

Design Exercise

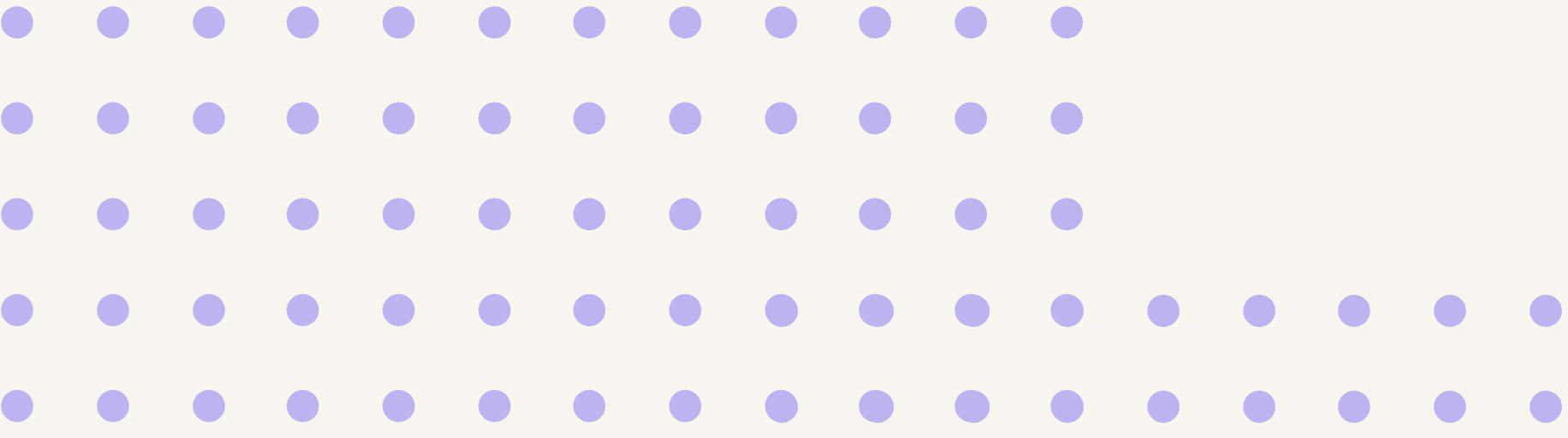
AR Payments App

Charisma Kausar

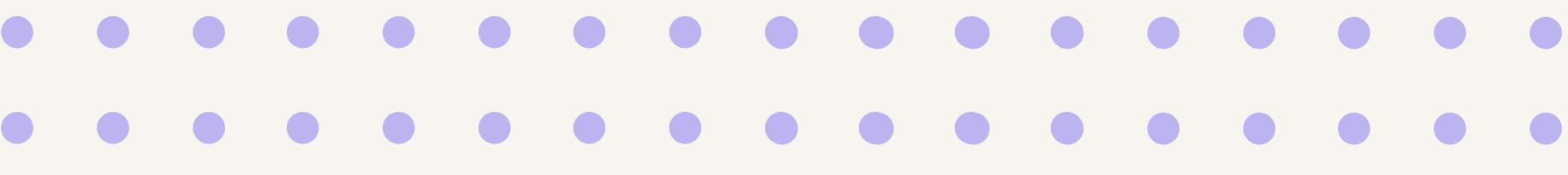
2022 Semester 1
CS3240 Interaction Design

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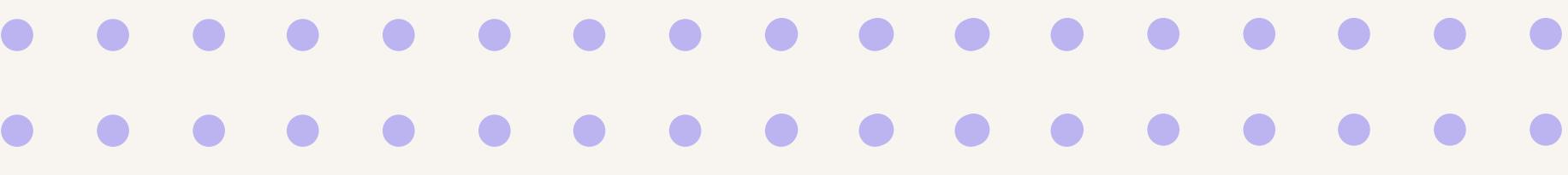
1. User Research



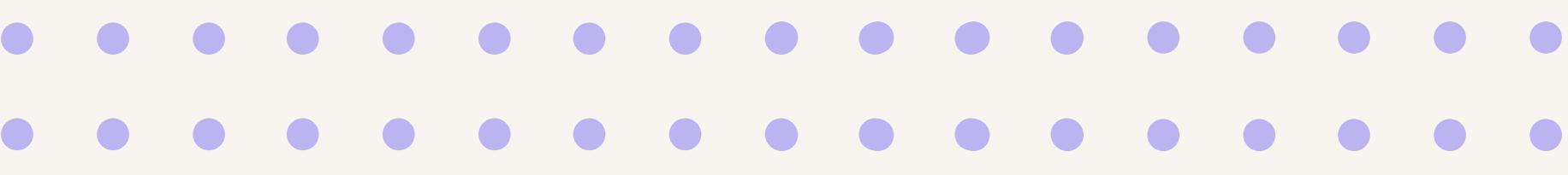
2. Ideation



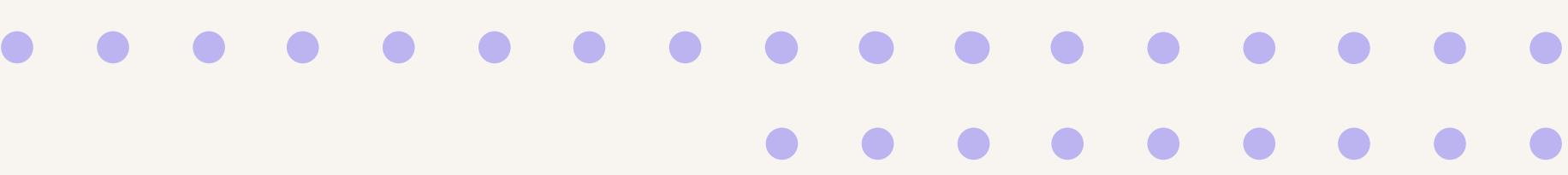
3. Designing for AR



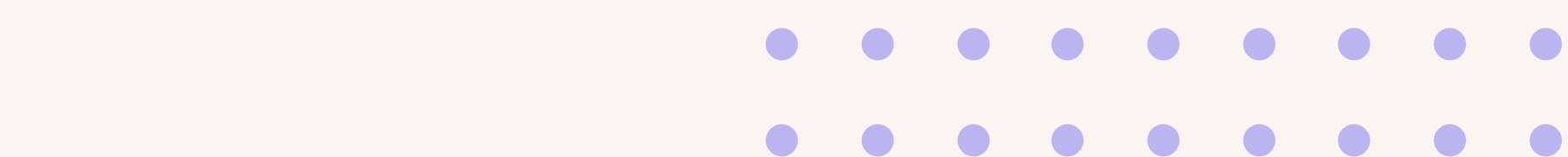
4. Wireframes



5. Hi-Fi Prototype



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1. User Research

Problem Statement

To create a futuristic application to **order** and **pay** for goods and **send money** to friends and family that is more convenient than existing applications.

Requirements:

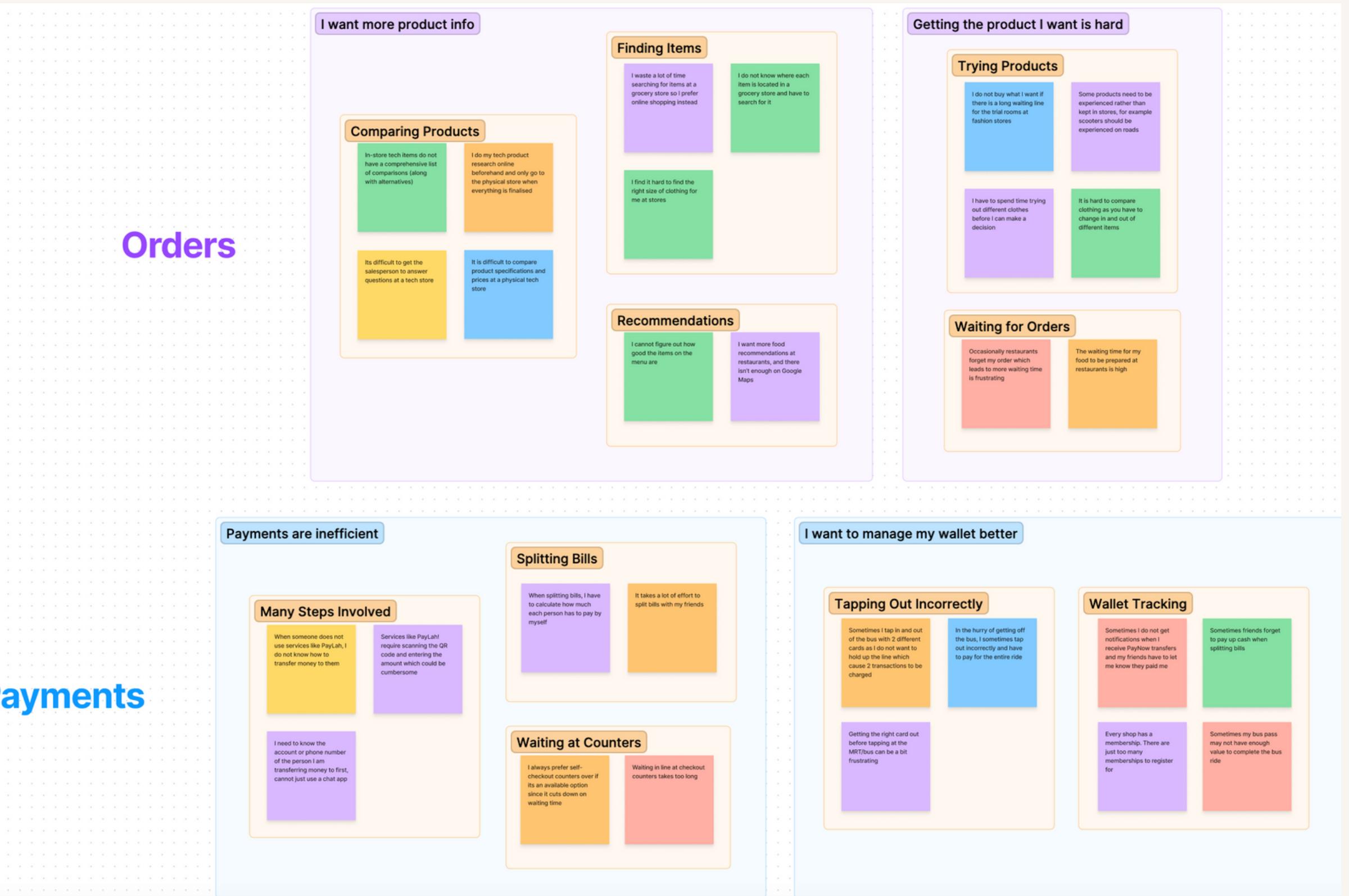
1. Ordering goods
2. Paying for goods when the amount is pre-determined
3. Paying or sending money by entering amount

I compared online payments with in-store payments through online research and scoped my project to only **in-store/physical payments** as it has more room for improvement.



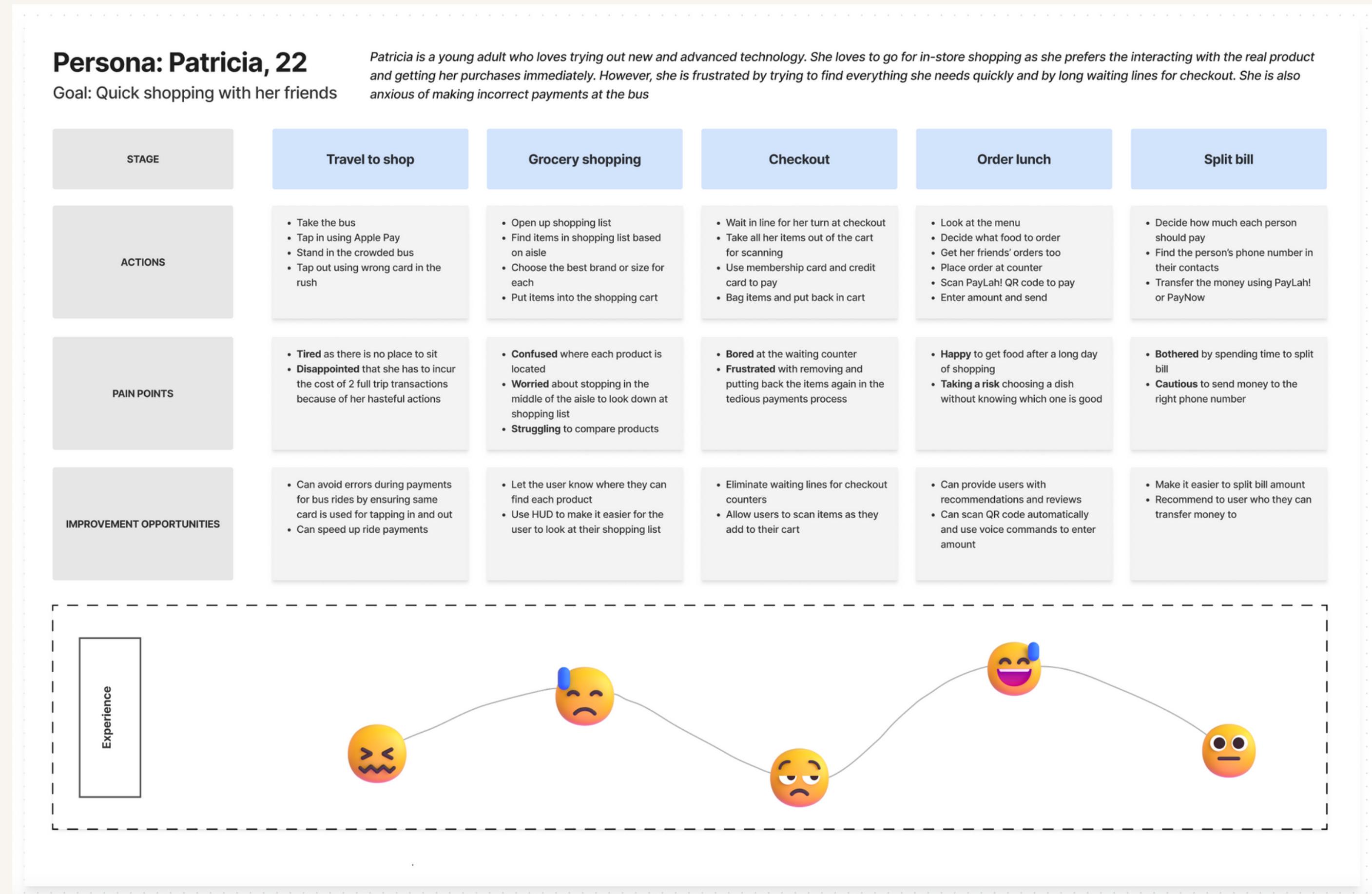
Affinity Diagram

I conducted 6 user interviews to understand people's pain points when ordering and paying for goods and summarised their problems in the following affinity diagram.



Link: <https://www.figma.com/file/huF7ifwhKdSXPvxnCjFYjG/IDE---Affinity-Diagram?node-id=0%3A1>

User Journey Map



Link: <https://www.figma.com/file/pjrOxz32uqRoySjxHBQgzG/IDE---User-Journey?node-id=0%3A1>



2. Ideation

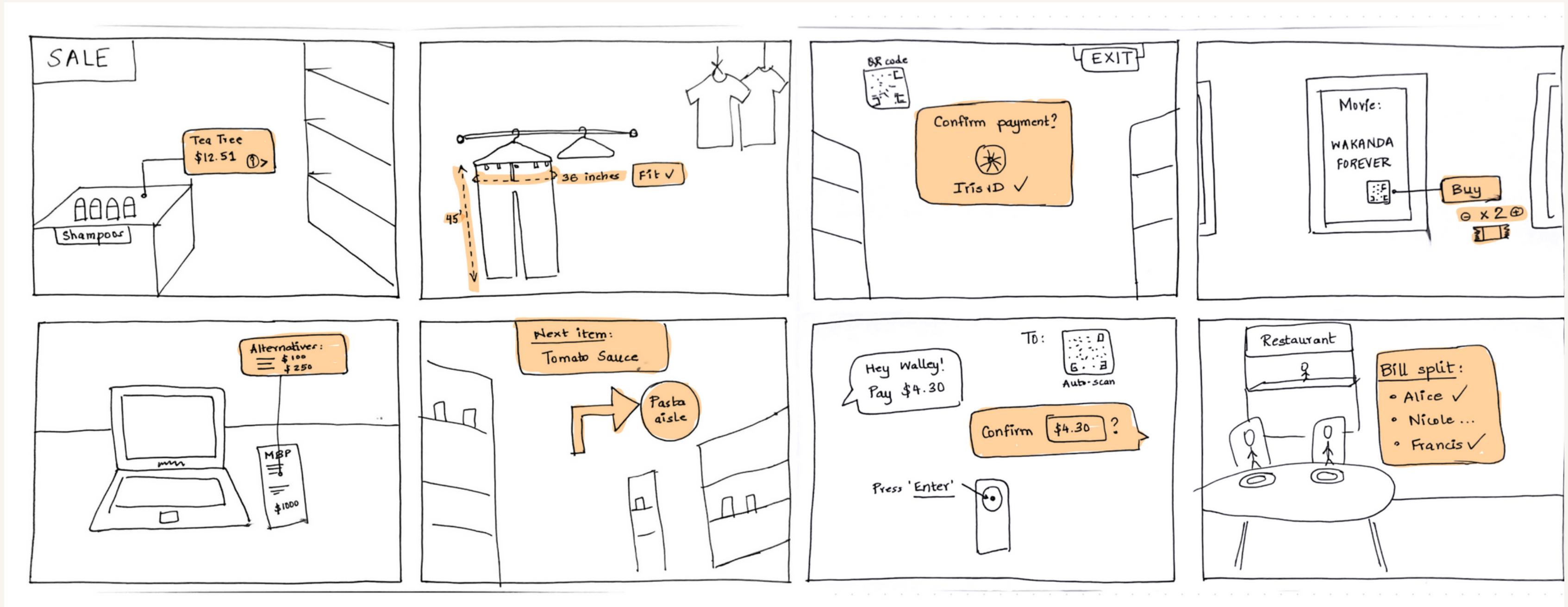
List of Ideas

Problem	Ideas
It is difficult to find items at a physical store	Show navigation guidance to the nearest product on their shopping list using smart glasses. This would include the distance and pathway to the product location.
It is difficult to find more information about products at physical stores	Show the user some product information such as price, available sizes, alternatives, etc. when they take a look at the product. Expanding only one detail card and hiding the rest unless the user chooses to see it will allow less clutter.
Waiting in the checkout line is inefficient and tiring	Allow users to scan their products as they collect them using their smart glasses. After collecting everything, users can scan a QR code to connect to the store's server, apply any store discounts and pay their final amount without any waiting lines.
Sending money to small store owners or friends and family involves a lot of steps	Speed up money transfers by auto-scanning QR codes. Get contact details of friends and family to transfer money to using facial recognition in case the person is nearby. Use voice control to enter amount as difficult to type in smart glasses.

Brainstorming Link: <https://www.figma.com/file/OiV9SvpLWRtzXG1y1DVt1/IDE---Brainstorming?node-id=0%3A1>

Crazy 8s

*Smart Glasses UI highlighted in orange for easier comprehension



Link: <https://www.figma.com/file/nKOFhDYGXZQr9d00m2xh6L/IDE---Crazy-8s?node-id=0%3A1>

Key User Tasks

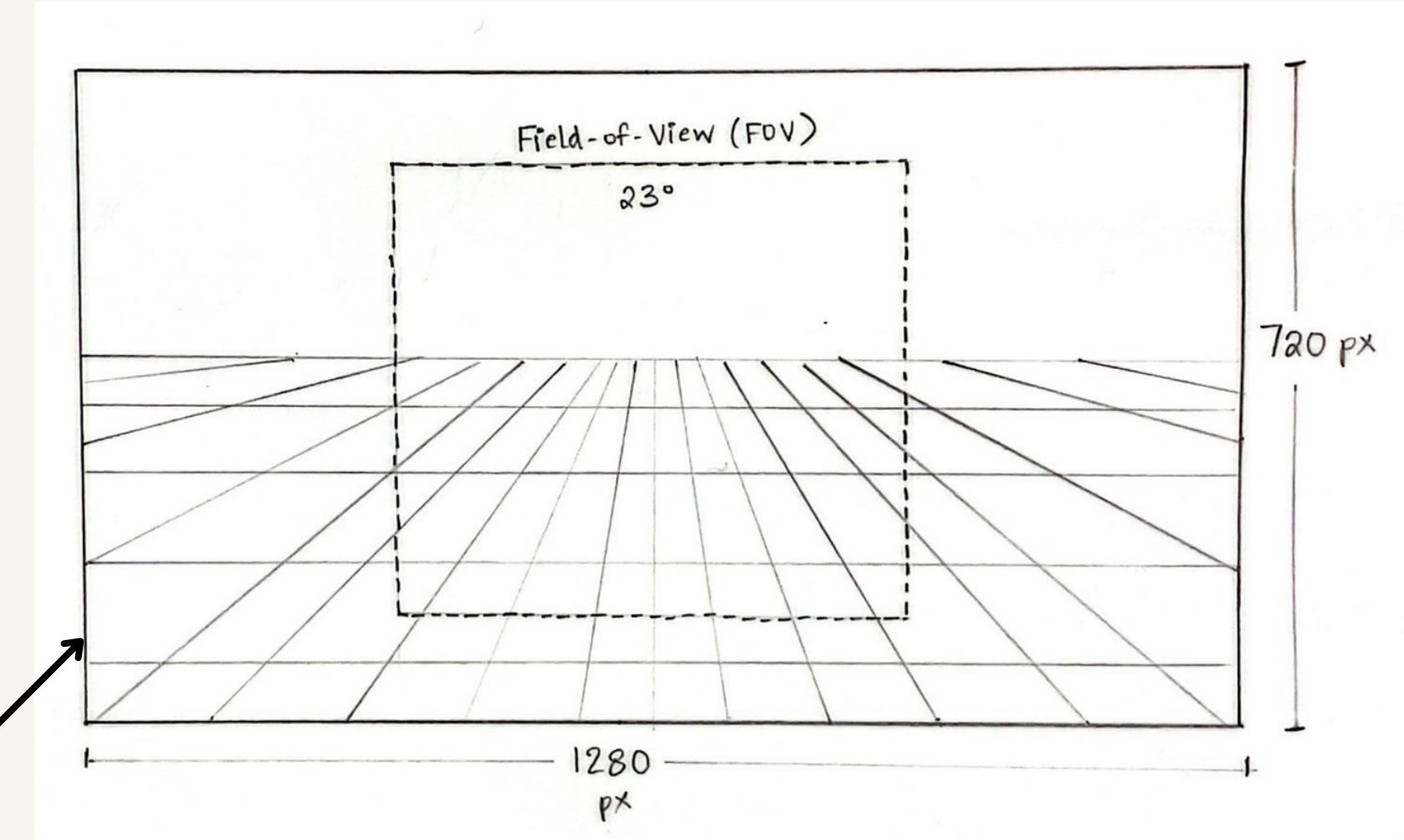
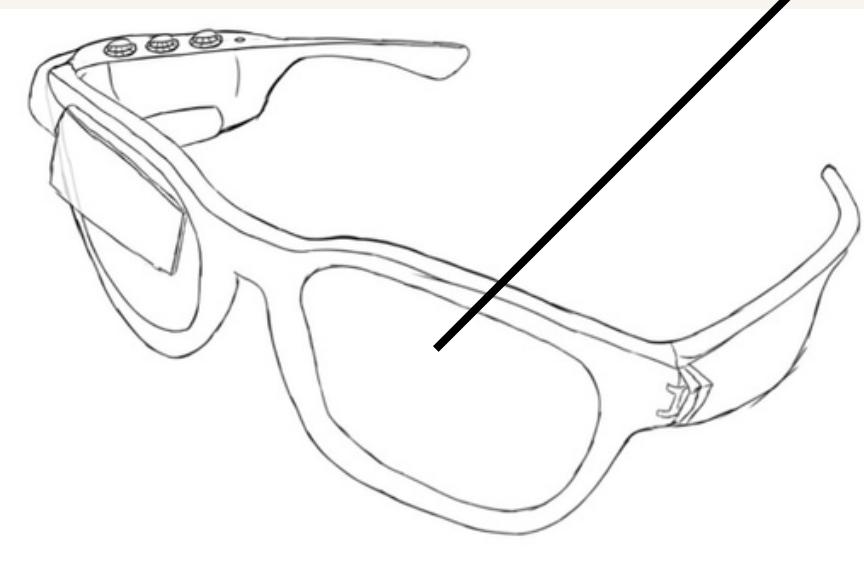
Based on my ideation process, I decided on the following user tasks:

- 1. Wallet management:** Adding cards to the app and configuring payment settings for smooth payments
- 2. In-store Cart Payments:** Finding items using navigation guidance, checking product info, self-scanning items to add them to the cart, and paying for them using a QR code instead of checkout counters for better in-store experiences.
- 3. Manual Input Payments:** Voice input and facial recognition to enter the amount and/or recipient and transfer to small shop owners, friends and family.

3. Designing for AR

Smart Glasses

The AR payments app can run on smart glasses with an in-built camera, microphone for voice control, 1280x720 visual display, and built-in NFC for tap-to-pay functionalities. The app can be controlled using the touch controller.



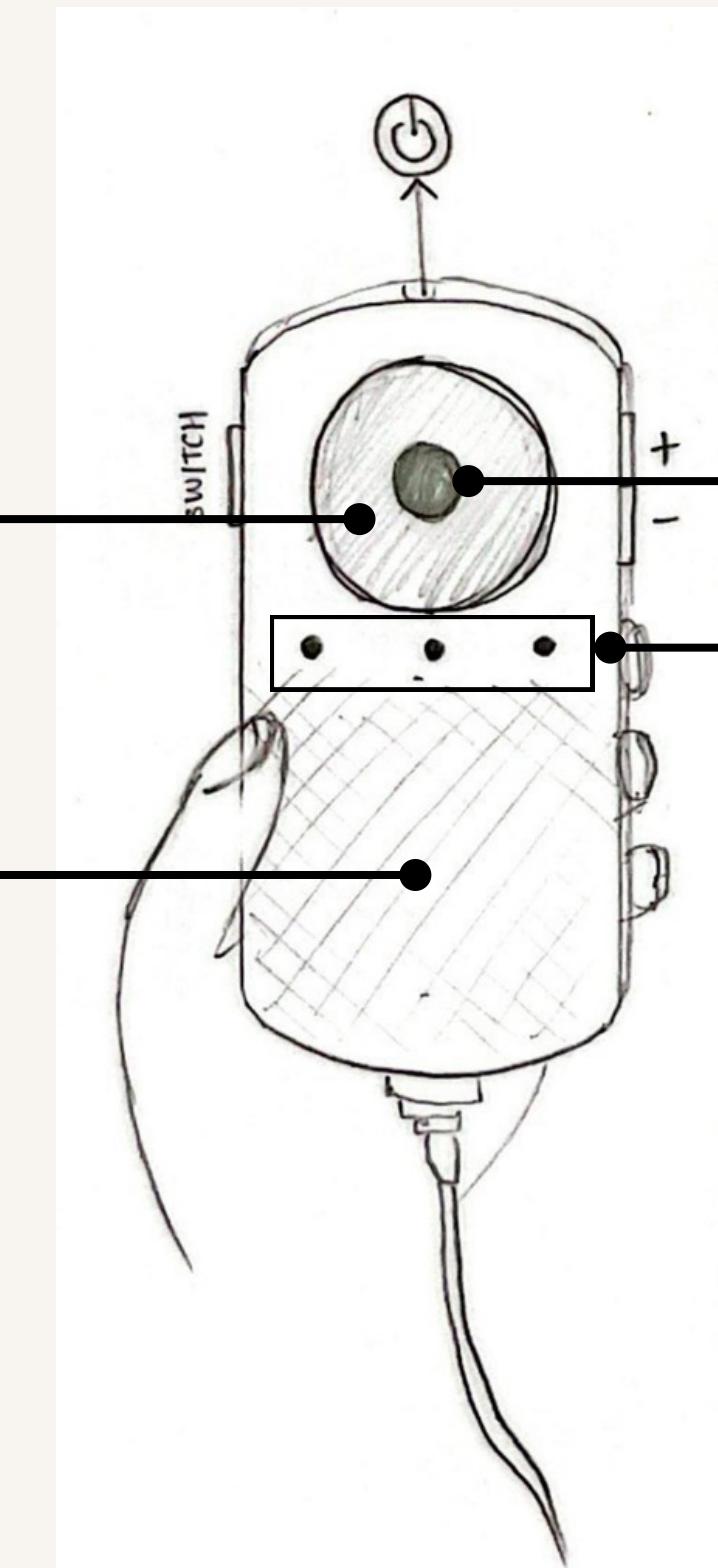
Touch Controller

Cross-key for
up-down-left-
right controls

Trackpad for general
touch control

Available trackpad controls:

- Tap
- Drag
- Flick/Scroll
- Pinch Out
- Pinch In



Enter key to
select or confirm

Back, Home, and
History buttons

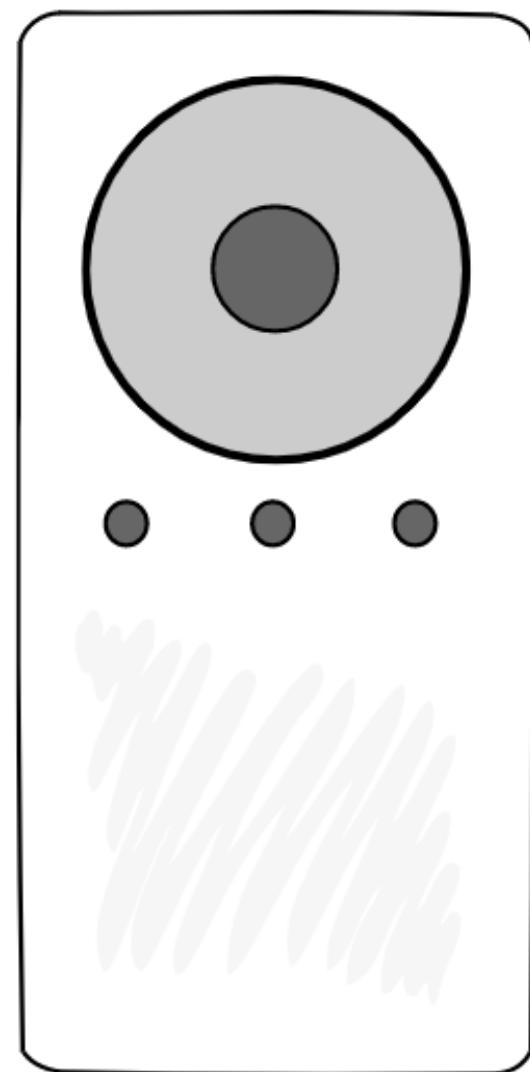
Design Considerations for AR

- UI has to be *translucent* with a slightly *blurred background* (similar to glassmorphism) to allow the user to be able to see their environment as well as the app UI clearly.
- The UI must *not obstruct the center view* of the user so that they can view their environment comfortably.
- There must be *guidelines* to help people get started as augmented reality smart glasses are a new platform for most people.
- *Colors that are rare* in shopping environments must be used to allow the UI to be seen clearly.

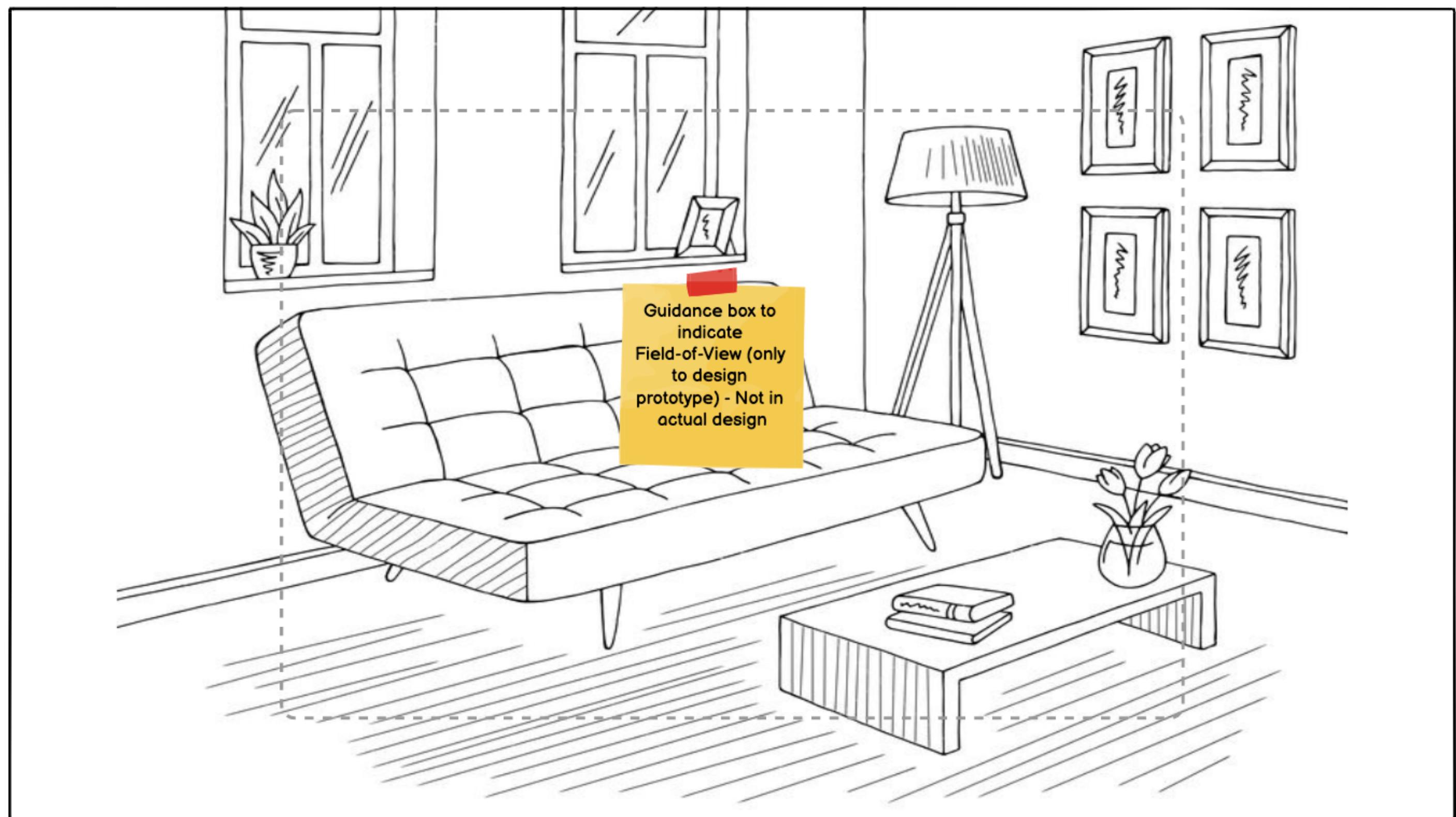
4. Wireframes

<https://balsamiq.cloud/s93sme9/pxnjp5o>

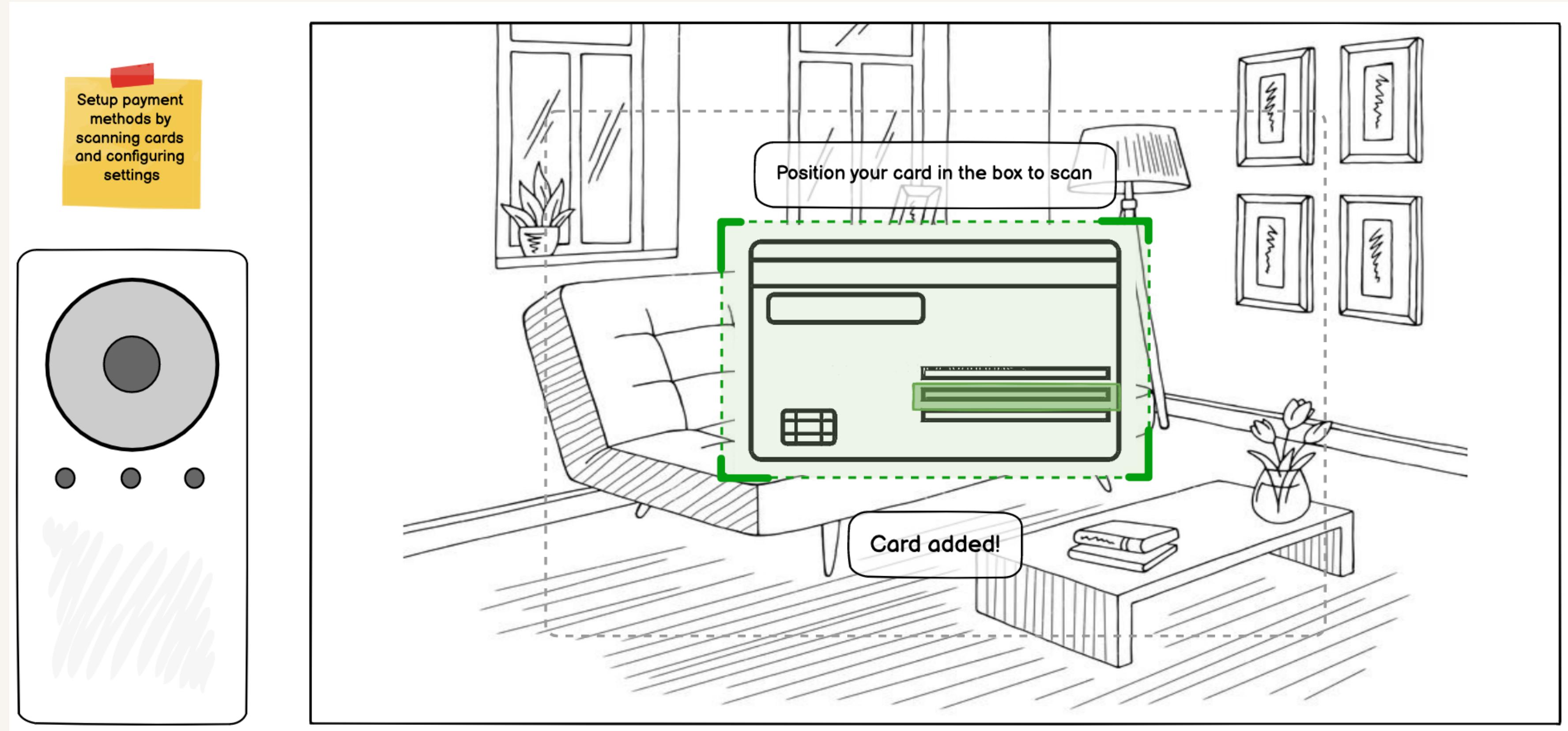
Field-of-View



Touch
Controller
for input

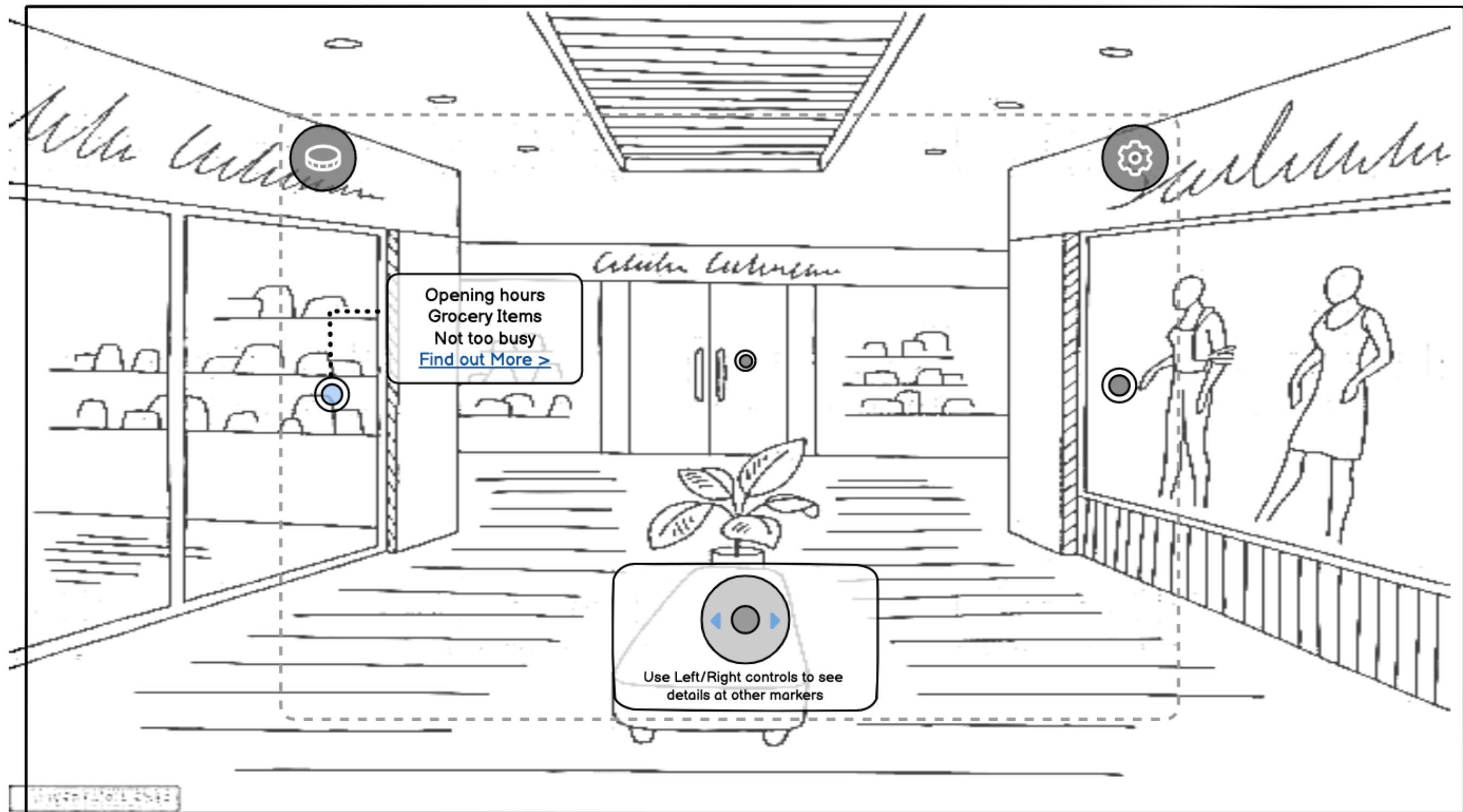
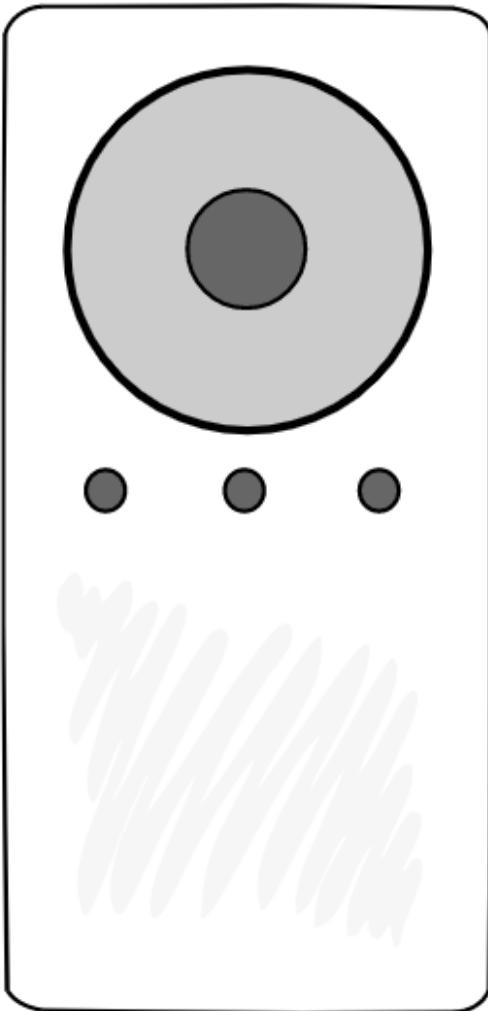


Wallet Management



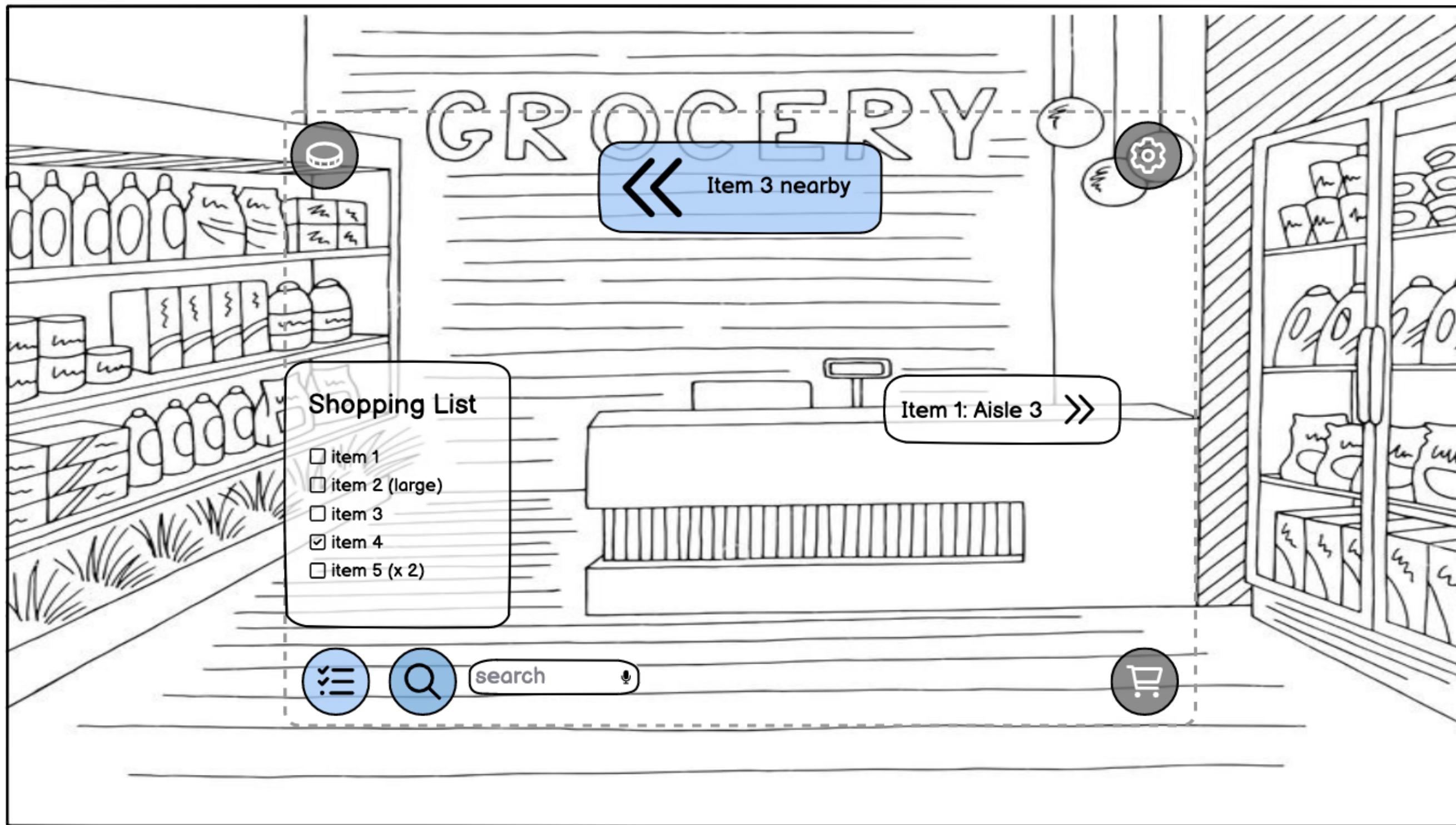
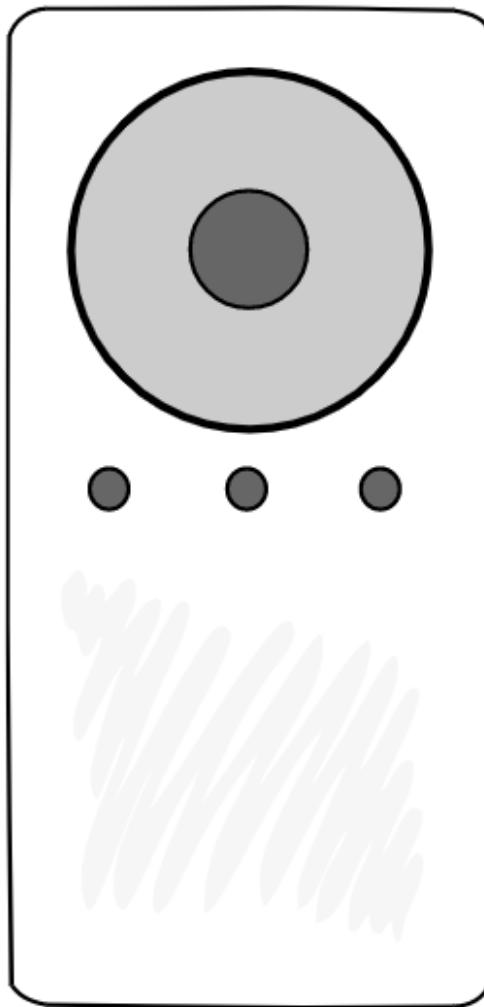
Guidance Tips

Markers at different shops and items, select a marker for more details
Use the cross controls to see details for nearby circle markers

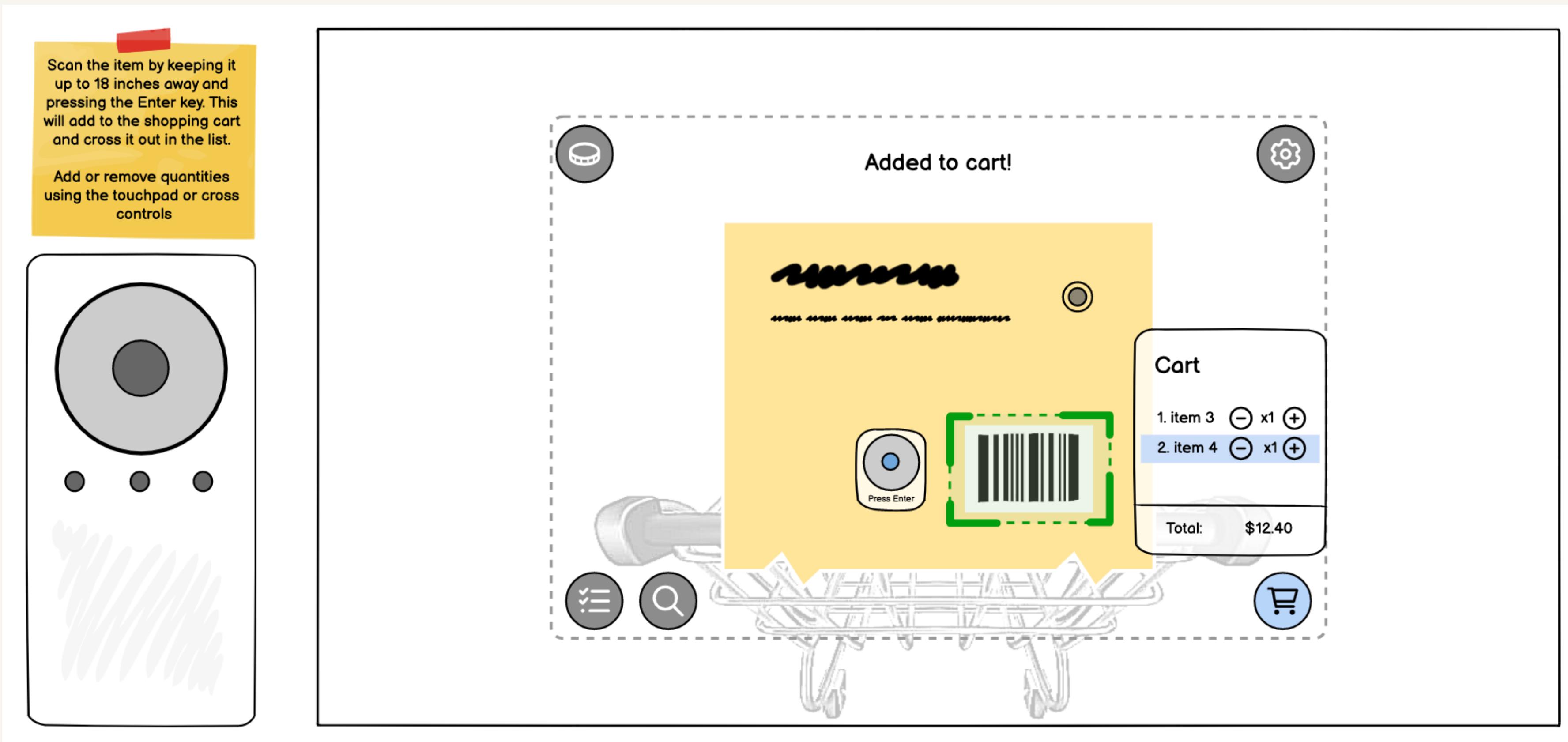


Item Directions

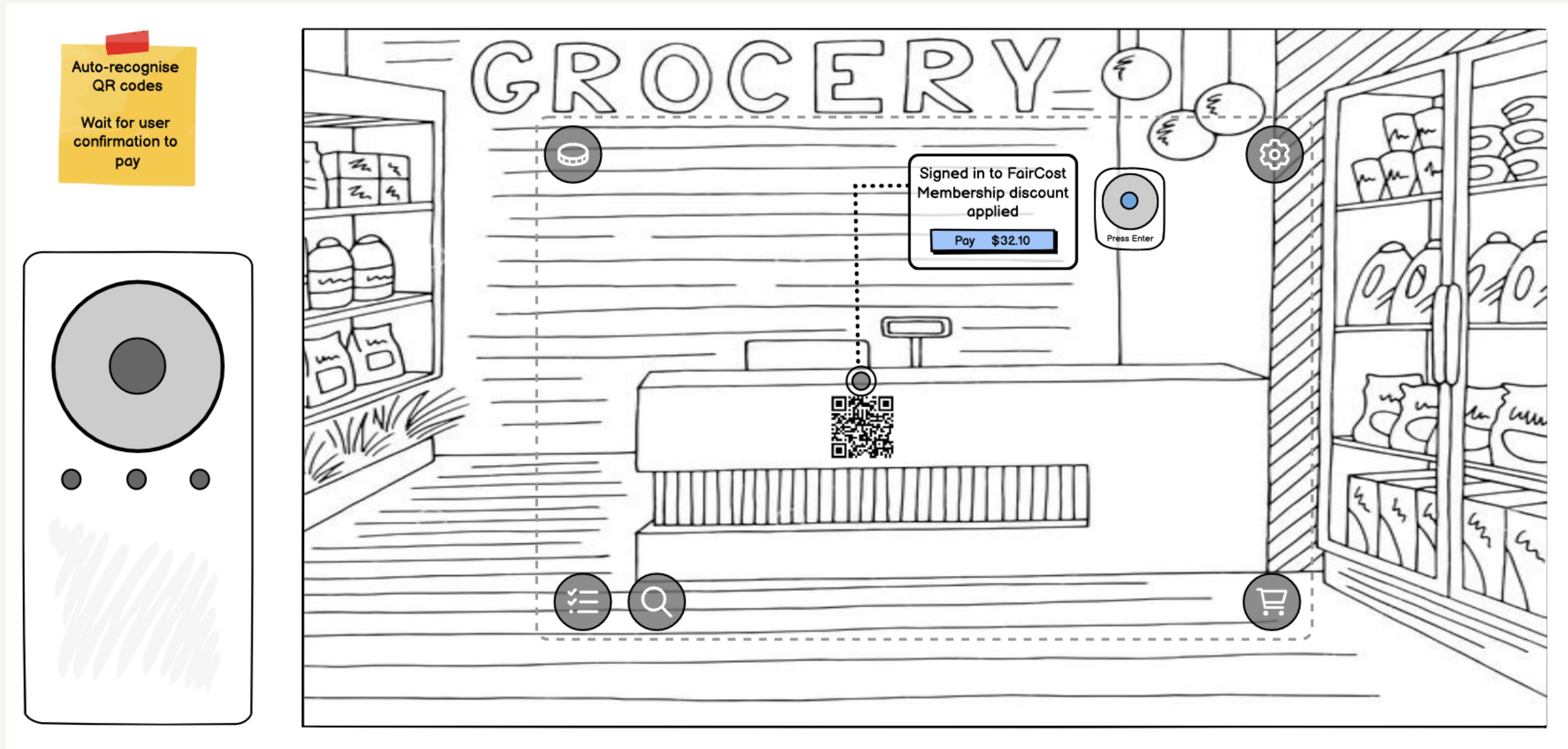
Directions to navigate to the nearest product(s) on the shopping list are shown
Directions update as user moves
All UI elements are translucent



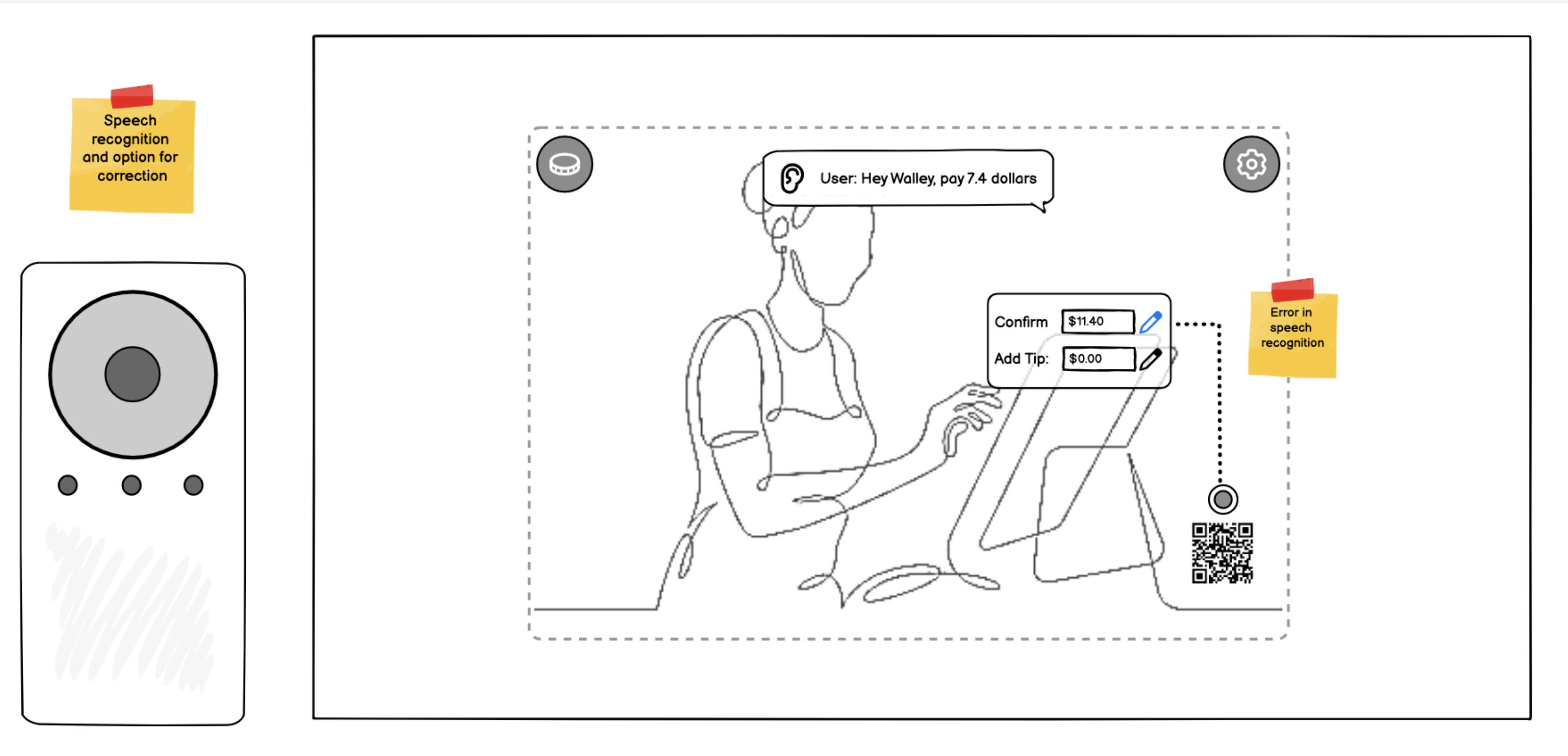
Scan to add to cart



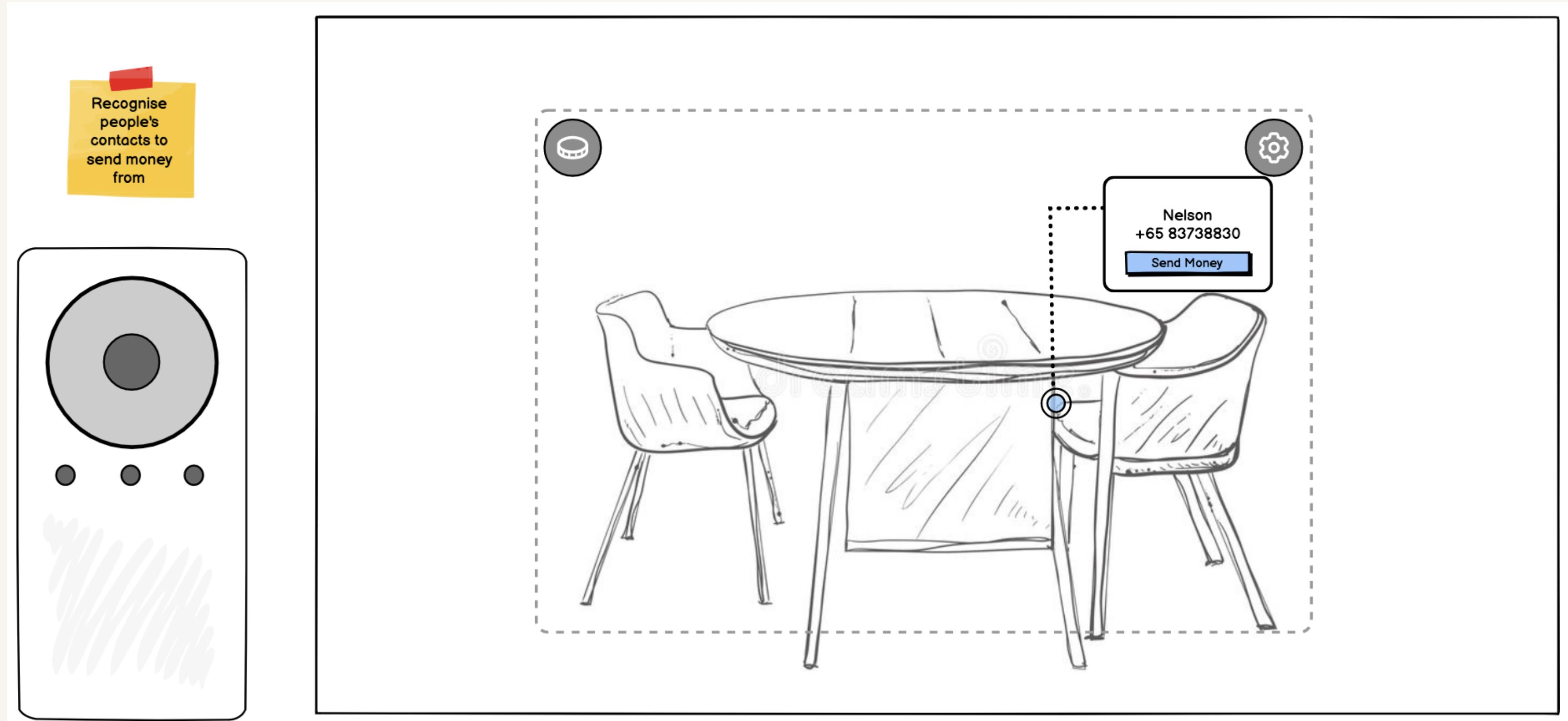
QR Code Checkout



Voice Input for Entering Amount



Facial Recognition for Contact Details



User Reviews

- *Some UI components are too big due to too much detail.*

--> Use smaller components and place them on the corners. Give out information in small chunks and only if the user asks for it.

- *The ring (coin) icon for payment options is not intuitive.*

--> Changed to menu icon to represent real-world more accurately and for external consistency.

- *The numeric keypad to correct voice input takes up screen space and it is difficult to type.*

--> Allow the user to re-enter the amount using voice input again as accuracy is high, compared to keypad input which requires more user work than needed.

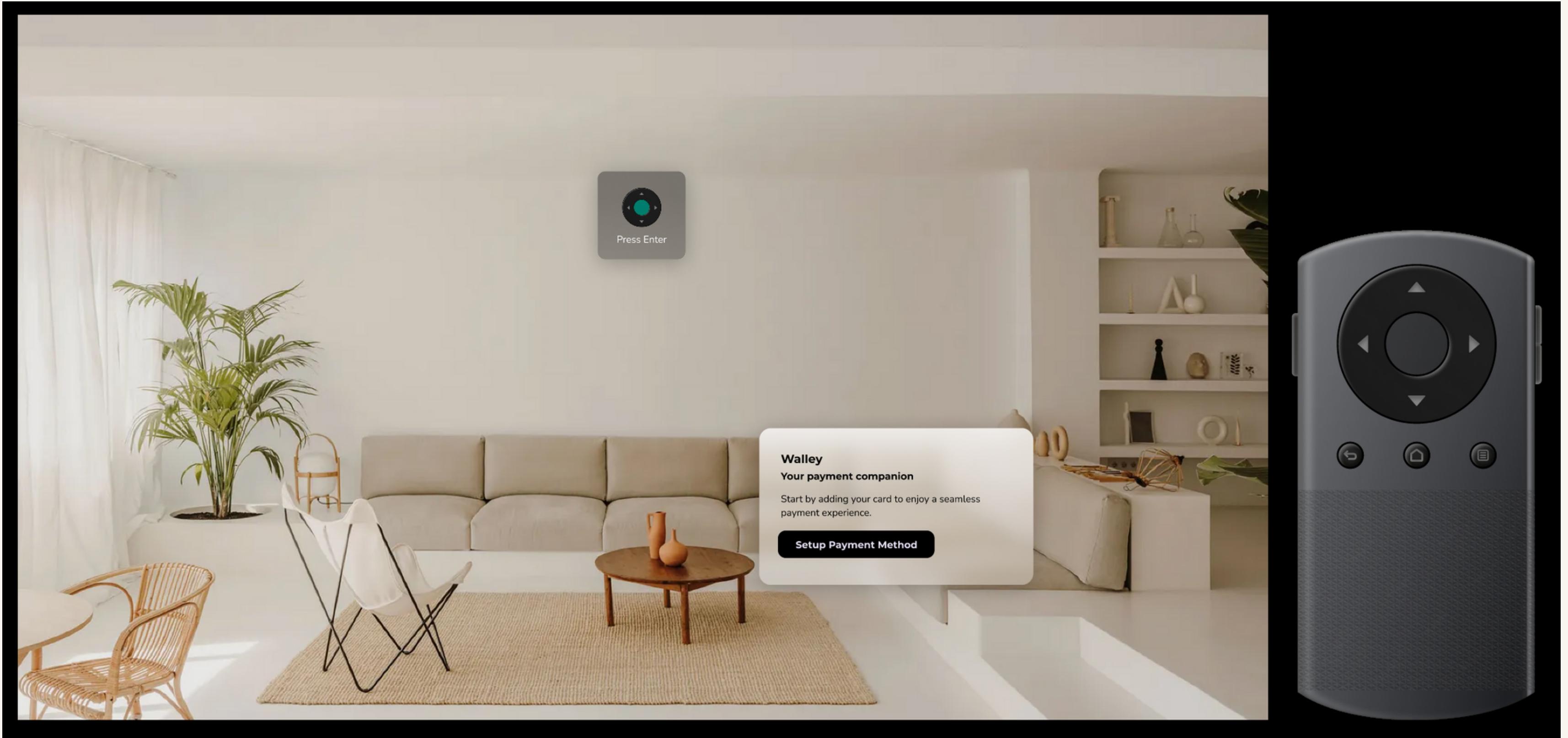
- *More user guidance tips will be helpful so as to not misunderstand what the controls are.*

--> Add more help tips at the beginning to explain how the controller works.

5. Hi-fi Prototype

<https://www.figma.com/proto/q22DLAcC0N0DHVWssfusdY/IDE---Hi-Fi-Prototype?page-id=0%3A1&node-id=35%3A205&starting-point-node-id=35%3A205&scaling=scale-down&show-proto-sidebar=1>

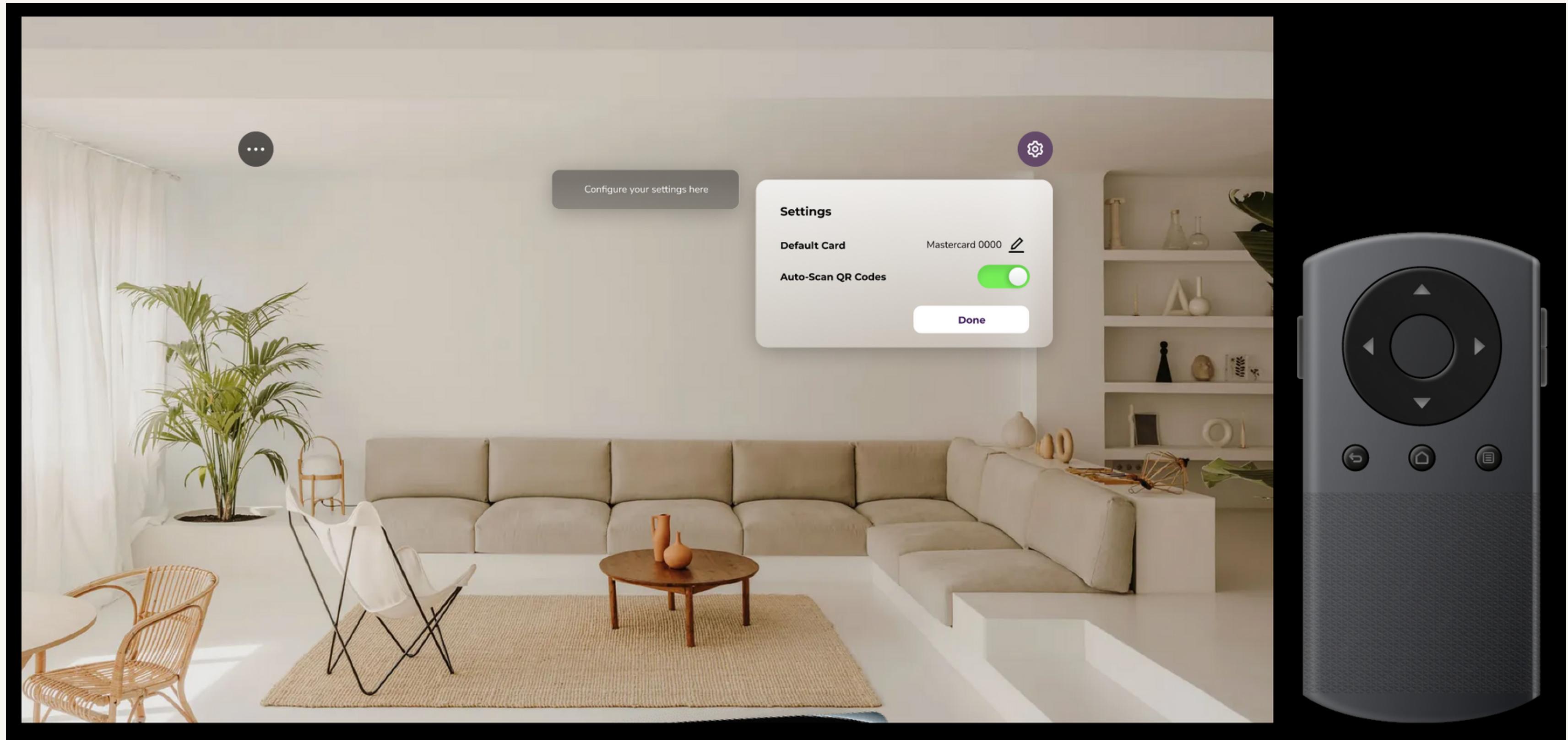
Task 1 - Landing Page



Scan Card



Settings Configuration



Guidance Tips



Store Details



Task 2 - Item Directions



Item Details



Comparing Alternatives



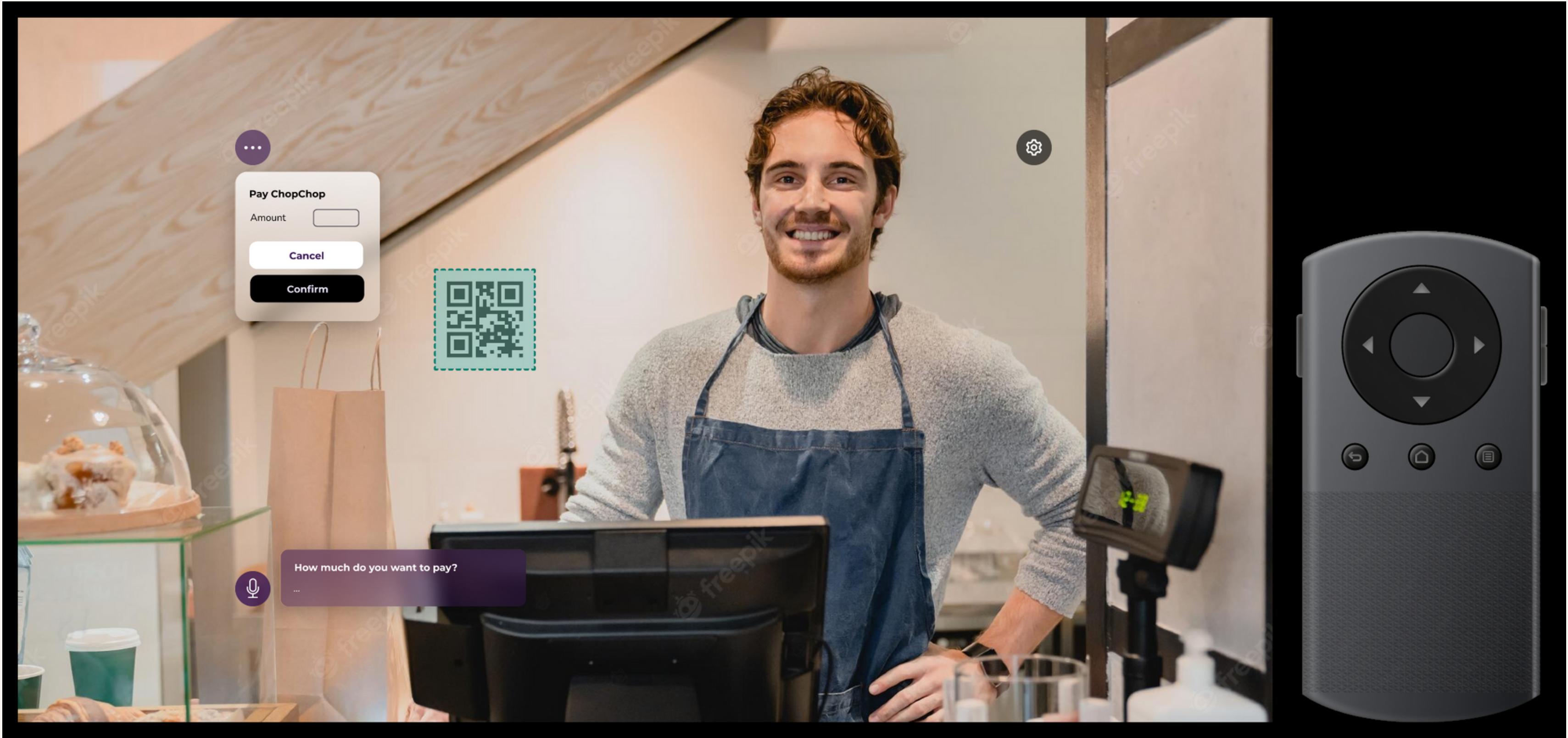
Scan to Add to Cart



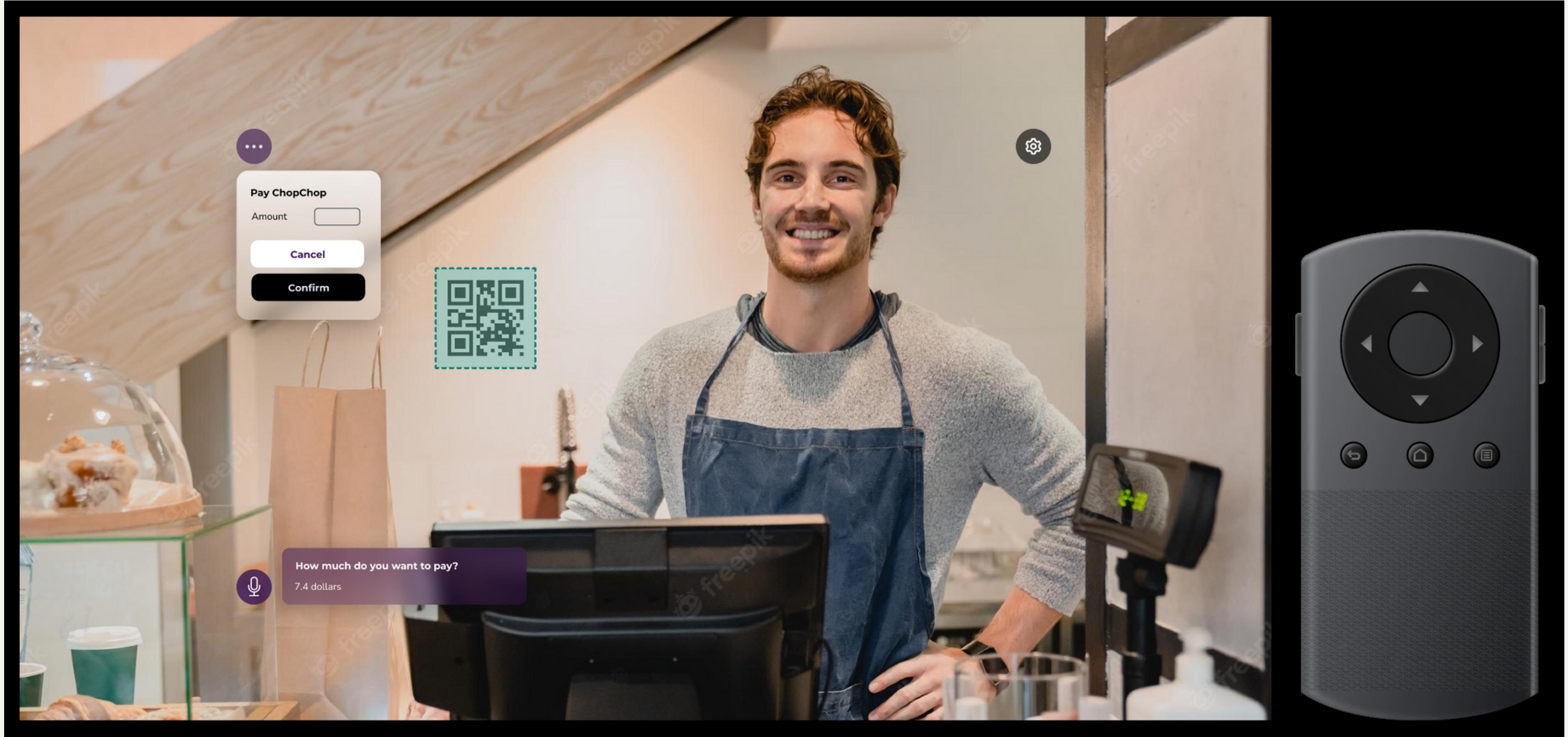
QR Code Checkout



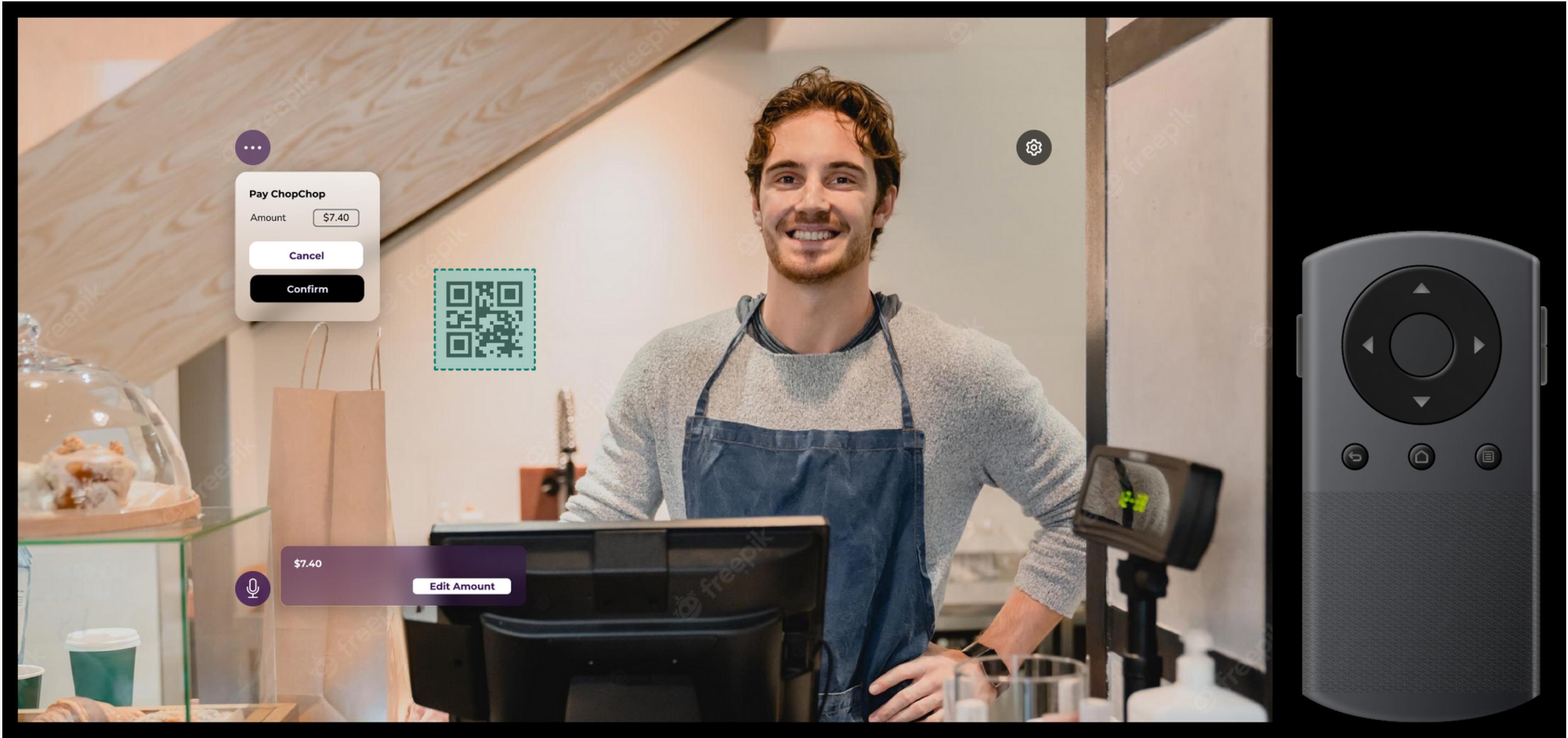
Task 3 - Waiting for Voice Input



Voice Input for Amount



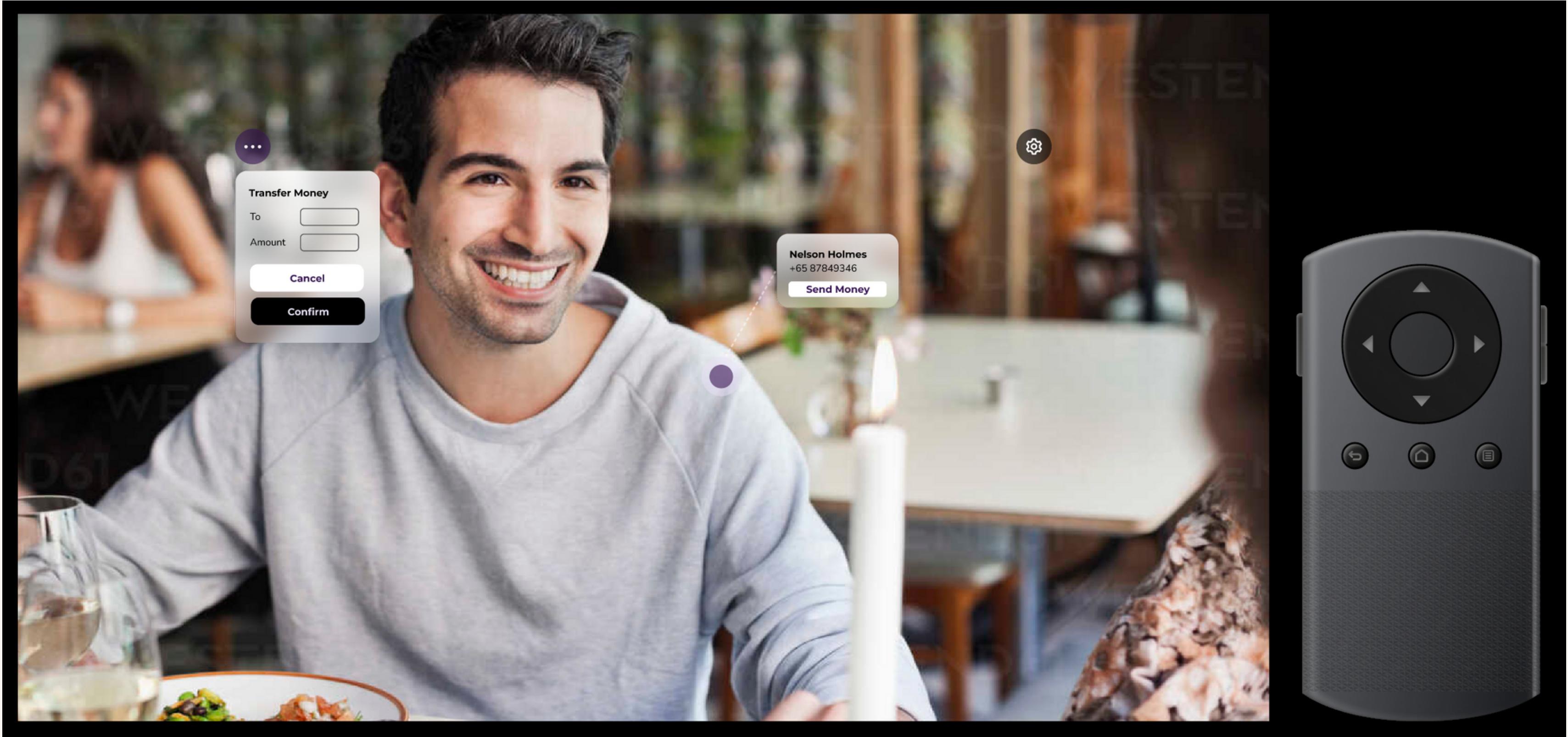
Correct Speech Recognition Errors



Transfer Money



Contact Details through Facial Recognition



6. Reflections

Comparison to Existing Apps

Feature	Comparison
Navigation Guidance	Very few existing applications provide navigation guidance and they require looking at the app instead of in front of them which is not safe for users. The smart glasses app has a HUD display to keep the head up while looking at the desired UI components.
Automated QR-code scanning	Scanning the QR code automatically when the user looks in the direction for a few seconds reduces the number of steps involved compared to loading the scan feature in apps like PayLah! which usually holds up the checkout line.
Voice input	Voice input for payments is not supported by existing apps like PayLah!. Allowing voice inputs avoids user errors like not inputting the decimal point and in general is more easier for many users.
Facial Recognition	Getting contact details of people around you through facial recognition on top of looking up the contacts like most current apps helps when transferring money to people around us, for example, splitting bills.
All-in-one experience	There are various budding apps that support self-scanning of products, showing product info, etc. but none of these support all the features in one. Moreover, the user has to pull up their mobile camera every time which makes it very inefficient. This limitation can be solved using this smart glasses app.

Reflections

- Designing for AR was very difficult for me as I was unfamiliar with smart glasses and the touch controller. I had to research about field-of-view and the controls available to model them on Figma. However, the unfamiliarity also helped me to get creative and allowed for lots of insights.
- Designing for an in-store experience meant the user had to move around in their environment a lot which required many changes in background scenes. This was difficult to model accurately according to my chosen scenarios.
- The step-wise design process proved to be helpful to be able to design for a product that I do not have experience using. The affinity diagram, user journey map, and Crazy 8s were all useful steps to be able to visualize a working prototype.
- The data-ink ratio concept was especially relatable when building this AR payment app as we have to make the best use of the limited space available so as to not obstruct the user's view.
- Evaluating my work using Nielsen's 10 usability heuristics helped in each stage of the prototyping process to improve my design and make it intuitive enough for new AR users.

Design Exercise

Thank You!

Charisma Kausar

2022 Semester 1
CS3240 Interaction Design

