Feliz

A Product to Improve Remote Working Experience

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August 2022

the Glasgow School of Art | University of Glasgow

COFFEE

YOUR WORK FRIEND
IS ALSO TAKING REST

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The Start...

Motivation

In 2021, I travelled alone to the United Kingdom for further education. I was looking forward to getting to know my classmates and making friends with them because I did not know anyone here. Due to the pandemic, we were divided into two groups (A and B) for using the studio space during the first semester. So, unfortunately, it took me two semesters to ultimately become acquainted with my classmates and make a few friends.

This brought back memories of my work experience during the pandemic. At the first outbreak, I was unable to do my work since we were required to stay at home unprepared while the company laptop was kept in the office. Since I did not have the opportunity to meet my colleagues at the workplace, I did not see or communicate with them for one or two months. I was home alone and felt cut off from the rest of the world. At that moment, I realized that going to work is about more than just getting a living; it's also about networking and mental wellness.

Recently, I've heard that the majority of people will work remotely in the future. "Working anywhere" will become a future lifestyle. Imagine using your laptop to communicate with your coworkers while on a beach in Spain or in a café in Geneva.

Therefore, I wanted to improve the experience of remote work by eliminating its drawbacks while retaining its benefits. I believe this project will have a beneficial impact on people's futures and help me reflect on the work-life balance in my career.

User

The intended user group consists of company employees who work from home. They are predominantly 18 to 64 years old and of any gender.

According to a study (Sam Bromley, 2022), the retirement age presently varies between 61 and 68 years old, depending on when persons were born and their gender. "The legal minimum working age in the United Kingdom is 13, however adult employment rights and regulations do not apply until the age of 18 (Slater Gordon Lawyers, 2015)." Therefore, assume that the age range of employed individuals who may to work from home is between 18 and 64.

The workforce eco-system includes stakeholders such as long-term contractors, temporary contractors, subcontractors, complementors, etc., in addition to the full-time and part-time employees(Roger Trapp, 2022).

With the advance of technology, there will be more sorts of collaboration between businesses, as well as a variety of remote working scenarios. In this research, I will focus mostly on working from home, which is now the most common kind of remote working.

Defining the Problem-Secondary Research

Since the Covid-19 pandemic, many employees have adopted a new pattern of working from home. During the pandemic, the number of employees who do their job at home has increased significantly. According to a survey conducted in the UK, "on average, 54 percent of the workforce regularly worked from home (CIPD, 2020)." "Early estimates from Eurofound showed that, as a result of the pandemic, nearly 50 percent of Europeans worked (at least partially) from home, compared to 12 percent prior to the epidemic (Galanti et al., 2021)."

Working from home has several advantages, including (Eurofound and ILO, 2017):

Advantage

Greater flexibility of working time and space

More time to spend with family

Individual and organizational performance is enhanced

"social isolation is associated with home-based telework (as evidenced by employees reporting missing informal contact with and emotional support from co-workers)."

------ Eurofound and the International Labour Office (2017)

There are also downsides associated with working from home (Eurofound and ILO, 2017). I choose to focus on the third disadvantage, which is the difficulty in communicating with coworkers, because it is a key issue that the majority of remote working employee are facing. There are different types of workplace communication: informal, formal, verbal, non-verbal, written communications... (Breath Australia, 2021) and so on. Isolation results from the lack of informal communication amongst coworkers.

"While loneliness can harm the physical, emotional and mental health of remote employees, developing work friendships through greater engagement can make people happier and lead them to put in greater effort toward their job."

------ Cheri Beranek (2022)

Disadvantage

Working hours are extended, even if unpaid or not required

Boundaries between work / personal life are blurring

Difficult to communicate with colleagues

"People working from home miss the random meetups in the reception area, hallways, kitchen, and restroom. They miss impromptu invitations to grab a coffee or lunch, and chats in the conference room before a meeting starts."

------ Achurch Consulting (2021)

Defining the Problem-Primary Research

Design ethnography research was undertaken in order to understand the life of people who work from home. In online ethnography, tweets on the topic of working from home are gathered (internet only research, where the identity of participants cannot be verified). People from many professions, including social service worker, designer, and scientist, have engaged in interviews.

Finally, the data collected from online ethnography and interviews were incorporated into the theme analysis. They were cut from printed copies and organised by theme. From the result, people's most common complaint is that they lack social interaction with their coworkers.

Here are a few of their experiences:

Online Ethnography
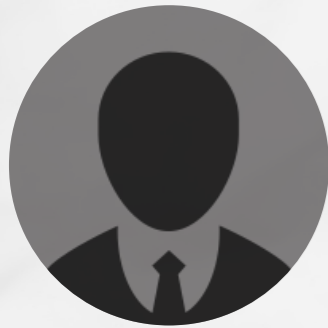
"There's a very nice man working at my company's restaurant and he always says hello to me and we chat. Today he saw me and say 'where have you been!!!' cause I have been working from home for the last few weeks."

"Working from home is lonely. I eat my lunch by the window every day just to people watch and get fresh air."

"I think half and half is fine. People don't need to be in office everyday but some contact with colleagues is good for personal development and society."
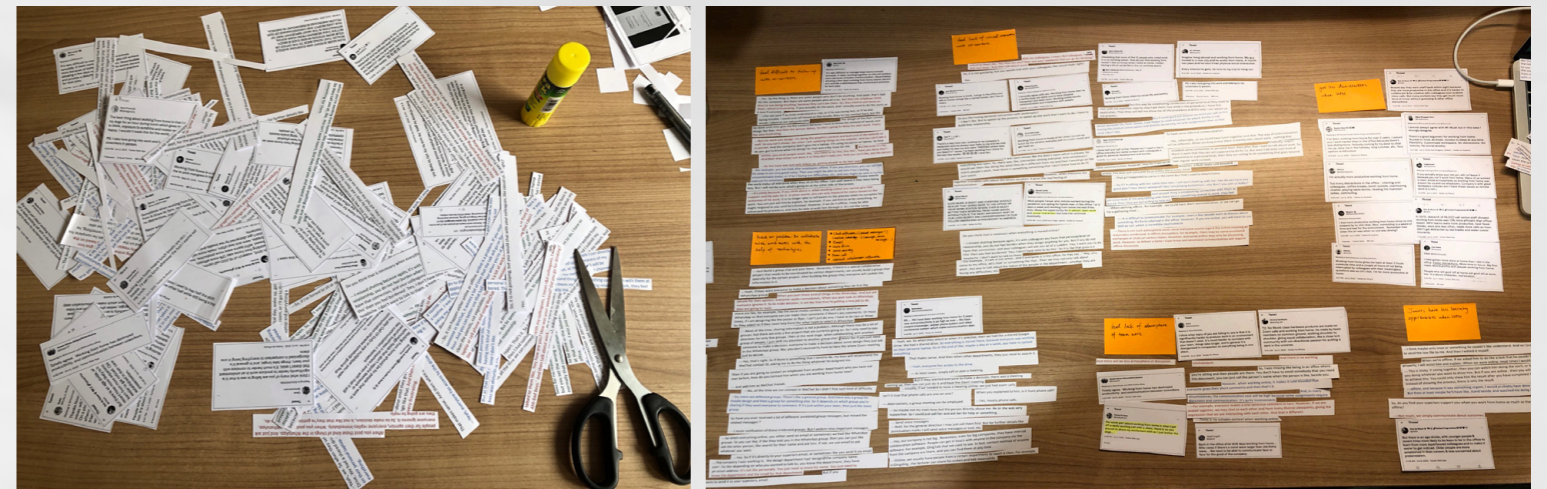
Interview

Social Service Worker

"when working offline, we could have short conversations, or have lunch together and chat, informally. But when working online we only talk about work."

Interior Designer

"There is not the atmosphere since eveyone would regard the online meeting as reasonably condensed. In offline encounters, for example, there may be some emotioal exchanges or chats on various topics.'

Material Scientist

"If some guys are around me and I talk to him about personal life, food, dinner, I am happy to work whatever he asked. However without this kind of conversation but directly burdening me with assignments then I will not be happy about it."

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Design Intention and Requirements

Design Intention

The design intention is to restore serendipity by providing opportunities for employees who work from home to engage in social interactions with coworkers.

In the past, employees would frequently encounter random coworkers in the office kitchen. They may be carrying a cup of tea or coffee while chatting with strangers or reconnecting with colleagues from another department they have not seen in a long time. This kind of social interaction in office has many names: water cooler moments, spontaneous meeting, coffee break, impromptu invitations...

Coffee Break

Casual Collisions

Chance Encounters

Serendipity

Water Cooler Moments

Impromptu Invitations

Informal Communication

Spontaneous Meetings

what did you do at the weekend?

I smashed my house up with a bat

User Requirements

Real-time conversation

Natural way of interaction

Portable

Avoid disturbs

Not easy to damage/wear

No overheat

Use in darkness

Good display quality

Concept Generation

With the design intention of providing opportunities for employees who work from home to engage in social interactions with coworkers, I started brainstorming 30 ideas of how to connect people and what the interaction between people and the product should be. Listed below are some of the ideas generated.

According to the responses of the interviewees, the following was their favourite experience: what if people WFH can bump into colleagues who are doing the same thing (for example, taking coffee/feeling tired/excited)? On the basis of this idea, detailed sketches of the physical product's potential form were created. The presence of components such as a projector, camera, microphone, and speaker has been verified through function analysis (in Technical Report) and sketch iterations. The next detail to determine is how to trigger and set up the video call.

What if the user experience is...?

1. What if people WFH can bump into colleagues who are doing the same thing (for example, taking coffee/feeling tired/excited)?

2. What if people WFH are connected to the team via sound?

3. What if the people WFH are connected by given opportunities to share moments of their daily life?

4. What if people WFH are connected via smell?

What if the user product is...?

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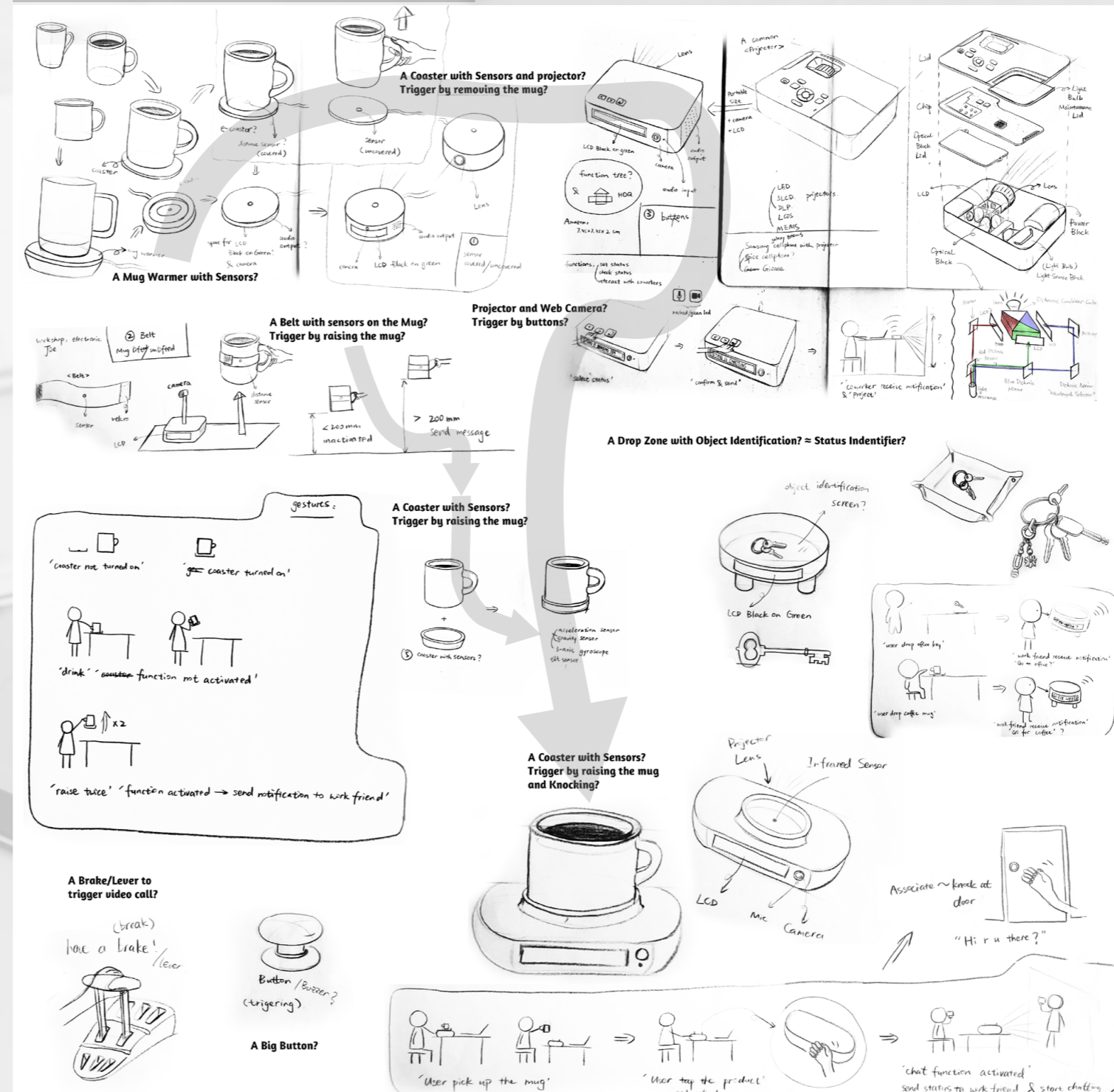
Concept Evaluation

Prototype

Polyfoam rough prototype was used to test interaction and product dimensions. Also, several methods for triggering the video call, including buttons, levers, knobs, and touch screen swiping. Few classmates were asked to experiment with these various trigger approaches. The advice I received was to make it as simple as possible. Taking a break is all about relaxing, thus users do not want a complicated or entertaining product.
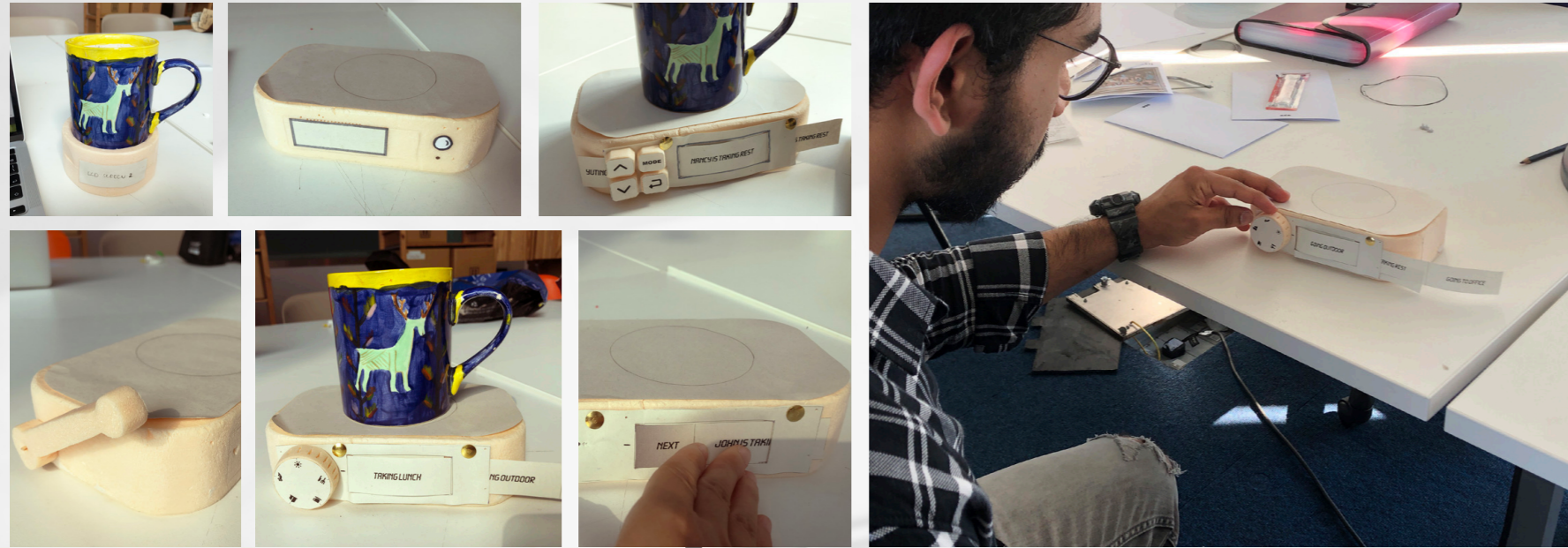
Video Prototyping

Utilizing video prototyping to simulate the intended user experience. The response I received from the actors was that the real-size display was excellent for communication, as it made them feel as if they were communicating face-to-face in the same room. And it is simple to interpret body language.

Several issues were also identified: Home is a private place. Should there be an accept option prior to starting the video conference, in case people are not ready? How will the third individual join the chat if there are currently two participants?
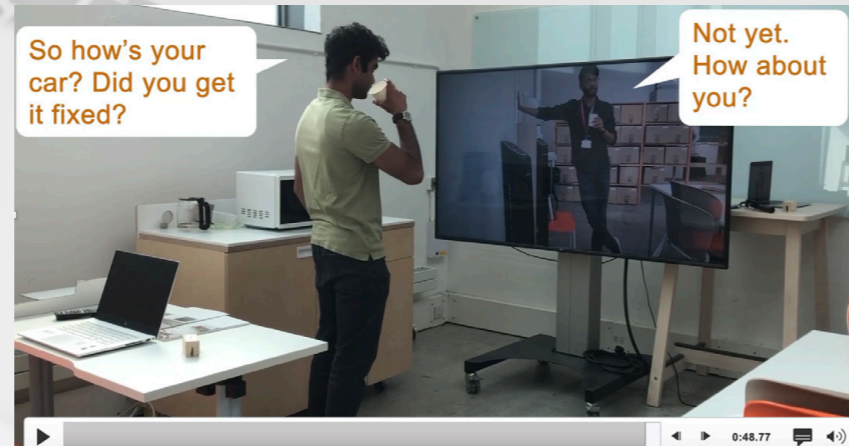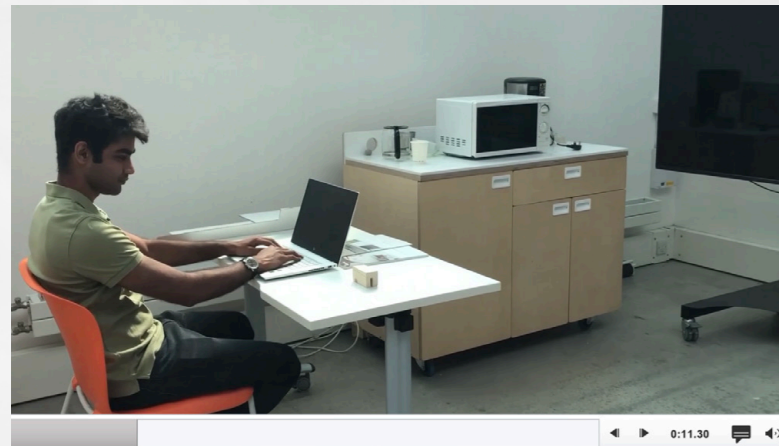

Roleplay

In the roleplay with classmates, simple models such as paper and polyfoam were used to develop solutions to the problems I have identified so far.

In the most cases, people raise their mugs only wanting to sip tea or coffee, instead of chatting with others. Therefore, the two triggers (raising the mug and knocking) are necessary, as simply by raising the mug is not equivalent to "want to socialise with co-workers." It may also be drinking, cleaning the mug, refilling the mug, etc.

Some issues were also identified from the roleplay: How to add a third person in the call? Does the person being selected get any option to 'reject' the video call?
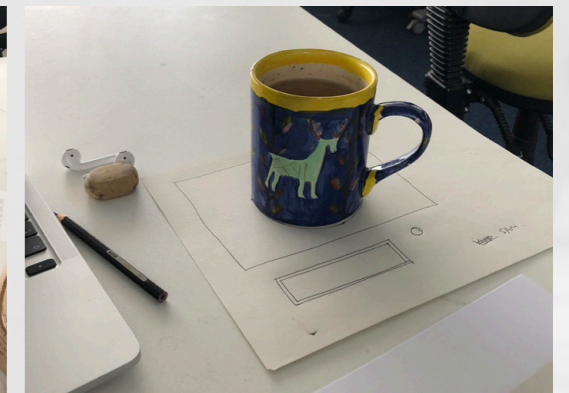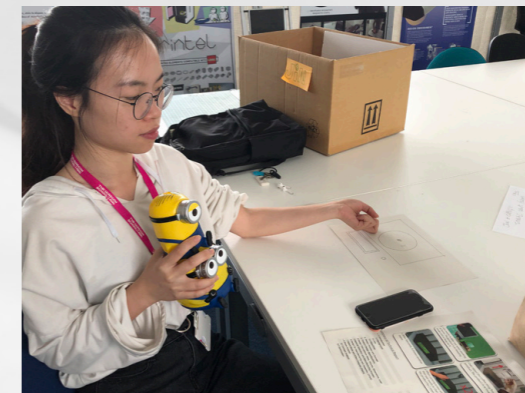
Concept Evaluation

Initial Conceptual Model

In the initial conceptual model, there was a setting that required the user to watch random names appear one after another on the LCD and tap twice to trigger a video chat when they came across someone they wanted to chat with. However, this model only provides the option for users to "select," not for those being selected to "reject." In addition, the mechanism by which the third participant joined the chat is unknown.
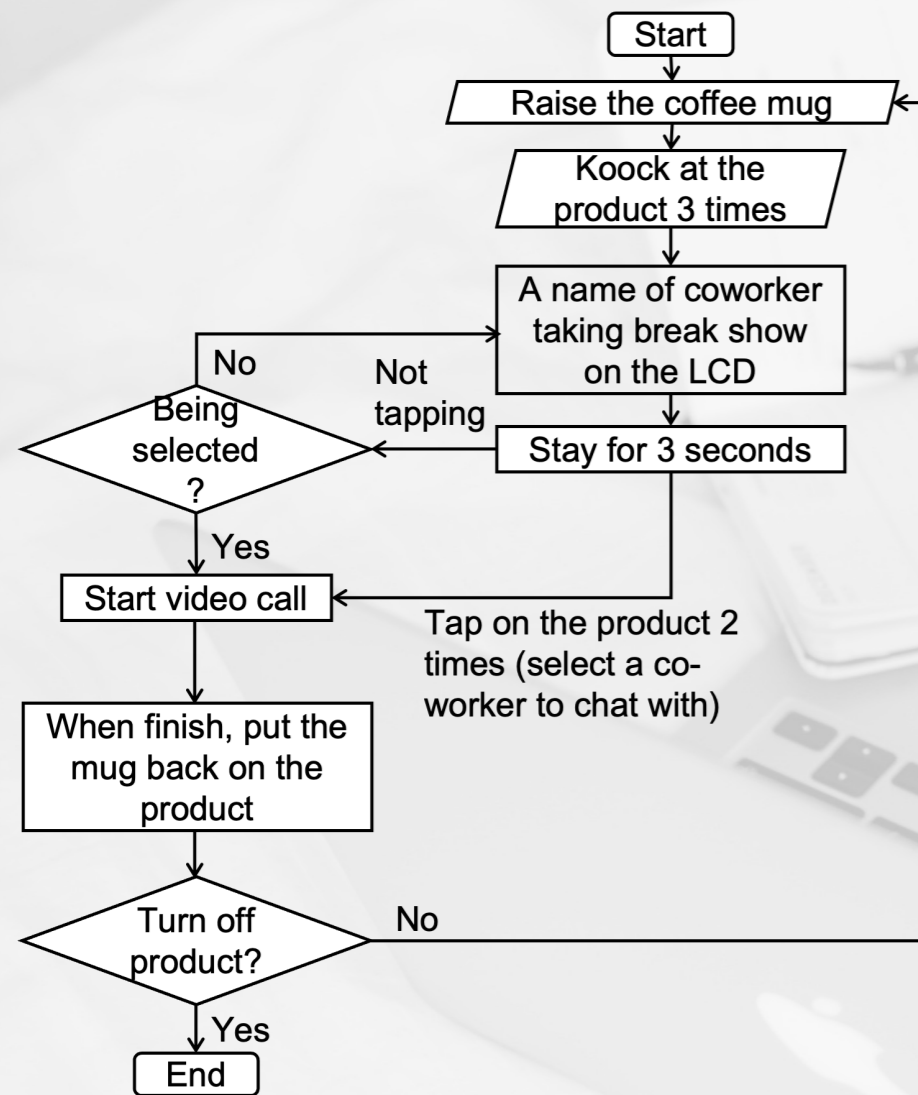
Refined Conceptual Model

If 'select' options are provided, 'reject' options should also be available. However, the rejected individual will feel unhappy, which goes against the intention of this project, which was to promote socialisation.

I took a step back and reflected on the watercooler moment at the office, when there is no option to'select' or'reject' who employees will bump in with in the office kitchen. Who they will encounter in the office kitchen is completely random. People cope with this randomness by chatting one or two sentences about the weather with any acquaintance they encounter and find an excuse to return to their seats. However, if they meet a work friend, they will remain longer in the office kitchen to have coffee and catch up. I wish to duplicate this type of randomness with this product by using the 'random pairing' feature.

With the random pairing feature, it is simple to add the third participant to the chat. Only one thing to keep in mind is that there should be a 5-second buffer time for users to get ready emotionally and physically before beginning the video call.

I also altered the instructions to knock twice and three times. With the new conceptual model, it is no longer necessary to tap twice to initiate the video call with a coworker. Therefore, I decided that the difference between knocking twice and three times should focus on connecting individuals within the team or the entire company, which provides opportunity for both introverts and extroverts to socialise.

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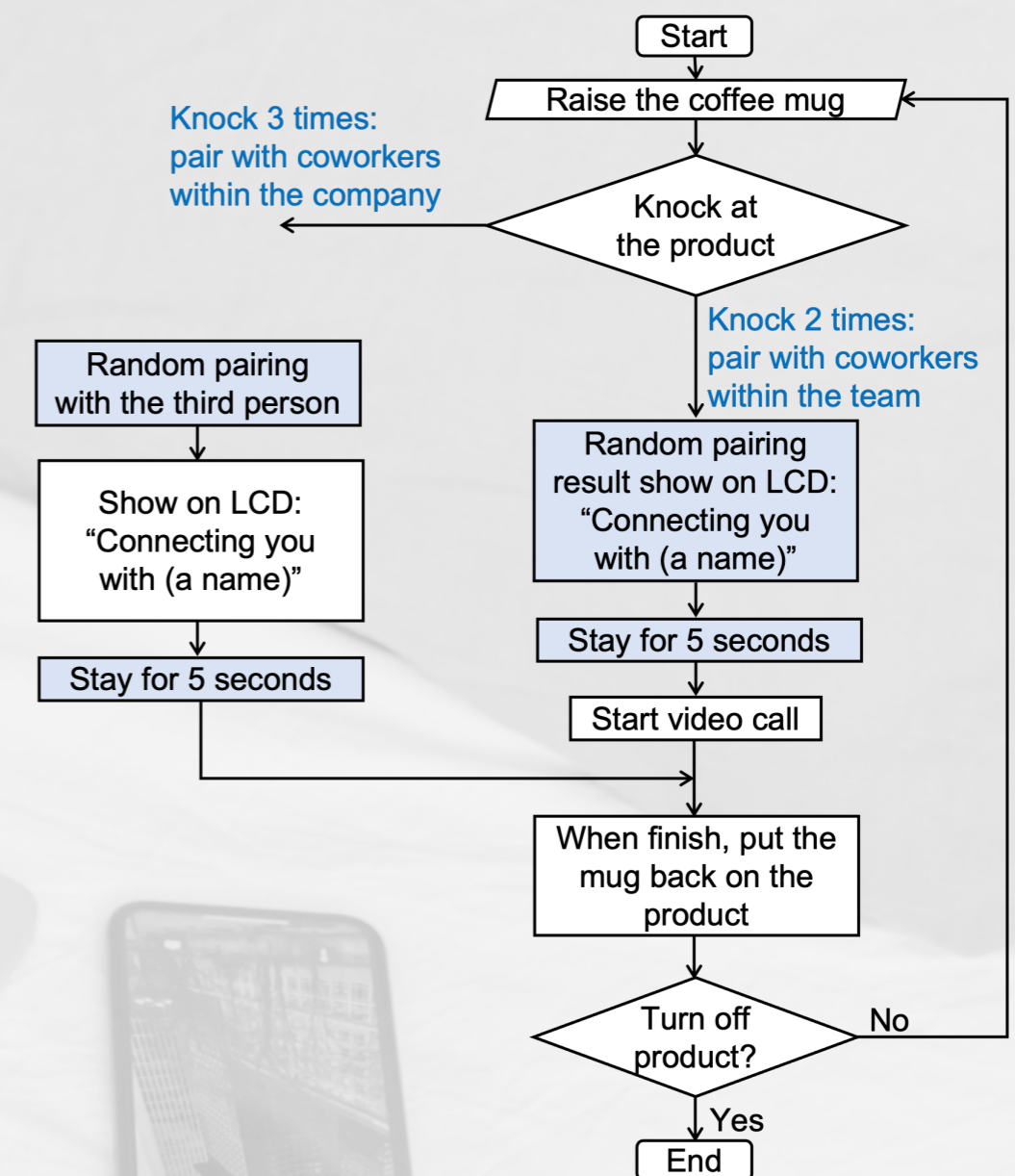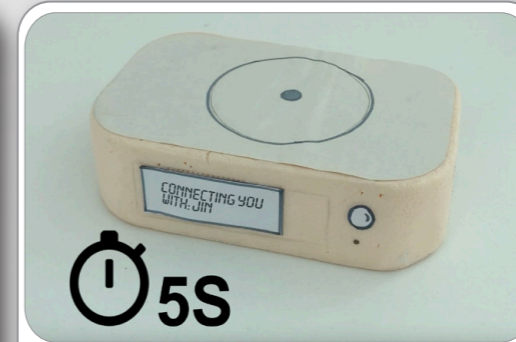
User Scenario

User A

A-1. User A is working from home with the device powered on and a mug placed on the product.

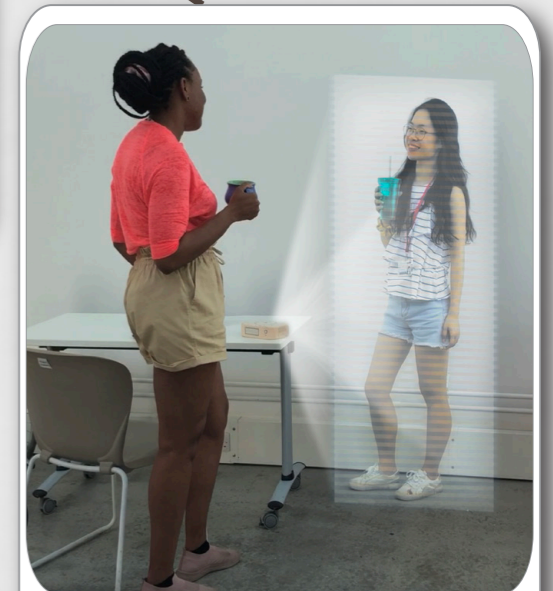A-2. User A raise the mug from the product.

A-3. To connect with colleagues inside the team, user A knock on the product twice. (if knock 3 times then connect with colleagues over the company.)

A-4. The product randomly pairs user A with a colleague inside the team. The pairing result will display for five seconds on the LCD.

User B

B-1. User B is working from home with the device powered on and a cup placed on the product.

B-2. User B raise the cup from the product.

B-3. To connect with colleagues within the team, user B knock on the product twice. (if knock 3 times then connect with colleagues over the company.)
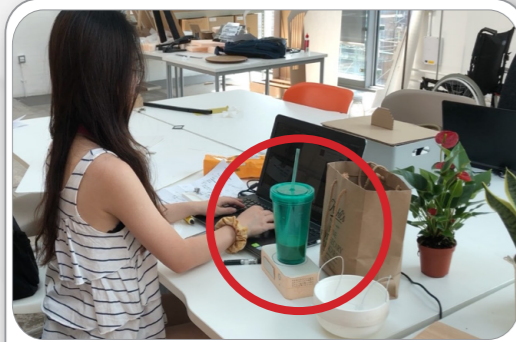

B-4. The product randomly pairs user B with a colleague inside the team. The pairing result will display for five seconds on the LCD.
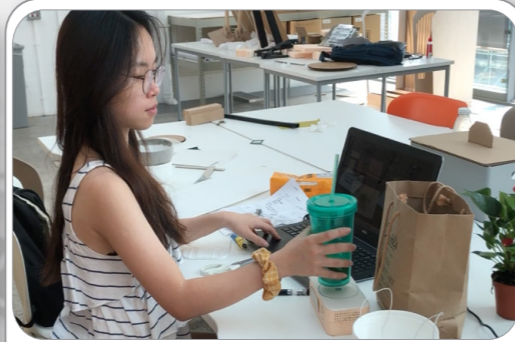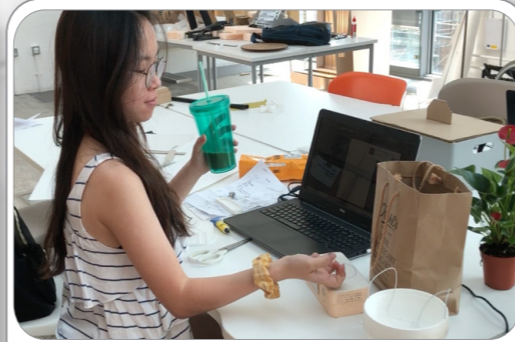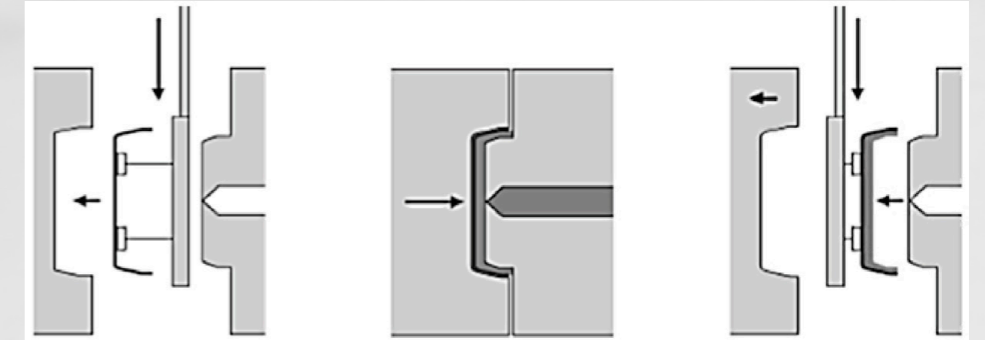
Interaction

5. A video call in real time is projected on the wall 1:1. Two users are chatting and resting.

Technical Specifications

IMD Film for Upper Casing — (The In-Mold Decoration (IMD) process was used to enhance the aesthetic of the product. In IMD, a film layer is put to the mold and adheres to the product when the molds separate.)
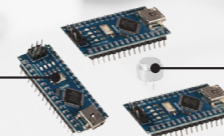

The In-mold Decoration (IMD) Injection Molding Process
(Woyan, Bruchmüller and Koch, 2016)

Pressure Sensor — (0.1-10kg high precise pressure sensor, install at both left and right hand side for right- and left-handed users)
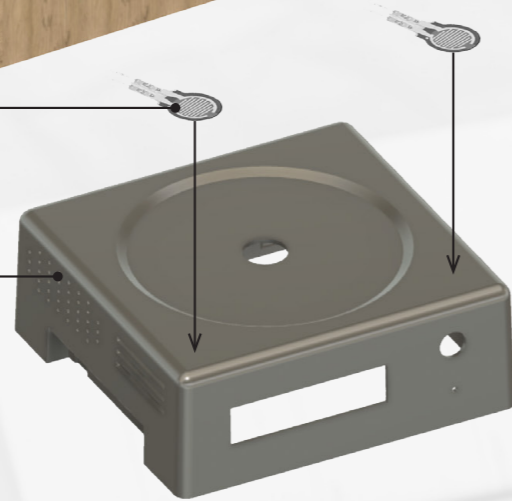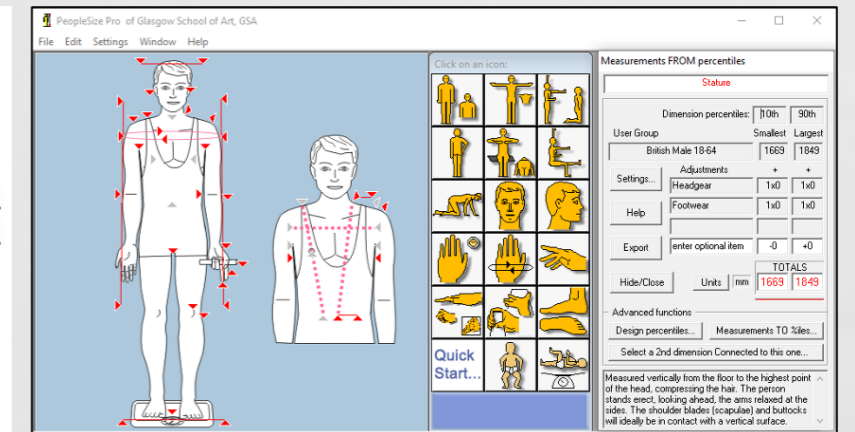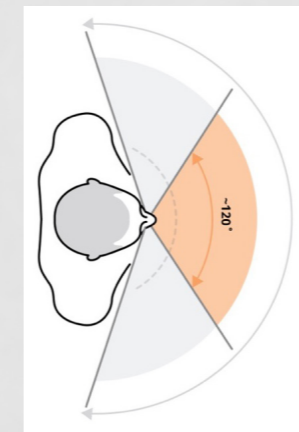
Upper Casing — (Material: PC, manufacture by injection moulding with a thickness of 1.5mm. The thickness and material were determined by analysing the manufacturing method, service temperature range, sustainability, strength, mass, and price (refer to Technical Report page 12 and page 17))

Waterproof Ultrasonic Sensor

Arduino Nano — (3 arduino nano were utilized for multiple inputs and outputs)

(Cooling fan at the level 18dB was chosen as most people would not have problem with any projector at the noise level of 30 dB or less)

Cooling Fan

(DLP projector, 1080P, 60Hz refresh rate) **Projector Unit**

Stereo Speaker

M3 Tapping

(For operation in the dark, clear white LED) **LED Lighting**

Camera (100 degree wide-angle FOV web camera, capture speed 60 frames per second at 1080P)

Microphone (Frequency Response Range: 50Hz to 20kHz)

LCD

Hook

Lower Cap (Material: PC, manufacture by injection moulding with a thickness of 1.5mm)

IMD Film for Upper Casing

In consideration of anthropometric data (human eyes field of view, height of 10% to 90% of British males between the ages of 18 and 64), the field of view of the camera was chosen to be 100 degrees. (refer to Technical Report page 9) (niteeshyadav, Field of View - AR/VR (XR) Typography Guidelines)("PeopleSize")

IPX4
resistant to water splashes from any direction

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Final Product

Product Details

Projector Unit Lens

Cooling Fan

Screw Tapping

Stereo Speaker

Power Cable Slot

Grille

Waterproof Ultrasonic Sensor

Stereo Speaker

Grille

LCD Display

Camera

Microphone
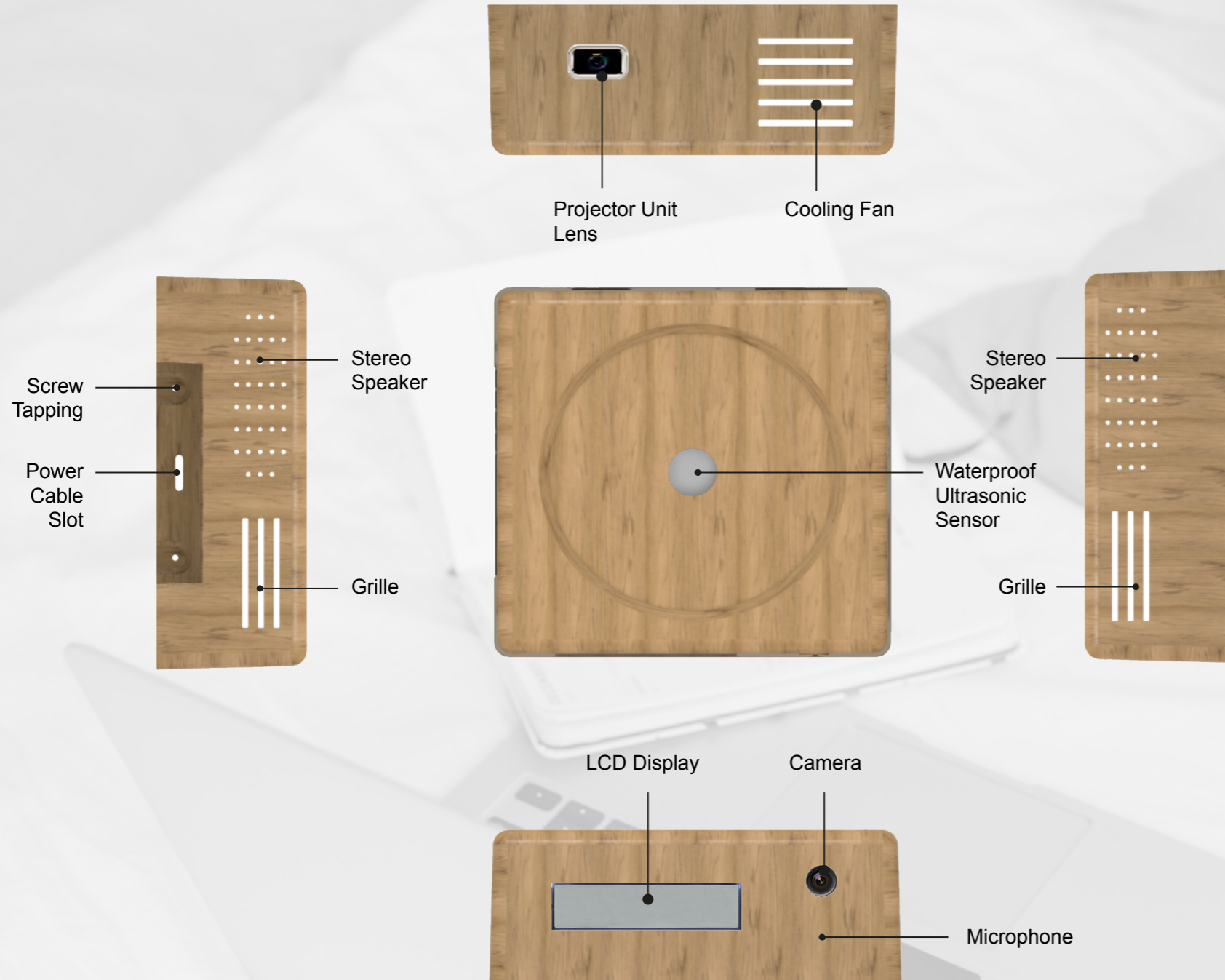
Aesthetics

There are various colour options available to fit the interior design of the user's home. There are three colour options: wood pattern, white, and silver, each of which is achieved by applying a distinct IDM film.

Wood Pattern

White

Silver

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