Project One

Calculator App

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Table of Contents

Step 1 Define the Problem

Parameters- For this first project I need to create a calculator app that is designated to perform some kind of function in solving an equation.

For this calculator app the following are requirements:
1. Design for a smart phone screen size
2. Design both a portrait and landscape versions
3. Design 5 to 10 screens to demonstrate functionality
4. Design to be simple

These things will be done through identifying a profession or activity that would benefit from a specialized calculator app, identifying the functions the calculator must provide. Then design an appropriate interface using the principles of interaction and user testing. Keeping the calculator app simple. This assignment will explore observation, conventions, and feedback— three important concepts in interaction design.

Questions:
1. What is a wanted calculator that most people need today?
2. What things should be implied in the calculator to make it unique?
3. What kind of audience would you attract with this app?
4. How simple can the calculator be?
5. What components need to be on the app for it to be simple?
6. What are some of the phone's features that can be used in the app? Camera?
7. How do people interact with the app?
8. What things should be observed in building this app?
9. What platforms should this benefit?
10. What makes this app better than others?

Step 2 Conduct Initial Research

Research calculators (including purpose, history, types, what four-function calculators do, etc.)

Calculators are made and designed to help people with their mathematical difficulties. There are several different types of calculators to help solve mathematical equations such as taxes, tips, volume, area, graphs, and many more. The first type of calculator to be created was called a abacus and was used by Sumerians and Egyptians around 2000 B.C. It was made to help do addition and subtraction effectively and accurately. From then to today calculators have changed dramatically going from mechanical calculators to micro processing calculators that are able to compute millions of numbers per second and do it accurately.

Research existing calculator apps (pay special attention to specialty calculator apps)

There are a wide range of calculator apps that can be downloaded to mobile devices that can help you do practically anything you want a calculator to do including calculating calories, calculating time, calculating speed, and measurements of all kinds like money and weight along with several others. Some of the top apps found in either the apps store or google play store include:
1. Office Calculator which is great for finding the amount it would cost on groceries and supplies along with being just a simple 4 function calculator.
2. Digits(apps store)-a calculator that keeps every equation as a sort of printout and can be customized to use different colors for the buttons.
3. Home Improvement Calc- calculates the measurements for home improvement projects
4. Auction Calculator- Helps people find how much money you will earn from selling on selected websites such as ebay and amazon.
5. Kitchen Calculator app- makes measurements for cooking a lot easier.
6. Speed Distance Time Calculator-measures the average speed and time and distance.
7. Medical Calculator- designed to diagnose symptoms on the body.
8. Love Calculator- measures the compatibility of names to one another.

Research smart phone technology (list every technology and interaction smart phones afford)

Over recent years there are numerous things that a smart phone can do through it's own capabilities with voice activation, vibration response, camera, light, loud audio speakers, front and rear facing cameras, microphones, touchscreen, paperweight, movie player, music player, video game device, social gatherer, making phone calls, voicemails, messages in text and voices, emails, display, bluetooth connect, wifi connect, and even heart rate monitor.

Research interfaces in general (visual research)

Step 3 Choose your Research

Explore subject opportunities for your calculator app by developing word lists, etc.

Subjects:
Food- calories, sugars, cups, tablespoons, ounces, sodium, cholesterol, grams, servings, carbs
Measurements- distance, amount, time, height, weight, depth
Money- Pounds, Real, Dollars, Yen,
Function- 4 function
Tipping- percentages, money
Taxes- money, income, brackets
Volume & Area- packaging

Choose a final subject direction for your calculator app

I have decided to put together an app that is a package sizing app that uses your camera and at least one form of measurement to determine the size of an object that you need to ship along with estimating the costs to ship(this must have a scale of weight applied) from one destination to another.

Research your target audience -

My target audience is to everyone that who has a smart phone that needs to send any kind of package to somewhere in the states or even figuring out what size box you would need to package materials for moving or shipping. This app will be useful if you are in need of a rough estimate of how big a box you will need to ship the item and what if would cost to have shipped from one zip code to another.

Develop a list of things your app interface must do for the project to successfully solve problems

Some things that the interface will need for this project to work successfully would be:
The use of the phones camera
Measurement Input boxes
Centimeters and Feet/inches
10 numeric digits with a period
Zip code input boxes
Weight input box

6

Step 4 Brainstorm and Test Concept

Explore concept opportunities by developing word lists, mind maps, etc.

Camera- display "take image button" & Horizontal and Vertical guides
Input dimensions- Input a side box, Calculate box dimensions
Inches and Centimeters selection box
Display style of box- square or rectangle
Weight input box
From Zip code input box
To Zip code input box
Total estimate costs output box

Sketch out ideas

See following page for sketches

Create three scenarios for user testing your app

1. There is an object that needs to be packaged but you dont have a ruler but you know the measurement of one side, how will you use this app to find the measurements for the sides you do not know.

2. You konw the dimensions of the object to be packaged but you have an oversized box that would work if you have enough padding. Find how much padding you would need to fill the box so the object is not loose inside.

3. You have the weight and Zip code of where the package you are sending is going, calculate the cost for you to send the package to where it needs to be shipped.

Conduct usability test 01 using concept prototypes and/or paper prototypes & Receive peer and instructor feed-back

For the most part of the user one testing most of the outlines or sketches made sense for interactive design however there were a few things that needed to be changed because of confusion in the designs such as the box check off area and how will you input the numbers and little things like that. I did tests with a few people to make sure that it wasn't just one person that didn't understand what I was hoping for in the design.

7

Step 4 cont'd
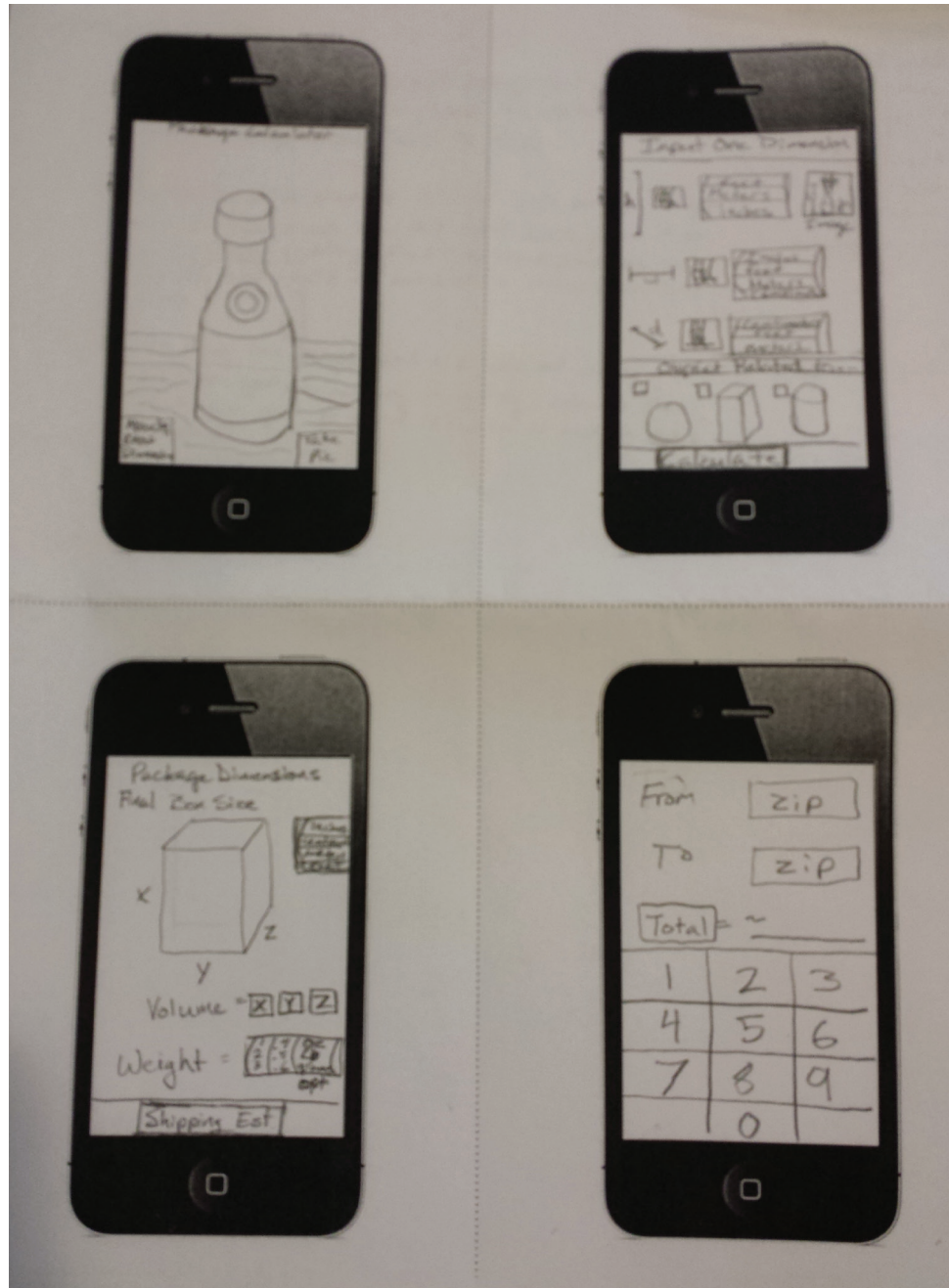
Step 5 & 6 Develop/Refine Interaction and Form

Create wireframes to structure your interface
See before page for wireframes.

Refine your three scenarios based on user testing observations and concept development

1. Jen needs to ship an item but needs to find the smallest size box that the object can fit into but you only the know the measurement of one side which is 3 inches, how will Jen use this app to find the measurements for the sides she does not know?

2. You know the dimensions of a few objects to be packaged and shipped to a missionary and you only have one box to ship them in, you want to know what things will fit and how they all will fit in just that box, calculate how much stuff you can send to that missionary to make his week a good week.

3. You have the weight and Zip code of where the package you are sending is going, calculate the cost for you to send the package to where it needs to be shipped.

Conduct usability test 02 using paper prototypes
See next page for test 2 paper prototypes

**Refine wireframes after conducting user tests**
For the user test for test two I decided to change only small features such as how the page would look with the numbers showing at the bottom of the pages to help indicate that you can do input using them rather than expecting nothing to come up and use your own key inputs for the number input areas. By adding numbers to the bottom of the page they can indicate or know that all you can input are numbers in the boxes so it doesn't confuse the user as to what they are going to type in those blank areas.

Conduct usability test 03-06 using paper prototypes and/or digital prototypes

I am still working on my digital pieces trying to configure how the app should respond. I am working on axure but I need to change it to accommodate what I want to have the app do in the prototyping. In exploring different types of user faces for creating a prototype for my packaging calculator app I came across Pop which is a great app for taking pictures of mock up app drawings and being able to link the photos together through the use of adding buttons from one page to another. I tried to use this app because it is simple and fun to use but the only down fall with what I experience with this app is the difficulty I was having making up the drawings and taking pics of all of them. The POP app also was going through some

Wireframes/ Test 2
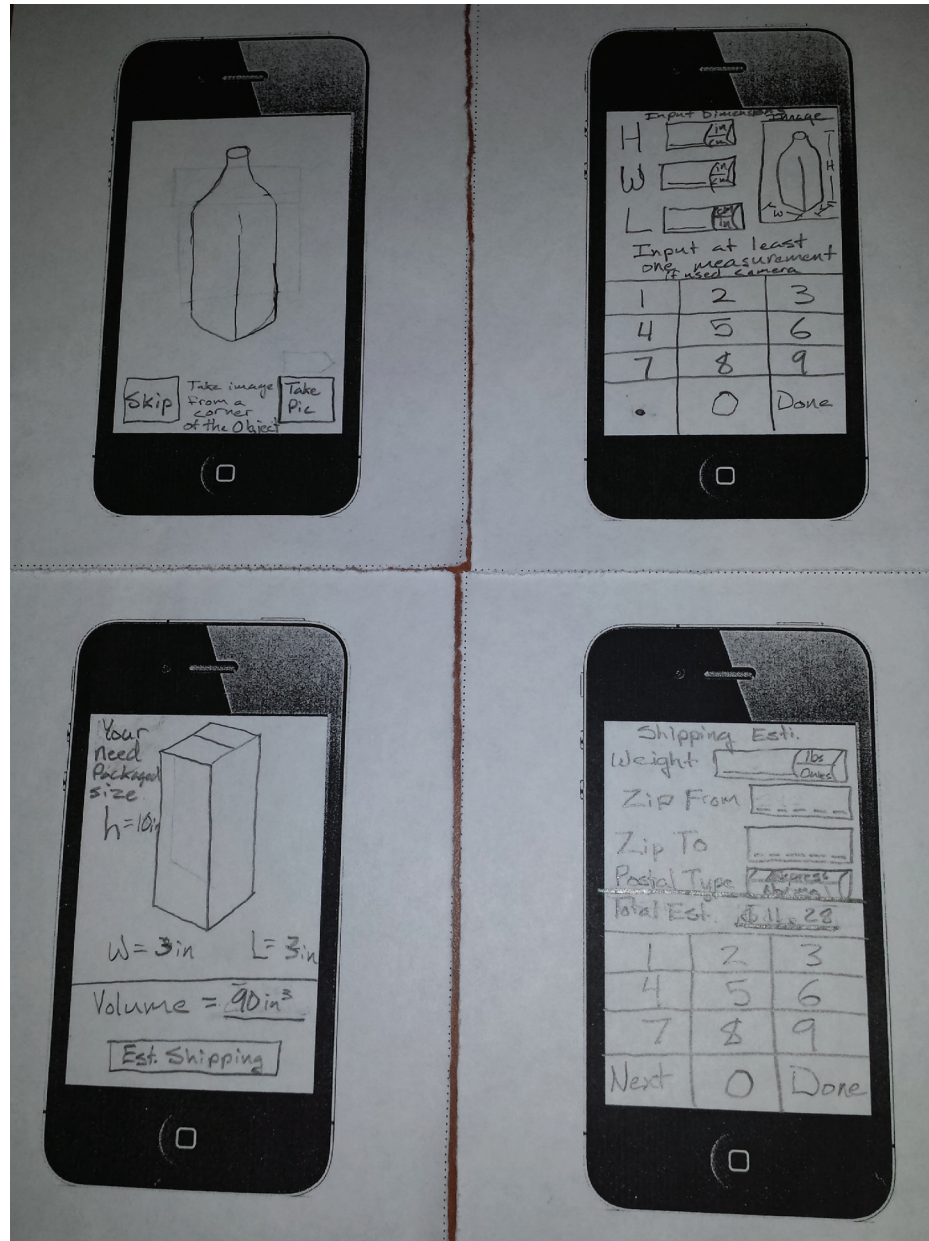
technical difficulties that I found through using it and also by an email they sent out saying that they were having security issues and are trying to update the app. I also attempted to axure and as I used that app I was overwhelmed with the amount of information and things you needed to know just to make the layout of the app go well with the size of the screen. I was having many challenges trying to pick it apart but was not convenient to me so I decided to continue to explore. I do however still have the software and will try to understand it later as I do have a desire to understand how it works. I finally resorted to using marvelapp.com because is was one of the least confusing to use and I was able to upload images of the app that I drew up on adobe illustrator. I enjoyed this prototype application because it wasnt as confusing to use as I found the other applications to pick apart. With the use of dropbox to upload images I was able to sort them out and make a mock app for which I was able to have others test and give feedback as to what they noticed that could be confusing or easy to understand. With that in mind there were several things to go through to make this app make sense to others and I am sure that if I tests more people I would have even more to develop for such a simple app such as this packaging calculator. I can only imagine the things that people went into to develop and build actual apps with all the coding and steps to produce an outcome.

From the four images that I made up from the beginning I have developed an enormous amount of

Projects   **Calculator App**   **Edit**
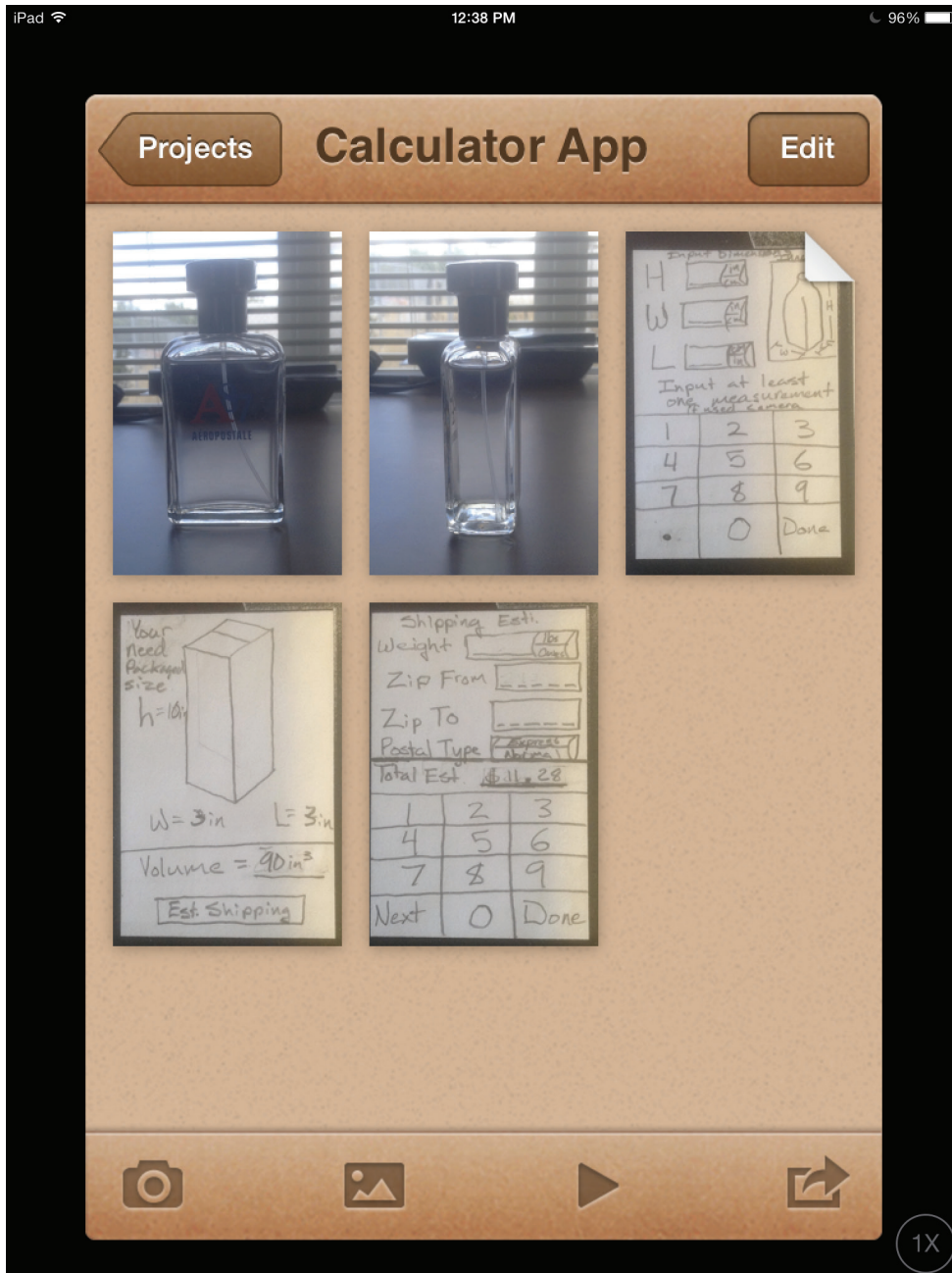
pages to show user interaction from one step to another thinking about things from how to display buttons and how to make each input area so that users know what part they are inputting data into. I also observed how people handled the app and what it might be like if they actually used it.

Play with form and features- When designing the app I wanted to make things simple and quick for using. I decided to start with opening the camera to take a picture of the object that you want to send and use it as a way of measuring so long as you know the length of one side of the object. I used 3 buttons that can take you to other screens or the same screen to take another image. I wanted to use another way of for finding dimensions instead of using a ruler or something and the phone has a way to taking pictures so I thought it was a good way to use other features of the phone. I also made it an optional feature to use so that you can type in the measurements if you already know them making it user friendly. I also added that you can use two types of measurements in either inches or centimeters for a way to help those that know one or the other. I thought many times that foreigners dont know inches so I decided to make centimeters an option. For the layout of the inputs I made sure that you can see what input box you are typing in and the number keypad is always displayed. This makes it known to the user that they have to input an number to move to the next box and the boxes are highlighted red when needed to have an input. From there I decided that the colors of the buttons should be different than the input boxes showing

11

that they are buttons and not inputs for the app. I also decided that after the calculations that the display should be on a single page without the keyboard to show that there isnt anything to input but only buttons to continue on or to go back to the beginning. This is a flow method that helps you go one step at a time. I noticed as I made different slides or pages that I would have to make a way to go back to previous pages and I incorporated that. I tried to incorporate everything simple and for the most part of the calculator app it is simple but once you get into the aspects of designing how things interact especially with typing in words and things in the input boxes there are several aspects to look at.

Receive peer and instructor feed-back-
As to feed back from peers or the instructor, I got many ideas to get rid of a few aspects that are confusing from the previous tests. One in particular was to how the end information for finding the volume of the object looked because it seemed like there were too many numbers and images to display and they said it didnt need all of it. I decided to take that page and eliminate the image and the number input keys to show that it was just a page of the final results. That seemed to clarify and simplify what things needed to be shown. As for other feed back most of them said that the app worked really well. One other piece that my peers said that I could improved upon was the way to show differences between boxes for input and output so I decided to take that in effect. I did this by adding colors and transparencies to the buttons to show that they are different from other functions in the pages. I had to add a red box to show what inputs are being selected. I also added a warning to show that you have to add a measurement between inches and centimeters to distinguish the sizes for the calculations. Another thing that was hard to estimate was the precise size for the app to be created. I originally tried to match the size of the art board to the screen size and found that I had made it longer than expected. I also noticed that it works better on android devices than apple devices. From the beginning I was hoping to make it work well between both platforms but I find it best to stay with the android platform because the appearances of the app seem to be closely related with how it is setup. The appearance is something more that you would see in an android app. Thankfully because of marvelapp.com I was able to test the app on both platforms so I was able to see the differences in size from my iPad to my Samsung Galaxy phone supporting both platforms.

Step 7 Final App Designs
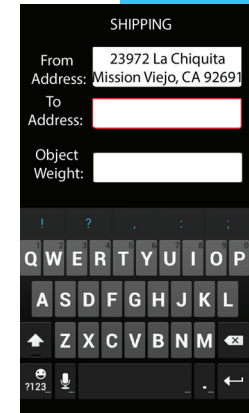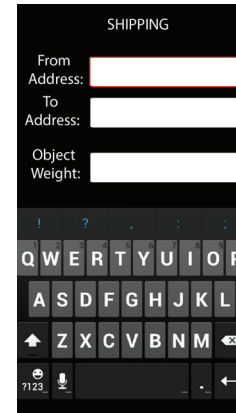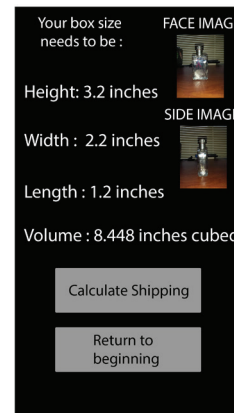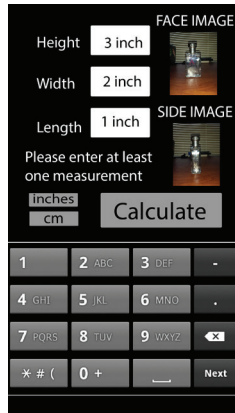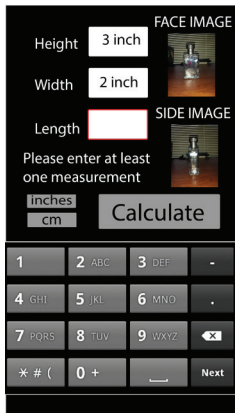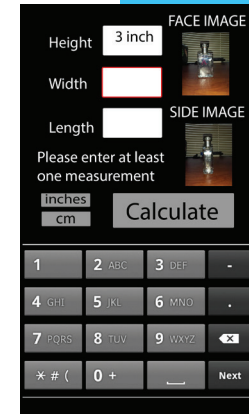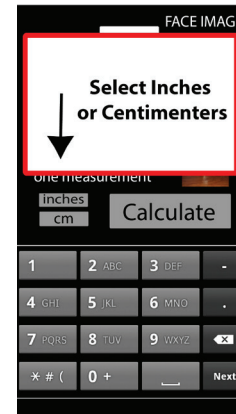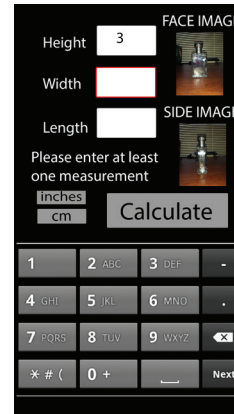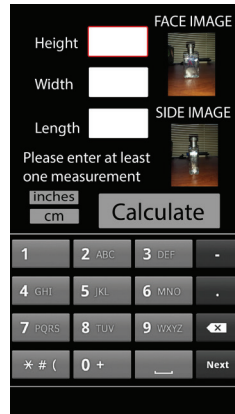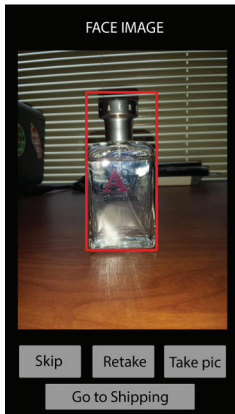
13

SHIPPING

From Address: 23972 La Chiquita Mission Viejo, CA 92691
To Address: 345 West 5th South Rexburg Id, 83440
Object Weight: [ ]

1 | 2 ABC | 3 DEF | -
4 GHI | 5 JKL | 6 MNO | .
7 PQRS | 8 TUV | 9 WXYZ | ⌫
* # (| 0 + | ___ | Next

Pounds | Grams

SHIPPING

From Address: 23972 La Chiquita Mission Viejo, CA 92691
To Address: 345 West 5th South Rexburg Id, 83440
Object Weight: .125 pounds

Calculate

1 | 2 ABC | 3 DEF | -
4 GHI | 5 JKL | 6 MNO | .
7 PQRS | 8 TUV | 9 WXYZ | ⌫
* # (| 0 + | ___ | Next

SHIPPING

From Address: 23972 La Chiquita Mission Viejo, CA 92691
To Address: 345 West 5th South Rexburg Id, 83440
Object Weight: .125 pounds

Total = $5.25 | Clear

1 | 2 ABC | 3 DEF | -
4 GHI | 5 JKL | 6 MNO | .
7 PQRS | 8 TUV | 9 WXYZ | ⌫
* # (| 0 + | ___ | Next

Height [ ]   Skip to Shipping
Width [ ]
Length [ ]

Please enter all measurements

inches / cm | Calculate

1 | 2 ABC | 3 DEF | -
4 GHI | 5 JKL | 6 MNO | .
7 PQRS | 8 TUV | 9 WXYZ | ⌫
* # (| 0 + | ___ | Next

Height [3]   Skip to Shipping
Width [ ]
Length [ ]

Please enter all measurements

inches / cm | Calculate

1 | 2 ABC | 3 DEF | -
4 GHI | 5 JKL | 6 MNO | .
7 PQRS | 8 TUV | 9 WXYZ | ⌫
* # (| 0 + | ___ | Next

Select Inches or Centimenters

↓

Please enter all measurements

inches / cm | Calculate

1 | 2 ABC | 3 DEF | -
4 GHI | 5 JKL | 6 MNO | .
7 PQRS | 8 TUV | 9 WXYZ | ⌫
* # (| 0 + | ___ | Next

Height [3 inch]   Skip to Shipping
Width [ ]
Length [ ]

Please enter all measurements

inches / cm | Calculate

1 | 2 ABC | 3 DEF | -
4 GHI | 5 JKL | 6 MNO | .
7 PQRS | 8 TUV | 9 WXYZ | ⌫
* # (| 0 + | ___ | Next

Height [3 inch]   Skip to Shipping
Width [2]
Length [ ]

Please enter all measurements

inches / cm | Calculate

1 | 2 ABC | 3 DEF | -
4 GHI | 5 JKL | 6 MNO | .
7 PQRS | 8 TUV | 9 WXYZ | ⌫
* # (| 0 + | ___ | Next

Height [3 inch]   Skip to Shipping
Width [2 inch]
Length [ ]

Please enter all measurements

inches / cm | Calculate

1 | 2 ABC | 3 DEF | -
4 GHI | 5 JKL | 6 MNO | .
7 PQRS | 8 TUV | 9 WXYZ | ⌫
* # (| 0 + | ___ | Next

Height [3 inch]   Skip to Shipping
Width [2 inch]
Length [1]

Please enter all measurements

inches / cm | Calculate

1 | 2 ABC | 3 DEF | -
4 GHI | 5 JKL | 6 MNO | .
7 PQRS | 8 TUV | 9 WXYZ | ⌫
* # (| 0 + | ___ | Next

Height [3 inch]   Skip to Shipping
Width [2 inch]
Length [1 inch]

Please enter all measurements

inches / cm | Calculate

1 | 2 ABC | 3 DEF | -
4 GHI | 5 JKL | 6 MNO | .
7 PQRS | 8 TUV | 9 WXYZ | ⌫
* # (| 0 + | ___ | Next

Your box size needs to be :

Height: 3.2 inches

Width : 2.2 inches

Length : 1.2 inches

Volume : 8.448 inches cubed

Calculate Shipping

Return to beginning

Final Summary

Even after doing many tests and analysis there are always things that come up with design that can be improved upon. When I thought all was done I noticed that there are things such as adding blinking lines to indicate where the text will show in the box and how things will write in the app such as an address and if there is a function to write things faster using the keyboard to create the wording for text input. I could go on talking about how things should function but the amount of time to input all the data and screenshots for each little interactive function would make this booklet go on for twenty more pages. The main concept in doing this project was to design an app simple enough for a child to use and understand. This was to help us observe, explore conventions, and get feedback. We observed how people used the app and their interactions with dealing with scenarios. We created and explored conventions by making symbols and objects that we hope people understand from using other apps found across the app markets. We explored feedback from observing how people used the apps and how the app responded to users. These three things were necessary for finding out how to develop a user friendly app and accomplish what we want them to do.
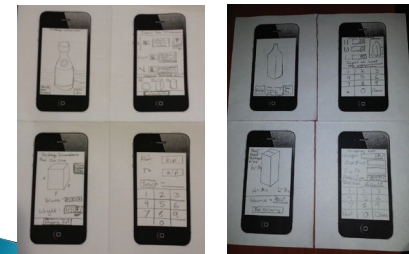
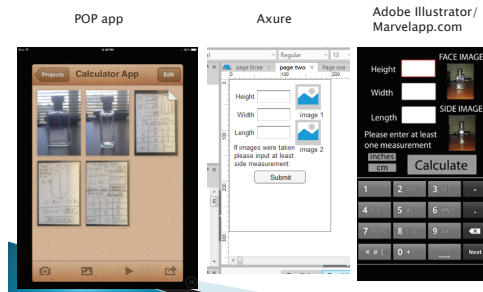Presentation-

Calculator App

Skylar Neilson

Goals

‣ Packaging Calculator App– calculate the size of an object, find the volume of an object, and find the cost to ship the item from one address to another.

‣ Observe
‣ Explore Conventions
‣ Expand Feedback
‣ Simplify
‣ Repeat

Paper Prototypes

Digital Prototypes

POP app   Axure   Adobe Illustrator/Marvelapp.com

Calculator App Final

‣ http://marvl.in/286egb

15

8. Resources:

http://www.thecalculatorsite.com/articles/units/history-of-the-calculator.php
http://en.wikipedia.org/wiki/Calculator
http://www.axure.com/
https://marvelapp.com/project/41180/#
https://itunes.apple.com/us/app/pop-prototyping-on-paper/id555647796?mt=8