Husky Bites

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Group IoT - The Dream Team
CSS 480 - Human Computer Interaction

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Overview of Product

Husky Bites is an application designed for UW Bothell students to facilitate and to speed the purchase of transactions for food, beverages and snack bar items from all the cafe locations on campus ('Common Grounds' and 'Food for Thought'). It will offer the convenience of ordering and paying for available items ahead of time via online without standing in line. In addition, it will incorporate the Retail aspect of Internet of Things by connecting to a Point-of-Sales system to process payments and to keep track of inventory by placing orders based on the traffic quantity of items sold through the application.

Summary Table

Group Members	Responsibilities and Deliverables
Mariana	- Functional/non-functional requirements - Use case diagrams/Formal Scenario - Review, edit and organize project main sections & presentation set-up
Smriti	- Interview analysis - Usability evaluation
Brian	- Strengths/Limitations - Interview Analysis
Neil	Interview Analysis
Dwina	- Summary briefings - Sketches and wireframe of design - Edit presentation and requirements document
Sasha	Functional/non-functional requirements

Summary Briefings - Class Assignment

Smart Homes

Application #1: Vivint Smart Home
Description: A home security control system that connects doorbell cameras, security cameras, smart thermostats, door, window sensors, and smoke detectors from a single user interface.

Strengths:
- Offers ease of use by being simple and intuitive.
- Offers convenience by remotely controlling your home security
- Eliminates switching between different home control apps
- Eliminates extra work like physically flipping switches
- Allows you to see and speak with front-door visitors
- Adjust climate controls for comfort and energy savings
- It remotely locks and unlocks doors for front-door visitors

Weakness:
- Connectivity, firmware updates and functionality issues
- Continuous crashing
- Play video recording and doorbell doesn't work

Usage Statistics:
- A total of 23,941 users
- from only 70% of these users seems satisfied

Smart Homes

Application #2: SmartThings

Description:
An app that turns your home into a smart home by by connecting various sensors and devices to the SmartThings platform.

Strengths:
- Open platform, so you can choose any compatible device to add to your system and pair it with any app so you can control and monitor many aspects of your home through your smartphone.

Weaknesses:
- Must use a smartphone/tablet with this system

Usage Statistics
- Google Play Store: 3.4/5 stars (total 2,898 reviews)
- Apple App Store: 2/5 stars (total 913 reviews)
- Windows Marketplace: 3.6/5 (total 246 reviews)

Retail

Application #3: TCI - Smart Retail Solution

Description:
A point of sale (POS) and store management software designed for retail businesses of various sizes. Main features include POS, payment processing, customer service, customer relationship management (CRM), back office operations, employee management and reporting, e-commerce and accounting.

Strengths
• Comprehensive and advanced POS and retail management software tools • Includes mobile features to help offer better customer service to its users • Comes with online, email, and phone customer service available 24/7

Weaknesses
• Needs extensive training in order to use this app • Lacks a comprehensive set of accounting features

Usage Statistics
• Over 1,000 retailers in 70 countries

Tracking

Application #4: Tile

Description:
This app works with Time, a tiny Bluetooth tracker that finds everything items in seconds - like your phone, keys, and wallet.

Strengths
• Matchbook-sized Bluetooth Low Energy Device • Attack or stick Tile to anything you seem to lose consistently • Uses an app to help you find your Tiled items quickly and easily up to 150 ft. • Can be used to ring your phone when phone is lost, even when it is set to silent mode

Weaknesses
• Needs to be charged consistently • Non-removable battery, so user needs to buy a new one every year • No Android support (yet).

Usage Statistics
• Over 6 million Tiles sold

Smart Cities

Application #5: Ford Pass

Description:
An all-in-one app for Ford and non-Ford owners that keeps track of vehicles, where to find parking in the city, and connecting with your Ford Dealership.

Strengths
• Easily find and reserve parking in major cities with up-to-date info • find gas stations based on user preferences • connect with customer service for assistance on vehicle

Weaknesses
• Requires login credentials every time user launches app • Mileage, vehicle health, and fuel levels don't update

● Multiple bugs, such as app crashing when searching for car dealership

Usage
● Rated 2.5 stars with over 300 reviews on App Store
● 2.8 stars with over 1,000 reviews on Google Store

Wearables

Application #6: Apple watch
Description: A smartwatch app to be used with an iPhone. It turns our wrists into smartphone holsters by enabling text messaging, phone calls, and such. Additionally, it has helped revolutionize the fitness world by giving people more data about their workouts and related health monitoring
Strengths: ● Has many functionalities ● Accessibility
Weaknesses: ● Requires an iPhone, not compatible with other platforms.
Usage Statistics: ● Over 14 million Apple Watches sold in 2016

Wearables

Application #7: Implanted
Description: An Insulin Pump and a Blood Sugar monitor
Strengths ● Ability to measure blood sugar and inject insulin without an additional injection or blood draw. ● Minute by minute update of blood sugar level. ● Automatic and continuous control of blood sugar through pumped insulin
Weaknesses ● Risk of personal medical data being compromised through interception of signals. ● Risk of an attacker remotely hacking the insulin pump and killing the user. ● FDA approval is a slow process, the devices are several years old technology.
Usage ● 350,000 Americans used insulin pumps as of June 2014

The Problem

The cafes on campus tend to be highly trafficked with customers during specific times and waiting time in queue lines tend to increase drastically during the gap between times when classes start or end, but slowly decrease during the middle of the class times. It is not acceptable for students to be late for class all the time. They have a very busy schedule and cannot afford wasting time by waiting too long in line. Therefore, reducing wait time at queue lines can keep customers happy by significantly increase the number of customers served during the 15 minutes between classes.

Goals

The Husky Bite goals are to offer the following values:

1. Maximize productivity by reducing waiting time and length of queue lines.
2. Providing convenience of viewing, ordering and paying for any available items ahead of time via online.
3. Accommodate the needs of all students including those who cannot physically be in line waiting whether it's for physical or other different reasons.
4. Improve production time by reducing interaction time between customer and barista to improve production time
5. Prevent waste of resources by preventing mistakes since order is clearly chosen by customer beforehand
6. Improve "customer experience" and "customer service while being on campus cafes
7. Return of Investment by keeping track of inventory automatically

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Specifications

Functional requirements for student

The section describes functional requirements for the student, which focuses on the capabilities of the system to satisfy the needs of the student effectively and to provide a good customer experience.

Table 1

FR-ID	Requirement Description	Priority
FR-STU-01	The system shall allow student to log in to app through myuw.edu account using a username, password and cell phone number	High
FR-STU-02	The system should allow student to access and select a choice of preference from all the café location options	High

FR-STU-03	The system should allow student to access and view item categories, ingredients description and quantity availability of all menu item options to corresponding café locations	High
FR-STU-04	The system should allow student to select and order any item that appears as available on the app display	High
FR-STU-05	The system must display a verification button to prompt student before submitting item order	High
FR-STU-06	The system should allow student to make special requests including various dietary restrictions	High
FR-STU-07	The system shall have options for receipt (SMS or Email)	High
FR-STU-08	The system shall allow student to view order confirmation number id, café location, estimated preparation time and pick up time.	High
FR-STU-09	The system must allow student to cancel order or go back and modify order if a mistake was made before selecting confirmation button.	High
FR-STU-10	The system shall save history of past orders or allow student to repeat past common order items	High
FR-STU-12	The system should offer student with various payment options i.e. PayPal, Credit/Debit, depending on merchant	Medium
FR-STU-13	The system should prevent student from multiple transaction from the same order.	High

Functional requirements for employee

The section describes functional requirements for the employee, which focuses on the capabilities of the system to ensure that employee is able to obtained all the information required to perform her or his role responsibilities in the most effective way to ensure the needs of the customers.

Table 2

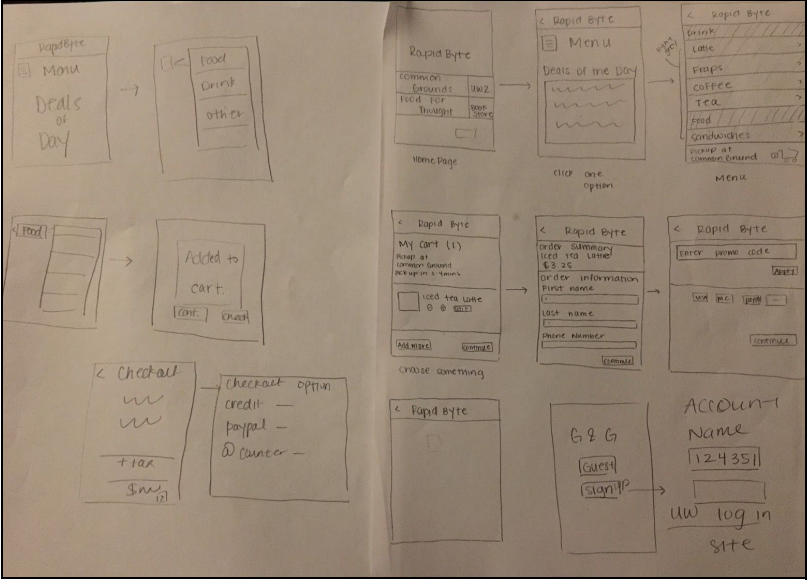| FR-ID	Requirement Description	Priority

FR-EMP-01	The system should allow employee to view order request number, item description details placed by customer, and customer information (first name, last name, and cell phone number)	High
FR-EMP-02	The system should allow employee to verify and confirm order number by providing a prompt button	High
FR-EMP-03	The system should allow employee to provide estimation time for order pick-up by providing option buttons after order confirmation	Medium
FR-EMP-04	The system must allow employee to keep track of order numbers by checking if order has already been picked up by a customer or still pending	High
FR-EMP-05	The system must allow employee to update and track food inventory by providing a prompt button	Medium
FR-EMP-06	The system could keep track of inventory for the employee	Low

Non-Functional requirements

The section describes non-functional requirements, which focuses on the qualities of the system by predicting the uncertainty of common problems related to Availability, Usability, Maintainability and Portability.

Table 3

NFR-ID	Requirement Description	Priority
NFR-01	The system must process money payment within 24 hours of transaction.	Medium
NFR-02	The system should be available to all its users simultaneously as students and employees will be connecting at the same time.	High

NFR-03	The system should deal securely with payment information and any other customer sensitive information.	High
NFR-04	The system should allow users to find Login buttons within 5 to 7 seconds	Medium
NFR-05	The system should ensure accuracy in inventory quantities	Medium
NFR-06	The system should be available in all mobile platforms	High

Sketches of Design
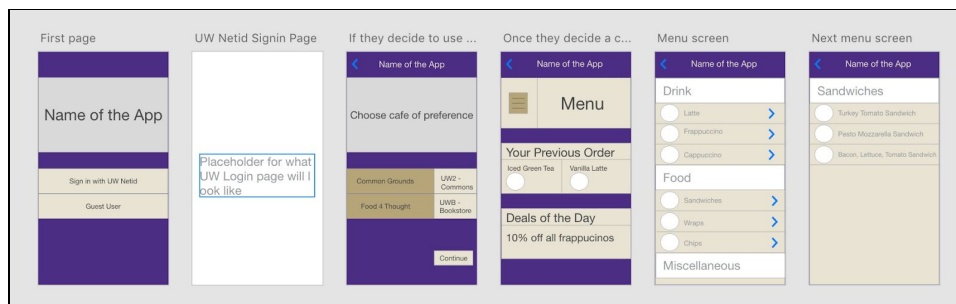
Figure 1.1, Original Lo-Fi Prototype

Figure 1.2, First draft of Hi-Fi Prototype

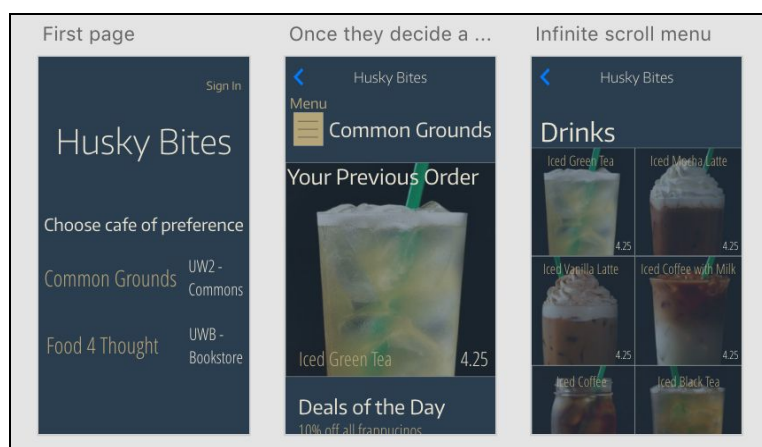# Screenshots of Design (Wireframe)

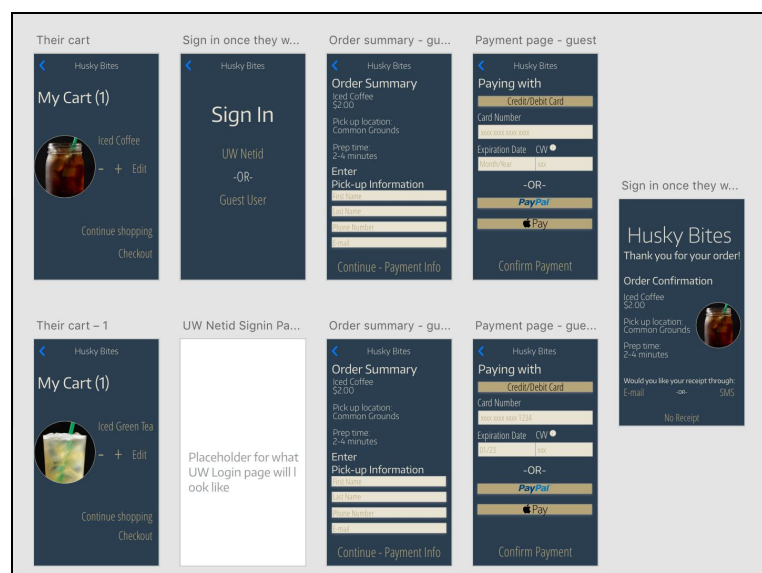

Figure 1.1, Choosing location, Front Page, & Menu

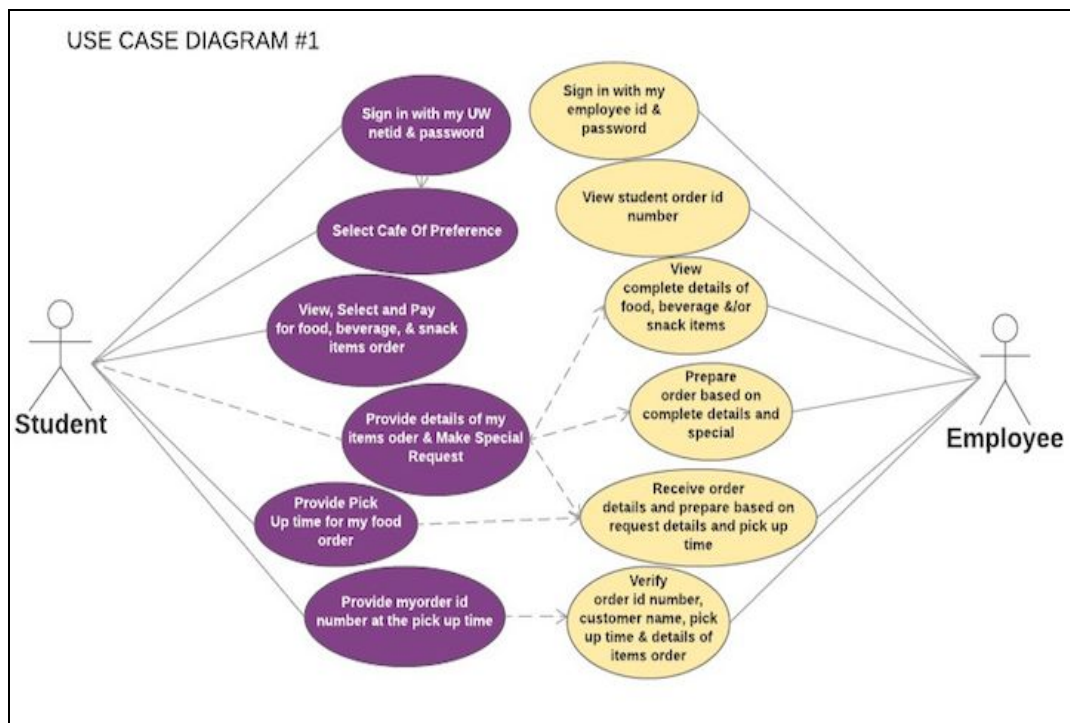Figure 1.2, My Cart, Sign in, Order Summary, Payment, Order Confirmation

Above are screenshots of the hi-fi prototype for Husky Bite. When creating this hi-fi-prototype, there were many HCI concepts leveraged such as Gestalt's Law of Perceptual Organization, using direct manipulation such as form fills, radio buttons, and alerts. As seen with the lo-fi prototype and the first draft of the hi-fi prototype, the sketches started off with a boxy layout and very old-school style. On paper, that original designed looked clean and clear but once put on a wireframe, it showed how dated the design actually was.

In order to get an idea of what users wanted to see in a product such as this one, I asked 4-5 people to go through my lo-fi prototype and then go through the first draft of my hi-fi prototype and see if the flow was maintained and their initial reaction on the design. Through this, I was able to see that users prefer the look of cards and few steps when ordering something in order to quickly get what they need. They, also, mentioned that the typography and colors did not visually please them.

When creating the final design, all parts of each wireframe card was taken into consideration like color coordination, typography, and overall style as seen in whether to use a list or just cards, rounded edges or sharp edges, and order of the cards. Using the information I gained through my simple interviews, I was able to choose complementary colors and typography that made the product more appealing to the users. Also, the impact of photos and shorter steps made the users enjoy using the app more than with the lo-fi and first draft hi-fi prototype.

Use Case Diagrams
Use Case Diagrams involving student and employee

Formal Use Case Scenario
Use Case Scenario involving student and employee

USE CASE ID:	UC-STU1
Primary Actors: (PEOPLE)	Student & employee
Actions involve: (ACTIVITIES)	Order and pay for food and beverage items from Common Grounds Cafe via online using Husky Bites App.
Goal in context: (CONTEXT)	Provide the food and beverage, order id number and items based on user requirements.
Preconditions:	Student signs into Husky Bites App, an app where they can place and pay for an order. Employee signs into cafe system, view, confirm, prepare order to student.
Triggers: (user needs /wans)	Student wants to eat and drink, but has very limited time, so places and pays for an order on Husky Bites App.
Main Scenario	1. Sign in into Husky Bite App using his/her UW netid. 2. Choose cafe of preference 3. View and select menu button 4. View and selects items categories 5. View and selects drink button and chooses coffee option 6. Select iced soy latte option 7. View and selects food button and chooses sandwich option 8. Selects BLT sandwich option 9. Selects special request button and types "no mayo" 10. Add all his/her selections to a car 11. View order summary, pickup location, preparation estimation time, and order id number. 12. Enter exact pickup time

	13. Press check out button 14. Pays for order with a credit/debit card 15. Pick up food items by providing order id and complete name and cell phone number
Postcondition:	Student picks order up at respective cafe with order information at hand Employee provides items by verifying order ID number, student information and it is pulls it off from the queue system.
Technologies	Mobile devices(smartphones, tablets, laptop) from different platforms Point-of-sales system

Methods of Collecting Data

- Interview with Group 8
- User testing on the Hi-Fi Prototype of design

Interview Analysis

General

Our team interviewed five students from group 8 and we learned that we all share very similar problems and expectations when purchasing items from on campus cafes. Based on the fact that we are also UWB CSS students, we all have very similar frustrations and ideas relating to experiences on obtaining food on campus. However, we aimed to construct questions as neutral as possible to ensure that our opinions did not affect the responses from the other group. Alternatively, we may have simply predicted correctly through knowledge and guesswork.

Based on other answers obtained, we deducted that waiting time, line length and convenience were not the only reasons why students do not chose to use the cafes. There were other factors and reasons on their responses that involve the following different areas:

Choice Selections and Price

Some students said that food selection options were very limited when it comes into variety and healthy choices and price range is high.

Security

Some students said that they would use the app if it were available and shown to be trustworthy and that they would trusted if they would log into the school system.

Accuracy in Sample Representation

The fact that this is a convenience sample, and not a representative sample, It is worth noting that they were CSS students selected from an evening class. Most CSS classes are in the afternoon and evening, so it is likely they will have similar afternoon and evening schedules for most of their time at UWB. Notice that the distribution of iOS vs Android does not match the US market share either (Apple has a 44% market share .[https://www.digitaltrends.com/mobile/us-smartphone-market-share-january-2017]). It would be interesting to ask similar interview questions of more representative groups, as well as selecting groups of customers in line.

How we came up with these questions?
Our target audience are current UWB students, so it was important for us to know their opinion on the existence of this app. We tried to make questions that would help us get an insight into some crucial aspects such as if the problem that we foresaw actually exists among our audience, and what the potential uses of this application could be.

Summary of the answers:
Students seem to not favor long lines. Lines are the most traditional way of business yet prove to be a huge consumer of time for students, especially those that have back to back classes. The time waiting for orders resulted in an average of about 5-10 minutes. For a wait any more than 10 minutes, the students would rather not place an order. This usage of time doesn't leave much for students to socialize or accomplish other necessary tasks within the 15 minute break between classes. Ordering food ahead of time and picking it up immediately, whether they pay at the counter or beforehand, students can save exponential amounts of time that would result in the benefits of everyone involved.

Another factor that students care about is the variety of options as well as keeping them at a lower price. The food options at UWB include: Subway, Food for Thought, Starbucks (at the next block), Common Grounds, Food Trucks, and Cascadia's coffee shop. Even with these, there still doesn't seem to be enough options for meals.

As for the mobile platform between Android and iOS, Android seemed to be the majority of the phones students had. Therefore, the android version of the application will be first in line for development and the iOS version would be next.

For making electronic and mobile transactions, students seemed to be comfortable with all forms. These include online purchases, mobile app purchases, and third-party transaction applications such as paypal and venmo. Since students trusted these methods of transactions/purchasing/making orders ahead of time, the methods will be implemented into the application in order to continue this level of trust.

Some other features suggested by students include:
- Social media sharing
  - Students can share and post their purchases to social media to show their friends
- UberEats
  - Integrating the application with UberEats
- Rewards Points/Coupons for using the app
- Happy Hour

These suggestions are very possible to implement and would fall under "Should have" in MoSCoW. Maybe not happy hour.

Usability Evaluations

We are going to test for usability by having the users of that app take a quick survey about the app's ease of use and pace of delivery compared to the usual in-line orders. For people that do not already have the app or do not know about the app, we will have a banner or

posters promoting the application that people in the line can easily see. The same survey will be given out to the new users. Feedback received from the survey will help us evaluate our application. If most people say that the app was easy to maneuver through and they received their items much quicker than they would have sitting in a line, our application is successful in this evaluation.

Milestones

I.   Wednesday, May 10 - Summary Briefing powerpoint

Each team member had to submit two applications that are being used in the realm of IoT. From there, we narrowed our summary briefing down to groups and had 1-2 of the applications found per grouping.

II.   Sunday, May 14 - Determine new application

Team members submitted possible new application they wanted to work on to the group and we narrowed it down to the idea with the most votes.

III.   Monday, May 15 - Group Interview with Group 8

Go over our 'Summary Briefing' and 'Requirements Specification' with Group 8 being our user. Likewise, we will be users for Group 9 by looking at their 'Summary Briefing' and 'Requirements Specification'.

IV.   Thursday, May 18 - Group Meeting

Go over what needs to be completed with our 'Requirements Specification'. Work on the Lo-Fi prototype so then we can start the Hi-Fi prototype over the weekend.

V.   Friday, May 19 - Group Meeting

Go over what needs to be completed with our 'Requirements Specification'. Work on the Lo-Fi prototype so then we can start the Hi-Fi prototype over the weekend.

VI.   Monday, May 22 - Group Meeting

Finalize 'Requirements Specification' and go over the Hi-Fi prototype. Make small tweaks on the product.

VII.   Wednesday, May 24 - Group Presentation

Do the early bird Group Presentation!

Strengths and Limitations

Strengths	Limitations
- No app exists for these cafes - Accepts multiple payment methods - Improves flow and reduces congestion of lines between classes - Allows customers to select specifically what they want - Can enable tracking of specific customer trends	- Only usable on campus - Reduces opportunities for impulse purchases (lost revenue) - Potential for confusion at order pick up (lost revenue, potentially angering customers) - Requires using a smartphone, limiting access - Backups can occur when making beverages - Requires a constant connection in the cafe

Appendix

Powerpoint

Group 3 - IoT Presentation

Interview Questions

The following are the questions and answers given in the interview session:

Customer Base Questions

1. What is your biggest frustration with eating on campus?	A. Lines, price B. Classes are back-to-back C. Options
2. What would most improve your experience getting food on campus?	A. Customized meals B. More Options C. Better, healthier food options D. Prepacked meals E. Protein shake bar F. Food at the gym
3. How often do you use the coffee shops on campus?	A. Every day B. Twice a month C. If I forget… D. Three times a year E. 4, 0, 5, 0, 0
4. What time of day are you normally on campus?	A. Noon-9 B. Noon-9

	C. 11-midnight D. 330-8 E. 1230-8, sometimes 10am
5. How often do you use the food trucks on campus?	A. None, none, sometimes ezells B. "Too expensive"
6. Would you like to be able to order food ahead of time?	A. For sure B. Good option C. Convenience fee wouldn't be a big deal to 1 person, big deal for another

Convenience Questions

7. How much time do you spend waiting in line for food on campus on average?	A. 5-10 minutes, 5-10 minutes B. I try to go while class is in session C. I try to go before my first class
8. How often do you decide not to order food because the line is too long?	A. Yes B. Or I look at my bank account
9. How long a line is "too long"?	A. 8 people B. 5 is ok C. 7 D. 10 E. If I think it will be 10 minutes
10. Do you ever decide not to buy something because the line is too long?	A. [sure?]
11. How long are you willing to wait for your order?	A. [10 minutes]
12. What type of phone do you have?	A. 4x Android, 1x iPhone

Trust Questions

13. Do you make online purchases?	A. I wouldn't hesitate for Amazon vs another company, a new company would make me hesitate. I look at reviews to determine if I trust the app.
14. Would you feel comfortable making purchases from an app?	A. If app is endorsed by university, then yes B. Login with webnet id C. Make sure it's secure

15. Would you feel comfortable entering your credit card information into the app or using alternative services such as venmo or paypal?	A. Any option is fine B. Could I skip the line and still pay in person?

General thoughts

16. Any other Features?	A. Social media reporting B. Uber Eats C. Pizza D. Rewards for use, coupons for use E. Happy hour
17. Is Rapid Bite a good application name or what should we change it to?	A. Really? B. QuickBite C. Rabies D. QuickByte E. Don't name it food for thought
18. Preference?	A. FFT has more snacks... B. FFT is more expensive.... C. Hours D. Finals week should be 24hrs

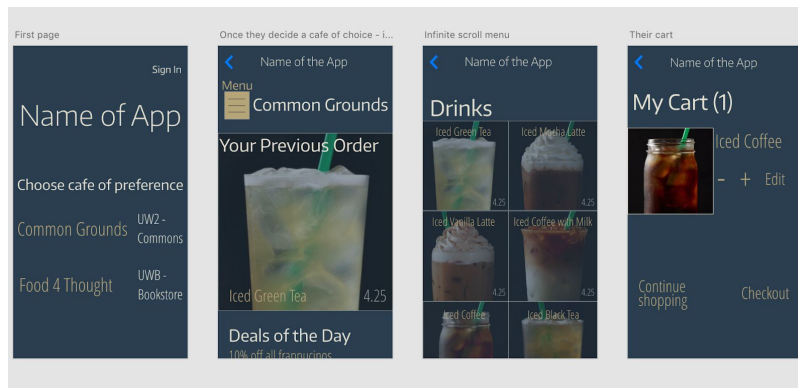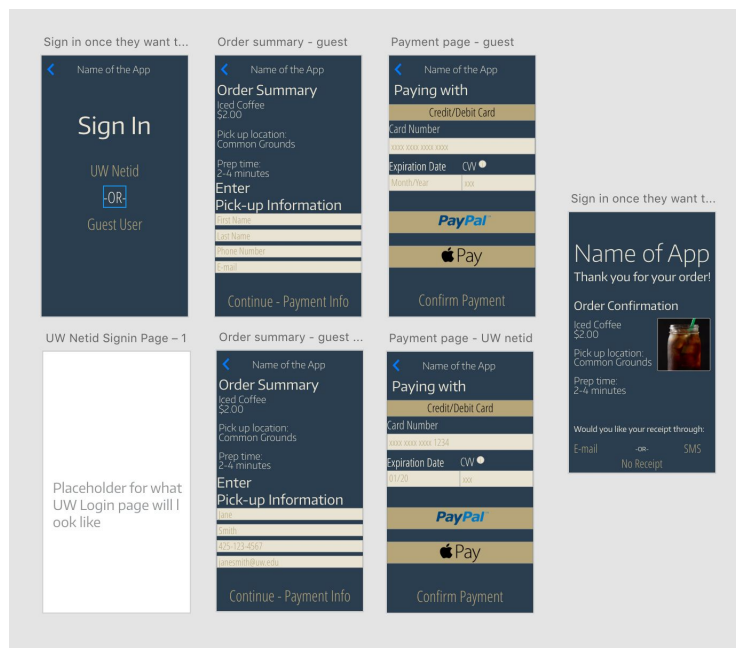# Previous designs that did not make it

Figure 1.1

Figure 1.2

The designs above did not make the cut of the final product due to fixing some minor design issues such as create more button-like icons rather than some sort of screen-wide header. Also, there have been fixes to the design with the name being finalized and overall last-minute tweaking.