

Support People Eating Well

Human-Computer Interaction

Group 8

Yuhang Liang - 2297860

Yi Liu - 1605486

Zhuowei Lai - 2151468

Qi Wang - 1890104

Yuqing He -2315088

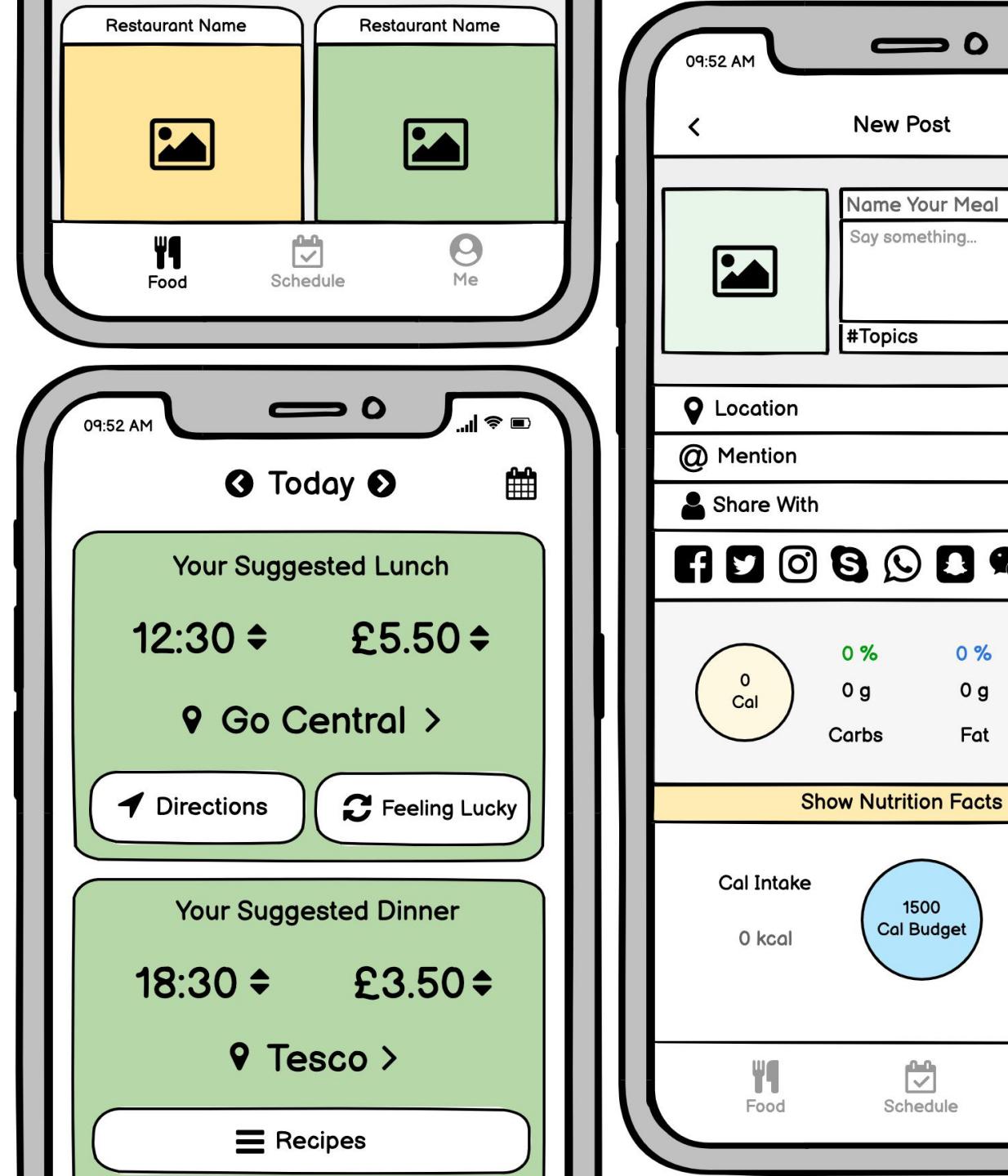
Introduction

After our preliminary survey, we found that students and office workers are often negligent about "eating well". This project is designed using user-centred design to provide a solution for users' irregular and unhealthy eating habits.

In this project we talk about "eating well" in three key points: eating healthy, eating affordably and eating regularly.

Our main goal is to help users balance affordable prices with healthy choices, so we will provide an intelligent meal planning system to automatically recommend their daily meal. By recording users' actual meal time and linking them to the schedule system like Canvas or Google Calendar, the system will analyse the user's daily routine and suggest in advance whether they should eat out or cook at home, it will also provide a number of nutritional and healthy options for users to choose from.

The core functions of the system have been carefully designed and rigorously validated to ensure that our system is what the user needs.

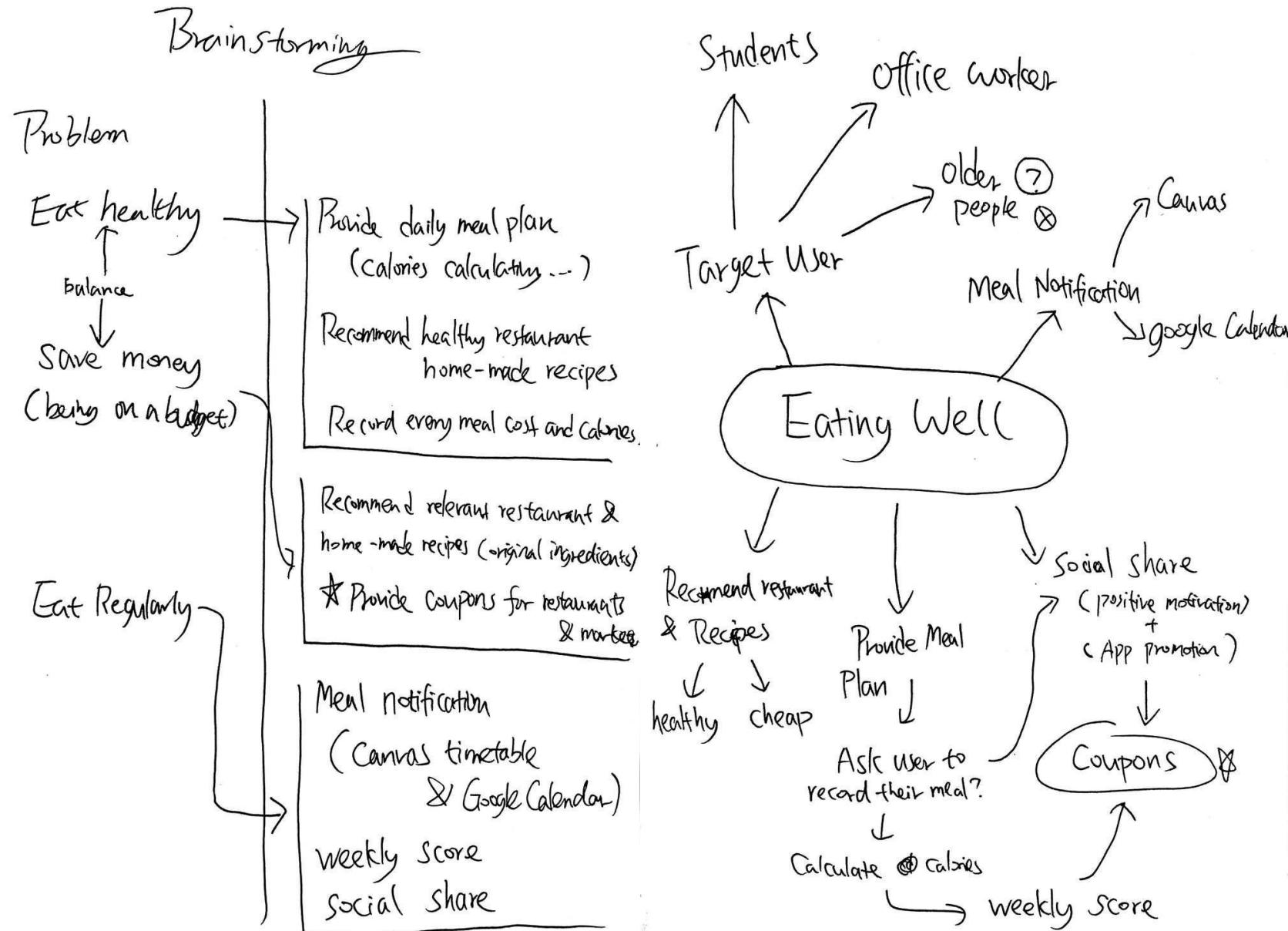


Brainstorming

During the brainstorming phase we embrace all relevant ideas that help us to expand our thinking and set the tone for our ideal system.

After we had narrowed down our ideas, we identified two core problems and one additional problem that needed to be solved, as well as all the corresponding possible solutions.

The next thing we needed to do was to empathise with the users in questionnaires and interviews to make sure we had the right idea to help us get to the real user needs.



Empathy

We use both questionnaires and interviews to help us empathise with our users, and the reason for this is that both methods have their advantages and disadvantages. Questionnaires help us to get a lot of data quickly but do not allow us to get a deeper insight into interesting cases, whereas interviews make up for the lack of questionnaires and allow us to get a deeper understanding of the user.

Questionnaire

- The advantage of questionnaires is that they are very easy to share widely. As we are targeting both students and workers, it is relatively easy to get feedback from different participants.
- As the length of the questionnaire is limited, we did not want to give participants a long and annoying questionnaire, so we tried (as far as possible) to design core questions that would help us to analyse users' eating habits and to avoid duplication of the question range. The questionnaire was also designed to avoid jargon, leading questions, ambiguity questions, and to avoid collecting irrelevant personal information.
- We created our questionnaire on Microsoft Forms and its rich functionality allowed us to try out various question types and also helped us to analyse the results graphically.
- We also designed different branching questions based on the participants' selections, for example, when participants chose that they did not have a healthy diet, we continued to ask them provide some reasons why they did not maintain a healthy diet. This helped us to further analyse the user's existing problems and provided the basis for our interview.

The screenshot shows a Microsoft Forms survey titled "Diet & Health Questionnaire" (饮食与健康调查问卷). At the top right, there are buttons for "问题" (Questions), "答复" (Responses), and a count of 150 responses. The survey begins with a brief introduction: "The following questionnaire is designed to help our group project by collecting information about how people find their balance between eating healthy and being on budget. The questionnaire is completely optional. There are only approximately 10 questions in total." Below this, a note in Chinese states: "这份问卷的主旨是为了帮助人们寻求在健康饮食与合理预算之间的平衡点。问卷的所有问题均是可选项，总共约有10个问题，十分感谢您的参与以助力人们健康饮食！". The first question asks for age, with options: Under 18 (18岁以下), 18-24, 25-34, 35-44, 44+, and Prefer not to say (不愿透露). The second question asks if the participant is a student, with options: Yes (是) and No (否).

问题

答复 150

Diet & Health Questionnaire

饮食与健康调查问卷

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The following questionnaire is designed to help our group project by collecting information about how people find their balance between eating healthy and being on budget. The questionnaire is completely optional. There are only approximately 10 questions in total.

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1. What is your age? (您的年龄?)

Under 18 (18岁以下)
 18-24
 25-34
 35-44
 44+
 Prefer not to say (不愿透露)

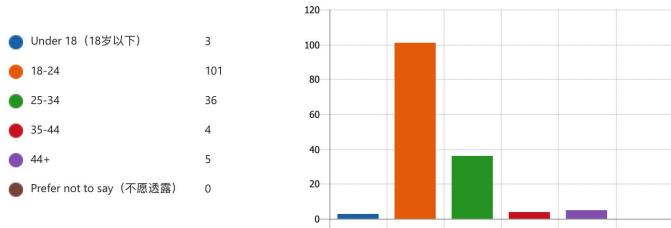
2. Are you a student? (您是学生吗?)

Yes (是)
 No (否)

Questionnaire

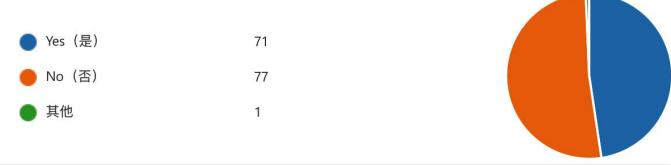
1. What is your age? (您的年龄?)

[更多详细信息](#)



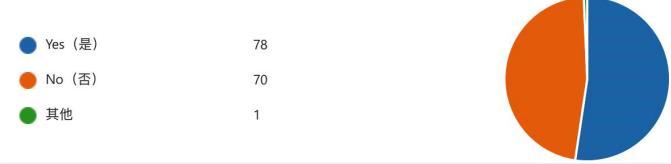
2. Are you a student? (您是学生吗?)

[更多详细信息](#)



3. Do you have a healthy diet? (您认为您目前饮食是否健康?)

[更多详细信息](#)



4. Do you intend to have a healthy diet? (您打算维持一个健康饮食吗?)

[更多详细信息](#)



5. Which one do you think is more important to eat healthily or to be on a budget?

(您认为健康饮食和低预算哪个更重要? 或都重要?)

[更多详细信息](#)

Eat healthily (健康饮食)	72
Be on a budget (低预算)	5
Both (都重要)	71
Other	1

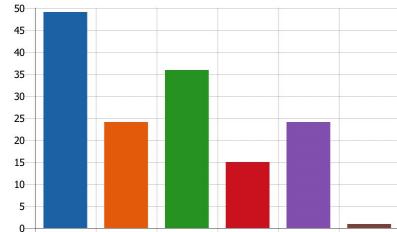


6. How often do you prepare and cook a meal from basic ingredients in a week?

(您每周自己做饭几次?)

[更多详细信息](#)

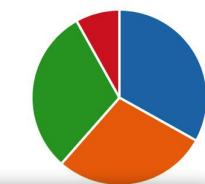
Never (从不)	49
Once a week (一周一次)	24
2-3 times a week (一周2-3次)	36
4-6 times a week (一周4-6次)	15
Daily (每天)	24
Other	1



7. How do you usually have your meal? (您通常如何吃饭?)

[更多详细信息](#)

Cook by myself (自己做饭)	49
Take-away (外卖)	42
Go to a restaurant (去餐馆吃...)	45
Other	12

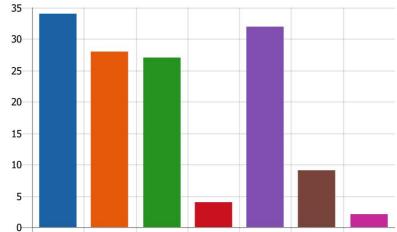


9. What are the main reasons that you do not have a healthy diet?

(您没有维持健康饮食的主要原因是什...)

[更多详细信息](#)

Bad eating habits (坏的饮食...)	34
Lack of time to plan (没有时...)	28
No ideas what to eat (不知道...)	27
Low budget (低预算)	4
Capricious timetable (时间混...)	32
Lack of cooking skills (缺乏烹...)	9
Other	2



8. How important do you feel about these factors when you choose meal?

(当您选择一餐饭时, 您认为以下这些维度对您的重要性有多大?)

[更多详细信息](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5

Taste (味道)

Price (价格)

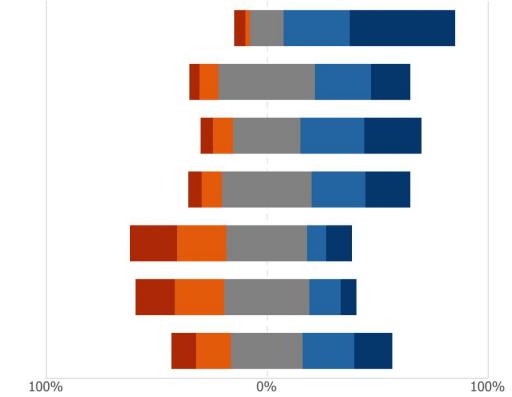
Health (健康)

Time (时间)

Calories (热量)

Appearance (外观)

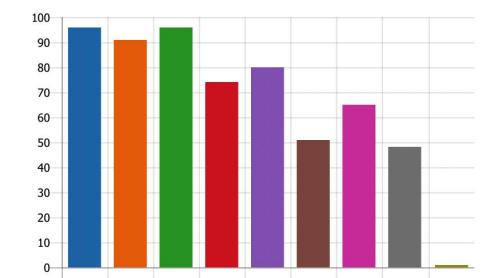
Distance (距离)



10. What are the useful functions to you? (如果现有一个饮食App, 您希望拥有哪些功能?)

[更多详细信息](#)

Provide daily meal plan (提供...)	96
Recommend healthy restaura...	91
Recommend healthy home-m...	96
Record every meal cost and ca...	74
Provide coupons for restauran...	80
Meal notification (用餐提醒)	51
Provide eating habits score (...)	65
Record meal photos and quick...	48
Other	1



Questionnaire - Results

Once we had collected 149 results, we found the following highlights of the results:

- The majority of participants in our survey were young people, with a slightly higher number of students than working people.
- Nearly half of participants consider their current eating habits are unhealthy, and almost everyone would like to have a healthy diet in the future.
- Nearly half of participants think that being healthy is as important as being both healthy and affordable.
- 1/3 of participants usually eat out, the remaining 2/3 cook their own meals 1-6 times a week.
- The main reasons people believe they are not maintaining a healthy diet are **confused time management, lack of planning** and **bad eating habits**.

After the results above, we found that participants had a desire to be healthy and affordable, but at this stage we did not intend to design the software specifically, but rather to obtain a wide range of different information.

Interviews

- One of the benefits of the interview is that we can ask more open questions so that we can get a more detailed picture of what the issues are and understand the key directions we need to focus on.
- We tried to find some of the typical users in the questionnaire to facilitate our interviews and dig deeper to understand their needs in more detail.
- For those who lacked the time to plan a healthy meal, we tried to understand why they were unable to eat on time and tried to find a design solution to their problem.
- For those who have enough time to cook and are looking for healthy meals, we tried to help them to reduce their food budget by providing both healthy and affordable recipes.
- In fact we knew that users did not actually know what they wanted, so we avoided asking them directly what kind of software they wanted and instead empathised with them in more detail from the problem side and tried to understand their needs.

	Transcript for Interviewee 1
Q:	May I know your age?
A:	22
Q:	Are you a student or not? And if you are, what is your programme?
A:	Yes, I am a student from International Business.
Q:	Do you think you have a healthy diet?
A:	Not exactly.
Q:	Do you intend to have a healthy diet?
A:	Yes, of course.
Q:	Which one do you think is more important to eat healthy or to be on a budget?
A:	I think eating healthy is more important, although I would like to reduce my budget to save money. I believe that eating healthy is a prerequisite for living a healthy life and I like healthy food.
Q:	How often do you prepare and cook a meal from basic ingredients in a week?
A:	About 2-3 times. I often cook and eat together with a few of my friends.
Q:	Approximately how much money do you spend on food and drinks each week?
A:	About £100-200, depending on how many times I eat out.
Q:	Do you think your current budget is high or low?
A:	I think it's a bit above the normal, I'd love it if you could help me lower it.
Q:	What is your favourite food?
A:	Chinese food.
Q:	Where do you usually buy your ingredients/food?
A:	Tesco and Chinese market, I usually buy some daily fruits and vegetables from Tesco, and then I get some Chinese ingredients and snacks from the Chinese market.
Q:	What kind of ingredients/food you usually buy?
A:	Fruits, yogurts, milk, vegetables, fish, chicken.
Q:	Do you think you have a regular mealtime? When do you usually eat breakfast, lunch and dinner?
A:	I think I have a relatively regular diet with breakfast between 7am and 9am, lunch around 12pm and dinner between 5pm and 7pm. But still sometimes it gets broken unexpectedly.
Q:	Such as?
A:	Sometimes there are unexpected changes in the curriculum that cause disruptions to the original plan, as cooking takes time to prepare in advance.
Q:	Do you think you should have a supervisor who helps you maintain healthy habits, why?
A:	That would be nice. I wish I could get some advice on ingredients or recipe choices to help me stay healthy.

	Transcript for Interviewee 2
Q:	May I know your age?
A:	26
Q:	Are you a student or not?
A:	I'm no longer a student, I currently work for an IT company.
Q:	Do you think you have a healthy diet?
A:	No.
Q:	Do you intend to have a healthy diet?
A:	I hope, but I don't know if I can do it.
Q:	Which one do you think is more important to eat healthily or to be on a budget?
A:	I want to eat healthy, but I don't think I can do that. Because I always eat fast food at short notice, then I can spend more time on the things I'm interested in.
Q:	How often do you prepare and cook a meal from basic ingredients in a week?
A:	About 3, maybe less, and I always eat the food prepared in the restaurant.
Q:	Approximately how much money do you spend on food and drinks each week?

A:	Around £100, mostly on fast food.
Q:	What is your favourite food?
A:	Many varieties. Such as French, Italian, Spanish and Chinese
Q:	Do you usually eat snacks between meals?
A:	Sometimes.
Q:	Where do you usually buy your ingredients/food?
A:	Tesco and Sainsbury.
Q:	What kind of ingredients/food you usually buy?
A:	Sausages, curry rice, meatballs and many snacks.
Q:	Do you think you have a regular mealtime? When do you usually eat breakfast, lunch and dinner?
A:	Sometimes regular and sometimes irregular, I always skip breakfast and have lunch around 12am and dinner between 5pm to 7pm and have a snack at 9pm. Sometimes I get so involved in working that I forget to eat.
Q:	About how many times a month does this happen?

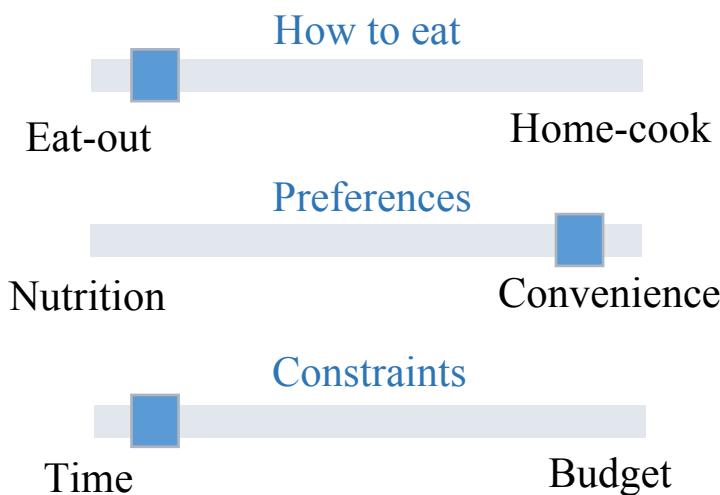
A:	I think probably at least once a week.
Q:	Do you think skipping breakfast has any bad effects on your health?
A:	Maybe there is, but I'm not sure right now.
Q:	Do you think you should have a supervisor who helps you maintain healthy habits, why?
A:	No, I don't like to be supervised. But if there is an app to help me plan my meals, I am happy to do so.
Q:	If there was an app here, what features would you like to have?
A:	I would like the app to help me plan my diet, including things like restaurant recipes, and ideally to help me automatically calculate my daily calorie intake.

Interviews - Results

- We interviewed a total of 2 people. One of them was a student from the International Business and the other was a worker from an IT company. This was the result of a careful selection in our questionnaire, and these two participants corresponded to our target of students and office workers respectively.
- They both had some problems related to unhealthy or irregular eating. We found that student participant was also less likely to cook their own meals, sometimes even disrupting their schedules due to sudden changes in their course schedules. Student participant was also more likely to have low budgets.
- The second participant, a working person from an IT company, preferred fast food as it was more convenient for their tight schedule. Their eating patterns may be more irregular than students, and they may easily forget to eat on time. He also suggested a function about automatic calorie counting, which we will consider in depth later. For these two subjects, we have gathered requirements for healthy & low-budget food recommendations and function of reminders.

Persona A: Kasia

Office worker with irregular meals



Summary

Office workers who often eat irregularly. They are so busy with their daily work that they cannot eat on time because of meetings. In addition, they often overwork in the evenings and forget to eat at appropriate times. However, they want to eat healthy, but don't have enough time. They don't want to waste their time cooking because they are likely to spend it on relaxing.

Key characteristic

Age 29

Busy work

Always fail to eat on time and sometimes forget to eat

Reluctant to cook.

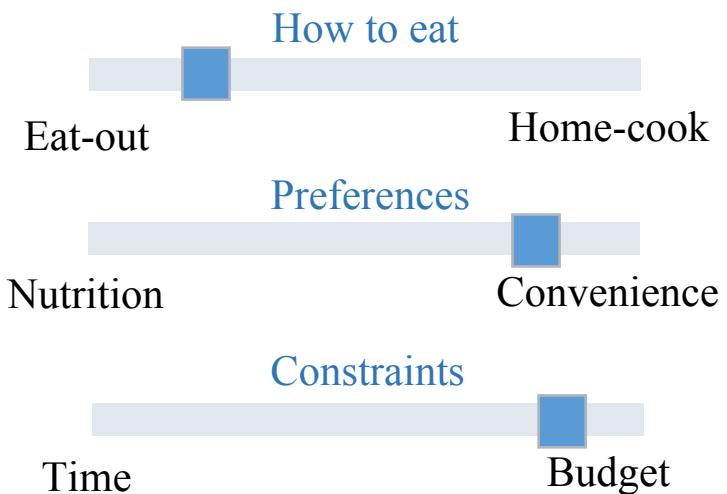
Want to focus on nutrition / healthy but don't want to spend too much time.

Goals

Eat conveniently and save time
Eat healthier and more regularly

Persona B: Peter

Student with poor eating habits



Summary

Students who eat food for basic needs and who give little thought to nutrition. They often get up late and skip breakfast. They often eat fast food to save money and order takeaways for convenience. They often live in school dormitories and hardly cook their own meals. They sometimes choose to eat out or order takeaways because the food in the canteen does not suit their tastes.

Key characteristics

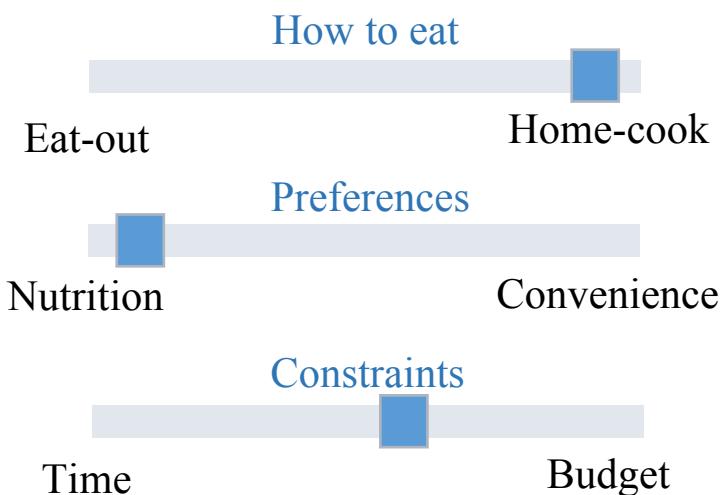
Age 22
Eating for basic need
Do not consider nutrition
Eat fast food
Hardly cook by themselves

Goals

Have a healthy diet with affordable prices
Convenience and save time
Richer choice

Persona C: Elsa

Individuals who prioritise a balanced meal



Description

People who place a high value on a balanced diet. They eat healthy foods and aim to lose weight or keep fit. They combine exercise and diet to stay healthy, so they record their food intake and exercise to find out better health guidelines. They keep a tight control on the amount of calories they consume each day according to their body's condition.

Key characteristic

Focused on food nutrition
Have high expectations of their health
Strictly control their diet

Goal

Eat healthier
Record their food intake and calculate calories
Have balanced meal guidance
Recommend feasible advice on health

Scenario A: Worker - Anna

- **Story description**
- “I work as a multinational saleswoman, so my days are full. As a result, I have little time to cook and have to order takeaways or fast food regularly; I often need to contact overseas clients, so the uncertainty of meetings leads to me eating very irregularly. Over a long period of time, my body has become obese and unhealthy, so I am particularly troubled with diet arrangements.”
- **Key requirements**

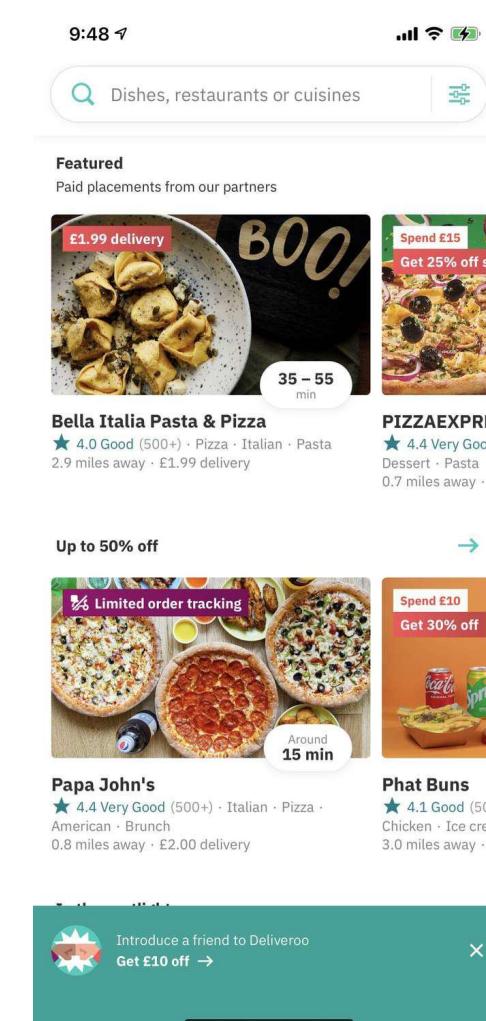
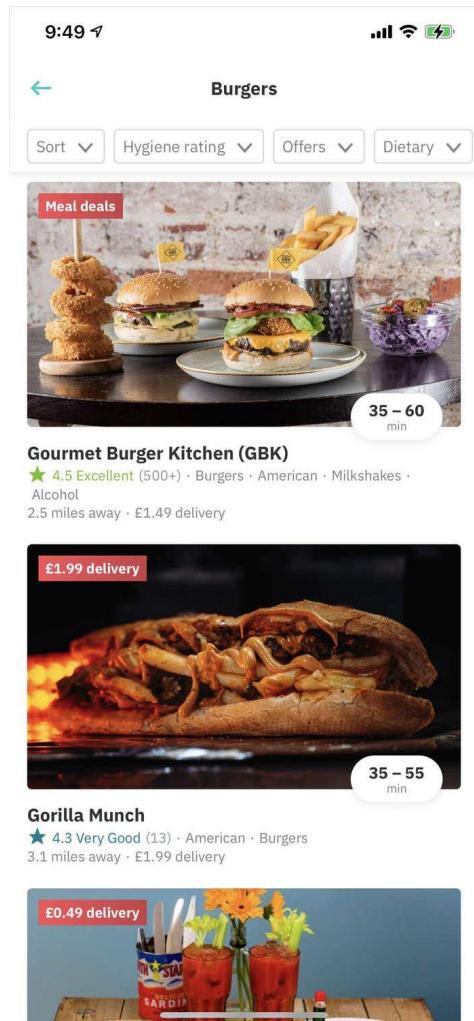
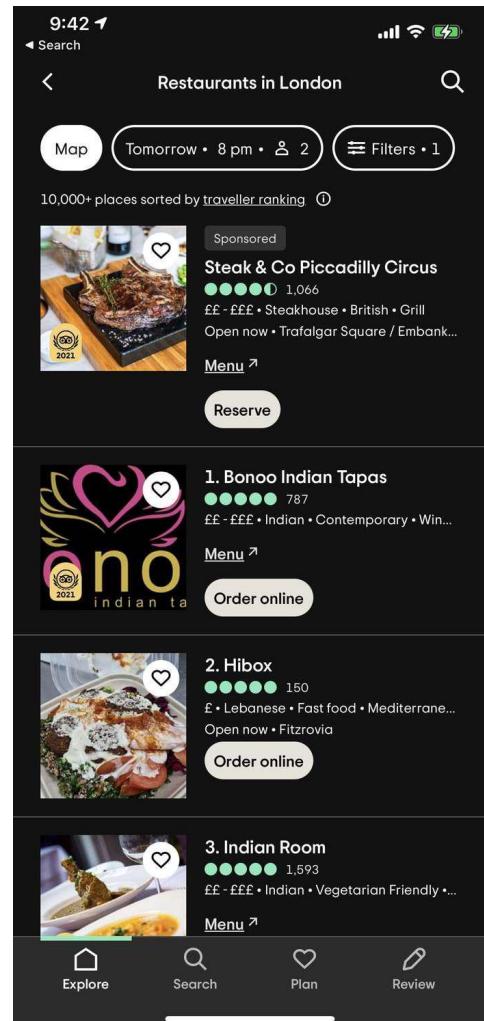
Flexible and reasonable eating arrangements; Eating healthy but not taking extra time

Scenario B: Student - Alan

- **Story description**
- “I am a post-graduate student. In order to control my budget, I often need to cook by myself, but the headache is that it is difficult to find a low-budget and healthy diet plan; sometimes because of the tight schedule and time constraints, I can only order takeaway or eat fast food, but For a restaurant that has never eaten before, I don’t know whether it is healthy or not, and it may exceed the budget.”
- **Core requirements**
- A balanced diet on a low budget; Reasonable diet arrangements and restaurant recommendations based on time

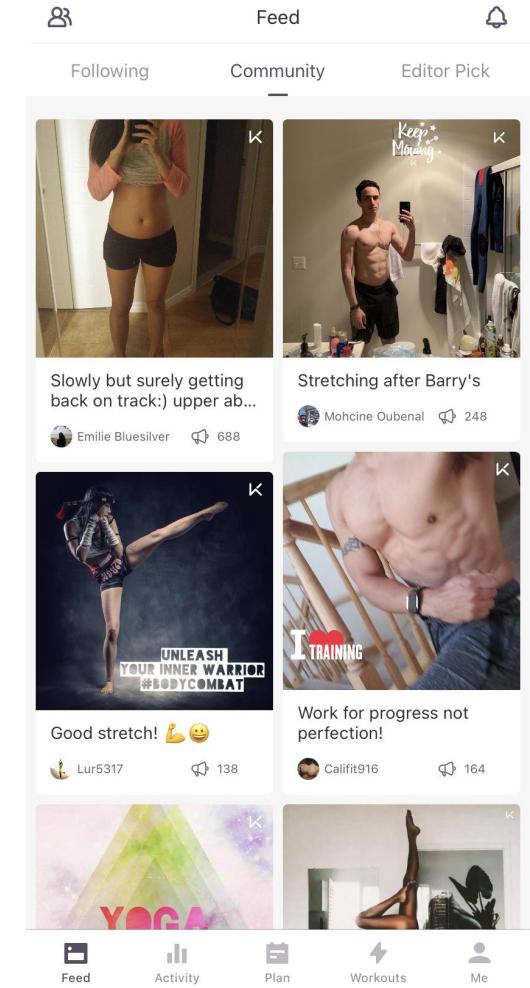
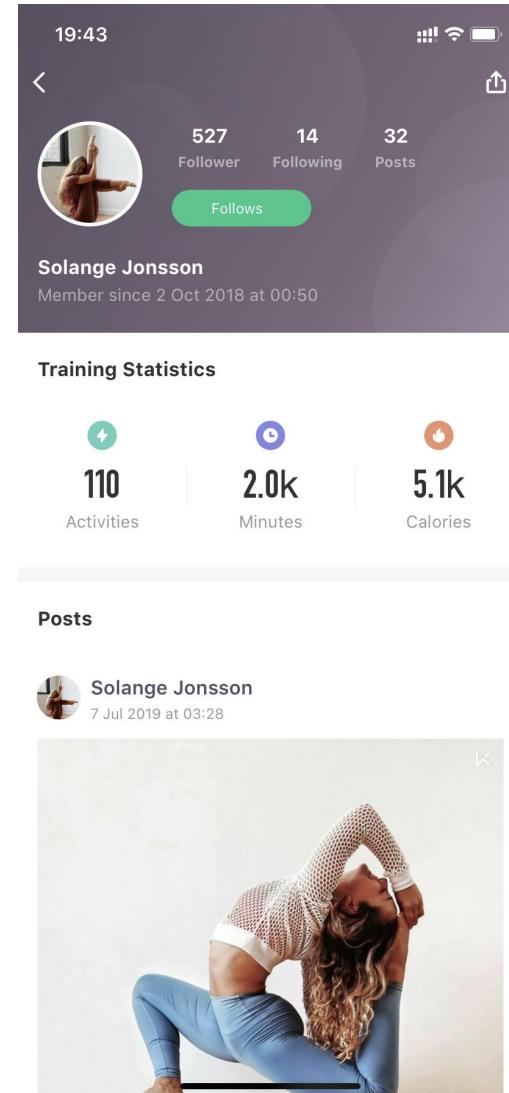
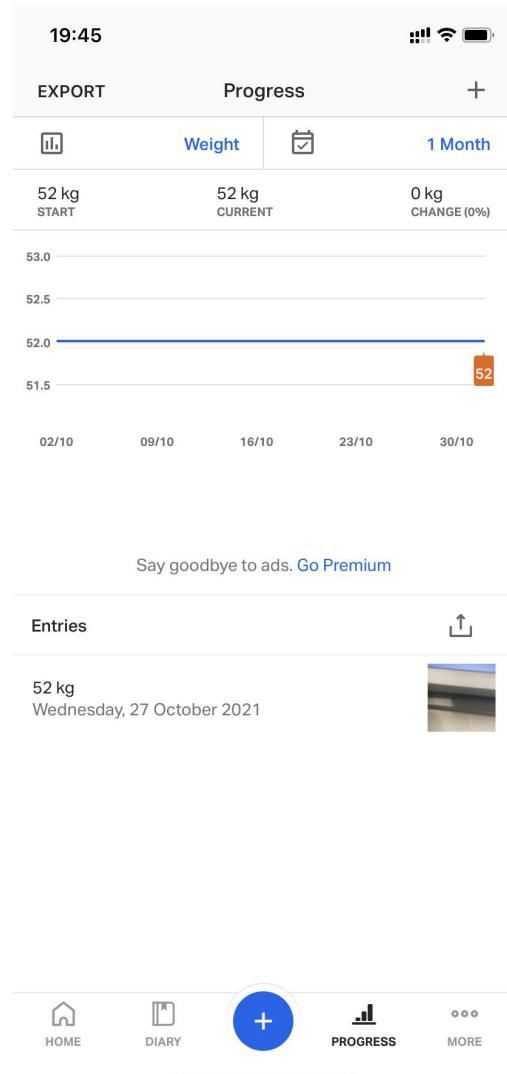
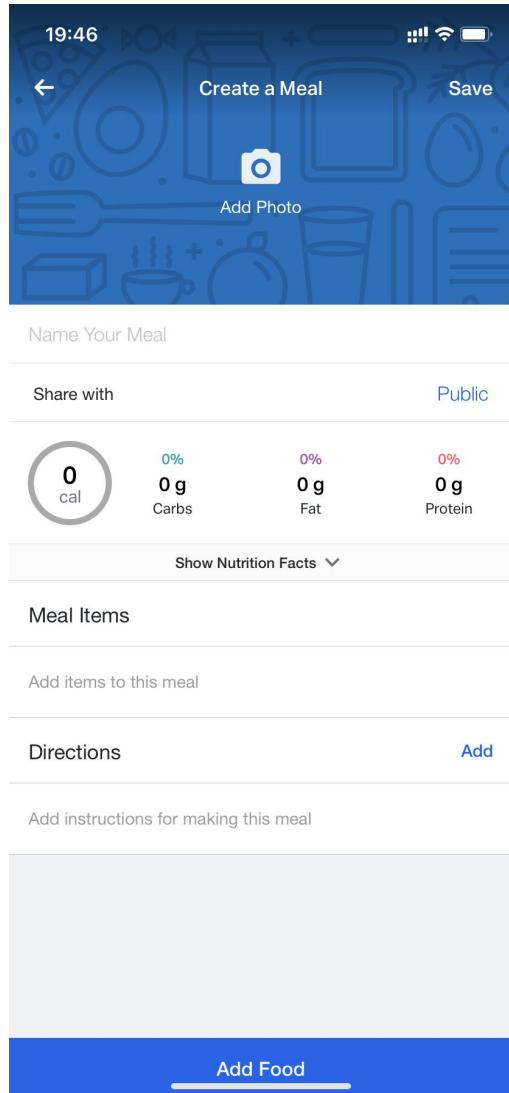
Existing Products - Food Recommendation

We have researched a number of existing food recommendation apps and without exception they all use a card view, as it gives the user a quick sense of a restaurant's style and allows them to decide whether or not to choose it. In addition to this, price and distance are often prominently displayed.



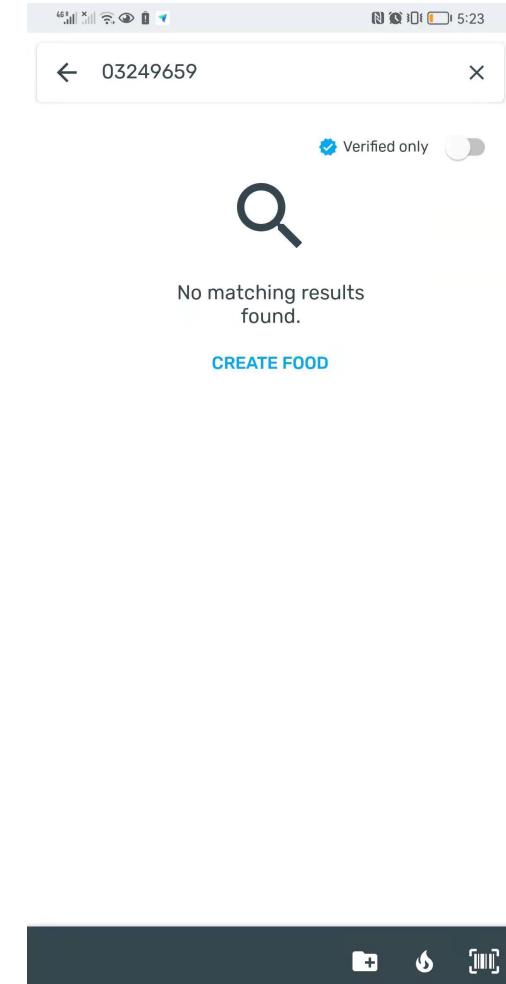
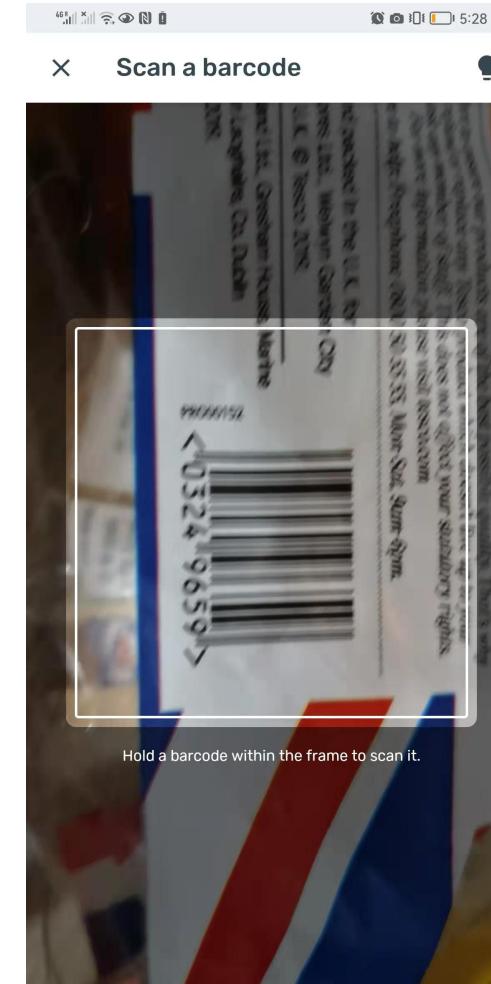
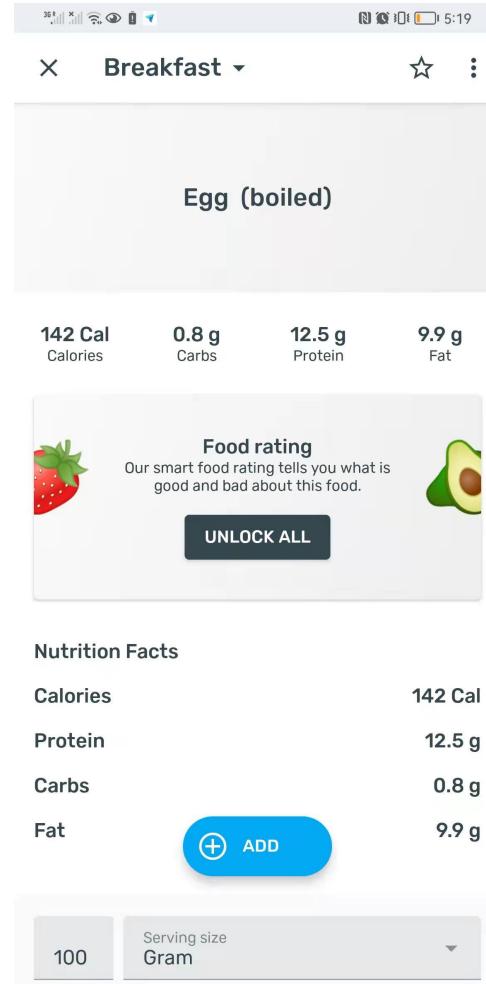
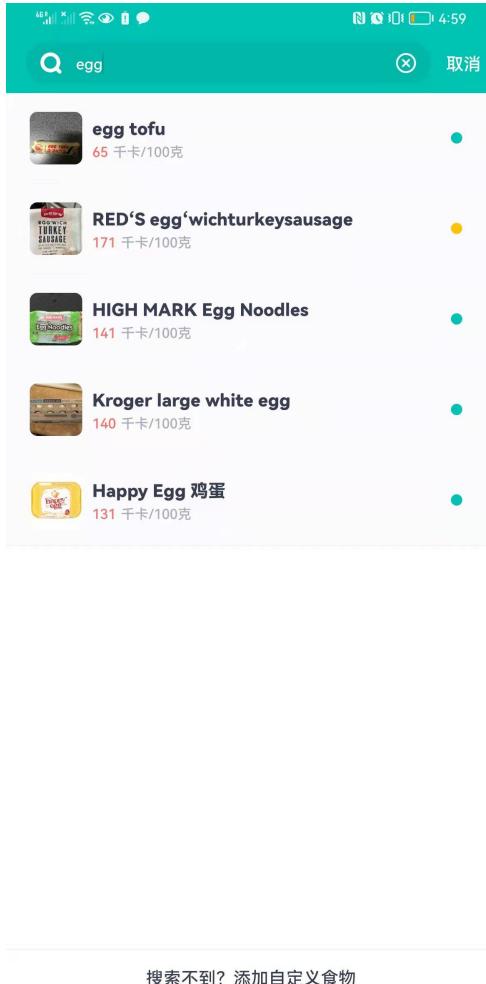
Existing Products - Record & Share

We have also researched a number of existing health & fitness apps and most of them have a share module, as it gives users a positive motivation to keep using this app and record their bodies' changes. In addition to this, users can get more inspiration from other people's comments and likes.



Existing Products - Calorie Counter

We looked at some of the existing calorie counting apps and found that they use three ways of counting calories, direct name search, taking a picture of the food to customise the calories and taking a picture to identify the barcode. The barcode recognition method is convenient, but there are often cases where the results are not found. However, these have given us a lot of inspiration.



Existing Products - Points Redemption

We looked at some of the existing point redemption apps and found that they collect points in a variety of ways for different products, such as the price of a purchase at the supermarket, or a completion plan after the user has set a goal that can be converted directly into points. Points can be redeemed for coupons or merchant vouchers, which can be an incentive for users to continue using the app and to share it with their friends.

A screenshot of the Tesco mobile app interface. At the top, it shows 'vodafone UK' signal strength, the time '05:47', and battery level '49%'. Below this, the title 'Apples & Pears' is displayed with a back arrow. Underneath, there are two sections of product cards:

- Tesco Pink Lady Apples Loose**: £0.62 (£3.65/kg). Includes a small image of three apples and an 'Add' button.
- Tesco Pink Lady Apple Minimum 5 Pack**: £2.80 (£0.56 each). Includes a small image of a five-pack box and an 'Add' button.
- Tesco Jazz Apple 6 Pack**: £2.40 (£0.40 each). Includes a small image of a six-pack box and an 'Add' button.
- Tesco Gala Apple Minimum 5 Pack**: £1.60 (£0.27 each). Includes a small image of a five-pack box and an 'Add' button.
- Tesco Organic Ripe & Ready Pears 550G**: £2.00 (£0.36 each). Includes a small image of a bag of pears and an 'Add' button.

At the bottom, there are navigation icons for Home, Favourites, Search, Clubcard, and Basket.

A screenshot of the Tesco Clubcard mobile app. At the top, it shows 'vodafone UK' signal strength, the time '05:46', and battery level '50%'. The main header says 'TESCO Clubcard' with a 'Tap to scan' button and 'Collect Clubcard points' text. Below this, there are two sections:

- My points**: Shows 54 Points and £0 Worth in vouchers. It also says 'Collect 96 more points for a £1.50 voucher'.
- How your Clubcard points work**: A link with a right-pointing arrow.

At the bottom, there are navigation icons for Home, Favourites, Search, Clubcard, and Basket.

A screenshot of the Tesco Clubcard mobile app. At the top, it shows 'vodafone UK' signal strength, the time '05:46', and battery level '50%'. The main header says 'How your Clubcard points work' with a back arrow. Below this, there is explanatory text and two examples:

- £150 spent**: You use your Clubcard when you shop for groceries in store and online.
- 150 points**: You collect 1 point for every pound you spend*.
- £1.50 to spend with Tesco**: We turn your points into vouchers and send them to you in your quarterly statement. Or you can get them when it suits you with Faster Vouchers. Then spend them on your shopping in store or online.

At the bottom, there are navigation icons for Home, Favourites, Search, Clubcard, and Basket.

A screenshot of the Tesco Clubcard mobile app. At the top, it shows 'vodafone UK' signal strength, the time '05:46', and battery level '50%'. The main header says 'How your Clubcard points work' with a back arrow. Below this, there are two examples:

- £1.50 to spend with Tesco**: We turn your points into vouchers and send them to you in your quarterly statement. Or you can get them when it suits you with Faster Vouchers. Then spend them on your shopping in store or online.
- £4.50 to spend with Partners**: You can enjoy up to 3x your Clubcard voucher value to spend with 100+ Reward Partners.

At the bottom, there are navigation icons for Home, Favourites, Search, Clubcard, and Basket.

Stage Summary

Based on things we have done so far, we have harvested a wealth of information to help us understand our users. We summarized with two key points, the first being to maintain a balance between healthy and affordable eating, and the other being to maintain regular eating habits.

However, Most of existing solutions do not combine meal recommendations and regular meal improvement at the same time. The reason for this is that the software usually does not have access to the user's daily schedule, so we intend to connect it with the user's existing schedule system (Canvas or Google Calendar), so that it can help different users in two different dimensions at the same time.

Changing existing habits is not easy, however, social sharing and coupon encouraging are very effective and incentive as a positive feedback based on our research of competitors.

Key Requirements

1. Helping people eat healthy

- Provide daily meal plan based on their preference (vegetarian settings, calorie calculating, etc).
- Recommend healthy restaurant, home-made recipes according to provided meal plan (also allow user to search the different results).
- Record every meal cost and calorie.

2. Helping people save money on food and beverage (Being on budget)

- According to the food budget, recommend relevant restaurant & home-made recipes (takeaway delivery or original ingredients).
- Provide coupons for restaurants & markets.

3. Helping people eat regularly

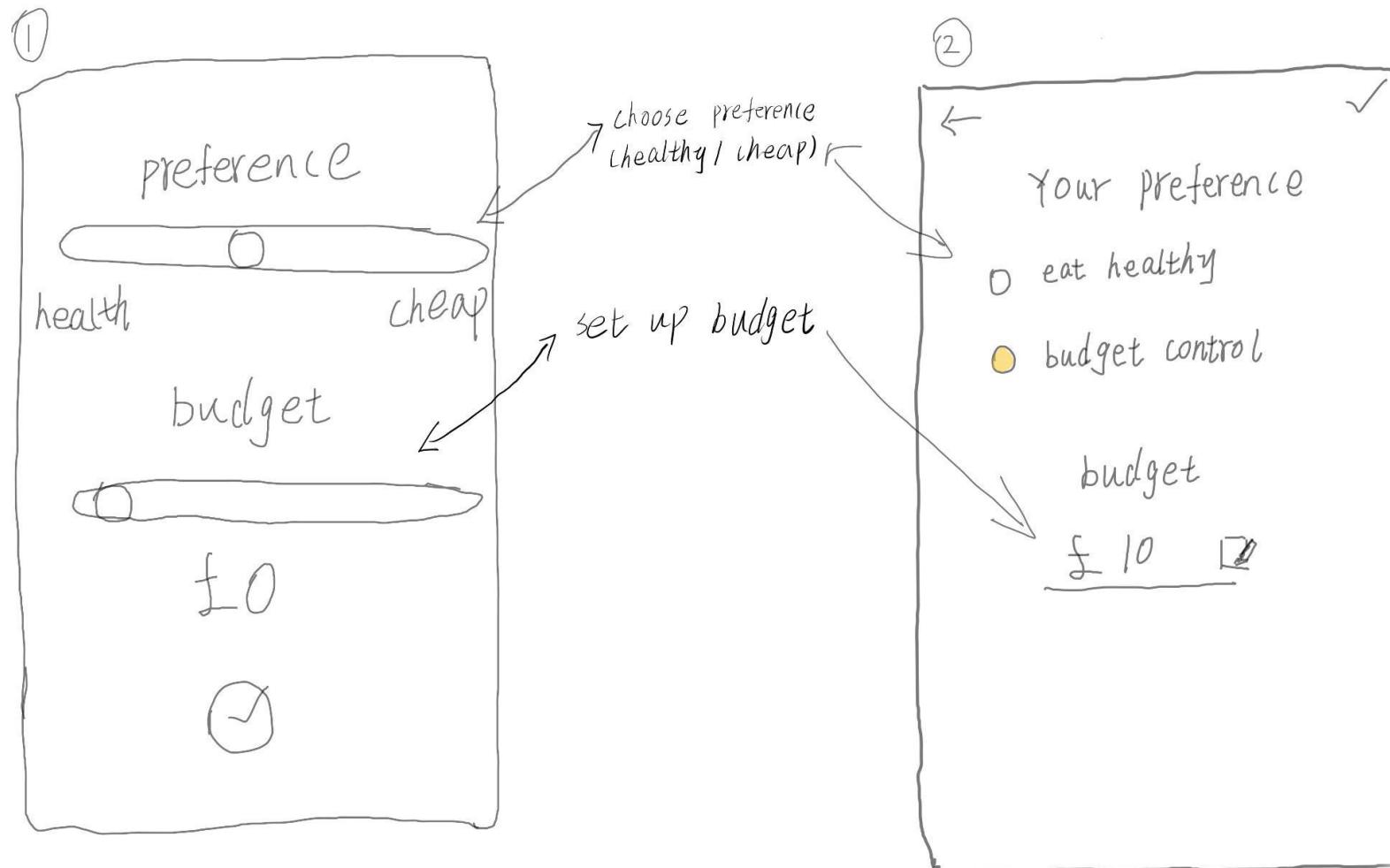
- Meal notification (According to user's timetable or calendar to help them eat regularly)
- Provide a weekly score for their eating habits.
- Redeem coupons based on weekly scores.
- Allow them to share on social media.

Sketches

After the research, we had an initial idea for our meal system. We then sketched out them and we encouraged any kind of ideas to help us expand our thinking. These sketches also helped us to visualise our ideas and lay the foundations for our next lo-fi prototype.

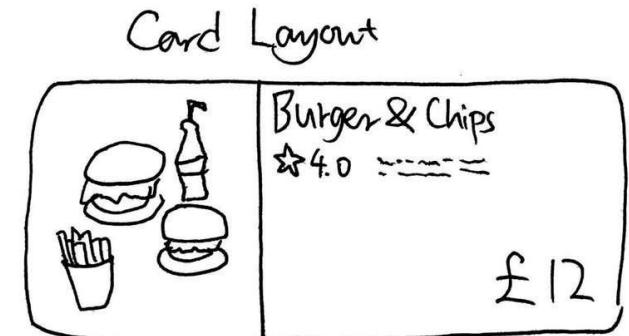
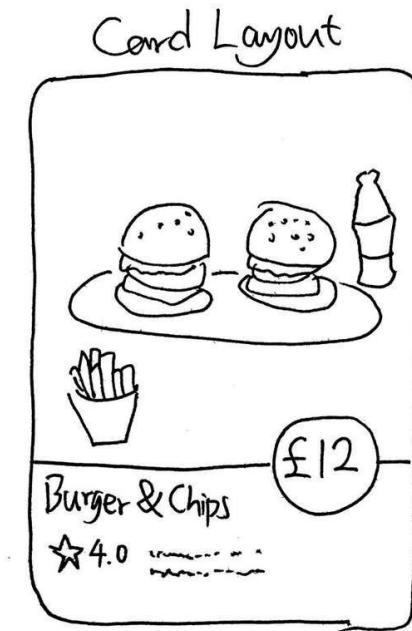
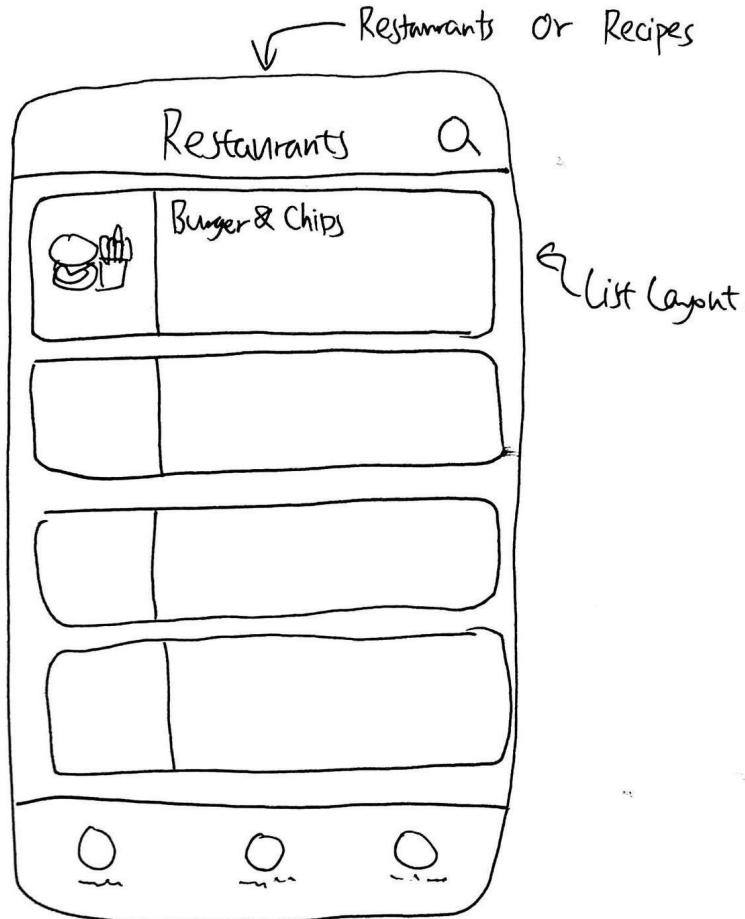
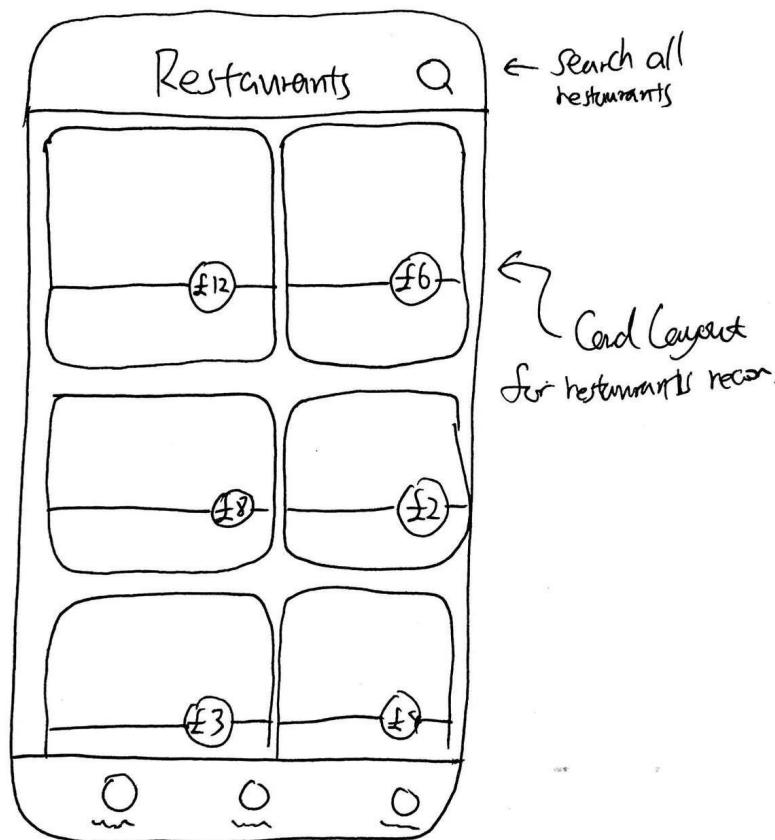
Sketches - Welcome Page

The welcome screen is relatively simple and straightforward as we need to capture some of the user's preferences, for example whether they care about affordable eating in particular or healthy eating in particular. We tried two different design approaches, such as a slider to allow the user to choose between the two.

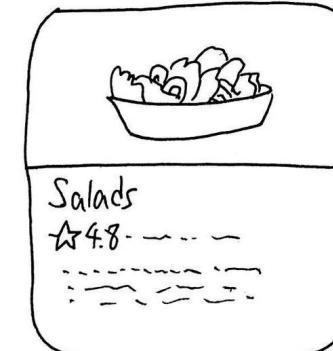
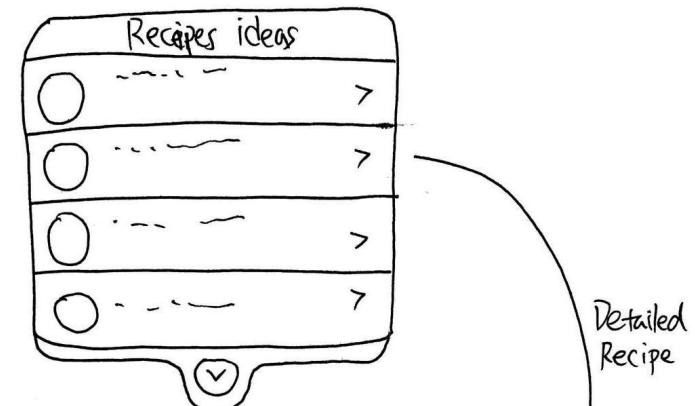
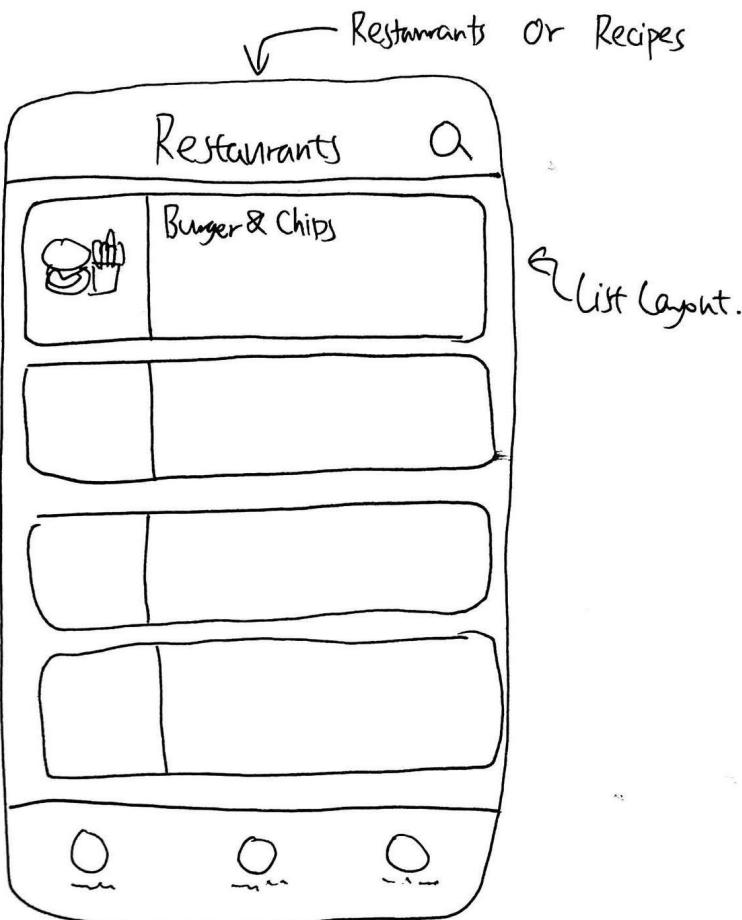
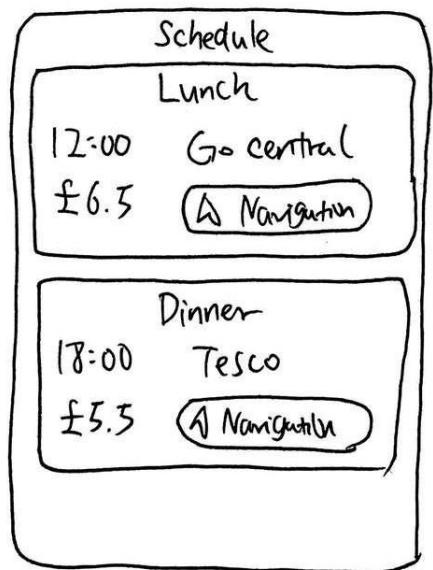
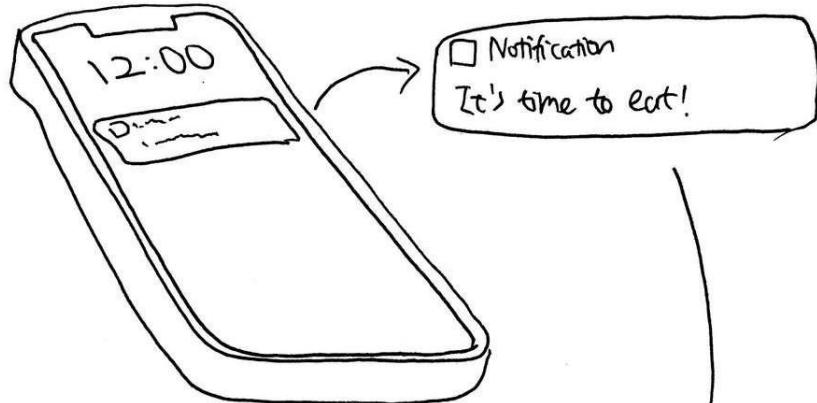


Sketches - Restaurants Recommendation

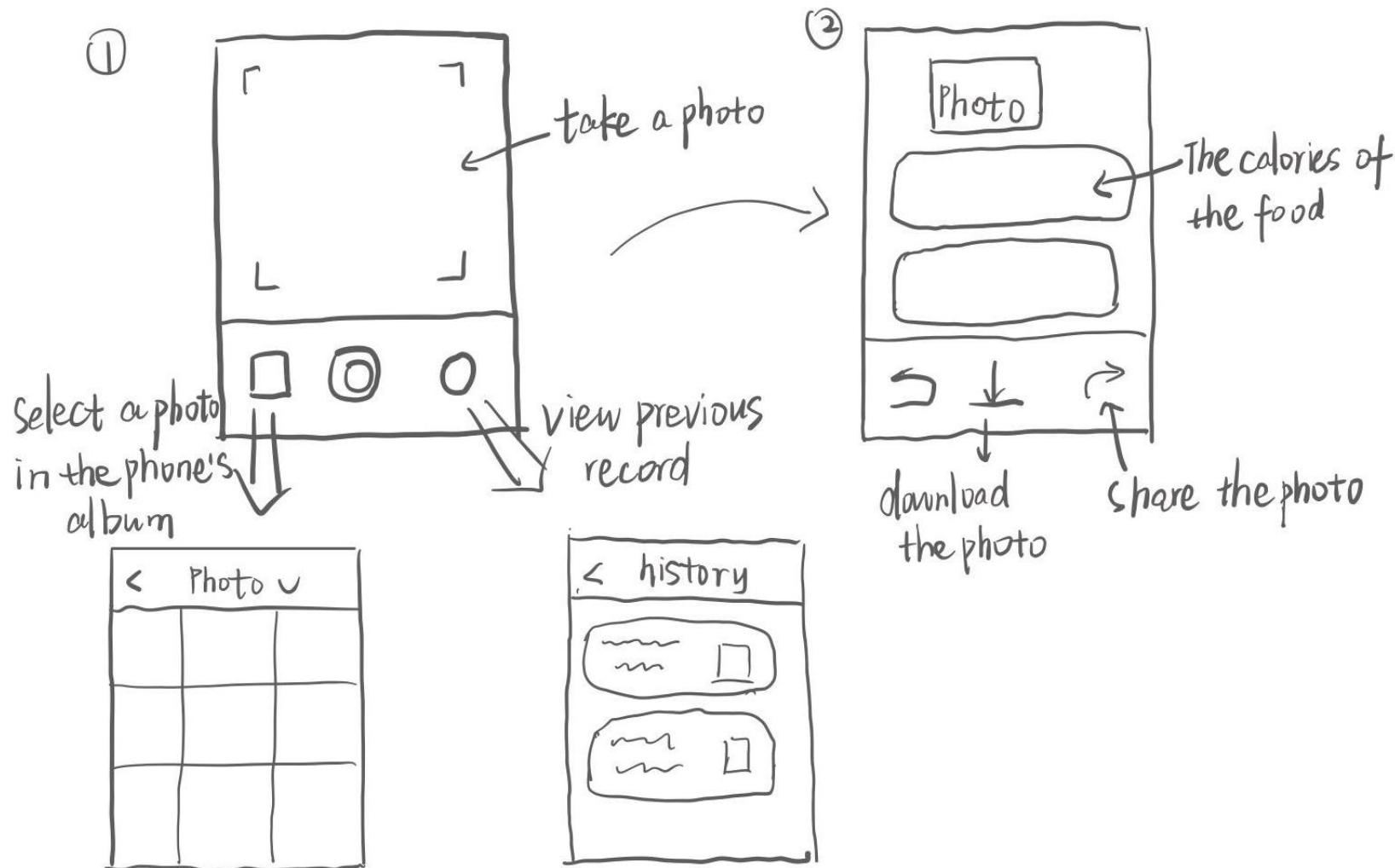
After comparing several existing competing products, the card view is one of the most user-friendly ways to make restaurant recommendations, allowing users to visualise the flavours of the restaurant and quickly select the restaurant they want. In this sketch we drew two different card formats, corresponding to the status of the restaurants and the recipes.



Sketches - Meal Plan & Receipt Ideas

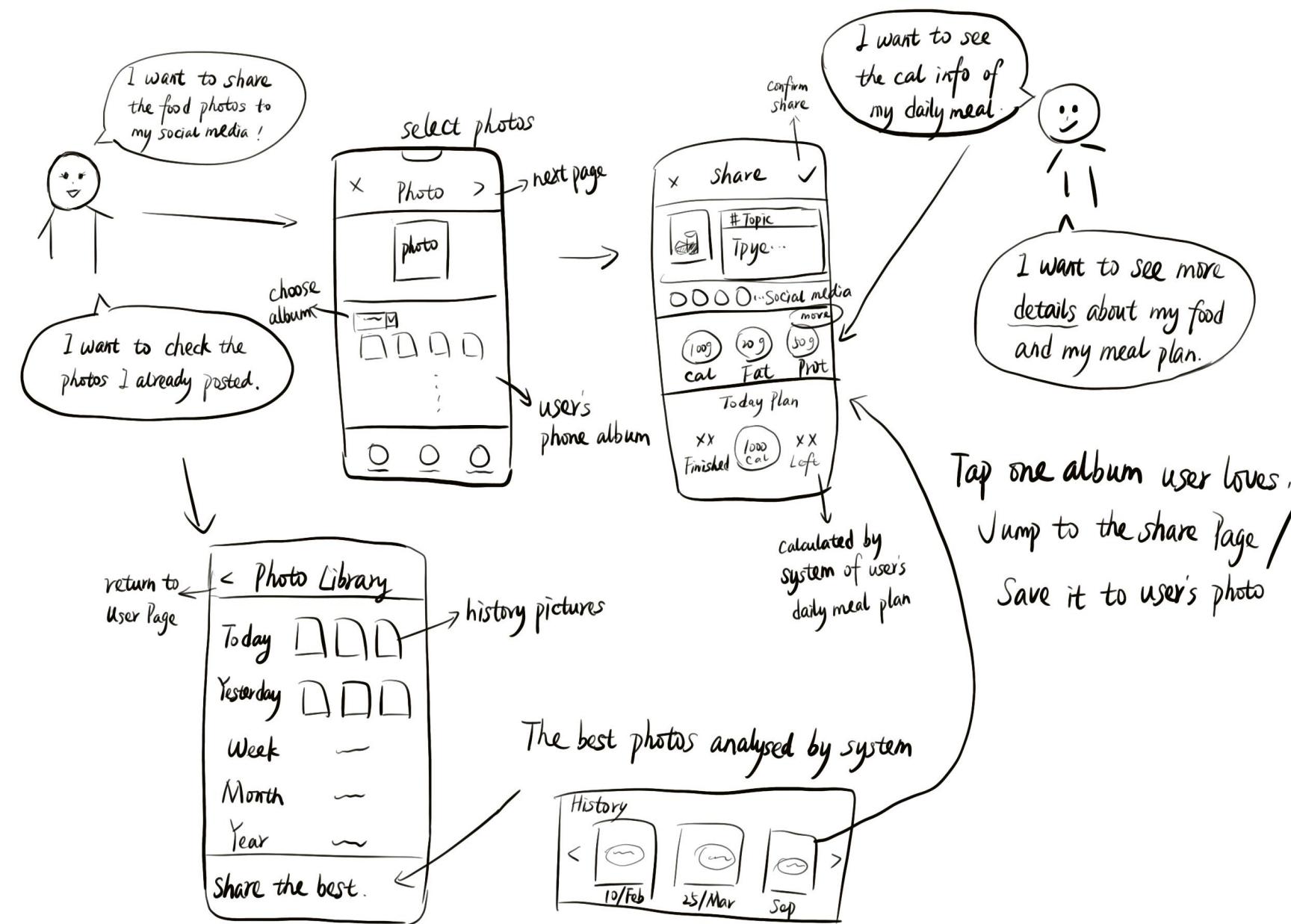


Sketches - Calories Calculation



When it comes to automatic calorie calculation, the first thing that comes to mind is photo analysis, which can be achieved by the machine learning from a large number of samples. The user takes a picture of their meal, or they can select an existing photo from their album. The system immediately calculates the calories of the food and displays them directly on the picture. Users can also check previous records in this system, as this data will be stored for a long time.

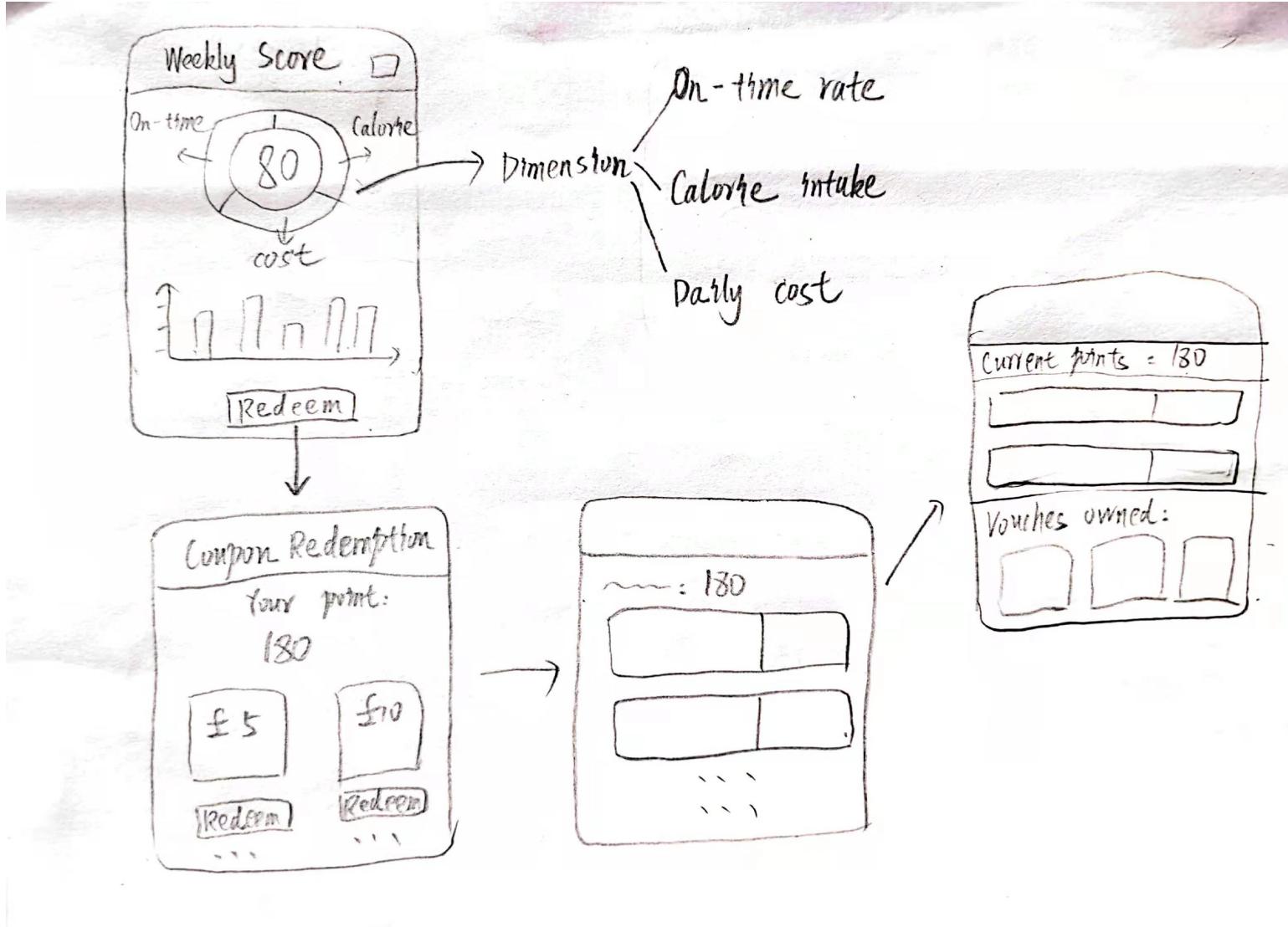
Sketches - Social Sharing



Social sharing can motivate users to maintain a good diet habit. After users checked their daily calorie/nutrition information, system will provide sharing function for users to share their meal photos on social media.

Users can view all their previously captured photos from the photo gallery page and select some of their favourite best albums from them. The system will analyse the construction of the photos and provide users with some beautiful albums for easy sharing or saving.

Sketches - Weekly Score & Coupon Redemption



The system will automatically provide the user with a weekly score to summarise their diet for the week. The score will be based on a number of dimensions from user's diet habit.

It is not easy to maintain a good score (eating habit) for a long time, and to motivate users we have likewise designed a coupons / vouchers redemption function.

Lo-Fi Prototype

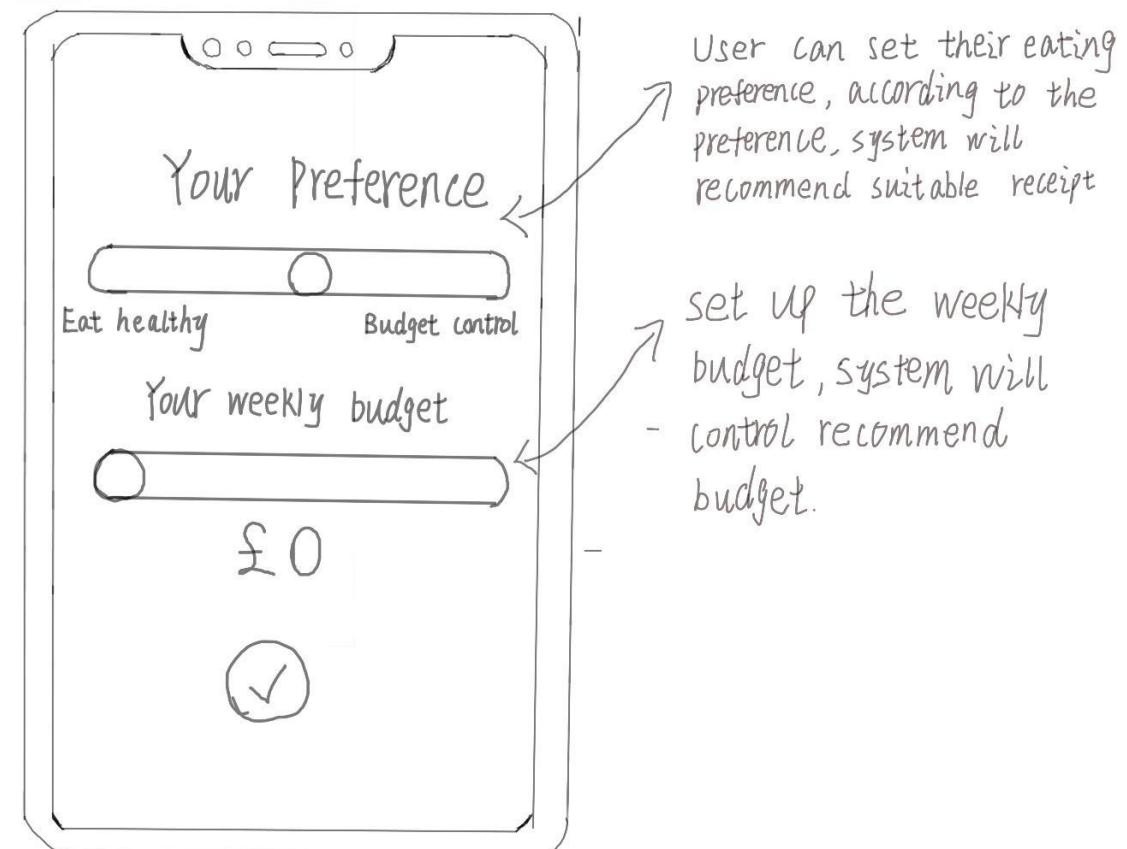
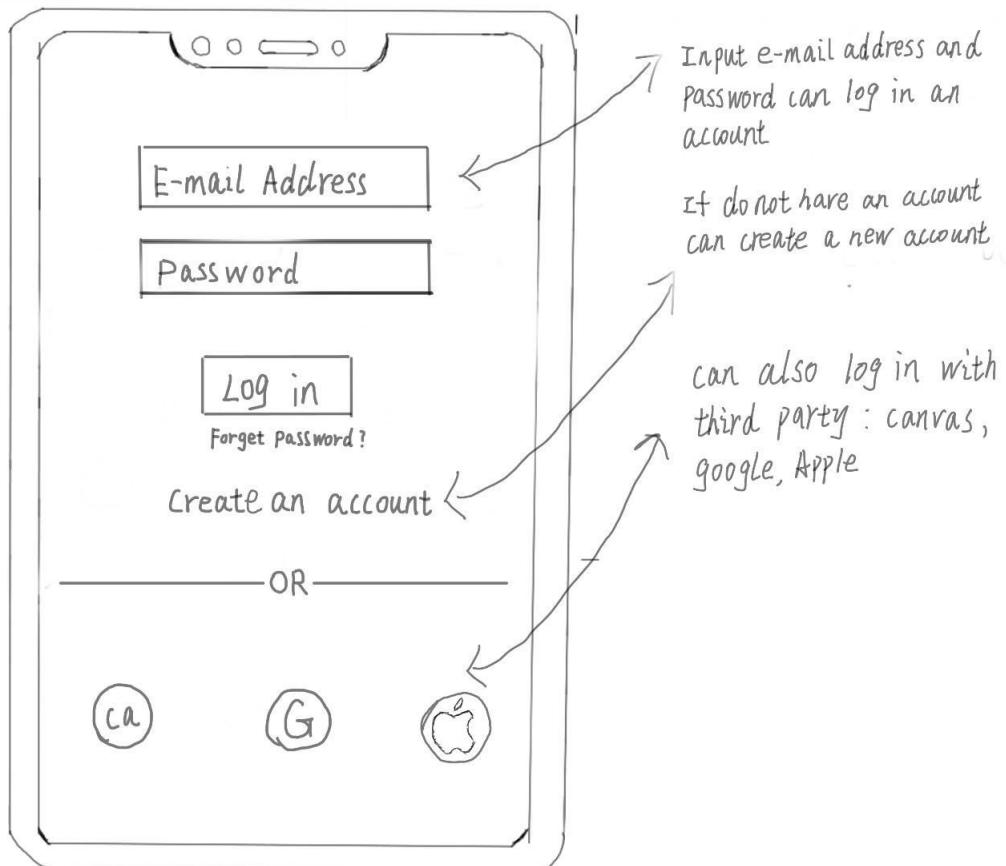
We decided to hand-draw the lo-fi prototype, because it allowed us to verify the design more quickly and we can switch the design immediately if the solution does not match the user's needs.

We chose sketches that were closer to the requirements gathered from the questionnaires and interviews for our lo-fi prototyping.

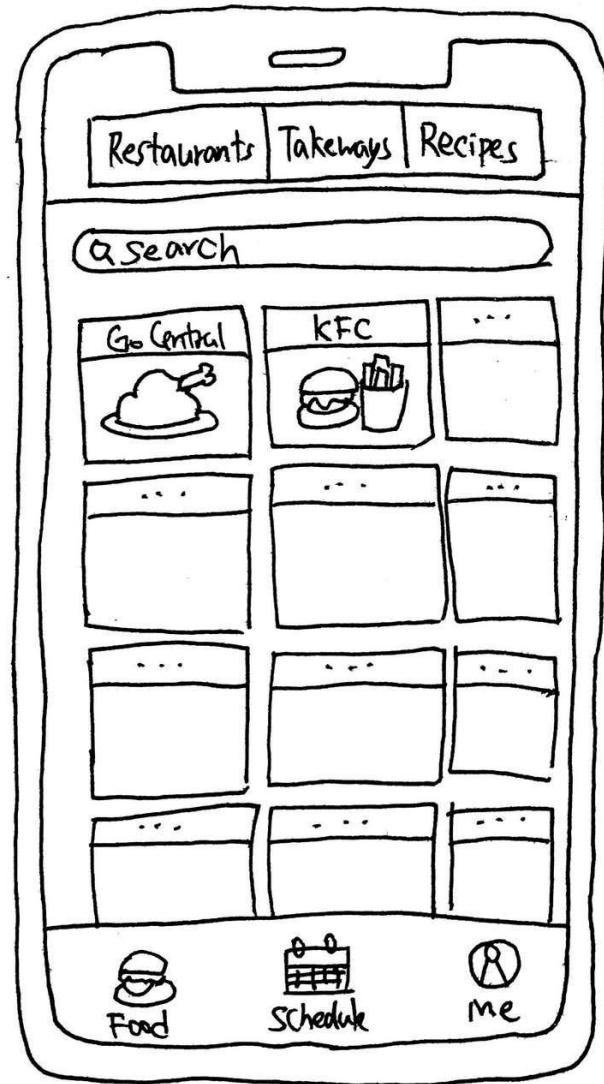
In this section we will give you details of the functionality for each prototype and then in the next section we will show you the user evaluation of these prototypes.

Welcome Page

On the welcome screen users will be able to select their preferred login methods to connect with an existing schedule system (Canvas, Google Calendar). The system will fetch the connected schedule system and remind the user to eat at the appropriate time. The welcome page will also ask users to select their dietary preferences (healthy eating or budget control) and weekly budget. This information will be saved and the system will recommend relative restaurants or receipts based on the user's preferences.



Restaurants Recommendation



Recommend restaurants or recipes options that are healthy or inexpensive.

User can search the result.

Restaurants are presented in card format to give users a quick overview of the flavours of the food.

There are three buttons at the top of this page, respectively are Restaurants, Takeaways and Recipes. The restaurants recommendation page will provide wide range of restaurants options for users.

The system will suggest restaurants that match the user's preferences (e.g. low-budget or healthy needs). The preferences are based on the information entered in the previous step.

The restaurants are arranged in a card format, which has the advantage of giving the user a quick overview of the restaurant style.

Users can also search for the food they are looking for to get the appropriate results.

Recipes Recommendation



- When user selected Recipes button.
- Search the results
- Different categories of recipes.
- Show more results.

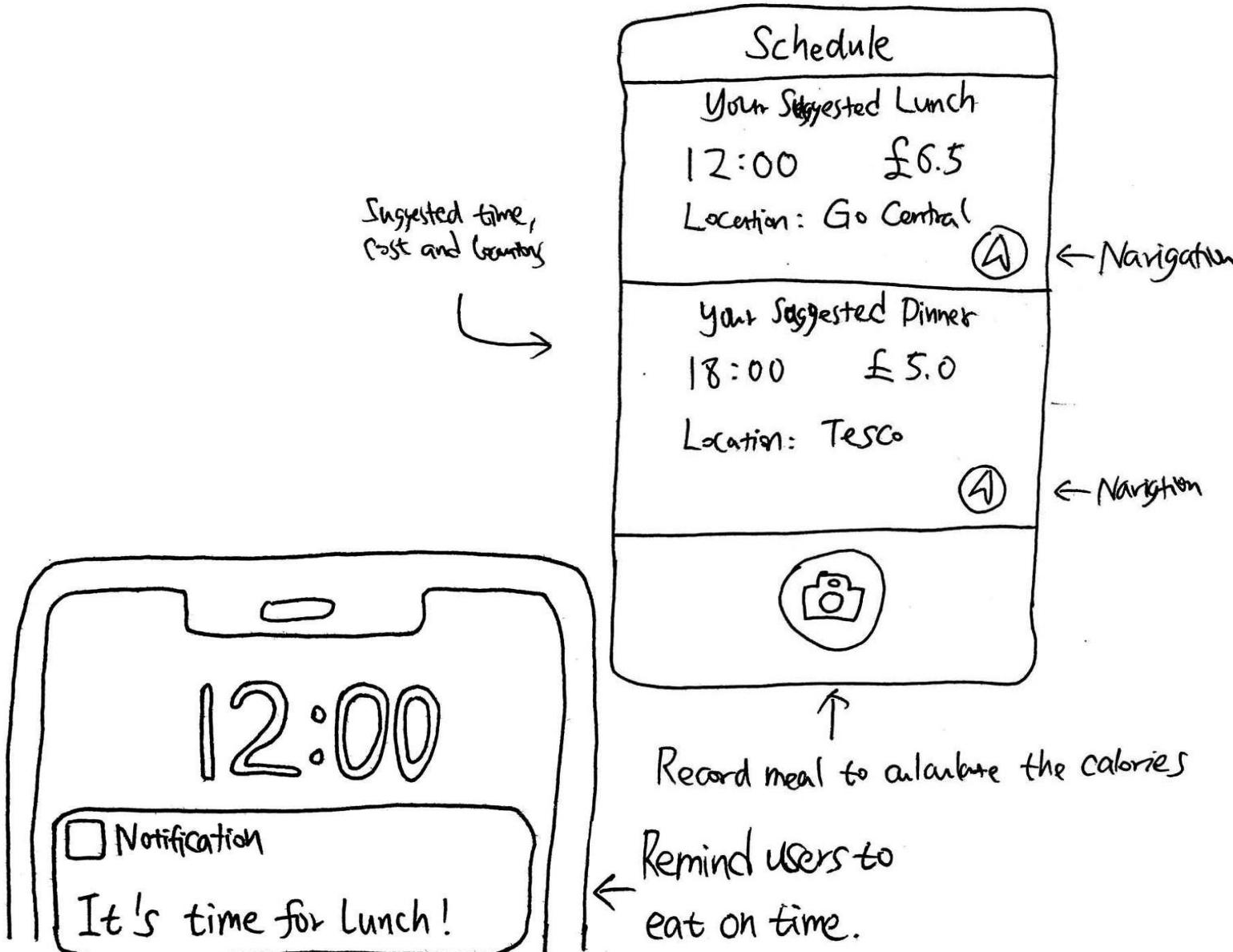
When the users tap on the recipe button, the system will display different categories of recipes, such as healthy recipes or cheap recipes.

Some popular recipes are displayed under different categories and then more recipes are collapsed. When the user is interested in a category they can tap "show more" button to expand it.

The users can tap on the corresponding recipe to see the detailed ingredients and preparation instructions.

Under this page users can also search for recipes they are interested in.

Notification & Meal Planning



The system will notify the user when it is time for the suggested meal. The suggested meal plans include specific times, locations (cooking at home or eating out) and navigation features.

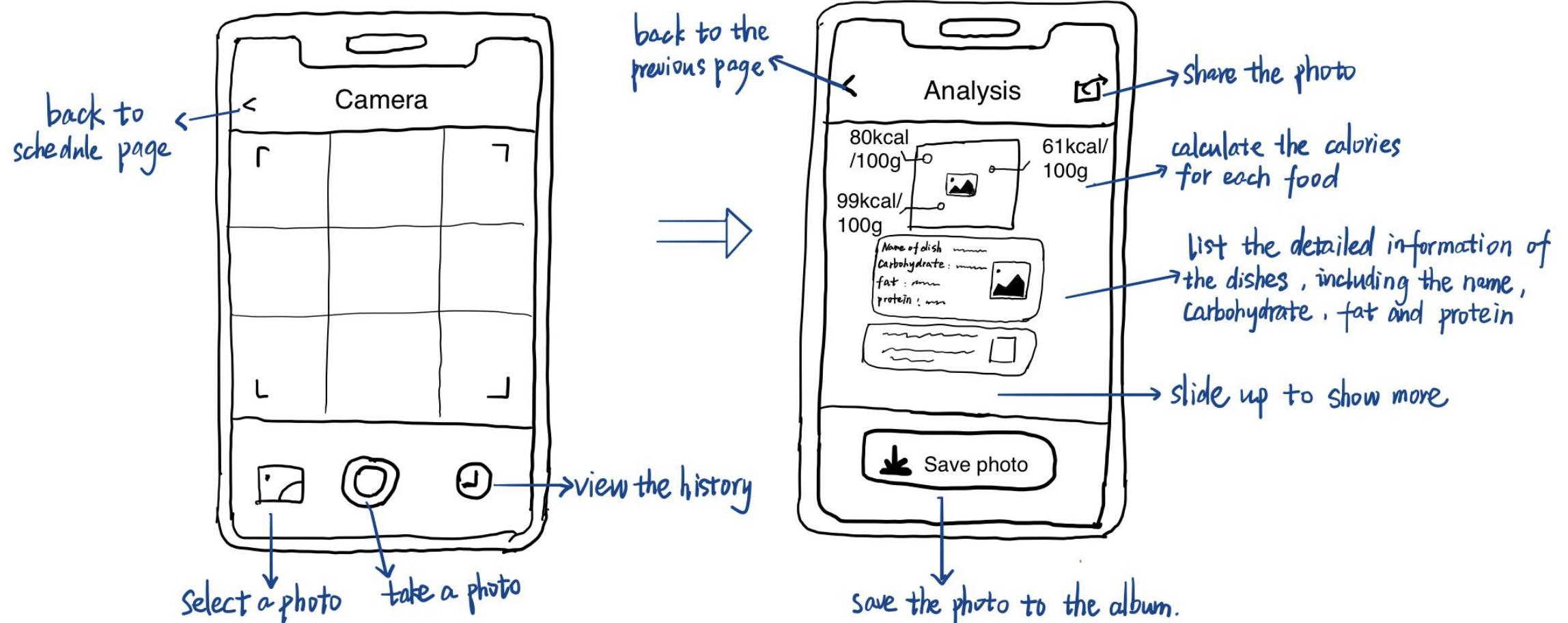
The Suggested time is based on the schedule system connected by the user (Canvas or Google Calendar).

The probability of recommending cooking at home or eating out is dependent on the user's weekly budget and the system will schedule it according to the gaps in the schedule.

When the user gets their food they can take a photo of the food. The calories will be automatically calculated after the picture is taken

Calories Analysis

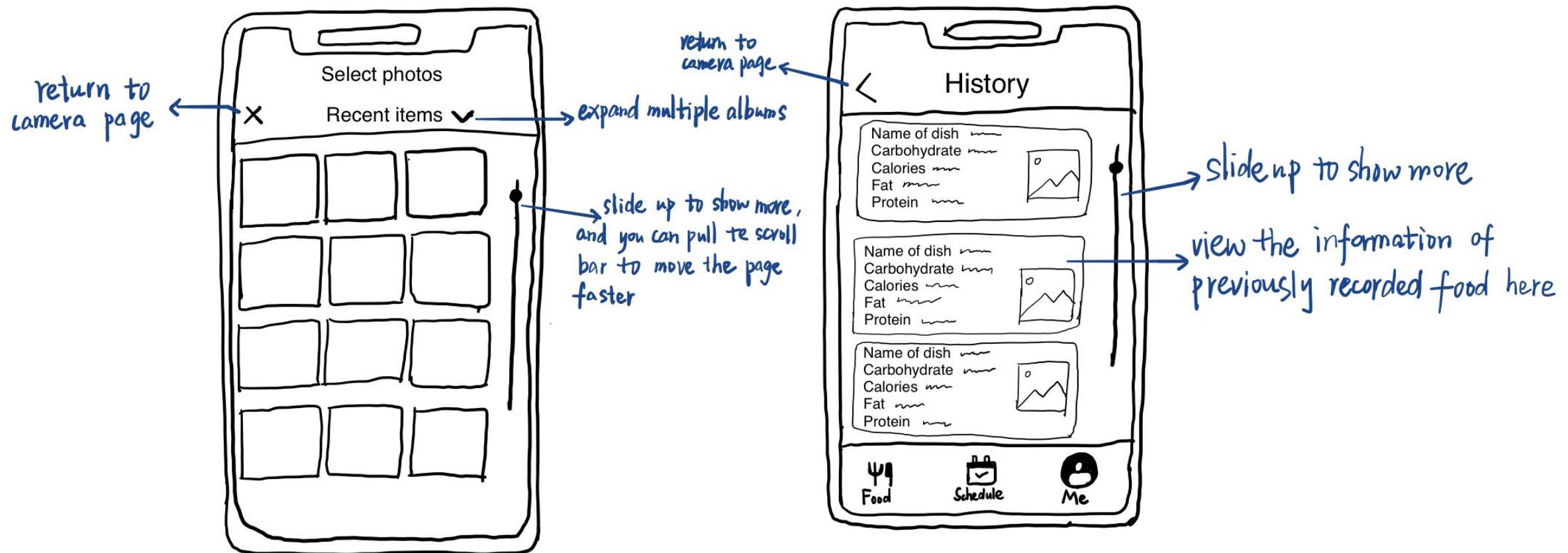
When the users tap the camera button, they will be taken to the photo page which will be able to record every meal they have actually eaten. Users can choose to take a photo or select an existing photo from their album. When a photo is taken or selected, the system will scan the photo and analyse it automatically. Calories will be displayed directly next to the dishes, which is a very user-friendly function for those who want to control their weight.



Select Existing Photos & History

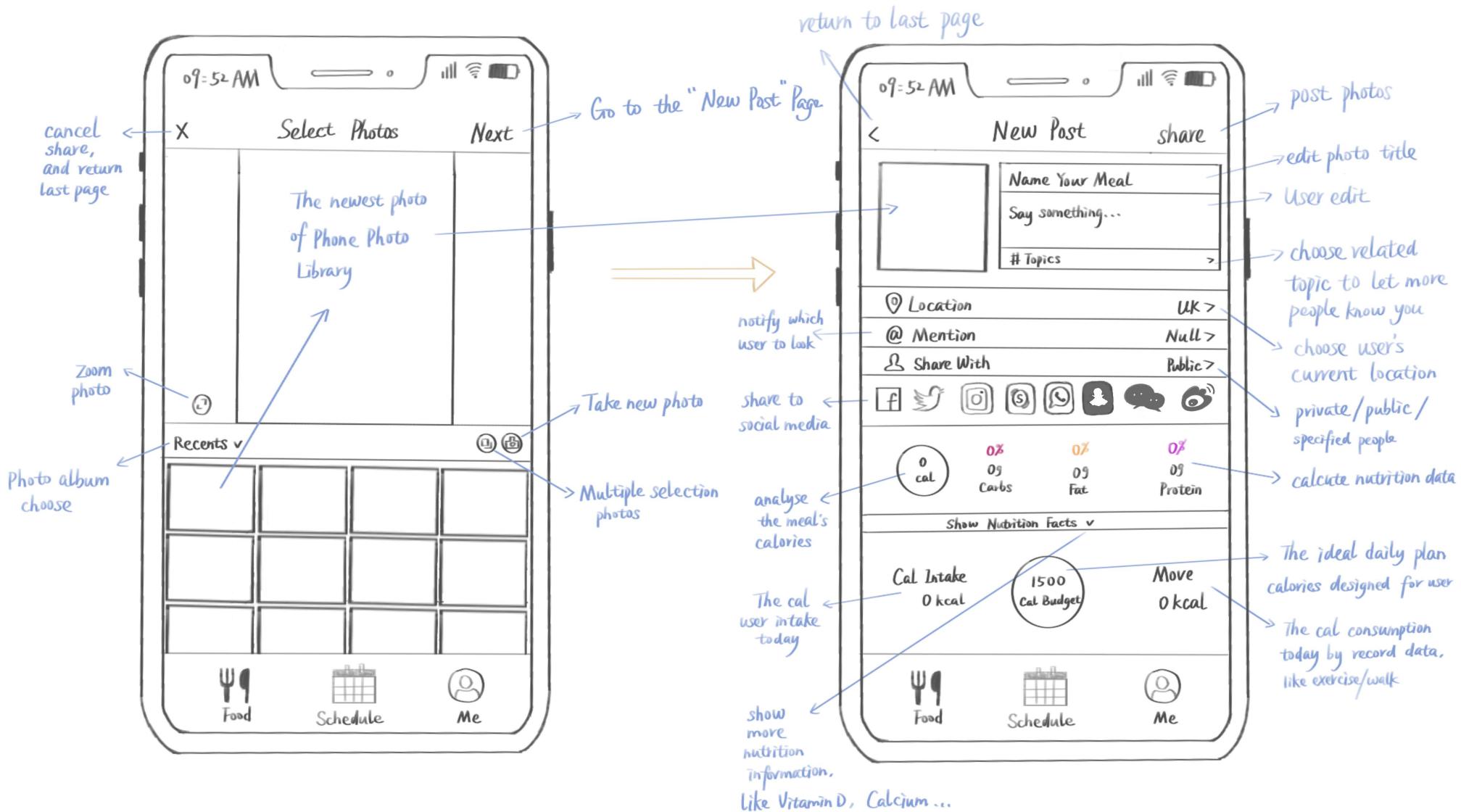
The photo selection feature is designed to help users upload existing photos in order to analyse the calories and other information, as sometimes users do not always open the app to record them in time, and this feature is a supplementary method. The "Select Photo" page seems to be the native phone album, allowing users to easily select different albums from their phone.

The history page helps users find details of recently recorded dishes, including dish name, carbohydrates, calories, fat, protein, and thumbnails of their meals. The system will record these data into user daily calorie plan to help them manage their healthy meal plan easily.



Select Photo & Share

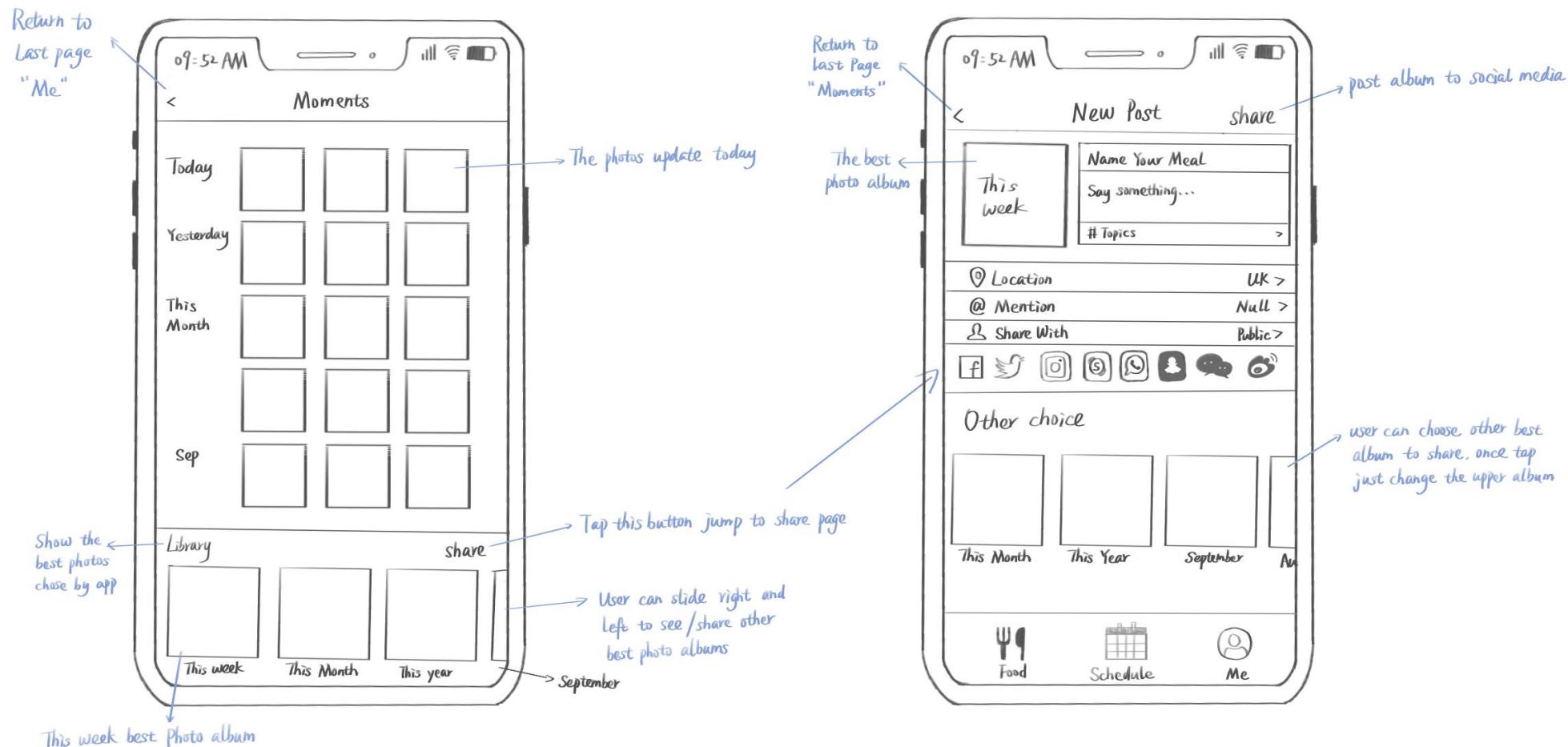
Supporting users with social sharing is a very important encouraging feedback strategy. Users can choose to share their photos to different social media platforms, mention people who will see it and set share people groups(private / public).



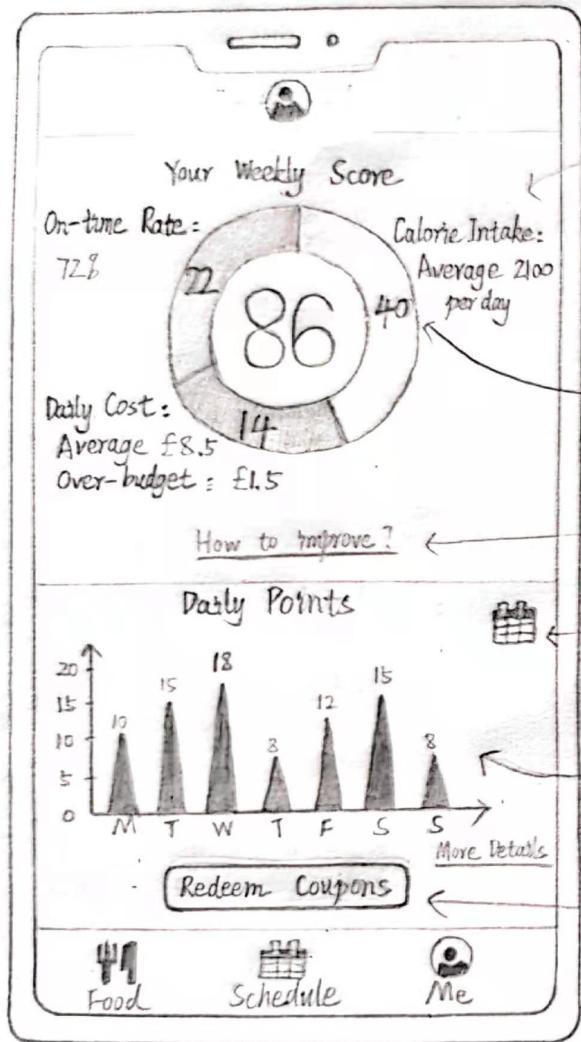
Moments & Social Sharing

The system will record all the photos uploaded by the users and automatically select the best ones from the users' database to create some albums for users to review all the food they had eaten (weekly, monthly, and annually). The best photo albums can be analysed by the system or selected by the user from the photo library, and these photos will be selected for a special album named by the users. Users can easily review and share all the photos and albums they have uploaded to the app.

The second one is kind of similar with the former slide for users to share their photos quickly. If users choose the album from photo library, the "New Post" page will be different from the former. User can choose other best album to replace this one quickly.



Weekly Score



Weekly scores are calculated based on the user's eating behaviour, including on-time meal rates, calorie intake, daily cost, etc.

Users can see the score of each item

If user taps here, a suggestion section will pop up on the screen.

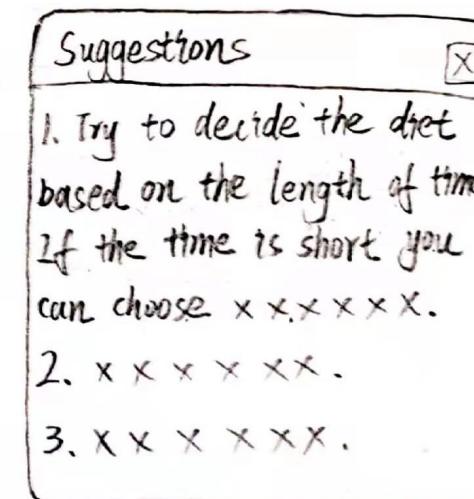
Calendar button allows the user to check previous scores.

This chart allows the users to see the daily scores.

If the user clicks on this button, the screen will switch to the coupon page.

On this page, users can check their weekly score, as well as three components, namely on-time meal rate, calorie intake and daily spend. The score for each component is also displayed, along with relevant data (e.g. average daily spend, whether you overspent), based on the user's eating habits over the last week.

By tapping "How to improve?" button, the user can also see the targeted advice provided, which is displayed in a separate pop-up window.



In addition to this, users can also check what their daily score is, as well as their score for any previous week.

At the bottom of the page, there is a button for coupons & voucher redemption page.

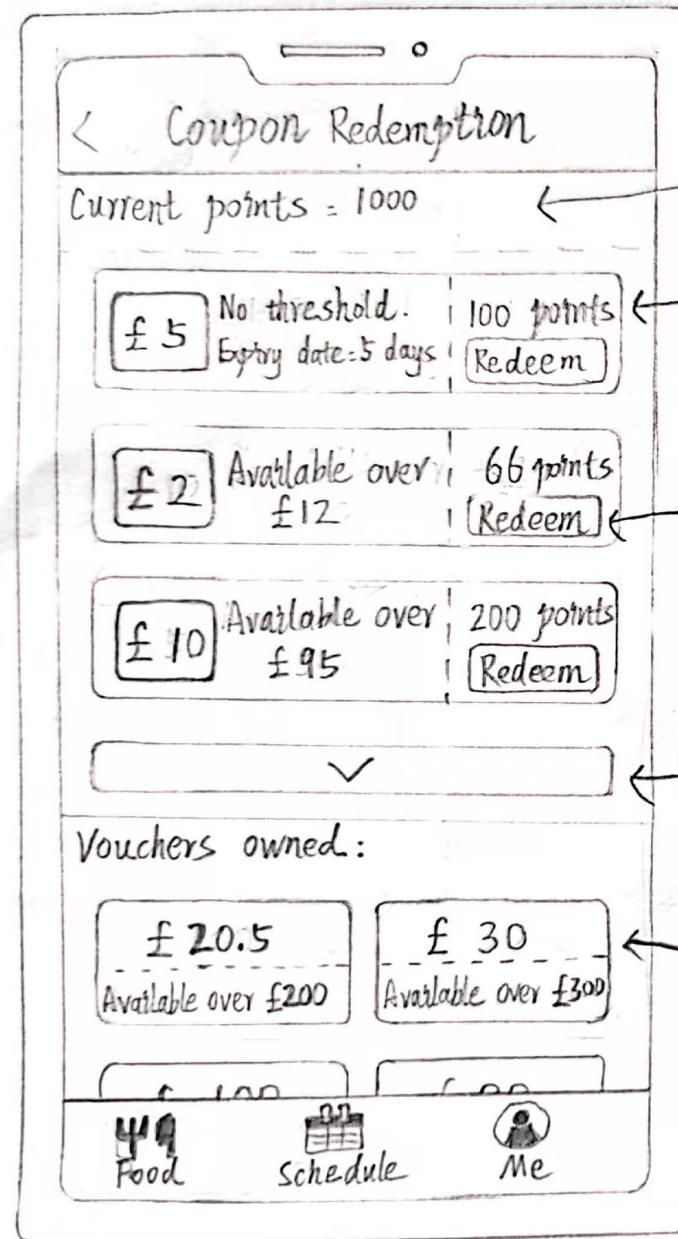
Coupon Redemption

Once on the voucher redemption screen, the first thing users will see is the accumulated points the user currently has, and below that are the various types of vouchers, each of which will have a redemption button on the right hand side, and the points spent.

If the user wants to see more coupons, they can click on the drop down button.

At the bottom of the screen, users can also find information on the coupons they have purchased and can still use.

Click on the arrow in the top left corner to return to the previous page.



Here, user can see the points they already have.

This section shows the vouchers that can be redeemed, including the amount, points, usage requirements, etc.

Click here to redeem this voucher if the points meet the requirements.

If the user click on the drop down button, you can see more coupons.

Here user can see the coupons that they already have and have not used.

Evaluation

The evaluation process was carried out throughout our design process. We used different methods to try and get feedback from users, and we carried out a number of evaluations during the project to ensure that our design solutions met the needs of the users.

We proposed different evaluation methods for different functions, in most cases we arranged a user group and let users go through our prototype, explaining to them after each step what the next step would be. At the same time, we observed how the users were using it to see where they got stuck. After the users had done all their actions, we interviewed them to get their feedback and suggestions. Functional suggestions given by the users were recorded but not accepted directly, instead a questionnaire was conducted to all participants in order to get the widely accepted functionality.

Evaluation - Welcome Page

The welcome page is a relatively simple and straightforward page, and users have no questions under this page. In the post-event interviews, some users expressed that they would like the app to offer a feature to set goals so that they can set a healthy goal and monitor the achievement of their goals. We recorded this suggestion and surveyed all 9 participants in our test group and most of them accepted this idea, so the feature was eventually implemented. We added a personal information page to record the user's goals (weight loss, weight maintenance and weight gain) and another page to record physical information, including gender, height and weight. It will be combined with a points reward feature to encourage users to achieve their goals.

←

What is your goal?

Lose Weight

Maintain Weight

Gain Weight

→

← Skip

Sex

Male Female

How tall are you?

178 cm

How much do you weight?

61 kg

What's your goal weight?

65 kg

✓

Function	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied
With Personal Info Collect	0	0	2	7
Without Personal Info Collect	0	8	1	0

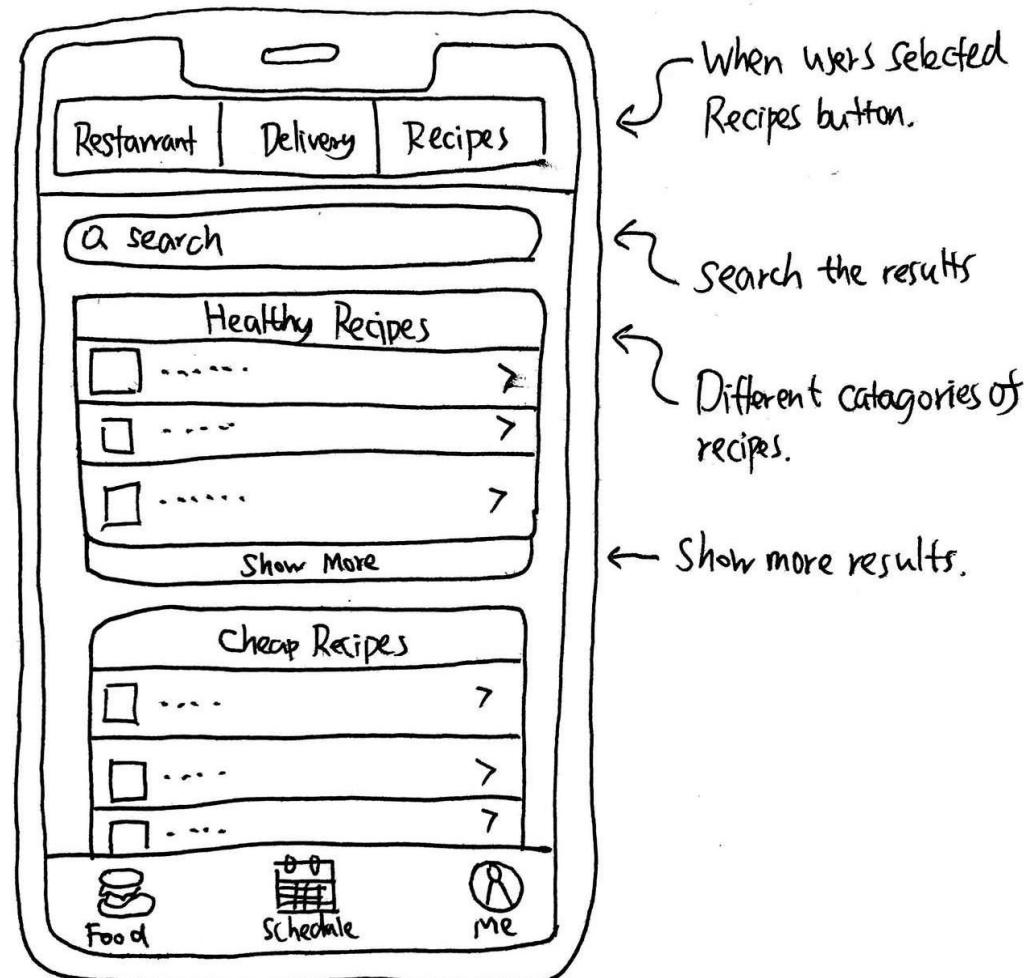
Survey Results of Personal Infomation (Goal) Function

Evaluation - Restaurants & Recipes

The restaurant and recipe recommendation pages are very easy to understand for the user. This comes from our pre-survey of competing products. Users were not confused by these pages, but also raised some new suggestions, such as the lack of sorting of restaurants and the lack of a way to bookmark their favourite results. As these suggestions do not interfere with the core functionality and do not affect the interaction of this interface, they were accepted straight away after a brief discussion among our group members.



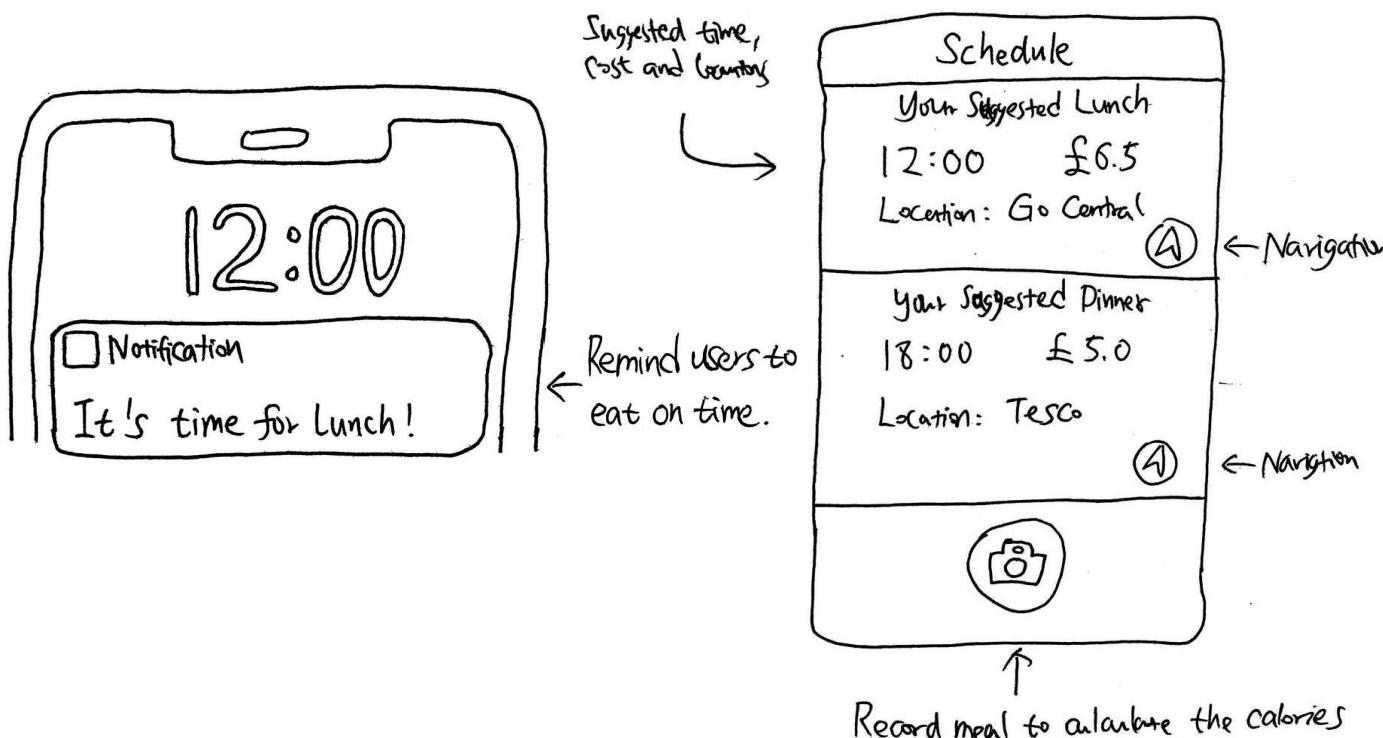
- Recommend restaurants or recipes options that are healthy or inexpensive.
- User can search the result.
- Restaurants are presented in card format to give users a quick overview of the flavours of the food.



- When user selected Recipes button.
- Search the results
- Different categories of recipes.
- Show more results.

Evaluation - Meal Planning

When we demonstrated this page to our users, they first did not quite understand what the page was for. When we briefly explained it, the users quickly understood what it meant. After that the process was very smooth. They were also curious about how these schedules were generated and whether they could choose their preferred restaurants in their budget range. Some users also noticed that we only showed the plan for current day and they wanted to know the meal plan for each day of the month. Two of our users also expressed their frustration with lunch choices and would love to use our app if we have a feature that allows them to randomise their lunch plan (similar to Google's "I'm feeling lucky" function). In response to these two suggestions we also conducted a user survey. We believe that it is possible to add random restaurants as long as the plan adheres to the user's pre-defined goals. As most all users would like to have some customization options, we will also allow users to adjust their plans and will design the calendar feature so that users can view their meal plans for each day of the month in our next iteration.



Function	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied
With Calendar	0	0	5	4
Without Calendar	4	4	1	0
With Randomization	0	0	0	9
Without Randomization	2	4	3	0

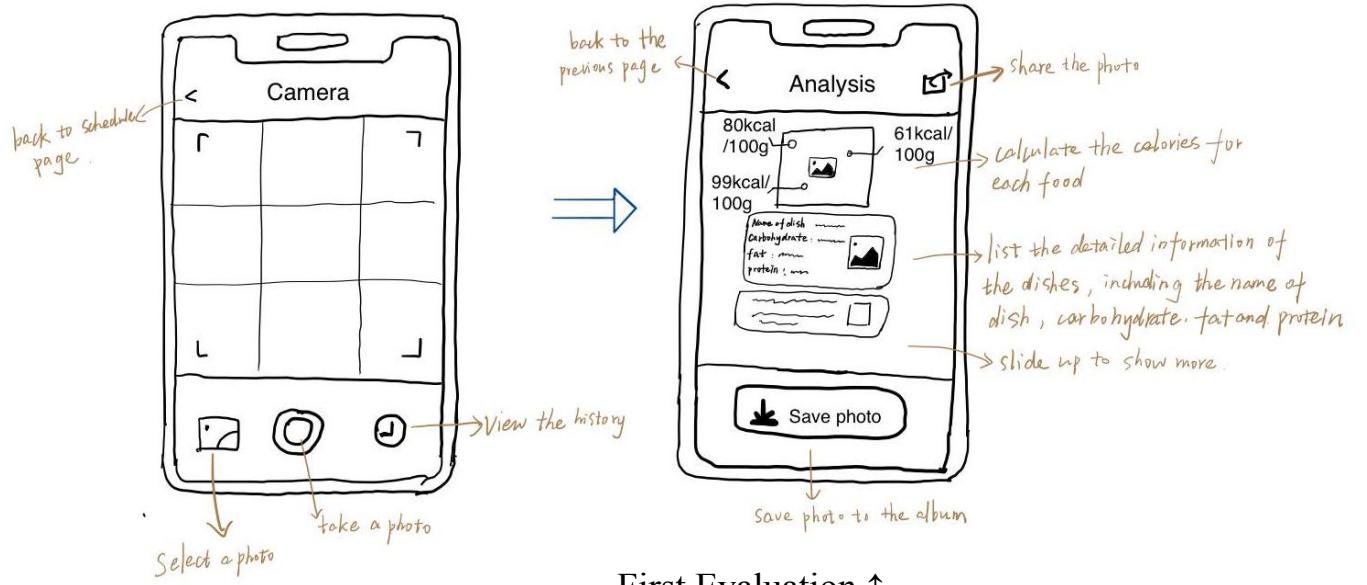
Survey Results of Calendar & Randomization Function

Evaluation - Food Analysis

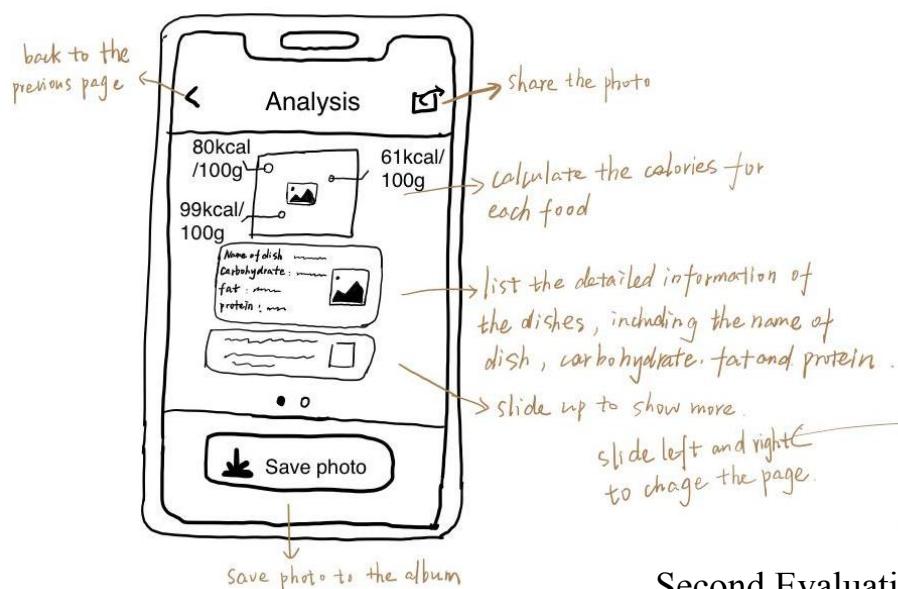
Almost all users really like this feature of the automatic calorie calculation by taking photos, especially for those who have their own calorie logging needs, which saves a lot of time.

During the evaluation process we realised how much users appreciated this feature, so we decided to enrich it by adding more detailed information (fat, protein & carbohydrates) and also some dietary advice to the calorie calculation, so that users could scan the picture to get more information and see if there was anything they could do to improve their meal.

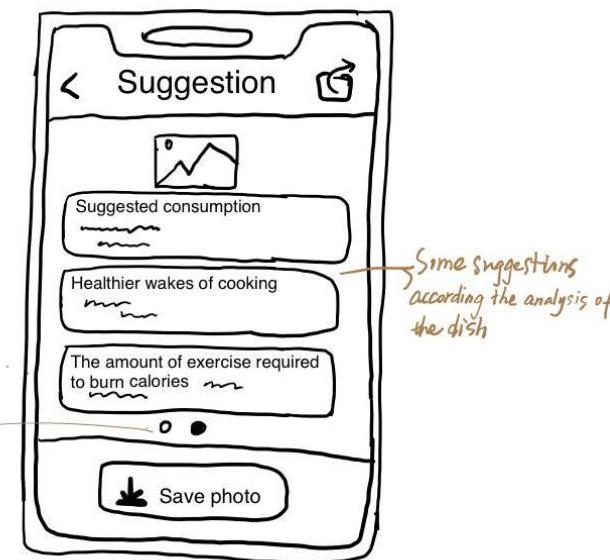
This food analysis function was evaluated a total of two times and after the second presentation to the users, it was very well accepted.



First Evaluation ↑



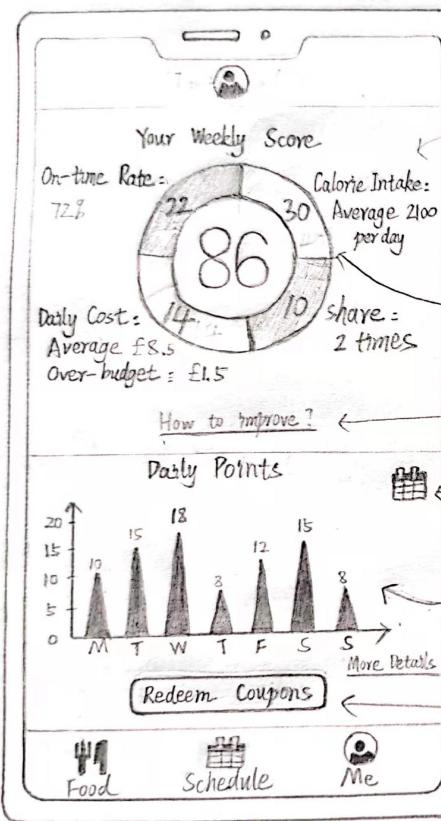
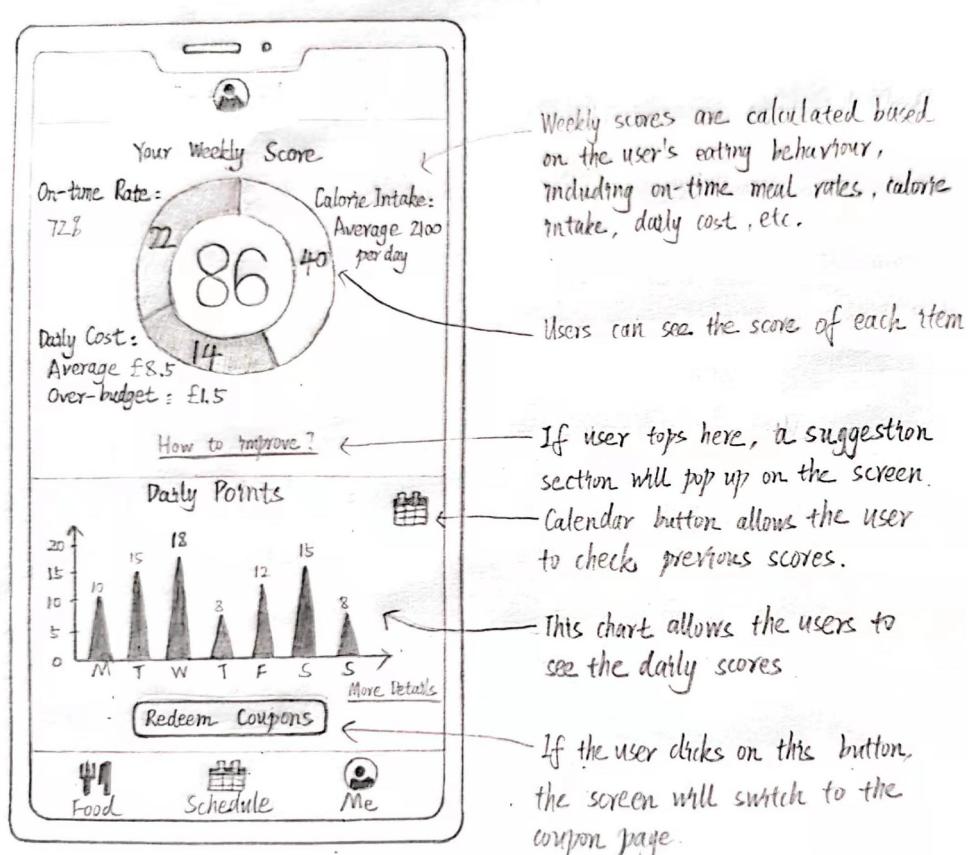
Second Evaluation ↑



Evaluation - Scores & Coupons

Users had no lags or queries with this page and were surprised and pleased with the weekly scoring and vouchers redemption feature. These are certainly very attractive functions for users, as it allows them to eat healthily, regularly and save more money at the same time. This, of course, coincided with our original intention in designing the software. However, they also made some suggestions about the components of our points, they wanted more ways to earn points and we came up with the idea that we could encourage users to share and earn extra points, which is an important positive feedback for the users and also for us to gain exposure. Any key features need to be carefully designed and validated, we also conducted a survey on this idea and it proved to be the right one.

The more times users share, the more points they earn, but there is a limit, for example, to a maximum of three shares a day. We believe this will give users greater motivation and also allow them to share to more potential users.



Function	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied
With Social Share to Earn Extra Points	0	1	4	4
Without Social Share to Earn Extra Points	1	5	3	0

Survey Results of Social Share to Get Bonus

Evaluation - Social Sharing

Social sharing is a very important feature, it is the source of an encouraging feedback for our users, it gives them a sense of achievement when their friends see their food sharing and high scores, it also gives them extra points for sharing themselves. We therefore evaluated this social sharing feature very carefully.

The social sharing feature was evaluated twice. In the first evaluation we realised that direct sharing of photos could be problematic, as sometimes the real-time colour temperature could not be automatically adjusted by the camera according to the surroundings. Adjusting lightness value of photos will be essential for users in dim surroundings. Therefore as currently designed, the photo parameters cannot be adjusted and would be shared directly on social platforms. However, it occurred to us that we could just save the photos and then let users edit them in their own photo beautification app, so which one is the better option? Should we provide a photo editing function?

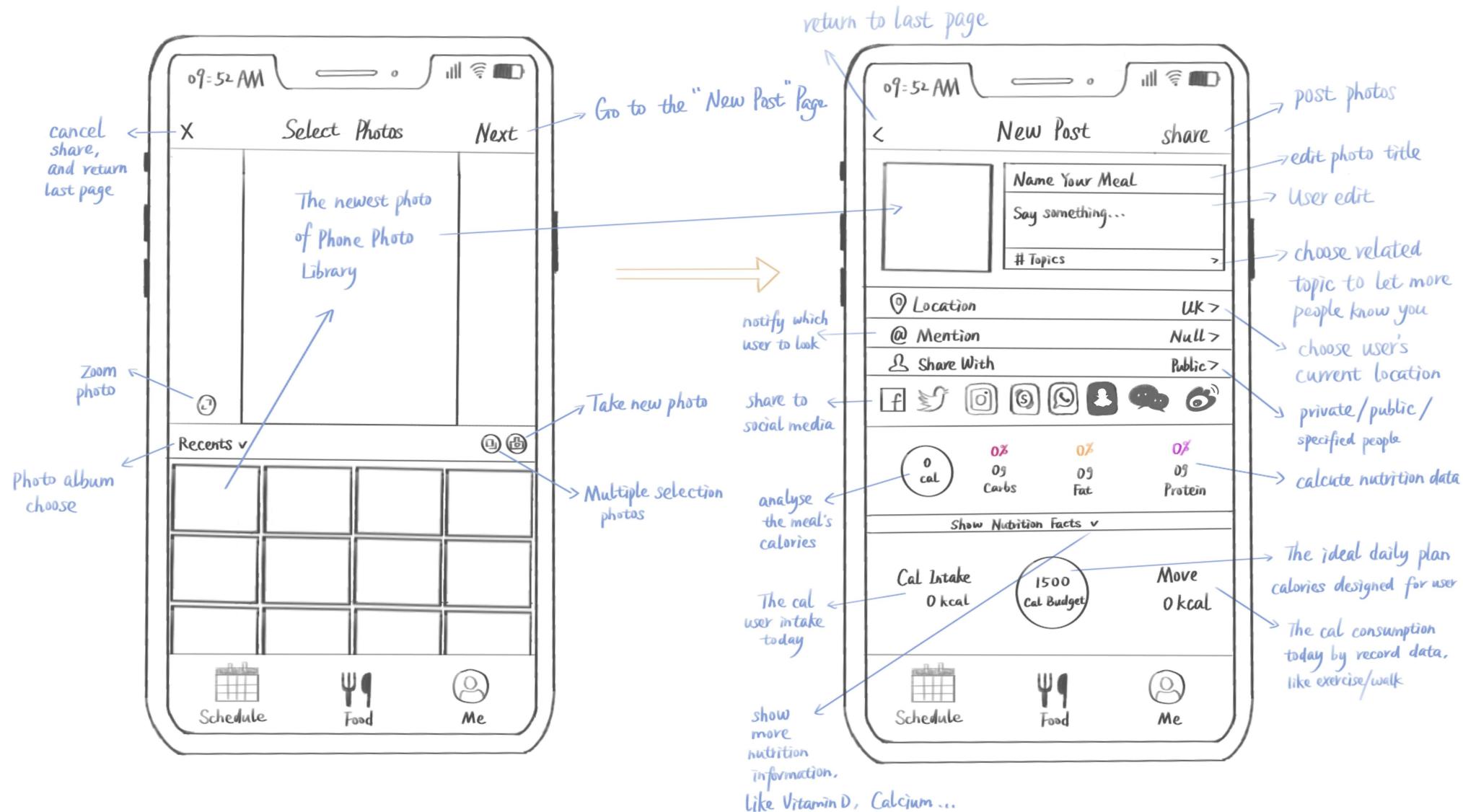
For the second evaluation we decided to use an A/B Test to confirm whether we wanted to add a photo editing function in order to get user feedback on the photo sharing.

Two one-tailed hypotheses were devised based on this feature, which were: (1) Users will complete social sharing more enjoyably when using the new design (with photo editing) compared to the old one. (2) Users will complete social sharing more enjoyably when using the old design (without photo editing) compared to the new one.

We designed a simple task to test our hypothesis: share a photo from our system to social platform. As it is difficult to avoid bias caused by individuals when using a between-subjects design, here we have used a within-subjects design to implement our task.

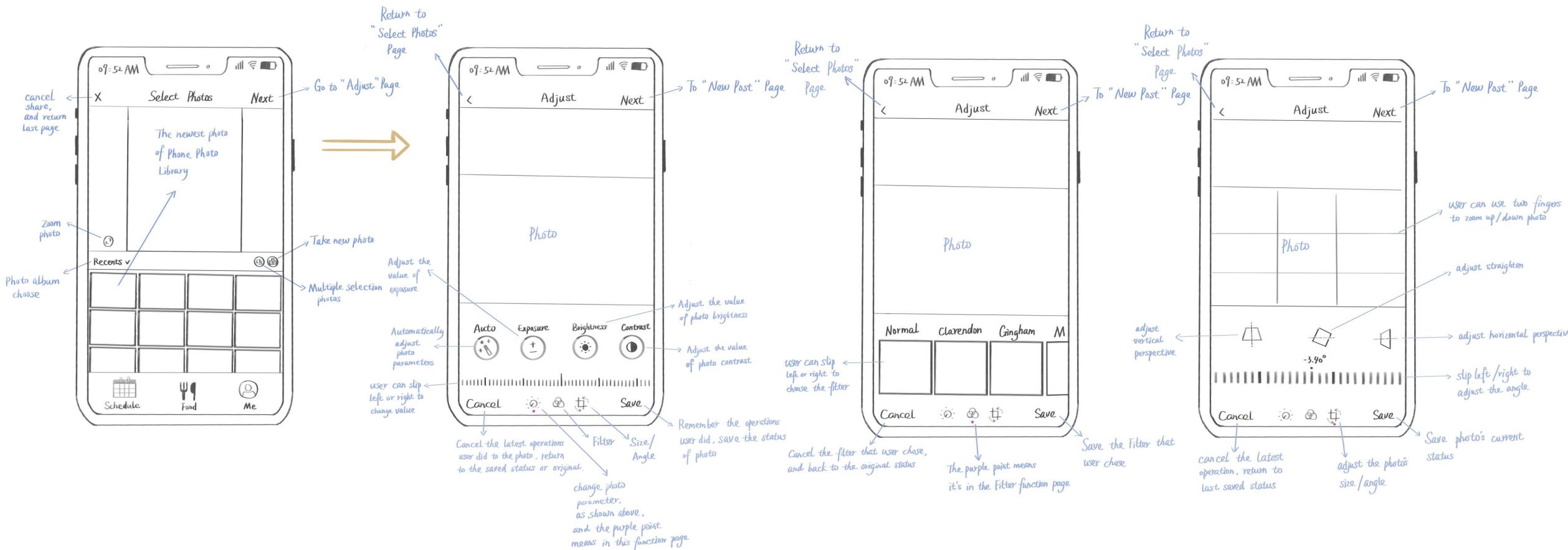
Evaluation - A/B TEST

A: Users select photos, edit them in their own photo beautification app and upload them to the system for social sharing.



Evaluation - A/B TEST

B: After choosing photo, it will add an edit page for users to adjust the photo. In this page, user can adjust photo parameters, add filters and change the size/angle.



A/B Test - Results

When we demonstrated the B type, all the participants chose this one. They thought it will be more thoughtful and useful for users to edit their photos instead of using their own beautification app. This will reduce the number of user actions.

The result shows that users prefer to have an edit photo function before sharing. Some users noticed that they cannot check the photos they already uploaded before from the share page. Therefore we decided to add an extra button in [Me] page, which will be shown in Hi-Fi prototype.

Designs	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied
New Interface	0	0	2	7
Old Interface	5	3	1	0

Survey Results of A/B Test

Accept / Reject	Hypothesis	Reasons
Accept	<p>Hypothesis 1: Users will complete social sharing more smoothly when using the new interface compared to the old one.</p>	<ul style="list-style-type: none"> 1. When the lighting is poor, users can adjust their photos before sharing them through an in-app feature. 2. The new interface is skippable, if the user does not need to adjust the photo
Reject	<p>Hypothesis 2: Users will complete social sharing more smoothly when using the old interface compared to the new one</p>	<ul style="list-style-type: none"> 1. Although users can save photos and then edit them using their own photo beautification app before sharing, this adds an extra step to switch apps.

Results of Hypothesis

Evaluation

- We designed A/B Test to get user's feedback about photo share module. After receiving a few feedback from our target users, it shows that users prefer to have an edit photo function before sharing.
- These respondents think having these edit functions, like adjusting photo parameters, changing filters or photo size means that they have more choice to beautify their meal pictures, because sometimes the color temperature in real time cannot automatically be adjusted by camera according to changes in surroundings. Adjusting lightness value of photos will be essential for users in dim surroundings.
- Some users noticed that they cannot check the photos they already uploaded before from the share page. So we believe it will be possible for users to check their photo library in the "New Post" page. Although we want to meet all the users need, the phone space is not big enough to put all the modules in one page. Therefore we designed two different share pages for users who come from different former pages to improve our system availability, which will be shown in Hi-Fi prototype.

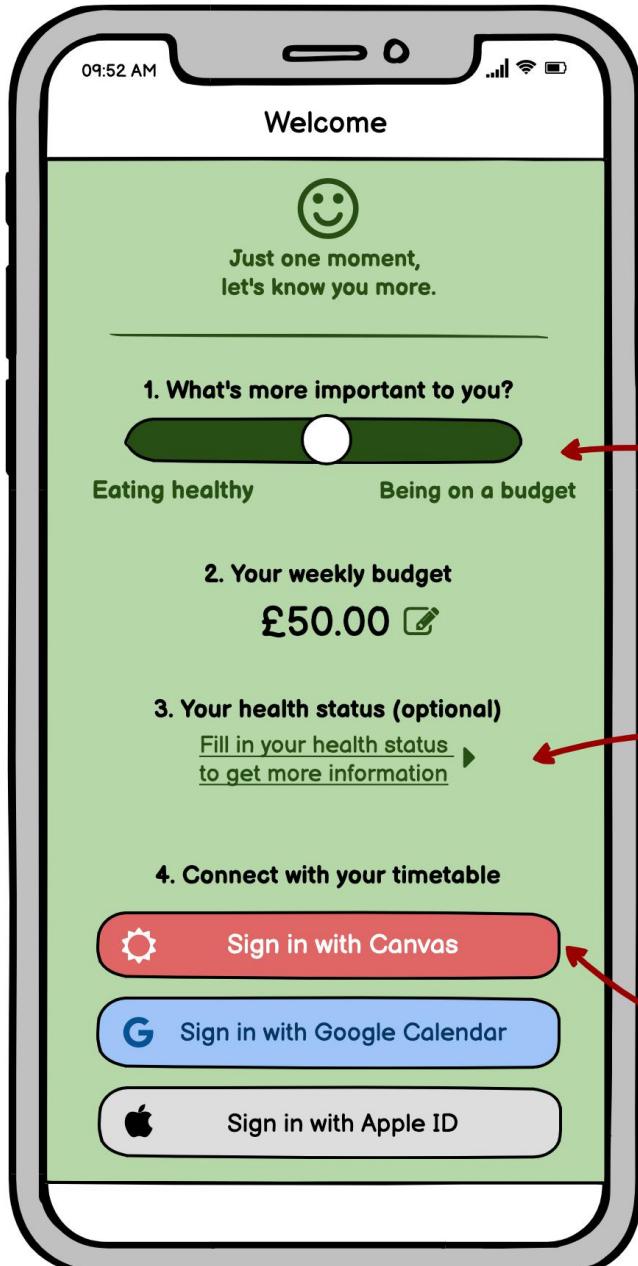
Hi-Fi Prototype

After many iterations of evaluation, our final design was widely accepted by users. Next we will present all the upgraded prototypes based on evaluation feedback.

Each wireframe diagram will be described in detail and you will find out more about each features of our products on the following pages.

Based on all the tasks we have done so far, you will gradually understand how our system has been improved and upgraded step by step to where they are now.

Hi-Fi Prototype - Welcome Page



This page will be displayed when the users open the app in the first time. This page is used to collect the user's dietary preferences and basic information. These information will be used to make dietary recommendations and will be connected with existing scheduling systems (e.g. Canvas, Google Calendar etc.)

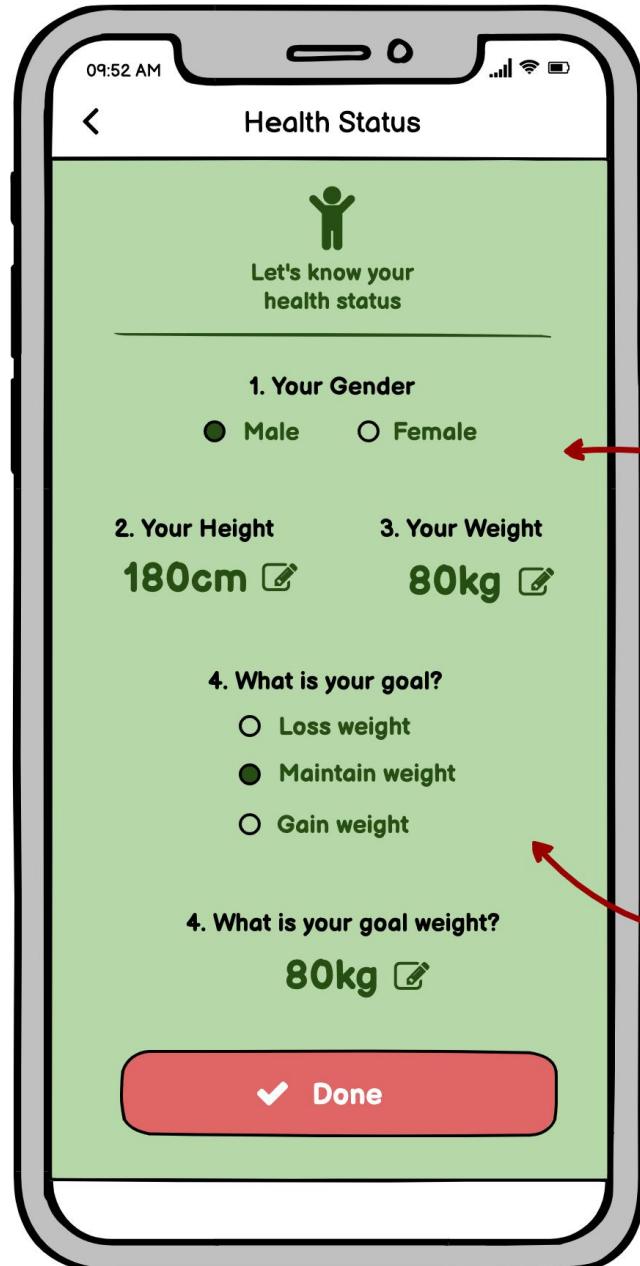
Based on the results of previous evaluation, we have added optional health information for users to fill in, and users can also earn additional rewards based on their actual diet each week.

Meal planning and recipe recommendations will be based on your preferences and weekly budget.

It will take you to the [Health Status page](#) where you can enter your health information for more accurate weekly statistics and extra bonus.

Suggested meal time will be based on your connected schedule system.

Hi-Fi Prototype - Health Status



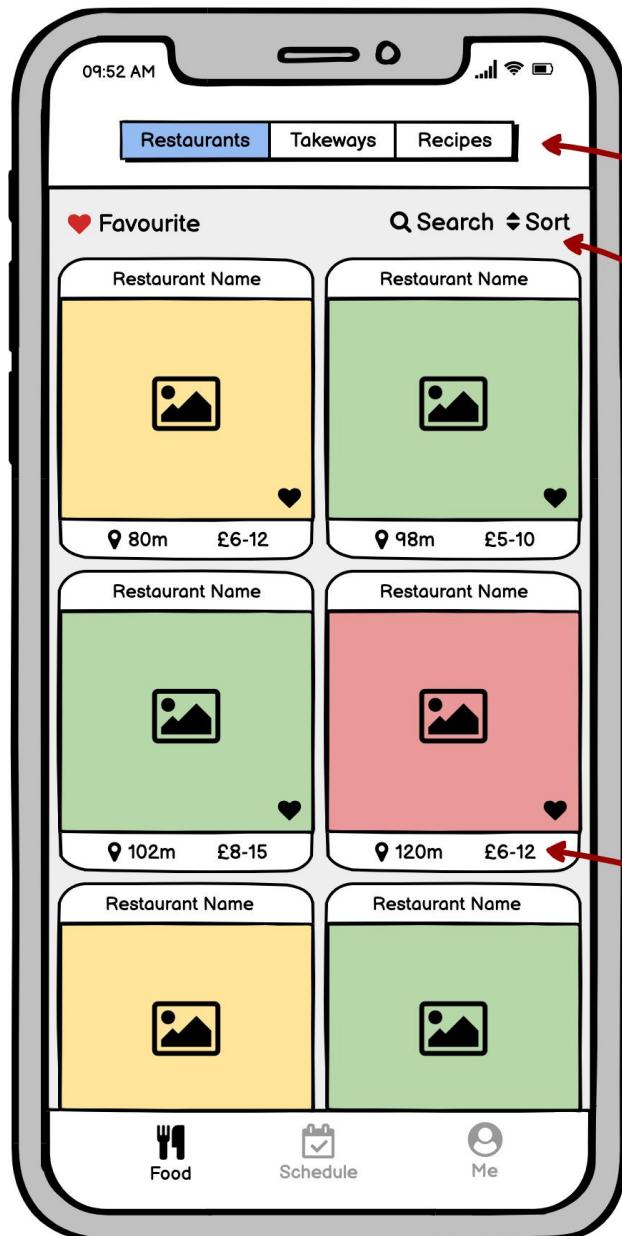
The health status page is optional for users. Users can fill in it to obtain a more accurate meal plan.

In addition the system will also compare the user's actual daily meal with their goals and give appropriate advice in the weekly statistics.

The health information entered will be used in the system to recommend more accurate meal plans.

The goal information entered will be counted in the weekly statistics and reward points will be given based on the actual meals eaten.

Hi-Fi Prototype - Restaurant Recommendations



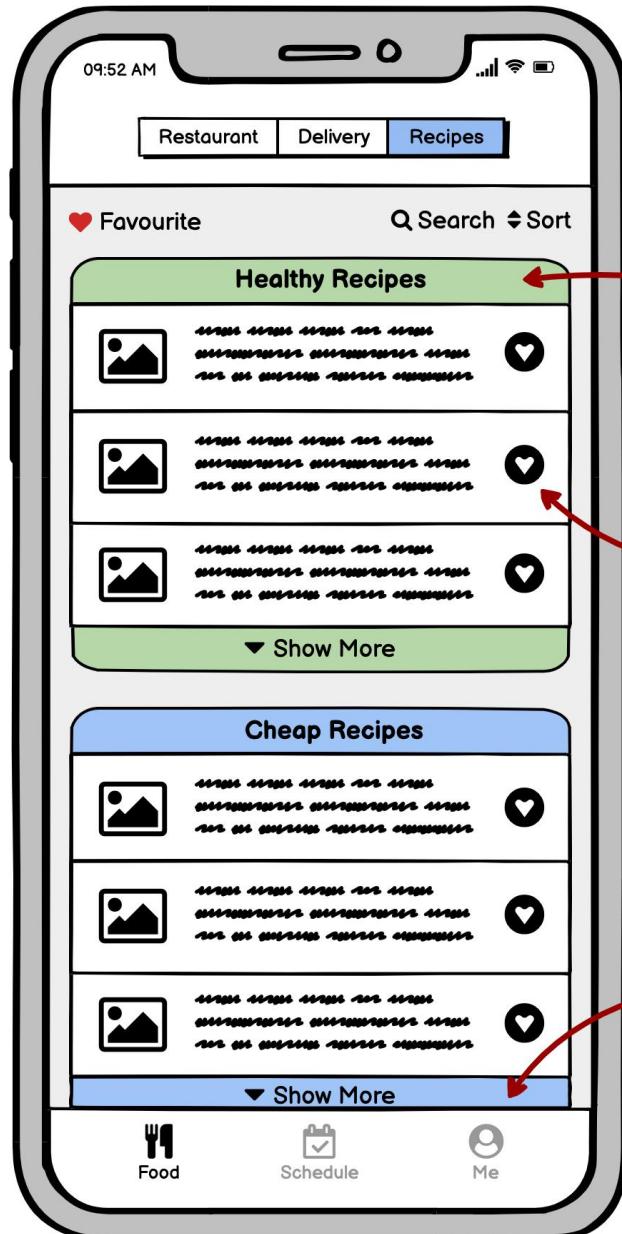
Once the user has completed their personal details and preferences on the welcome page, they will be taken to the food recommendations page. The recommendations on this page are based on collected preferences.

Based on the personal information you provided, the system will recommend restaurants, takeaways and recipes that match your preferences.

You can search, sort and bookmark the results

The distance and estimated cost of each restaurant will be displayed

Hi-Fi Prototype - Recipes Recommendations



The recipe pages are also recommended according to user preferences. Users can choose between different categories of recipes. If users find a recipe they like they can also add it to their favourites list.

The recipes are divided into different categories for you to choose from.

The favourite button allows you to add your preferred recipes to the list.

Expand to show more

Hi-Fi Prototype - Schedule



The system will alert the user when it is time for the suggested meal plan. The suggested time is based on the schedule system connected by the user (Canvas or Google Calendar).

Check the monthly calendar, this button will take you to the [Calendar page](#)

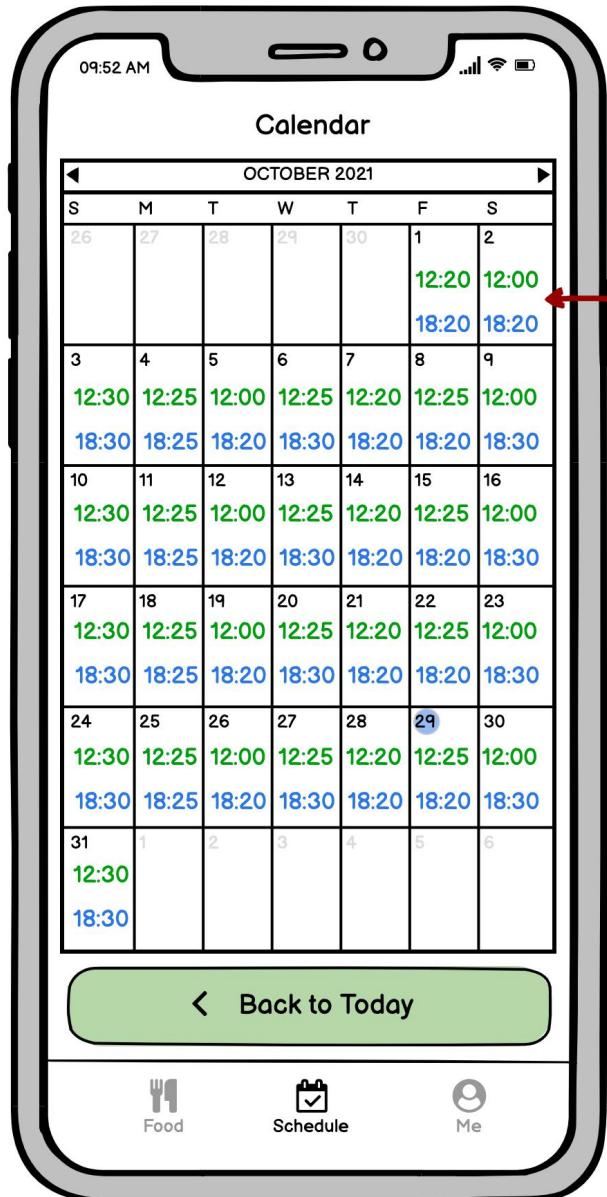
Suggested time, costs and locations are changeable. System will record your changed information to calculate your weekly meal statistics.

If you want to see more options available, this button will take you to the [Food page](#).

Recipes button will give you suggested recipes. This button will take you to the [Food->Recipes page](#)

You can record your meals and the system will automatically calculate the calories based on the pictures you take.

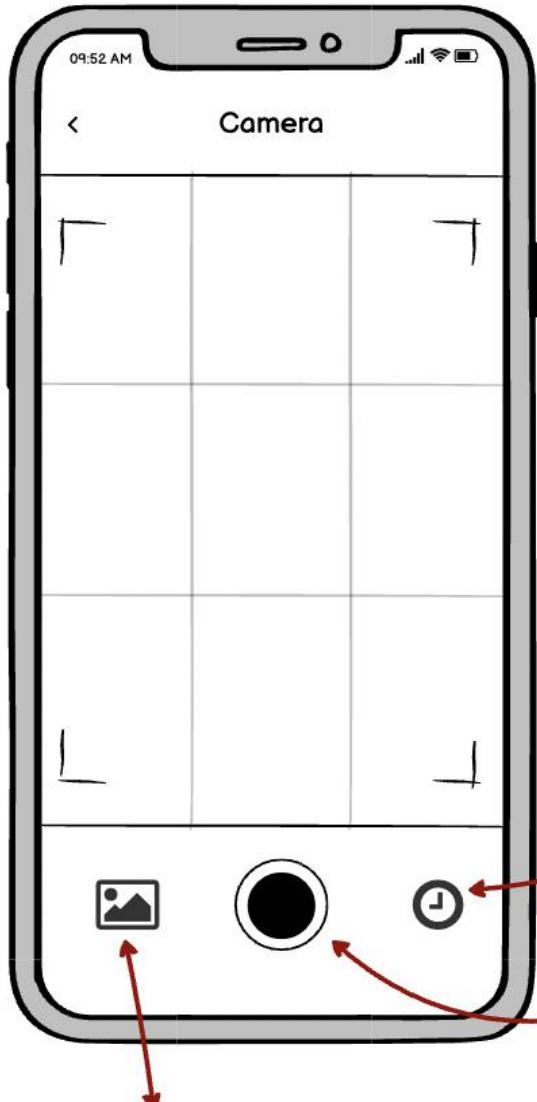
Hi-Fi Prototype - Calendar



Based on feedback from previous user evaluations, we have added a calendar function to make it easier for users to view their plans for the whole month. The entire month's schedule and plans can be checked on this calendar page. Users can tap on a specific date to check the plan for that day.

The daily lunch and dinner times are automatically calculated and adjusted according to your schedule in Canvas or Google Calendar.

Hi-Fi Prototype - Meal Recording



When the user tap on [Record My Meal] button, they will be able to record every meal they have actually eaten. Under this page the user can take a photo or select an existing photo for calorie analysis.

Users can also skip the step of taking photo and simply tap on the History button to view all historical analysis records.

If you want to view the foods that have been recorded recently, this button will take you to the history record page

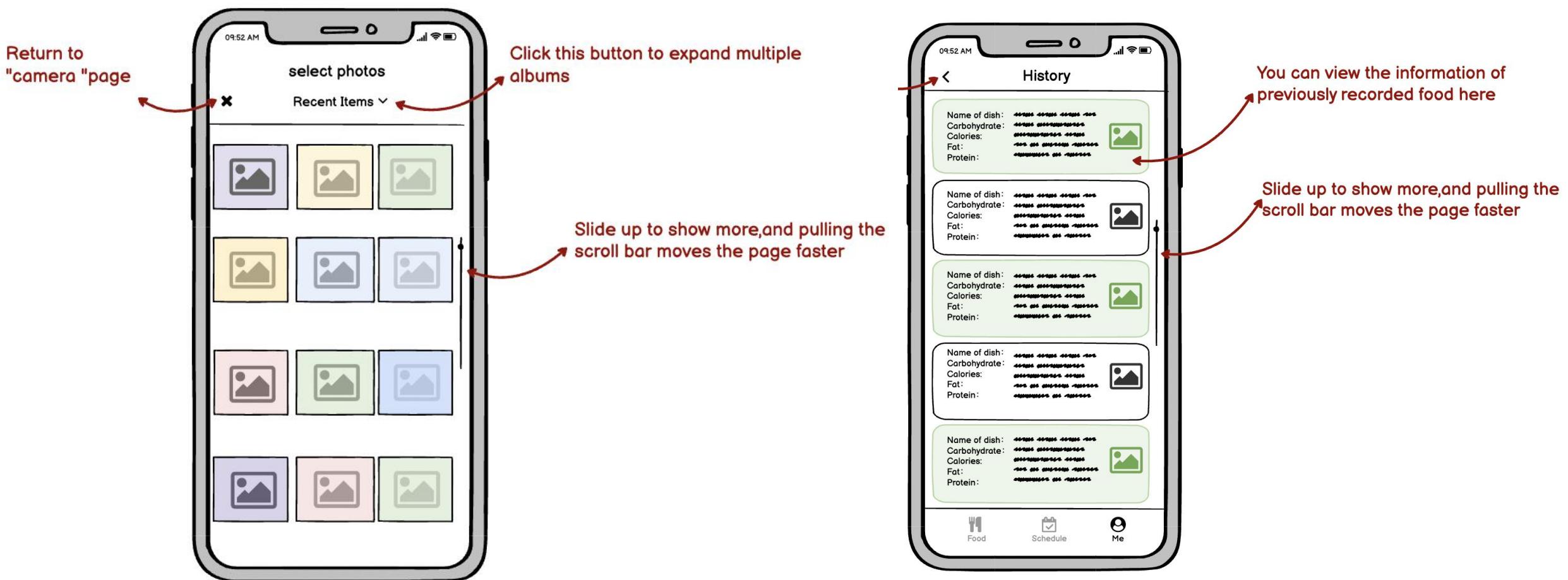
Click here to take a photo, after you take or select a photo, the system will automatically turn to the analysis page

Select a photo for scanning and calculation, this button will take you to the select photos page

Hi-Fi Prototype - Select Existing Photos & History

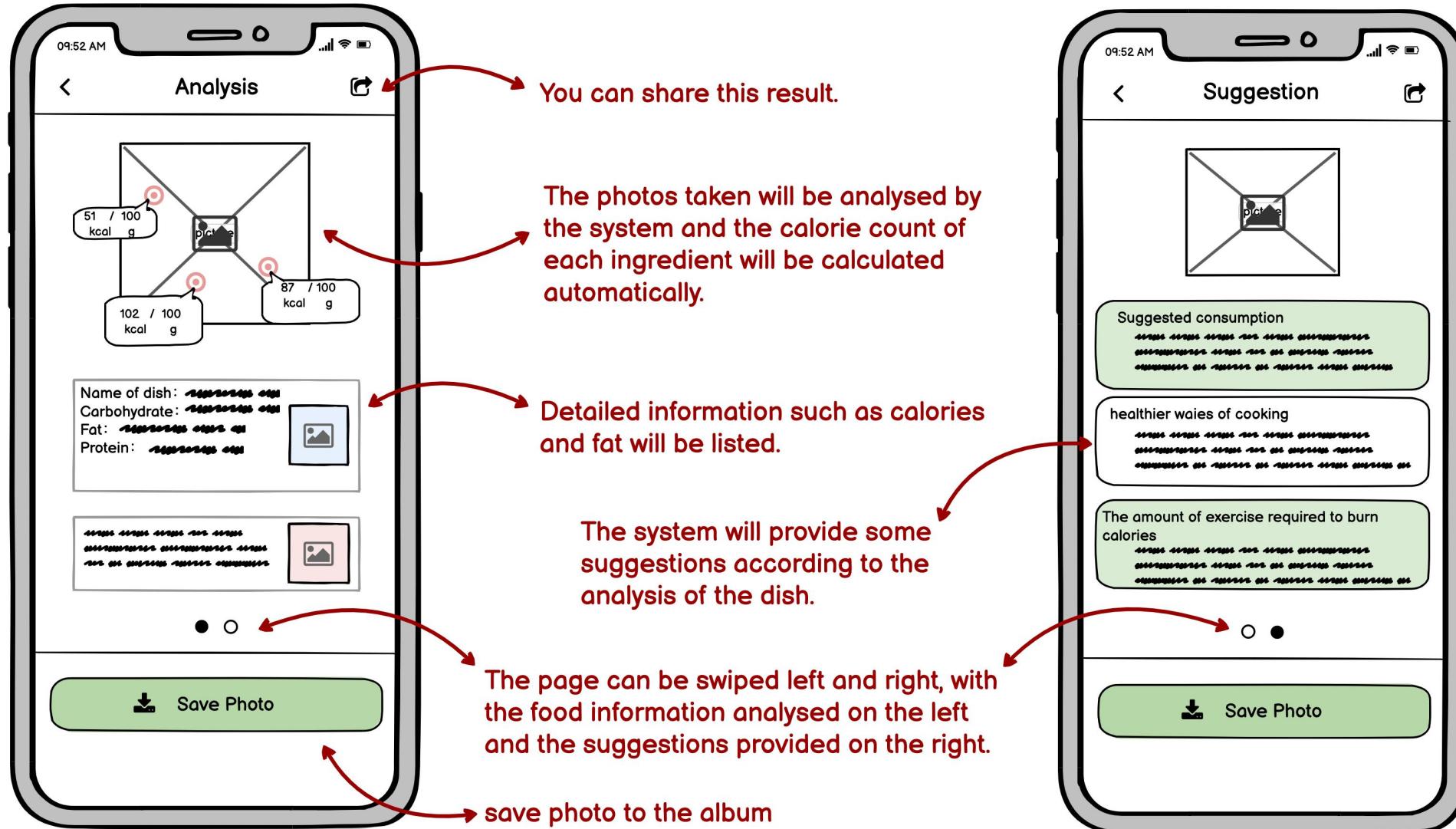
As sometimes users forget to take photos during meals, we allow users to upload existing photos. When a user selects an existing photo to upload, the system will display all the albums that the user currently has.

The history page helps users find details of recently recorded dishes, including dish name, carbohydrates, calories, fat, protein, and thumbnails of their meals. The system will record these data into user daily calorie plan to help them manage their healthy meal plan easily.



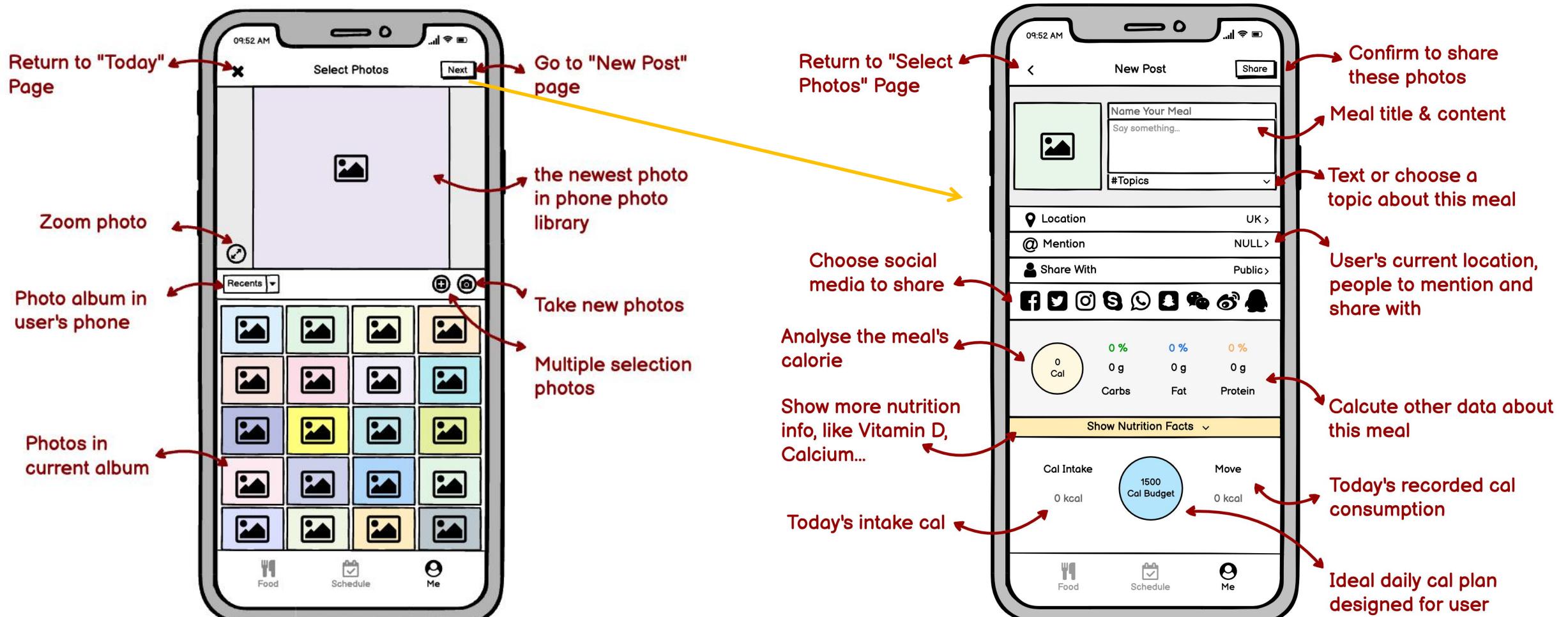
Hi-Fi Prototype - Analysis & Suggestion

The calorie content of each dish is shown next to the dish in kcal/100g. For easy identification, the dish is marked with a red circle. If the user wants to save the photo in the phone album, they can tap on the Save button at the bottom of the page. The advice page usually has three suggestions for consumption, a healthier way of cooking and the amount of exercise needed to burn calories.



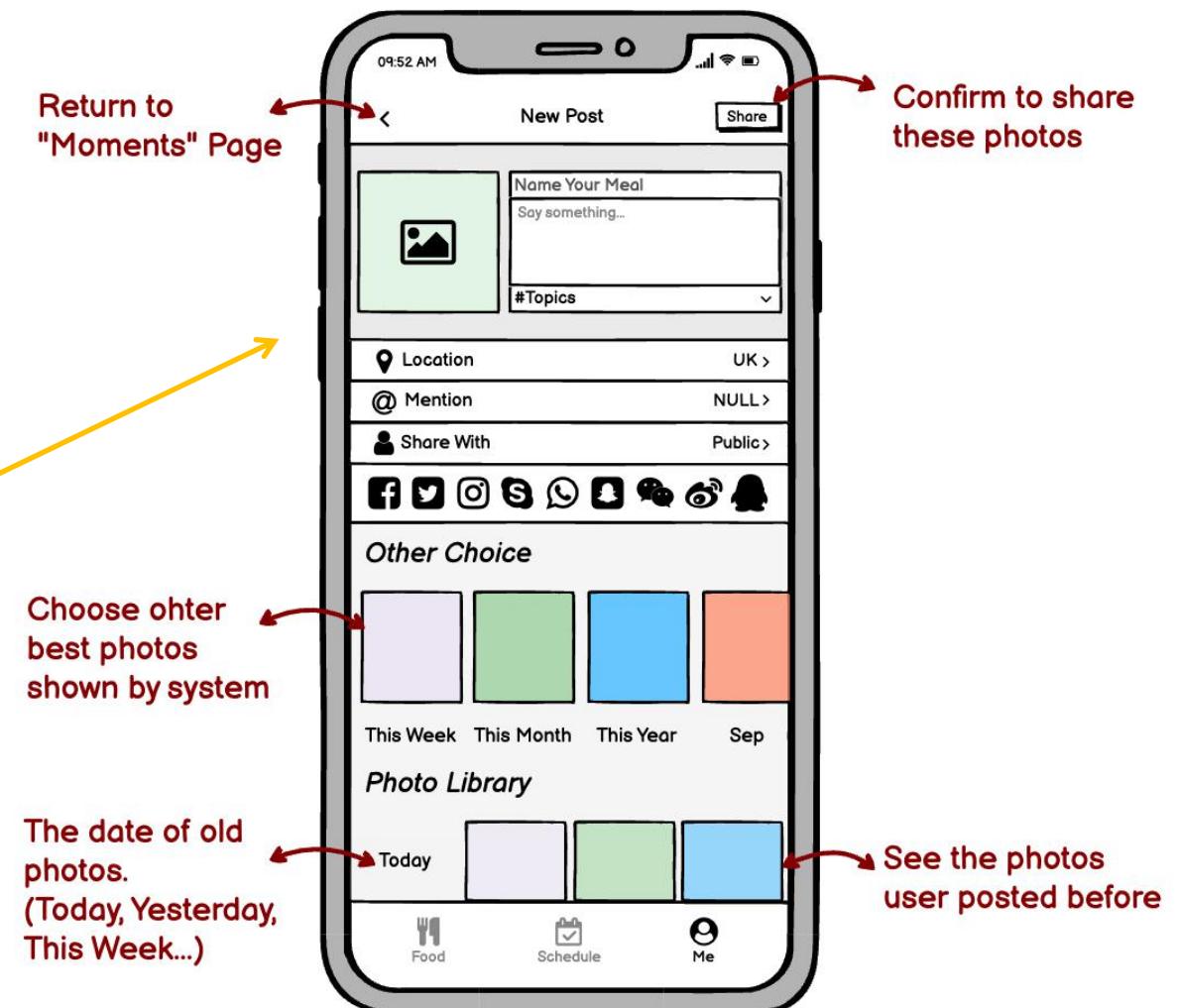
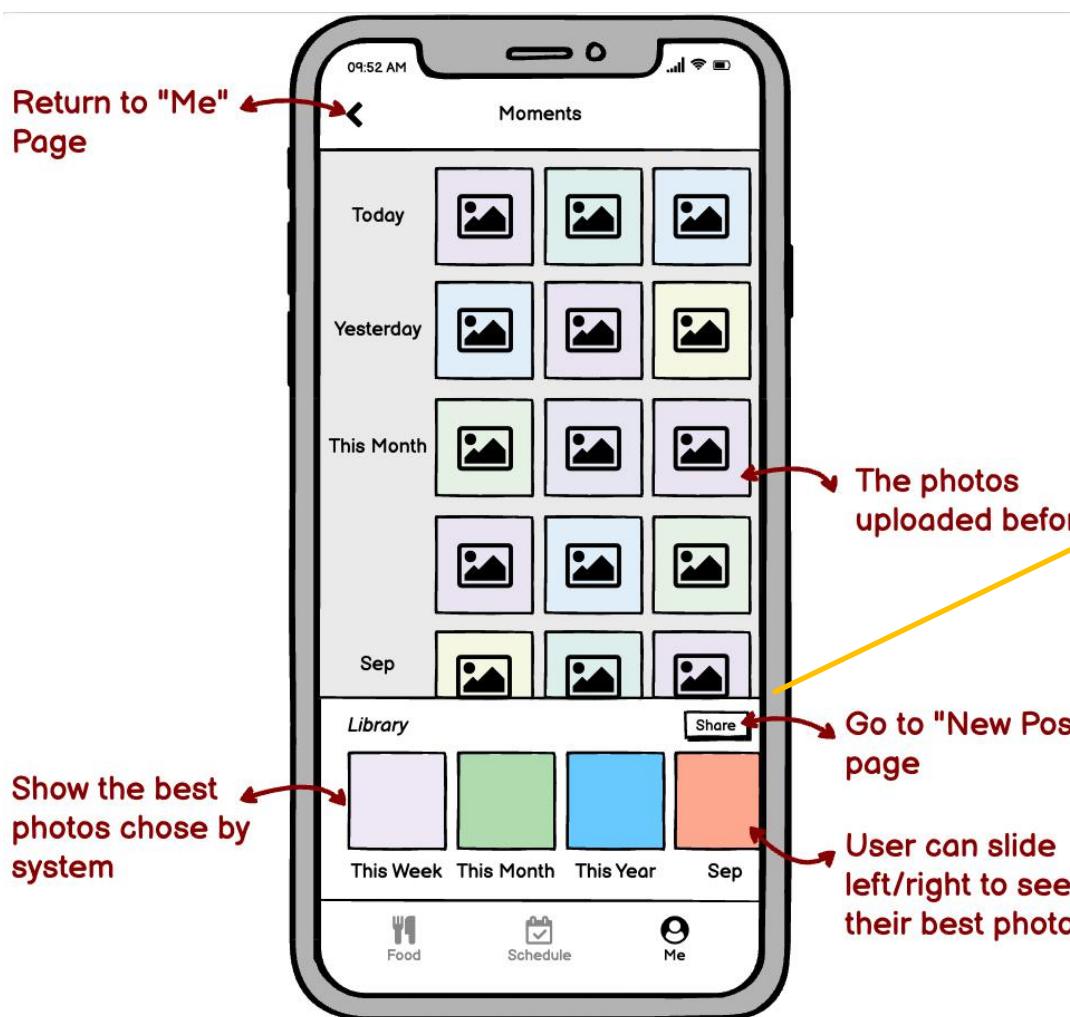
Hi-Fi Prototype- Select & Share

This page allows users to select their photos from their albums or take one by the app. Users can zoom the photo or choose multiple photos at once, and these photos will be shown in the centre of screen. After tapping the "Next" button, it will go to the "New Post" page for users to text more info about their food and share it on social media. It will also allow users to display nutritional information about the food and their daily meal goals.



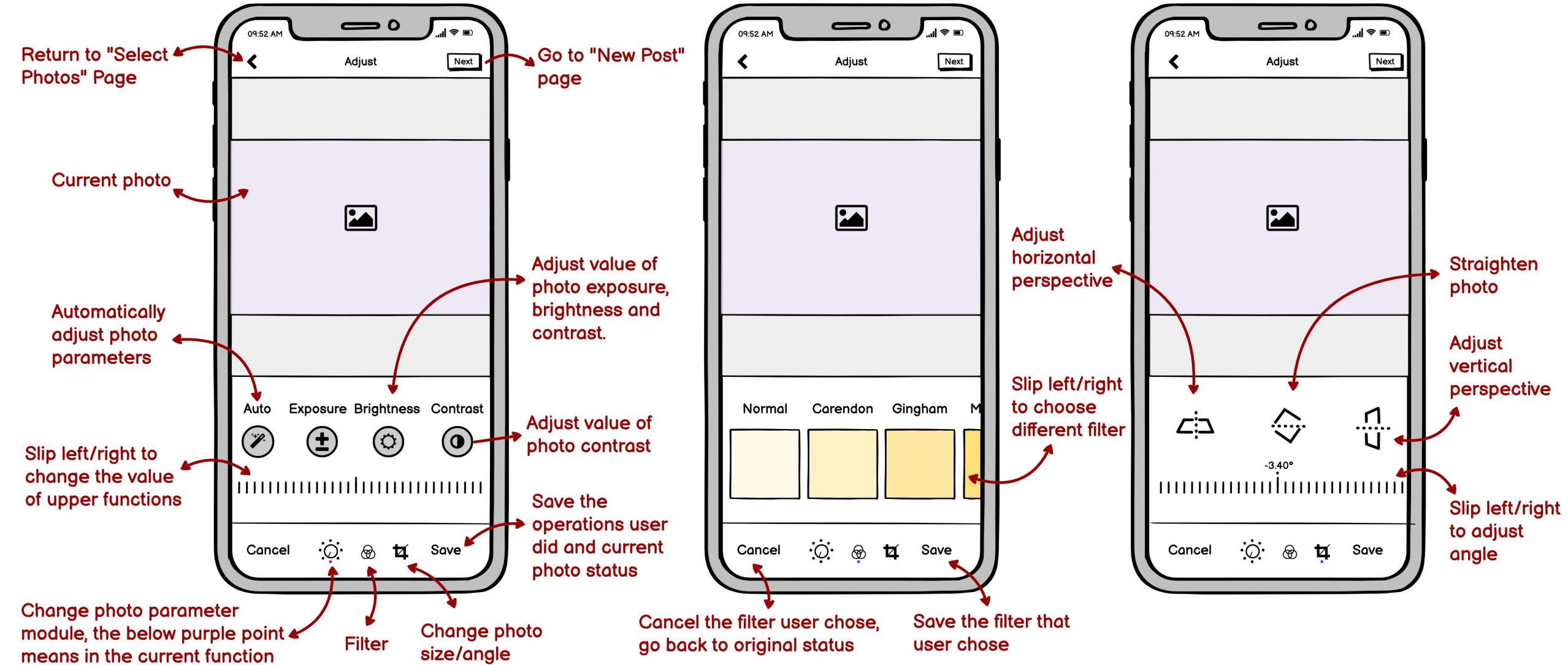
Hi-Fi Prototype - Moments & Share

This page records all the photos previously posted by the user and shows the best photos analysed by the system to make it easier for the user to review or share. Once the user presses the "Share" button, they will be taken to the "New Posts" page, which provides the user with the same sharing features, as well as displaying a photo gallery of the other best photos and all the older photos shown by the system.



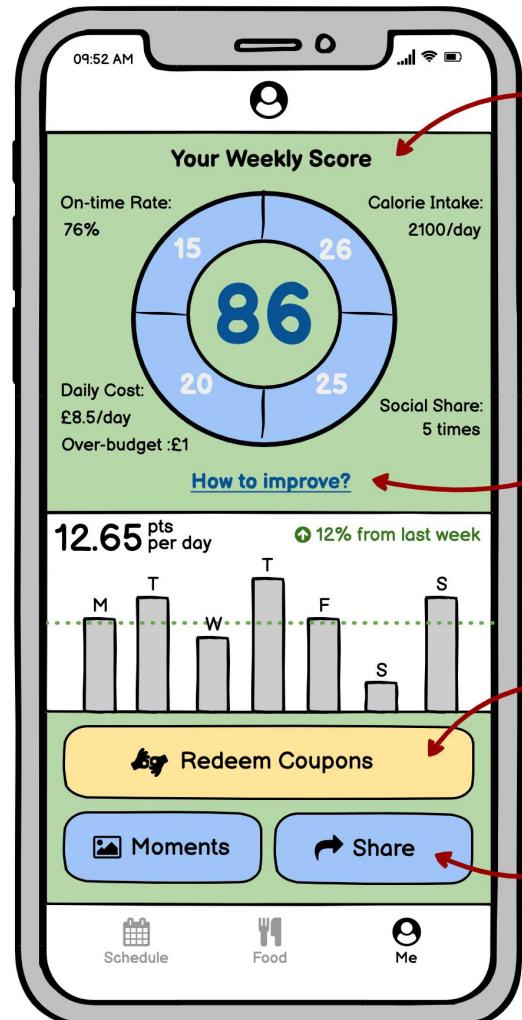
Hi-Fi Prototype- Edit photo

Based on feedback from previous user evaluations, we added this Adjust page for users to edit their photo before posting it. There are three main functions shown in the below, changing photo parameter, filter and size/angle respectively.



Hi-Fi Prototype - Weekly Score

On this page users can view their weekly score and calculate their total weekly points based on the four dimensions of their weekly diet: on-time rate of meal, calorie intake, number of shares and budget spent per day. The users can also check the points for each day and can also find out suggestions to improve their score. To motivate users to maintain good eating habits, we have also designed a function to redeem coupons based on the points earned, which is a virtuous circle.

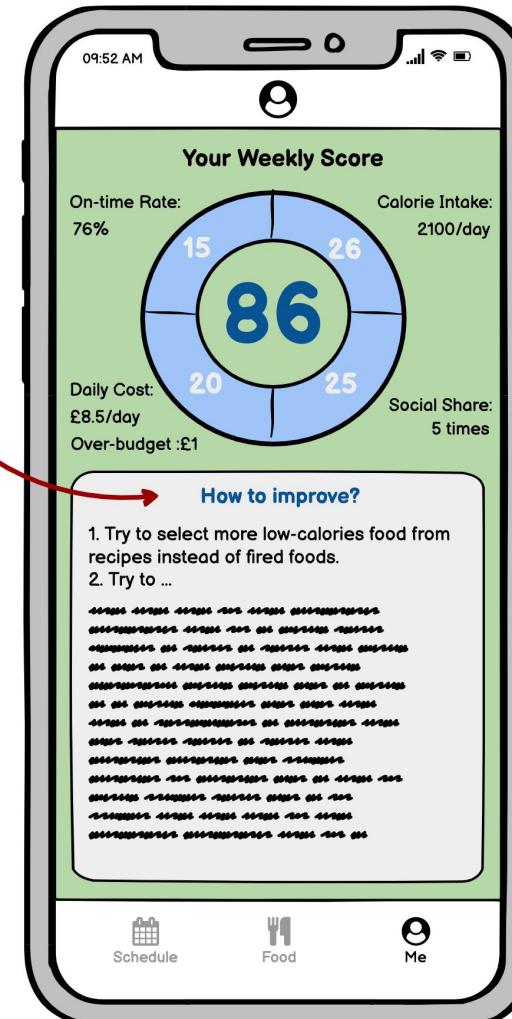


Users' weekly scores are based on their actual eating behaviour, plus a small bonus for additional sharing.

This button will expand with suggestions that users can follow to improve themselves.

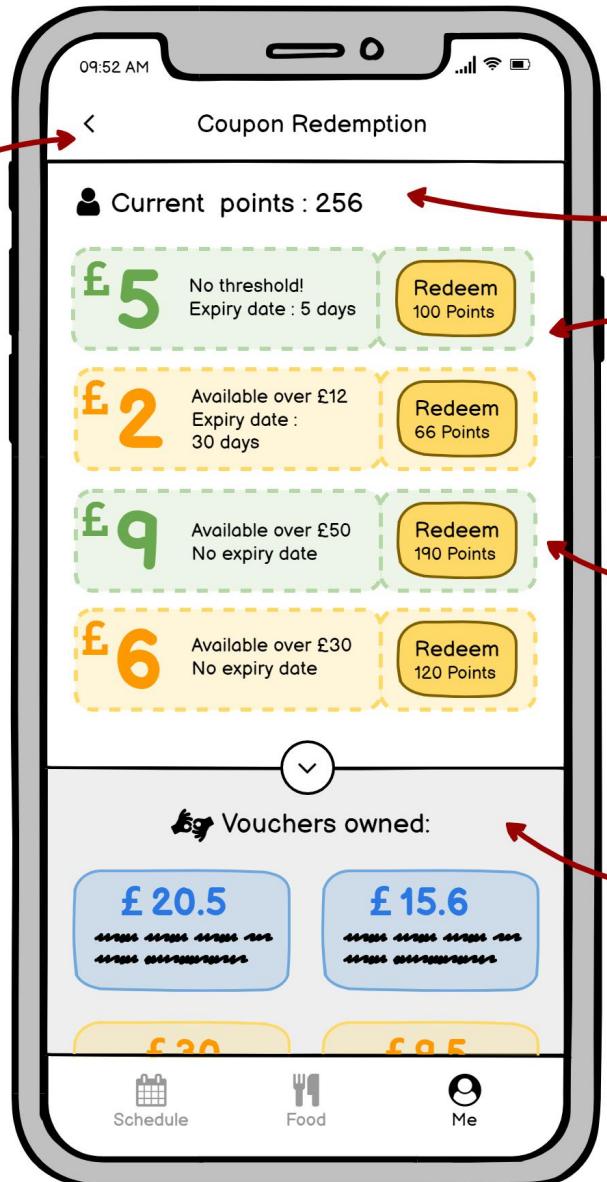
Users can use their points to redeem coupons / vouchers, this button will take them to the [Redemption page](#).

Moments & Share buttons



Hi-Fi Prototype - Coupon Redemption

Once on this page, users can check their points and select the coupon that suits them to redeem. The coupons / vouchers can be used whether they are ordering a takeaway or buying ingredients. It is also possible to view the coupons that the user already has.



Return to the
Weekly Score page

Users can see the points currently accumulated here.

This section shows the information about the redeemable vouchers, including the amount, the expiry date and the requirements.

Tap this button to redeem the voucher. Users can also check the points needed to redeem the voucher here.

Users can see the vouchers they have redeemed and not used.

Summary

Through research into competing products we found that few of the existing products had been made to combine diet recommendations with a schedule system, so the project carried out a series of studies on meal planning and healthy recommendation and ended up with a highly finished product that could be connected to the user's schedule system and intelligently analysed user's behaviour to provide suggestions and recommend affordable, healthy meals for their needs.

The initial problems identified in the project have all been resolved and the intended requirements have all been met. Each key function has been critically evaluated and validated, and the final improvements reflect the usability of the system when dealing with different users.

Due to the time constraints of the project itself, if we had more time we would have done more research on how to help users maintain a virtuous circle for eating healthy, for example by creating an internal community for all users with a need of healthy eating, etc.

As we are in the middle of Covid pandemic, our group members are in different countries and time zones. We are collaborating and building documents through Lark. Our regular weekly synchronisation of progress has ultimately resulted in a very positive outcome within the very limited time available.

We hope this project is useful for you to understand how we support people "eating well".
Thank you for your reading!