Grab n' Go

Team 13: DesignSquad - Dec 5, 2022

Amber Jiang - ajiang@ucsd.edu
Tony Meng - tqmeng@ucsd.edu
Jingyi Lin - jil140@ucsd.edu
Kevin Lin - ktlin@ucsd.edu
Yuchen Guo - yug006@ucsd.edu

Table of Contents

Challenge and Rationale

Challenge and Rationale

Feeding themselves is something that most, if not all, adults have to consider on the daily. Food courts are a popular destination for congregation and a quintessential American dining experience, yet they've stayed mostly the same for decades.

We chose Price Center as our specific site because university students and their experiences were accessible to us. We would often hear complaints about Price in our day-to-day, so we knew that a problem existed and that it challenged many students everyday.

User Research Insights

Online Research

Long lines are frustrating

76% of customers will leave when they see a long line for food

Desire for more convenient ordering and seat finding

UCSD students complained about not having a consolidated platform to order and not being able to find empty seats

Smart locker benefits

- QR code scanning to unlock lockers saves pickup time
- Contactless ⇒ convenient
- The average customer spends less than 6 min using the locker

Fieldwork

There are there long lines, and crowds also tend to gather around the check-out and pick-up areas and customers wait around for their order to be called.

Seats are hard to find and people end up wandering around for minutes, looking for an empty table.

Orders pile up as workers' attentions are being demanded elsewhere. It becomes a problem to call out orders and verify receipts.

Key Problems from User Interviews

Ordering lines are too long

"I went to Starbucks, there were like 40 people in line and I decided that I'm not gonna wait"

"I just don't want to waste my time waiting."

"It's really crowded everywhere, I wouldn't even get food. I'll just go to like the market, because I know [...] it'll take too long if I order"

Pickup areas are crowded

"I don't know if someone's gonna pick up my order thinking it's theirs. and I don't wanna deal with that. So I just usually wait. Watch and like wait for my number."

"and then I pick it up so that I know it's just me touching it."

It's hard to find seats

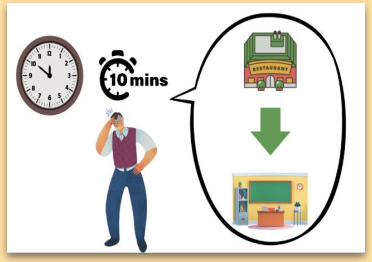
"I didn't really check the seating situation beforehand, and I was like, Oh, I'm gonna just eat at Price Center."

"But when I picked up my food, I looked back and like all the seats were full. So I was like I don't even know how I'm gonna eat this. So like, I was kind of like wandering around..."

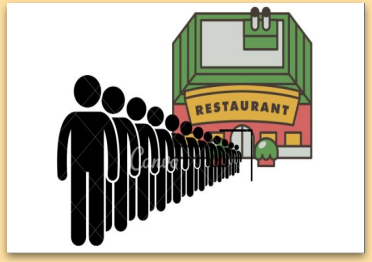
"I get anxious knowing that I need to find a seat."

Storyboards that Resonated with Customers

Ordering kiosks with predicted wait times lets users avoid long, tiring lines



Mark has a class in 10 min; however, he is hungry. He decides to go to the food court and grab something quickly and leave ASAP.



Mark is in a rush but the waiting lines for restaurants are too long; he doesn't have the time to wait

A kiosk that can place digital orders at restaurants, filtered by waiting time (to skip the busy options)

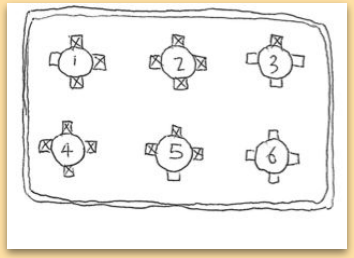
Mark can order and pick up his food in < 10 min by skipping the long waiting line and ordering on the kiosk; he is happy that he can get to class in time without being hungry

Storyboards that Resonated with Customers

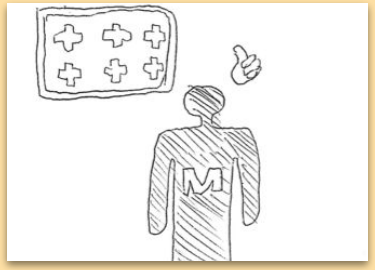
Digital seat-maps save users the trouble of searching around themselves

Marcus got his food but he looks left and right, there is so many people everywhere that it's hard to find where to sit.

Seating availability is not clearly visible for him



A digital map that has the layout of all the seats and shows which seats are available



Customers will be able to easily find empty seats after checking the map rather than wandering around looking for seats

Personas

"I just want to grab a quick lunch and go! I've got lots of studying to do."

Bio

Marilyn is a 19 year old, first generation college student. She loves being at university, and wants her time there to be worthwhile and mean something.

Marilyn

19 years old | full-time college student

Goals & Motivations

- Marilyn wants to excel at school and is excited by the potential of new opportunities. She wants to focus her time on studying, so she wants her meals to be quick breaks from her time at the library.
- Marilyn wants to quickly order lunch and easily find a seat at Price Center so she can optimize her time for classes and studying.

Routine

- She is on campus everyday on weekdays, and her schedule is stacked with classes. At most, she has about one hour between classes, and she needs to get lunch during that hour.

Challenges

- Marilyn's schedule doesn't allow her to wait in long lines to order, and then have to wait even longer while her order is prepared.
- In pursuit of her academics, Marilyn doesn't want to waste lots of time wandering around Price Center to look for seats. Unfortunately, the crowded seating areas make this difficult on her busy schedule.

"Man, food service is a difficult field. Time, customers, organization... The orders are nonstop!"

Bio

Jane is a 22 year old part-time student and is working at her campus food court part time. The location is convenient and the extra cash helps with tuition.

Jane

22 years old | part-time student & worker

Goals & Motivations

- Jane needs to maintain satisfactory work performance by delivering orders on a timely basis. The better she performs, the more likely she can earn a promotion and get more money to help with student loans.
- Jane needs to manage orders effectively to reduce her mental stress in the workplace.

Routine

- Jane works multiple shifts a week. When she is not working, she is doing homework. These two commitments keep her at a moderate stress level.

Challenges

- Jane has to deal with irritated customers, who may behave unexpectedly.
- Because she has to interact with customers in many different ways, her attention is constantly divided among other interrupting tasks.
- Her restaurant doesn't have a good way for managing order tickets, and she needs to remember which ones still need to be completed and served. She needs to look through several tickets before finding the one she wants.

Mission Statement

Through a kiosk, we aim to streamline the dining experience in Price Center—which encapsulates ordering food, receiving food, and finding seats—so that customers can save time, conserve energy, and avoid hassle.

Interactive Kiosk

Pickup Kiosk: Setup Location

Our pickup kiosk (Locker Station A) would be set up at the **North Entrance of Price Center West**, allowing nearby restaurants like Subway and Starbucks to run orders efficiently between their kitchen and the pickup locker.

For optimum service speed, designated workers can run orders in batches (e.g. with trays or carts.) It is located away from the dining area to avoid overcrowding. Customers can quickly enter (and possibly queue along the wall if necessary) and conveniently exit through the sliding door after picking up their food.

Additional Kiosks (pickup lockers and ordering kiosks) can be installed at other locations throughout Price Center, such as next to the wall between Santorini and Tapioca Express. For areas with increased customer traffic, more lockers can be installed and attached to the locker station for higher service capacity.

Pickup Kiosk: Physical Setup

Extended Design Rationale Notes

The pickup kiosk consists of two major units:

Pickup Station

- The **screen** displays kiosk instructions and provides feedback for the user's actions. It is placed above the scanner and directed toward the user's eye-level at a 30° tilt. This makes it easy for users to see the kiosk screen under various lighting conditions.
- The **scanner** is placed underneath the screen and closer to the user's hands, making it easier for users to scan their pickup barcode.
- The **scanning laser** points downward toward the floor of the scanning area, which helps prevent users from accidentally looking into the scanner.

Locker Column(s)

- The lockers are deliberately placed on the right of the pickup screen. This helps to reinforce an interaction flow that intuitively progresses rightward, matching the most common left-to-right mental model of progress.
- Two lockers (with an internal space of 11x11x11") store most standard fast food takeout boxes. Larger orders can be stored across multiple lockers. The locker doors have 3D-printed hinges that swing outward away from the pickup screen, giving users room to easily see and walk to the opened locker to retrieve their food.
- The lowest locker is elevated 2" from the bottom of the column to mitigate external impacts (e.g. from cleaning carts) and preserve locker/food hygiene.
- At locations with higher customer traffic, additional locker columns can be attached for increased service capacity. The vertical locker door numbering system allows for new columns to be easily added without renumbering existing lockers.

Pickup Kiosk: Key Features

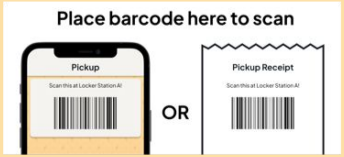
Pickup Locker Identifiers
There are multiple signifiers telling users that this is "Locker Station A". The ordering app/kiosk guides users to look for the correct locker station.

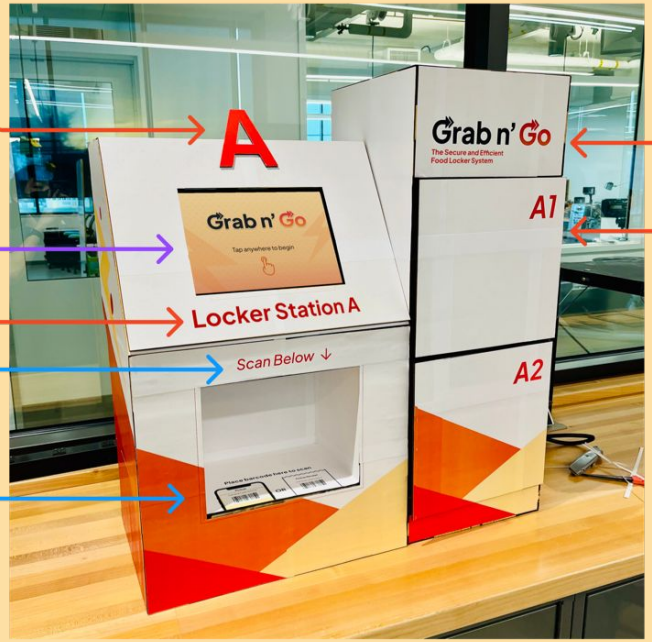
- Large and clear "A" on top of the pickup station
- "Locker Station A" directly next to the screen
- If the user scans a barcode for a different locker station, the on-screen directions would guide them to the correct locker station.

9.75 × 7.03" touchscreen display

Barcode Scanning Area
There are multiple signifiers guiding users to scan their pickup barcode:

- "Scan Below ↓" label
- On-screen guidance
- Pictures of example barcodes that can be scanned:





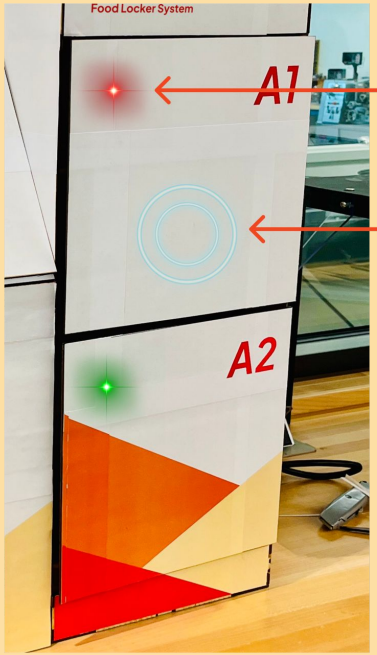
Note: This is the pickup kiosk. The ordering kiosk would have more prominent entry-point signifiers associated with ordering.

Logo and Tagline
Large and clearly visible at the top of the kiosk. It helps users identify the brand and what the kiosk is for.

Lockers
Lockers are arranged in vertical columns and store food orders. The locker doors open automatically when the barcode is scanned, allowing users to quickly pick up their order.

- Each locker has a 11×11×11" space, allowing food orders to fit comfortably. Large orders may be placed in multiple lockers.
- Each locker has an identifier that begins with the Locker Station Identifier (A in this case), which helps users identify what locker station they are at. Lockers are numbered vertically, so new locker columns can be installed to increase service capacity.

Pickup Kiosk: Additional Photos



Locker Features for Employees

Locker Status Indicator Light
Each locker has an indicator light that indicates to employees at-a-glance whether the locker is empty (blue), ready for pickup (green), or needs attention (red). This saves them time when deciding which locker to put orders in.

Wireless NFC Lock
A NFC tag is installed inside each locker door. When an employee taps their NFC bracelet to the door, the locker door will beep, unlock, and open. The NFC bracelet allows them to open locker doors even while carrying multiple food items.

Locker Internal Barcode Scanner
Each locker has a built-in scanner that reads the barcode on the order ticket (adhered to the order container) and communicates with the pickup station to keep track of its contents.
With this system, workers don't need to think about loading orders into the correct locker or contacting the customer. The locker system automatically detects the incoming order and sends a notification to the customer when their order is ready.

Key User Interactions

1. Order

Users **order** ahead on a mobile device. (They can also scan the QR code on the kiosk or use an ordering kiosk.)

2. Scan

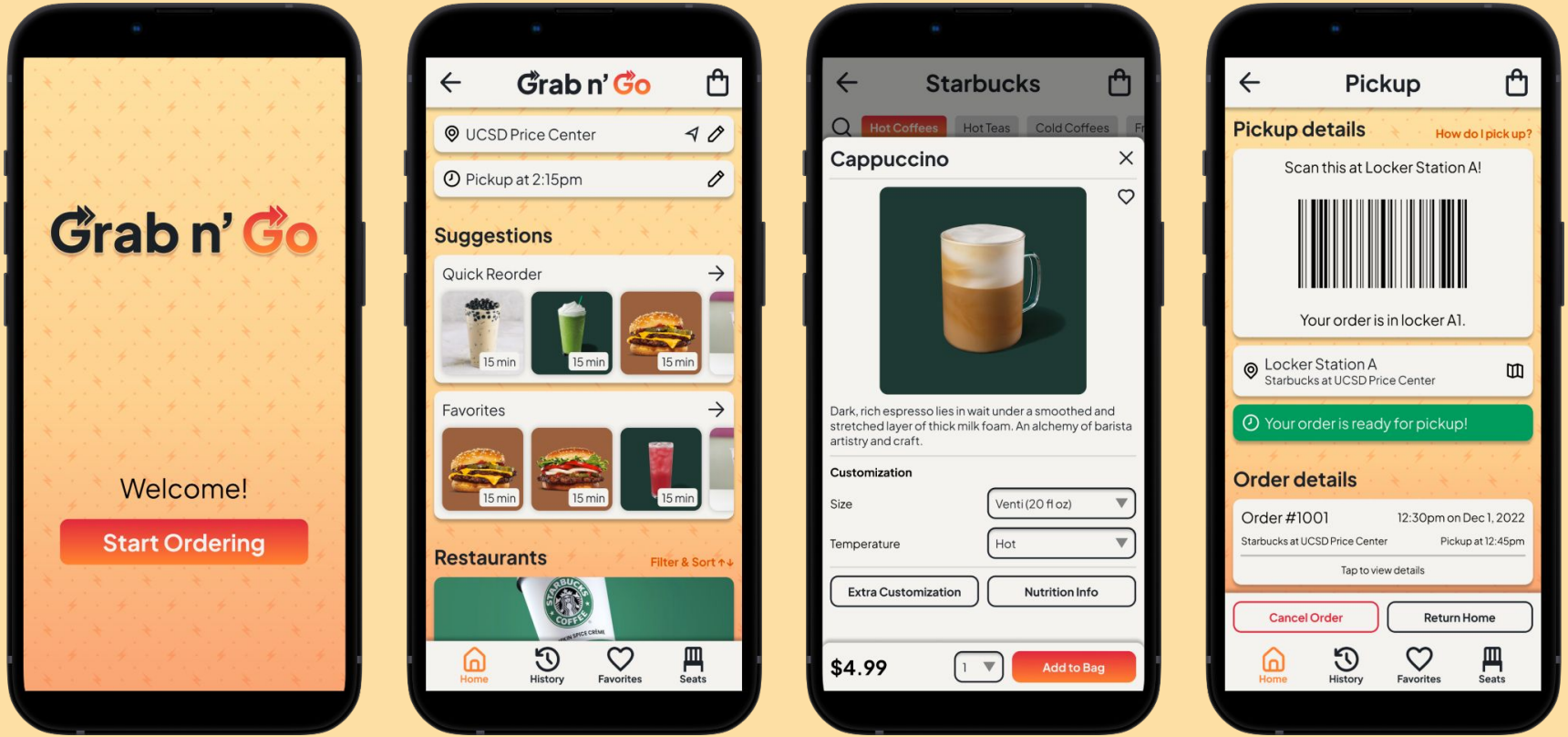
When their order is ready, customers come to the pickup kiosk and **scan** their pickup barcode (which is in their mobile app or on their pickup receipt.)

3. Pick Up

The customer's assigned locker opens. The user can quickly **pick up** their order!

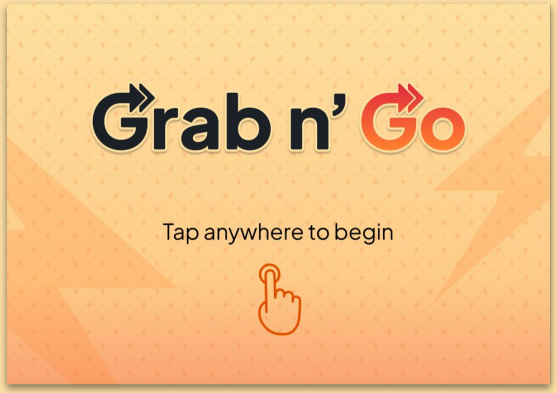
Screen Designs: Companion App

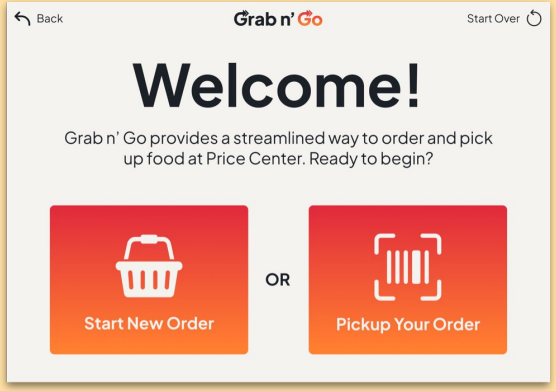
Interactive Prototype

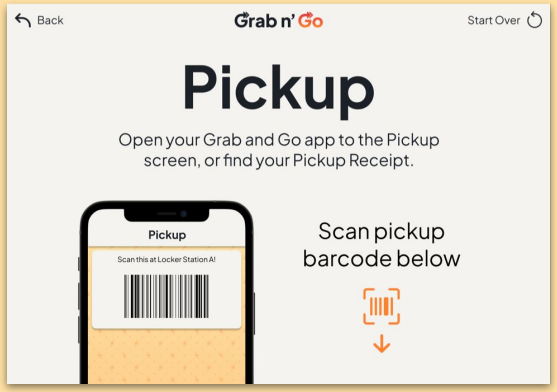


Screen Designs: Pickup Kiosk

Interactive Prototype
(Click invisible square next to logo to simulate barcode scanning)







User Test Process

Paper Prototype Testing

Full Test Plan: Tasks and Interview Questions

Feedback and Insights:

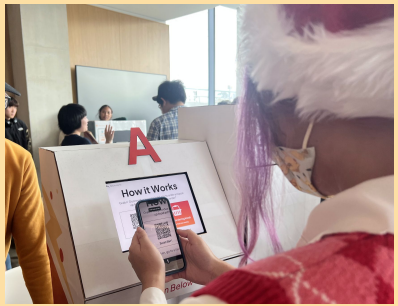
- Food court locator
  - There should be a way to view walking directions to the food court or pickup location.
  - There should be a confirm button to leave the location screen.
  - The pickup location screen should display the interior map of the food court to show the pickup location in more detail.
- Home page
  - Users wish there was a "order history" page and a way to sort and filter the restaurant list.
- Seat map
  - Instead of highlighting certain areas, a heatmap would be more helpful.
- Pickup kiosk
  - Users thought the locker location indicator could be interactive. In reality, it is just a diagram.

Most, if not all of these suggestions are reflected in our high fidelity prototype.

Final Kiosk Prototype - Overview

Full Task List

Our group tested the completed interactive kiosk prototype with ten potential users and gathered the following feedback.



Areas that were satisfactory:

- The kiosk looks sharp and the scanning (pickup) process is smooth.
- The phone app is easy to use and the UI is delightful to experience.
- The phone app ordering sequence is intuitive and yielded no roadblocks amongst users.

Areas for improvement:

- The point of entry on the kiosk is unclear and requires considerable thinking on the user's part. Perhaps a stronger indicator of how to start the kiosk would be beneficial.
- Provide clearer instruction of how to start the kiosk and order, especially for new users.
- The legend for the seatmap is not obvious and readily visible. Some users missed it, while others took quite a while to find it.
- After ordering, the pickup time is quite small and due to its importance, should be larger and more visible.

Final Kiosk Prototype - Iteration after feedback

Using that feedback, the team felt it was appropriate to make one final iteration for a critical feature - refining the point of entry on the kiosk.

- Figure 1 (before): first-time users are unlikely to recognize that a pick-up kiosk is strictly for pick-up. In this situation, how can users figure out how to engage with it? The “what is this?” is too small to serve as a meaningful point of entry.
- Figure 2 (next iteration): the pickup kiosk now has two options on the main menu: Order or Pickup (figure 3), that are pulled up simply by tapping on the screen. This would direct the user to the necessary information, without the need for the user to ponder where they could find said information.
- In addition, the kiosk skin now displays the tagline (what the kiosk is), and “Locker Station A” to clarify what it is and which station it is (figure 4).

Figure 1

Figure 2

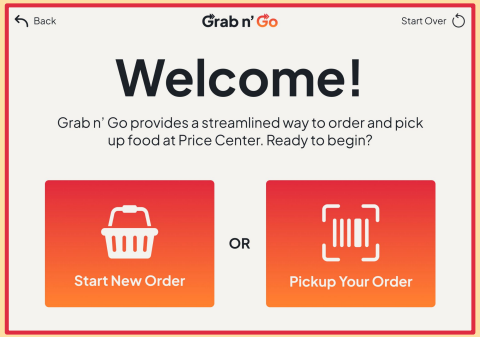


Figure 3

Figure 4

Conclusion & Acknowledgments

Conclusion and Acknowledgements

Thank you to all of the teaching staff for DSGN 100!

- Professor Dow, for creating and teaching this class
- Rachel Hartanto, for your makerspace insights
- TAs and IAs, for your advice and support throughout the quarter

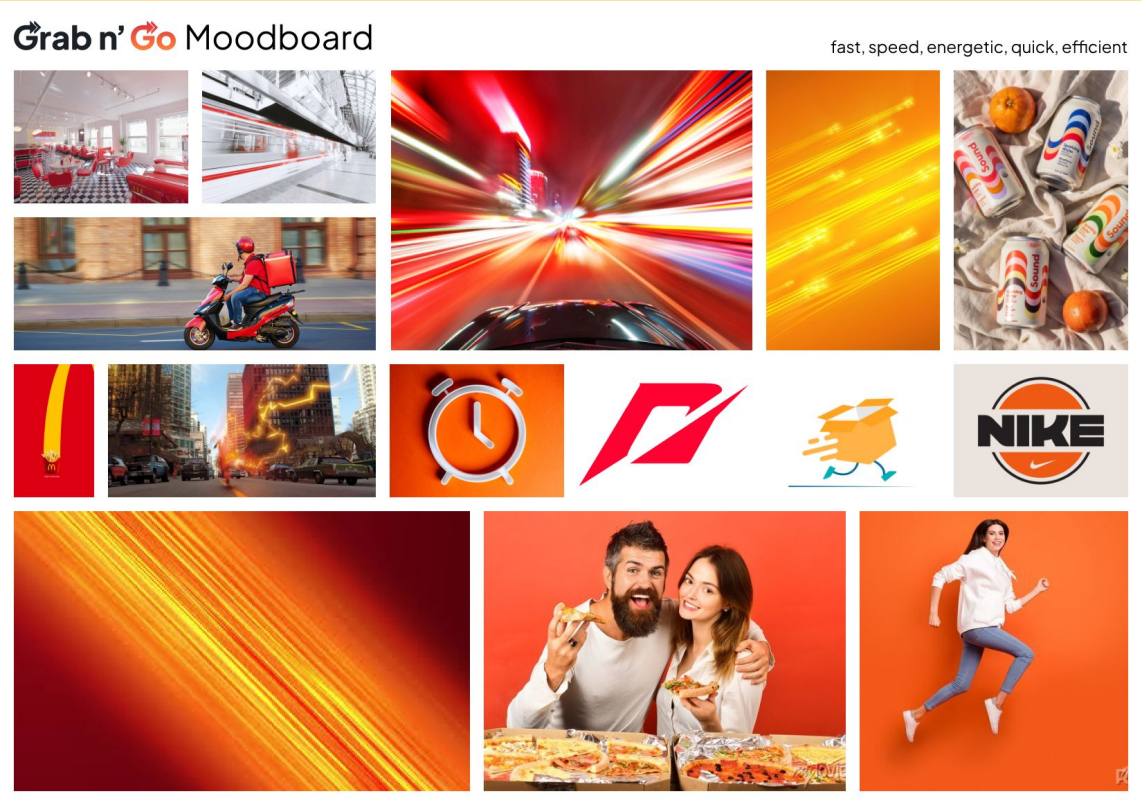
You all made this class a great learning experience for everyone.

Team 13: DesignSquad

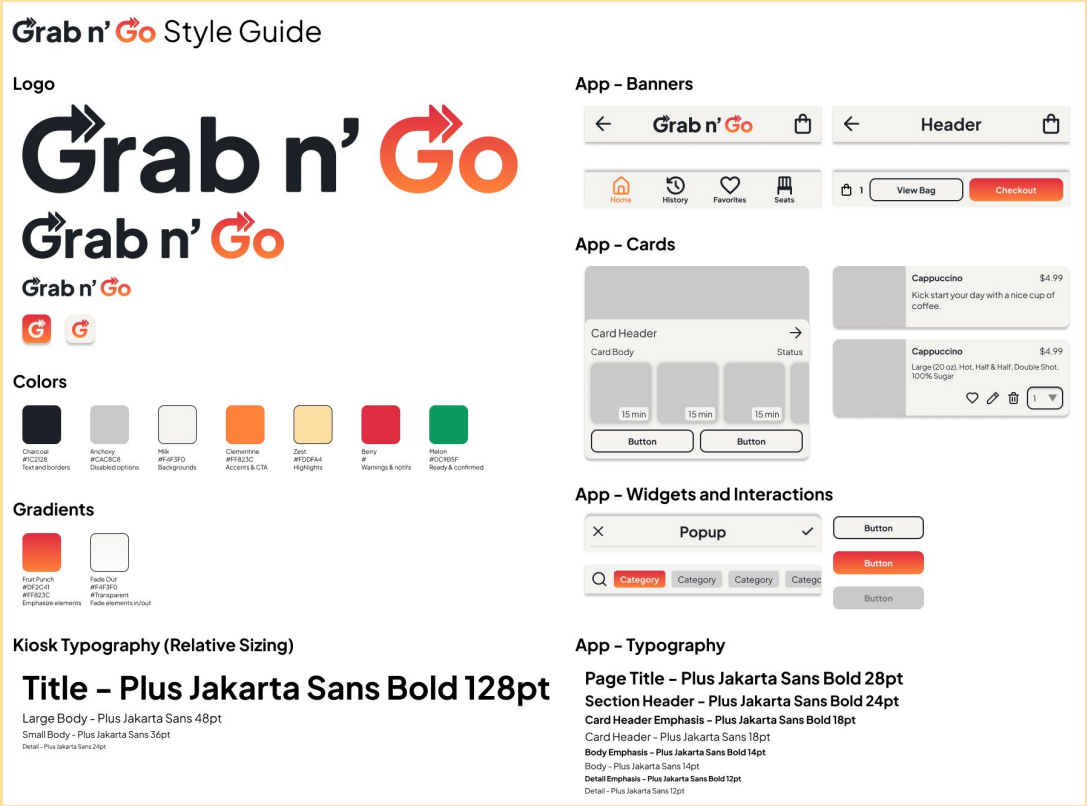
- Amber Jiang - ajiang@ucsd.edu
- Tony Meng - tqmeng@ucsd.edu
- Jingyi Lin - jil140@ucsd.edu
- Kevin Lin - ktlin@ucsd.edu
- Yuchen Guo - yug006@ucsd.edu

Process Appendix

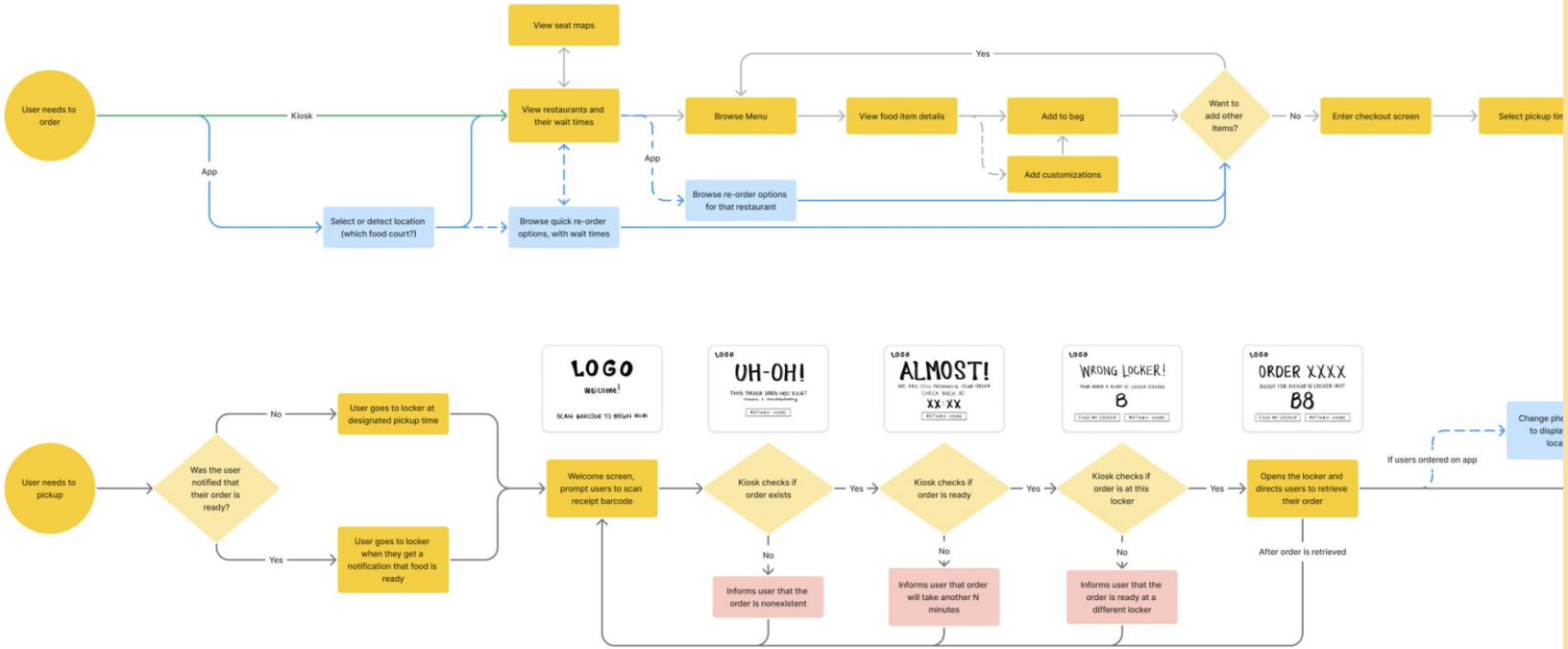
Moodboard


Grab n' Go Moodboard
fast, speed, energetic, quick, efficient
NIKE

Style Guide

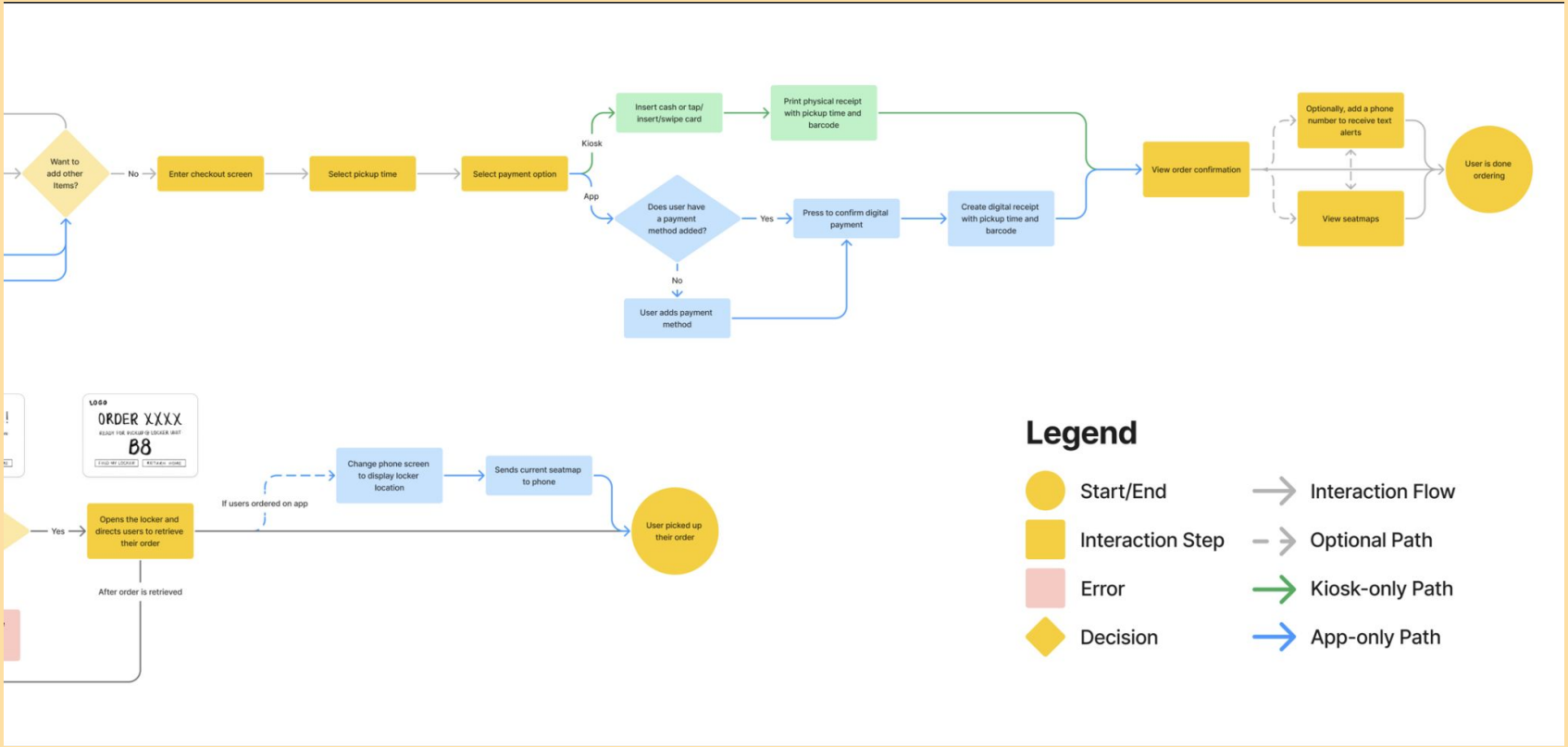

Grab n' Go Style Guide
Logo
Grab n' Go
Grab n' Go
Grab n' Go
Colors
Charcoal #1C2126 Text and borders
Anchovy #CAC8C8 Disabled options
Milk #F4F3F0 Backgrounds
Clementine #FF823C Accents & CTA
Zest #FDDFA4 Highlights
Berry # Warnings & notifs
Melon #0C905F Ready & confirmed
Gradients
Fruit Punch #DF2C41 #FF823C Emphasize elements
Fade Out #F4F3F0 #Transparent Fade elements in/out
Kiosk Typography (Relative Sizing)
Title – Plus Jakarta Sans Bold 128pt
Large Body - Plus Jakarta Sans 48pt
Small Body - Plus Jakarta Sans 36pt
Detail - Plus Jakarta Sans 24pt
App – Banners
Grab n' Go
Header
Home
History
Favorites
Seats
1
View Bag
Checkout
App – Cards
Card Header
Card Body
Status
15 min
15 min
15 min
Button
Button
Cappuccino
$4.99
Kick start your day with a nice cup of coffee.
Cappuccino
$4.99
Large (20 oz), Hot, Half & Half, Double Shot, 100% Sugar
App – Widgets and Interactions
Popup
Button
Button
Button
Category
Category
Category
App – Typography
Page Title – Plus Jakarta Sans Bold 28pt
Section Header – Plus Jakarta Sans Bold 24pt
Card Header Emphasis – Plus Jakarta Sans Bold 18pt
Card Header - Plus Jakarta Sans 18pt
Body Emphasis – Plus Jakarta Sans Bold 14pt
Body - Plus Jakarta Sans 14pt
Detail Emphasis – Plus Jakarta Sans Bold 12pt
Detail - Plus Jakarta Sans 12pt

User Flows



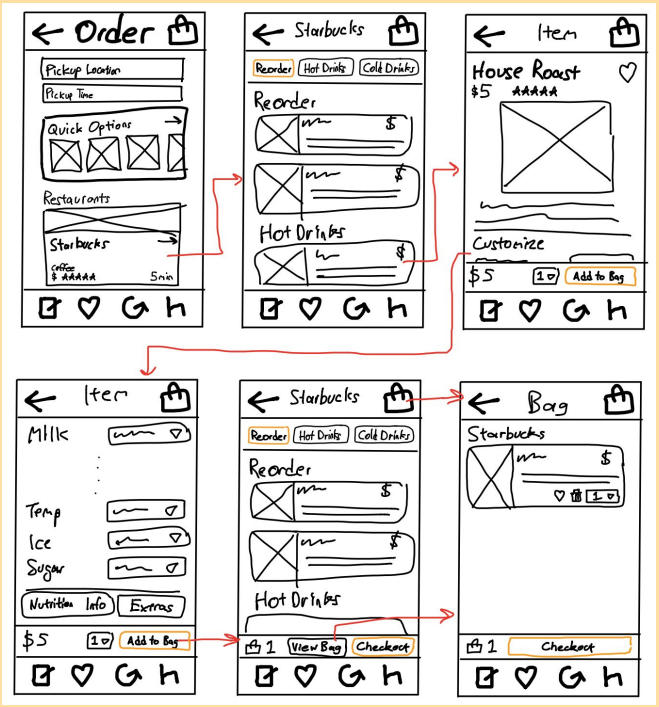
(Continued at next slide)

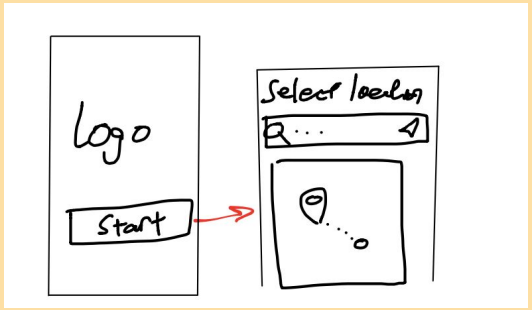
User Flows

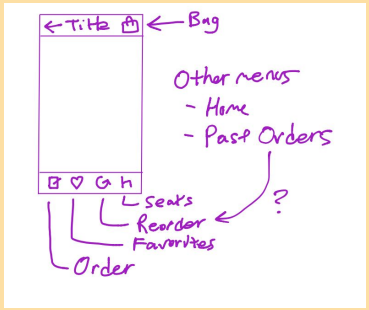

Want to add other Items?
No
Enter checkout screen
Select pickup time
Select payment option
Kiosk
App
Insert cash or tap/ insert/swipe card
Print physical receipt with pickup time and barcode
Does user have a payment method added?
Yes
Press to confirm digital payment
Create digital receipt with pickup time and barcode
No
User adds payment method
View order confirmation
Optionally, add a phone number to receive text alerts
View seatmaps
User is done ordering
LOGO
ORDER XXXX
B8
Yes
Opens the locker and directs users to retrieve their order
If users ordered on app
Change phone screen to display locker location
Sends current seatmap to phone
User picked up their order
After order is retrieved
Legend
Start/End
Interaction Step
Error
Decision
Interaction Flow
Optional Path
Kiosk-only Path
App-only Path

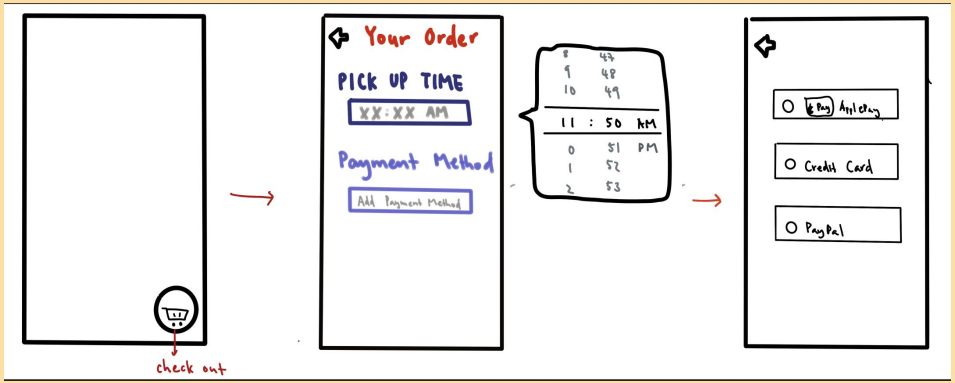
Wireframe Sketches – Kiosk

Wireframe Sketches – Mobile App

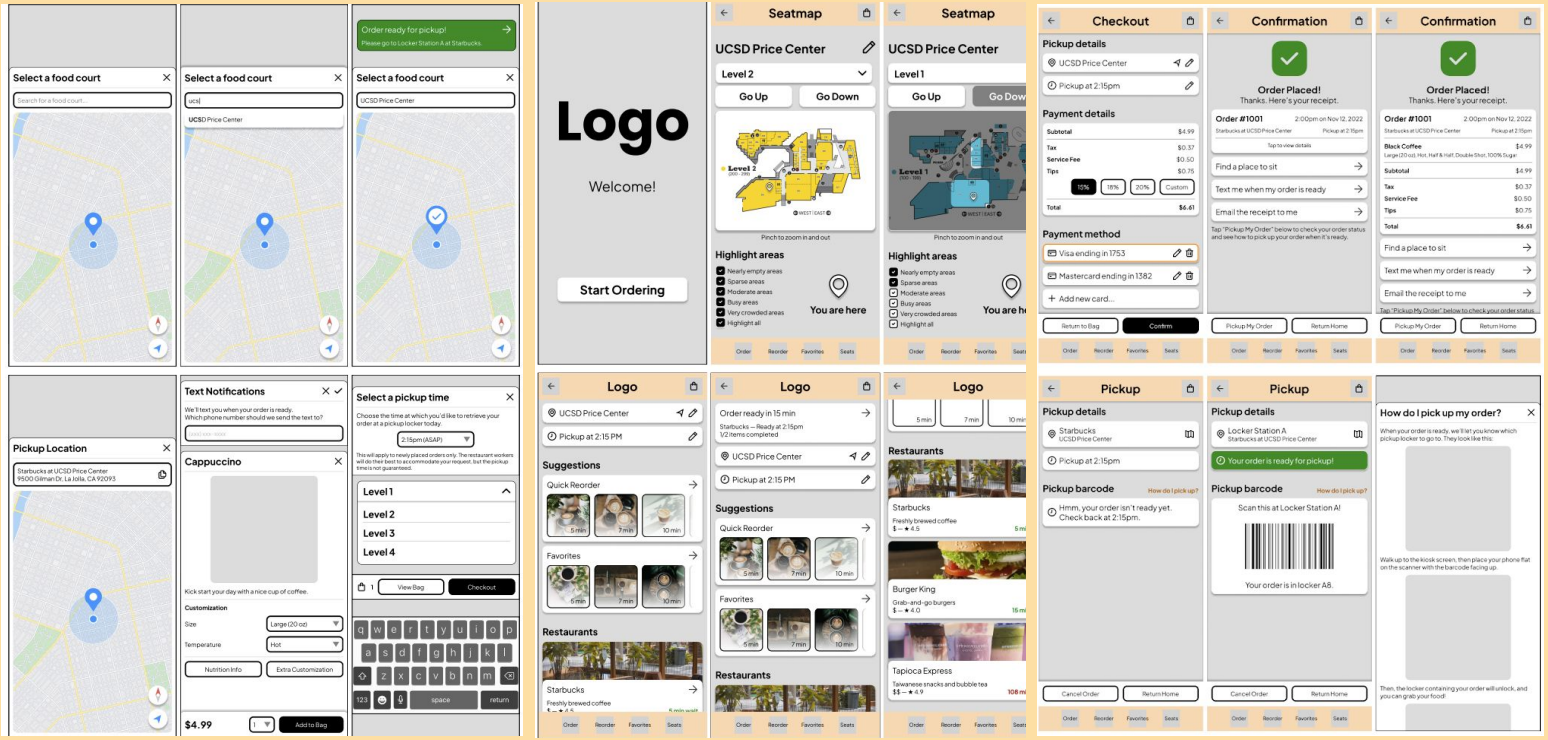




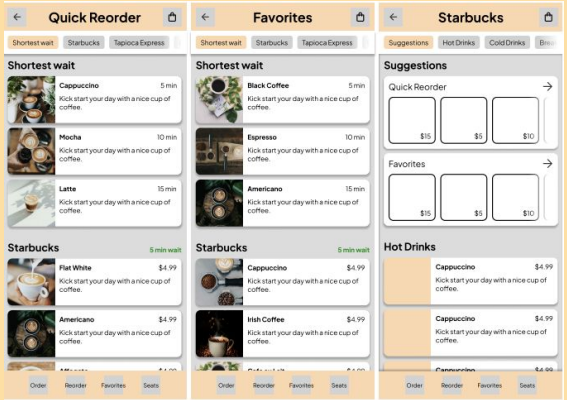


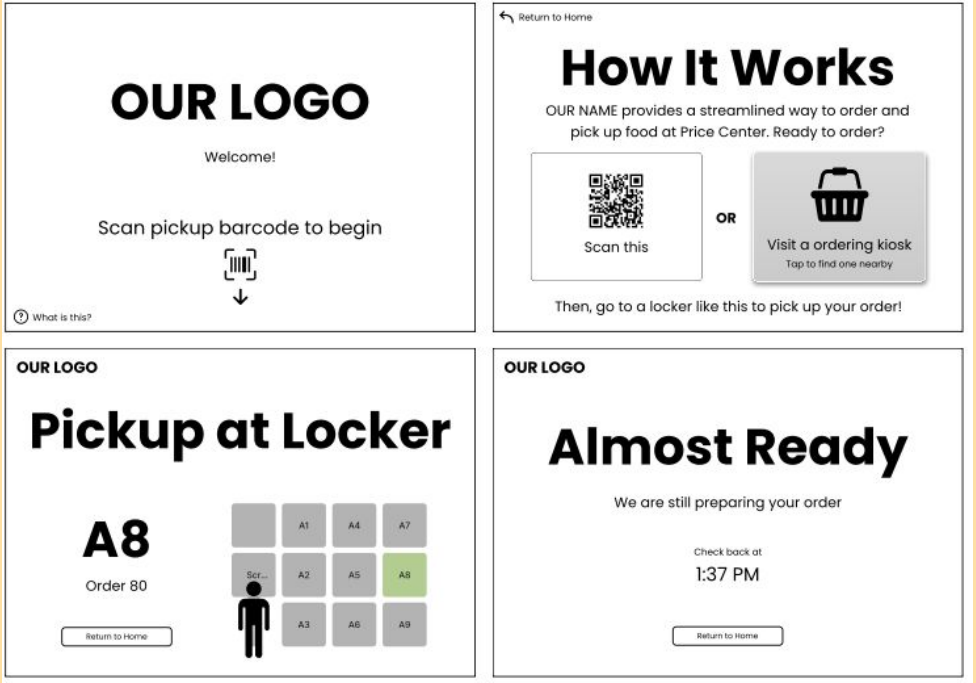


Lo-Fi/Paper Prototype (Printouts)



Lo-Fi/Paper Prototype (Printouts)





Paper Prototypes: Test Plan

"Things a therapist would say"

Background questions
- How often do you go to PC?
- How often do you order food using your phone?
- opinion on wait times, ordering, seating, etc
- What is your favorite restaurant and is this restaurant using mobile ordering options?

Start screen
- What are your first impressions of the start screen?
- Now, if we were on the starting screen, what would you do first?

Tasks: Ordering App
- View dining options at UCSD Price Center
- Find out the wait times of Starbucks, Burger King, and Tapioca Express and see which one is fastest
- How much will a black coffee cost?
- Order a large, hot, black coffee
- Find when your order will be ready
- Ok, you're done ordering -- check if there's a place to sit on the second floor

Tasks: Pickup
- Check if your order is ready
- Oh, your order is ready. Find where you should pick up your order
- Use the barcode to pick up your order

Questions during the task
- If you were looking for a pick-up barcode, where would you expect to find it?
- If you were looking for an estimated wait time, where would you expect to find it?
- If you were looking for an available seat, what would you expect to help you with?
- What are you thinking?
- Is that what you expected to happen?

After the task
- What did you make of ordering/payment/pick-up on the page?
- Why did you [not/do/click/pay attention to this]? instead of []?
- How was the experience of using the product to complete this task?
  - [Probe:] What are your thoughts on the language used?
  - [Probe:] How easy or difficult was it to navigate? intuitive
  - [Probe:] What are your thoughts on the design and layout?

UX questions at the end
- How would you describe your overall experience with the product?
- What did you like the most about using this product?
- What did you like the least?
  - What are ways to improve those?
  - Are there any features you wish were here?
- What, if anything, surprised you about the experience?
- What, if anything, caused you frustration?

User impression questions at the end
- How likely are you to recommend this product to a friend?
- How frequently would you use this product?

HiFi Prototype - User Testing Task List

DSGN 100
DesignSquad A4 Final Kiosk Task List

Scenario: You hear there is a new kiosk ordering system that you can use at Price Center, but you don't know much about it. One day, you decide to check it out, and you walk up to one of the kiosks in Price Center.

Kiosk tasks:
1. Find out how this ordering system works.
2. You prefer to order on the phone. Use your phone to order.

Phone tasks:
3. View the dining options at Price Center.
4. Find the dining location with the shortest wait time, and open the menu for that location.
5. Add a cappuccino to your bag if it's under $5. Pick the largest size and hottest temperature.
6. Place the order.
7. Find out how long it will be until it is ready.
8. Since you have some time, check if there's a place to sit on the second floor of Price Center. You like the view from up there.
9. It's been 15 minutes, and your pickup time has arrived. Check if your order is ready.
10. It's ready! Find where and how to pick up your order.

Kiosk tasks:
11. Using what you just found out, access your order using the kiosk.
12. Pick up your order.

More Detailed Feedback during Hi-Fi User Test

- The color schemes for the seats are not obvious or easy to locate at first. Seat Map legend is not readily visible.
- Some users indicate that they prefer seat map legend next to the map instead of in the drop-down.

- Too many drop-downs
- The seatmap wording could be simplified.
- No need to show empty seats
- More clear indication to navigate to the second floor on the seat map

- Get lost in the app - too much information and take some time to navigate back to check the order status
- Time indication is small
- Looking for the pickup location on the ordering details page and taking a bit more time when getting direction to the locker
- The kiosk and ordering app is overall intuitive

Demo Preparation Document

ARRIVE AT DIB AT 12:00PM TO PICK UP LOCKER.

- If not raining: transport the kiosk to Library Walk.
- If raining: the demo will be at DIB 208.
- Kevin: buy a starbucks drink (does not have to be cappuccino)

Demo Responsibilities

- 2 Spokespeople: **Amber, Tony**
  - Pitch the user research, kiosk premise + process, how it works / key design points and WHY it was designed that way
- Task Facilitator + Wizard: **Kevin**
  - Read off tasks. Open locker door when barcode is scanned.
  - Notify user about any task flows that are not included in the Figma prototype, and keep them on task.
  - "That's not part of the task"
  - Task List
- Photographer: **Jingyi**
  - Take photos of the user testing process, especially any REACTIONS and PAIN POINTS.
  - Pain points: Please point to or include the specific part of the interface that the user is having trouble with
- Notetaker: **Hogan**
  - Take notes about the user test. Be sure to include reactions, pain points.
  - You can create a new document (e.g. in A4 Design folder)

Elevator Pitch

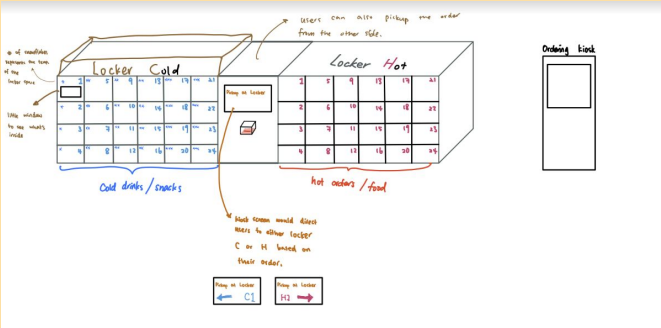
Pitch Statement:

- The Grab n' Go locker system provides a secure and efficient way for busy students to order and pick up food at Price Center.

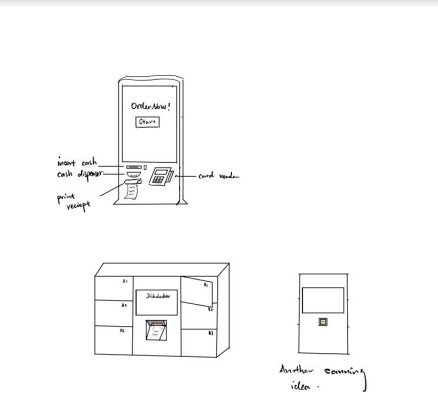
Mission Statement:

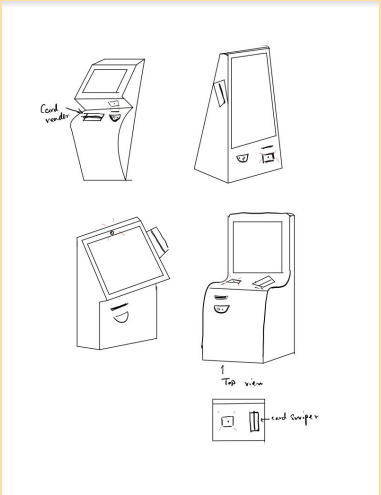
- Through a kiosk, we aim to streamline the dining experience in Price Center—which encapsulates ordering food, receiving food, and finding seats—so that customers can save time, conserve energy, and avoid hassle.

Explorative Sketches

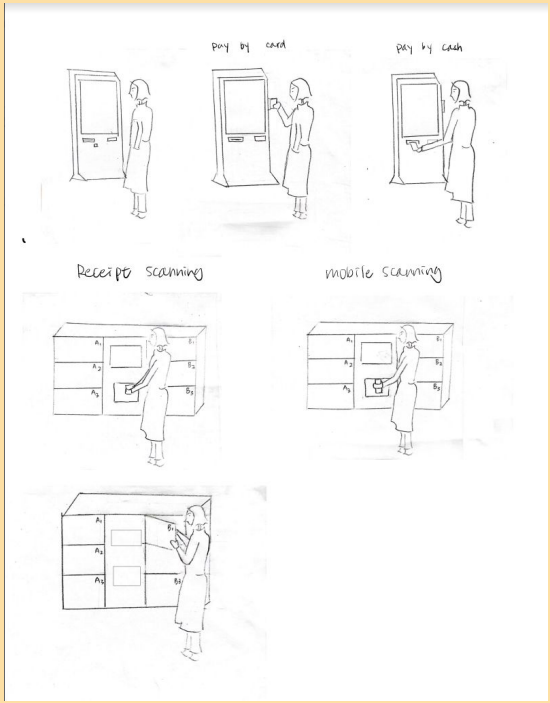


Locker + pickup kiosk design



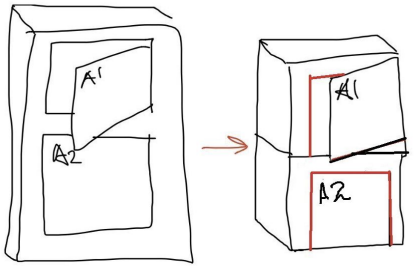


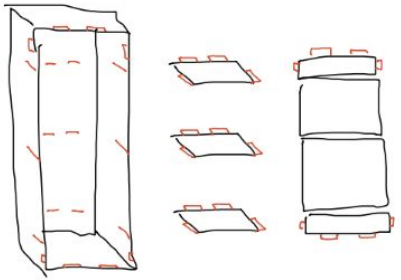
Ordering Kiosks designs

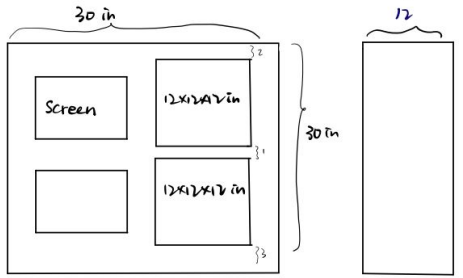


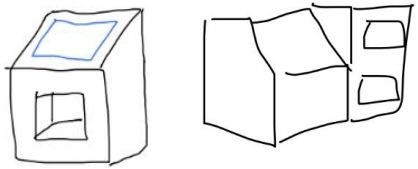
User interactions sketches

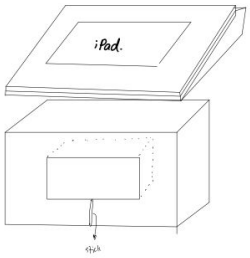
Iterations of Physical Kiosk Design

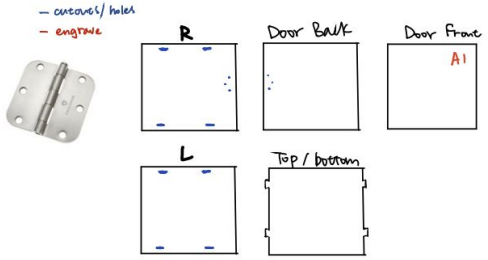




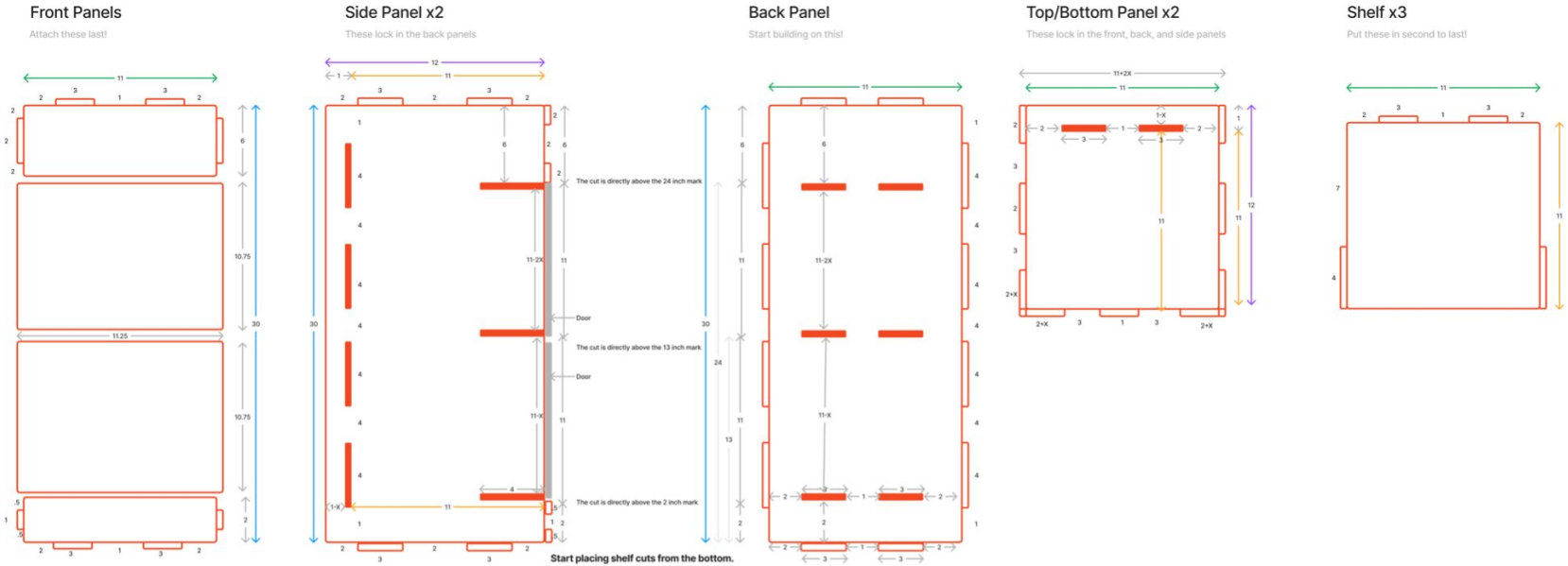




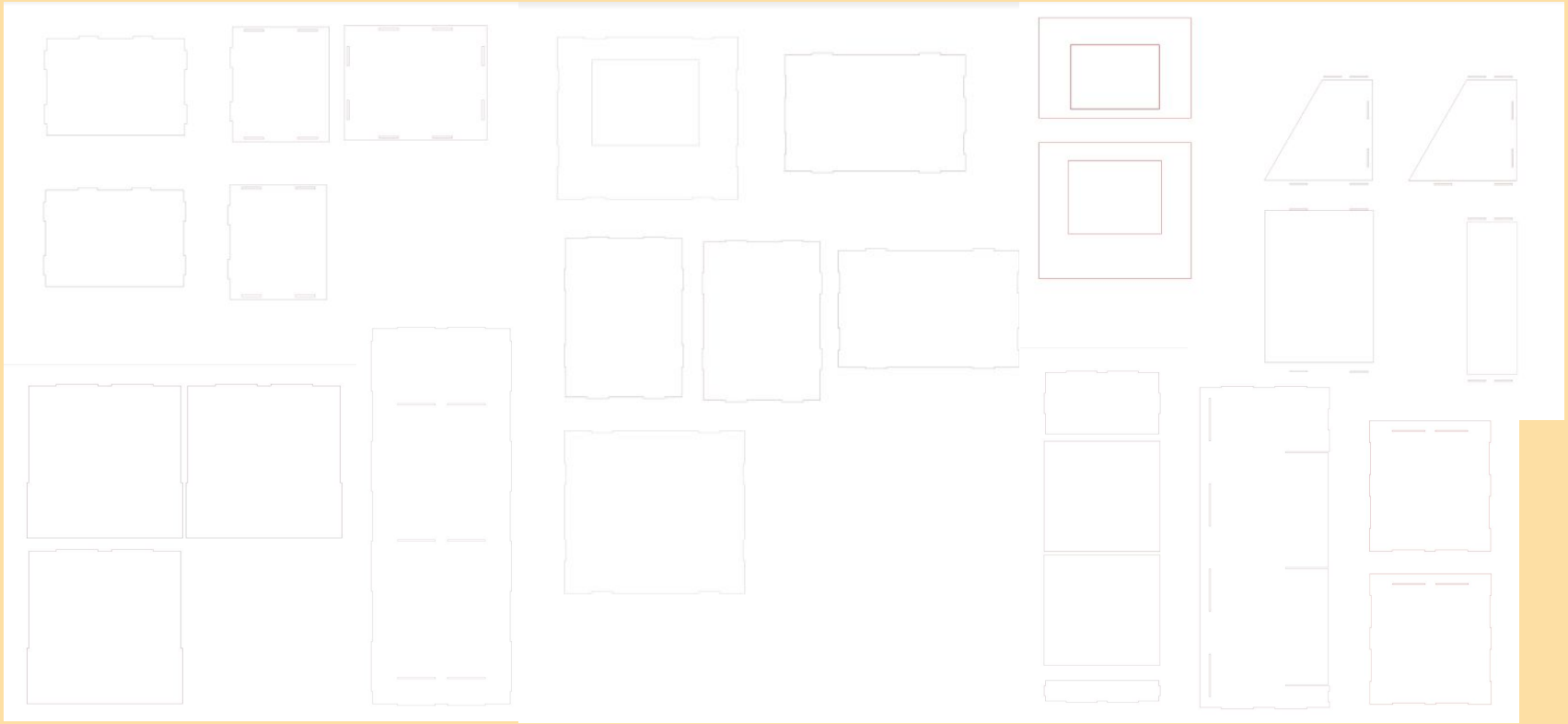




Locker Assembly Blueprints



Vector Design in Inkscape for Laser Cutting



Skin Design

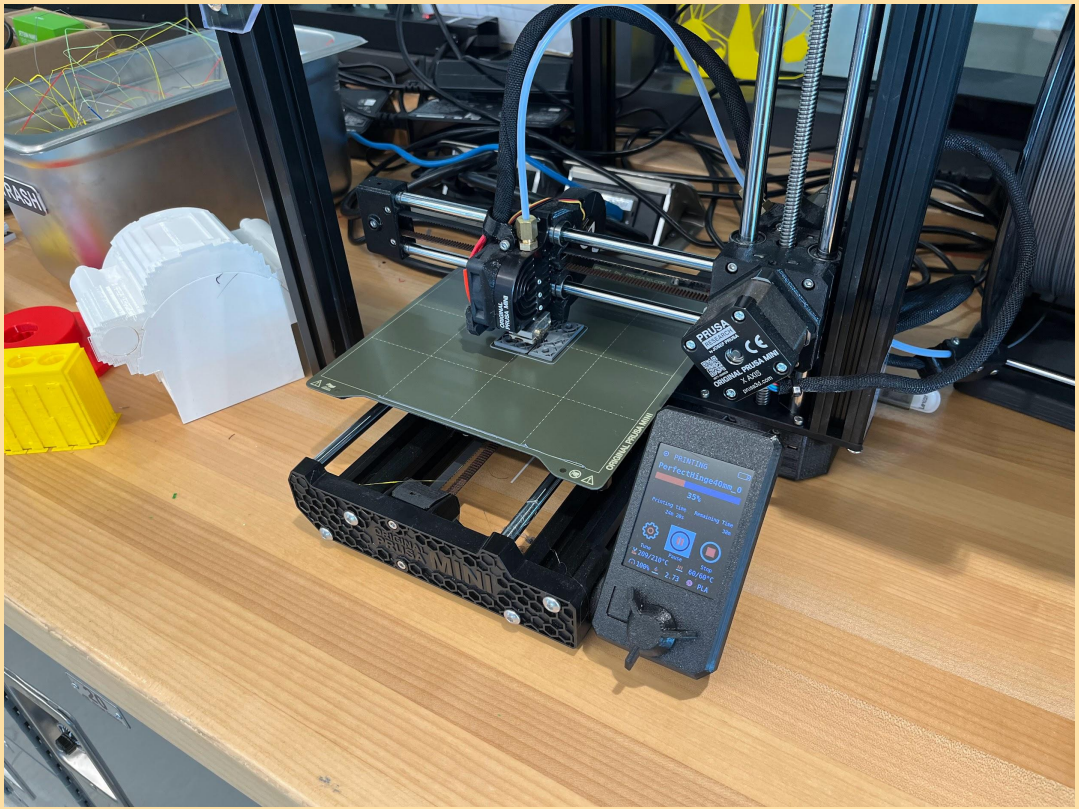

Grab n' Go
A1
A2


Scan Below ↓

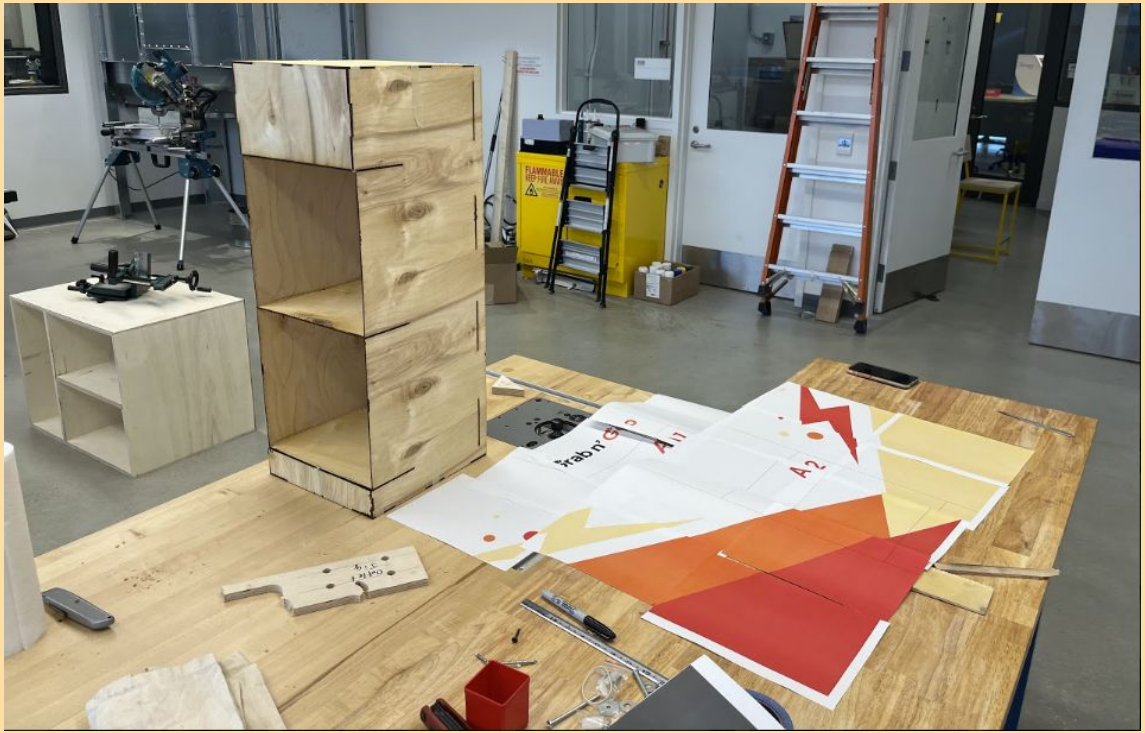

Place barcode here to scan
Pickup
Scan this at Locker Station A1
OR
Pickup Receipt
Scan this at Locker Station A1

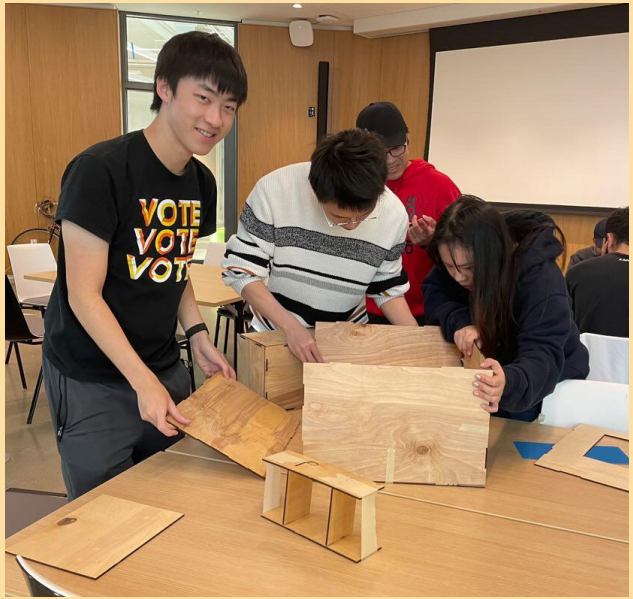
Early Cardboard Prototype

3D Printing


PRUSA
ORIGINAL PRUSA MINI
Original Prusa MINI
PRINTING
Perfectlinge4Omm_0
35%

Building Process





Building Process