Food Scanner

Team Black Dragons

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Problem and Solution Overview

Among the plethora of challenges within the scope of feeding a family healthy food, we have decided to focus on distinguishing healthy food for your entire family. Problems like picky eaters, dietary restrictions, and desiring more meal diversity can make prioritizing health for the whole family a very time consuming task. Instead of an app that meets the needs of a single individual, we are proposing a family-centric app with multiple facets for tracking food allergies and aversions, setting goals, finding and saving recipes, and tracking food consumption -- each of these with family overviews and specifics for family members, which can all be used to help meal-decision making in the future. The crux of this app is the scanning capability. The app will allow users to scan nutrition labels in the store to quickly receive feedback about the food, especially information about allergies, goals, and recipe compatibility. Scanning the receipt is also an option for less tedious operation, and incorporating budget concerns.

Contextual Inquiry Target, Stakeholders, and Participants

For contextual inquiries, we sought out participants with three qualifications: parent(s) of a family with young children, strong health consciousness, and the primary grocery shopper for the family. We felt that each of these three qualifications helped narrow our audience to a specific group that had unmet needs in the family meal domain. We performed three contextual inquiries with participants who met our criteria and found that all three experienced similar problems and concerns during this process. The groups all felt that whatever process they used to prepare for their shopping trips was too time consuming, and that a better solution was needed.

Our first contextual inquiry was with Kevin. Kevin is a borderline health fanatic. He has prepared a meal component guide to help him plan a healthy dinner for his wife and family. Essentially, he participates in the task of “meal planning”, where he carefully selects classes of ingredients to compose the meal in a way that will meet macro goals (achieving a specific intake ratio of fat, carbohydrates, and protein). This contextual inquiry was focusing on how he makes the selection of foods to meat he and his family's health goals. We sat down with him prior to

grocery shopping, and observed his methodology of selecting the ingredients that would go in that night's dinner.

The second participant observed was Julie. Julie is married and has two girls ages 5 and 2. She is a stay-at-home mother who watches her children and provides meals for the entire family. She is physically active, healthy, and desires the same lifestyle for her growing family. There were two observations made with Julie. The first involved her talking through her meal planning process that happens with pen, paper, and online resources. The second involved a typical shopping trip to Costco in South Jordan to carry out part of her meal plan. Through these experiences, we were able to learn some of her struggles to provide balanced, healthy meals for her children.

The final participant, Jane, is a mother of two children aged 3 and 4. Jane is a full-time graduate student who is frequently worried that she is not providing healthy enough options for her children, and who has very little time to devote towards keeping track of the foods her family consumes. Jane has spent time searching for the a solution to optimize the time she allocates to the problem, but since she hasn't found the solutions she has been looking for she usually doesn't follow a set process and improvises once in the store. This inquiry was conducted at the Whole Foods grocery store at Trolley Square in Salt Lake City with Jane and her two children. Jane had prepared a list; but as her shopping during the inquiry progressed, she frequently began to add items to her cart which were not on her list and which were both less healthy and took less time to prepare. Jane was ultimately less satisfied with her purchases than she had anticipated she would be.

Contextual Inquiry Results and Themes

In the contextual inquiry with Kevin, we learned that some people (even health fanatics) aren't too concerned with every single nutritional value listed on a food label. Rather, people generally have a few categories where they are concerned. In the case of Kevin, he is concerned with Fat, Carbohydrates, and Protein. Another participant, however, has been warned by the doctor about health risks, so he is more concerned with cholesterol and salt. As a result, we can see the common theme that while all nutritional categories are required on the back end of a food tracking/management solution, users have a specific set of nutritional categories that are the most important to them that should be surfaced on the front end.

Another issue that was found during the inquiries was that the shopping experiences of our participants is generally not an enjoyable one--especially if they were shopping with their children. Julie struggles to make it to more than one grocery store at a time because her children have a small shopping time window in which they will cooperate. Her two-year old threw a temper tantrum and was screaming when she suggested that they stop at a bakery to get a loaf of bread after the first trip to Costco. The atmosphere inside of a grocery store is not relaxed and our participants who were shopping with their children during the contextual inquiry were frequently distracted by the children. This resulted in the parents feeling rushed which led

them to compromise on their food choices more often than they likely would have had the children not been there. These observations lead to the conclusion that a solution to the problem would need to be quickly used at certain points of a shopping trip rather than demanding long periods of concentration and significantly extending the shopping trip.

It was also clear from the time spent with the participants that, while many resources currently exist to help solve this problem, the information that they were looking for is scattered throughout the internet and in magazines and cookbooks. Searching through such a large set of data is a very real challenge, especially when trying to keep specific the needs and desires, like those of small children and of Kevin and his wife in mind, making the planning phase very time consuming. Jane mentioned that she spent about fifteen minutes preparing to shop, and knew she would have needed more to prepare fully. In addition to the complications in planning for shopping is the fact that much of the available information is in a format that is difficult to parse on a smartphone screen, which was the most used tool for the process. A solution designed to minimize these problems would have to take into account the need to present the desired information in a format that is easily consumed on a phone, potentially from within a crowded and distracting location like a store.

Answers to Task Analysis Questions

1. Who is going to use the design?

The primary group of users for this design will be health conscious young parents. Secondary groups could be coworkers or roommates who want to plan healthy meals together.

2. What tasks do they now perform?

These groups currently use cookbooks, blogs, social media, magazines, and research studies to plan meals. They shop at grocery stores occasionally and loosely follow these plans. They search nutrition labels to find details about the ingredients, and the nutritional values each food will provide.

3. What tasks are desired?

Our users desire something that will help organize their meal planning efforts and ultimately save them time. They desire a faster approach to determining whether a food is healthy, and whether it will meet their goals or not.

4. How are the tasks learned?

The tasks must be simple enough that they can be learned the first time using them. If the system is too complex we are afraid our users will lose interest.

5. Where are the tasks performed?

The tasks should be able to be performed anywhere with mobile devices and a connection to the internet. This will allow for busy parents to plan meals in any spare time they have, which

could include during commute time, in the grocery store, waiting for doctor's appointments, in the office, in the kitchen, etc.

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

This design allows for heavy interaction between users and their data. The data will help them decide which meals to plan to prepare.

7. What other tools does the person have?

The person using our design will still have their current sources of information to search and meal plan. Our design will allow the planning to happen more efficiently and effectively.

8. How do people communicate with each other?

Our design does not require users to communicate with each other outside of the methods that they normally interact. Every member of a family or group will have access to the group's progress and goals.

9. How often are the tasks performed?

Meal planning and shopping should be weekly or biweekly activities. Meal tracking is an almost daily activity.

10. What are the time constraints on the tasks?

The scanning portion requires quick (near immediate) feedback. Otherwise this feature will lose efficacy.

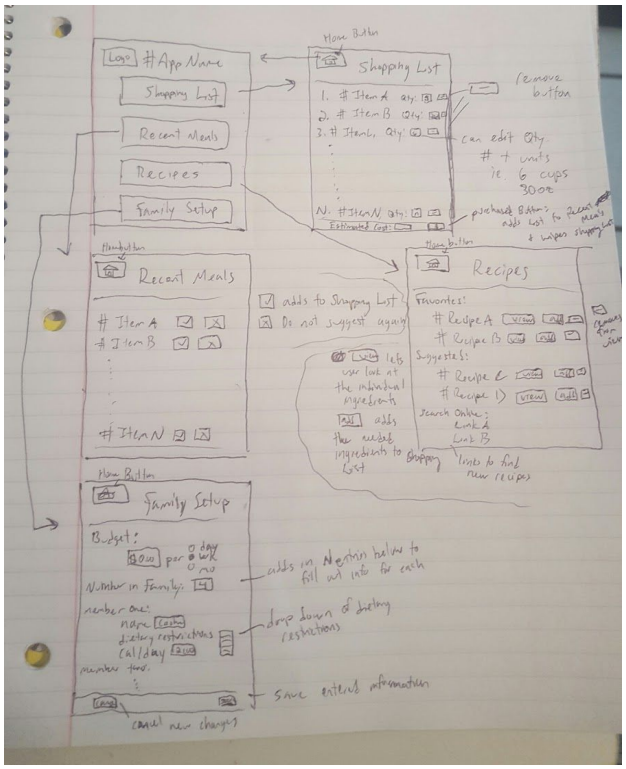
The meal planning tasks don't have particular time constraints. Any effective design will need quick tasks to allow the user to save time. Our small sample from contextual inquiries needed about 15 minutes to plan meals for a week and 30 minutes to shop.

11. What happens when things go wrong?

When our design experiences trouble there will be no major catastrophe. The user will sense that something has gone wrong and may continue performing the tasks on pencil and paper. This will be an inconvenience that causes frustration but it will not cause any damage to the user. Data loss would be the worst consequence, and this could be mitigated with data backup solutions.

Proposed Design Sketches

Initial Design One:



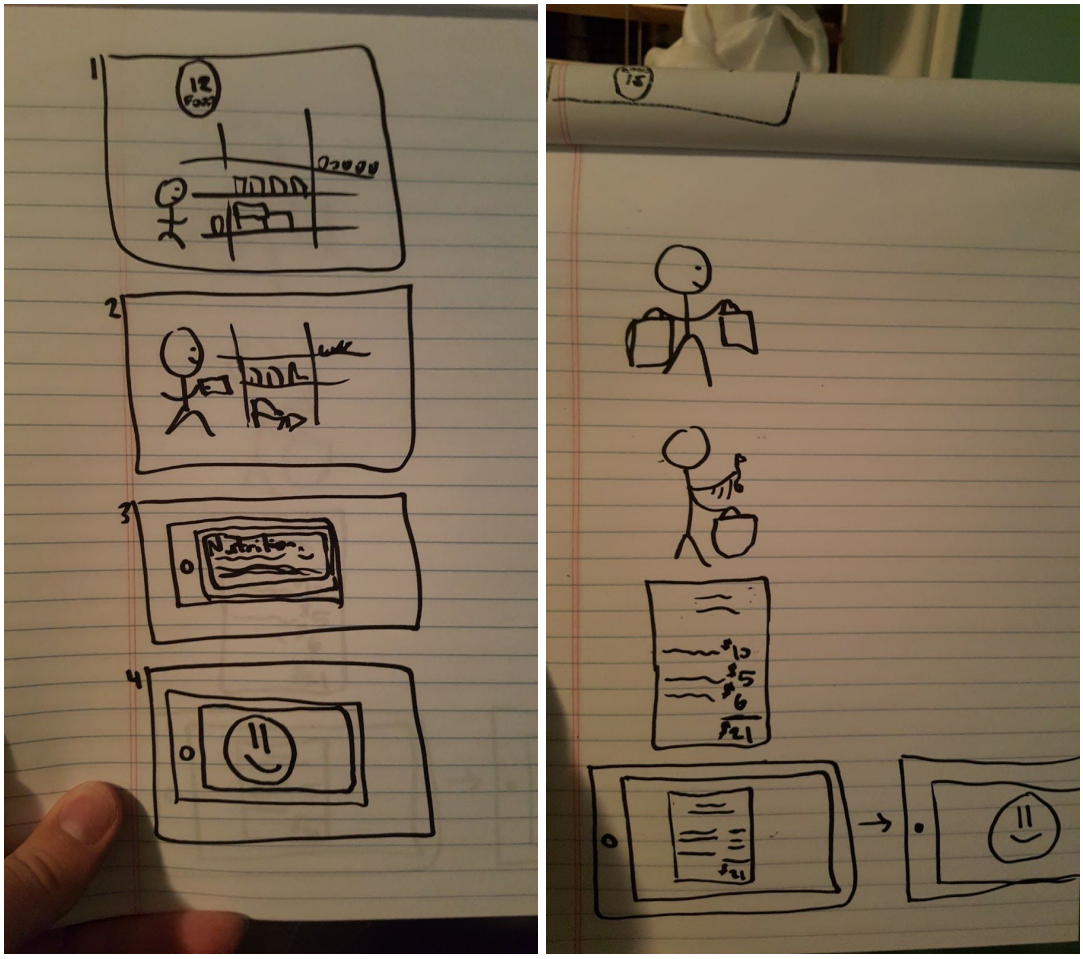
Tasks: Budget, Recipes, Meal Tracking, Shopping List

This app allow users to update a shopping list at anytime, for use on their next store visit. It tracks their recent meals (recently purchased items) and allows them to easily add it again to the shopping list, or remove from the list if they did not like it. It also has a recipe interface for users to view their added/favorite recipes. Here they can view ingredients and add all the needed ingredients to the shopping list with one button press. There are also links to find recipes from popular websites online. The last functionality is in the Family Setup interface. This allows the user to enter a budget in a specific timeframe, as well as add individual family members, listing their caloric intake per day and dietary restrictions.

Initial Design Two:

Tasks: Finding Healthy Food, Budget, Recipes, Shopping List

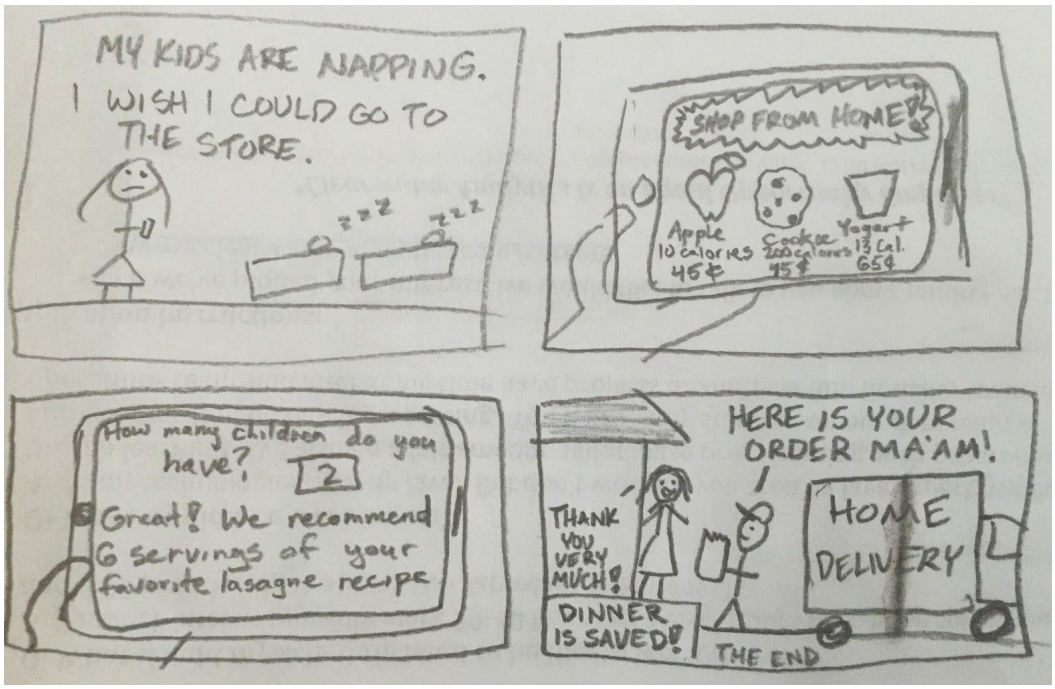
This app will use image processing to allow the user to point the camera on their phone at either a receipt or a nutrition label. Upon doing so, the app will process the information and provide immediate feedback whether those food items are 1) meeting their goals, and 2) affordable. Scanning nutrition labels of healthy/inexpensive food will show a smiley face. Scanning nutrition labels of unhealthy or expensive food will suggest alternatives.



Initial Design Three:

Tasks: Budget, Finding Healthy Foods, Recipes, Shopping List

This application will allow the user to shop for meals from home. The prices, nutritional information, and recommended servings will all be available to help in decision-making. This design is meant to help our users who struggle to get their children to the store or do not have time to shop. A home delivery service would then bring the right amount of food to a user's door.



Design Decision: During the contextual inquiries we discovered that staying under budget, finding food that accommodates everyone, and planning healthy meals with variety can be major struggles. We have selected a meal planning app that combines ideas from our first and second designs to assist families in solving these problems. Our app will have the ability to scan nutrition labels and receipts to help in decision-making. These tasks are the most compelling because we can provide a new design that has not been developed previously.

Written Scenarios

Scenario 1 - Shopping whilst keeping all of family dietary goals and restrictions in mind:

Claire is a mother of two, Ann and Mason, and is married to Todd. She works hard to keep her family eating healthy foods to prevent obesity and help Todd with his heart conditions. Todd needs to keep his sodium and cholesterol low. Chaire and Mason also have dietary restrictions. Claire is allergic to gluten, and Mason is lactose intolerant. Claire is attempting to lose weight by watching her caloric intake.

Step 1 - Add each of the family members into the app. For each family member, select from dropdown lists their priority nutrients (sodium and cholesterol for Todd), and their dietary restrictions (gluten for Claire, and lactose for Mason). Lastly, optionally input health goals for each person (lose weight for Claire).

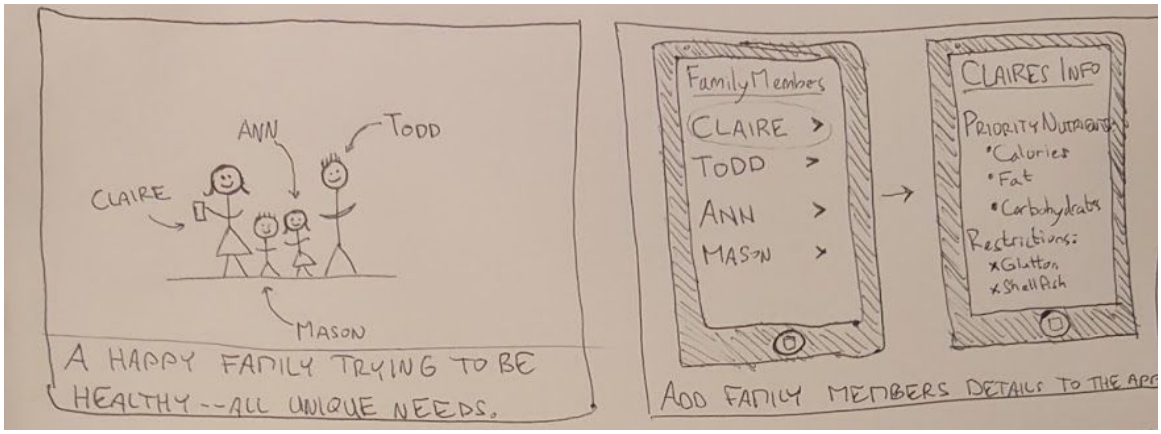
Step 2 - Browse recipes -- the app will filter results based on the information included in each of your family members. Select a recipe.

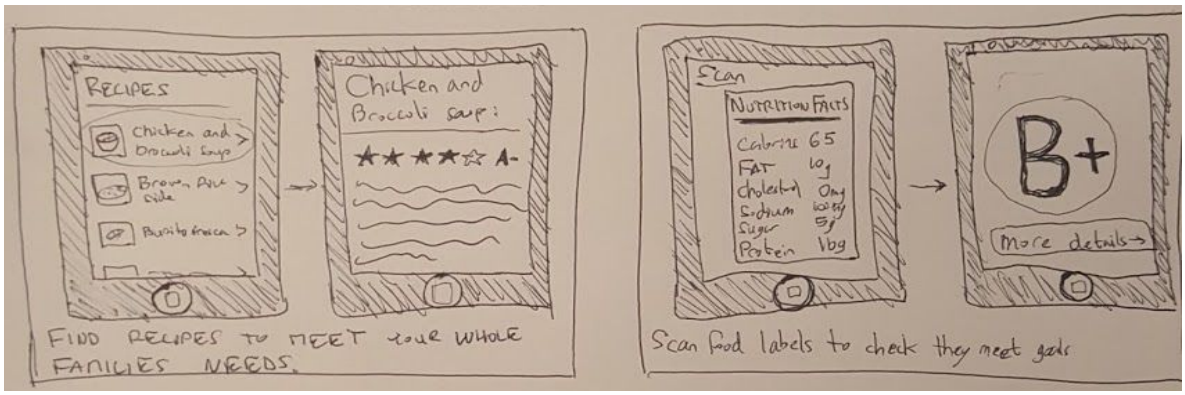
Step 3 - Grocery shop. Use the scanning app to check foods. It will quickly let you know if they are A) part of your desired recipe, and B) healthy and within your family's dietary restrictions. See suggestions for alternate food options if something isn't going to meet your family's needs.

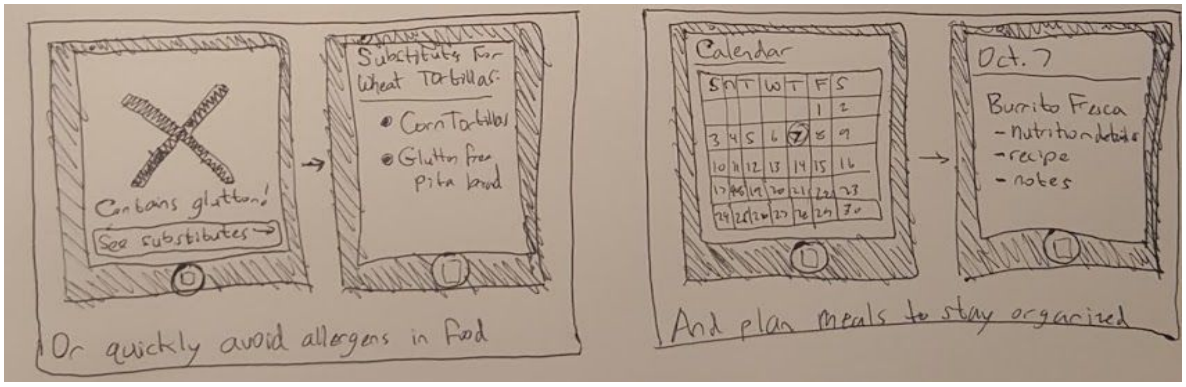
Scenario 2 - Creating custom meal plans to fit different dietary goals.

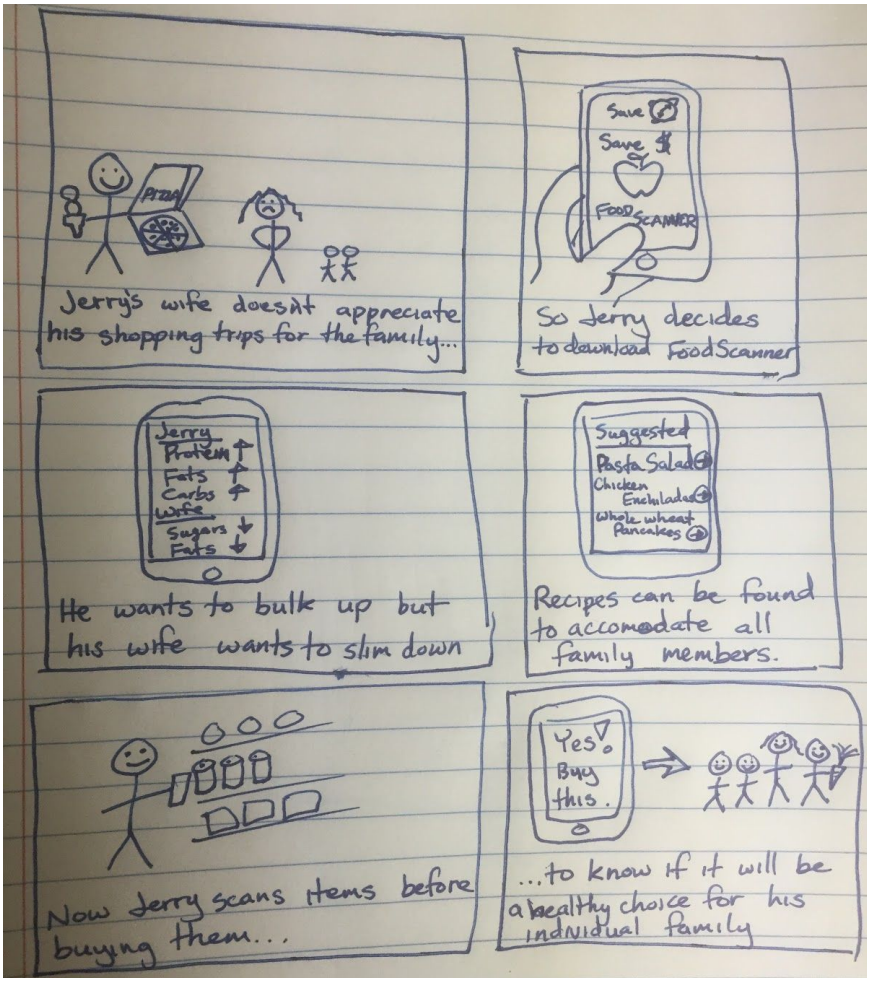
Jerry has a wife and two children. He and his wife have different nutritional goals which make it difficult to shop for their children. Jerry decides to download FoodScanner to find common ground between their diets. FoodScanner recommends meals that will meet both of their needs as well as the needs of their children. When he is in the store he scans food labels to know if he should buy them. It is as if his wife is in the store with him helping him make smart choices.

Storyboards of the Selected Design






Contains gluten!
See substitutes
Substitutes For Wheat Tortillas:
Corn Tortillas
Gluten free pita bread
Or quickly avoid allergens in food
Calendar
Oct. 7
Burrito Fresca
- nutritional info
- recipe
- notes
And plan meals to stay organized


PIZZA
Jerry's wife doesn't appreciate his shopping trips for the family...
Save
Save
FOOD SCANNER
So Jerry decides to download FoodScanner
Jerry
Protein
Fats
Carbs
Wife
Sugars
Fats
He wants to bulk up but his wife wants to slim down
Suggested
Pasta Salad
Chicken Enchiladas
Whole wheat Pancakes
Recipes can be found to accomodate all family members.
Now Jerry scans items before buying them...
Yes!
Buy this.
...to know if it will be a healthy choice for his individual family