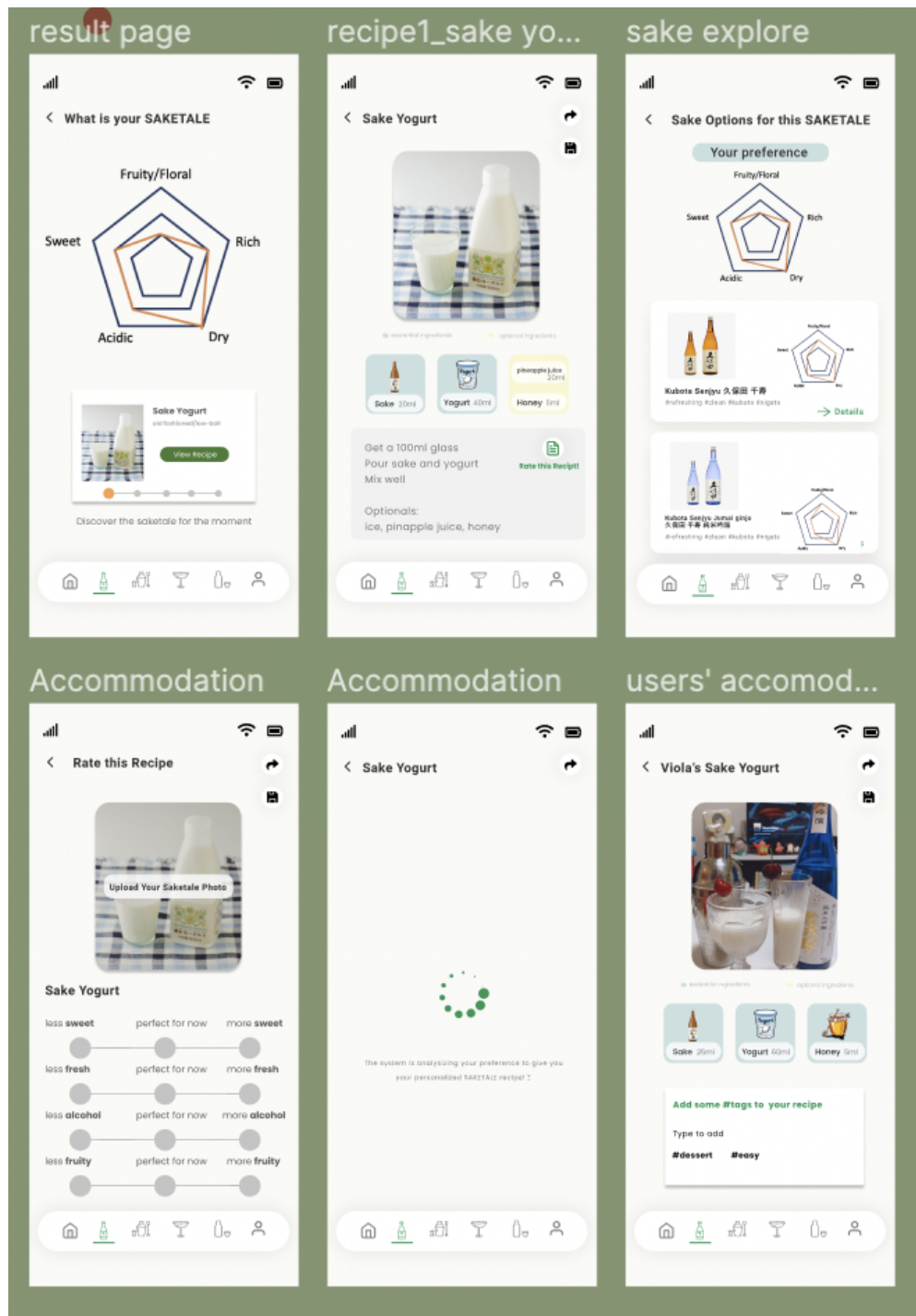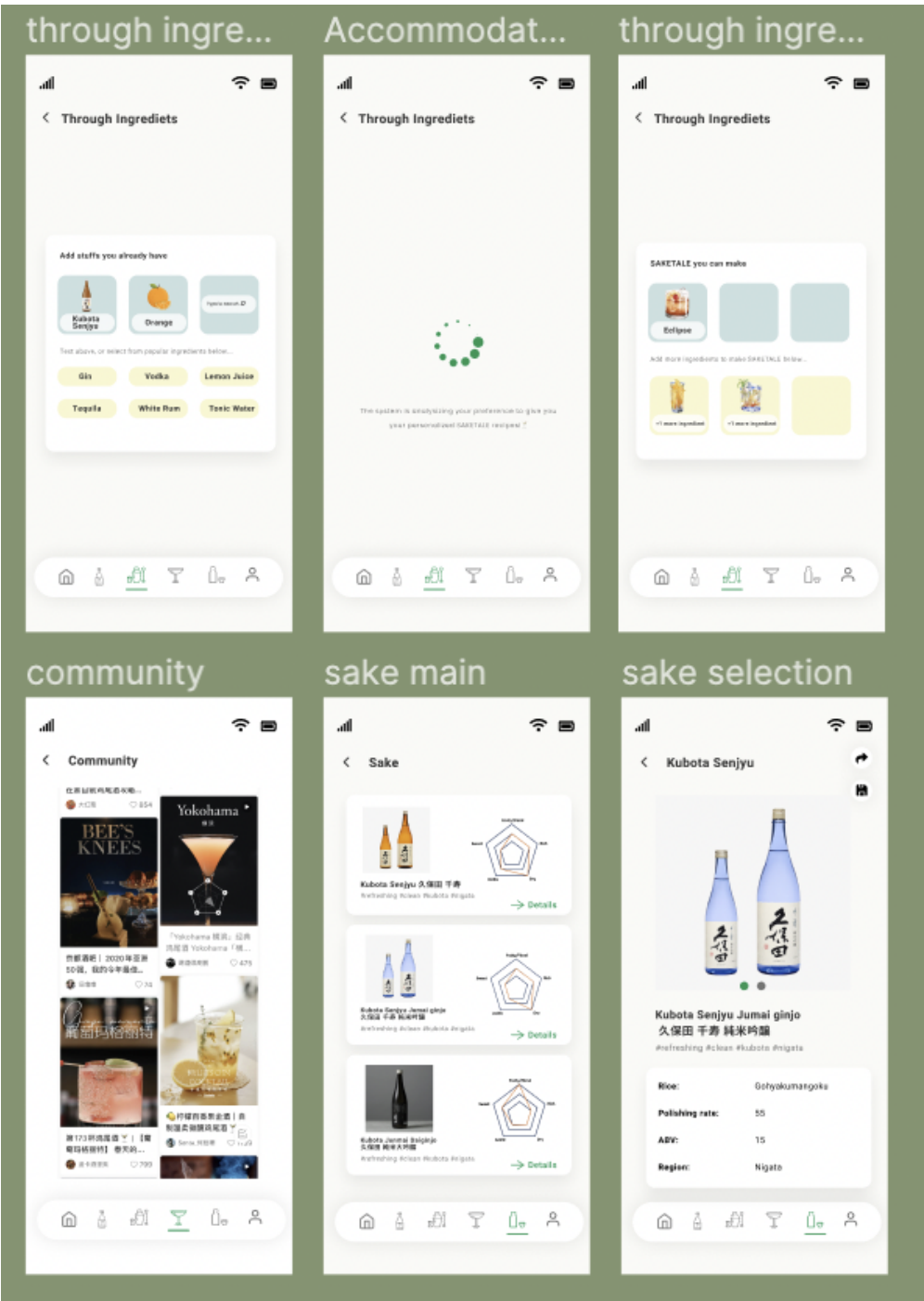 are information in all genre, and there are specialized communities like *xiachufang* , the Chinese version of cookpad, for users to browse and learn about cooking, and *xiaohongshu* , which is mainly about sharing personal recommendations of cosmetics and beauties.

The [Community] function in SAKETALE is a place for users to explore what other people are making and also upload their own cocktail recipes to influence the community.

4.3.4 Sake

Last but not the least, the [Sake] function serves as a dictionary for users to understand and search for different kinds of sake, and SAKETALE cocktail recipes. The interfaces are illustrated in (Figure 4.11). Each sake has its own tasting component, the region, and people's comments below. This function hopes to serve as an information base by keeping the information as simple and informative.

Understanding that there are tons of sake brewers in Japan, and the innovation rate is huge, SAKETALE for the initial stage only support information from Asahi-Shuzo Sake Brewing Co. Ltd [5], where the Kubota series [6] is being introduced. There are exactly 4 kinds of Kubota sake in the system, which are *senju, senju junmai-ginjo,junmai-daiginjo,*and *hekijun*, and are highlighted in Figure 4.12. Apart from the fact that it is extremely difficult to put all the sake information from different breweries at the current stage, there are 2 reasons for picking up the Kubota series. First and foremost, the availability. Since the Kubota series is well-known in Japan domestically, it is really handy and people can get them even from supermarket, unlike a lot of sake where are only sold at specialized liquor stores. Also, people in China can get Kubota series easily online. Secondly, the taste is well-defined. Unlike other sake, Kubota series have the official taste chart (Figure 4.12), making it easy for the author to choose the

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5   Asahi-Shuzo Sake Brewing Co. `https://www.asahi-shuzo.co.jp/`

6   Kubota `https://www.asahi-shuzo-online.jp/SHOP/307511/list.html`

different types of sake in this initial stage and clarify the chosen sake into the
SAKETALE taste system 4.2.1.
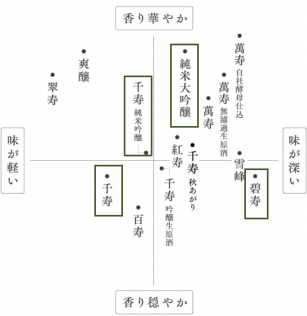
Figure 4.12 Kubota Series Infor-
mation

Figure 4.13   Kubota Sake in
SAKETALE

Chapter 5

Finding and Evaluation

This Chapter explains users' experiences and feedback towards the SAKETALE journey in detail. Figure 5.1 demonstrates the core flow of this research to make the following chapter easier to understand.
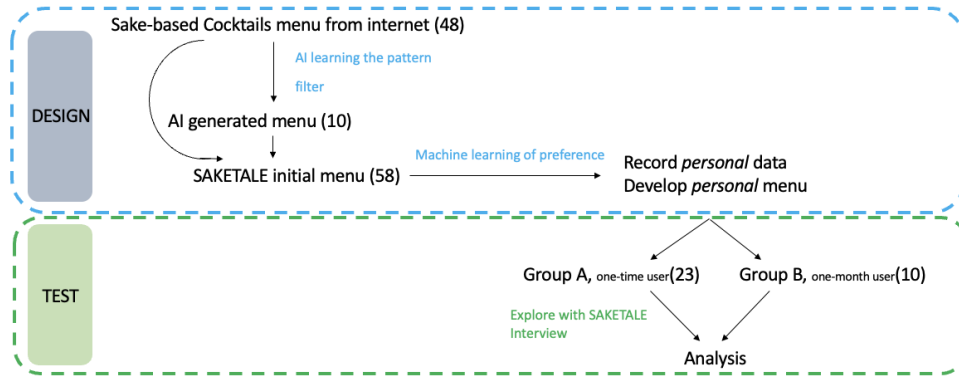
Figure 5.1 Flow of the Research

5.1. Methodology

The data of SAKETALE is collected from users who experienced the SAKE-TALE mobile application, and made their own cocktails after. The evaluation is analyzed both quantitatively and qualitatively through the evaluation form that participants received after the SAKETALE experience, and a deep interview that lasts at least 30 minutes. There are in total 33 participants in the experiment. All of the participants are Chinese and have been living in China for at least 10

years, and are or were in China in the past 3 years. While they are not necessary in China at the time of the experiment. The participants are randomly divided into 2 groups, with one group (Group A) uses SAKETALE for 1 time, and the other (Group B) use SAKETALE for 1 month. The details of the demographic information of the participants are shown in Figure 5.2.

	Group A	GroupB	Total
Number of Participants	23	10	33
Gender (Male)	11	3	14
Gender (Female)	12	7	19
Average Age	25.9	25.2	25.7
Drinking Frequency (Everyday)	6	3	9
Drinking Frequency (≥1 per week)	8	3	11
Drinking Frequency (≥1 per month)	6	3	9
Drinking Frequency (barely)	3	1	4

Figure 5.2 Demographic Information of Participants

The hypothesis here to make up the two groups is that participants' preference of SAKETALE would be significantly different , where Group B participants like SAKETALE experience more as they have engaged with the application for a longer time.

For Group A participants, they are asked to explore with SAKETALE mobile application, and make a cocktail accordingly. After the experience, an evaluation form is given to assess:

i) participants' drinking habits, attitudes towards Japanese sake and cocktails in general

ii) the overall experience with the application, and willingness to use the application in the long term

iii) rating and feelings towards each segment

iv) imaginary frequency of using each segment

v) other functions that would be good to have

vi) demographic information: age and gender

Group B participants are asked to keep using the service for one month. There are no force requirements to use the service every day or every time they want to make something to drink at home, but participants are asked to use the application at least 2 times within the one-month time period. Instead of iv) imaginary

frequency of using each segment, Group B participants are asked about
iv) the real frequency of function used and reason

5.2. Target Users

The SAKETALE is targeting Chinese consumers in the hope to build up the
sake knowledge and enthusiasm. The main target is consumers between the ages
of 18 to 40. As analyzed in Chapter 2.2, Chinese consumers around 18 to 34
years old are extremely willing to explore new culture in alcohol, and they belong
to the large group of cocktail-lovers, home bar lovers. On the other hand, the
major consumers of Japanese sake are around 25 to 40 years old. Combining both
segments, the main target for SAKETALE is consumers from 18 to 40 years old.
The frequency of drinking is not an important factor to determine target users
because no matter if the user is an experienced drinker or very new to the world
of alcohol, it is very likely that each user can find the function he wants, from
[Through Ingredients] to find out how to make magic out of materials one has in
hand to [What is Your SAKETALE] to let the mechanism to choose the perfect
drink for you for the moment. Also, the more time users spend exploring and
developing their personal preferences, the better the system can interact with the
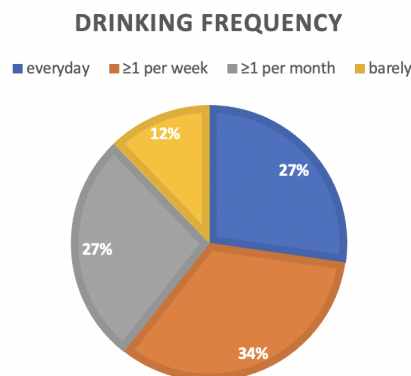users to accommodate a variety of needs.

Figure 5.3 Drinking Frequency

For the 33 participants involved in the experiment, the drinking frequency is

shown in Figure 5.3. 27% of participants almost drink every day, and 34% of participants drink at least once per week, 27% drink at least once per month, and only 12% of participants drink barely. It shows that young Chinese consumers are pretty regular drinkers. So what kind of alcoholic drinks are people drinking? Figure 5.4 demonstrates the tendency that participants are going to choose each type of alcoholic drink when they are about to drink something. From the chat, it is easy to notice that participants would most likely to grab a beer if they want to have something alcoholic (14.71%), then it comes to cocktails (11.76 %), and wine & champagne and spirits (6.86 %). During the interview, participants mention that beer is one of the easiest drinks they could grab, and the alcohol level is not too high. While as for wine, there is a lot of association with "for health", "for the romantic feeling".
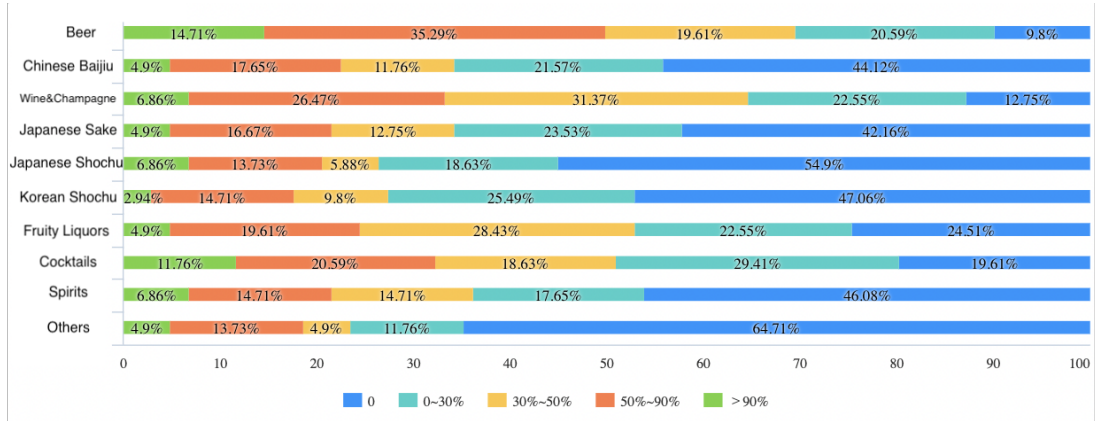
Figure 5.4 Tendency of Choosing Different Types of Drinks

As for cocktails, Figure 5.5 illustrates a word cloud of it. Participants hold a complex image of cocktails. While some think cocktails are strong, others may consider cocktails as low-alcoholic drinks that are not easy to get drunk. Some associate cocktails with fancy bars with bartenders who suit up, while others like to have fun with cocktails, and would explore and have a lot of fun with it in a more casual way. However, most of the participants enjoy cocktails, saying the drink has good taste, and it is fun. It is not surprising that people hold such different attitudes towards cocktails as cocktails themselves are diverse and have

different faces. It can be strong or soft, formal or casual. Therefore, the market needs to be educated, and SAKETALE is here to take the role.

On the other hand, participants' understanding towards Japanese sake is more consistent (Figure 5.6). For most of the participants, sake has a high barrier to entry as they need to have a lot of knowledge to understand it. Also, participants often consider sake as strong and pure alcohol, which some of the female participants are too afraid to try. Besides, the positive images associated with sake are premium, craftsmanship, cute design, and a representation of Japanese culture. Moreover, participants hold a feeling that sake is mostly for older people. After the experiment, both groups of participants start to think differently towards sake, and SAKETALE, which is discussed in the following section, Chapter 5.3 in detail.

Figure 5.5 Image towards Cocktails

Figure 5.6 Image towards Sake

5.3. Overall Experience

Participants are asked to rate the degree of satisfaction with the experience on a scale of 1 to 5, where 1 means "don't like the experience", and 5 stands for "like the experience, and would like to use it more often". Group A participants rate the degree of satisfaction right after they finish the test, and Group B participants rate it after one month of using the service. The average satisfaction rate of Group A is 3.61, and Group B is 3.80, there is no significant difference between Group A and Group B in the 0.05 level (p value=0.58>0.05) (Figure 5.7).

It is a good signal where both the first-time users (Group A), and long-run users (Group B) are satisfied with the overall experience. Noticeably, both Group A and Group B participants share similar feelings towards SAKETALE (Fig-

	Group A	Group B
Mean	3.608695652	3.8
Variance	0.976284585	0.4
Observations	23	10
Pooled Variance	0.808976157	
Hypothesized Mean Difference	0	
df	31	
t Stat	-0.561518317	
P(T<=t) one-tail	0.289240738	
t Critical one-tail	1.695518783	
P(T<=t) two-tail	0.578481475	
t Critical two-tail	2.039513446	

Figure 5.7 T-test Degree of Satisfaction

ure 5.8). Both groups were surprised about how simple and easy it could be to make a sake-based cocktail, and they really found the recipes are personally related to themselves, and therefore, the drinks taste good. Also, the [What is Your SAKETALE] part makes participants want to share the result on social media or with their friends. As for the cocktails participants made, for Group B, the long-term participants, 70% mentioned that they want to share what they made on social media, and for Group A, the one-time participants, 86.9% are willing to share what they have made in public. The reasons for sharing are similar but a little bit different for both groups. For Group A, the first-timers, it is more about sharing the excitement of the first time making a personally-designed cocktail with sake as the base, and sharing their types and personalities to their friends. While for Group B, it is more about sharing the progress in cocktail mixology, and the appreciation of getting to know the topic deeper.(Figure 5.10)

Figure 5.8 Feelings after Experiment

Figure 5.9 indicates the frequency of using each function for Group A and Group B participants. It is calculated through ranking each function where the most frequently used function gets a point of 4, and the least frequently used function gets 1 point. While the point in the figure is calculated by an average.
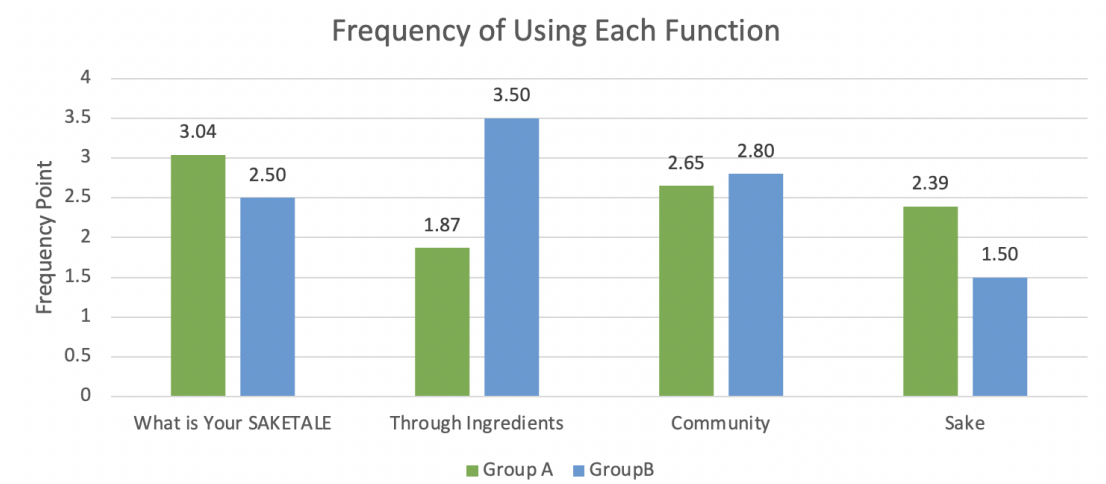

Figure 5.9 Frequency of Using Each Function

For Group A, there is an evenly spread of frequency points where [What is Your SAKETALE]'s rate (=3.04) is slightly higher than the rest of the functions. Participants again, refer to this function as interesting, good for first-timers, and good for social media, giving them an impulse of wanting to share with the public. [Community] and [Sake] get similar points (Frequency Point= 2.65, Frequency Point= 2.39). These two functions are similar in a way that is more information-focused, and Group A participants imagine themselves would use these functions to understand the world of cocktails and sake. While on the other hand, [Through Ingredients] gets the lowest point (Frequency Point= 1.87) as those first-timers saying that they do not have so many ingredients and liquors at home currently, and therefore it is hard for them to imagine that they would use this function often.

For Group B, the long-time users, the distribution of frequency points is slightly different. The most-frequently-used function is [Through Ingredients] (point=3.50), with 70% of participants rate this function as the first most frequently used func-
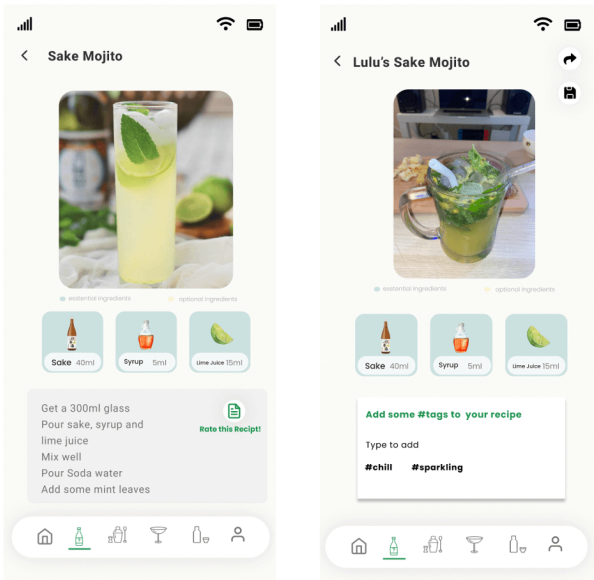
Figure 5.10 Participants' SAKETALE

Figure 5.11 Participants' SAKETALE Application Views

tion during the time of the experiment, and 20% of the participants give out a point of 3, meaning it is the second most frequently used function by them. During the interview, participants mention that [Through Ingredients] can help them to use up what they already had, and therefore, they are using this function most often. In addition, the second most-frequently-used function is [Community] (point=2.80), following by [What is Your SAKETALE] (point=2.50) and [Sake] (point=1.80).

Last but not the least, Group B participants are also asked about their real frequency in the experiment time (one month) of using SAKETALE. The average number of times that Group B participants used 11.3 times, with the detail of distribution shown in Figure5.12. 40% of participants use SAKETALE around 11 to 15 times per month, 30% use 0-5 times per month, and 10% use the application 6-10 times, 16-20 times, and >21 times separately. The following Chapter 5.4 Segment Analysis is going to discuss participants' engagement by breaking into each function of SAKETALE.
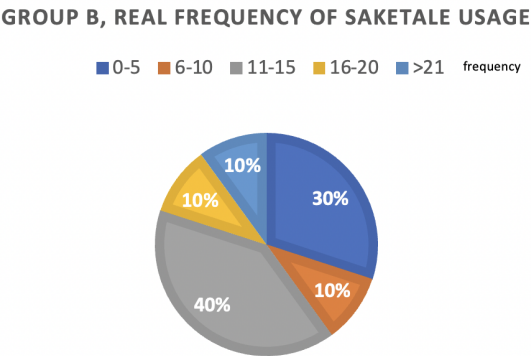

Figure 5.12 Group B, Real Frequency of SAKETALE Usage

5.4. Segment Analysis

5.4.1 [What is Your SAKETALE] Feedback

Referring back to Chapter 4.3.1 What is Your SAKETALE , [What is Your SAKE-TALE] is the function that stimulates the bar experience for users, where users get 8 questions to access the drink for the user for the moment. There are some differences between Group A and Group B in the opinions towards this function. Definitely, for first-timers, Group A participants often find this function intriguing as they want to get tests to see their types, with 86.9% of them wanting to share their SAKETALEs for the moment to the public. Actually, people these days enjoy sharing the test result with friends or on social media. Not to mention by the end of the year people often share End of year Wrap by music application for example, on May 26th, 2021, Chinese people suddenly started to share the result of "What is Your Color" by NetEase that is a short version of MBTI Test [42] of personality. In the interview of SAKETALE, the function of [What is Your SAKETALE] has reminded participants of those similar cases, saying that they would be willing to share the result with the public. However, the [What is Your SAKETALE] is not only a one-time function to access people's interests. After all, what people want to drink at this moment can be very different from the next moment, and the aim of the system is to analyze the core of similarities within the variations to develop users' portfolios. Understanding in the way where [What is Your SAKETALE] is more about discovering different needs in different circumstances, Group B, the long-term users actually use this function pretty often as discussed in Chapter 5.3 Overall Experience.

5.4.2 [Through Ingredients] Feedback

This function as explained in Chapter 4.3.2 Through Ingredients, is the function that gives out SAKETALE recommendations by analyzing users' input of what they already had and their drinking preferences. The attitude towards this function is largely different between Group A and Group B participants. Referring back to Figure 5.3.3 Frequency of Using Each Function, Group A would use this function least frequently, while in practice, Group B participants had used

[Through Ingredients] most frequently. As users start to buy more and more materials for their home-bar experience, they tend to use this function more often to "explore more possibilities ", "use up the big bottle of liquor", and "learn new stuff that is specially adjusted" for them. The figure 5.13 is from one of the Group B participants where she said that she would use the [Through Ingredients] to combine what she had at home to make different saketales.

Figure 5.13 Participants' SAKETALE 2

5.4.3 [Community] Feedback

Community function (Chapter 4.3.3 Community), is the function where users can update and share their recipes of SAKETALEs to the community. Users can upload either pictures or videos. This function is still in the beta period, and the functions are not that sophisticated. Users feedback towards this function include i) have "filter" and "search" functions where they can easily find out what they are interested in. ii) incorporate the "follow" function that users can follow their friends or users who get the style they would appreciate and want to learn more from. iii) develop a "recommendation" function. For example, have SAKETALE for you today on the opening page or "This week's trend", in a way to help users to organize all the pieces of information to make this function more user-friendly.

5.4.4 [Sake] Feedback

Referring back to Chapter 4.3.4 Sake, this function serves as an encyclopedia for users to expand their knowledge towards sake. Group A and Group B users have a spread of opinions on this section. In general, Group A, the first-timers imagine that they would use this function often but in fact, for Group B, the one-month users, used this function least often (Figure 5.3.3 Frequency of Using Each Function). In the next step, the author attempts to analyze whether there is a pattern between users with different drinking frequency in different groups, and the result is shown in Figure 5.14. As it is shown in Figure 5.14, there is no clear pattern between the drinking frequency and the frequency of using [Sake] function for Group A participants. This pattern (no clear pattern) is more clearly shown in Figure 5.15.
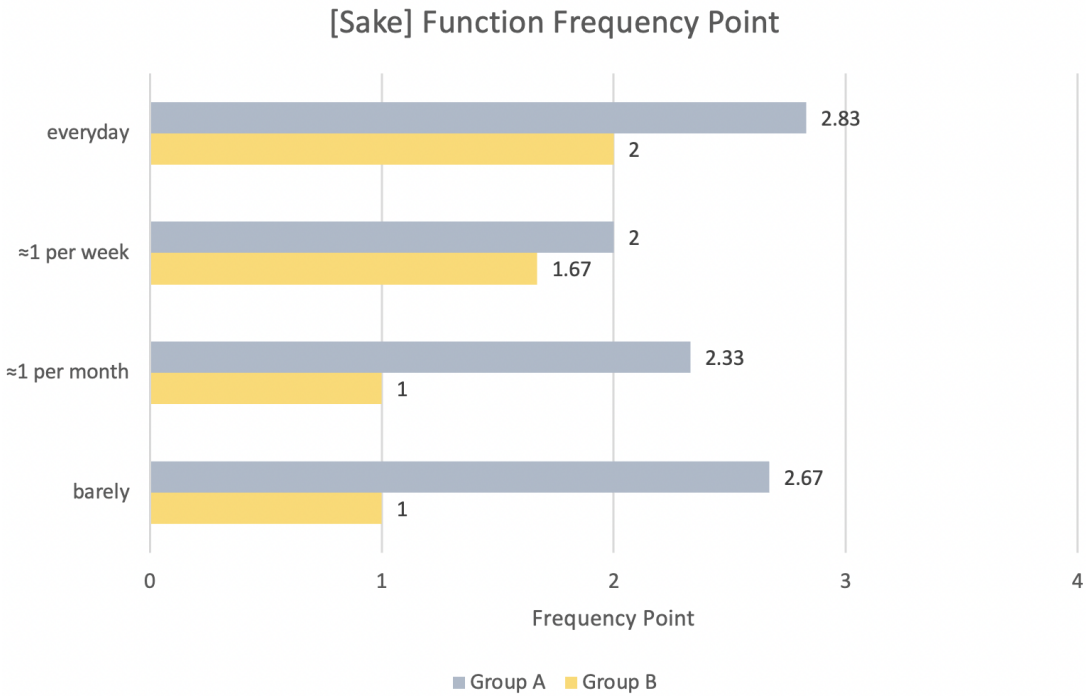

Figure 5.14 [Sake] Function Frequency Point

On the other hand, for Group B, the long-term group, there is a slight trend where those people who drink more frequently would also like to use the [Sake]
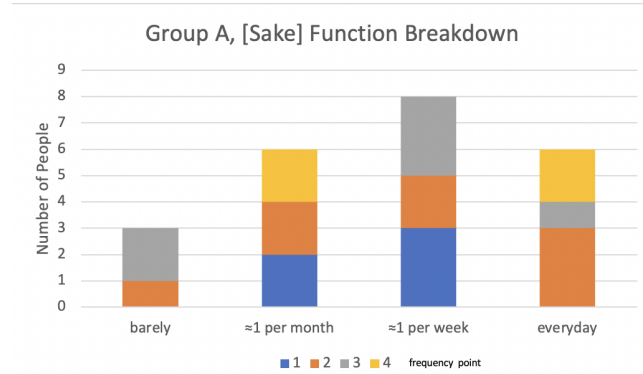
Figure 5.15 Group A, [Sake] Function Breakdown

function more often. One of the reasons is that those frequent drinkers are most
likely to be the ones who are interested in alcohol in general, and the [Sake]
function is a good way for them to acquire general knowledge towards a brand-
new field. On the other hand, the breaking-down Figure 5.16 still shows that the
[Sake] function is undermined by users, where 70% of the participants use this
function least frequently during the experiment time. Although the function is
not as frequently used as others, participants do mention it is good to have the
information there, and it serves as a reference for them if they want to buy a bottle
of sake, or often when they are at the Japanese restaurant, and try to understand
the drink selection the restaurant gets. In addition, the [Sake] function can not
only be accessed from the home page, but also available on the recipe page, when
the user clicks the "sake" button for more relevant sake information for the specific
recipe (Figure 4.3.1.3 Result Pages). Therefore, it is still necessary to keep the
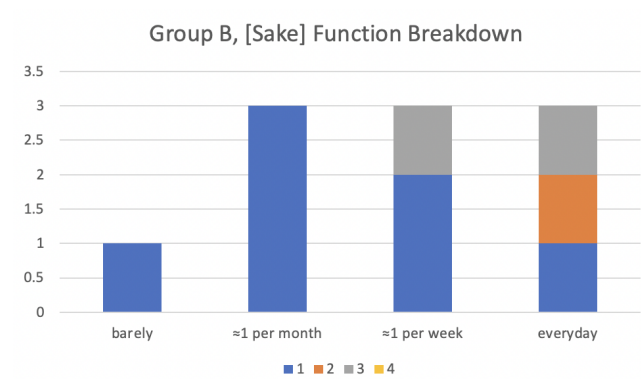function in SAKETALE.

Figure 5.16 Group B, [Sake] Function Breakdown

Chapter 6
Conclusion

This Chapter includes the conclusion of the current research with the discussion of the design, and its feasibility with limitations. Also, this chapter discusses the future possibilities and market opportunities in the field.

6.1. Research Conclusion

This research aims to identify the feasibility of promoting sake-based cocktails, the SAKETALE, and the style of home bar among Chinese young people. Through the development of the mobile application SAKETALE, which has four distinct functions, [What is Your SAKETALE], [Through Ingredients], [Community] and [Sake], with the following user experience test that splits participants into two groups, one-time group, and long-term group, the experiment has confirmed that Chinese young consumers have a strong interest towards Japanese sake, but at the same time still do not have a lot of knowledge associate with it, and have no idea where to acquire the adequate knowledge. Therefore, those current alcohol lovers turn to other drinks available in the market, such as beer, red wine, and other Ready-to-Go drinks. However, consumers are curious about the topic of Japanese sake and are eager to learn more. As a result, the introduction of mingling sake with cocktails lowers Chinese consumers' barriers to entering the world of sake, telling them what types of drinks are for them, and at the same time, introduce consumers with a lot of interesting possibilities of dealing with what they have in hand to make recipes out of them. Also, SAKETALE application serves as a good source of information-gathering, showing users general information on the topic of sake and providing them a community of exploring what other people are doing. In fact, this research has shown that both first-time users and long-term

users are willing to engage and contribute to SAKETALE in the future, despite their current drinking frequency. This research confirmed that the market gap of sake in the Chinese market is huge and promising, and SAKETALE would be an effective way to educate consumers and to further engage them in the world of sake.

6.2. Research Limitation

Despite the promising results from the current research, there are still limitations in the process.

1. Insufficient number of recipes in the database
   Unlike IBM's Chief Watson [38] which has around 3,500 recipes as initial input, there is only a limited number of sake-based cocktail menus and therefore SAKETALE only has 48 initial inputs. Therefore, in the case-based reasoning part (Chapter 2.3.1), this insufficient data is hard for the system to develop a pattern. In the end, after carefully inspecting the outcomes from the Textgenn system, only 10 AI-generated recipes are being selected to the SAKETALE system. It is hoped that as more and more users engage in the community and upload their creative menu to the community, the system is able to learn the pattern, and therefore come up with more natural recipes in the future.

```
####################
Temperature: 0.5
####################
[sake police liquor 10ml, sake 30ml, pineapple juice 100ml, soda

[Sake Millen Happines] sake 20ml, sake 120ml, sake 30ml, syrup 5ml

[sake game] sake 30ml, automi 20ml, strawberry size 120ml, lemon slice
```

Figure 6.1 Example of AI-Generated Recipes

2. Insufficient Questions in [What is Your SAKETALE] function
   Currently, there are only 8 questions available in [What is Your SAKETALE] function. Therefore, users would get exactly the same set of questions every time even though the questions are placed in random order. Users have

complained about getting bored of the exact same questions over time and therefore would use this function less. As a future direction, the author would prepare a set of questions and would make sure to update questions or answers to make sure users could keep interests with the function.

3. Insufficient recommendation on sake
   At the current stage, the SAKETALE system only supports the Kubota series of Japanese sake in its database. Since Kubota has not officially entered the Chinese market, participants that are located in China currently may use other sake that they can get handly. In order to truly become an encyclopedia of sake to Chinese consumers, one of the most efficient ways would be to have a collaboration with Sakenomy or Sakenowa applications (Figure 6.2), which are based in Japan, and already gathered a number of users who are engaged in the community.

4. Insufficient sample size
   Currently, the research only involved 33 participants, while only 30.3% of them are long-term users. Therefore, the quality of [Community], along with other factors that need users' engagement like the learning part to understanding users' needs are not fully achieved to some extent. Therefore, in the next stage, more user tests are essential before the final launch of the service.

6.3. Future Development

Even though the research results have shown the high feasibility of realizing SAKETALE in the market, there are a number of parts that SAKETALE could consider to make the service better.

1. Incorporate music element into the design
   Creating ambiance is also one of the key elements for drinking. Sester. et al, 2013 [43] have demonstrated that people's drinking order would be influenced by the ambiance, and music is one of the elements that Sester. et al [43] has incorporated into their research. In addition, the Deli bar
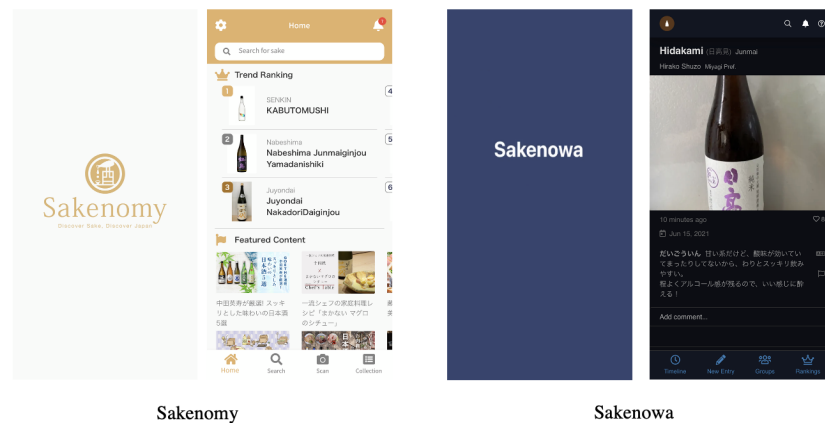
Figure 6.2 Examples of Existing Sake Information Applications

project that the author participated in (Chapter 3.1), has also included the music element into the package where users can scan the QR code to open the pre-selected music in Spotify [1] (Figure 6.3). Also, Japanese insulated product manufacturer, Thermos [2], has started a campaign called *otona*-bar (the word *otona* stands for both adults and sound in Japanese), where the sound of a bar, for example, the sound of soda, the sound of bartender swirling the insulated wears are recorded as long as a selection of a list of music (Figure 6.4). As a future direction, SAKETALE should support music as a part of the experience to further create the ambiance of enjoying a saketale.

2. Add the idea of food pairing
   Drinks and food are two indispensable factors that people often associate with each other. In the world of wine, there are pairing specialists called sommeliers who are wine professionals to give customers personal advice on wine and food pairing in a fine dining restaurant. Although the world of sake, cocktail food pairing is not as developed as that of wine, participants

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1 Sportify `https://www.spotify.com/us/`

2 Sportify `https://www.thermos.jp/english/`

Figure 6.3 Deli Bar Music Element

Figure 6.4 Thermos Music Element

in the research do show interest in the topic, not to mention that drinking in the traditional Chinese culture is always associated with ceremonies and food. Therefore, adding the concept of SAKETALE with food pairing is a promising direction to take into consideration.

3. Expend from the Chinese consumers' framework
   In this study, the author focuses on Chinese consumers' behavior solely. However, in the long run, SAKETALE should not be limited to the Chinese market but take a step back to the home country of sake, Japan to change the stereotype of sake in the market and revitalize sake, especially among young consumers. Also, SAKETALE has an enormously huge potential in western countries where the cultures of home bar, and cocktails are more immersive.

4. Expand information about sake
   As I have always keep mentioning, the topic of sake is extremely wide and deep. Not to mention that different regions have their specialties, but also the way of enjoying sake, for example the temperature of sake could also largely influence the taste. Considering the current system only support Kubota series, there is a long way to go to expand the database to enable [sake] function is truly informative. Also it would be interesting to categorize sake by region in the future, which is also one of the most common ways to fill sake into different categories.

5. Recipes considering the temperature of sake
   Drinking sake is also a complex matter as some sake is best to taste at room temperature, others are better to be cooled or heated. Regarding the fact that current SAKETALE recipes have yet incorporated the temperature issue into consideration, and all the recipes are basically supposed to be cold, it is a direction to also consider sake's characteristics at different temperature to suggest different recipes. Therefore, users can have a better overview understanding towards sake.

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Appendices

A. What is Sake (Making Process)

Sake is a Japanese word that usually refers to alcoholic beverages in general. It is also called *nihonshu* in Japanese, which is known as the "Japanese alcohol" in English, and therefore, sake is always considered as the national drink of Japan. The depth of sake is an overwhelming topic as the process of making sake is sophisticated. The taste of sake is a complex yet personal topic as well. This chapter is contributed to introducing the sake-making process briefly in order to build up an overall understanding of sake.

   Sake is a brewed beverage. The main material involves in sake production is rice, and therefore, the type of rice plays a significant role in production. Besides, koji, the type of enzyme involved in the brewing process, yeast, water, and filtering process also contribute to the taste of sake. Despite the complex mechanism that would influence the taste of sake involved in the production, the general process of making sake is actually straightforward as shown in Figure A.1 [1]. First and foremost, preparing rice is the key. Rice is milled and polished to get rid of the undesired outside part where proteins, fats. minerals and vitamins concentrated. Then the ideal rice is washed, steamed, and got cool down. Some proportion of these cleaned rice is mix with koji molds in a warm and humid environment. Here, the chemical reaction called saccharification takes place where starch in rice is converted into sugar. Actually, this brewing technique has originated in China. However, Japan is now the only Asian country that is still using this brewing technique to make alcoholic beverages [10]. As the next step, Koji rice is mix with washed rice, yeast, and water, first on a small scale called moto, and then transfer into a big tank with more rice and yeast adding up for fermentation. Yeast is known as the key factor to influence the sake's flavor. Yeast facilitates the process of converting starch into sugar and produce amino acids at the same time.

The amino acid adds to the sake's umami, a distinct taste of sake. Since 1906, the Brewing Society of Japan has started the process of regulating the type of yeast by naming different types of yeast. For example, #7 yeast, and the most widely used yeasts are #6, #7, #9, #10 [10]. Each yeast has its distinct characteristics to produce sake with a unique aroma and taste. At times, brewers use the in-house-produced yeast to make house special sake. The fermentation usually takes 3 to 4 weeks. After that, the fermented product gets pressed, filtered, pasteurized, bottled, and labeled.
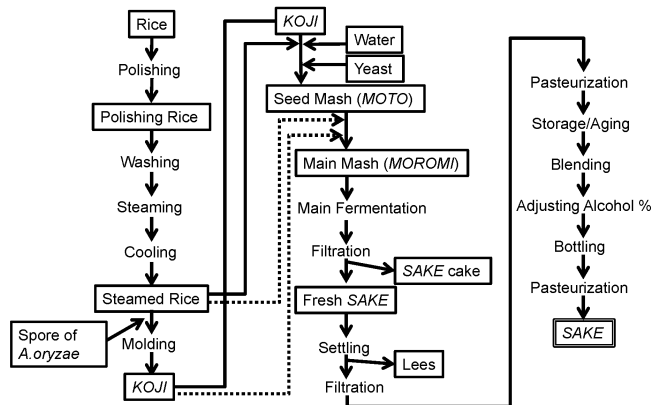

Figure A.1 Sake Production [1]

B. Tasting and Rating Sheet of Sake

This section show the tasting and rating sheet developed by the Comprehensive Guide to Japanese Sake [10].

Name:						Date:		
Sample No.								

		Colorless	Pale yellow	Gold		Amber	Dark amber
Appearance	Color/hue	Colorless	Pale yellow	Gold		Amber	Dark amber
		-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ -------------☐--					
	Clarity	Clear					Dull
		-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ -------------☐--					
Nose	Intensity	Undetectable					Strong
		-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ -------------☐--					
	Characteristics	Undetectable					Strong
	Fruity banana	-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ --------------- ☐--					
	Fruity apple	-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ --------------- ☐--					
	Grass/green	-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ --------------- ☐--					
	Cereal	-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ --------------- ☐--					
	Caramel	-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ --------------- ☐--					
		-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ --------------- ☐--					
Palate	Sweetness	Dry		Medium			Sweet
		-- ☐ ---------- ☐ ---------- ☐ ------------ ☐ ---------- ☐ ---------- ☐--					
	Body	Watery		Medium			Heavy
		-- ☐ ---------- ☐ ---------- ☐ ------------ ☐ ---------- ☐ ---------- ☐--					
	Finish/aftertaste	Lingering		Fair			Fine
		-- ☐ ---------- ☐ ---------- ☐ ------------ ☐ ---------- ☐ ---------- ☐--					
	Characteristics	Undetectable					Strong
	Acidity	-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ --------------- ☐--					
	Umami	-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ --------------- ☐--					
	Bitterness	-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ --------------- ☐--					
		-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ --------------- ☐--					
Conclusions	Quality	Poor	Acceptable	Good	Very good	Excellent
		-- ☐ --------------- ☐ --------------- ☐ --------------- ☐ -------------☐--					

Figure B.1 Sake Tasting Sheet

75

Figure B.2 Sake Tasting Sheet for National New Sake Award

C. SAKETAILE Initial Recipes

1 [Sake Refresher]

sake 80ml, gin 10ml, syrup 20ml, lemon slice

2 [Sake Fizz]

sake 60ml, gin 20ml, soda 40ml, cream 10ml, sugar one spoon

3 [Sake Julep]

sake 30ml, gin 10ml, syrup 12, pineapple juice 10ml, mint leaves

4 [Saketini]

gin 60ml, sake 30ml, olive

5 [Parisian]

sake 45ml, gin 30ml, cassis liquor 15ml

6 [Svadka]

sake 45ml, vodka 45ml, lemon juice 15ml

7 [Green Nippon]

sake 60ml, green mint syrup 20ml, lemon juice 10ml, pineapple juice 10ml, lemon slice

8 [Black Nada]

sake 40ml, coffee liquor 20ml

9 [Kalua Fizz]

sake 30ml, coffee liquor 20ml, lemon juice 15ml, syrup 5ml, soda 50ml

10 [Sake Dream]

sake 30ml, Cointreau 15ml, lemon juice 10ml

11 [seoryuh]

sake 30ml, blue liquor 15ml, lemon juice 10ml, syrup 5ml

12 [Fantastic Remann]

sake 50ml, White Curacao 10ml, Kirsch 5ml, lemon juice 3ml, tonic water 50ml, blue Curacao 6ml, lemon slice

13 [sky blue]

sake 45ml, blue Curacao 10ml, lemon juice 5ml, lemon slice

14 [Blue Yogurt]

sake 50ml, blue Curacao 20ml, yogurt 120ml

15 [Shiroume]

sake 45ml, White Curacao 15ml, lemon juice 30ml, salt (around the glass)

16 [Sake lychee]

sake 45ml, lychee liquor 45ml, Cointreau 5ml, lemon juice 5ml, syrup 5ml

17 [Kihi]

Sake 120ml, lychee liquor 60ml, ume-shu 15ml, syrup 5ml

18 [Sake Kir Royal]

sake 80ml, cassis liquor 30ml, soda 100ml

19 [Cassis Musume]

sake 80ml, cassis liquor 30ml, calpis 100ml

20 [Sake Flip]

sake 180ml, orange juice 60ml, soda

21 [Frozen Sake Lime]

sake 45ml, lime juice 15ml, sugar, mint leaves

22 [Sunset Sake]

sake 60ml, tomato juice180ml, lemon slice

23 [Samurai Rock]

sake 60ml, lime syrup 10ml

24 [The Green Tea]

sake 120ml, lemon juice 30ml, green tea 60ml, syrup 10ml

25 [old fashioned cocktails]

sake 60ml, soda10ml, sugar, lemon slice

26 [sake highball]

sake 45ml, ginger ale 30ml, lemon peel

27 [Tanpopo]

sake 75ml, calpis 25ml, orange juice 40ml, soda, mint leaves

28 [Nagomi]

sake 40ml, ume-shu 10ml, milk 20ml, macha power 5ml

29 [Apple Vinager]

sake 50ml, apple juice 100ml, Okinawa moromi vinager 30ml

30 [Fresh tomato]

sake 60ml, fresh tomato $\frac{1}{4}$ cut, syrup 5ml, mint leaves

31 [Inspiration]

sake 60ml, sakura liquor 20ml, pineapple juice 10ml

32 [sakerinya]

sake 40ml, strawberry juice 100ml, syrup 5ml

33 [yogurt pine]

sake40ml, pineapple juice 20ml, yogurt 30ml

34 [orange prince]

sake 45ml, orange juice 60ml, tonic water

36 [sake orangina]

sake 20ml, orangina 150ml, yogurt 40ml, honey 2ml, milk 10ml

37 [salty grapefruit]

sake 60ml, grapefruit juice 75ml, salt around the glass

38 [purple lady]

sake 20ml, Violet liquor 10ml, blue liquor 5ml, syrup, 1-2 strawberries, soda

39 [sake bloomson]

sake 20ml, Kimia 20ml, orange juice150ml, syrup

40 [Hareha]

sake 45ml, milk 90ml, cocoa power 5ml

41 [sake acerola]

sake 30ml, acerola juice 120ml

42 [snowhite]

sake 30ml, yogurt liquor 15ml, lemon 15ml

43 [spring snow]

sake 30ml, gin 20ml, macha liquor 10ml, lemon juice 5ml, syrup

44 [sake mojito]

sake 40ml, syrup 5ml, lime juice 15ml, mint leaves

45 [sake tonic]

sake 60ml, tonic water 30ml, soda 30ml, orange slice

46 [sake sour]

sake 45ml, lemon juice 15ml, sugar 5ml, soda, lemon slice

47 [peach ring]

sake 140ml, peach liquor 60ml, mint leaves

48 [sake cassis tonic]

sake 60ml, tonic water 60ml, cassis liquor 5ml, lemon slice

49 [sake cola]

sake 80ml, coke 80ml, lemon slice

50 [Lemon Tea sake]

80ml Sake, 20ml lemon tea

51 [yogurt sake]

Sake 100ml, Plain yogurt 200 g, Honey 15ml

52 [peach sake] sake 90ml, peach liquor 30ml, calpis 40ml 53 [grapefruit sake]

sake 40ml, grapefruit juice 90ml, lemon 5ml, sugar 5ml

54 [sake in Thai]

sake 50ml, coconut juice 100ml, lime juice 10ml, honey 5ml

55 [Pina Cholada sake]

sake 30ml, coconut juice 30ml,pineapple juice 30ml

56 [Cherry Vanilla]

sake 60ml, cherry juice 60ml, vanilla extract 3ml, soda

57 [pomegranate smash]

sake 90ml, pomegranate juice 60ml, lemon juice 10ml, mint leaves, soda

58 [Mango Malady]

sake 15ml, mango juice 15ml, coconut milk 10ml, lime 5ml, rum 5ml