



**Learning about food through a story of snapshots**

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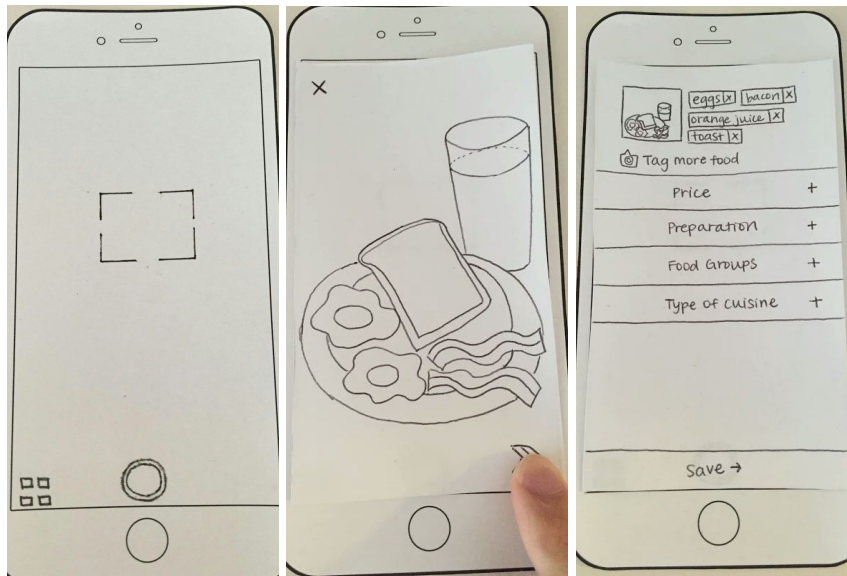
Analyst, Writer

## **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.

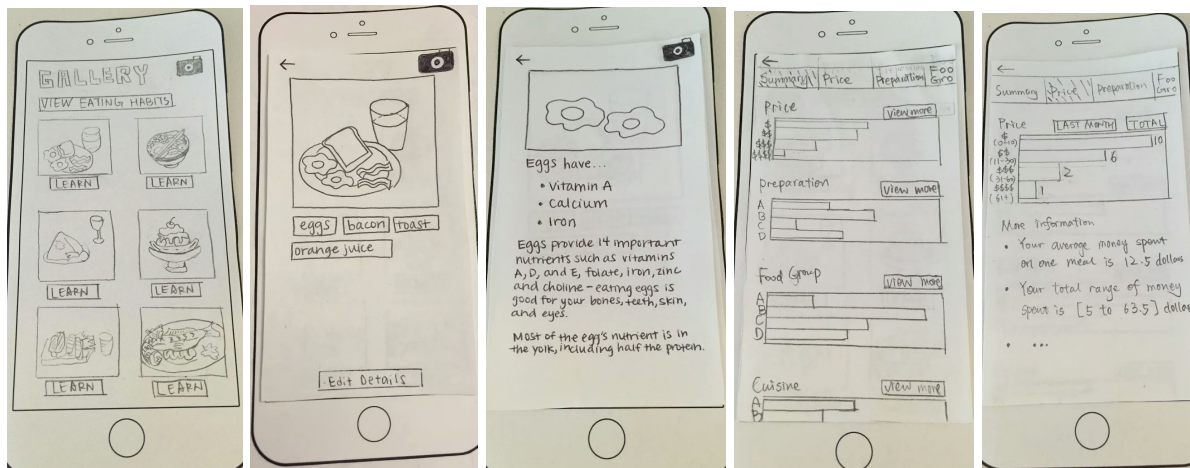
# Initial Paper Prototype

## Task 1: Taking Pictures To Track Food With Options To Add Detail



The first task starts at a camera screen, similar to the popular social media app Snapchat, so that the user can take a photo right away. The photo can be accepted or rejected, and then more details can be added. The details the app presents is based on a survey of over 100 people and their interests with regards to learning about their eating habits. The list expands and options for each category are presented and can be pressed to be added to the photo.

## Task 2: Learning and Reviewing Eating Habits



From the gallery the user can see all their pictures. If a picture is selected they can see an enlarged image and pressing on a tag generated in task 1 will show more details about it so the user can learn. There are also bar graphs accessed through the “Learn Eating Habits” button where each selected value in the expandable list from task 1 builds up over time as a bar. To see more details about a given category the top bar is selected or the learn more button is pressed.

## Testing Process

For our usability test, we wanted to see how people navigated through our app FoodPic and what their overall impressions of the functionalities were. We wanted to see if participants could complete our two tasks with relative ease.

We asked the testers some initial questions to know their experiences and to confirm they were fit for testing. We then gave them some context as to what they were doing and what the app was meant to be used as and then prescribed them the tasks. We wanted them to take a picture and add details, as well as learn about the photo they took. Initially our questions were a bit leading. For instance, we told them to “learn more” and put them in the gallery. Of course, there is a button labelled “learn more” from the gallery and that’s where we started them for the second task. We reworded the task as to not lead the tester on. Finally we gave the user a few questions to get a feel for how they liked our application.

During the tests, Amy Wang was the facilitator, Leesa Xu played computer, and Tad Perry and Patrick Liang were in charge of taking notes.

## Participants

Our first usability test was with a female participant who has food journaled in the past for her nutrition class. She had a food diary using pen and paper for the most part, but also tried using a food journaling app that tracked exercise and food habits. However, she felt that the app was too tedious so she stopped using it shortly afterwards. We felt like this participant could give us some valuable insight about our app because she has experience with food journaling. We met up with our participant in the Research Commons in Allen Library, where we were able to sit down at a table and have her go through our paper prototype. The library was a communal and comfortable space where everyone was able to meet at.

Our second usability test was with a male participant who enjoyed taking photos occasionally for fun. He mainly used mobile applications such as Snapchat and Instagram to share what he was eating with his friends. He particularly enjoyed spreading the word about new restaurant openings and favorite menu items that his friends may be interested in. This participant enjoyed eating new things and was particularly interested in seeing how often he eats out or cooks at home. We conducted our usability test in Suzzallo Library because the setting was casual enough to make the participant feel comfortable. It was also an easy meeting spot for everyone. We were interested in gaining insight to our paper prototype from a male perspective, and seeing how different genders react to our mobile application.

Our third usability test was with a female participant who was a vegetarian and recently became vegan. She food journaled for a couple of her classes before and also used MyFitnessPal to track her protein intake. She liked how she could see whether or not she was getting her daily vitamins through that app. We conducted our usability test with this participant in Suzzallo Library because it was a convenient location for her to meet after her class. We also felt that this was a good environment to share thoughts and ideas with each other. We were particularly interested in seeing how people who had stricter eating habits, in this case vegan, would influence our paper prototype. We want to make our design accessible to a wide spectrum of people so we wanted to get a diverse pool of participants.

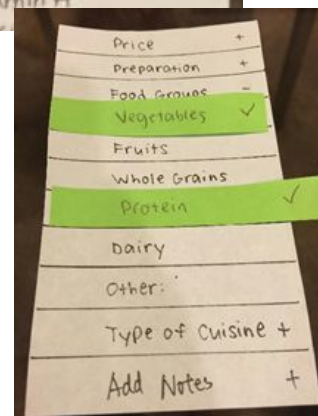
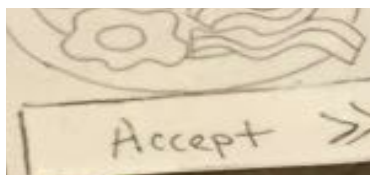
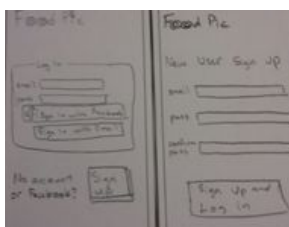
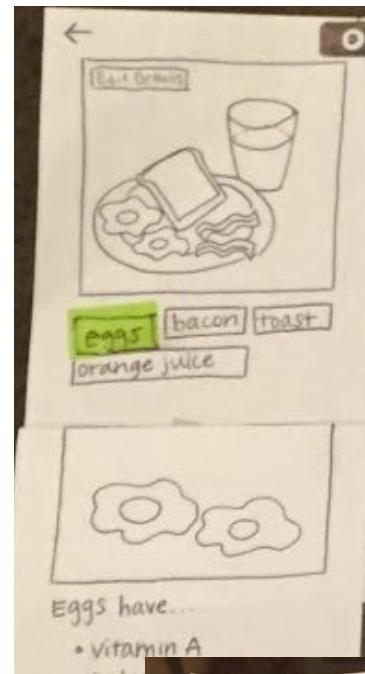
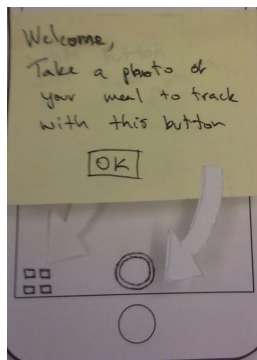
# Testing Results

## Heuristic Evaluation

During the heuristic evaluation, the biggest thing we took away was the confusion surrounding the first screen of the application. We had poor documentation and help. We also failed to meet user control and freedom in places where functionality was unclear.

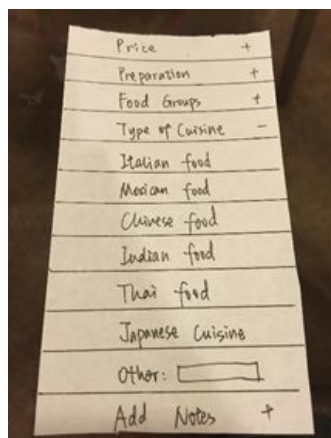
To fix these issues we gave first time tips on the home screen, changed the button for accepting pictures to contain clarification text, and had a tag preselected upon opening a photo such that it was clear this was possible.

Also as a way to recover from errors such as losing a phone or deleting the application, we added an option to login so that the system could remember information about the user.



## Usability Testing Results

Our first participant was not aware that they could select more than one field for "preparation" and "food groups" categories. We had no feedback built in, so we added check marks that would be applied to each value as the user clicked it. They also were not quite sure what 'type of cuisine' entailed, whether it was something like 'breakfast' or 'American'.

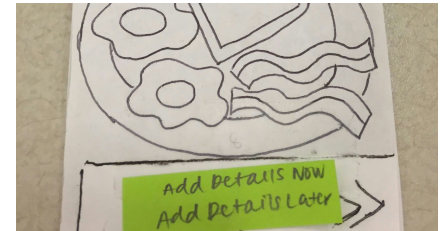


So instead of a blank text field, we gave suggestions similar to our other categories in the expandable list. Our participant noted that they thought it'd be nice to have a field to tag location if she ate out somewhere and wanted to remember where that eatery was in the future. In order to remember unique information about meals, we added in one more "add notes" category to the list.

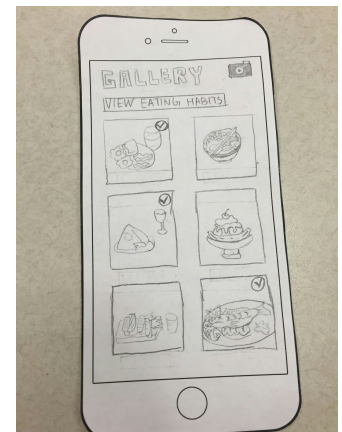
The critique in section as well as the first usability test made us think about people who did not want

to add details at the moment they took a picture. From the screen in which the user accepts the picture they took, we added two options, again changing the button. Along with this we added check marks in the gallery under pictures that had information inputted at some point.

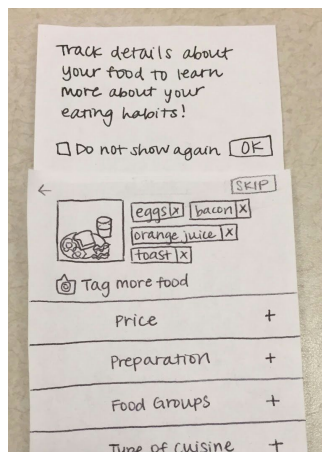
The second participant noted he wouldn't be able to add details from the gallery. He also wanted to see the specific meals over a certain price (ex. the one meal over \$61 he ate), so we made the graphs clickable in the 'review eating habits' screen where clicking on a certain bar will show those photos. Pressing on the graph would now send the user back to the gallery with only the pictures contributing to the bar selected in the graph.



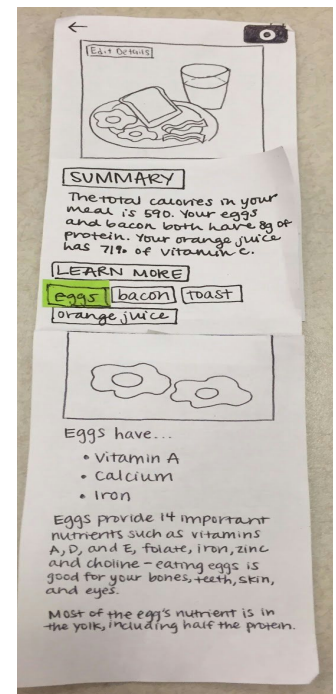
(check marks in the gallery)



The tester noted that filling out the whole accordion was tedious. The last two participants both entered in all the categories in the "Add Details" screen and wanted each portion of their meal to be represented. This made the whole process quite long, and directly went against our goal to make the application low-burden. We added a first-time use tool tip and the option to skip the "add details" screen. We don't want the user to feel obligated to fill in fields for information they feel no need to track. Although not shown here, we will change the wording of 'Tag more food' to 'Add food tags'.

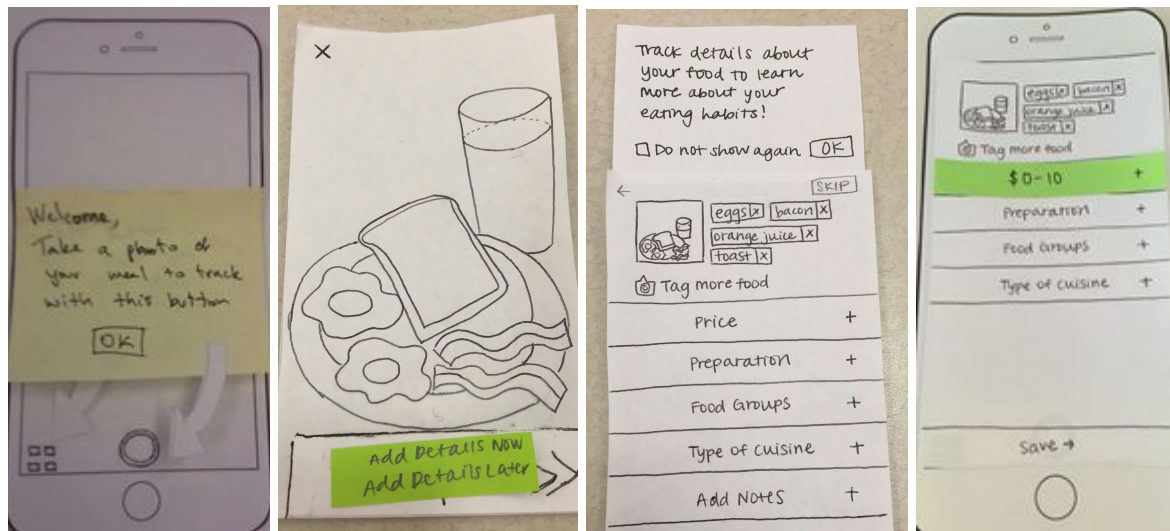


In two of the usability tests users wanted to be able to see an overall summary of their whole meal, instead of just being able to learn about the tags so we presented aggregated data based on all the nutrients in all of their foods in the picture as well as the ability to learn about a specific food. This is also a place where the application can present suggestions based on what the person has been eating recently. This is important because the user can get feedback from the application based on what they eat, such that instead of just reading that fats are bad, the app can say that they are eating fatty foods often.



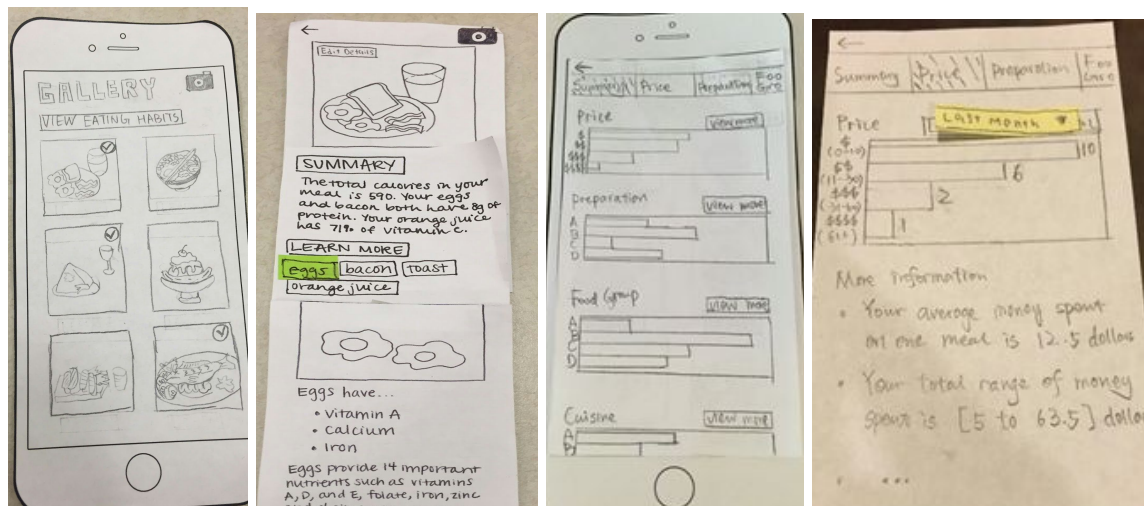
# Final Paper Prototype

## Task 1: Taking Pictures To Track Food With Options To Add Detail



The first task starts at a camera screen, with usage tips for first time use. The photo can be rejected, have details added, or simply saved to the gallery. The user can add details in the form of notes and categories given by the application. The accordion list gives feedback so that the user knows they can add multiple fields from a given category, and what value they selected after selecting it.

## Task 2: Learning and Reviewing Eating Habits

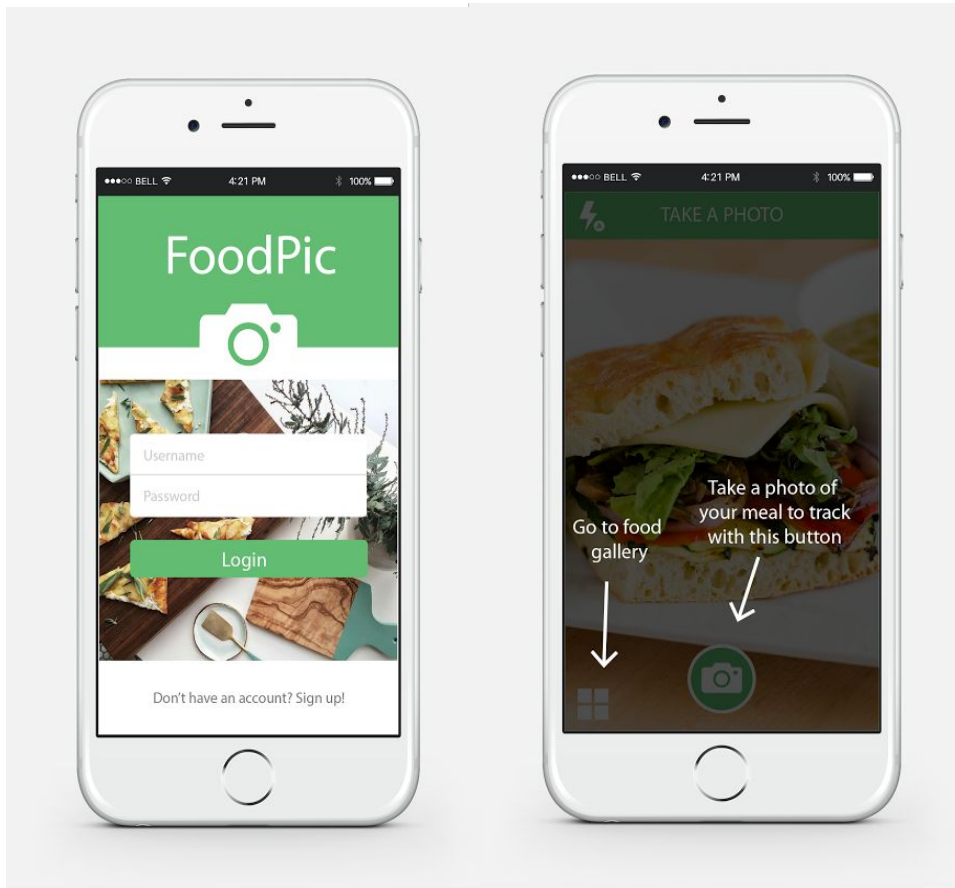


From the gallery the user can see all their pictures. If a picture is selected they can see an enlarged image and an overall summary of nutritional information based on all the tags for food. There are also bar graphs accessed through the "Learn Eating Habits" button where each selected value in the expandable list from task 1 builds up over time as a bar. To see more details about a given category the top bar is selected or the learn more button is pressed.

## Digital Mockup

In the digital mockup, we tried our best to give our users the general idea of what the app is like, what the interactions are. We refined the screens from the paper prototype and made them more realistic and convenient to fit a phone app.

### Task 0: Application Introduction



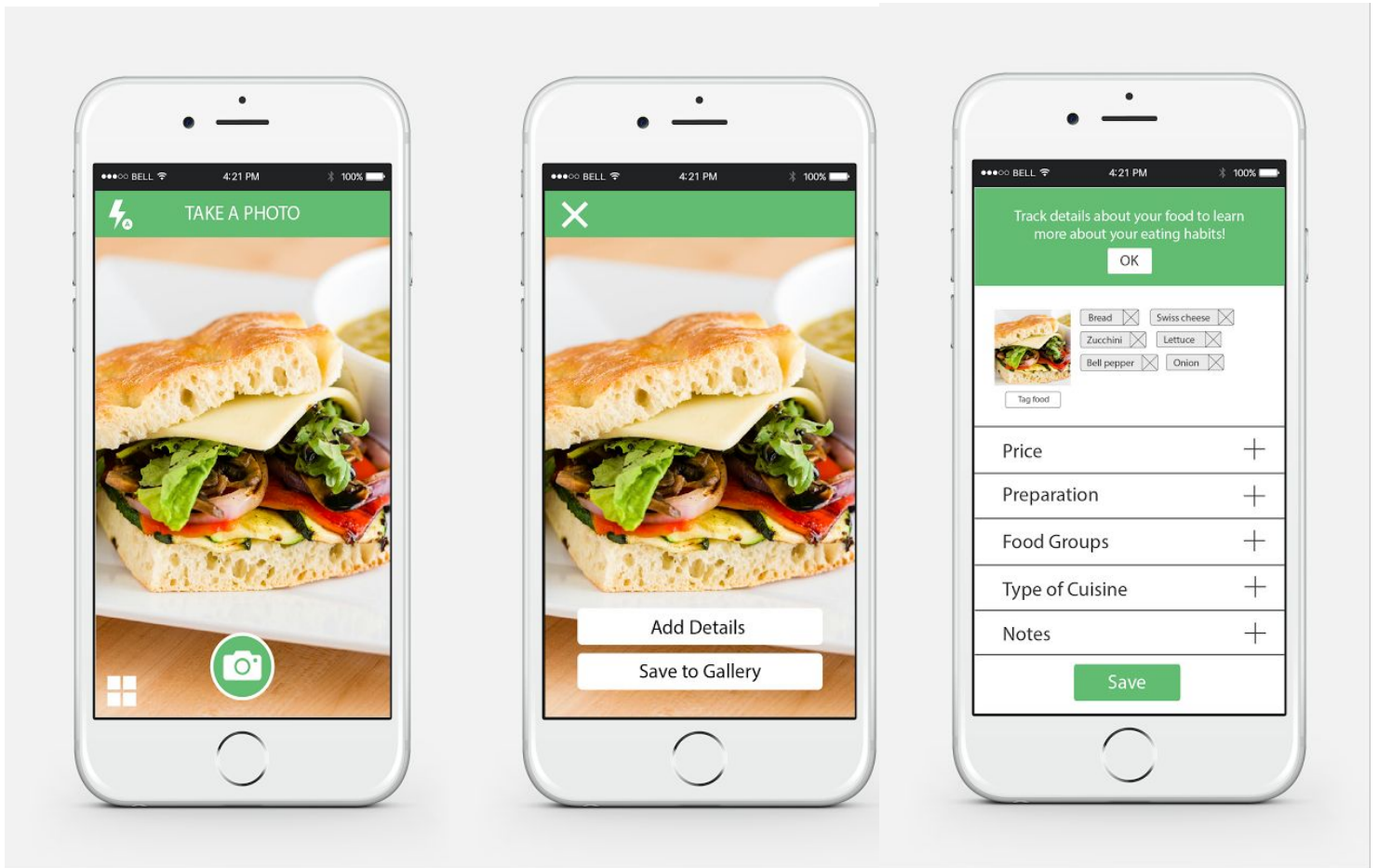
screen 0.0

screen 0.1

Screen 0.0: Application start screen.

Screen 0.1: Tutorial Wizard: introduce the two main functions.

## Task 1: Taking Pictures To Track Food With Options To Add Detail



Screen 1.1

Screen 1.2

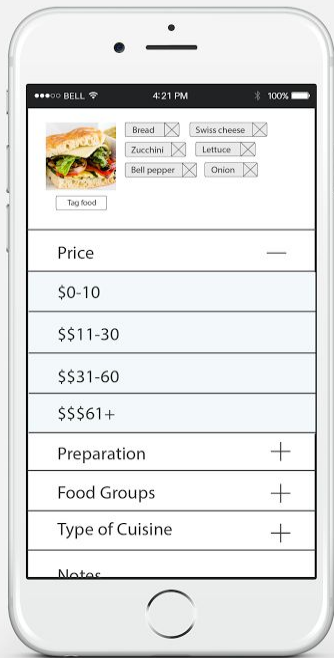
Screen 1.3

Screen 1.1: This is when the user is ready to take a picture and focusing on the food. The user can press the camera button to take the picture or press the gallery button on the left-down corner to go to the gallery straightly.

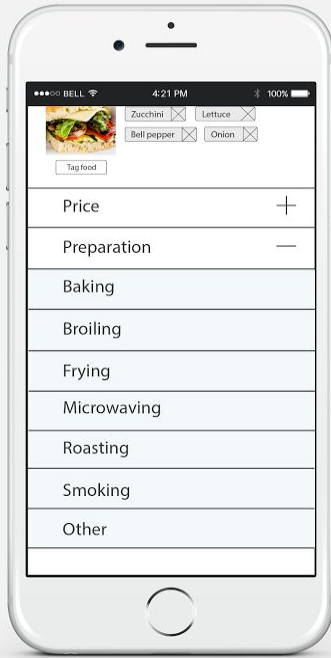
Screen 1.2: The user already took a picture, if he/she is not satisfied with this picture, he/she can use the delete button to go back and try again. Otherwise, the user can choose to go to either the “Add Details” page in Screen 1.3 or go to the gallery page and try to add details later.

Screen 1.3: The user now lands on the “Add Details” page, a short message tells the user to record the details he/she is interested in learning. There are 5 sections on this page, after adding the details the user wants to track, he/she can hit “Save”.

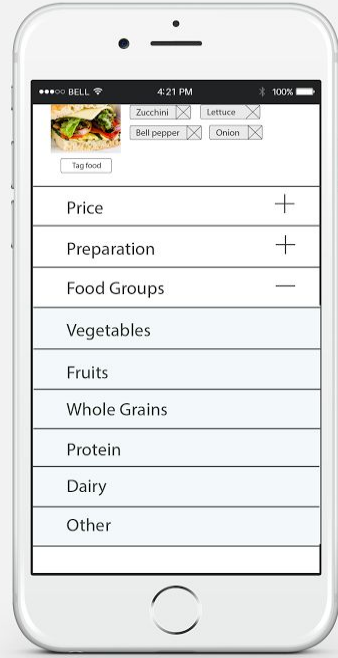




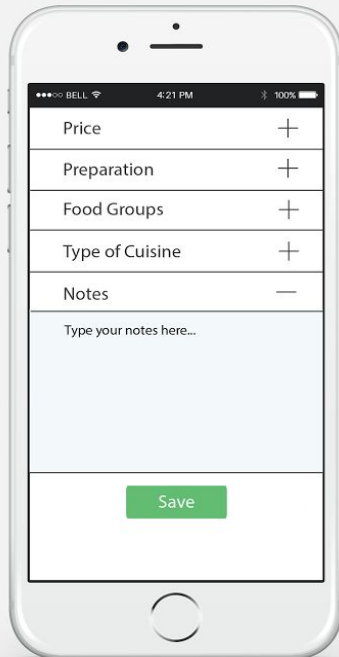
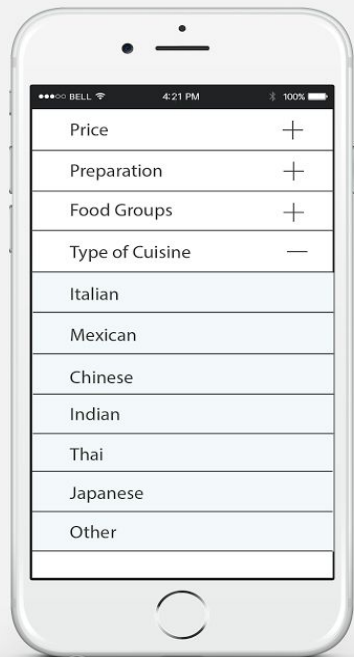
Screen 1.4  
Screen 1.7(below)



Screen 1.5  
Screen 1.8(below)



Screen 1.6

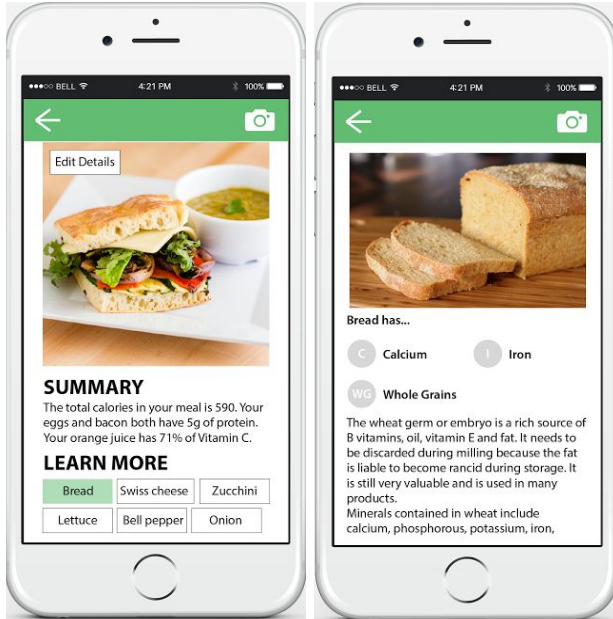


Screen 1.4, Screen 1.5, Screen 1.6, Screen 1.7, Screen 1.8: The user expands each section and adds details for each section. “Preparation” and “Food Group” sections can choose multiple choices while “Price” and “Type of Cuisine” can choose only a single item. Additionally, the user can add some notes like location or their feeling about the food in the “Notes” section. The user will save this meal and go on to the gallery page.

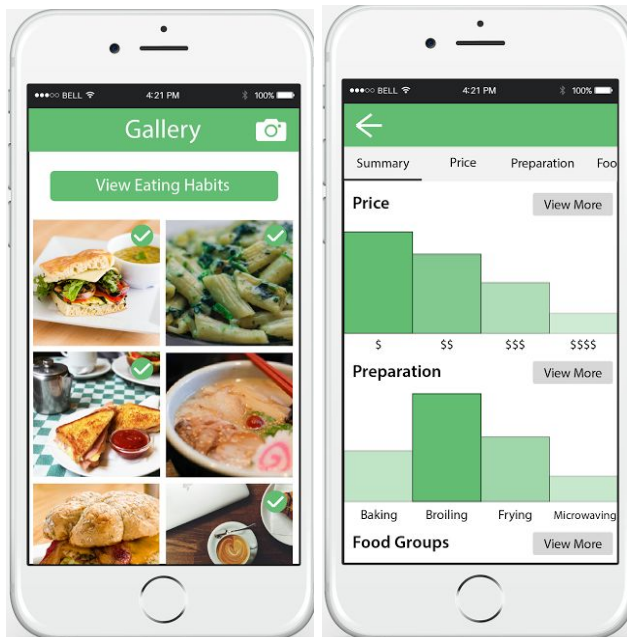
## Task 2: Learning and Reviewing Eating Habits



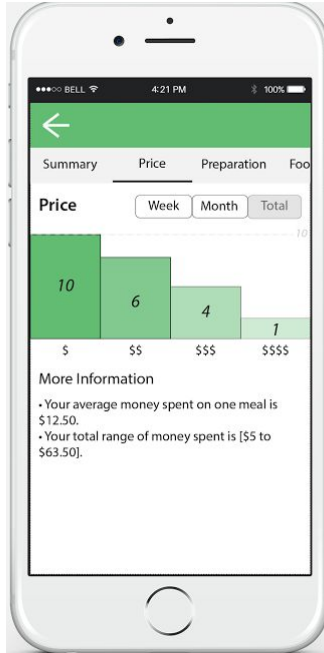
**2.1** This task starts at the gallery. This screen is accessed from the opening screen of the application, or after a meal is saved. The gallery is a time-sorted list of all the pictures the user has saved. The upper right button that is a camera icon will allow the user to take another picture, while pressing on any given picture will expand the picture and show its tags with an option to edit (delete, add tags, and alter tags and fields).



**2.3** After pressing a tag the user can see what they ate in more detail, as well as learn about what they are eating. The user can see how often they are ingesting particular vitamins and nutrients based on how often that tag appears throughout their photos. Furthermore, the application tracks and compiles data based on fields and tags.



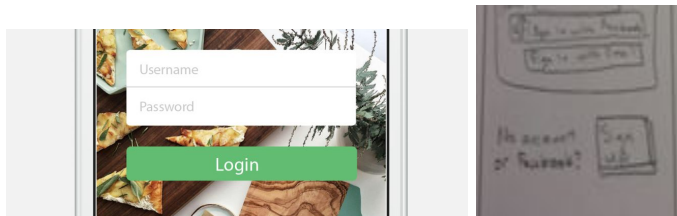
**2.4** After the user hits the back button, they come back to the gallery screen and can hit the “View Eating Habits” button to be taken to a screen showing them data accumulated over time for the types of food they ate. The scrollable tab bar along the top of the screen allows the user to select a particular field to see more detailed graphical information. The tab bar scrolls left or right by holding and dragging. The same page can be accessed from the button near each graph labelled “View More”, while “Summary” is selected by default along the top.



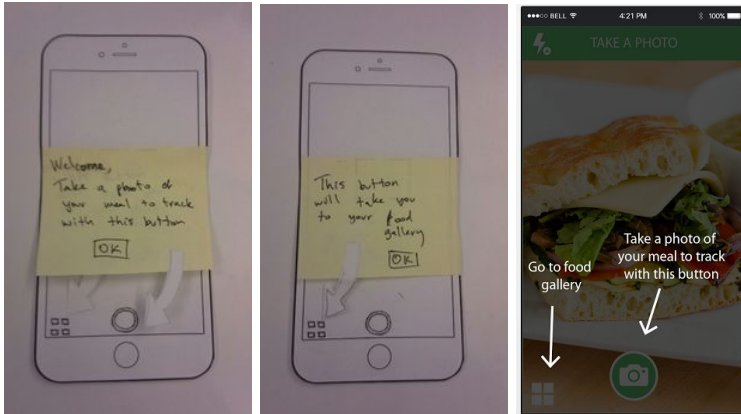
**2.5** With more detail the user can review exactly how often they have selected each field over time. Here the user selects “Price” and the graph is displayed. The span of data can be changed with the buttons above the graph to look at data recorded more recently or overall. The “More Information” section lists facts or suggestions the application calculates based on the patterns found in the data. If the user selects a bar in the graph they will be taken to the gallery with the pictures contributing to the graph.

## Design Changes

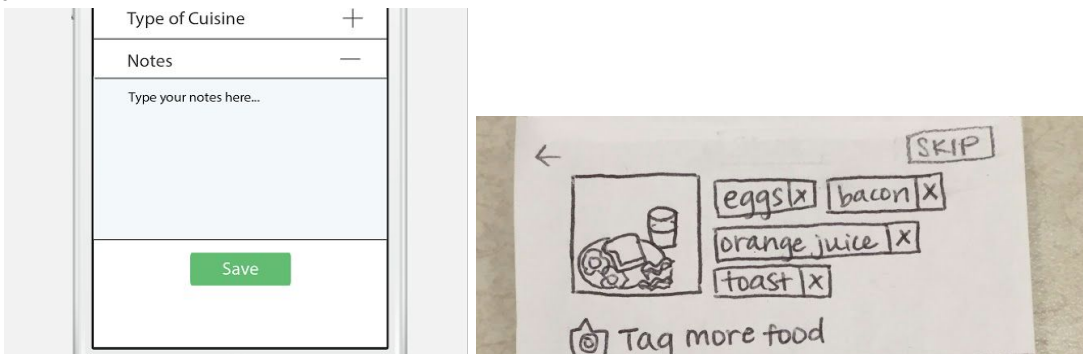
Most of the design changes from the final paper prototype to the digital mockup are minor. The “Sign in with Facebook” option was taken out, because we had never added in functionality for our app to be compatible with Facebook and this simplified the login functionality.



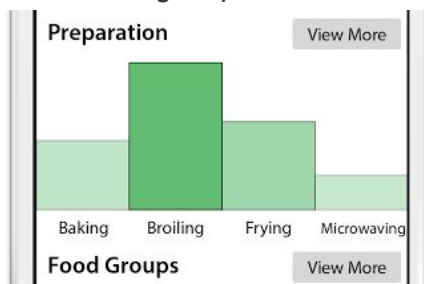
For the first time tips, instead of pop-ups, the high fidelity allowed us to darken the screen such that both tips could be shown at the same time and the other aspects of the home screen could still be seen without being blocked. The camera screen also now includes an option to control the flash.



The two buttons allowing the ability to save directly to the gallery or add details made the option to 'skip' adding details from the "Add Details" screen redundant, so it was not included. Also with the ability to make things look more like buttons, the "Save" button was altered to look distinctly different from the options in the expandable list.



The data graphs being displayed are also now vertical bars instead of horizontal, with the biggest bar being emphasized with a darker green.



## Discussion

In general, we think the process of iterative design is very effective and powerful to design an application. We relied a lot on the user feedback which we think is the most important thing to form a better design. At the very beginning of the design process, we spent a lot of time thinking about what the structure and elements our paper prototype should include, which made up a long list of aspects of a certain meal. Then we realized that what aspects we should include should depend on the user's preferences. Therefore, we sent out a survey to find out what the users want to track and got a hundred responses back. The top four aspects are: price, preparation, food groups and type of cuisine. When presenting our first paper prototype to users for their feedback, we find that there are many problems we never would recognize. Like the arrow button for accepting the photo. Users seem to be confused about how the arrow button would work, as it could stand for swiping and taking another photo, instead of accepting this photo. We changed it to "Add details" and "Save to Gallery" to make it more user friendly and consistent with our app. It appears that it is preferable to improve our design by getting more reliable user feedback.

During the heuristic evaluation, we revealed several essential problems of our application including unclear meaning of the first screen of the application, poor documentation and help, missing control with the system. We also failed to meet user control and freedom in places where functionality was unclear. We then modified the paper prototype according to these findings and generated a new robust frame of our design. After this stage, we then went on the usability testing stage, where we could get reliable and useful feedback from users who would potentially use our application. We discovered some misunderstandings when conducting the usability tests. Such as one participant was not aware that they could select more than one field for "preparation" and "food groups" categories and another participant would love to add the location he had the meal. We fixed the first problem by adding checkmarks on the side of the selected entry and the second problem was fixed by adding another "Add Notes" field, etc. Finally, the result seemed all good and we started to finalize our design and converted it into a digital mockup.

Our tasks were to 1) track food through photos with options to add more details and 2) learn about eating habits. We made the tasks more specific by dividing them into smaller tasks such as "Take a picture of your meal", "Add the details for tracking this meal", and "Can you find out what is the average money spent on the meals in the recent month?". By adding some descriptions the participants would feel more reasonable to complete the tasks and make the whole process more user-friendly. We want to learn how the participants would navigate through the design and use that to think through our design again.

We think iterative designs are really necessary and we could have used more. For example, our digital mockup would improve more if we can do more usability testings and gain feedback from others. Since digital mockup are much more visualizable than the paper prototype, users would have a better understanding and trust on our app which may cause different feedbacks from the formal usability tests.

## APPENDIX

### FoodPic Mobile App Usability Testing Plan

Purpose: The purpose of this usability study is to examine the usability of FoodPic mobile app

To be more detailed, here are a list of things we are planning to include:

- Recruitment students or employees who want to learn about their eating habits and love to take photos and share with others
- Introduce them to the FoodPic app.
- Have each participant complete a list of tasks on the FoodPic paper prototype.
- Take notes during each study session while observing the participants and their interaction with the paper prototype.
- Interview participants after each study to get more in-depth knowledge about how the paper prototype works for them.
- Modify the current paper prototype based on feedback and iterate.

### Mobile Adoption Usability Study Kit

Study Equipment

- Laptops.
- FoodPic paper prototype kit
- Note taking tools

Roles

- Facilitator: conducts interviews and tasks
- Observer/Note taker: takes notes, and records critical incidents during interviews and task scenarios.
- Computer: Interact with users using the paper prototype

### Script

“We are interested in improving people’s food journaling experiences and finding simple ways to allow people to learn about their eating habits. During this usability test, there are no wrong answers. Just remember that we are testing the app itself, not you. Please think aloud as much as you can. Do you have any questions?”

### Initial Questions

1. Have you ever food journaled in the past?
2. What tools did you use?
3. What do you usually want to learn about your eating habits?

### Task Scenario for Participants

1. Track food through photos with options to add more details
  - a. Participant Task 1: Take a picture of your breakfast.
  - b. Participant Task 2: Input details about your meal and save it into your photo gallery.
2. Learn about your eating habits
  - a. Participant Task 3: Learn about the eggs that you just ate for breakfast.
  - b. Participant Task 4: Learn about how much money you spent on food in the last month.

**Debrief Questions**

1. What did you like the most about our app?
2. Is there anything that you found confusing about our app?
3. Is there anything else that you would want to see in our app?