

FOODPIC



Learning about food through a story of snapshots

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Problem and Solution Overview

In this day and age in which there is an increase in knowledge about nutrition, more attention is being paid to how people's diets affect their health and well-being. Because of this, food journaling (both on paper and applications) has become popular for those who are looking to have a better understanding of what they're eating and how to control it. However, many popular food journaling applications and methods these days focus too much on the exact numeric details, especially calories, which makes it difficult and tedious for people to track what they eat. In order to combat this problem, our proposed solution is to design a mobile application that focuses on helping people learn about their overall eating habits rather than emphasizing exact numbers. The application will make use of a photo-based input method via the phone camera which is simpler for the user. With each picture, the application will create pre-selected tags based on food groups and ingredients, which the user can then add to or delete. Through the accumulation of tags, users can see visualizations of their food habits and also obtain new information about what the food they eat contains.

Contextual Inquiry Participants

We completed three contextual inquiries where we met with our participants around lunchtime. During these sessions we had our participants who still continue to food journal guide us through their process. We asked questions about their food journaling experience, including what the highlights and setbacks were.

Participant 1 (Bianca*): In the contextual inquiry with Bianca, our team learned more about food journaling apps and how they are used to achieve specific goals. Bianca is currently a student who uses MyFitnessPal, an app that tracks daily calorie intake in order to help people lose weight. We talked to her while she was still eating her lunch in one of the school cafeterias and had her show us how she used the app to record her meals. In high school Bianca would record her daily food intake by writing it down on paper but she found that to be difficult and eventually resorted to using phone apps. She was encouraged by her father to start using the app because he had a good experience with it and lost 15 pounds through using the app. The app serves as a helpful reminder to be conscious of what you are eating and staying healthy and fit. Bianca tries to record her meals into the app during the same time period that she's eating, but when she's busy she may record food in advance (especially if it's the same kind of food), or she may forget to record anything at all. Overall, Bianca has had a very positive experience with the app and feels like it's helping her achieve her goals of staying healthy and losing weight.

Participant 2 (Gillian*): For the next contextual inquiry, we talked to Gillian around lunchtime in one of the library cafes on a university campus. Gillian is in her mid 40s and used to food journal rigorously for two years. She used MyNetDiary, a detailed online website, to track her daily calorie intake for her nutritionist who would then analyze the spreadsheet. She also used FitBit

for personal use and to track her daily meals. The period she was food journaling a lot was when she wanted to lose 40 pounds, and so her ambitious goal to lose weight ultimately made her decide to food journal for quite some time. She mentioned how she liked having a nutritionist because it made her feel accountable for her actions, especially in terms of food tracking. She felt like the accountability motivated her to do something she may not have done by herself. One thing she didn't like about her phone apps were that the calorie inputs for food weren't precise enough. Because she had a set goal, every calorie counted towards her daily intake so she had to be a perfectionist. It was also difficult for her to remember tracking her food all the time so she would prefer receiving notifications on her phone. Since she hasn't been tracking her food for over a month now, she noted how she felt rebellious for not confining to the old rigid standards of documenting all of her meals. There is a negative implication in this thought whereas food journaling should be more of a positive, enriching experience.

Participant 3 (Jenny*): During a bus ride to dinner, Jenny described her experiences with food journaling in the past. Jenny is currently a university student who wants to major in nutrition. She loves to cook her own meals but finds herself making a giant pot of the same thing and eating that for the remainder of the week. At one point Jenny was really curious about what she was eating on a daily basis so she decided to create a personal Instagram account where she took a picture of her food, edited it to make it look pretty, and uploaded it into her food journaling collection. She did this for about 10 different meals, and felt pretty accomplished that after this time period she already received 4 followers. When I asked why she posted photos of her food, she said that she was mainly interested in knowing what she was eating. She didn't really care for the exact calories or nutrition content in the food. She enjoyed playing with her photos of food and uploading them in a concentrated space so she could refer to it and reflect on her eating habits. She eventually stopped doing it because she realized she was taking the same kinds of photos with her phone. This inquiry was particularly interesting because it came from a different perspective; Jenny didn't have a specific goal such as trying to lose weight. It is important to consider that many people who take pictures of their food may not be trying to achieve a specific goal but are more interested in getting a holistic idea of their eating habits.

*Names have been altered to maintain confidentiality of participants.

Contextual Inquiry Results and Themes

Across all of our contextual inquiry participants the people we were interviewing were looking to monitor the food they ate every day. The primary reason was to lose weight, but this is not always the reason that people are monitoring their food, as evidenced in our third contextual inquiry participant. Everyone had some issues sticking with the tracking everyday righteously, because it can be time consuming, limit what the person eats, and make them feel guilty. Because we don't want to create another version of popular apps like MyFitnessPal, we decided to focus on these problems instead of focusing mainly on calorie counting, and also integrating the aspect of learning about nutrition and health which is valuable.

Although our participants did not all have the same overall goal in using a food journal, there were some common difficulties that they ran into. As we watched our first two participants take us through the input methods on their current apps, it became clear that they had difficulty in accurately amounting an exact number of calories to each meal or snack they were eating. Many times they had to estimate based on experience or what they thought.

There also arose the problem of remembering to keep track of what they were eating. In order to account for this issue, they had to get into the habit of inputting food as soon as they knew they were going to be eating it. There were both upsides and downsides to doing this. The upside was that they were able to plan meals ahead of time if they knew that they were having a specific meal (e.g. eating pizza with a friend outside) so that they could adjust accordingly. The downside was that there was a rigidity and lack of diversity in the food they sometimes ate due to the adjustments they made and the input methods.

The participants did note that sometimes they had to learn how to be more creative with their food choices in order to combat this sense of rigidity, but it was up to them to learn over time how to substitute healthier options.

Another theme that came up in the contextual inquiries was the concept of accountability. The participants added that it was helpful for them to have people close to them working towards the same goal, so that they could support each other. If one person found that the other person was slipping in their habits, the former could make sure that the latter stayed focused.

These themes suggested many different features, some which of we may not use because of how we want to narrow our focus for our project in order to avoid creating an app similar to what already exists. However, there is a need for the input method to be simpler and less tedious. The amount of guessing that goes into it can make it unreliable. The aspect of learning about nutrition seems to be missed in current food journaling methods. It appears that it is ultimately up to the user to educate themselves on how to change their eating habits, but there is the opportunity to bring the user into the world of nutrition and health more. This is an overarching concept that can cover the problem of rigidity in diet as well. Finally, the influence of social circles is not something to be missed. Having a shared goal can be much more empowering, but we do need to keep in mind that there are pitfalls to this (e.g. being too public, the friend/family member in the circle quits).

Task Analysis Questions

1. Who is going to use the design?

- This design will be useful to people who usually take photos of their food and love to share their food with others. The design could also be helpful for people who want to know how often they eat at certain places, or how often they eat certain food. Unlike the food journal apps nowadays, which feel rigid and constricting, our design would try to make all people who want to monitor what

they eat able to do so easily. Anyone who is looking to understand more about their diet or their habits when eating would be able to benefit from our design.

2. What tasks do they now perform?

- Most people now food journaling are recording calories, and very concerned about if they follow the calorie plan. Inputting data about their food often with other meals as a template. For instance they will select from a database a meal that is very similar to theirs. Currently, it adds some kind of burden to the users which cause people to quit. The people who would use our design may already take photos of their food, and our design would help them tie that data to knowledge about their eating habits. The tasks will be recording meals and reviewing them and learning from it.

3. What tasks are desired?

- We want people to be able to see what they are eating over time. The overall task is to be tracking everything they eat. Our application would inform and display aggregate information that helps the person make decisions about their meals. Our goal is to have the person eating what they want to, whether that is healthier or just less, or at certain places with certain people. We want them to enjoy their interaction with food on a daily basis.

4. How are the tasks learned?

- Our design would be intuitive, allowing the person to learn how to collect data easily. There would be different portions of the app separating the data behind what they eat and how they record. Some information, like where they are eating and when, may be recorded automatically and have no learning required, while there may be some learning for how to interpret the analysis the design will give them.

5. Where are the tasks performed

- The tasks would be performed where the people eat and throughout the day at time of place. The most effective time for people to be thinking about food is when they are hungry and want to have a meal, and this meal they choose to eat is what we want to record.

6. What is the relationship between the person and data?

- The person is using the data to decide how they should eat next. Other people on the app *may* be able to use the data to see when they ate with their friends or where their friends commonly eat. Also they can go to the food place where their

friends shared. They can know the dish and place of a meal they enjoyed weeks ago. The data is recorded by the person using our design, and it would be used to show trends to the person using the design.

7. What other tools does the person have?

- There are many food journal options available. People may be using an application to track, or a physical notebook that is organized for recording dietary information. Most people also have cameras readily available and applications on their phone allowing them to see what they eat with pictures. One person interviewed made an Instagram account for just their food for tracking.

8. How do people communicate with each other?

- Our application would have a social aspect so people can share certain things about what they ate, or at the very least be able to take a photo they took in the app, and share it to social media. Currently applications like MyFitnessPal have messages and statuses so people can share. Delicious food could be shared with friends and family or even they can invite them to join a certain meal.

9. How often are the tasks performed?

- The tasks are performed when having each meal.

10. What are the time constraints on the tasks?

- The person has to input the information about their food before they forget. If someone is taking a photo of their food, there have to take the photo before they eat any of it, so the time is limited.

11. What happens when things go wrong?

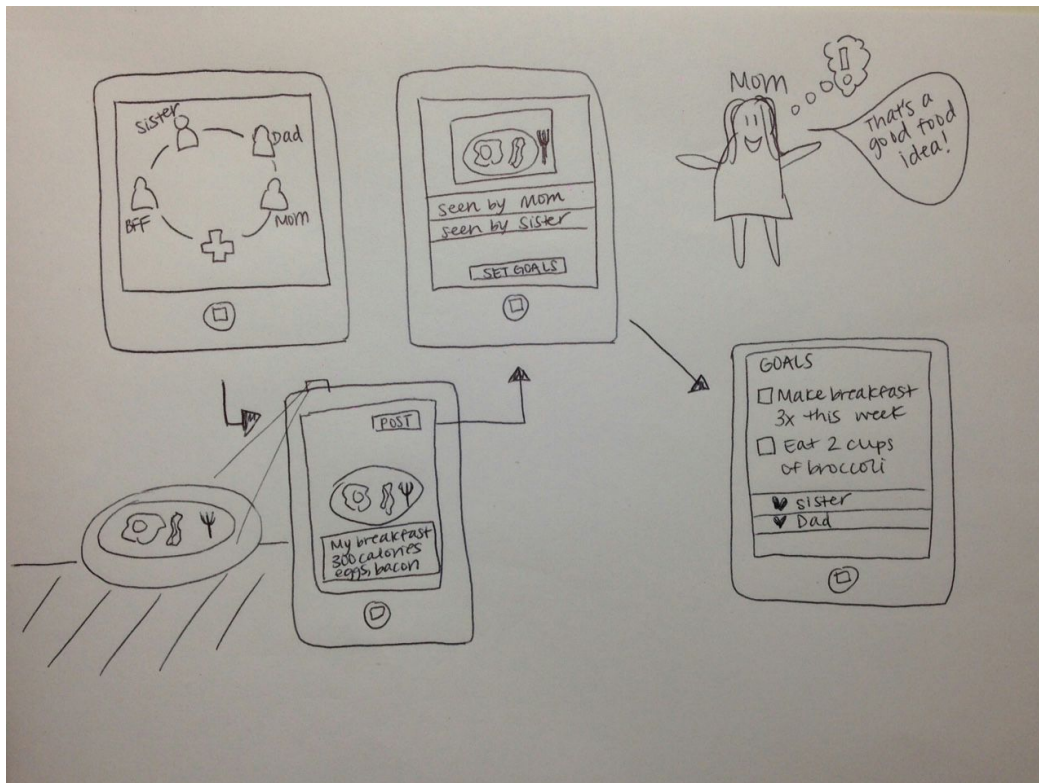
- When people are not tracking or forget to input the meals the data is less helpful. We plan to have support structures to help motivate people to continue to track what they eat. Showing them what kind of nutrition inside a certain food can help their health, or what nutrients they are missing based upon what kinds of food they are eating will motivate them to continue use.

Proposed Design Sketches

Design 1: Social circles focus

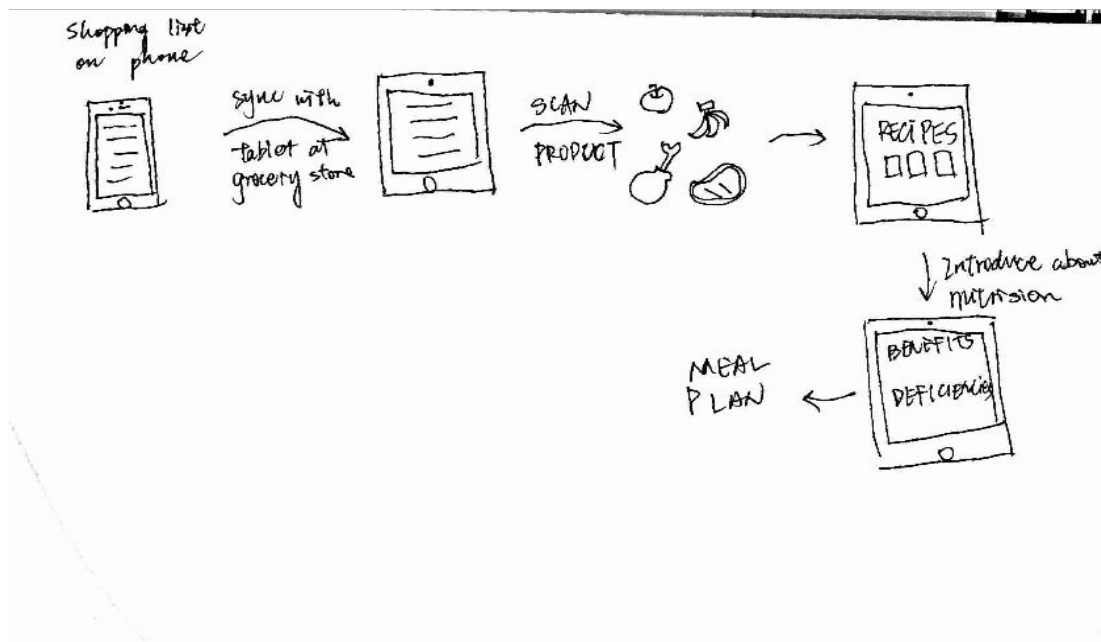
Using a mobile app on his or her smartphone, the user starts by adding family members and close friends into a social circle to share what they're eating. This provides the user with social support and gives them a sense of accountability (**Task 5**). As they upload photos of the food

they are eating into the app, the user has the option to add more details about the food. The information that gets stored with the food photo can help both the user and the social circle become more aware about the details of the food (**Task 1**). As people in the same social circle browse through other people's photos of food, they can become inspired with new food ideas (**Task 2**). Each person in the group can set personal goals and can see how others are doing on reaching their goals and milestones. They can also congratulate others on these achievements to offer support (**Task 6**).



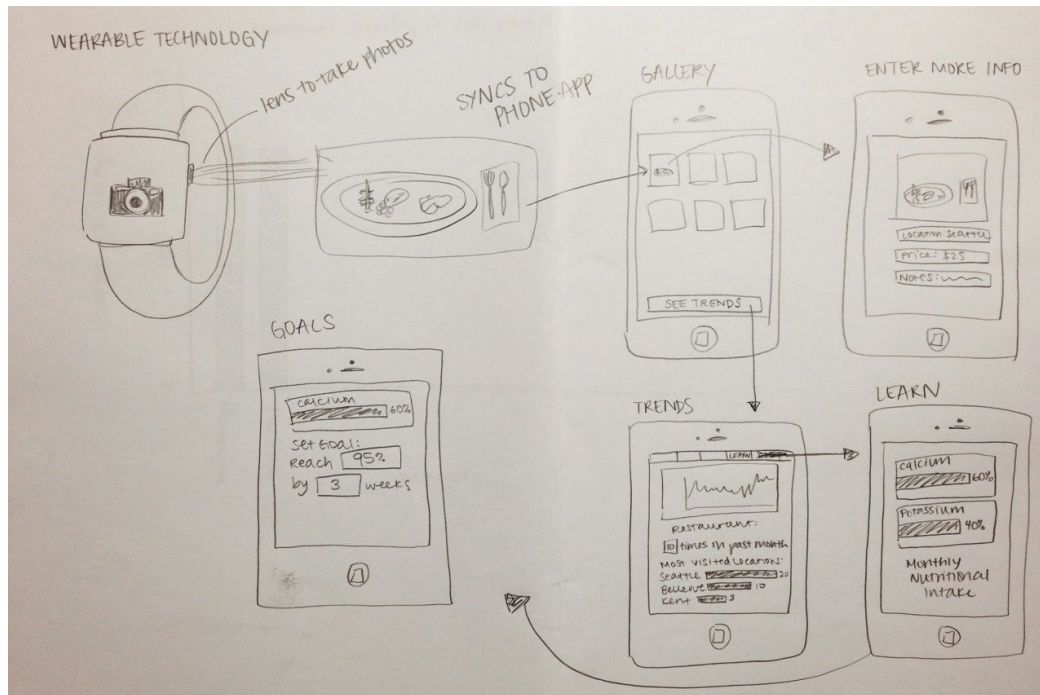
Design 2: Grocery shopping focus

The user can track food by scanning the scan code using the tablet instead of taking pictures which might not be accurate because of point of view and light (**Task 1**). Once the product is scanned, the shopping list will cross off the product and the app will direct you to a page for recipes and food gallery which talk about how this product can be used in cooking or creative eating ways (**Task 2**). At the same time, the app can recommend similar food which have similar nutritional composition but taste different. It can simply introduce a little bit about each food's benefits and deficiencies for the customer to take into consideration (**Task 4**). Now with the shopping list and the information the app provides to the customer, the customer set up food plan and can go home enjoying the meal (**Task 6**).



Design 3: Photo-based food tracker

The user can track food by taking pictures of it whenever and wherever using the wearable technology. After the photo is taken, the photo gets synced with the phone app, and the user can then add additional details regarding the food that the wearable technology didn't capture (**Task 1**). The user can then view a history of all the photos that he or she took over time. This would be displayed in a gallery in the app, giving the user an opportunity to reflect on the photos taken (**Task 3**). After looking at the photos in the gallery, the user can also learn more about dietary needs, deficiencies or food groups based on what the person is eating. The app can generate useful information about the pictures of food that was taken using the wearable technology (**Task 4**). With the helpful information that is generated, the user can then proceed to set goals as he or she wishes. The goals can vary in motives, ranging from social goals such as eating out with friends more or personal goals such as getting more calcium intake (**Task 6**).



Choice of Design and Tasks

After considering multiple design platforms, our group decided to design a mobile application centered around taking pictures of food to easily track eating habits. Most people carry phones with them everyday so a mobile app would be readily accessible. We chose to focus on the following two tasks: 1) track food through photos with options to add more details, and 2) learn about dietary needs, deficiencies or food groups based on what the person is eating. When we conducted our contextual inquiries, we found that participants who food journal would feel guilty when eating something unhealthy and have to document it. Other participants would sometimes forget to food journal or not have the time to go through the entire process of documenting their food in an existing mobile app. With these factors in mind, we wanted to create a way to track food that was fun, easy, and quick. We also conducted a contextual inquiry with a participant who tracked her food by taking photos of them. She enjoyed looking back at her photo gallery to understand the kinds of food she had been consuming. Based on feedback and our review of Professor Fogarty's research on photo-based food journaling, we felt like this could be a realm for our team to explore. It eventually led us to design our first task because we believed that tracking food through photos would benefit all of our participants and those who enjoy taking photos of their food. Based on the feedback we got from critique, we chose to not focus on calorie-tracking and make the user input a more personalized experience. We created an optional feature to add more details about the picture of the food depending on the user's preference. When we asked the participant who enjoyed taking photos of her food what she did with all of her photos, she said that she only "looked" at them. However, she would be interested in learning more about the kinds of food she was eating. The same goes for all of our contextual

inquiries--our participants were very curious about their food intake and wanted to learn about their eating habits. Participants stated that they didn't really understand nutrition labels, dietary needs, and food groups, and had to do most of that research on their own. Thus, we chose to incorporate our second task which was to learn about dietary needs and other food information based off the user's input of food photos. The food metrics and information are generated within the app so users can document their food and learn about it at the same time. We believe our design blends well with people's daily lives and allows people to effortlessly track their daily food intake. Taking pictures of food can be fun and only takes a few seconds, and for the small amount of work they put into documenting their food, people can learn a whole lot about their eating habits.

Written Scenarios

Task 1 (Storyboard 1)

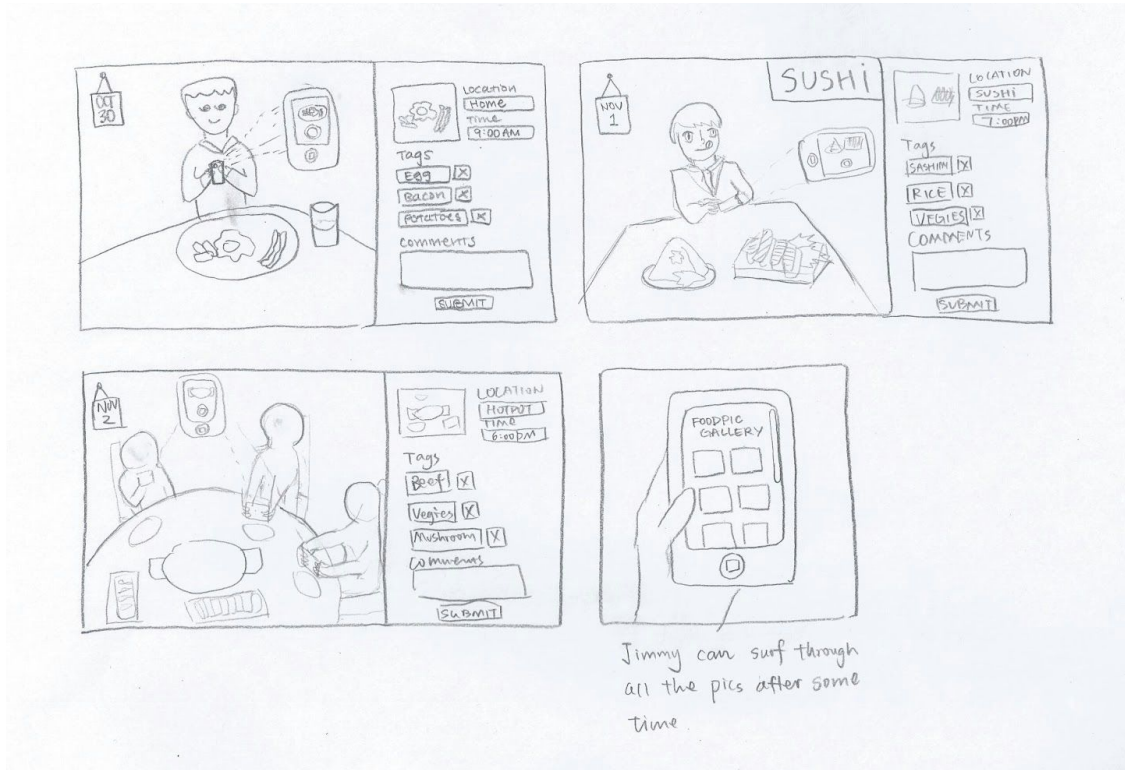
Jimmy is a sophomore at the University of Washington who lives in an apartment in the U-District. Jimmy got up in the morning on October 30th and had breakfast at 9:00 AM. He took a picture using his phone and commented and tagged the details of that meal. He also recorded the location and time. The mobile app FoodPic stored all this data and saved the meal into the photo gallery. Jimmy didn't feel like recording the other meals he had that day, so he wasn't reminded by the app. Since our design is a completely lightweight photo-based food journal, we don't want the user to feel rigid and pushed. The design is for people who want to learn about their eating habits, and the more data they input, the more details they will get from our design. The next day, Jimmy had dinner at a sushi bar and was willing to record that meal, so he opened FoodPic to take pictures, manually input his sashimi and rice rolls, and submit the data. He also recorded 7:00 PM as the time and the location for future reference. The next day, Jimmy received an invitation from his friends to have dinner together at Little Sheep Mongolian Hot Pot. They ordered delicious food and used FoodPic to record them. They could also just take pictures of the meal and come back to add some details, comments, and tags later. After some time, Jimmy had a good number of meals recorded, and could surf through the food galleries to learn about his eating habits.

Task 2 (Storyboard 2)

Jimmy is a sophomore at the University of Washington who lives in an apartment in the U-District. Jimmy is hungry right now and is thinking of what to eat. The first thing that comes to mind is a slice of delicious pizza. He first decides to check his mobile app to see what he has been eating recently before making up his mind. Since he has used FoodPic for some time, he wants to see if the app can help him see if he should eat something healthier. Jimmy opens FoodPic, and realizes that he has recently been eating ice cream, hamburgers and bagels which contain a lot of carbohydrates. He becomes aware that he might need a more balanced diet. The app teaches him a little bit of nutrition composition of each kind of food and helps him to know about his food habits better. Eventually, Jimmy makes himself a salad thanks to the new knowledge he learned from FoodPic and starts a balanced diet.

Storyboards of Selected Design

Storyboard 1: Track food through photos with options to add more details



Storyboard 2: Learn about dietary needs, deficiencies or food groups based on what the person is eating

