

CS 420  
Human-Computer Interaction  
Section 1001  
Final Project Report

Foodle  
Meal Delivery Service for College Campuses

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## **I. Project Overview, Purpose, and Motivation**

Foodle is a mobile application that provides convenient meal delivery to customers on university and college campuses. It is specifically designed for students and faculty who would like to order meals from the comfort of their location without leaving the building so that they can focus on their work. With this mobile app, customers would not have to walk to the restaurant and wait in line to pick up their food. Building-to-building meal delivery is especially convenient for universities located in places with harsh weather conditions, such as Las Vegas summers, Seattle rain and East Coast winters. Since deliveries will be made within the radius of the university and nearby surrounding areas, the restaurants that will be available to specific campuses through Foodle will be limited. Users will still be able to do other tasks such as updating account information, payment methods, drop-off locations, and bookmarked restaurants and order lists outside of campus. Foodle is designed with a specific demographic in mind, and as such, better accommodates the needs of university students and faculty.

## **II. Existing System Analysis and Evaluation**

After looking at similar food delivery apps such as DoorDash and Postmates, we felt that the majority of them had a rather cluttered design throughout. So, the time required to comprehend and use those apps was much greater than what we believed should be required of busy students and faculty. On the other hand, other analyzed apps had interfaces that were simplified too much and did not give users sufficient information on the current screen. We decided we wanted Foodle to have the best of both worlds, by implementing a minimalist design that still gives users important information and the finer details at the appropriate time. Initially, we wanted Foodle to stand out from the rest of these apps not just because of its focus on college and university users, but also that we wanted the design to have a more vibrant and visually appealing color scheme than competing services. However, we realized that the reason for standardizing an off-white background with a dark font color was because it offered better readability and contrast. Thus, we decided to follow that sensible trend. Additionally, we noticed a trend in design that has been taking over lately, that which is to offer a “dark theme” for websites and apps. This is something we would love to implement (if we had the time and resources) since it makes using the app in the dark or at night easier on the eyes. Instead of using third party software to achieve it, implementing it ourselves would ensure that users get the features they want with the best experience possible.

Further analysis showed many different implementations of the search bar. Due to the vast number of restaurants available to the general public and intended users, this is a must. Despite our services limiting options to places within a certain range of campuses, allowing a user to find a specific restaurant quickly once they have decided would help users navigate through the application with ease. Likewise, if a user has not chosen a specific restaurant, and rather a specific cuisine, we want to make it easy for them to find all available choices too. So, a filtering system is another functionality that we believed was important to have for our users. Whether it be the food category (burgers,

sandwiches, soup, seafood, etc.), food temperature (cold, warm, hot), price range (standard \$, \$\$, \$\$\$, or specific range), or some other attribute which the user is interested in, we want to make their searching as easy as possible.

We also found order history pages to be a standard, which we also believe should be implemented in any service where payments or transactions are made, food related or not. However, we wanted ours to be more intuitive and not just a means of reviewing previous orders. Therefore, we implemented “purchase again” and “bookmark” options so that users can easily reorder their favorite meals. This means that with just a few taps, a user can place their go to order from their favorite restaurant on campus, or just as easily tweak the order to what they crave for the day.

In most of the services we analyzed, users are asked to choose how they want their delivery to be made - meet the driver outside, have a meal delivered to the front door / main office, or have the delivery person follow specific instructions. Since our services are uniquely tailored for university campuses, we decided we wanted to implement something similar that would make it as seamless a transaction as possible for both the customer and the deliverer. Our solution would be to have designated drop-off zones in each campus building so that the customer does not have to interrupt their workflow. Instead, the food can be dropped off at the front desk with a specified person or the deliverer can wait at the designated area for an agreed amount of time until the user arrives.

Another trend we picked up on was the use of the home page for promotions, specials, and featured restaurants lists. We believed this was a guideline we should follow, as it gives users something to look at when they first enter the app. Even when we may be starving, sometimes it is just unbelievably hard to decide what we want to eat. Having these promotions and specials appear on the homepage is a win-win solution that gives users recommendations/ideas while helping partnering businesses get the exposure and recognition they deserve.

There were many other trends and commonalities we observed in the other apps that we would have liked to add as features, however given the time constraints we were not able to get to them. One feature that we would definitely want implemented is that many apps provide outside-of-app notifications for order tracking but notified the user too frequently and kept every notification visible on screen. This is a useful but can be cumbersome, so we would revise it by displaying only the most recent update. Given more time and resources, this feature would be essential to implement.

### **III. Employed Methods of Target Users & Key Features**

#### **A. User Interviews for Identifying Target Users**

1. When designing this application, we decided that our target demographic would be college/university students and faculty. Our focus being on those who have tight schedules and want to focus on their studies/work. The

students we interviewed were students at the University of Nevada Las Vegas, who frequently stay on the campus for multiple hours, and eat/order meals on campus daily.

## 2. User interviews:

- a) The first user we interviewed for our application was a 22-year-old Electrical Engineering major at UNLV. The student says they frequently eat on campus or have their food delivered. For this user, the most important feature they wanted implemented was the ability to see or filter restaurants that offer free delivery, as delivery charges can often increase the total bill by upwards of 15%. This feature could help them keep within their monthly food budget while still being able to have healthy meals.
- b) Another user we interviewed was a Finance major at UNLV. She was a first-time user of food delivery applications and wanted the ability to see photos of the delivery driver for security reasons. This way she could feel a bit safer being able to match the face of the deliverer to the profile picture, as accepting food from a complete stranger can be discomfoting. Furthermore, this user also wanted the ability to have their meal be dropped off at a designated “drop off spot”, similarly for security reasons. This would remedy the safety risk of being alone when picking up the food. The drop off location would be in places that are public such as the library and would potentially be comprised of a shelf to store the food on each floor.
- c) We also interviewed a Biology student at UNLV who said they frequent the Lied Library multiple times a day and stay on the upper floors for multiple hours at a time. Something that they wanted to see this food application implement was the possibility of drop-off at their exact location, as opposed to a designated zone. Their reasoning being that they get so caught up in their work and studies, that getting up from where they are would break their concentration. Furthermore, they don’t feel comfortable leaving their area and things unattended for too long. This is especially true for users in the upper floors of the library, as having to go down to have access to the street can take more than a couple of minutes.

## B. Competitive Analysis for Identifying Key Features

1. One of the identifying key features that was implemented into Foodle is giving the user the option to have their order dropped off at a designated zone (one for each campus building) or having it delivered directly to the user. The user also has the ability to specify which floor of the building they would want their food dropped off to.

2. Another key feature which was implemented into Foodle is the ability to look at order history information in detail.
3. We believe that having some sort of feedback upon completing important ordering milestones is crucial. Thus, with Foodle, we tried to make sure that there is a confirmation page that makes all order information available to the user for easy reviewing and editing.

## **IV. Usability Evaluations and Results**

### **A. Foodle and the Eight Golden Rules of Interface Design (Ben Shneiderman)**

#### **1. Strive for consistency:**

Foodle keeps a consistent design layout throughout the application. This was achieved by creating a design system during the preliminary design process. The design system includes a set color palette, fonts, and sizes that would be uniformly used throughout Foodle. Likewise, we wanted to make sure that the utility buttons are kept in the same place on different pages throughout the app (when applicable). The design team also ensured that spacing is uniform throughout each screen as well as the pixel dimensions of each image to achieve consistency. It is important for the user to feel as though the visual elements of Foodle are consistent and clean, as to not distract them and waste more of that same time which we are trying to save them.

#### **2. Seek universal usability:**

This rule of universal usability is a challenging criterion to meet since there is no such thing as an average user. We believe our app has come close, because even though its target demographic is college/university-centralized users, however the background of those people can differ from campus to campus immensely. We did our best to ensure that fonts were easily legible and other content easily visible, and that features were easy to learn and use. As for language barriers and other disabilities such as visual or hearing impairment, we were not able to address due to time constraints.

#### **3. Offer informative feedback:**

Within the Foodle application, we made sure to offer informative error handling messages for the user when required information was not entered or entered incorrectly. In our form collection screens, we identify specifically which part of the form contains the mistake after a user tries to submit. Informative feedback is also given when the user adds an item to the cart. The user knows exactly when their actions have produced a change for tasks such as: adding items to the cart, adding a new payment method to the profile, or the current status of the order.

In the future, we would like to implement an interactive notification area status for active orders that would show the order's ETA and current location.

4. Design dialogs to yield closure:

Foodle implements a clear beginning, middle, and end to a transaction. Starting with restaurant and food recommendations, the user can look for the food/drinks they want to order and are given a dialog to confirm the item(s) have been added to the cart. Similarly, when a user is ready to check out, they are received with a confirmation screen that displays the order confirmation number, the ordered item(s), the total price, and even offers feedback on the status of their delivery. Some specific actions such as adding a restaurant/order to the favorites section or adding an item to the cart will create a popup message to confirm and notify the action.

5. Prevent errors:

Foodle is designed in a way to reduce the number of errors made. In our application, when users sign up or log in to an account and make a mistake, the app will prevent any further progression, highlight the incorrect text fields, and notify the user where the error was detected. Another feature implemented in our app is the ability to edit an item (such as toppings, condiments, ingredients, and special requests) from within the cart without having to delete the item and start over.

In the future, our app will feature the ability to have users confirm, cancel, or edit their order during a limited time window after it has been placed.

6. Permit easy reversal of actions:

All pages on Foodle in which a back button can be implemented has one so that the user can go to the previous page they were on without having to start from the homepage or reopen the app. The cart page has a remove item button that allows users to take out or edit existing items as well. Ideally, we would have liked to implement an undo button for items recently removed from the cart.

7. Keep users in control:

Users have great control over the food item specifications, delivery location, payment methods, and search functionalities of the Foodle app. They have the ability to save and delete both locations and payment methods as necessary. Likewise, we would like to implement a method of deleting search and order history from accounts to give users control over their data.

Due to time restrictions, we were not able to implement a more robust filter and sorting functionality.

8. Reduce short-term memory load:

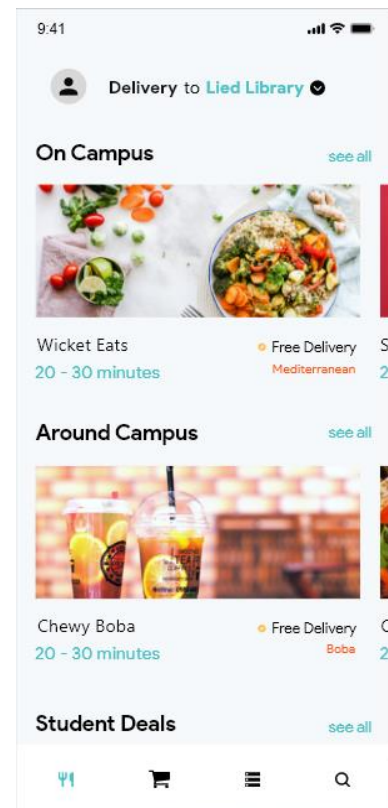
Users are able to store payment methods into their accounts so that they do not have to enter it more than once (unless they want to delete that information each time). They can also see their order history (listed from most recent to least recent), which is useful if they would like to review their transactions or easily reorder meals.

## V. Final Design Features and Functionality

### A. The Home Page

Since Foodle is designed for meal deliveries within the radius of campus, restaurants displayed on the homepage are grouped under the categories “On Campus”, “Around Campus,” and “Student Deals,” as these are the topmost categories that the restaurants will fall under. Organizing the homepage in this way immediately gives the user an idea of what the nearest restaurants they can order from are.

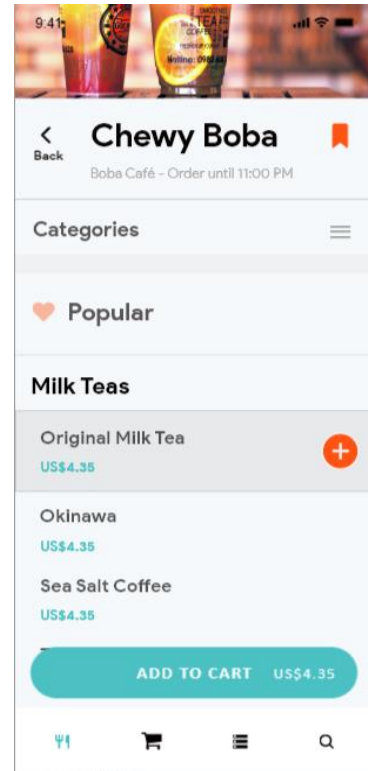
Similar to other apps such like DoorDash and Postmates, we utilized the carousel structure (side-scrolling cards) to show each restaurant and its information. The user can swipe right-to-left to see more. Part of the next card is visible to signify that the user can interact with the interface. This type of structure is common in existing delivery apps as well as unrelated ones, so users can feel comfortable seeing a familiar interface.



## B. Restaurant Page

Specific information must be included when the user clicks on a restaurant page. The information we decided to include by viewing competitor applications were the name of the restaurant, hours of operations, and the restaurants items based on categories such as “Popular.” This aims to give the user a quick recommendation based on the more frequently purchased items. Overall, this would expedite their decision process and allow an easier experience in selecting their food choice and proceeding with checkout.

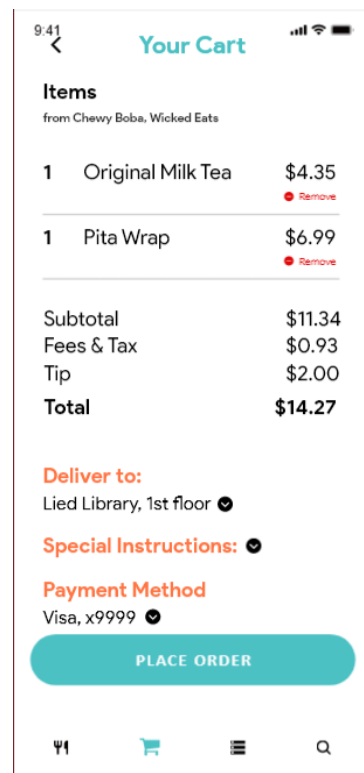
Another feature we added on the restaurant page is the ability to bookmark the restaurant. This helps the user by allowing them a shortcut to their favorite restaurants and the freedom to group their bookmarks in a way that makes sense to them. This allows a more efficient checkout experience for the user and improves information recall with logical groupings.



## C. Cart

It is essential that the Cart screen is both clear and simple in conveying information because this is the last screen the user will see before completing their order. The Cart structure is also similar to other meal delivery apps with a few differences. Through analysis of existing systems, we found that other apps do not have a visible “remove” button next to items in the cart and instead opt for swiping right-to-left to remove an item. Experienced users would likely know already that swiping is the action to remove an item. However, we decided to include a removal button with red font as an indication instead because users expressed that they would like to see a more obvious signifier for this action. This method follows the Golden Rule to “offer informative feedback,” as it clearly informs the user of an important action.

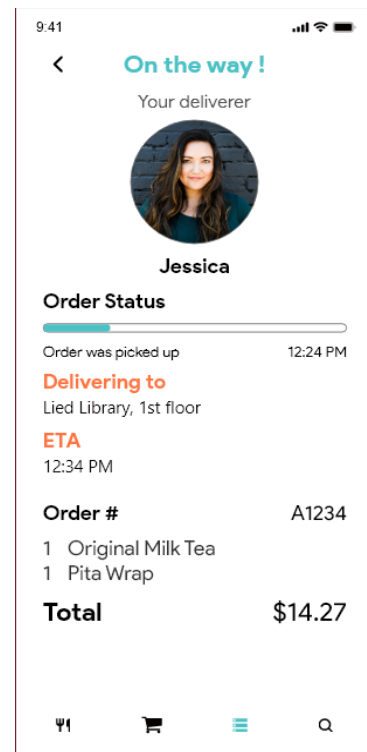
We also included signifiers to indicate that the user can make changes to their delivery location and payment method before they place their order. Again, this offers more informative feedback to the user.





#### D. Confirmation Page

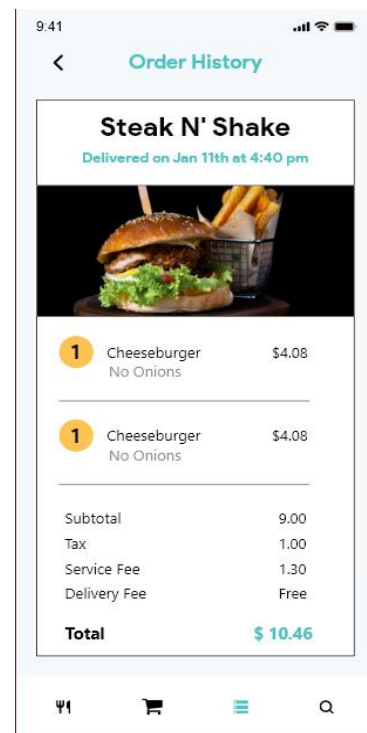
The Confirmation page provides important information and yields closure when the user places their order. We found it necessary to include a picture of the deliverer's face so that the user will recognize their deliverer when they receive the order. It also gives the user an acquaintance with their deliverer so that they are more comfortable when they meet. Users will see a status bar as the order makes its way to the destination. This gives the user a sense of progress so that they do not have to wonder about how their order is going. Finally, this page provides an order number for the user and customer service to reference if there are any issues with the order. The user will be able to return to this page in their order history until the order is completed.



#### E. Order History

Order history was a functionality that was requested by users we interviewed as well as a prevalent feature in competitor apps such as UberEATS and DoorDash. Foodle's final implementation of order history includes a unique vision in how the information is laid out to the user. The user has the ability to click on their past purchase and have a drop-down menu appear with the details of their order. The bottom of the screen includes a "Purchase Again" button which aims to expedite the user's experience if their goal was to repeat a previously made purchase.

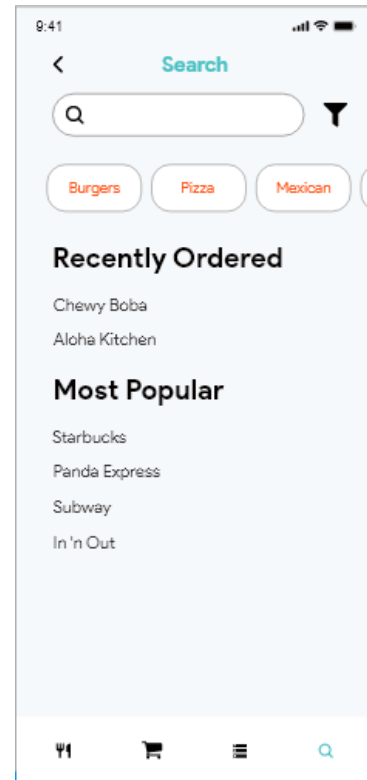
Another benefit to this feature is to reduce short term memory load for the user where the user does not have to remember the items they ordered in the past and are able to look it up themselves.



## F. Search

The Search page contains a carousel of food categories that the user is able to swipe through. We included popular food categories such as “Burgers,” “Pizza,” and “Mexican” for convenience if they needed a starting point to begin their search. Competitor apps such as DoorDash and Grubhub also implement this feature for the ease of the user. Once a food category is selected, Foodle displays restaurant suggestions around the area that coincide with the user’s choice.

The Search page also includes two categorical breakdowns of recommendations: “Recently Ordered” and “Most Popular.” These were popular inclusions in other food applications and allow the user to more easily decide on a restaurant to view and order from.



## VI. Implementation

### A. Low Fidelity Mockup & High-Fidelity Prototype with Adobe XD

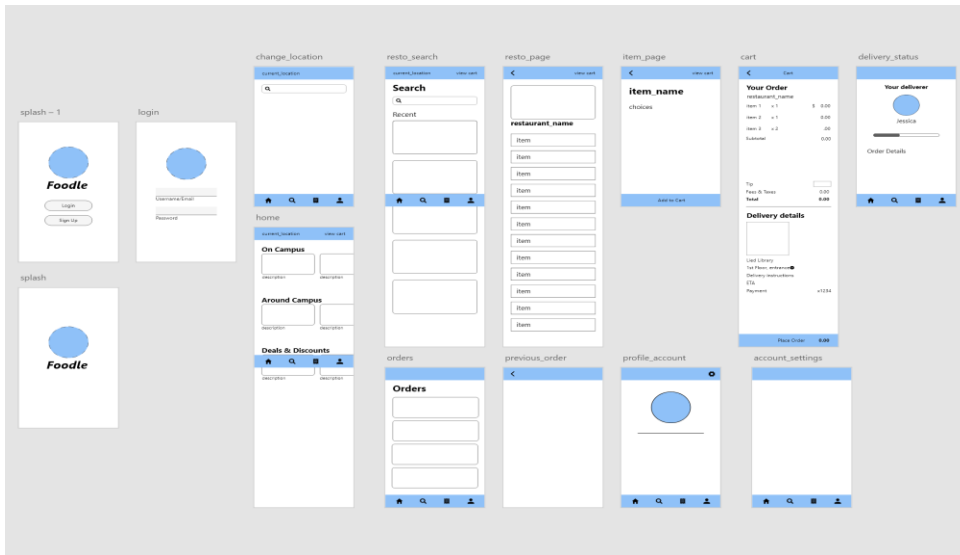
After we completed our competitive analysis and conducted user interviews to gain insight on what features we would be implementing in our application, we began the design process by creating a low fidelity wireframe on Adobe XD. In this wireframe, we created a quick iteration of all the screens in Foodle. We made sure to encompass the user flow of experience from their first interaction with our product (sign in) to the end (checkout details).

User Flow of Interaction with Foodle:

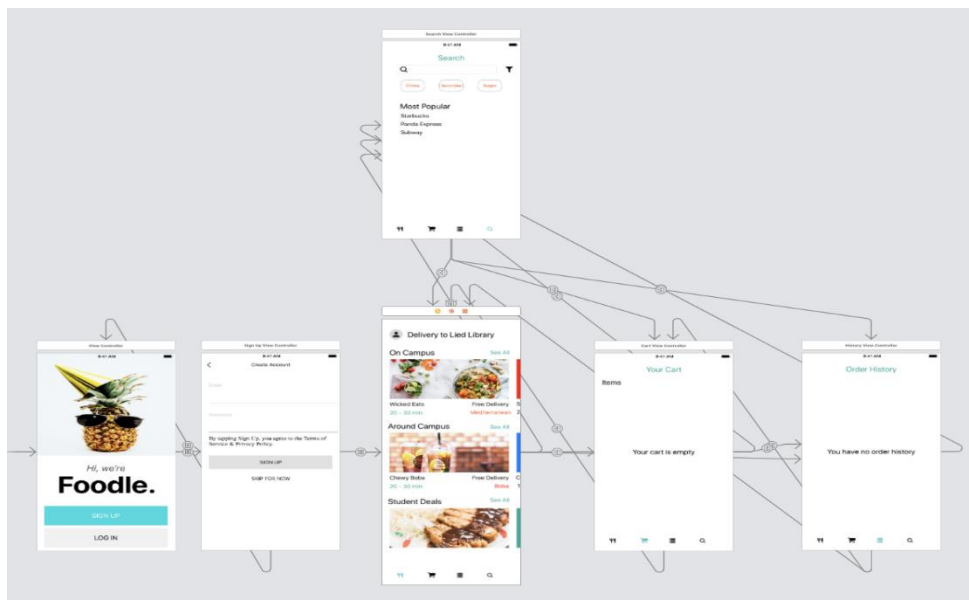
1. Sign into Foodle (or ability to skip for later)
2. Search through categories and recommendations to find food items they would like to order on or around the college campus
3. Ability to add the food item(s) to their cart
4. Initiate the checkout process where a payment is collected
5. Update user with their finish order, deliverer, whereabouts etc.

Implementing a wireframe created an excellent foundation to quickly begin the high-fidelity design process. For the high-fidelity prototype, we exchanged the placeholder text and images for the real text and restaurant images that would be in the

final design screens. Using Adobe XD, we were able to create animations that would ideally be implemented in the finished product such as drag, swipe, and tap animations.



## B. Storyboarding and coding Foodle on Xcode



After the UI team created the high-fidelity prototype on Adobe XD, the programming team exported the Adobe XD assets onto Xcode. From here, we began implementing the high-fidelity prototype into an actual IOS application. The implementation was mainly done via storyboarding. Coding was mainly needed when transitioning between view controllers. The programming team tried our best to implement all the features laid out by the UI team. However, we were only able to complete the core of the application, which includes: the sign in page, food homepage, cart page, history page, and the searching feature. A summary of the Xcode implementation can be shown below:

## **VII. Technical & Social Implications**

We consider the issue of user safety and privacy is of the utmost concern. Due to the fact that location and information of users will become available to the deliverer, there is potential for this information to be used for ill-intentions. With this in mind, it is important that deliverers of Foodle go through a strict hiring process with background checks to ensure deliverers are of sound mind. Also, user information should not be available to the deliverer once a delivery has been made to uphold user privacy.

Another potential implication of this service is that it could create more jobs, as the app will need deliverers, customer service and support staff to be a bridge between users and restaurants. It is possible that those who are already delivering for other meal delivery services will also do it for Foodle or leave the other service entirely to do Foodle full-time. It would also make sense for students or faculty to be able to deliver for Foodle since they are already on campus and could use any spare time for deliveries.

Lastly, with food and drink comes clean up and waste. Buildings on campus would begin to see an increase of trash in the form of food, drinks, plastic and paper bags and containers. With deliverers coming in and out of buildings, there would be an increase in foot traffic with potential for accidents and spills. The addition of more food in the buildings entails food odors inside, which may annoy and dissuade people from working in these buildings.

## **VIII. Challenges Encountered**

Our team experienced many challenges when it came to implementing the final design on Xcode. One of the first challenges we faced was exporting the Adobe XD design to Xcode. Initially, we thought that exporting the Adobe XD storyboards would create the Xcode storyboards. However, only the “.png” image files were exported as assets onto Xcode. The second challenge we faced was our lack of experience with the Xcode IDE and Swift programming language. Because of this, we had difficulty implementing many of the features we would have liked. One of the major features is the ability to scroll on the home screen horizontally and vertically. Additionally, there are a few storyboards that we were not able to complete due to time constraints. These storyboards include the deliverer profile and fleshing out the order history.

## **IX. Project Timeline & Team Member Contributions**

Our team worked on this project for the majority of the Fall semester. We took the first few weeks after the assignment to brainstorm project ideas. Once we had decided on the idea, we chose a standard means of communication and divided into subgroups to focus on specific parts of the project. We settled on two groups, one working on the user interface and design of the app, and another group that would focus on the code and implementation. The user interface and design team would first work on the design of the

application (in a span of 3 - 4 weeks), which would then be passed on to the implementation team to build out. Once the application was implemented and tested, we regrouped to collaborate on the project report and presentation components.

The first group consisted of Joshua Arber, Christian Camama, and Juan Uscanga who oversaw the design process and iterations for Foodle. They first began with competitive analysis and user interviews. Then they introduced the user flow of how the target user would interact with the application. The next step was to utilize the prototyping software, Adobe XD, to develop the application wireframe. They finished by creating a high-fidelity prototype that would be used as reference when passed on to the implementation and programming team.

The second group consisted of Tony Amin, Bryan Nunez, and Robert Deluna. This group used Xcode to build the actual IOS design of the application but ran into complications porting the Adobe XD files. This impacted our timeline as iOS implementation was delayed and were not able to implement all the pages designed by the UI team.

In terms of a timeline, the two groups would work at different times and different paces to meet the 8-week due date. During the first week, each member was to brainstorm ideas for the project on their own, and by the end of the week we would discuss and vote on the final project idea. During the next two weeks, we would conduct competitive analysis into similar services, as well user interviews. Once we had a solid idea of the interface and design features our user demographic was expecting, we moved onto the wireframe and low fidelity mockups. By the fourth week, our plan was to have user testing sessions done, and implementation of the high-fidelity mockup polished for sending to the developer team. While the design team was focusing on the wireframes and mockups, the development team was tasked with learning Xcode so that they would be prepared once the design team was done. In week 5, the development team started working on implementing functionality of the login and user profile screens. However, it was at this time that we came across some difficulties trying to import our Adobe XD files into Xcode, which led to a delay in the Xcode implementation. We decided to return to the mockup and polish it up to help reduce the number of errors and nuances that the development team had encountered. On weeks 7 and 8, we tried to clean up the interface and any bugs that remained. Additionally, we tried to add some of the extra features to make the app more user-friendly. During this time, the design team got started on the report and presentation to ensure it would be done by the final deadline. Once the development team had finished cleaning up the app, both groups reunited to finish with the final report and presentation.

## **X. Future Work**

A meal delivery service app is a complex program that calls for several features to be implemented in order to provide the best user experience. In terms of future work and if given the time and resources, they would go into improving Foodle by making it more universally accessible, allowing student pickups, and implementing quality of life features.

One feature we discussed was giving students the option to pick up orders for other students. If someone were ordering from a restaurant on campus, and another student was getting their order at the same time, the student at the restaurant would be given the option to pick up the mobile order. We could incentivize students to do this by giving them discounts on their order, redeemable coupons, or points towards future orders, and even money back on transactions. Since college students are always looking for ways to earn some money here and there, or save on spending, this would give these people the opportunity to get the most out of their experience when using the Foodle app.

University campuses can be some of the most diverse places, so it is important that the design of a college-focused meal delivery application consider and implement options to cater to a diverse group. This would include providing a color-blind mode, the ability to resize the interface, language preferences, a text-to-speech option, etc. These accessibility features would improve universal usability.

Some quality-of-life additions we would like to add involve rating and suggestion systems. The addition of a suggestion feature, which would recommend restaurants based on the user's previous orders, would allow users to be able to see these suggestions in their user profile, the home page, and in the search function of the app. Another feature would be to integrate user ratings and reviews of restaurants like Yelp. These features would enable users to find the restaurants they like more quickly. A rating system for deliverers would also be useful, as users would be able to separate good deliverers and not so good deliverers. Since Foodle is university-focused, reviews, ratings, and recommendations provide a higher sense of community, as students and faculty can share their thoughts about their university.

## **XI. Summary of Research**

- The Design of Everyday Things (2013) by Donald A. Norman  
We utilized this body of work to help give us insight in designing effectively with the user in mind. It served as a great reference material for the design team when implementing a successful user interface for Foodle that aims to be user centric.
- iOS Human Interface Guidelines  
These detailed iOS guidelines were referenced when creating an application for the iOS environment. It provided us with rules on consistency and helped us develop a clean and minimalistic design choices.

- Swift Resources

The Swift Resources were beneficial when proceeding to the programming portion of the Foodle design. It provided instructions on how to begin coding in the iOS environment.

- Designing for Mobile Apps: Overall Principals

This Medium article helped the design team have a blueprint in what overall principles should be included when brainstorming the initial mockups. It provides the common practices and design strategies to maximize the effectiveness of the interface for a mobile device platform.