Dining Hall 411

Morgan Foster, Nils Brown, Ralph Miller, Reem Alam, and Qiujie Wang

---

Table of Contents:

Design Phase for DH411

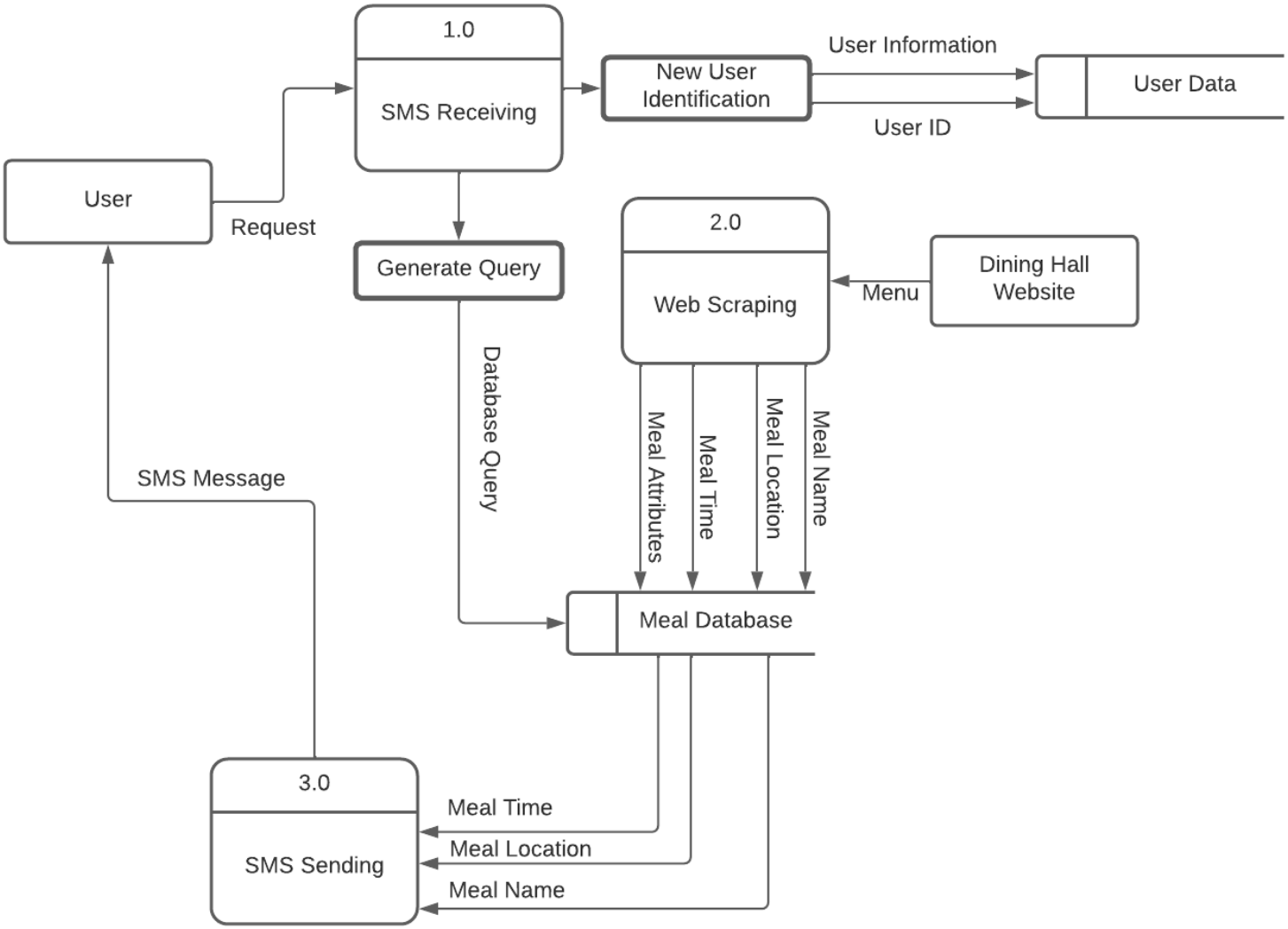
This report includes the description of the recommended solution which is converted into logical and physical system specifications. We determined functional, detailed specifications of system elements (such as data, processes, inputs and outputs), and the technical specifications of all system elements. To represent this information, we divided the report into sections including the following items:

- Data Flow Diagrams (DFD)
  - Includes a Level-0 diagram to represent a system's major processes, data flows and data stores at a high level of detail.
- Use Cases
  - Includes a use case diagram and 3 written use cases to show system behavior, along with key actors that interact with the system.
- Activity Diagram
  - The activity diagram to show the conditional logic for the sequence of system activities needed to accomplish notifying the user about the dining hall menus (DH411's main process).
- Relevant Designs of Databases
  - Includes two designs of two databases we will be using: one for customer information and one for the dining hall information.
- Forms & Reports
  - Includes design specifications: narrative overview, sample design, and testing and usability assessment
- Interfaces/Dialogues
  - Includes a mock up wireframe of what will be implemented into Adobe XD/Figma to create
- Systems
  - Includes outcomes and deliverables from designing distributed systems.

Data Flow Diagrams

In this section, we analyzed DH411's high level system structure and developed a level-0 DFD for those requirements.

The following diagram is our Level-0 DFD for DH411:

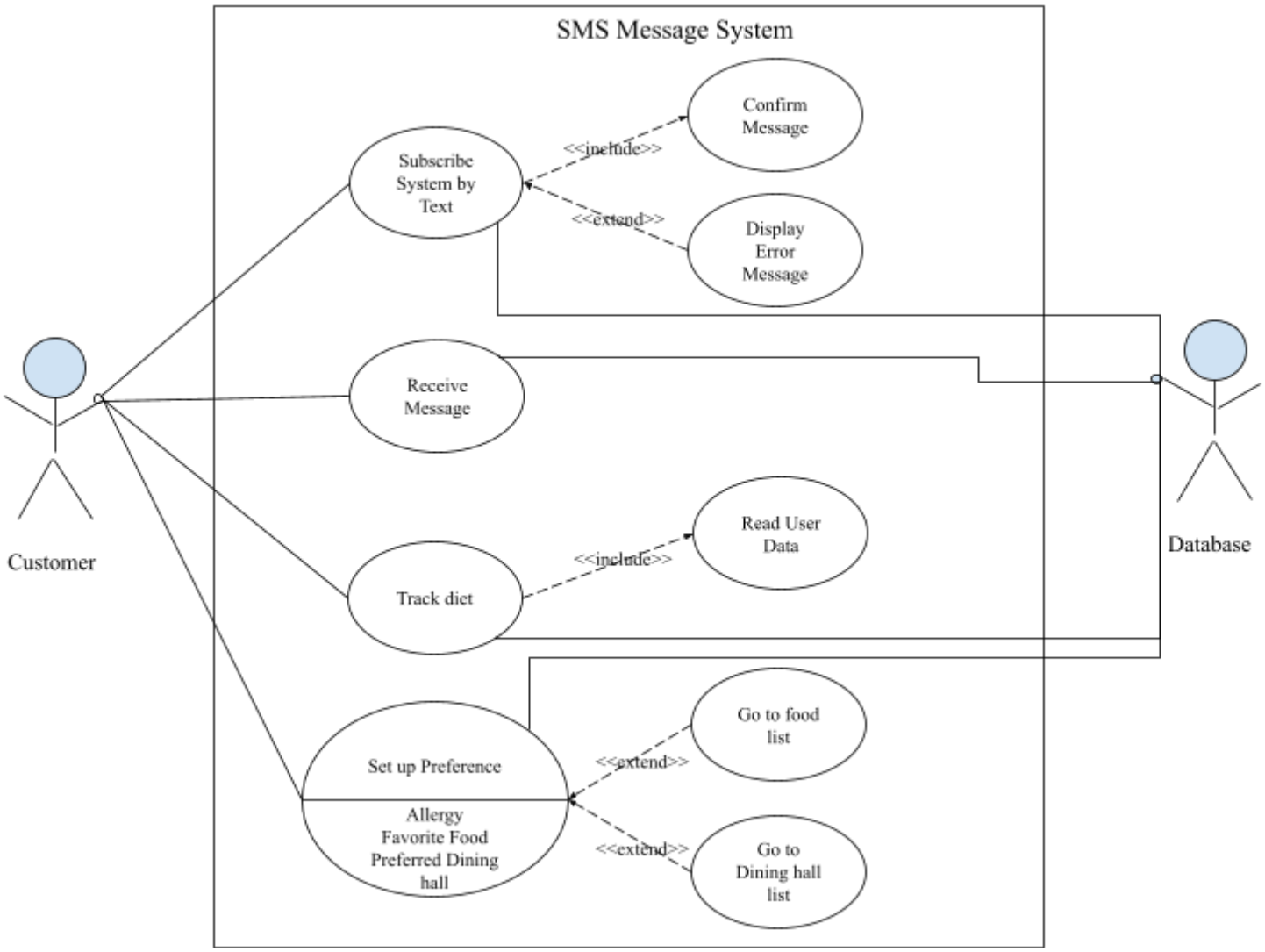


Use Cases

In this section, we will depict our system's behavior or functionality under various conditions as the system responds to requests from users.

Use Case Diagram

The following diagram is a use case diagram for our SMS dining hall service, DH411:



In the next page, we cover the contents of this use case in simple text to show what goes on inside each use case.

Use Case 1

Use Case Title: Setting up preference

Primary Actor: Customer

Level: Kite

Stakeholders: Customer

Precondition: 1. Customer subscribed to the SMS Service by texting DH411
2. Customers have preferred dining hall or food.
3. Customers are allergic to some foods.

Minimal Guarantee: Display error message for any uncompleted tasks.

Success Guarantee: Receive accurate information of dining hall menu

Trigger: Customer subscribed to the SMS Service by texting DH411

Main Success Scenario: All preferences are successfully set in the database.

Extensions: 1a. Food that customers are allergic to is not on the list.
1a1. Customer stops the subscription.
1a2. Customer manually enters the food name.
1b. Customer preferred dining hall is not on the list.
1b1. Customer stops the subscription.
1b2. Customer manually enters the dining hall name.
2a. Setting preference processes are interrupted.
2a1. Display error message.
2a2. Customer tries again.
2a3. Customer stops the subscription.

Use Case 2

Use Case Title: Receiving Message

Primary Actor: Customer

Level: Blue

Stakeholders: Customers

Precondition: Customer already subscribed to DH411

Minimal Guarantee: Customer gets daily notifications.

Success Guarantee: Send notifications on time.

Trigger: Time gets close to lunch/dinner.

Main Success Scenario: Receive accurate information on the dining hall menu with preference.

Extensions: 1a. Customer successfully subscribes but doesn't set up preferred food/dining hall.
- 1a1. Customer stops the subscription.
- 1a2. Send today's most popular food/dining hall.
- 1a3. Customer order takeout/delivery.

2a. None of the dining halls offer preferred food.
- 2a1. Customer stops the subscription.
- 2a2. Send today's most popular food.
- 2a3. Customer order takeout/delivery.

2b. All of the dining halls offer food that the customer is allergic to.
- 2b1. Customer stops the subscription.
- 2b2. Customer order takeout/delivery.

3a. Customer receives the wrong information.
- 3a1. Customer stops the subscription.
- 3a2. Customer asks to resend the information.

Use Case 3

Use Case Title: Diet Tracking

Primary Actor: Customer

Level: Fish

Stakeholders: Customers

Precondition: Customer already subscribed to DH411 for a long period of time.

Minimal Guarantee: Customer gets daily notifications.

Success Guarantee: Provide useful suggestions.

Trigger: Customer has used SMS message system for a long time.

Main Success Scenario: Receive accurate information on the diet suggestion.

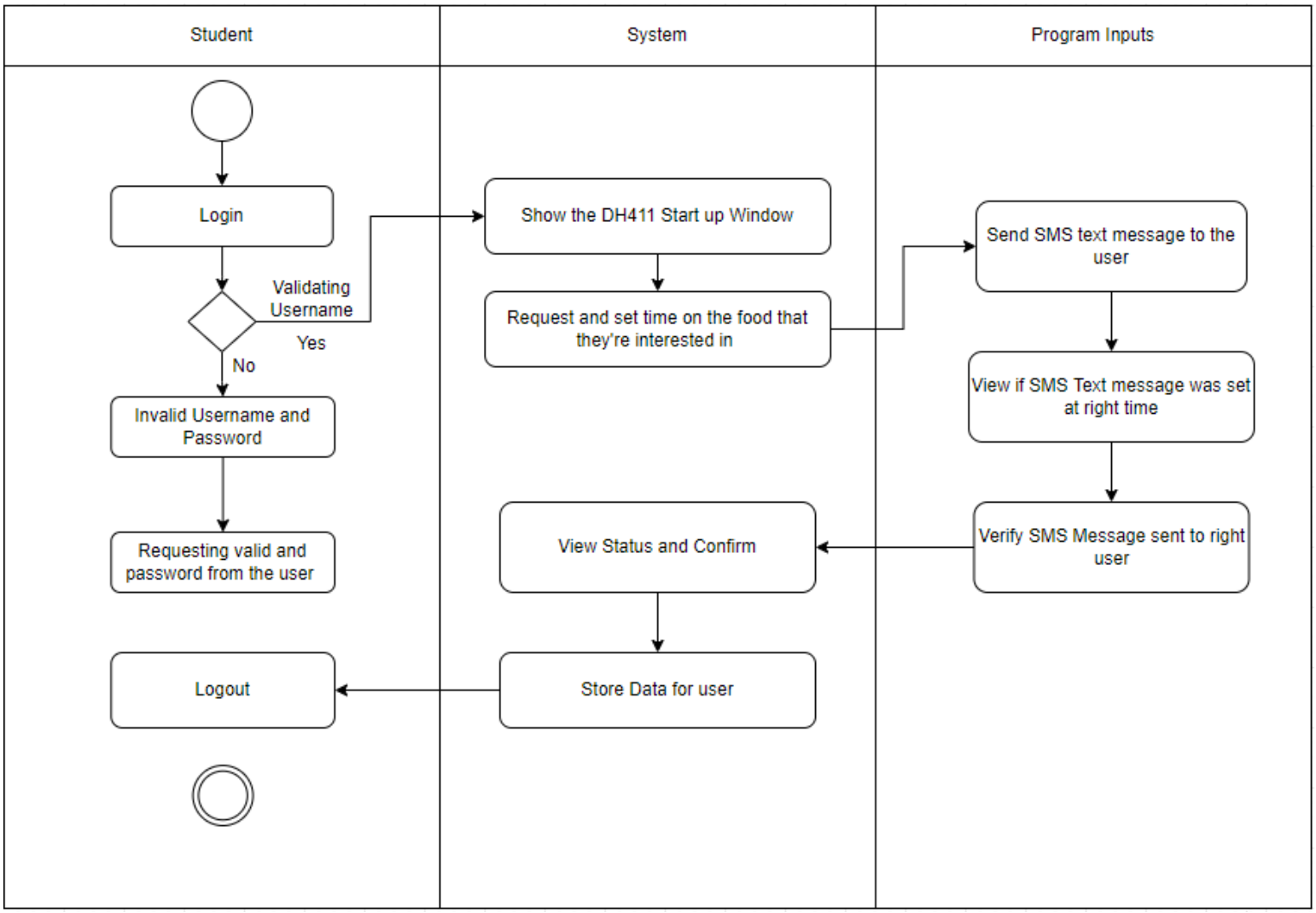
Extensions: 1a. Customer doesn't receive the daily suggestions.
- 1a1. Customer stops the subscription.
- 1a2. Customer manually asks to resend the information.

1b. Customer received the not appropriate suggestions.
- 1b1. Customer stops the subscription.
- 1b2. Customer asks for alternative suggestions.

Activity Diagrams

In this section, we will show the conditional logic for the sequence of system activities needed to accomplish DH411's main process.

The following diagram shows an activity diagram for notifying the user about the dining hall menus (DH411's main process).



The Diagram displays a Student login that takes the users information(A phone number or user log in that prompts to the #) Then it goes to a system setting that will be used as a display screen for the user to interact with and check what they would like/allergic to/dislike that then would send them a SMS message to tell the user where their requested food is located that day and which dining hall it is then located.

Design of Databases

Our system consists of two databases: one for customer information and one for the dining hall information. Both will be in SQL style.

Customer Information

	Customer ID (Phone #)	Favorites	Uses	Allergens/Preferences
Example:	(123)456-7890	Taco Bar, Bar Indian	4	Shellfish

Dining Hall Information

	Date	Location	Food Option	Health information
Example:	2/21/2022	Porter Kresge Dining Hall	Allergen Free Halal Chicken Thigh	Gluten free

Forms and Reports

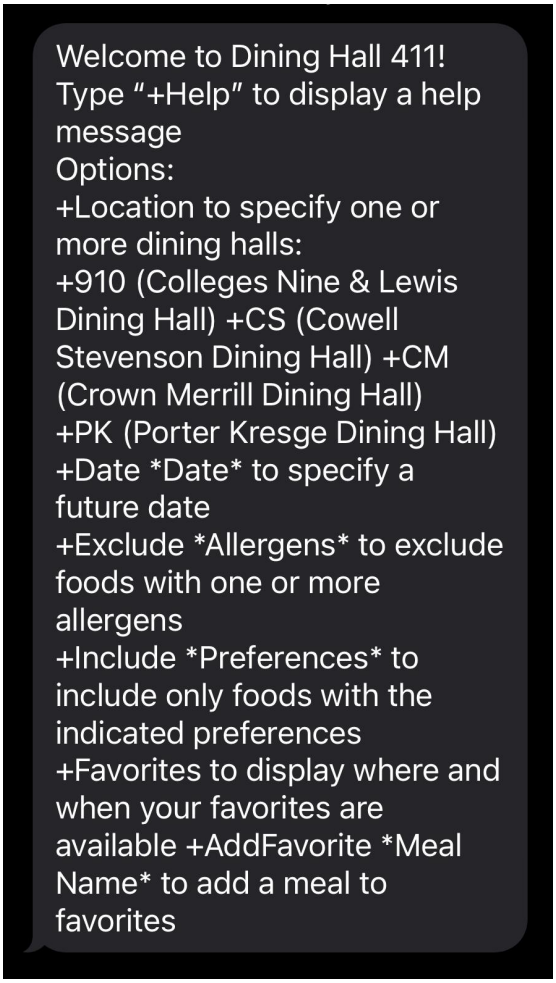
In this section, we will discuss the design specifications for the design of forms and reports.

(a) Narrative Overview

This section provides a narrative overview containing relevant information to developing and using the form within DH411. It explains the tasks supported by the form, where and when the form is used, characteristics of the people using the form and other pertinent information.

Form: DH411 Menu Notification
Users: Students, Faculty and Staff at UCSC
Tasks: Notifies users about dining hall menu daily; allows users to set meal preferences and dining hall preferences
System: SMS Messaging on any mobile device
Environment: Campus with dining halls

(b) Sample Design



(c) Testing and Usability Assessment

This section provides all testing and usability assessment information.

User Rated Perceptions

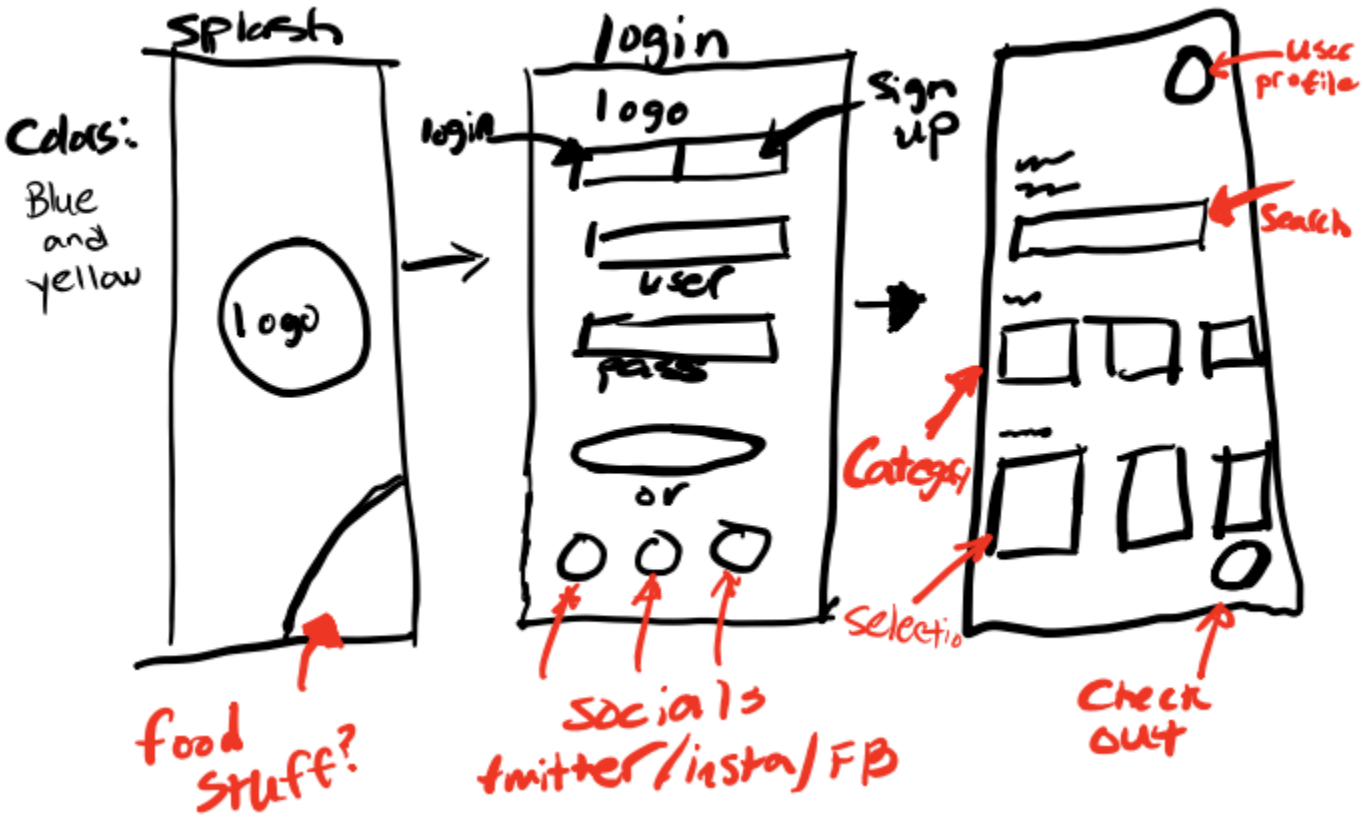
- Consistency [1 = Inconsistent, 5 = Consistent] = 4
- Accuracy [1 = Inaccurate, 5 = Accurate] = 5
- Reliability [1 = Unreliable, 5 = Reliable] = 5
- Sufficiency [1 = Insufficient, 5 = Sufficient] = 4

Improvement Notes:

Improve the Include/Exclude functionality
Make user more comfortable with the options
Remove options to make use more clear or less confusing
Improve readability
Include wait time/crowd levels

Interfaces and Dialogues

The Interfaces given below is a mock up wireframe of what will be implemented into Adobe XD/Figma to create. The splash screen is implemented so that the logo of the Dining Hall would be implemented in the center. The next page would then display a login screen that would take in the user's information. It would also need a phone number because the desired request is to send the user an SMS Text message to notify them of their request. It also displays a Sign up screen in case the user doesn't have a login, they could also use 3 socials, instagram/twitter/Facebook if they would like to log in with that. The 3rd page would then display a users profile that they could tap on with a search bar that search for their desired food, there's a categories page that would then display the food that UCSC offers at the dining hall, with a selection of the specific food that the school offers and at the bottom of the page is a check out they could tap on that the user then would check out and have confirmation of what they would like then sent through the SMS system.



Systems

In this section, we will discuss the outcomes and deliverables from designing distributed systems.

---

1. Description of Site

a. Santa Cruz, CA.
b. Hosted locally on service computers
c. Personnel Characteristics
    i. Average 4 years of TIM classes
    ii. Understanding of UX

---

2. Description of Data Usage

a. Data usage is equivalent to the size of the Dining Hall Menu Database added to the size of the User Database
    i. Estimated 0.1-0.3 MB depending on the number of users

---

3. Description of Business Process

a. SMS Receiving
    i. SMS message is accepted by python code
    ii. New user profile is added to the database if needed
    iii. Database of Dining Hall menu is queried and response is sent to SMS Sender
b. SMS Sending
    i. Query is received from DH menu database
    ii. New Message is generated in accordance with user input
    iii. Message is sent to the user.

---

4. Contrasts of Alternative IS Architectures for Site, Data and Process Needs

a. Pros and Cons of no technological support
    i. Pros
        1. Maintenance cost eliminated
    ii. Cons
        1. New options not handled by system
b. Pros and Cons of non-networked, local system
    i. Pros
        1. Hosting on campus provides faster access to UCSC dining hall resources
    ii. Cons
        1. Local outages can cause problems
        2. Support can be rescinded by the university (e.g. Loop bus tracker)

c. Pros and Cons of various distributed configurations
    i. Pros
        1. More messages handled at once
    ii. Cons
        1. Complexity with outages
        2. Cost
