Parking Meter Redesign

DEA 3590

Alicia Valencia
Alynna Sanchez
Anne Cramer
Eli Vicarte
Yanqi Guo
Yuexing Hao

Project aim & vision

Project Aim & Vision

1. To design a parking solution that is intuitive and easy to use for senior adults- *addressing cognitive and motor capabilities*

2. To address accessibility issues that often aren't accounted for- *such as accommodating non-native English speakers and allowing for adjustable heights*

3. To envision a more interactive experience- *through voice response features and visual alerts.*

Design Approach

1

RESEARCH

Baseline observations
User journey mapping
Video

2

IDEATION

Initial sketches

3

USER VALIDATION

Prioritization of ideas
User involvement

4

DESIGN

High fidelity ideas
Prototyping

RESEARCH:

Meet Deanne

81-years-young, Deanne is loving her retirement filled with travel, singing, and occasionally attending classes at Cornell.

She is comfortable with technology as long as it is intuitive and easy to use, but she doesn't like figuring it out on her own.

She just got a sporty Kia Soul and is feeling more and more confident about driving around the Finger Lakes area, but she really hates the modern parking machines in Ithaca.

RESEARCH:

Baseline observations with Deanne

The first step was not clear. Deanne had to press a random button to start.

Deanne was unaware that she needed to know her license plate

Payment methods did not work, and it was difficult to remove the card

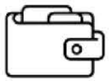
The process took so long that Deanne got a ticket while trying to pay!

This sparked how we would measure success

Since Deanne's overall time to attempt to use the parking meter was over 10 minutes, we decided that success would be measured by a **decrease in the amount of time** for our final design,

RESEARCH:

Deanne's Journey

PERSONA	PULLING INTO PARKING SPOT	SELECTING PARKING OPTIONS		PAYING / ADDING MORE TIME	RESULT
 Deanne	 "Where is the parking meter?"	 "Wow, this looks really complicated. Where do I start?" ↓ "What key do I press?" ↓ "Is this thing even working?"	 "What is my license plate number?" ↓ "Maybe it's on my insurance card?" ↓ "Ugh! I have to walk back to the car"	 "It's not accepting my card" ↓ "Let me try another card" ↓ "Wait, it just added more time!" ↓ "It's still not taking my card! Let me see if I have any change"	 "It didn't work, I have to park somewhere else" ↓ "I got a parking ticket?!?!?!" ↓ "&%$&^%!*&!!!!!!!"

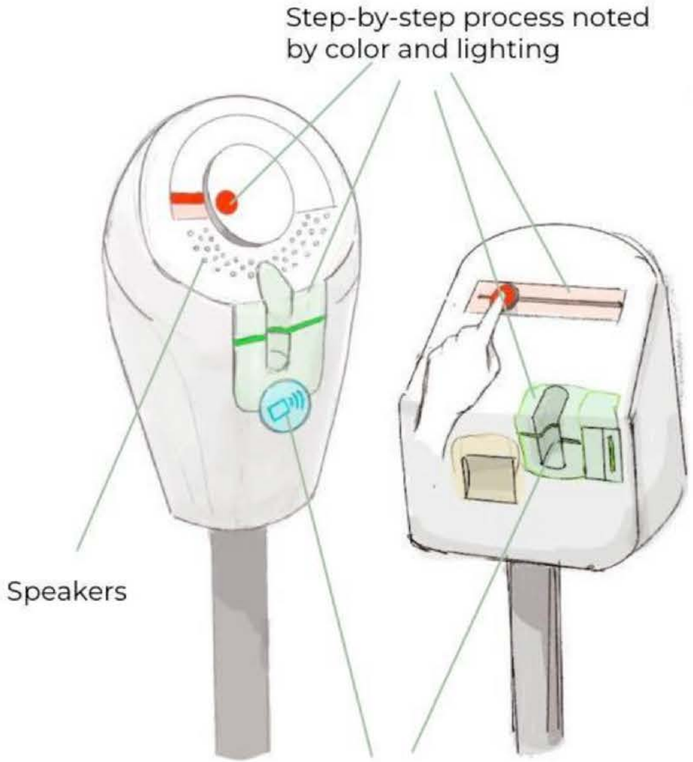
RESEARCH:

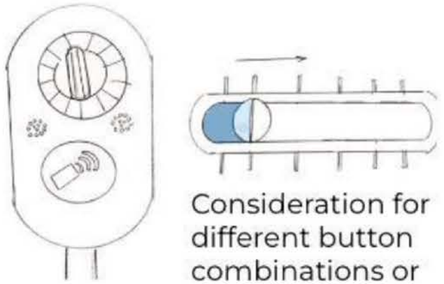
Deanne's Journey with Parkee

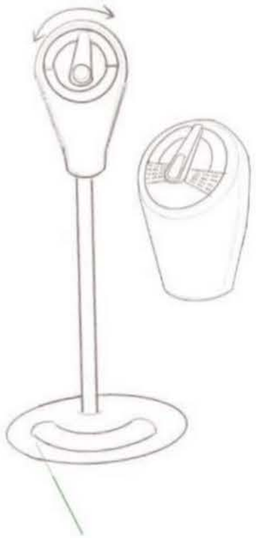
PERSONA	PULLING INTO PARKING SPOT	SELECTING PARKING OPTIONS	PAYING / ADDING MORE TIME	RESULT
 Deanne	 "Nice, the meter is right here at the car"	parkee "Ooh it talks!" ↓ "Different languages are possible!" ↓ "Wow, it lights up to show where I'm supposed to be looking"	parkee "The tap to pay feature is so easy" ↓ "I like that it can add time for me" ↓ "It even remembered my payment option when I came back!" ↓ "It's still not taking my card! Let me see if I have any change"	 "That was easy!" ↓ "It looks like it's smiling at me!"

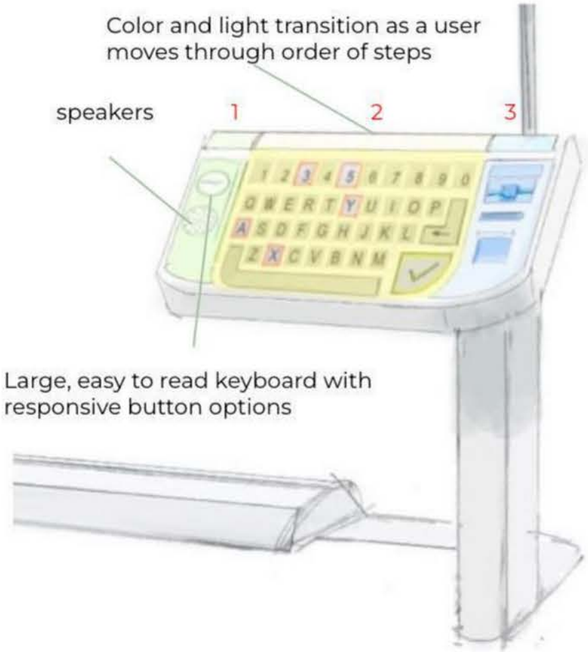
RESEARCH:

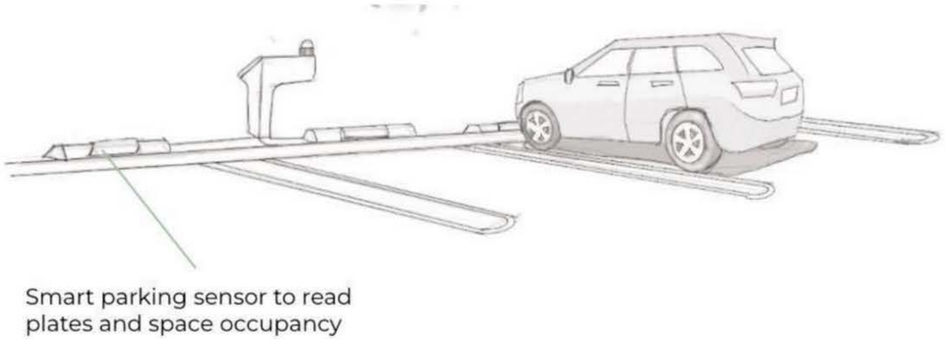
Initial Sketches









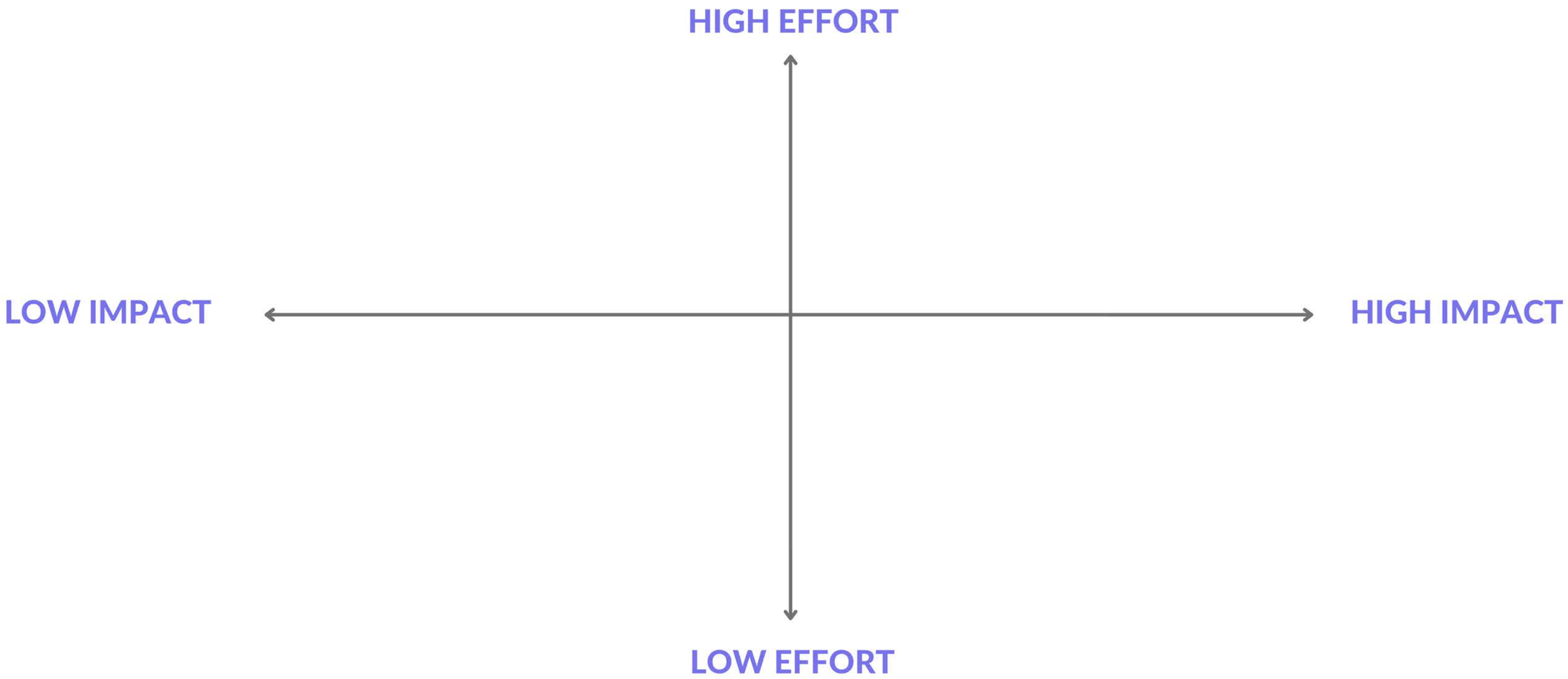


We realized that our ideas lacked structure

While attempting to sketch was a great way of discovering what problems we'd need to solve that we couldn't realize through research, we decided that we needed to prioritize what to solve for and make sure that everything was intentional.

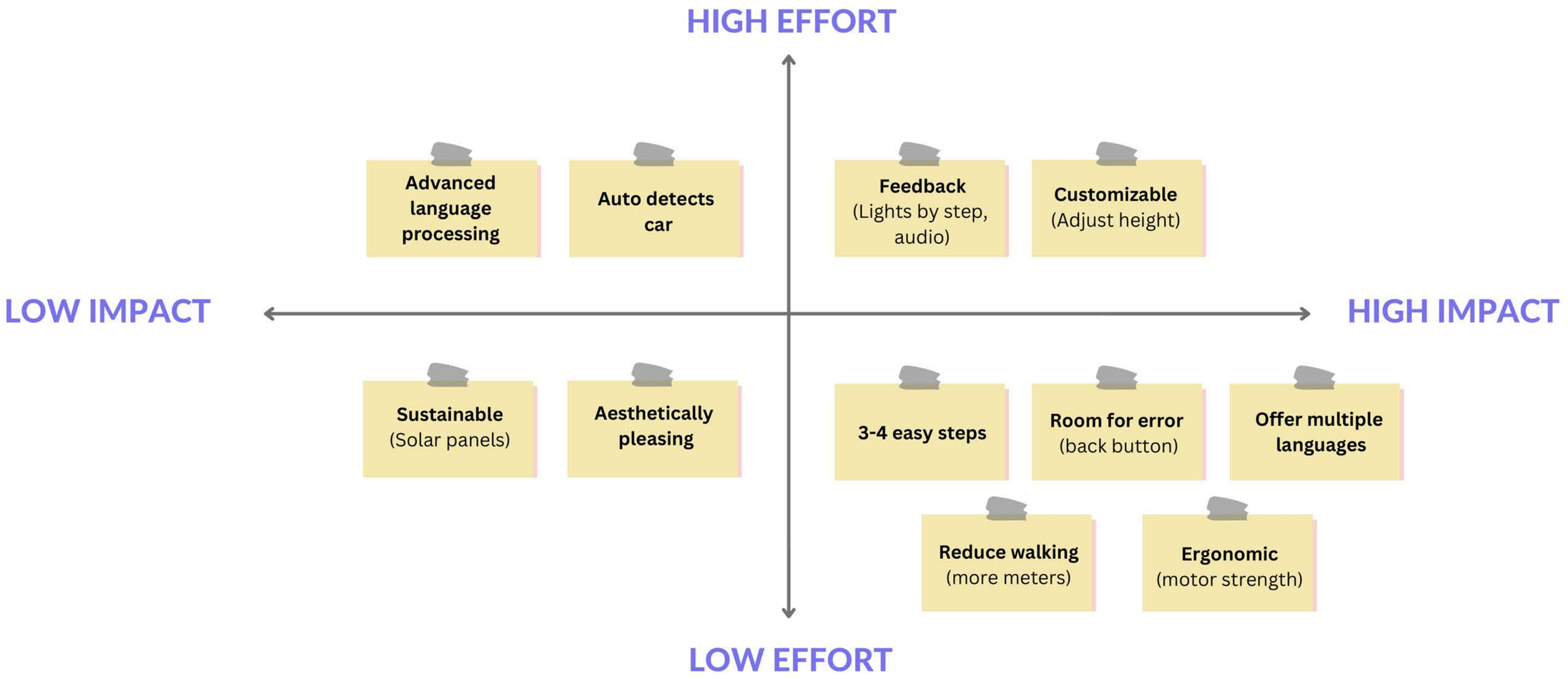
IDEATION:

Prioritization of ideas



IDEATION:

Prioritization of feature ideas



IDEATION:

User involvement- *Patt, age 75*

Goal 1:

Intuitive

1. **3-4 easy steps**
2. **Room for error** (back button)
3. **Feedback** (Lights by step, audio)

Goal 2:

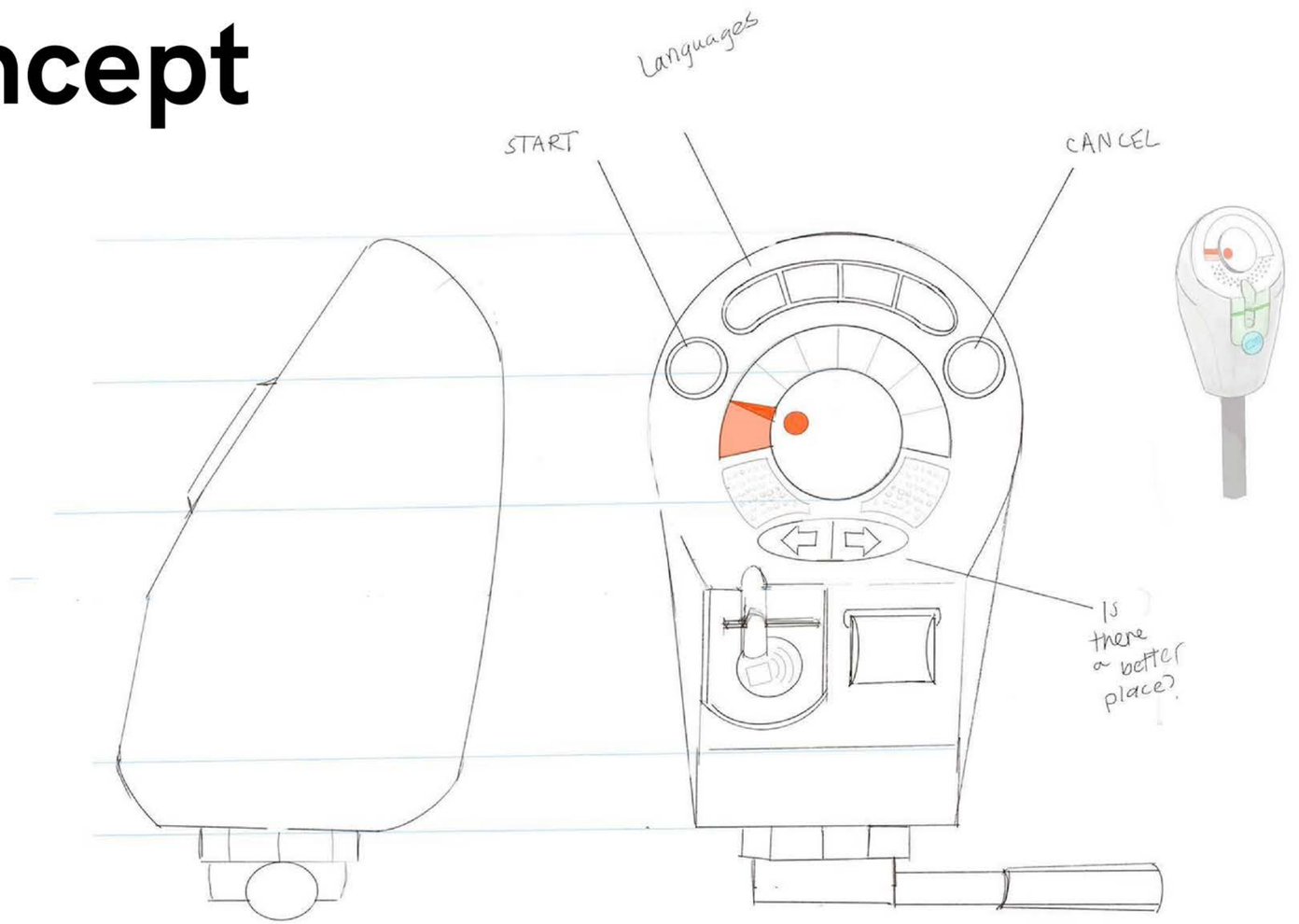
Accessible

4. **Customizable** (Adjust height)
5. **Ergonomic** (motor strength)
6. **Reduce walking** (more meters)
7. **Offer multiple languages**

DESIGN:

High-fidelity concept

After re-prioritizing ideas, we got back to sketching and decided on this final iteration.



DESIGN:

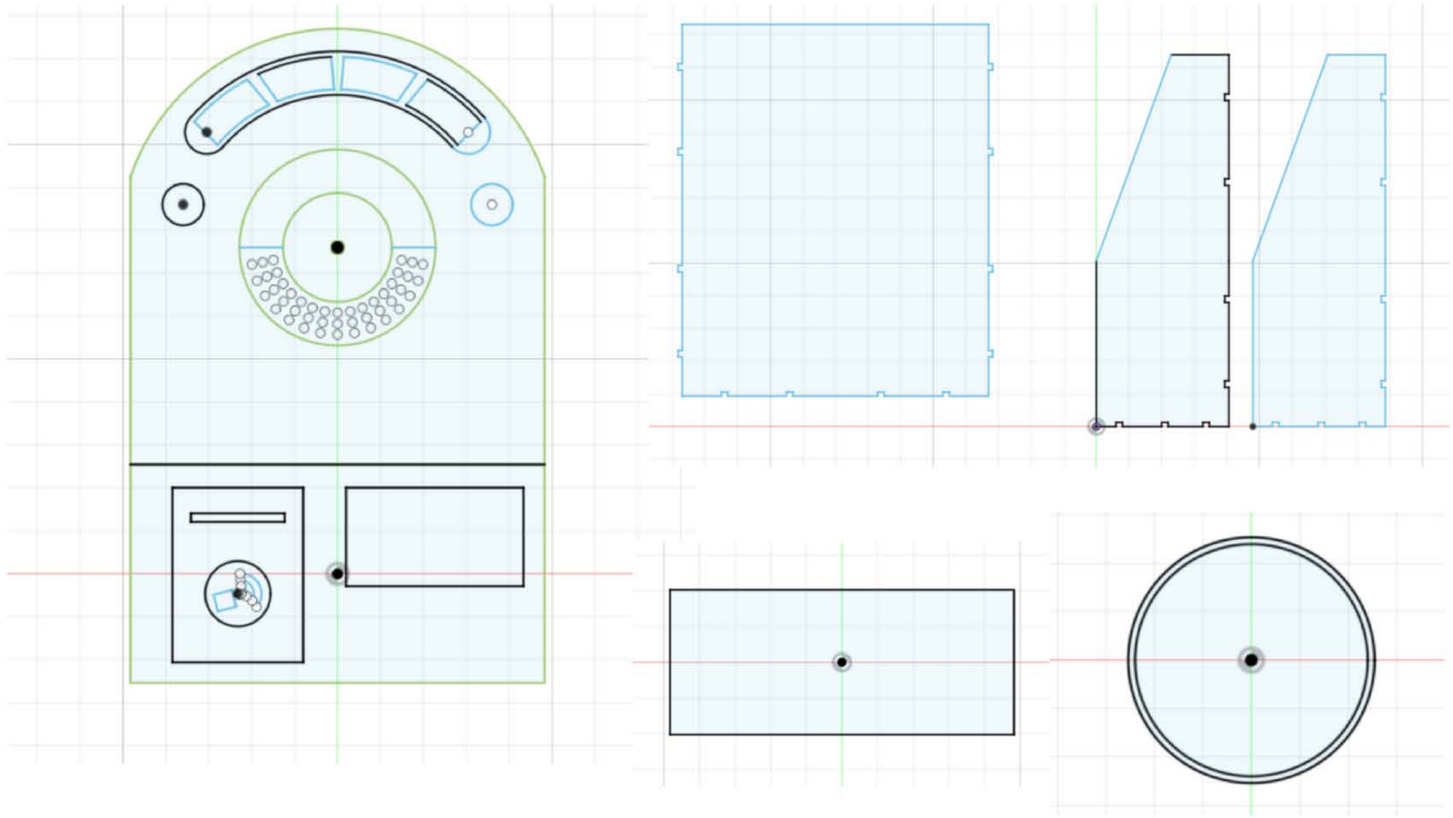
Prototyping

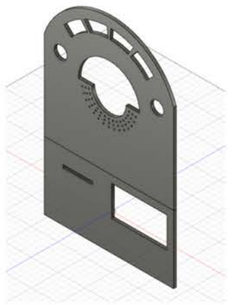
We then came together and finalized our prototype design, drawing in scale and using the parts we had to determine sizing and placement

DESIGN:

Prototyping

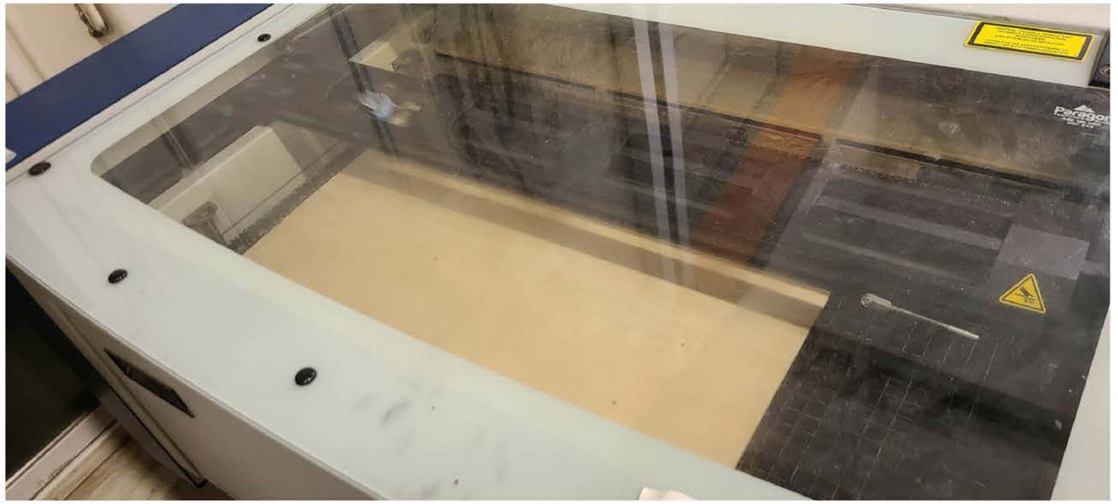
We moved on to manufacturing the prototype. The first stage was to convert the design on paper to a 2D model using Fusion 360 so that we could laser cut the files



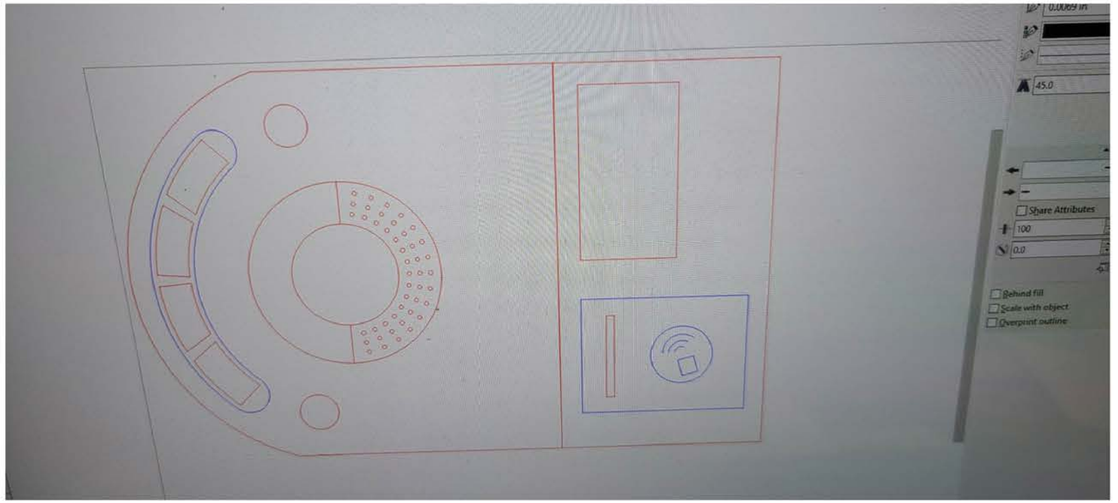


DESIGN:

Prototyping

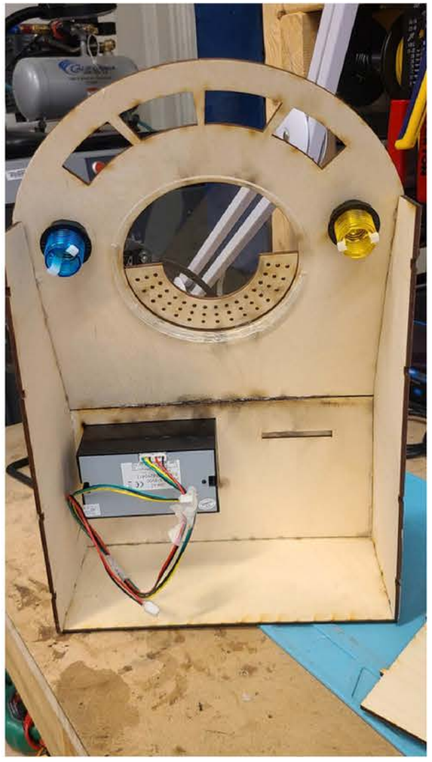


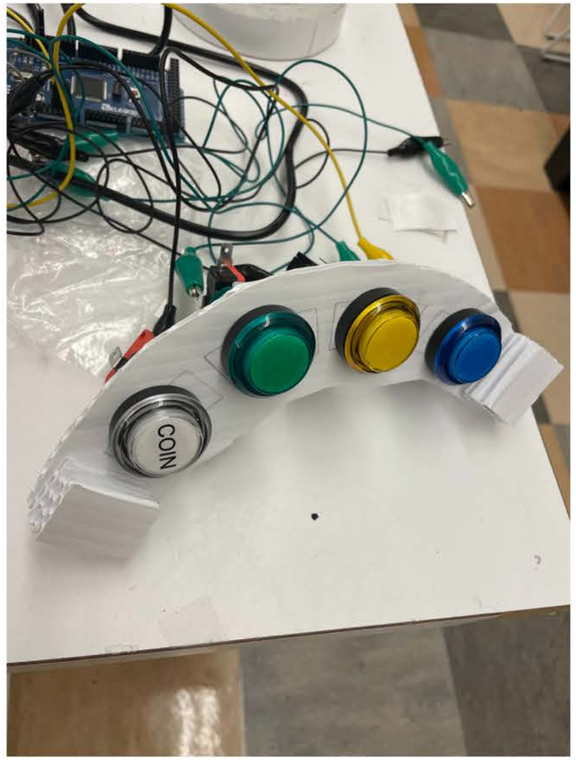
The next step was to laser cut the files. We chose to use 1/8" plywood as our base.



DESIGN:

Prototyping

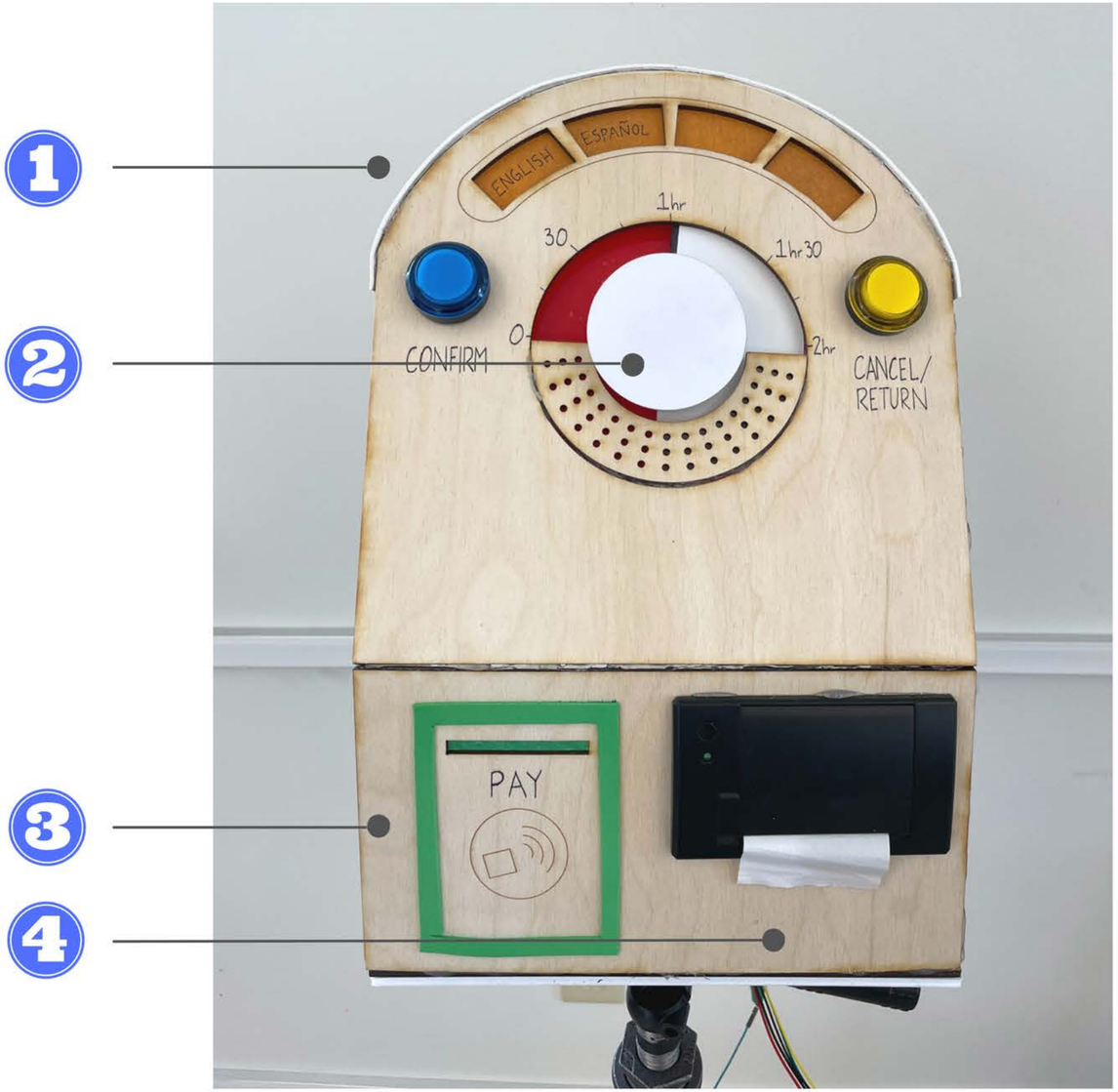




Key Features

Goal 1: **Intuitive**

4 easy steps



4 easy steps make the process faster and less overbearing for new users.

Goal 1: **Intuitive**

Room for Error

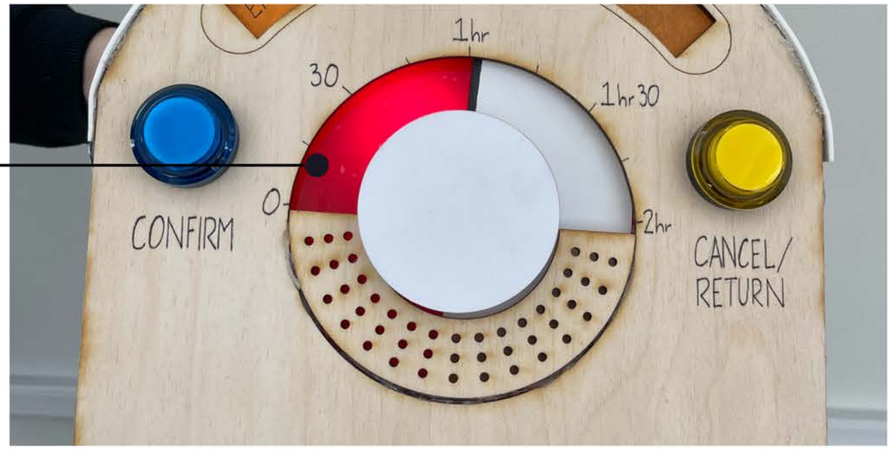
Back/Cancel buttons:
Allow users to easily return to the previous step

Audio Confirmations:
Gives users time to change their minds.

"Please say yes to confirm"

Goal 1: **Intuitive**

Feedback



Lights:

Lights guide the user's eyes and help indicate which step the users are on (Voluntary attention)

Goal 2: **Accessible**

Customizable

Adjustable heights:
Allowing for multiple heights reduces the need for awkward positioning and strain when using the machine

Goal 2: **Accessible**

Ergonomic

Large buttons and dials:
Dial requires minimal motor strength to turn, and large buttons are easy to push

Tap to pay:
Offering tap-to-pay lets users who have these cards avoid the difficult insertion of cards into the reader.

Goal 2: Accessible

Reduces walking

Parking meter at every car:
Having parking meters for every car reduces the need to walk back and fourth. It also increases visibility.

Goal 2: **Accessible**

Language Selection

Top 4 languages in Ithaca:
Offering the top 4 languages spoken in Ithaca (English, Spanish, Mandarin and Korean) allows more people to use street parking

Options labeled in their respective languages:
This ensures that those who can't read English can also use the meter

Goal 2: **Accessible**

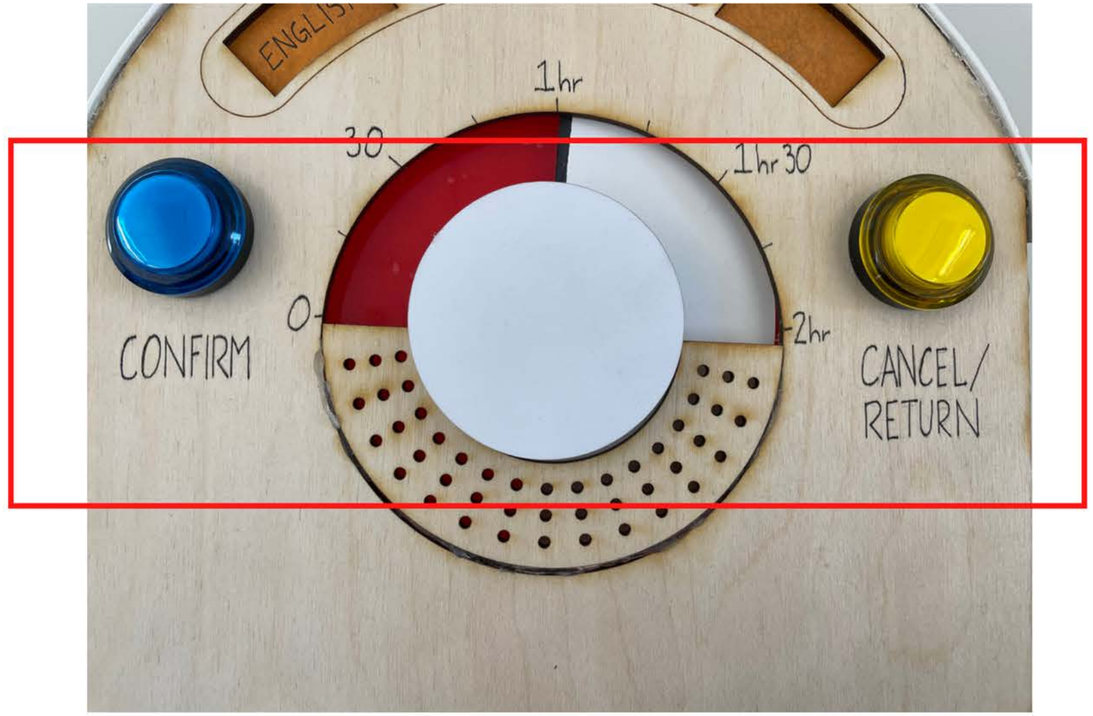
Color contrast

Blue and Yellow Buttons

Blue and yellow buttons are easy to see and differentiate for people who are color blind

Red and White Dial Background

Red LED lights up to show the time selection of the dial like an progress bar



Evaluation & Testing

EVALUATE:

Final observation comparison

To be done

When observing Deanne using our new parking meter, we anticipate a time decrease.

Initial time:

>10 mins

Estimated new time:

< 3 mins

Limitations:

- Deanne has been involved in the design process so she may already be aware of how to operate the meter
- We had to wizard-of-oz the feedback and audio, making the experience different than in real life.

Future considerations

To Consider:

We are considering **adding a tray** on the meter to allow users to rest their belongings while **searching through their bags** for payment

To Consider:

We can further think about how to **indicate** that the parking meter has run out of time without requiring users to leave their site and **approach the machine**

To Consider:

Making our prototype as close to **real life** as possible can increase our ability to do effective **user testing**