

Appendix

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Appendix 1.1: Project brief

TU Delft

DESIGN FOR OUR future

IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the procedural checks to be completed by the student and supervisory team about the student IDE Master Graduation Project. The document cannot include the involvement of an external organization, however, it does not constitute a legal employment relationship that the student and the client might agree upon. Most notably, this document facilitates the required procedural checks to be documented.

- The student confirms the team who he/she is going to collaborate and how that will come about.
- All relevant stakeholders confirm their support about the student's engagement in the study process.
- IDE's Board of Directors confirms if the student is allowed to continue the Graduation Project.

4 USE Adobe Acrobat Reader to OPEN, EDIT AND SAVE THIS DOCUMENT
Always open and save files with the following names: Student Name and ID number

STUDENT DATA & MASTER PROGRAMME
See also forms attached to the Form 1 IDE Master Graduation Project of 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th, 59th, 60th, 61st, 62nd, 63rd, 64th, 65th, 66th, 67th, 68th, 69th, 70th, 71st, 72nd, 73rd, 74th, 75th, 76th, 77th, 78th, 79th, 80th, 81st, 82nd, 83rd, 84th, 85th, 86th, 87th, 88th, 89th, 90th, 91st, 92nd, 93rd, 94th, 95th, 96th, 97th, 98th, 99th, 100th, 101st, 102nd, 103rd, 104th, 105th, 106th, 107th, 108th, 109th, 110th, 111st, 112nd, 113th, 114th, 115th, 116th, 117th, 118th, 119th, 120th, 121st, 122nd, 123rd, 124th, 125th, 126th, 127th, 128th, 129th, 130th, 131st, 132nd, 133rd, 134th, 135th, 136th, 137th, 138th, 139th, 140th, 141st, 142nd, 143rd, 144th, 145th, 146th, 147th, 148th, 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Appendix 1.2:

Literature review

In order to study the current status of food delivery waste and what objective factors and consumer subjective factors lead to FDW, a literature review was conducted on some related papers.

Literature review

New Notes

1. 中国武汉的食品配送浪费：模式、驱动因素和影响

Food delivery waste in Wuhan, China: Patterns, driver...

With the rapid development of e-commerce and the modern fast-paced life in large Chinese cities, food delivery services

<https://www.sciencedirect.com/science/article/pii/S09213...>



Recall

食物浪费的垃圾类型？

外卖食物浪费的主要人群？

调研消费者食物浪费的方法？

哪些现有政策对FDW有影响？

FDW碳排放计算方法？

食物浪费的主要构成？

外卖食物有哪些过度包装？

影响消费者的因素可能有？

Notes

- 可避免，不可避免，包装垃圾
- white-collar worker, College students, urban residents
- 实体考察（垃圾桶调研）/问卷/self-tracking survey/准备扔时的随机调研-大学/写字楼/居民区
- 起步价，满减优惠
- LCA-deliver food to consumer, FDW to waste transfer station, disposal of FDW
- 主食/汤&饮料/肉/蔬菜
- 袋子/盒子/餐具（依次塑料袋、纸袋、塑料勺子，纸质订

Request access to Q&A >

Literature review

Appendix 2.1:

Summary of user characteristics

This table summarizes the basic information of the interviewed users, such as gender, age, city, and occupation; as well as their views on takeout, such as the purpose of ordering, frequency, waste reasons, and value ranking.

| | Participant | Gender | Age | Profession | City | Food intake size | Motivation for ordering takeout | Frequency (per week) | Reason for waste | Sort by value |
|---|-------------|--------|-----|-----------------------|------------------|------------------|---------------------------------------|----------------------|--|---|
| 1 | Zack | Male | 27 | Industrial designer | Shanghai | Normal | Change taste/lazy | 2-4 | too unpalatable | Hygiene, ratings, prices, signature dishes |
| 2 | WenXue | Male | 39 | Structural engineer | Shanghai | Normal | Routine | 2 | unpalatable | Impressions, tastes, review pictures, sanitation |
| 3 | YunZhao | Female | 24 | Intern | Chengdu | Small | Change taste/lazy | 4-7 | Too much rice, order more for nutritional balance, Feels like plastic touching hot food is unhealthy | Combination of meat and vegetables, taste, price, delivery time, reliability, hygiene |
| 4 | ZiHan | Female | 26 | Purchasing Engineer | Shanghai | Small | Change taste | 4-5 | Too many staples in the set meal, Worry about fruit spoiling in summer | Hygiene, delivery time, price concessions |
| 5 | Jason | Male | 26 | Industrial designer | Shanghai | Normal | No time in morning/lazy/change taste | 7 | Unpalatable, poor appetite | The type of food want to eat, user reviews, distance, time, price |
| 6 | Daniel | Male | 26 | Supply chain engineer | Beijing/Shenzhen | Large | Workday lazy | 2-3 | Unpalatable | brand, taste orientation, price |
| 7 | Zzh | Male | 26 | Programmer | WuHan | Small | Don't want to cook | 4 | can't eat, no appetite, don't like soup | price, fast delivery, is it yummy |
| 8 | Ye | Female | 27 | Reporter | Shanghai | Small | Cooking by herself is not tasty/can't | not fixed | I order too much and can't finish it (staple) | Taste, price, hygiene, reviews, delivery time |

| | | | | | | | | | | |
|----|---------|--------|----|-----------------|----------|--------|---|----------------------|--|--|
| | | | | | | | cook, busy with work/lazy, no kitchen condition | | food/meat), I feel that the soup is not clean | |
| 9 | Gu | Female | 23 | Office clerk | Shanghai | Small | Don't cook | 12 | Don't like to eat (staple food), too full (meat), feel irregular (drinks) | Personal taste, merchant rating, brand marketing, user feedback |
| 10 | Ziyang | Male | 27 | Programmer | Shanghai | Normal | Don't want to cook | 2-3 | Not tasty/dislike | Three-party comprehensive evaluation (self, colleagues, platform), monthly sales, time |
| 11 | Qiaona | Female | 26 | Programmer | Beijing | Normal | Lazy to cook | 2-3 | The full reduction leads to too much order and can't be eaten | The type of food, discount, no shipping fee |
| 12 | Wu | Female | 28 | Programmer | Beijing | Big | Fast, worry-free, convenient, Don't cook | 14, Almost every day | Unpalatable, too much portion in order to make up for the discount | Taste, price - full discount, store rating (monthly sales, favorable rate), pictures of dishes, user reviews |
| 13 | Weilun | Male | 27 | Programmer | Shenzhen | Small | Don't cook | 3-4 | Unpalatable, staple food -too much rice | taste, price |
| 14 | Xintong | Female | 29 | Biostatistician | Beijing | Normal | Too lazy to move, kitchen hygiene is not suitable for cooking, convenient | 14, Almost every day | There are too many rice and few dishes, there are things in the set that do not suit your taste/unpala | The type of food she want to eat, feedback evaluation, full reduction, |

| | | | | | | | | | | |
|----|-----|--------|----|---------------|----------|--------|---|-------|---|--|
| | | | | | | | | | table. | |
| 15 | Xin | Female | 30 | Civil servant | Shanghai | Normal | The takeaways that you can't make by yourself/ are more delicious· change the taste | 10-12 | The main food rice will be left, and the side dishes may be left to eat next time | The type of food you want, merchant rating, delivery distance, price |

A different type of persona can be summarized

(small food intake/large food intake, strong environmental awareness/weak environmental awareness, high food requirements/low food requirements, strong purpose/weak purpose, strong goal/weak goal, more choices/less choices, Takeaway demand/dependency big/small...

Categorize persona according to the needs of ordering takeaways- lazy map convenient / change taste / poor cooking skills (no conditions) / big stomach king / exquisite diet / satiety and convenient / order every day /

Insights:

- Various evaluation criteria for ordering constitute the level of trust in the store, trust = evaluation + picture + brand + past ordering experience + past offline dining experience +...
- Many white-collar companies in big cities have canteens to provide meals, so these people order takeout mainly to change their taste or to be lazy and don't want to cook by themselves. The white-collar workers who do not have a cafeteria order takeout more frequently, which may be because they cannot cook or do not have time to cook or feel that cooking is very troublesome. The main choices for white-collar workers to eat are: 1. Company cafeteria 2. Takeaway 3. Cooking for yourself 4. Dine-in in restaurants 5. Convenience store/street breakfast 6. Going to someone else's house 7. Bringing meals
- Since the price of a meal is basically enough for delivery, and everyone has their own preferences, most people will choose to order takeaway by themselves, because they feel that there is not much benefit in ordering meals together (benefits < trouble) only in the company dinner / Afternoon tea or when there is not enough delivery time (breakfast/milk tea/snack), I will order meals with my colleagues.
- User feedback (evaluation pictures, evaluation text, favorable rate, sales)
- Passive acceptance (people around you/Internet push/current events), active understanding (when there are personal needs - search/interests)
- Some people think that takeout is not very healthy because of heavy taste, heavy oil and salt, more meat and less vegetables, and it is not easy to balance nutrition, or think that it is a small workshop and not a big brand
- Delivery time/distance is also an important factor for users to order food, because long delivery time may affect the taste of dishes, and if they are not delicious, they will lead to more waste
- There are several different purposes for users to pay attention to physical objects: 1. Their own needs (to understand and buy delicious food) 2. Passive acceptance (policy promotion, negative news - food safety)
- In terms of environmental protection, we have a better understanding of disposable non-recyclable materials,

Appendix 2.2:

Interview structure script

This interview structure draft shows the purpose, process, background questions, extension questions, etc. of this semi-structured interview with target users. As the basis for the interview, the real interview is not limited to the questions in this draft.

Structure

Interview goal:

- Understand the steps and stages of a consumer's FDS journey
- Barriers/reasons for consumers not prioritizing food waste
- Opportunities that consumers may be concerned about food waste

Warm up/Basic information:

Gender, Age, Occupation, Years of Work, Frequency of Ordering Takeout, Food intake size, Favorite type of food

Introduction:

Thank you for coming to my interview. Let me briefly introduce this project. I am currently studying interaction design at Delft Institute of Technology. This project is mainly to study the understanding of Chinese young white-collar workers on food waste in food delivery. Today's interview is about 30 minutes, there are three main parts, firstly, I will first let you talk about the usual ordering habits, and then I need you to share the screen to show the usual ordering process, and finally there are a few simple questions, this process I may need to record the screen, just use it as a record, and no personal information will be passed on, is that okay?

Background questions:

Can you briefly describe how you usually order takeout?

- Do you usually order takeout? How often (frequency)?
- When? Morning, noon, afternoon tea, evening, early morning?
- What do you like to order?
- How do you feel about your food intake? For example, can a normal serving of one person be eaten? Or do you need to order something else?
- When would you want to order takeout (motivation)?
- Do you usually order by yourself, or with someone else? with whom? (Order more by yourself or with others? Why?)

User journey:

Suppose you want to order takeout now, as usual (the common scene just mentioned), please share the screen before starting, you need to think out loud during the process, that is to say, you can say whatever you think in your mind, and say whatever comes to your mind.

- In this interface (select a restaurant), what do you generally judge what you want to eat? What factors affect you?
- In this interface (choose dishes), what do you generally judge what you want to eat? What factors will affect you?
- How long to order? Different situations can be listed.
- After ordering, do you write a review/questionnaire?

Summary questions:

- How do you feel about your food intake? For example, can you eat a normal serving for one person? Or do you need to order something else?
- Can you finish your usual takeout? (Frequency) If there is waste, why? (reasons, such as ordering too much (why ordering too much), unpalatable)
- What are the main factors to consider when ordering takeout? (After finishing speaking, let the sorting order, such as price, taste, evaluation, hygiene, etc.)
- What kind of service do you think the takeaway platform provides you can help you order more (appropriate? Taste?) takeaway? What can be improved? What can food delivery platforms improve to help you avoid buying (inappropriate, i.e. not meeting expectations) food?

Extended question:

- Do you usually pay attention to information about food? Any food related can. Through what to know? Why are you interested?
- Do you usually pay attention to some environmental protection related information? what is it? Why interest you?

Interview structure

Appendix 2.3: Interview key notes

Since all interviews are conducted in Chinese, the transcripts are also in Chinese. In order to facilitate English users to understand the details of the interviews, there is a translation in Appendix D for each interviewee's interview answers based on important questions and some important quotations.

Interview 1 - Zack
Ordering habits: order lunch on weekdays, cook dinner by yourself, don't want to eat in the cafeteria during the week, and don't bother to cook on weekends. Colleagues order milk tea together, make up orders, make up and receive. More for one person, I like to use WeChat, but I don't like QR me. One is because the discounts are few, and the other is because the interface is not clear.
Reasons for waste: excess in purchase-related, it's generally waste, which is better than the cafeteria. Reason for waste: too unappealing.
Judging factors: judging whether it tastes good or not according to the picture, whether it is heavy or not, mainly depends on the picture and text description to judge.
Food-related information: Fresh to consider when ordering, more vegetables, recommended signature dishes.
Sort: hygiene first, score that with a high score will not be too hygienic, price, signature dishes.
Other: that the picture is the main thing with the business model of buying online and take orders. The main portion is too small, the large portion package is the convenience, the small portion is not enough. I recommend the same type of many eating things, avoid shopping on WeChat, and don't give chopsticks back, but I am undecided.
Food-related information: novel looks at what is their biggest cook, but don't follow them, Kongqiang eat Chinese food (signature-related), popular foods on the internet (like popular science), go to the kitchen to see what they do.
Environmental protection related: recycling bottles, clothes (wash when needed), through WeChat, official accounts, QR code, public accounts forwarded to colleagues around immediate organizations, will not feel too carefully. It is good to know about environmental protection things, such as low-carbon life, but I don't pay much attention to it for the sake of convenience. All Forest, I use every day, to do it to plant the most expensive tree, will give a small number certificate. I feel that I have contributed to the earth. There is a successful one, I collect fragments, I really want to collect them, will forget, give positive feedback, and similar to games, interesting.

Interview 2 - Wenjie
Ordering habits: order lunch in the middle of the week. Because I eat already, I spend very little time ordering and thinking about food (not noodles, and I don't order things I haven't eaten often).
Reasons for waste: not really unappealing.
Judging factors: taste, looks, the degree of standardization of the picture packaging in the comments, recommended dishes, price.
Food-related information: fast very interested, only pay attention to restaurant and food information when shopping.
Environmental protection related: plastic bags, take to plastic restrictions, government policy promotion, free shopping.
Interview 3 - Yunzhuo
Ordering habits: There is a cafeteria during the week. When you get tired of eating or the mealtime is too late, there is no choice. I will order takeaway (only once at the afternoon with my colleagues). Because I have to make up the order I made up or I eat too much. For non-normal business, you may order more dishes. It may be unnecessary and prohibited to replace it. The pre-configuration will not change even if the remarks are different. Factors: highly dependent on the picture, QR code, choice to the company, discounts, cost-effectiveness, combination of meat and vegetables, audience feedback.
Sort: food and hygiene standard, taste, price, delivery time, reliability, hygiene.
Other: avoid plastic, reduce food waste.
Food-related information: DSD (production video, Michelin) trends starting a business (chocolate 3D printer), interesting food packaging after looking at reviews (if it is not a good idea to buy).
Environmental protection related: avoid plastic courses related to reduce (greenhouse effect, eating less meat), interesting food packaging after looking at reviews (if it is not a good idea to buy) better control the portion. "The portion of small noodles is very good, and snacks can be used as a substitute for better control the portion."

Interview 4 - Zhan
Ordering habits: There is a cafeteria at noon, takeaways at night, milk tea is not enough for one person, but I enjoy order it myself.
Reasons for waste: There are too many plastic bags in the set meal, but will be washed, fresh-out food is somewhat about recycling in summer, or it is more to avoid plastic hygiene, remained that the rice should be left, but

the store may be worried that customers will not be full and will be negatively rated, so they will still give more judgment factors: the safety and hygiene of the chain points that can be picked up offline are guaranteed, evaluation pictures, recommendations, full reduction, not averages.
Sort: hygiene, delivery time, price discounts in offline stores.
Food-related information: health-related (public accounts, stickers, articles, pseudo-healthy foods), brands you are major in food science (old knowledge), videos (popular science, documentaries (about sugar), food production, calculate calorie, emotion, concept (like to train, lose weight), discuss, vegetable, meat with fresh, paper bags instead of plastic bags, recyclable silicone fresh-keeping bags (from bagger's Good things brand), alternative food packaging in a lot of small plastic bottles.
Other: the takeaway, signature dishes are less ordered and more used. The tools will not order milk tea for everyone and use the hot shops to WeChat to order bags.
Interview 5 - Jiansen
Ordering habits: Every night during the week, late on weekends, order a set meal for one person, one meal, one vegetable and one meat, and it is enough for one person to dinner. I usually order it myself, set up a breakfast, and take things ordering with my colleagues. In the morning, I don't have time to make it. If it is not willing to eat, even if it is expensive to buy, will find a way to find someone to order together.
Sort: hygiene first, score that with a high score will not be too hygienic, price, signature dishes.
Other: that the picture is the main thing with the business model of buying online and take orders. The main portion is too small, the large portion package is the convenience, the small portion is not enough. I recommend the same type of many eating things, avoid shopping on WeChat, and don't give chopsticks back, but I am undecided.
Food-related information: novel looks at what is their biggest cook, but don't follow them, Kongqiang eat Chinese food (signature-related), popular foods on the internet (like popular science), go to the kitchen to see what they do.
Environmental protection related: recycling bottles, clothes (wash when needed), through WeChat, official accounts, QR code, public accounts forwarded to colleagues around immediate organizations, will not feel too carefully. It is good to know about environmental protection things, such as low-carbon life, but I don't pay much attention to it for the sake of convenience. All Forest, I use every day, to do it to plant the most expensive tree, will give a small number certificate. I feel that I have contributed to the earth. There is a successful one, I collect fragments, I really want to collect them, will forget, give positive feedback, and similar to games, interesting.

Interview 6 - Daniel
Ordering habits: I like to order 2-3 times a week, the company has meals in the middle of the week, I only order at night, I am too busy to cook. I cook by myself on weekends. I order by myself. I don't want to go with my colleagues, and I don't know what to order/choose. I will cook by myself when I have time, and order it with my partner.
Reasons for waste: generally can be eaten, and if it is not delicious.
Judging factors: price, looks, don't order what you don't like, understand your preference, sales, picture, pictures of dishes, detailed description information corresponding to the name of the dishes (what ingredients are included), look at the number of orders, see if reviews are acceptable, and reduce the full range. If the difference is not much and can't be changed, I will order it anyway, and the delivery time seems to be very important.
Sort: food and hygiene standard, taste, price, delivery time, reliability, hygiene.
Other: avoid plastic, reduce food waste.
Food-related information: personal needs (seasonal fruits and seafood, new products in supermarkets), personal account (recommended restaurants, knowledge accumulation - customer online topics, cooking methods) - because I like to cook.
Environmental protection related: plastic bags are not environmental, trends, public accounts, videos, and staying abroad have been widely affected (plastic bans are also planned), news.
Other: I am worried that the small shop I have never heard of uses non-sterilized cooking bags, which is unhygienic.

Interview 7-Zh
Ordering habits: There are cafeterias at noon and evening during the week. On weekends, we order takeaways noon and night. All of them are ordered by themselves. It is a bit too much for one person, but it can be eaten. "Because it's because I don't want to cook."

Interview 8 - Zhan
Ordering habits: I order every day at noon and at night. If order is too heavy, I will not order less meat or go to the convenience store to buy simple food. I can't buy too much. There are cafeterias in the kitchen and I cannot cook. More discounts, shop benefits group, if you don't order a set meal. If you don't have enough, order two orders and you will have a little more than 20. Pay attention to the money for packaging and takeaways, and also the packaging time for the packaging. It takes more than 20 minutes to order at home, very hungry. It takes about ten minutes to order at work. After ordering, there is a free delivery for a limited time. I will order a full set of 100. Generally, I will not order a small quantity. Buy more when eating.
Reasons for waste: There will be leftover meals. There is a lot of rice now. In comparison, there are more meals and less dishes.
Judging factors: related daily coupons, reviews, business activities, pictures. "The business will give you cash back when you write a review, so the best text is not credible, but the pictures are credible." Judging factors (such as reviews) based on pictures, packaging, full delivery.
Sort: the type of food you want to eat, feedback evaluation, full reduction.
Food-related information: design, trends and broadening-compensatory psychology, cooking, group buying, official account (brandy sponsored health activities), social news (food safety, food safety news).
Environmental protection related: save water, public service advertisements, prompts, do not take the initiative to be anything but some people may be affected by publicity.
Interview 9-Zhan
Ordering habits: order a cup of freshly ground coffee only during the week, a meal of coffee and a staple meal on the weekends, the characteristics are that you can't find more, more delicious, change the menu, generally don't order set meals, and eat more targeted. It is expected that the behavior will be opened at the expected time, and I really fit in the questionnaire unless the cash is reduced, which is very troublesome.
Reasons for waste: The main food rice will be left and dumped directly, and the side dishes (branded paper) may be left too late.
Judging factors: taste, price, distance (the milk bar is not far away), the picture of the new store merchant, the packaging whether the milk bar can be gone from the bar, the chain store, the merchant with a low rating will order it.
Sort: type of food you want to eat, merchant rating, delivery distance, price.
Food-related information: newly opened restaurant, quality restaurant (recommended by WeChat/organizational media, don't yourself food, food safety) but very hungry.
Environmental protection related: I was located at home in Guangzhou and found that a lot of garbage was produced every day. During the epidemic, the dry and wet garbage was not sorted and compressed (it felt very bad, but also very weird). Friends wanted to visit, so the Environmental Protection Bureau promotes (garbage treatment plants). The environment's harm, the need classification of garbage is very complicated, so I will try to be better to do it myself, recycling plastic bags - whether it can be completely recycled, can be recycled several times, go to the supermarket without plastic bags.

Reasons for waste: eat first, don't eat after meal, never drink soup because you don't like it. The meal is because I have no appetite and don't want to eat. Maybe I ate snacks before, and I don't particularly care about whether I eat well or not.
Judging factors: first look at red envelopes and discounts, pictures of dishes, what you want to eat that day.
Sort: Price, Fast Delivery, Delivery.
Food-related information: no special search, myself hot search (pickout of Lantai).
Environmental protection related: I don't pay attention to it, if it is on the news, I may take a look.
Interview 10
Ordering habits: irregular work / overtime / too tired / when the company does not have a cafeteria, I order takeaway. I love the environment, I try not to order it, but cooking by myself is really not delicious. Okay, I really like the initiative to organize orders. Colleagues will order milk tea together. When we meet together, we have no doubts to cook and order more. "Takeaway is a self-organized consumption method, and it is to consume the sometimes it is difficult to reduce. This is a kind of persuasion." There are many reasons for the full reduction, in fact, it is to reduce you to consume it. One is that you can't eat full much at all, and the other is that it is basically not worthwhile after the full reduction, because it costs more." General point very quickly, a few minutes or ten minutes, I'll be cooking. I'll not order, ask for position with other people, more than full for you.
Reasons for waste: because I have a few hours of each item to buy, and accidentally order more. "Sometimes I just want to eat a little, but I can't eat it, so I'll order more." At the time, I'm not very bad, I don't want to order any more. The main food and meat will be left, and the soup and drink will be left. "I don't have that the takeaway soup is not clean and I can't drink it."
Judging factors: what to eat, store rating, picture, introduction of dishes, food articles, user evaluation, hygiene.
Sort: Taste, Price, Hygiene, Review, Delivery Time.
Food-related information: starting to pay attention after cooking (ingredients, recipes, nutrition, health, environmental search for information), learn and benefit (search experience - eat new things, and pay more attention after the epidemic; learning about food preservation because it needs to be closed and controlled to stock up on food).
Environmental protection related: professional learning environment related (knowledge, topic selection, food production process, sustainable learning). The more you know about this topic, the more you will feel that everyone should be responsible for consumption, colleagues have a strong awareness of environmental protection will be affected, reduce energy transfer, carbon emissions, air pollution, water pollution, plastic (bring your own bag when going out, use less plastic bags, read books - try a vegetarian diet without beef (protein animal welfare)).

Interview 11-Zhan
Ordering habits: I often order in a cafeteria, the company has a cafeteria, I order it at night, and don't eat on weekends. I don't cook by myself. Usually, I order two meals at a time, one milk tea (just small quantities to make up the order) and one drink.
Reasons for waste: There is a lot of takeaways, and half of them are left over (like to eat vegetables but don't like to eat the main food, I don't usually dare to buy the snacks they send, unless they send food, because it doesn't look like much. I will be thrown away." The food you like to eat will be left and the end, so there will be need left, stress you may very tired, you won't drink the soup.
Judging factors: store rating, what to eat, reviews, signature dishes, not many meals, personal needs, discounts (generally, it is cheaper to go to the store than takeaway, Michele Bingzhang), brand effect (marketing - mostly left and right), the brand's QR code, you will be suspicious of spending money to invite people).
Sort: personal taste, merchant rating, brand marketing, user feedback.
Food-related information: when you eat, you will watch more than food bloggers (evaluate snacks, exploring abroad), and going out to play with friends will search for what to eat and abundance.
Environmental protection related: registered information (WeChat, Weibo, Douyin, rarely seen), there is a brand that does not use any neither as a bag, garbage classification, but after the epidemic it is not so strict, there are only two types.

Interview 12-Zhan
Ordering habits: Bring your own meals in the middle of the week. The company will also manage the meals, go out to eat on weekends, order takeaway when you don't want to cook, order at home you can't eat a piece and the food may be different on the day. "I don't think it's necessary, it just has to be ordered together, because it doesn't feel like there is much benefit, just order it together, maybe it's the type of milk tea that will be ordered together."
Reasons for waste: Normal appetite, look at recommendations, don't order set meals because there may be things you don't like, don't order drinks, don't look at money, sales and reviews because they think they are all fake ads, and trust stores that have gone online (based on recommendations) Evaluation on the website. "The evaluation of

just to ordering vegetables, I will open a way today."
Ordering habits: I order every day at noon and at night. If order is too heavy, I will not order less meat or go to the convenience store to buy simple food. I can't buy too much. There are cafeterias in the kitchen and I cannot cook. More discounts, shop benefits group, if you don't order a set meal. If you don't have enough, order two orders and you will have a little more than 20. Pay attention to the money for packaging and takeaways, and also the packaging time for the packaging. It takes more than 20 minutes to order at home, very hungry. It takes about ten minutes to order at work. After ordering, there is a free delivery for a limited time. I will order a full set of 100. Generally, I will not order a small quantity. Buy more when eating.
Reasons for waste: There will be leftover meals. There is a lot of rice now. In comparison, there are more meals and less dishes.
Judging factors: related daily coupons, reviews, business activities, pictures. "The business will give you cash back when you write a review, so the best text is not credible, but the pictures are credible." Judging factors (such as reviews) based on pictures, packaging, full delivery.
Sort: the type of food you want to eat, feedback evaluation, full reduction.
Food-related information: design, trends and broadening-compensatory psychology, cooking, group buying, official account (brandy sponsored health activities), social news (food safety, food safety news).
Environmental protection related: save water, public service advertisements, prompts, do not take the initiative to be anything but some people may be affected by publicity.
Interview 13-Zhan
Ordering habits: order a cup of freshly ground coffee only during the week, a meal of coffee and a staple meal on the weekends, the characteristics are that you can't find more, more delicious, change the menu, generally don't order set meals, and eat more targeted. It is expected that the behavior will be opened at the expected time, and I really fit in the questionnaire unless the cash is reduced, which is very troublesome.
Reasons for waste: The main food rice will be left and dumped directly, and the side dishes (branded paper) may be left too late.
Judging factors: taste, price, distance (the milk bar is not far away), the picture of the new store merchant, the packaging whether the milk bar can be gone from the bar, the chain store, the merchant with a low rating will order it.
Sort: type of food you want to eat, merchant rating, delivery distance, price.
Food-related information: newly opened restaurant, quality restaurant (recommended by WeChat/organizational media, don't yourself food, food safety) but very hungry.
Environmental protection related: I was located at home in Guangzhou and found that a lot of garbage was produced every day. During the epidemic, the dry and wet garbage was not sorted and compressed (it felt very bad, but also very weird). Friends wanted to visit, so the Environmental Protection Bureau promotes (garbage treatment plants). The environment's harm, the need classification of garbage is very complicated, so I will try to be better to do it myself, recycling plastic bags - whether it can be completely recycled, can be recycled several times, go to the supermarket without plastic bags.

Interview key notes

Appendix 3: User journey maps

Based on four different personas, the user flow map describes in detail the takeout ordering habits of four different groups of consumers, focusing on the five stages of pre-order, order, wait, eat, and after.

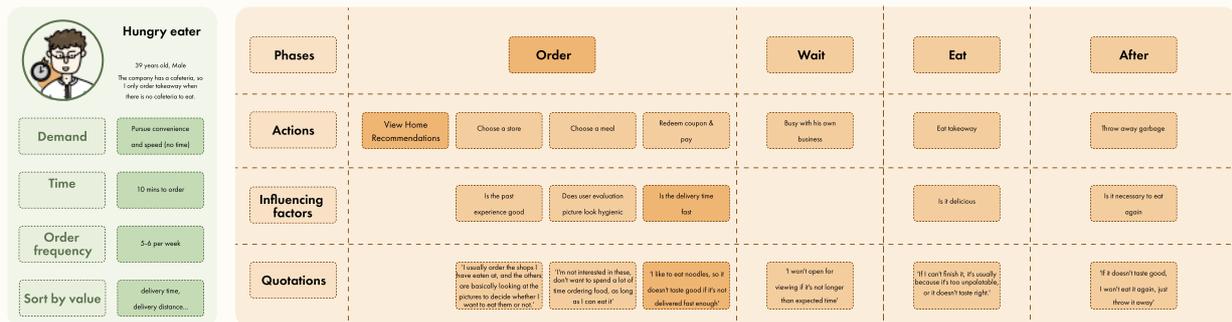


Figure *: User journey map-hungry eater

Hungry eaters are more concerned about delivery speed than food quality. They consider less factors when ordering, and the process is faster. Generally, food is wasted only when it is very unpalatable.

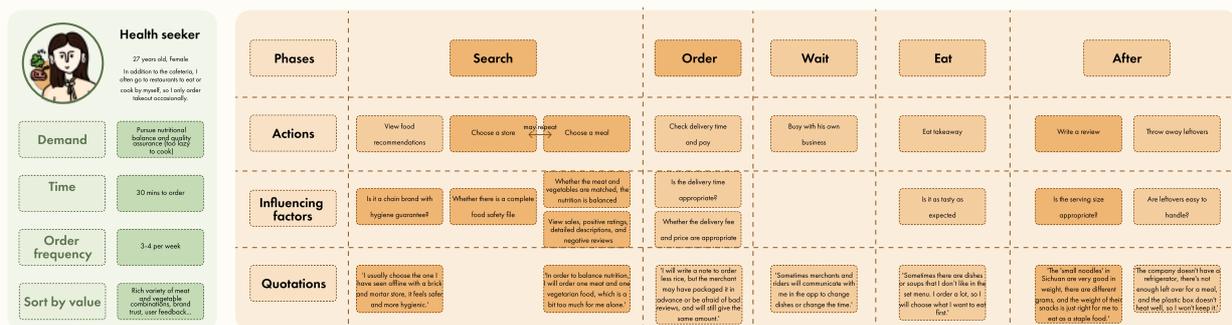


Figure *: User journey map-health seeker

Health seekers have high requirements for food, and will comprehensively consider various aspects, such as merchant reputation, nutritional balance, hygiene guarantee, taste, etc., and will spend more time looking for suitable stores and dishes. They may waste food because ordering too much or feeling unsanitary.

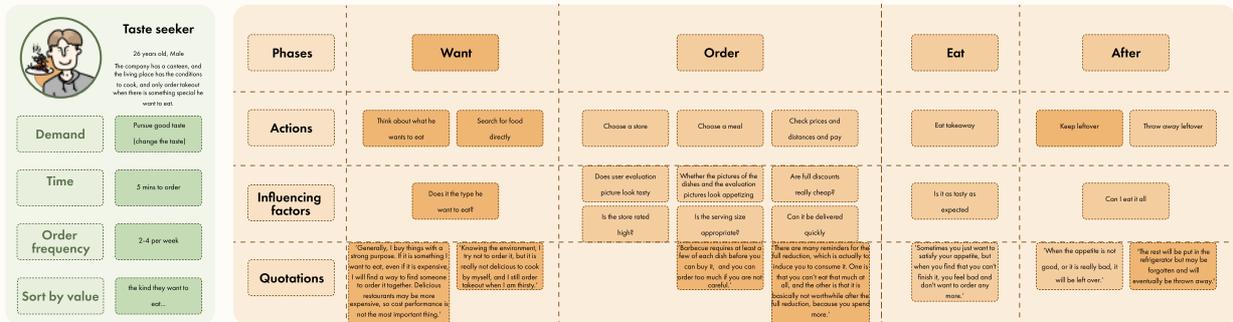


Figure *: User journey map-taste seeker

Taste seekers are more purposeful and will think about specific food types in advance. They have higher requirements for taste, and will pay more attention to evaluation or feedback when ordering food, and food will be wasted when it is unpalatable or the portion is too large.

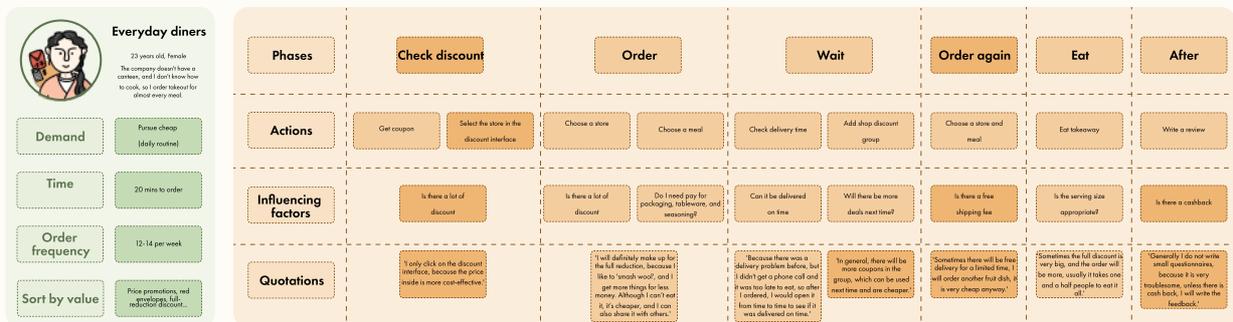


Figure *: User journey map-everyday diners

Everyday diners pursue discounts and cost-effectiveness. They will spend more time researching how to save money and get more food, and even pay more because of reduced shipping costs, which may be wasted because of excessive portions or inappropriate tastes.

Appendix 4.1: Co-creation assignment

Prior to conducting the co-creation session, a week before the one-to-many interviews and collaborative activities, a preliminary assignment was distributed. This assignment aimed to encourage participants to reflect on their usual post-ordering behaviors, particularly their attitudes and specific actions towards leftovers.

在线上标画出你消费外卖的过程:
(e.g. 写出从想点单到扔垃圾整个过程中的主要动作、关于食物浪费的心情变化、内心想法等, 可以附上照片或截图~)

e.g. 点了-打开 app-选菜...
参考表情
e.g. “我想*** 因为**”, 但是***
e.g. 吃完的剩余, 最后打包的垃圾...

Draw the whole process of takeaway ordering below:

e.g. write from thinking about ordering until throw the trash, including main behavior you did, emotional change about food waste, other thoughts in mind and etc. You can also put in some pictures or screenshots to explain.

在线上标画出你消费外卖的过程:
(e.g. 写出从想点单到扔垃圾整个过程中的主要动作、关于食物浪费的心情变化、内心想法等, 可以附上照片或截图~)

e.g. 点了-打开 app-选菜...
参考表情
e.g. “我想*** 因为**”, 但是***
e.g. 吃完的剩余, 最后打包的垃圾...

正在加班, 本人非常饿, 但是错过了午饭前边吃边聊的时间了, 此时, 饿肚子打开了APP.

热门的几家连锁快餐店, 比如大米先生, 更多高评分的一个小时才能送到, 果断给了

此时大多数历史订单推送给我了, 让我选择了经常光顾的一家餐厅-汉堡王

好想, 不到饭了, 吃啥最重要, 就选择最熟悉的套餐吧, 可以半小时送到, 真是最快且最卫生的一个选择了!

焦急等待ing

快速小哥送餐速度很快了, 但是想到今天, 我就多走几步路, 内心OS: 今天要多解馋, 太饿了

火速上楼, 嚼嚼

点了一杯大可乐, 三层牛肉汉堡, 一盒鸡块, 一只撒椒大鸡腿, 少量送超平的我, 但是嘛, 困能报加班晚饭, 那就多点些吧

想着全吃完汉堡会吃不下后面的小食, 我选择只吃一半的汉堡面包片 (听说这样可以少吃点碳水)

但是即使这样, 还是有点饱腹感了。当我咬了一口撒椒大鸡腿, 又辣又干, 果断放弃, 选择吃鸡块了

最后浪费了半只鸡腿, 只喝了一小口的可乐, 和两块鸡块, 实在吃不了了

OS: 本身鸡腿不好吃, 鸡块吃腻了, 但是汉堡吃的差不多了, 内心还是没有多少愧疚感的, 这种值了!

miro

After working overtime, Participant 1 found that the ordering time was too late and the waiting time at large chain stores was too long. The app recommended Burger King, which he had ordered before. It was the fastest and most hygienic, so he decided quickly. He was very hungry and waited anxiously. I ordered a much larger portion than usual, but since the company would reimburse me, I thought it was okay. Because I knew I wouldn't be able to finish everything, I chose to eat less carb bread first. The chicken legs were spicy and dry, so I wasted them. I didn't finish the drinks and chicken nuggets, but I didn't feel much guilt because I finished the staple burger and felt good.

在线上标画出你消费外卖的过程：

(e.g. 写出从想点单到扔垃圾整个过程中的主要动作、关于食物浪费的心情变化、内心想法等，可以附上照片或截图~)



Participant 2 first checked the ratings and delivery fees of the recommended stores, and then looked at the pictures and negative reviews of the food he wanted to eat to judge hygiene. Check to see if there are any offers before clicking. If you don't have time, you will skip this step. Because I have a small appetite and no room to store it at home, I order less. Take photos and comment to get points and discounts. It can be eaten normally. If it is particularly unpalatable, unclean or broken, it will be thrown away decisively. Classify kitchen waste and box garbage and throw them away.

在线上标画出你消费外卖的过程：

(e.g. 写出从想点单到扔垃圾整个过程中的主要动作、关于食物浪费的心情变化、内心想法等，可以附上照片或截图~)



Participant 3 opened the app to see what he wanted to eat at meal time. He mainly checked the delivery time, filtered the restaurants within half an hour, and checked the membership card discounts. I liked the beef curry but the portion was too big. I wanted to try something else but was afraid it wouldn't taste good and would be a waste of money, so I ended up choosing what I originally wanted to order. The portion was really big, so I quickly threw it away because I had to go to work in the afternoon as I thought the rest would not be my favorite and would make me gain weight. Overall, I will struggle with the selection process for a long time. Eating and disposing of garbage are not very important.

Appendix 4.2: Co-creation process

For the brainstorming aspect of co-creation, participants were presented with ideation questions based on the opportunities arising from the objective obstacles I identified in section 3.2.6. These questions aimed to guide participants in generating targeted ideas and suggestions.

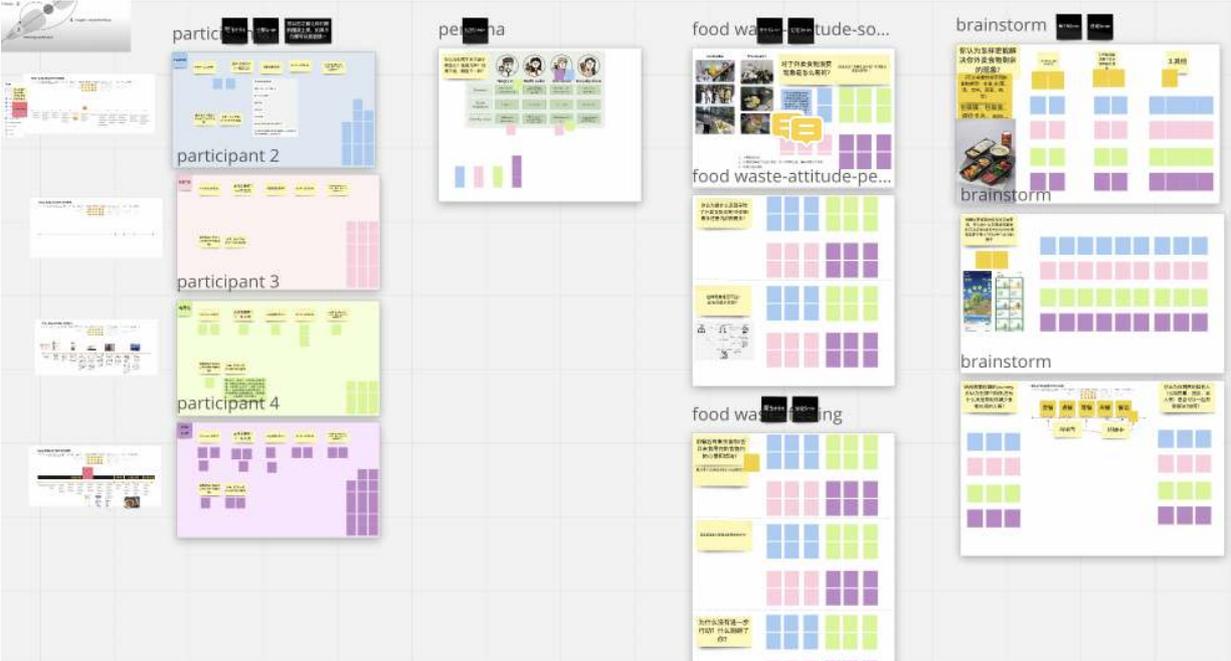


Figure : Co-creation Miro board

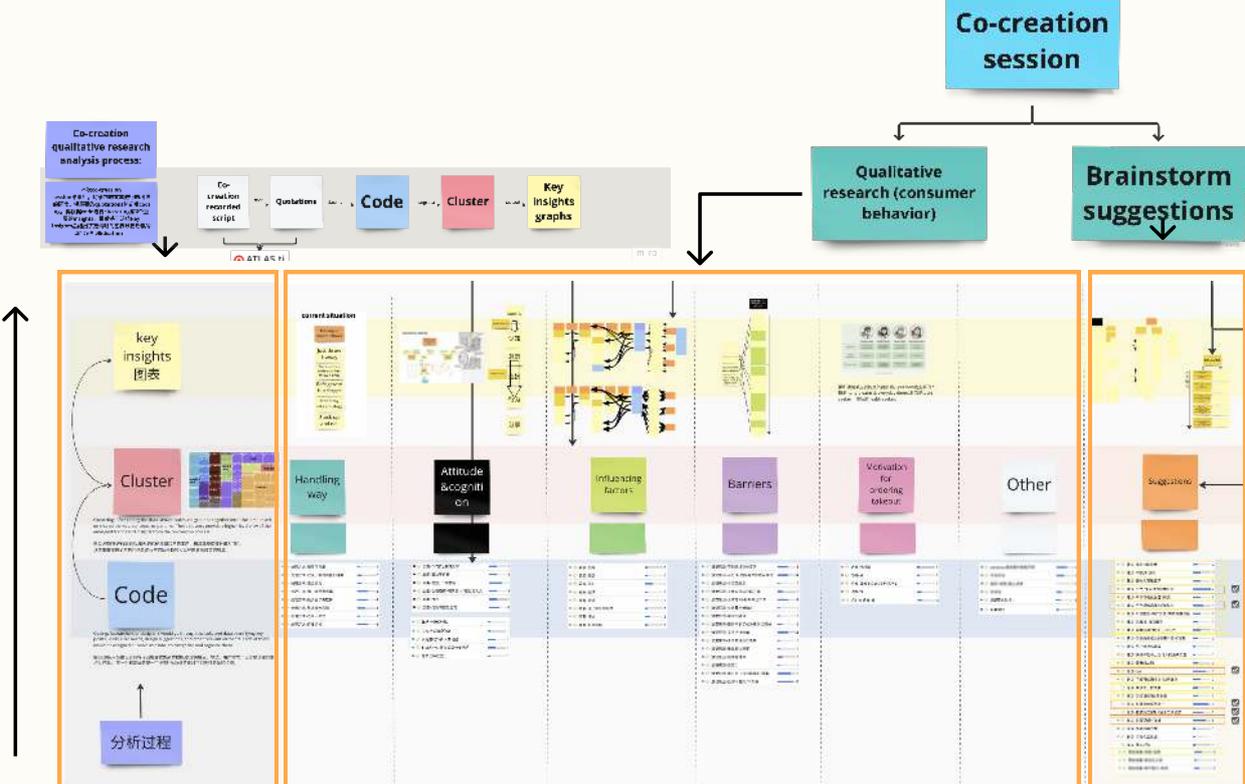


Figure : Co-creation analysis process

Preparation homework:

Draw your usual meal ordering process

warm up/understand habits:

- Why do you usually order takeout?
- How often do you order takeout? (several times a week)
- Where do you usually order?
- Temporarily or plan in advance?
- What do you care about most when ordering takeout? (price, health, hygiene, delivery speed, etc.)
- Is it usually possible to consume all the food?
- Share a takeaway story you can't finish eating

Persona:

Regarding the four personas in the picture, which one or several types do you think you belong to? If not, what's different?

Key issues regarding food waste:**- food waste-attitude-social**

What do you think of the waste of takeaway food? (Is it urgent? Does it affect the living environment? Does it affect the allocation of social resources, etc.?)

- food waste-attitude-personal

What do you think causes takeaway food waste? Are there more external factors or internal factors?

Is this phenomenon controllable? Who should change it?

-food waste-feeling

What are your feelings and thoughts about having leftover food/discarding uneaten food after a meal? Or the mood and thoughts of never wasting food? How do you deal with these leftover foods now?

Why was there no further action? What's holding you back?

Brainstorm co-creation:

How do you think you can better solve the problem of leftover food in your takeout? (You can consider targeting different food types: staple food-rice/noodles, soup, drinks, vegetables, meat, etc.) packaging bags, packaging boxes, evaluation cards, apps...

Based on the reasons for not changing mentioned above, what do you think can inspire you to take action? Or is it effortless for you to do? You can give a similar example.

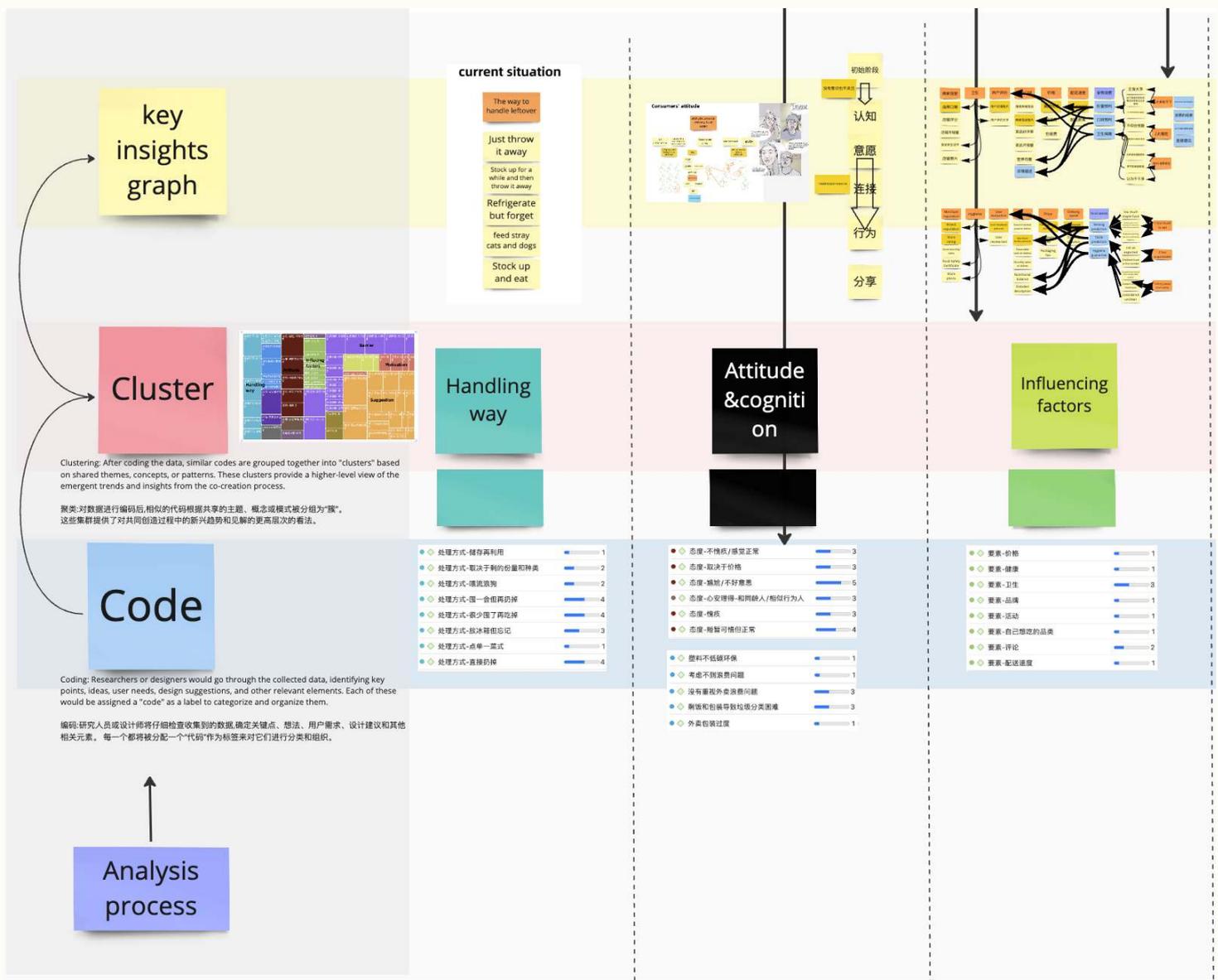
e.g. Gamification, reward, collection e.g. Ant Forest

Based on the journey you drew, at what stage do you think there are other solutions to help you reduce food waste?

Do you think other people around you (such as colleagues, friends, family, etc.) can come together to help solve it? How?

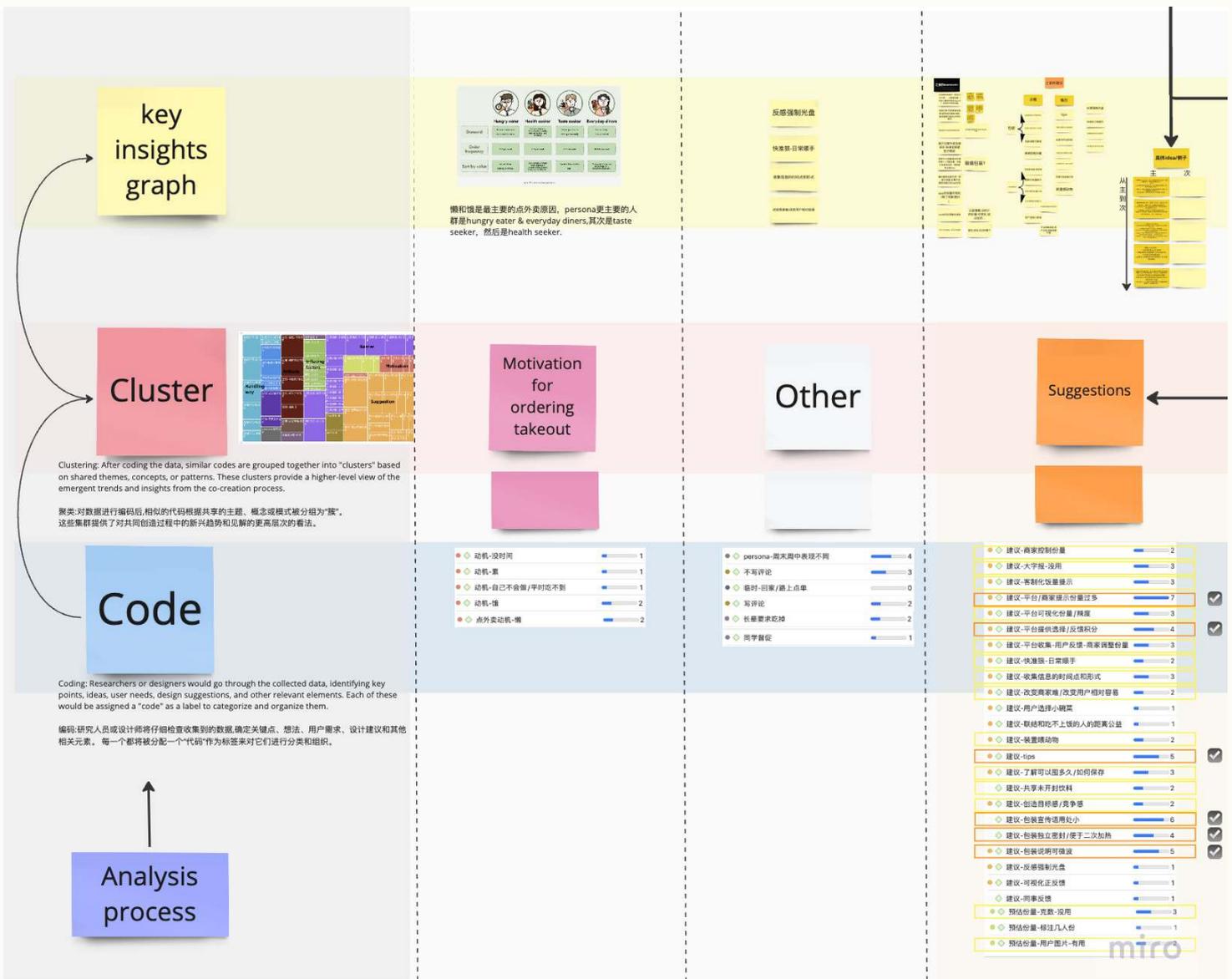
Appendix 4.3: Co-creation insight clusters

Following the conclusion of the session, an in-depth examination was conducted on the transcribed transcripts of the recorded audio, which had been granted permission for use. The ATLAS.ti tool was employed to facilitate this process. A total of 168 significant quotations were highlighted, and based on these quotes, 81 codes were generated through careful categorization. Subsequently, these codes were clustered into 6 pivotal insight clusters. Drawing from these insight clusters, a more coherent visualization was constructed to facilitate subsequent in-depth analysis and ideation efforts.



Coding: Researchers or designers would go through the collected data, identifying key points, ideas, user needs, design suggestions, and other relevant elements. Each of these would be assigned a "code" as a label to categorize and organize them.

Clustering: After coding the data, similar codes are grouped together into "clusters" based on shared themes, concepts, or patterns. These clusters provide a higher-level view of the emergent trends and insights from the co-creation process.



Appendix 4.4: Co-creation brainstorm suggestions

In the co-creation brainstorming phase, consumers offered numerous insightful suggestions rooted in consumer behavior psychology. After coding and clustering these key insights, five primary recommendations and several secondary suggestions were distilled. The suggestions, ranked from most to least important, are as follows:

1. Platform/Merchant Portion Reminders: Offline, waitstaff often help users gauge portions; online, users sometimes lack awareness of portion sizes. Tailoring suggestions based on individual ordering habits could be beneficial.
2. Hollow Slogans Have Limited Impact: Vague slogans lack significance; users prefer practical guidance. Information on placemats can be obstructed by food, and aesthetically appealing packaging could encourage users to collect and reuse it.
3. Packaging Instructions for Microwave/Sealing/Reheating: Unclear plastic packaging labels lead to uncertainty about microwaving suitability. Users are more inclined to save and re-consume leftover food if it's packaged hygienically and suitable for reheating.
4. Provide Reuse Tips: Offering guidance on repurposing leftovers, specifying the shelf life of different foods, and including separate pouches with instructions.
5. Platform Offers Selection/Feedback Incentives: Providing varying portion sizes for staple food; users choosing smaller portions could receive incentives like charitable donations, points, or discounts.

These insights, illustrated further in the graphic, will guide the development of concrete design ideas in the next phases of the project.

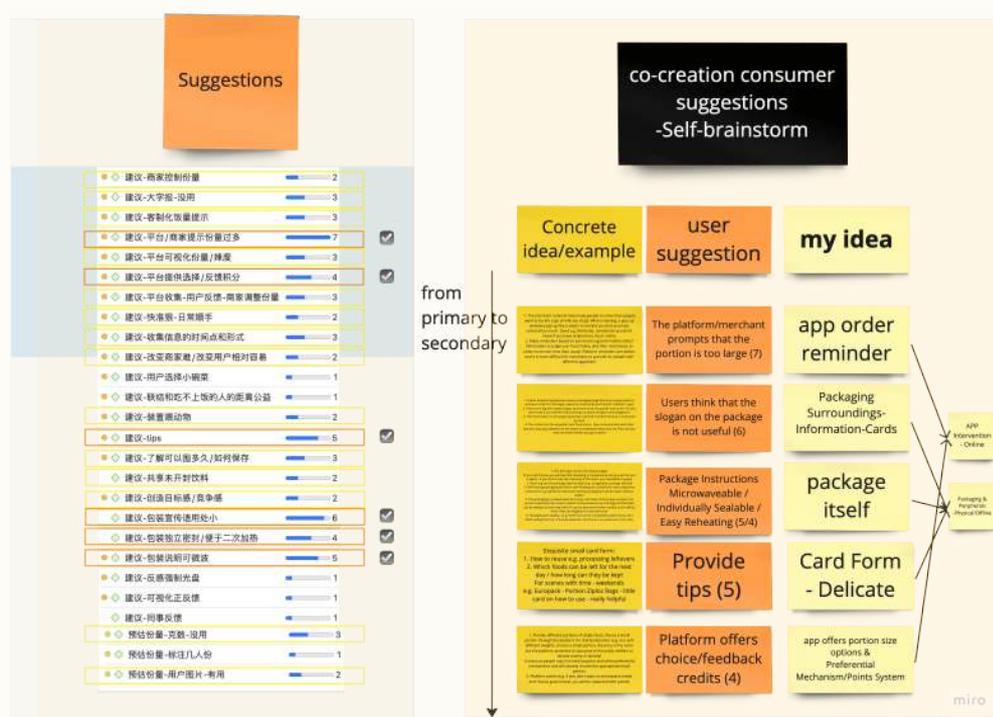


Figure: Suggestion analysis

Appendix 5.1: Self-brainstorm ideas-after co-creation

Based on suggestions in appendix 4.4, the key design points to focus on during the ideation phase can be summarized as follows:

1. Ordering Prompts on the App: Enhancing user awareness of portion sizes through order prompts on the app based on individual ordering habits.
2. App Offers Portion Options & Incentives: Providing portion size options on the app along with incentives such as discounts, points, or a rewards system.
3. Packaging Design: Designing packaging that is clearly marked for microwave suitability and resealing, ensuring it's convenient for users to store and reheat leftovers.
- 4.1 Packaging Accessories: Creating visually appealing packaging accessories that encourage users to collect and engage with information aimed at raising awareness about reducing food waste.
- 4.2 Information Cards: Including cards inside the packaging with tips on repurposing leftovers and extending the shelf life of different foods.

These design points primarily manifest in two main touchpoints: online app interventions (points 1 and 2) and offline packaging and related products (points 3 and 4). By aligning these points along the user journey, a solid foundation is provided for the subsequent brainstorming of design ideas.

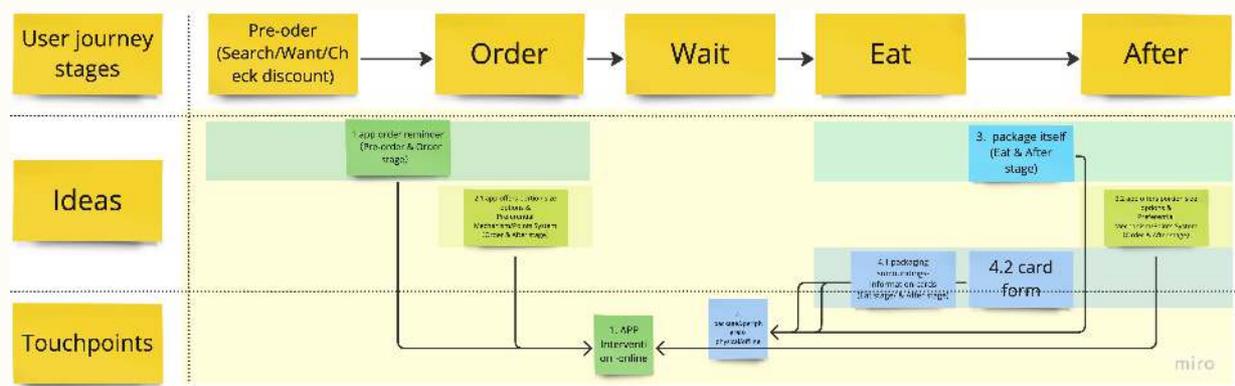


Figure: Ideas in User Journey

After considering these inputs and referencing successful cases, I further expanded the ideas in alignment with the project's design challenge, addressing both subjective and objective barriers. Once I had generated a sufficient number of design ideas, I organized them using a matrix that incorporated the user journey and criteria. I placed each important idea within the matrix and then filled in any gaps with additional ideas, resulting in a comprehensive matrix map filled with a wide range of ideas.



Figure*: Criteria Matrix



Figure*: Ideas about visualizing portion & taste

Appendix 5.2: Self-brainstorm ideas-after reframing design goal

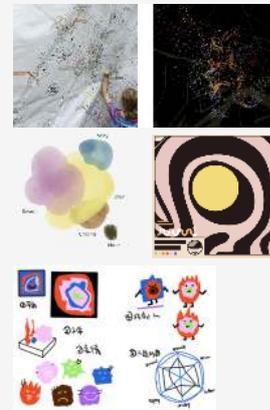
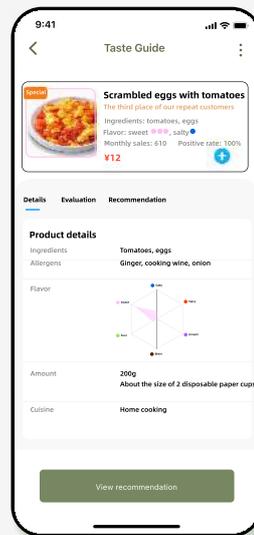
After co-creation, due to the reframed design goal and new interaction vision and criteria, a new round of self-brainstorm was conducted based on these contents.

Concept 1-Clear info

Ideation-converge

Workday scenario-Confident

- portion size
- flavor
- On the menu page, the taste of the dishes is marked by color---allowing users to understand the taste of each dish at a glance
- On the dish details page, mark specific ingredients and allergens---let users know whether there are taboos and foods they don't like to eat.
- On the dish details page, mark the specific flavor and cuisine---let users know the specific taste of the dish.
- On the dish details page, mark the specific amount---to help users predict the portion size.
- In the main dish options, provide "normal" and "small portion" options
- In the package options, indicate how many people it is suitable for
- In the set menu options, options are provided such as "Whether you want soup/drink", "Taboos", etc.
- Before confirming the order, it was prompted that the portion size exceeds the normal "e.g. one serving for a man"

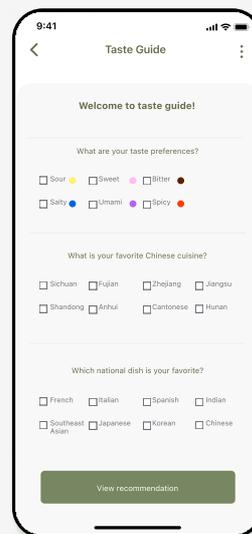


Concept 2-Food & taste guide

Ideation-converge

Weekend scenario-Confident

- portion size
- flavor
- Before ordering, allow users to take 2 minutes to fill in their personal food&taste guide, allowing the platform to retain their personal files.
- guide can add other frequent diners
- In addition to classification tags for restaurant types, the platform also provides classification tags for food intake and taste to search for restaurants, e.g. light/heavy, Cantonese/Sichuan cuisine, traditional cuisine/innovative cuisine, Chinese food/Western food, sweet and sour/spicy/sour/ Savory taste...
- After completing the guide, you can also send your profile to friends and family to help others understand their eating habits. e.g. Dinner with friends to learn about taboos and preferences
- When choosing a restaurant, based on personal profiles and feedback from users with similar tastes/food intake, restaurants that match the food capacity/taste are automatically recommended.
- When ordering a dish, it will automatically remind you that it contains taboos/disliked food types/disliked flavors based on your personal profile, e.g. onions, ginger, garlic/cilantro, fish/shrimp/vegetables/tofu,
- When ordering, automatically remind you that the food portion exceeds the usual portion based on your personal profile



Concept 1-Clear info

Ideation-converge

Goal 1.1 Portion-confident Environment-Workday

Design points

Clear Visual

- Picture - there is a reference for the size of the bowl
- Add reference standard, reference object-tennis, e.g. 1.5

Clear Information

- Staple food is increased into large and small portions
- Control color to highlight smaller options and use gray to downplay larger options
- Automatically select small portions, then select large portions if needed
- Rename small portion to medium portion? (Similar to Starbucks)
- Add description, small - light food friendly, large - weight gain friendly
- Modify the "one person" tags and use multiple reference tags such as g, kcal, etc.
- Detailed information: name, category, main raw materials, taste, portion size, preparation method

Confirmation

- Before confirming the order, add "are you sure" and recommend users to try a small portion first



Concept 2-Portion guide

Ideation-converge

Goal 1.1 Portion-confident Mind-Weekend

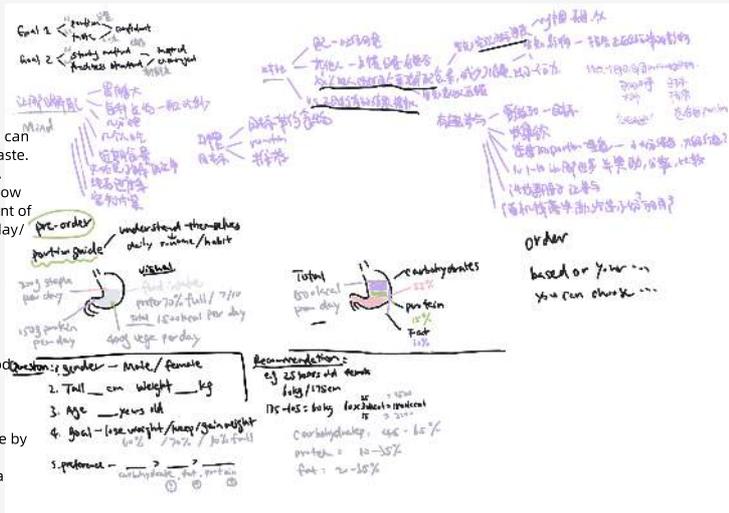
Design points

Understand their habits & what they can do in routine

- At the beginning of the guide, "By filling in this guide, you can learn about your habits and contribute to reducing food waste."
- By asking questions about gender, height and weight, age, goals (weight loss/maintenance/gain), and preferences (how full/dietary structure), we help users understand the amount of food that suits them, and propose specific kcal intake per day/meal. suggestion.
- You can refer to kcal's tag when ordering food
- Automatically calculate the kcal of this meal and select the appropriate portion size

Understand platform's goal

- Inform the progress of achieving the goal, China's Anti-Food Waste Law (provide food portions, specifications or recommended number of consumers)/"3060" dual carbon goals & "1+N" policy-Platform goals--Personal goals
- Inform the impact, e.g. "A person can save 50g of rice waste by choosing a small portion of staple food each time. When ordering twice a week, he can save about 5000g of rice in a year, which is equivalent to saving about 10kg of carbon emissions. Not only healthy, but also reducing carbon emissions, Reduce food waste."



Concept 3-Package & instruction card

Ideation-converge

Workday scenario-Inspired

- Tips to store, reuse, reheat, reuse
- Freshness
- A more obvious "microwaveable" mark on the packaging
- The instruction introduces that the PP5 material of the packaging can be heated, e.g. it usually takes a few minutes to heat, whether it can be heated together with the lid, and whether the lid needs to be opened.
- The instruction introduces the best eating time, which dishes are not recommended to be saved for the second meal, and which dishes are okay to reheat.



Appendix 6.1:

Brainstorm session process

This brainstorm session provided more divergent ideas and helped identify several conceptual directions with room for development.



Classify all brainstorming ideas and vote on the resulting conceptual directions.

Brainstorm session

Cluster & Analysis

pre-order & order stage

个人档案 (Personal profile)

健康 (Healthy related)

环保 (Environment-protection related)

推荐 (Friend recommend)

包装/大小份 (Big&small size package)

标签化评 (Labeled evaluation)

人工智能小助手 (AI assistant)

可视化 (Visualized description)

提示 (Reminder)

Pros

Cons

✓✓ AI assistant
 ✓✓ Personal profile
 ✓ Healthy related
 ✓ labeled evaluation
 ✓ Visualized description ✗

✗✗ Friend recommend
 ✗✗ Big&small size package
 ✗✗ Environment-protection related
 ✗ Reminder

HMW better help consumers feel in control & confident about estimating meal portion and taste?

Brainstorm session

Cluster & Analysis

eat & after stage

存储建议 (storage suggestions)

易加热包装 (heatable package)

喂宠物 (feat pets)

提示/科普 (popular science reminder/tips)

堆肥 (compost)

环保 (Environment-protection related)

游戏类 (game)

社群活动 (community activity)

合作宣传 (Cooperation & promotion)

共享 (share)

Pros

Cons

✓✓✓ storage suggestions
 ✓✓ heatable package
 ✓✓ compost
 ✓ popular science reminder/tips
 ✓ feat pets
 ✓ Cooperation & promotion

✗✗ game
 ✗✗ community activity
 ✗✗ share

HMW help consumers feel inspired & encouraged to improve understanding of freshness standards and create/provide knowledge of the objective conditions for storage and reuse leftover?

Appendix 6.2: Brainstorm session analysis

Score each direction according to the criteria, and draw more specific details of your own ideas. Finally, put all concepts into the matrix of criteria to check which concept can cover more design goals.

Brainstorm session

Cluster & Analysis

confident
 inspired
 encouraged
 motivator

opportunity, ability, motivation

1. AI assistant
 2. personal profile
 3. healthy related
 4. labeled evaluation
 5. visualized description
 6. storage system
 7. heatable package
 8. compost
 9. popular science reminders
 10. feat pets

把...和...的...原型图
 模块化
 7-5的

Ideation

Ideation & analysis

AI Assistant

Understand match → real portion of meal
 own food intake

Pre-order

Auto-recommend 1 week meals

| | |
|-----|-----|
| Mon | Tue |
| Wed | Thu |
| Fri | Sat |
| Sun | |

reserve

- change days
 - change meal
 - set on weekend
 - could change morning ...

order with AI

ask AI question
 in-depth help
 guide decision-making
 Auto fill in remarks

winter solstice
 dumplings
 Dragon Boat Festival
 Zongzi
 birthday
 Feast ...

recommend based on Festivals

Q: small portion
 A: small portion
 How can I choose small portion?
 1-
 2-

Q: healthy meal?
 A: healthy meal
 Q: fat loss meal?
 A: fat loss meal
 Q: promotion/discount

Q: question
 A: choose

Avoid coriander
 Avoid onion
 Slightly spicy
 not spicy
 less rice
 no soup
 no beverage
 ...

- based on solar term
 - festival
 - anniversary

- multi-step search on food name
 - could help other needs

- detail recommend reason
 - help user understand (what)
 - naturally express need

- Set in personal profile
 - Auto-base on previous order

Ideation

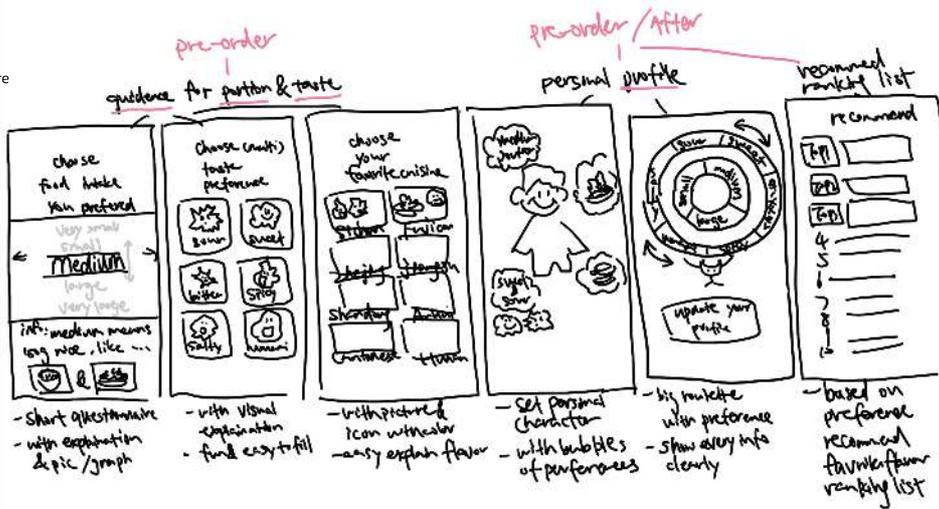
Ideation & analysis

2 Personal profile

understand their own food intake & taste preference → help platform to recommend to

2. Personal profile

- short interactive questionnaire
- fun character/icons
- understand own needs (portion&taste) better
- recommend based on needs



Ideation

Ideation & analysis

3 healthy related

recommen portion & taste by healthy goals

3. Healthy related

- set healthy goal
- recommend portion&taste by kcal/nutritional balance



4. Labeled evaluation

- label both merchant & user
- quickly understand portion&taste

5. Visualized description

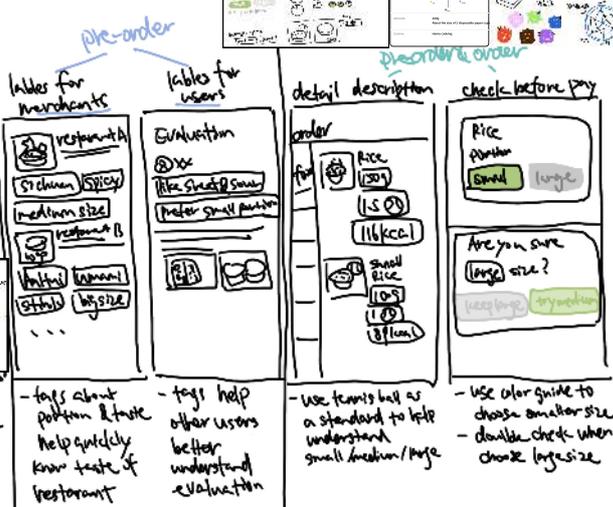
- visual clearly show info
- as a compare standard
- color flavors
- detailed describe portion&taste

4 Labeled evaluation

quickly help user to understand portion size and taste

5 Visualized description

use icon to visualize portion & use color to show more detailed taste



Ideation

Ideation & analysis

6 Storage suggestions

provide specific suggestion about how to store & reminder

6. Storage suggestions

- remind on physical object-package, recipe, card, magnet
- clear info how to store

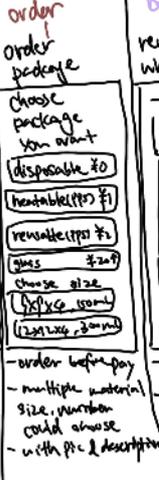


7. Heatable package

- offer choice to purchase different package
- provide condition to store&reheat

7 Heatable package

offer user condition to store & reheat

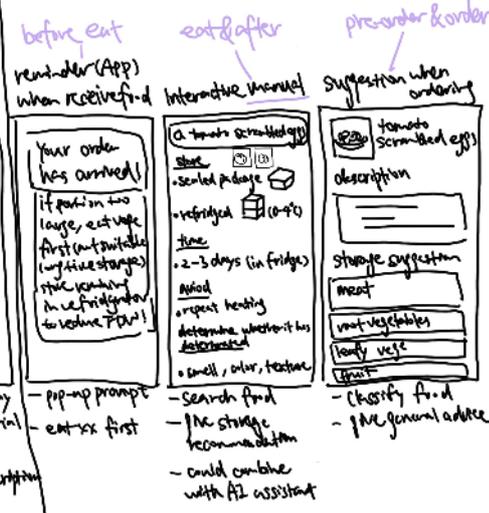


9. Popular science reminders

- specific suggestion how to store different type of food
- reminder, description, interactive search manual, AI assistant

9 Popular science reminders

provide very detail suggestion base on users need



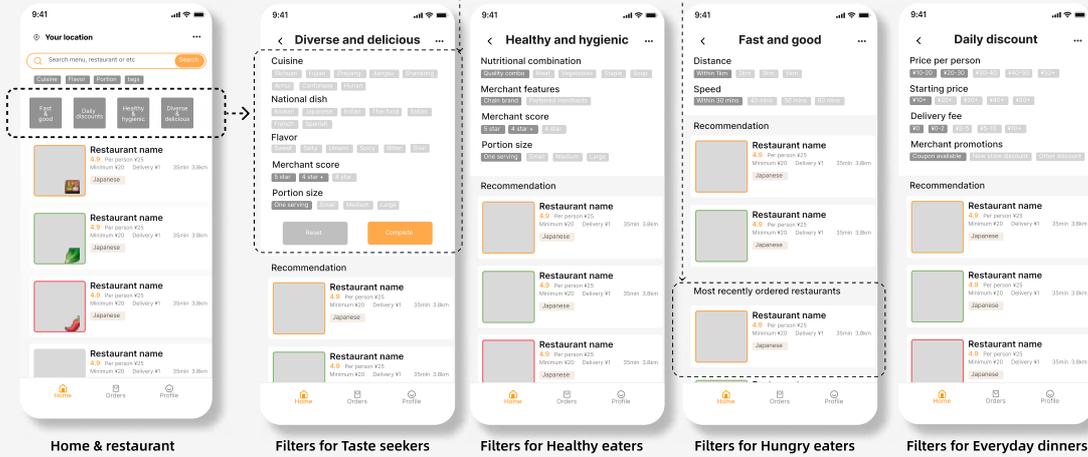
Lo-fi Prototype

Concept direction 1: Intuitive

- Only show this type of personas' needs
- Auto-select possible tags as default
- can also choose other tags

- Other than recommendations, add most recently ordered restaurants for hungry eaters
- help fastest and easiest to order takeout, avoid getting bogged down in too many choices

- Design for 4 different personas
- Each persona have their priority needs
- these 4 filters help users quickly find the meal fits their needs, so that decrease the possibility producing leftover & FDW due to unsuitable portion & taste



Lo-fi Prototype

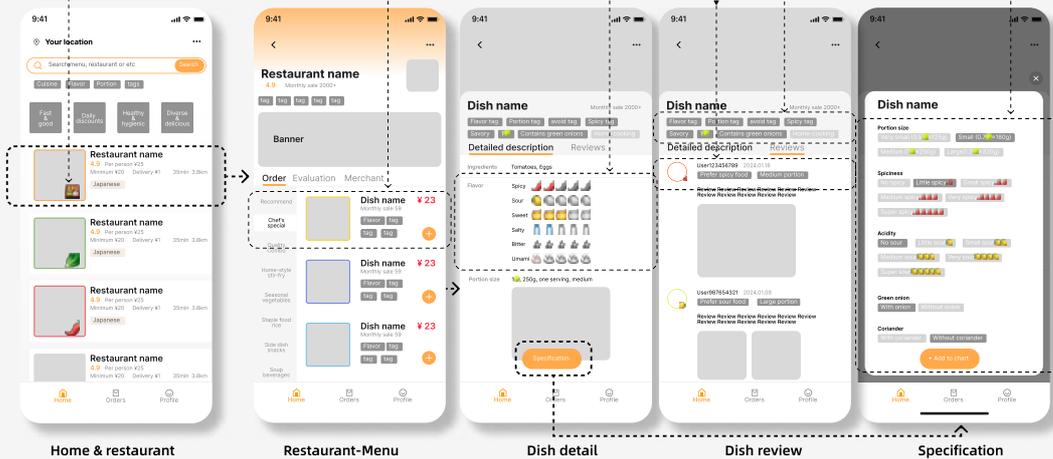
Concept direction 1: Intuitive

- Use different colored borders and small icons to distinguish the restaurant's taste
- Tags on the right show more info about portion and taste

- Use emoji to express the flavor in detail
- lower the threshold to understand the restaurant's taste
- balance the visual (abstract color blocks/characters) and text (boring charts)

- Show the most important info in tags, such as spiciness, what food need to be noticed, portion and taste
- Use colors and icons to display preference for flavors on the user's avatar, and tags indicate food intake.

- Use emoji to express the flavor in detail
- lower the threshold to understand the visual (abstract color blocks/characters) and text (boring charts)



Lo-fi Prototype

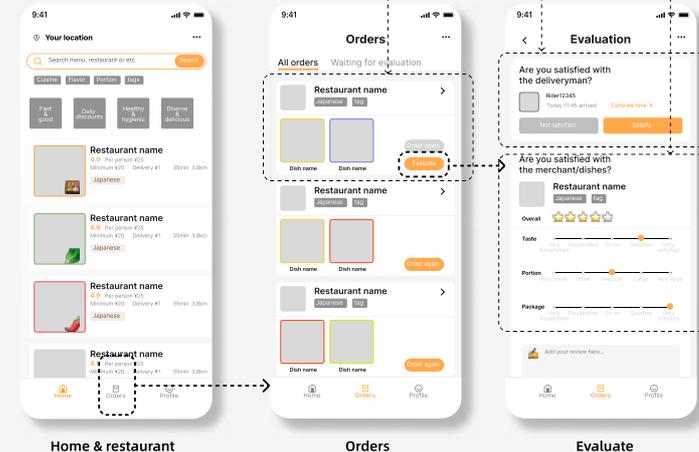
Concept direction 1: Intuitive

- View all orders
- Quickly order again
- Evaluate orders

- Evaluate deliveryman

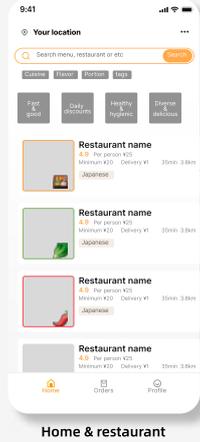
- Evaluate merchant & dish
- Use stars to review---Overall
- Merchant
- Use sliders to review---Taste, portion and package

- The review will reflect on both merchant's tags--flavor, portion size, and consumer's tags--Prefer flavor/food intake...



Restaurant visual & tags

Concept direction 1: Intuitive



Variations

Restaurant name
4.9 Per person ¥25
Minimum ¥20 Delivery ¥1 35min 3.8km
Japanese bento Salty Sweet
Medium portion 1

Restaurant name
4.9 Per person ¥25
Minimum ¥20 Delivery ¥1 35min 3.8km
Spicy Japanese bento Salty Sweet
Medium portion 1

Restaurant name
4.9 Per person ¥25
Minimum ¥20 Delivery ¥1 35min 3.8km
Japanese bento Sour Sweet
Medium portion 1

Restaurant name
4.9 Per person ¥25
Minimum ¥20 Delivery ¥1 35min 3.8km
Japanese bento Sour Sweet
Medium portion 1

Color box + type icon
colorful tag(Show cuisine/type/flavor/portion size)

Multi-color fusion color box + flavor text icon

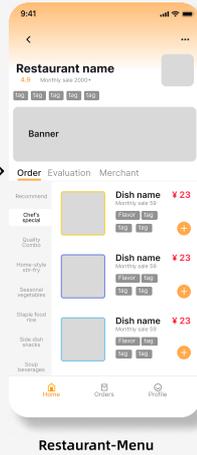
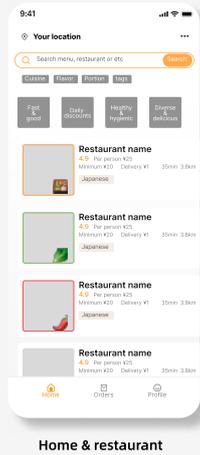
Two-color color box + flavor icon

Shape color box + abstract flavor icon



Menu-dish visual & tags

Concept direction 1: Intuitive



Dish name ¥23
Monthly sale 59
Sweet Small portion
0.7 contain onion +

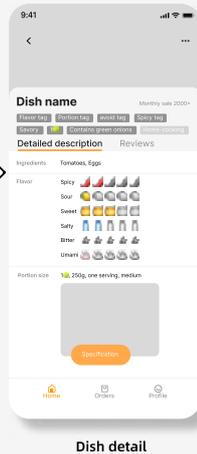
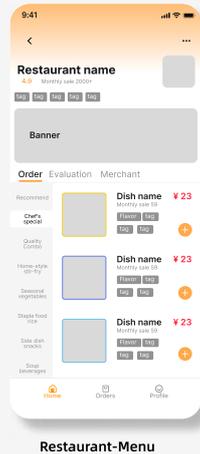
color box+tags(flavor/portion/notice)

Portion tags variations

| text | Analogy to tennis or apple? | g | combine |
|----------------|-----------------------------|------|-------------------------|
| Very small | 0.5 | 125g | Very small (0.5 ≈ 125g) |
| Small portion | 0.7 | 180g | Small (0.7 ≈ 180g) |
| Medium portion | 1 | 250g | Medium (1 ≈ 250g) |
| Large portion | 1.3 | 320g | Large (1.3 ≈ 320g) |

Dish description

Concept direction 1: Intuitive



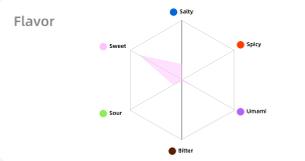
Important tags about portion&taste¬ice

Flavor visual variations

Flavor

- Spicy 🌶️ 🌶️ 🌶️ 🌶️
- Sour 🍋 🍋 🍋 🍋
- Sweet 🍬 🍬 🍬 🍬
- Salty 🧂 🧂 🧂 🧂
- Bitter 🍂 🍂 🍂 🍂
- Umami 🍖 🍖 🍖 🍖

Emoji graph



Hexagon chart

Flavor

abstract character

● Spicy ● Sour ● Sweet ● Salty ● Bitter ● Umami



Appendix 7.2:

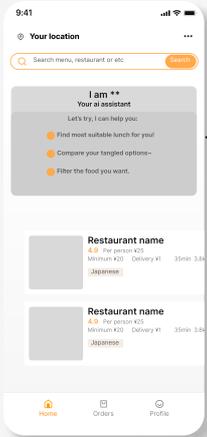
Low-fidelity prototype-concept 2

In order to test specific design points and to select or combine conceptual directions, low-fidelity prototypes as well as simple interactivity were produced on Figma.

Ai assistant entrance

Concept direction 2: Conscious

Home — Search — Questions — Recommendations — Compared — Final choice
 Why&how — Why&how — (restaurant&dish)
 ↑ ↓
 Profile ← Evaluate ← Submit order ← To check out
 Remarks



Home & AI search

AI assistant 入口

I am **
Your ai assistant

Let's try, I can help you:

- Find most suitable lunch for you!
- Compare your tangled options~
- Filter the food you want.

Prompt AI can assist

Have goals - choose the meal you want

Very confused - help you compare options

No goals - find the flavors and portion sizes that suit you

Questionnaire

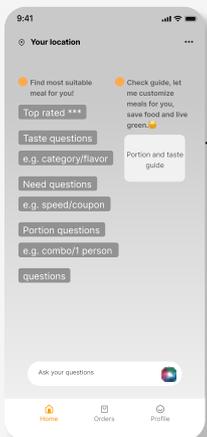
Concept direction 2: Conscious

- Choose your usual food intake: very small/small/medium/large/very large
Reference: Usually eat a portion of 180g of staple rice - too much/just enough/too little
- Choose your favorite flavor: sweet, sour, spicy, salty and umami
- diet-avoid/spicyness...
- Choose your favorite type: light food/Sichuan cuisine/burger/pizza/Chinese simple meal...
- The most important needs when ordering food: delivery speed, price, nutrition, portion size, taste...

guide content

1. recommend questions--- taste/portion/other needs/top rated...

2. guide-little questionnaire-portion& taste preference



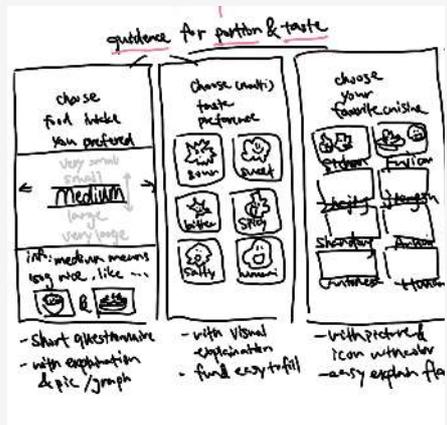
AI search

recommend questions---

- Find most suitable meal for you!
- Top rated ***
- Taste questions
e.g. category/flavor
- Need questions
e.g. speed/coupon
- Portion questions
e.g. combo/1 person
- questions

guide-little questionnaire-

- Check guide, let me customize meals for you, save food and live green. 🌱
- Portion and taste guide



guidence for portion & taste

choose food intake you preferred
Very small, small, **Medium**, large, very large

choose (multi) taste preference
Sweet, Sour, Spicy, Salty, Umami

choose your favorite cuisine
Sichuan, Burger, Pizza, Chinese simple meal...

Short questionnaire - with explanation & pic/graph

with visual explanation - find easy to fill

with picture icon with color - easy explain for

Concept direction

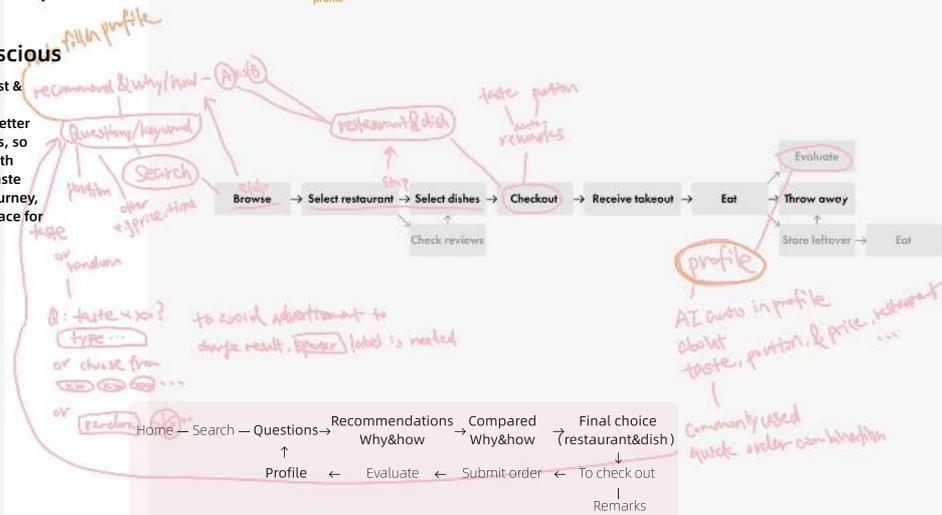
Intuitive v.s. Conscious

AI/just in time profile just as tool, give result/process, assist with tangled choices, not direct give only answer



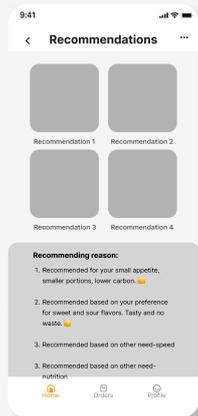
Direction 2: Conscious

- Combine idea (AI assist & Personal profile)
- AI assists consumers better understand their needs, so that to choose meal with suitable portion and taste
- shorten the original journey, so that giving more space for understanding needs



Recommendation

Concept direction 2: Conscious



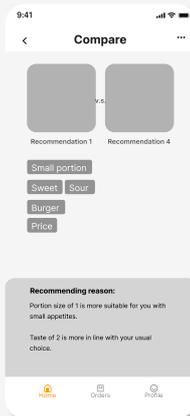
Recommendation results & reasons for recommendation

Recommending reason:

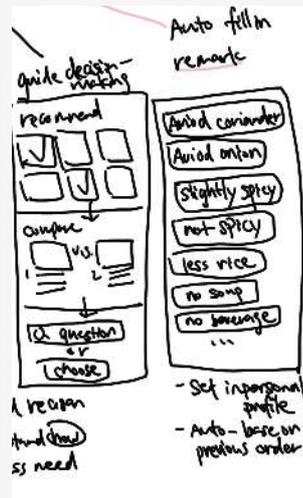
1. Recommended for your small appetite, smaller portions, lower carbon.
2. Recommended based on your preference for sweet and sour flavors. Tasty and no waste.
3. Recommended based on other need-speed
3. Recommended based on other need-nutrition

Quick tip: Choose the right portion sizes and flavors for lower carbs and less waste.

Compare recommended results (compare portion, flavor, etc.)

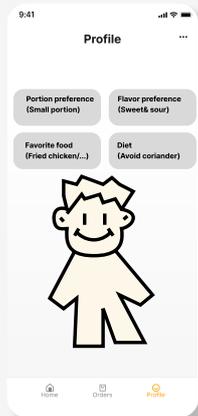


After selecting a meal, notes such as portion size, taste, taboos, etc. will be automatically filled in.



Profile

Concept direction 2: Conscious



Preference-portion/flavor/favorite/avoid/demand

- Portion preference (Small portion)
- Flavor preference (Sweet & sour)
- Favorite food (Fried chicken/...)
- Diet (Avoid coriander)
- Demand (Healthy & fast)

- AI automatically updates the profile based on the latest order, or it can be updated manually.
- Quick recommendations directly from profile

monthly report

- Most visited restaurants (frequency, proportion)
- The most ordered dishes (reasons why you may like it)
- Recent changes in taste and food intake...

Appendix 7.3: Low-fidelity testing storyboard & questionnaire

In the lofi test, in order to make participants more involved, personas and scene stories were set up. A questionnaire was set up through criteria to test whether the two concepts achieved the design goals.

Story setting

Persona- Everyday diners
Please imagine that you are a white-collar worker who orders takeout almost every day and pursues cost-effectiveness. Now it is lunch time on an ordinary midweek day. Your expectation for lunch is that the price is favorable and it can meet your taste and portion.

Health seeker
Please imagine that you are a white-collar worker who orders takeout 3-4 times a week and pursues health. It is an ordinary day in the middle of the week. You want to order a dinner after get off work in the evening. Your expectation for the dinner is nutritionally balanced and can meet your needs. Taste and portion size.

Taste seeker
Please imagine that you are a white-collar worker who almost only orders takeout on weekends and pursues taste first. It is lunch time on the weekend and you want to order a sumptuous lunch. Your expectation for lunch is that it is delicious and hearty and can suit your taste and taste. Portion size.

Hungry eater
Please imagine that you are a white-collar worker who has a short lunch break and pursues quickness. Now the lunch break of an ordinary midweek day is coming, and your expectation for lunch is to quickly find a takeaway that suits your taste and portion and has fast delivery.

Below I will introduce the specific designs of two different conceptual directions, so that you can simulate the ordering process in your mind. During this process, please feel free to think out loud. If you have any questions or suggestions, you can always ask.

Processes can think out loud about these questions:
At the user you just set up, do you think you will use this function? / Which function would you use? Advantages and Disadvantages? Ideas for improvements?
Will you skip this step? If you skip it, will it affect your understanding of portion& taste? Why?
Which transformation to choose? Combine? New ideas? Advantages and Disadvantages?

Questionnaire-concept 1

Questionnaire-concept 2

Questionnaire-concept 2

1. You feel fully informed about your food intake.
您是否充分了解了自己的食量

很不符合 不符合 一般 符合 很符合

2. You feel fully understand the portion size provided by the merchant/platform.
您是否能充分理解商家提供的份量多少

很不符合 不符合 一般 符合 很符合

3. You feel in control of the specific flavor and ingredients of dishes.
您能对菜品的具体味道和成分掌控

很不符合 不符合 一般 符合 很符合

4. You feel that merchants/platforms are responsive to special requirements for dishes.
您感到商家/平台对菜品的特殊要求有响应

很不符合 不符合 一般 符合 很符合

5. You feel you have ample choices.
您感到自己有充足的選擇空間

很不符合 不符合 一般 符合 很符合

6. You feel informed about the portion size you should order.
您感到对自己该点多少的份量有启发

很不符合 不符合 一般 符合 很符合

7. You feel guided when indecisive.
您感到被引导，当犹豫不决时

很不符合 不符合 一般 符合 很符合

8. You feel more aware of your ordering habits.
您意识到了自己的点餐习惯

很不符合 不符合 一般 符合 很符合

9. You feel inspired that you actions can reduce food waste.
您对于自己的行为可以减少食物浪费感到有启发

很不符合 不符合 一般 符合 很符合

10. You feel encouraged to choose portion sizes that best suit your food intake.
您感到受到鼓励去选择最适合自己的份量与食物份量。

很不符合 不符合 一般 符合 很符合

11. You feel encouraged to choose restaurants and dishes that suit your taste.
您感到受到鼓励去选择适合自己口味的餐厅和菜品。

很不符合 不符合 一般 符合 很符合

12. You feel conscious about reducing HDW when ordering food in the future.
您在未来点餐时会意识到减少HDW有意识。

很不符合 不符合 一般 符合 很符合

提交