

CALCULATOR APP DESIGN



The **Catered Kitchen**
Food Prep Planner

PROCESS BOOK

Debbie Murdock • Interaction Design • Fall 2019

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Calculator App

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Define: calculator app

CALCULATOR APP DESIGN

To build an interface for a calculator app to help with a daily function. The purpose is to research, brainstorm, develop and test a design concept.

THE CALCULATOR APP MUST INCLUDE:

- A design for a smart phone
- The design can be portrait or landscape
- Design 5 to 10 functional screens

PROJECT PARAMETERS

- Define the problem: verify what is required of the project
- Conduct Research: on history, type, smart phones, app design, purpose of calculators, well designed interfaces
- Choose Subject: by brainstorming, choosing a target audience, and developing a list of 3 to 5 things I would like my app to do
- Usability Testing: brainstorm and test concept with paper prototyping, sketch out ideas, create scenarios and persona's to help with user testing



Research: calculator app

HISTORY

Calculators date back to the time of the Egyptians when they used the **Abacus** to make addition and subtraction easier. The beads would slide across a rod to perform the arithmetic and there were 10 beads in a row.

Many transitions have been made since then from a **mechanical calculator** that was available to consumers in 1820 and was patented by Thomas de Colmar's. It introduced a four function capability. Meaning, it could perform addition, subtraction, multiplication, and division.

During the electronic age calculators would evolve using transistors so they could become an **all-electronic calculator**. Eventually in 1970, the **hand-held calculator** would be available and had a chip that would help the process of the calculator including the use of decimals and a screen display.

This opened up the market for different designs. Eventually, displays would improve. The cost of the calculators would become more affordable and different functionalities would develop for uses of the calculator.¹

Sources:

1: <http://bit.ly/2nfTk6f>



Abacus counter



First commercial counting machine



All-electronic calculator



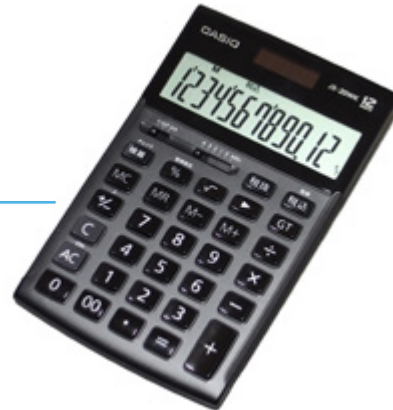
Hand-held calculator

Research: calculator app

TYPES OF CALCULATORS

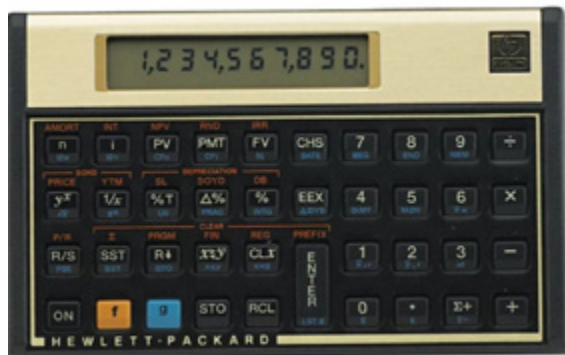
Basic

This is a hand held four-function calculator. It can perform the 4 arithmetic functions addition, subtraction, multiplication, and division



Printing

Function is used to provide a printed record of the calculations and has a paper tape attached



Financial

Allows you to calculate mortgages, depreciation, bond yields, and balloon payments. It will compute time value of money

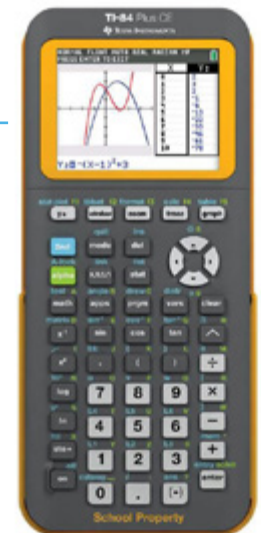
Scientific

Performs scientific notation and supports the functions of algebra and trigonometry



Graphing

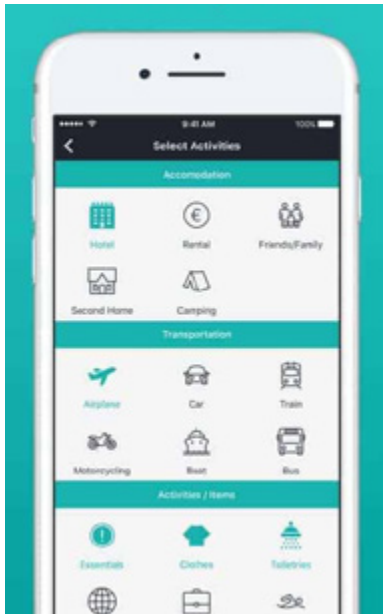
Graphs functions, can examine points that intersect, plot graphs, and solve equations



Research: calculator app

VISUAL RESEARCH

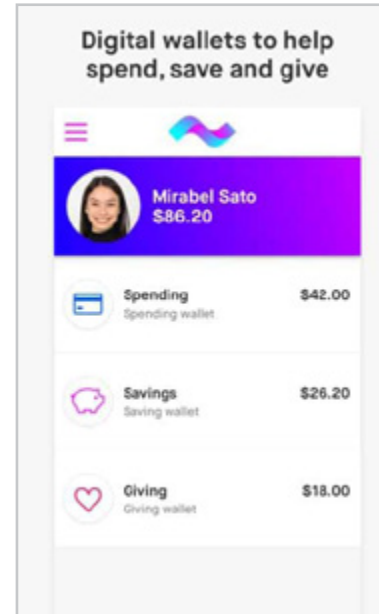
Usability and good design are the most important for successful apps. When looking for effective app interfaces I gravitated towards clean designs. The apps that were cluttered and had too many elements were overwhelming for my eyes to view through. I noticed that implementing just a few colors was better than the whole palette.



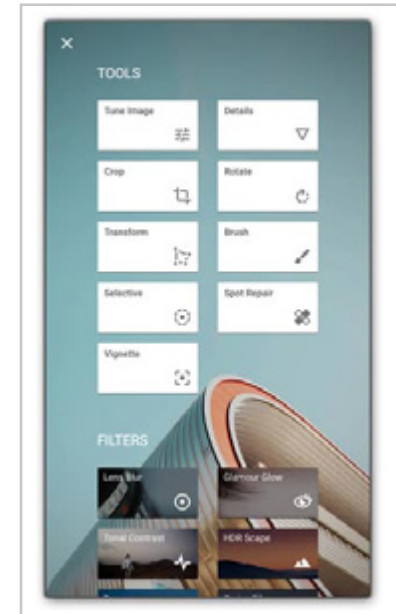
Only two colors are used in this design. The icons make the functions of the app easier to find.



This app only implemented two colors but used red in order for the user to know what to click on.



This is a very clean design and the typography helps to define what the purpose of this app is.



This is aesthetically pleasing in the background. The tools are kept very plain and black and white.

Research: calculator app

SMART PHONE TECHNOLOGY

A smart phone gives you accessibility to information quickly. It allows you to have applications(apps) on your mobile device to bypass the full websites and give the user more functionality in the task they would like to perform. The apps definitely make use of the smart phone easier. It takes time to know which apps are going to work best for your lifestyle and uses.

Advantages:

- Access to Internet
- Different ways to communicate
- Connect to several devices
- Download different applications
- Improved communication
- Alarms and reminders
- Entertainment
- Knowledge

Disadvantages:

- Distracting
- Unreliable data connection
- Expensive technology
- Safety concerns
- Being isolated from reality
- Overuse
- Waste time



Smart phone device with applications

Research: calculator app

BRAINSTORMING

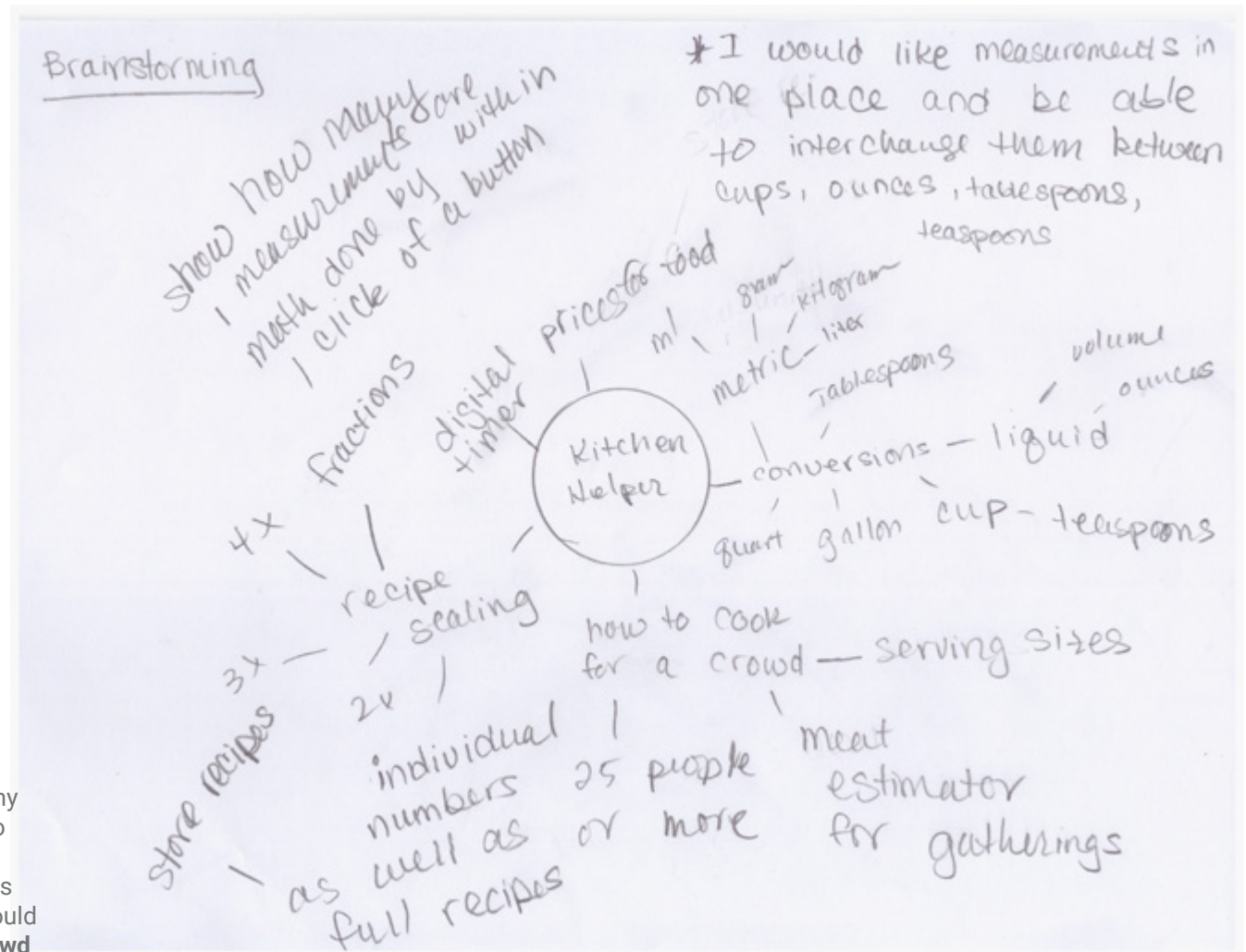
Possible calculator apps:

- pregnancy
- ovulation
- measurement conversion
- cooking
- shopping
- savings & goals
- running
- BMI
- weight loss
- food cost
- budgeting
- fitness
- servings-how much to make
- currency
- kitchen helper
- fitness
- out of debt
- vacation savings
- Bill organizer
- gratuity

FINAL SUBJECT

Cooking for a crowd app

After going through the mind map my ideas seemed scattered. I wanted to focus on one thing. I really liked the meat estimator and decided to focus my thoughts towards an app that could **calculate food needed to feed a crowd** and it would give the amount needed in **pounds** to help with your shopping



Research: calculator app

TARGET AUDIENCE

This app is going to be used for individuals that cook for large gatherings. They are always wondering how much to buy and if it will be enough to feed everyone. This could also be for those individuals who cater parties, family gatherings, or church dinner events. The people that use this app will know their way around the kitchen but just need a little extra assurance that they have enough food. This app would be used to help reduce any concern of running out of any of the food items purchased.

App interface functions:

- calculate how many bread or rolls to buy in pounds
- calculate how much meat will be needed with or without breading or other sauces
- calculate how many bags of salad or ounces of romaine would be needed per guest
- calculate how many pounds of vegetables needed per guest
- calculate how many potatoes in pounds needed per guest



A cook preparing food for a large meal

Scenarios: calculator app



Melody is planning to attend the annual Murdock family camp. She was assigned one day to cook dinner and is in charge of buying the meat. There were 60 people who confirmed that they would be attending the camp. She has no idea how much to buy for pulled pork sandwiches. There are a lot of big guys in the family that can eat a lot and does not want to run out of food or have tons of leftovers especially while camping.

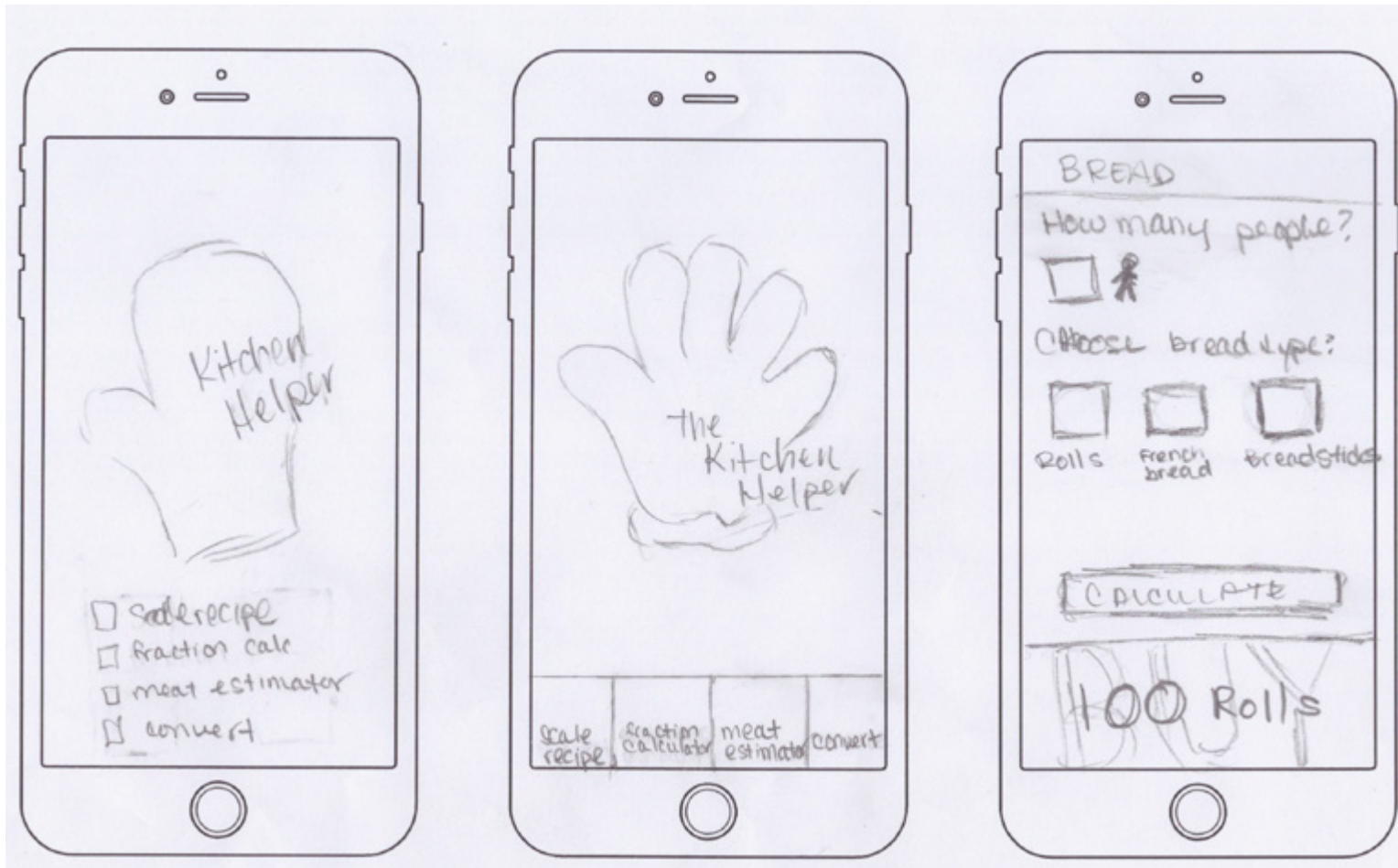


Brandon's wife sent him on an errand to buy potatoes for the church activity tonight because she had to work. When Brandon got to the store he realized he forgot to ask how many potatoes to buy. He did know that he needed enough potatoes to feed 84 people but had no idea how many pounds would be needed. He tried to call his wife to ask but she was tied up in a meeting. Brandon is stuck staring at the potatoes at the store trying to imagine how many potatoes his family would normally eat.



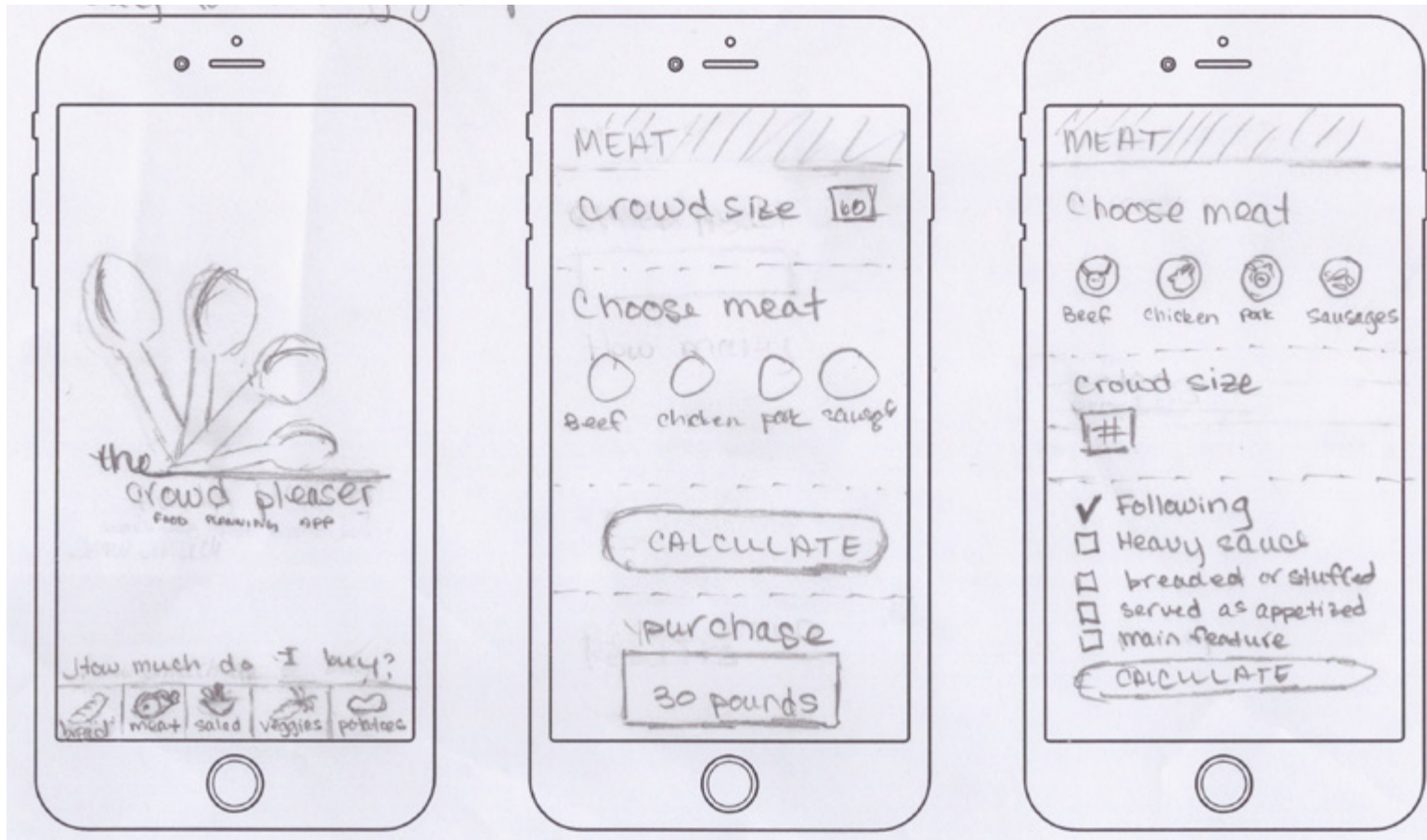
Grandma Jess loves having the family come home over the holiday. They have 35 people from her immediate family and she usually knows how many rolls to bake to feed that many. However, Grandma Jess had 2 extra families that were going to come because they had no where to go for the holidays. This would bring the total to 45 people. She is thinking it might be easier to buy rolls but doesn't want to buy too little and end up running out.

Sketches: calculator app



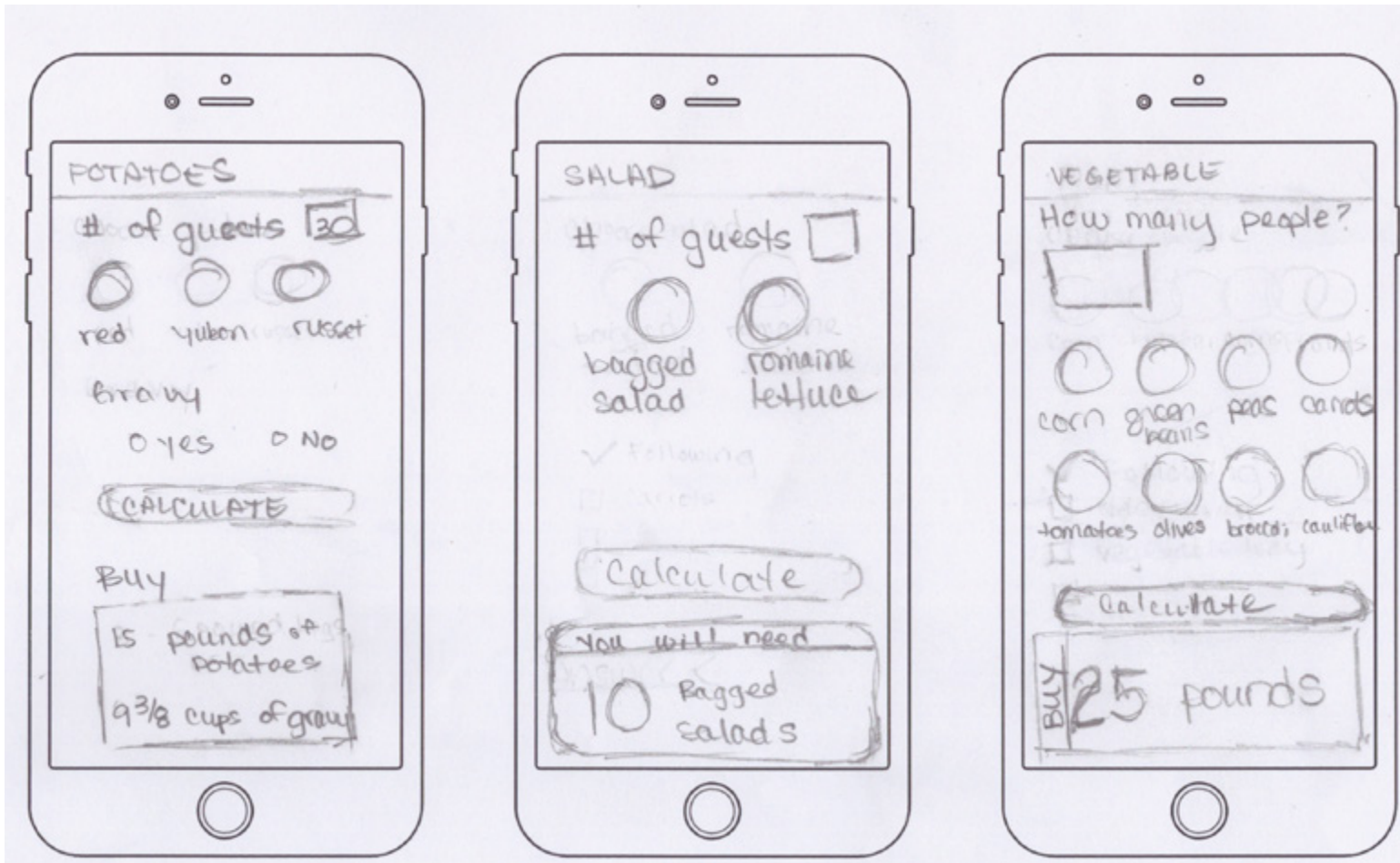
I ended up going in a different direction after I started sketching the first two prototypes. I originally was going to do a conversion calculator but decided to change and do an app for how much food will be needed to put a big meal together for a gathering.

Sketches: calculator app



These sketches show possible variances of different screens that would be designed for the crowd pleaser application. I tried to make it so not too much information has to be entered in and it will be more of a click and calculate type app with lots of icons.

Sketches: calculator app



These are three more example screens of different processes of the app can do by calculating how many pounds or cups would be needed for large amounts of potatoes, salad or vegetables. I'm still trying to figure out a good way to display the results.

Sketches: calculator app

LOGOS



I researched what items I could associate with catered and kitchen and I had the idea of combining a chef hat with utensils. Originally I wanted the fork and spoon to be a cut out of the chef hat. After my first digital draft it didn't translate well on the screen and didn't feel right for the app. I ended up changing gears and going with a lined hat and used the utensils around the wording as accents.

User Test: calculator app

TEST 01

User: Maryn Murdock

Occupation: Student

Age: 14

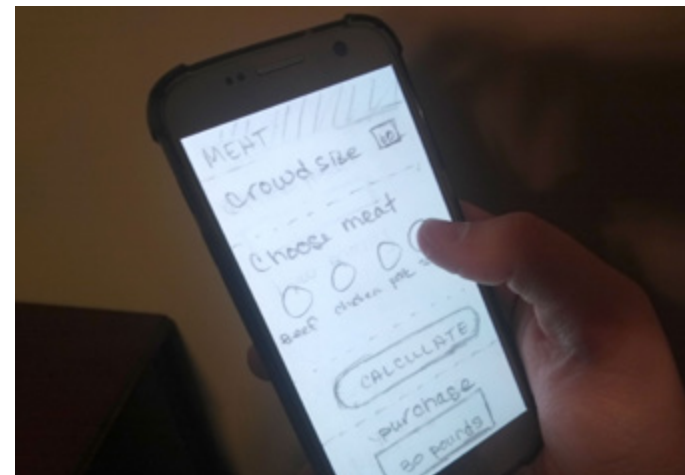
Concept Prototypes

I purposefully chose a teenager to user test because they spend the most time on phones than any other age group and very familiar with apps. She found the home screen prototype easy to understand. She knew that she would have options to choose which food she needed to buy. Another reason I chose her is because she cooks and is familiar with trying to get enough ingredients to make things.

When we moved on to second screen, she understood to enter a quantity. Then, she stopped and suggested that I put in some type of choice to put in the number of adults and children because the portions that children take are different than adults. She commented the app definitely needed some color.



Home screen Lo-fi prototype



Meat screen Lo-fi prototype

User Tests: calculator app

TEST 02

User: Matt

Occupation: Engineer

Age: 41

I found that I could download an app for Adobe XD and transfer the prototype directly to my phone. The only draw back is it loses all the typography because phones don't carry the same fonts.

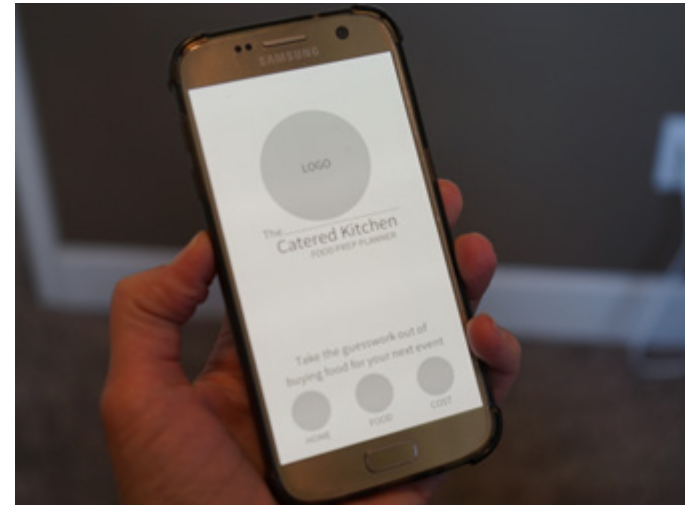
My first user was questioning why I had a home button and what the purpose was. Unless I decide to create an actual homepage, that will need to be replaced or taken off. The rest of the outline seemed easy to maneuver through.

User: Anne

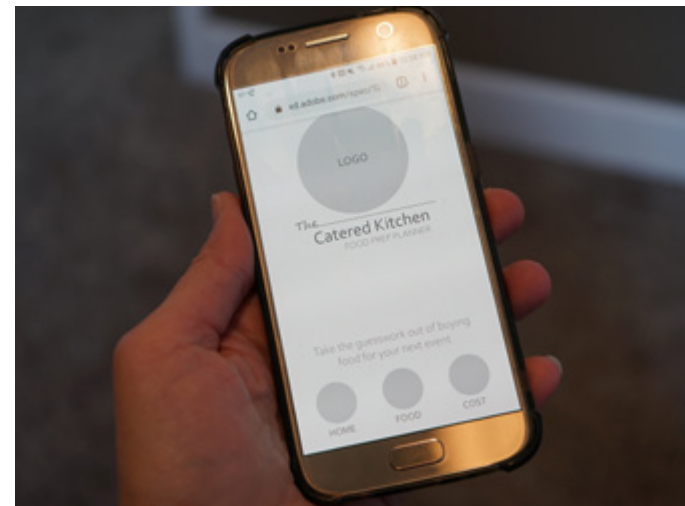
Occupation: Piano Teacher

Age: 45

She noticed that the name of the app really didn't reflect that it was a food planning app. It took her a moment to understand the purpose of the app. She also noticed the home button had no purpose. She was unaware of the function of the cost estimate screen until I let her know it was an outline for a calculator. She said the rest of the app was set up in a way where she could find her way around. She liked the idea of starch items to include rice.



User testing through the Adobe XD app does not apply the font choices



User testing as shown through the development link for Adobe XD

User Tests: calculator app

TEST 03

User: Marie

Occupation: Writer

Age: 43

I made the adjustments of what was suggested in the second user testing. It was pointed out having the title on the top which identified the food choice like meat and also having the sub-title choose meat was redundant. I switched out the bottom bar of the home screen and put a call-to-action button and it was much more clearer on how to move forward.

TEST 03

User: Christina

Occupation: Mother/Baker

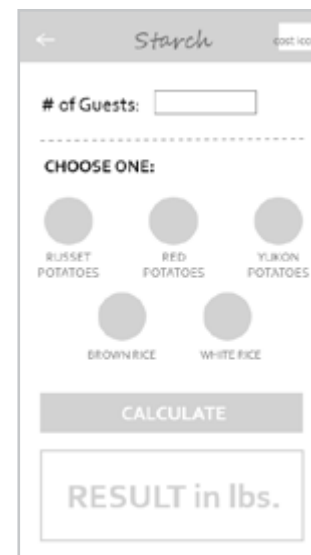
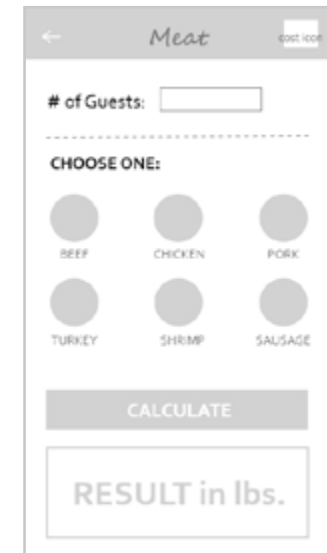
Age: 41

These questions were posed regarding the "estimate cost" screen which I hadn't developed further yet:

What is the cost icon?

Why does the last summary page have more than 5 slots if the user can only select one from each category?

For the digital images I plan on putting numbers in to get a better idea of how the calculator is going to come in to play.



Refined paper prototypes used for usability testing for Test 03

User Tests: calculator app

TEST 05

User: Donnie

Occupation: Web Developer

Age: 39

This user brought up good points to look at regarding the flow of the app. He was very thorough and provided a write-up for me.

of guests label – is that an editable field on every page? Or is it open (blank) field? I can see why you would want the user to be able to adjust the guest size as they go, so they can see how it effects the calculated value. Once set, however, it should retain its value from page to page unless edited. I don't know what the final look of that will be, but maybe add an edit button to the side of the number guests, so they know they can update it if necessary.

Are the MEAT/VEGETABLES/etc bars on wireframe 2 going to be links? If so, what does the down arrow do? Is there an intended order for the categories? It looks like you mean for the user to dive into one category then back out each time. That really breaks the simplicity of the flow. You should have forward/backward buttons that lead through a natural progression, and have them labeled so they know what's coming up.

You can still let the user start at any point in the flow, but you'll have to communicate that they still have choices to complete (if required).

EXPLORING COLOR

I researched what colors invoke people to feel hungry. The two colors that are more prevalent were yellow and red. They are warm passionate colors. Green and orange are associated with healthy foods. Orange is another color that stirs up the feeling of hunger. I tried red for my top banner but quickly changed it to green because the red was too harsh. I chose orange to be the color of all the action buttons. They give a real earthy feeling and hopefully is associated with eating healthy.

POSSIBLE COLORS

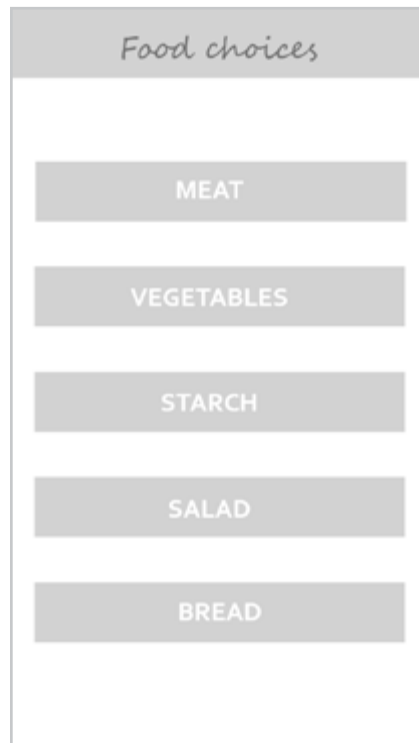


Wireframes: calculator app

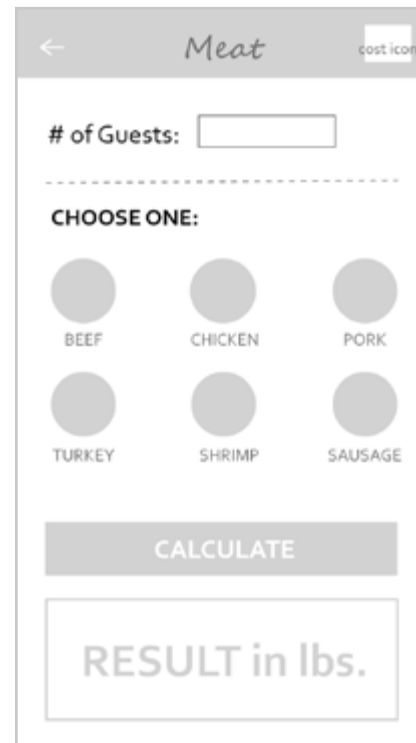
PAPER PROTOTYPES



Launch screen



Food choices screen



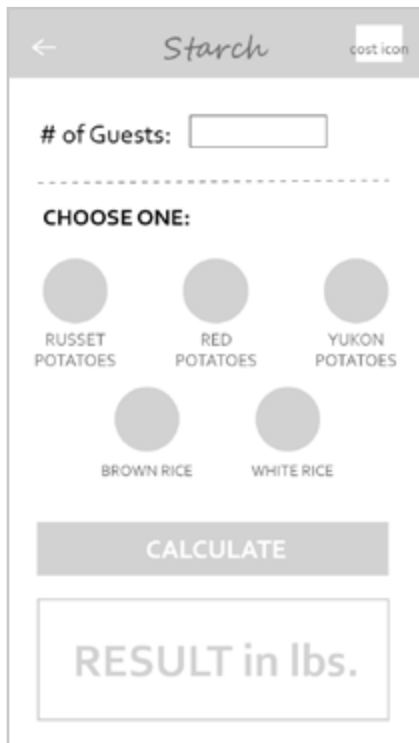
Meat choice screen



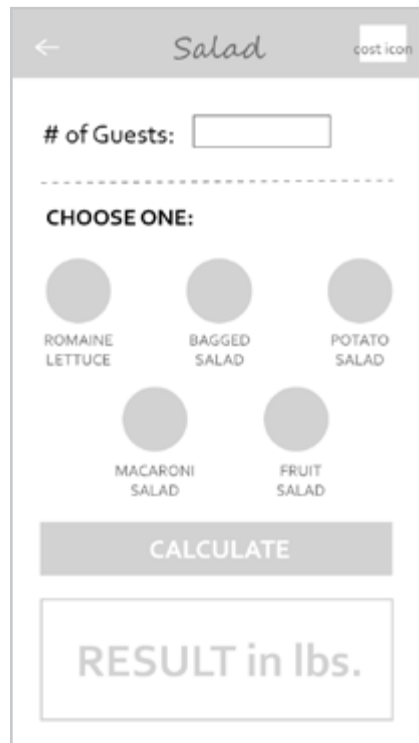
Vegetables choice screen

Wireframes: calculator app

PAPER PROTOTYPES



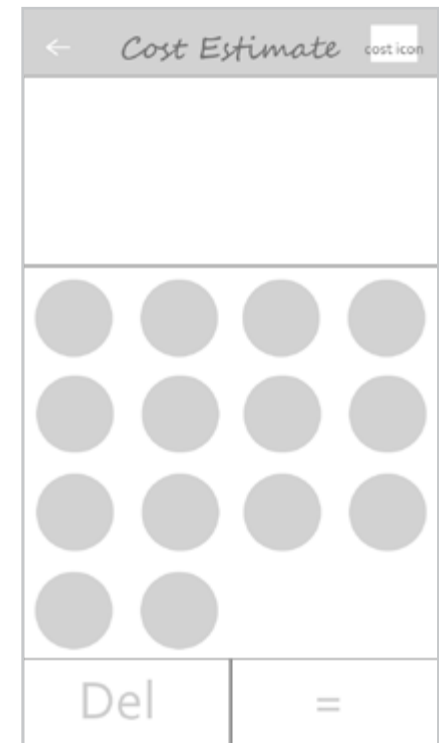
Potatoes choice screen



Salad choice screen



Bread choice screen



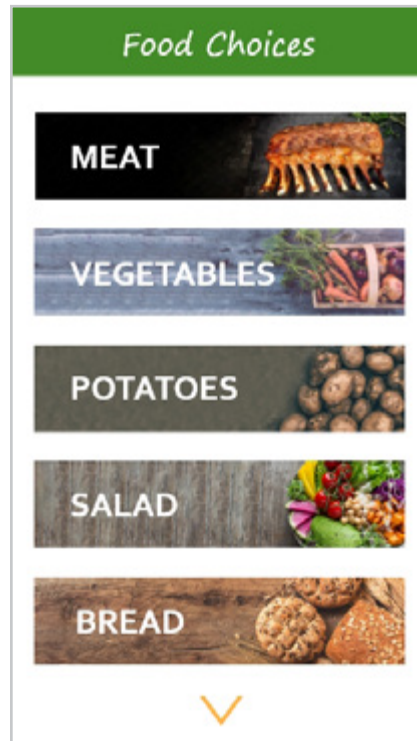
Calculator choice screen

Wireframes: calculator app

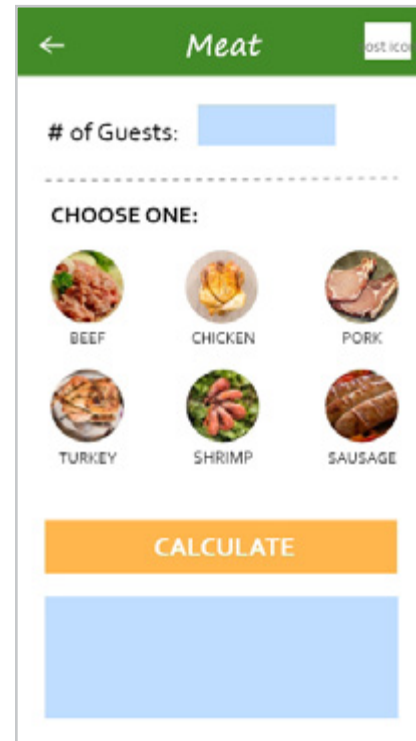
DIGITAL PROTOTYPES



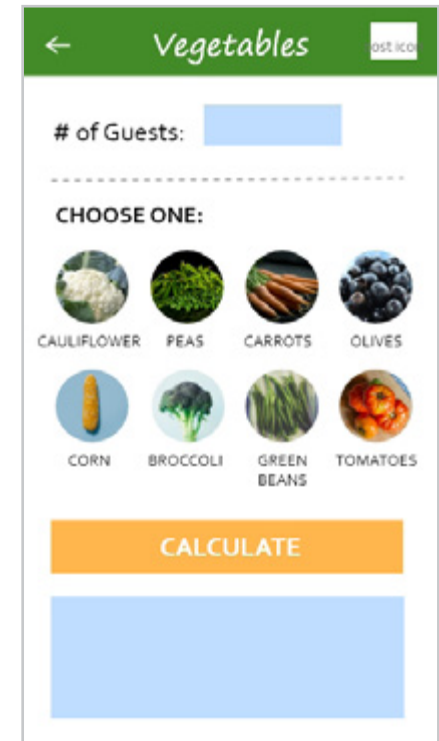
Launch screen



Food choices screen



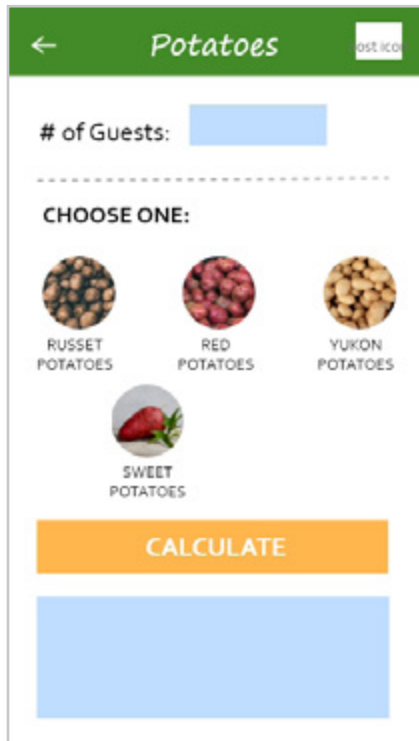
Meat choice screen



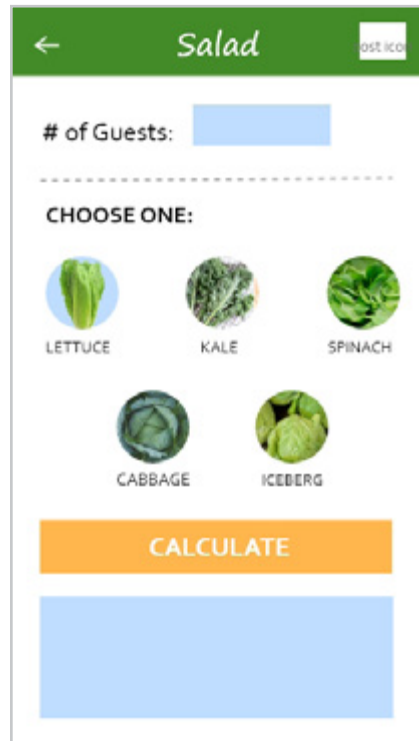
Vegetables choice screen

Wireframes: calculator app

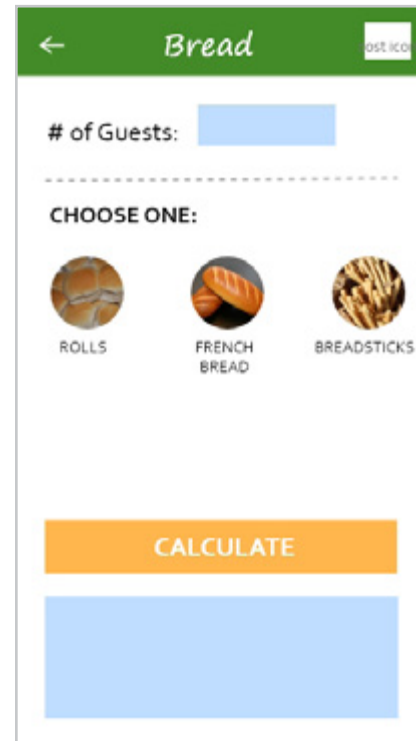
DIGITAL PROTOTYPES



Potatoes choice screen



Salad choice screen



Bread choice screen



Calculator choice screen



FINAL DESIGN

The

Catered Kitchen
 *Food Prep Planner*

Final Design: calculator app

DIGITAL MOCKUP

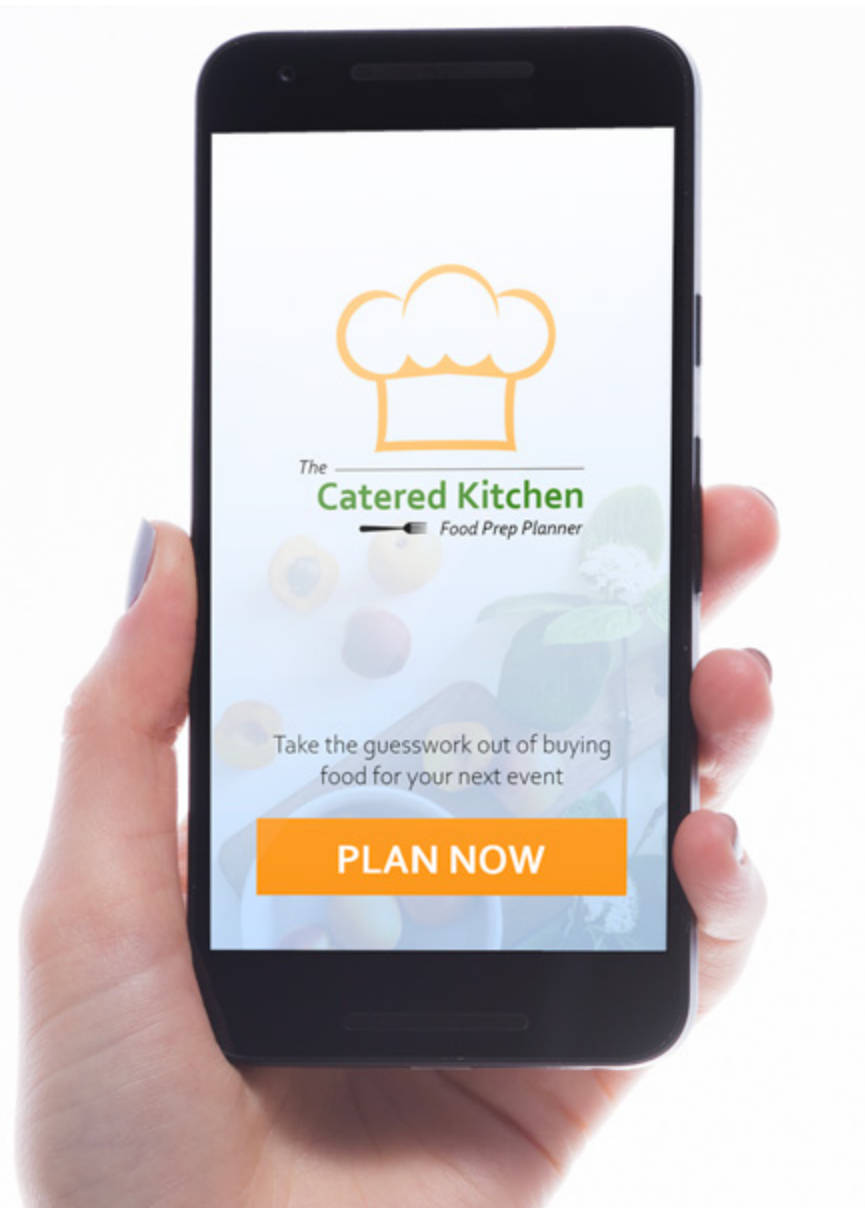
Digital mockup of The Catered Kitchen calculator app. Pictured is the Home screen. Background psd created by rawpixel.com - www.freepik.com.

VIDEO PRESENTATION:

<https://youtu.be/aSuYFDhohzM>

PROTOTYPE LINK:

<https://adobe.ly/2nWjETD>

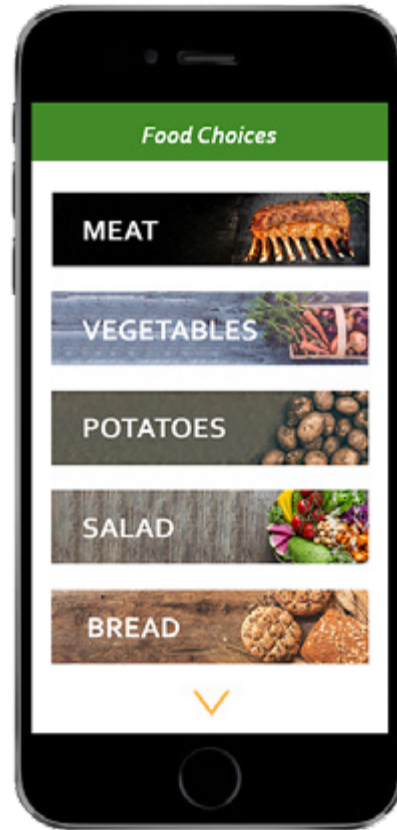


Final Design: calculator app

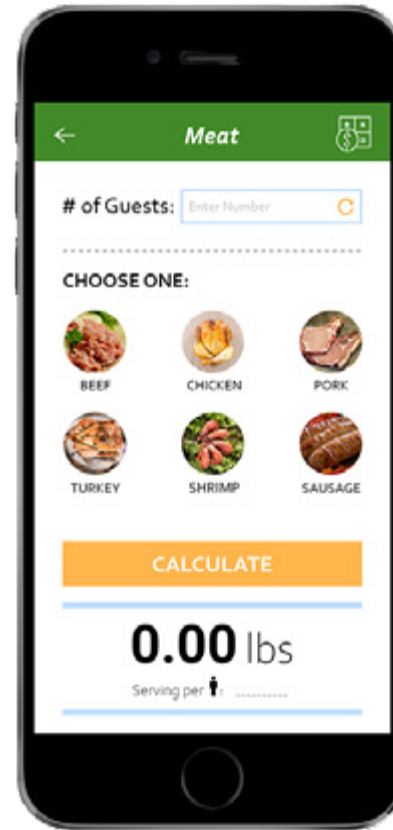
DIGITAL FINAL SCREENS



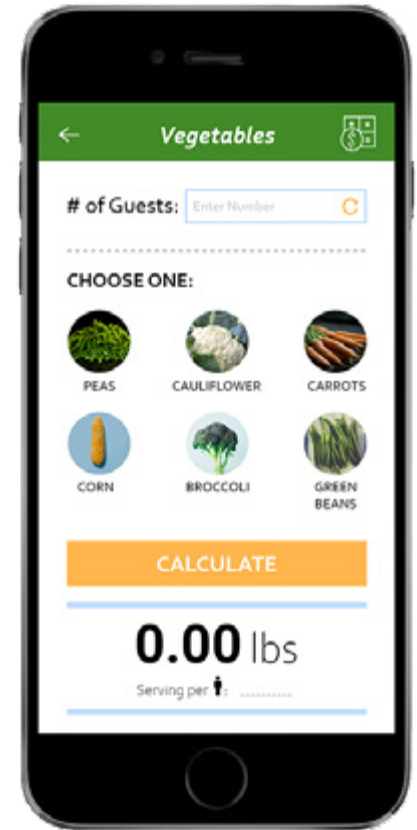
Launch screen: Enables the user to enter the program through the orange button and to choose what food to plan for



Food choices screen: Gives the options of various foods to choose. The orange arrow on the bottom indicates more choices which are not developed



Meat screen: Gives the choices of meat that the user would like to calculate for their gathering giving the pounds and serving size per person after the calculate button is pushed

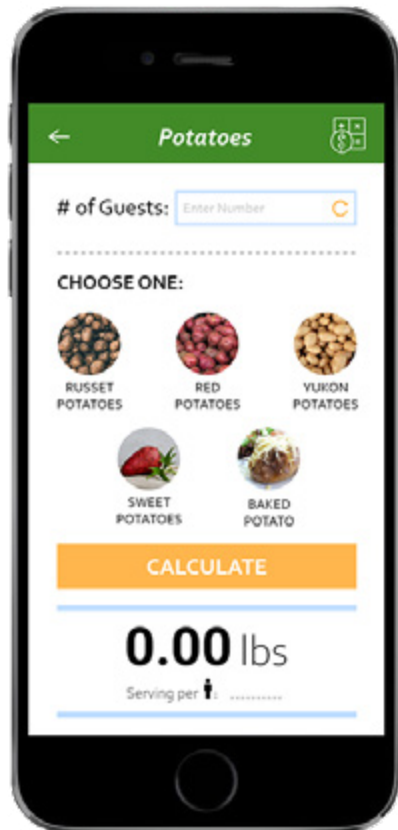


Vegetables screen: Gives the option to enter how many guests to plan for and various options of vegetables

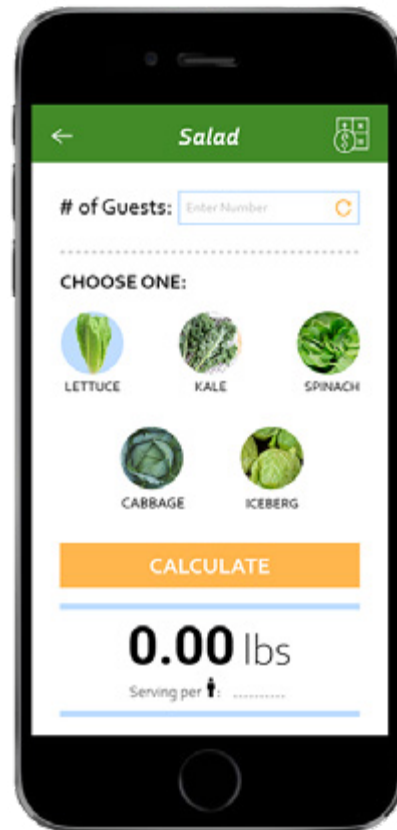
Digital Mockup source: <https://freebiesbug.com/psd-freebies/black-iphone-6-mockup/>

Final Design: calculator app

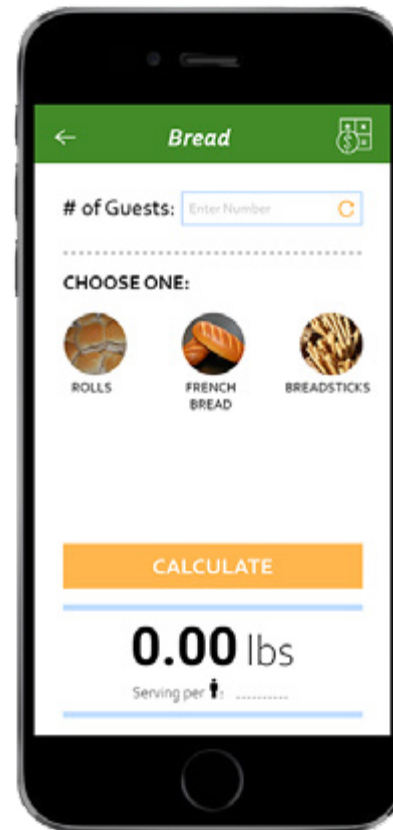
DIGITAL FINAL SCREENS



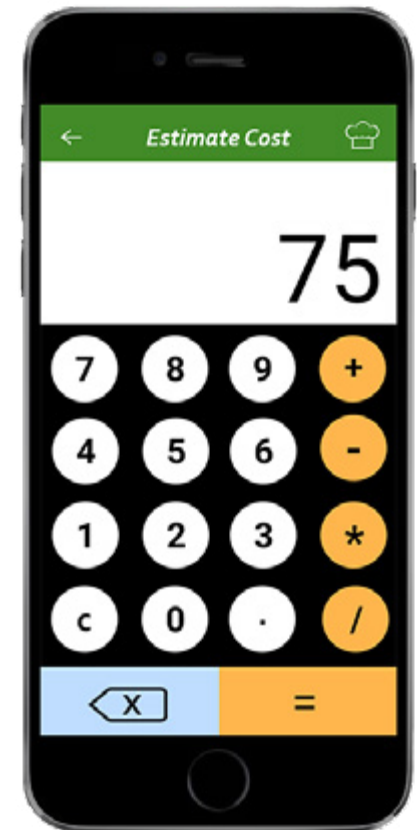
Potatoes screen: Gives the option to enter how many guests to plan for and various options of potatoes



Salad screen: Gives the option to enter how many guests to plan for and various options of salad and the results are given in pounds



Bread screen: Gives the option to enter how many guests to plan for and various options of bread



Calculator screen: Allows the user to estimate the cost of how much they will be spending according to the results they receive

Conclusion: calculator app

GOALS

My goals for this app was to design something that would be useful in every day life. I come from a background where I'm constantly cooking for extended family with as many as 60 guests or more. I always have to sit down and do the math and figure out how much food I will need to buy, especially for the meat. It gives me a lot of anxiety to think that I won't have enough or I'll have too much. That's why I thought a food prep planner that takes away the thinking would be beneficial.

This app would help to lessen the worry and give you more confidence that you will have enough food for your gatherings.

I could see this app being used for catering companies, restaurants, and even individuals that have big families like I do.

USER TESTS

The user tests influenced my design decisions greatly. I found the more complete my digital prototypes were the better the user testing. User testing on sketches went okay but the real changes happened once I put them in a high resolution wireframe.

I built my digital prototypes in Adobe XD and it really gave me a clear view of what I needed to add in order for the flow of the app to be seamless. It also was very useful when I could just send the prototype link to people that were helping me test the app. I targeted the same users that I used in the sketches and continued to use them as I was further along in the design process.

EDUCATION

I learned a lot regarding mobile apps by designing this calculator app. In my research I was not aware that only one font is usually suggested to use through the whole design. Two can be used but it's strongly urged to stick with one and use the weights and sizing of the font family to reinforce the typography.

Another aspect that became clear was the sizing of the buttons. The digital prototype helped me design the size of the buttons so they would be big enough to be clicked.

I noticed a lot of the action buttons are close to the bottom of the screen and the buttons that help the flow of the app are on top. As I learned these aspects of design for mobile apps, I tried my best to incorporate them into the design.



Feedback: calculator app

PRINCIPLES OF DESIGN

There are five principles to interactive design that help enhance the user experience. Interactive design is:

1. Consistent
2. Visible
3. Learnable
4. Predictable
5. Provides Feedback

All of these principles are important. Feedback, however, "serves a larger purpose in any system as a whole, in that it tells people how they can -and *should*- interact with what's on the screen."¹

FEEDBACK

Feedback is achieved in different ways with mobile applications. It gives the user "a signal that they have succeeded or failed at performing a task."¹ Here are some examples of the following feedback that users look for regarding interaction design:

1. Changing color - hovering,
2. Controls - buttons, hyperlinks
3. Communicates status - progress bars, animations
4. Error messages - dialogs, alerts
5. Clickable

¹ <https://www.givegoodux.com/feedback-5-principles-interaction-design-supercharge-ui-5-5/>

TESTING FEEDBACK

I tasked two of my children to tie their shoes with their eyes closed. I also asked if they could write their names without looking. Both were successful in completing these tasks. Then, I handed over my phone and asked each of them to text their Dad. My daughter was quite sure she could send it with her eyes closed until she realized that she didn't even know if the screen was on or off. She insisted she could send a text if I allowed her to be on the screen because she knew where the buttons were. The objective was to text "how are you" and she managed to text "hid zfe hog" before giving up completely.

Visual feedback is necessary in order to be successful in your designs. If the user does not have clear visual cues to follow, it will be difficult for the user to maneuver through the application.

ACTIVITIES

1. Elevator buttons have a visual presence and sometimes color to define action
2. Blue text on webpages usually are distinguished as hyperlinks
3. Stoplights use color to show stop, slow, and go
4. Not entering the correct information in a text field will have a dialog box appear
5. Progress bars when you're downloading information
6. Items are highlighted with color to show it's clickable
7. Animations that point to an access point
8. Call to action buttons
9. Check engine light indicates an error message
10. Drop down menus appear if you hover over it