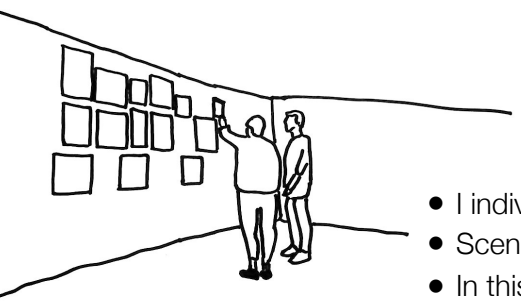
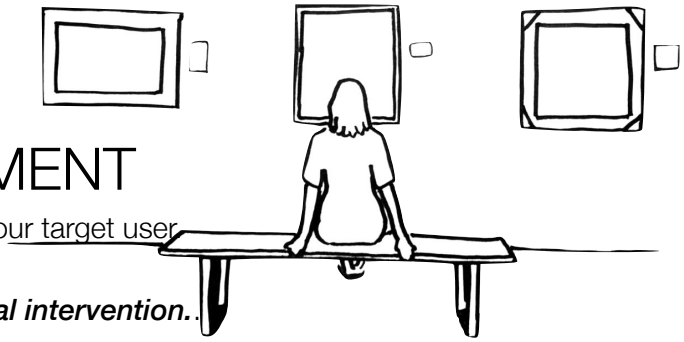
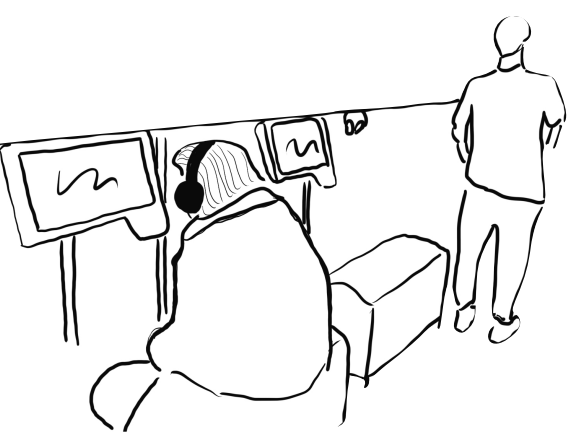
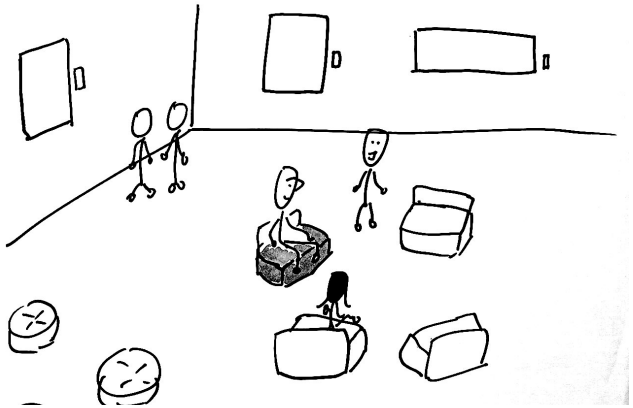


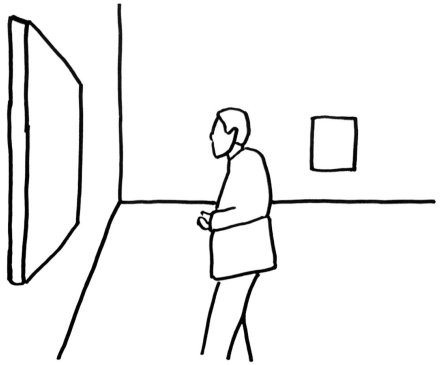


SKETCHING VOCABULARY DEVELOPMENT

- I individually ***sketched and traced art museum scenarios*** as art museum visitors are our target user.
- Scenarios include exhibition hall, seating area, and video booths.
- In this way, I practised my ***sketching skills*** while ***brainstorming scenarios for potential intervention.***







UNDERSTANDING TARGET USERS

Site visit

I went to 5 art museums in London to collect information about existing installation. I found that most installation are not used frequently.

Questionnaire + Semi-structured Interview

I designed this questionnaire to understand visitor behaviour & attitude toward interaction in museum. I also interviewed museum staff to get info about their view on staff-visitor interaction.

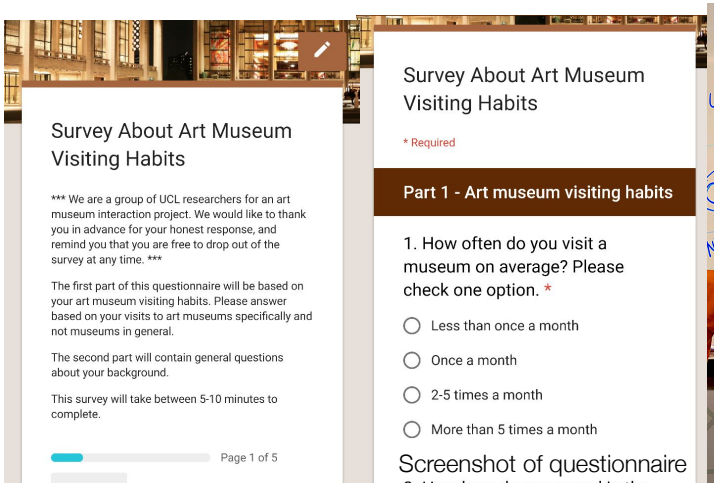
Qualitative data analysis

I led mind-mapping for interview & survey data. We found visitors like solitude, non-verbal interaction, interactive installation, but dislike trivial conversation in museum.

Personas building

I made persona cards as a summary from user research data and after discussion of findings.

Examples of current museum installations



Screenshot of questionnaire

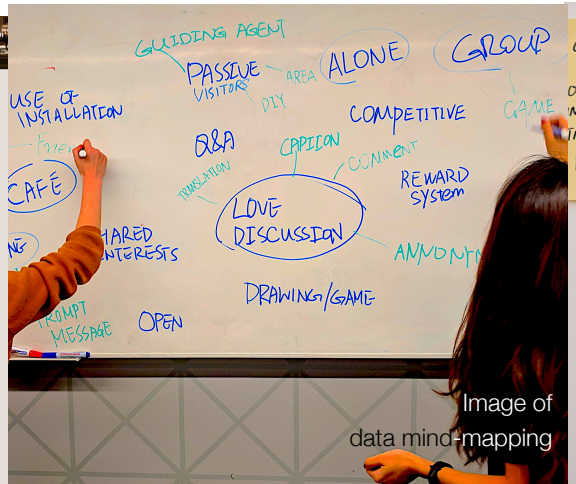


Image of data mind-mapping

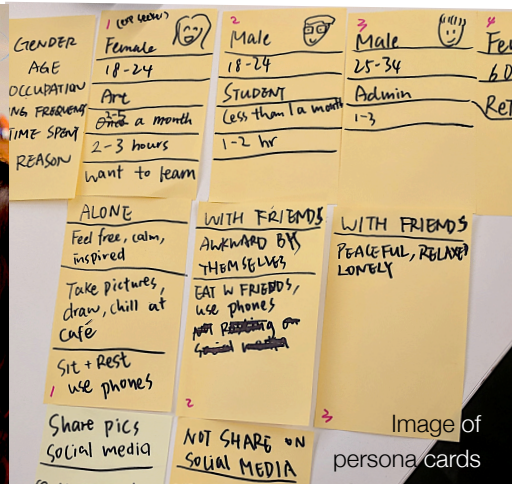
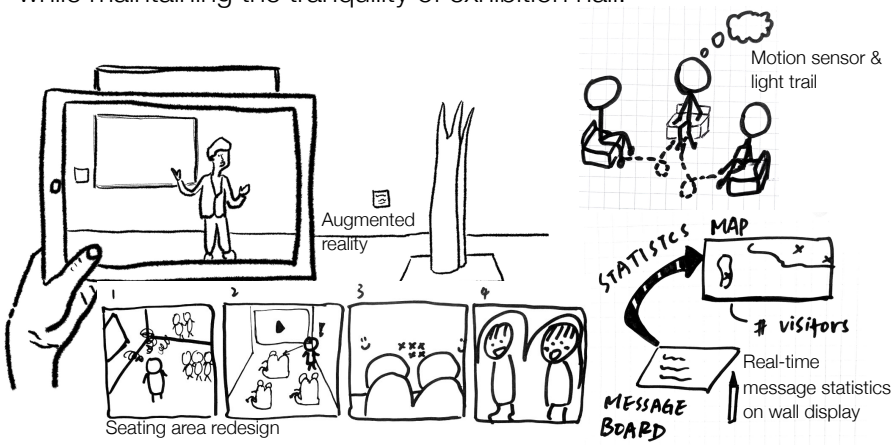


Image of persona cards

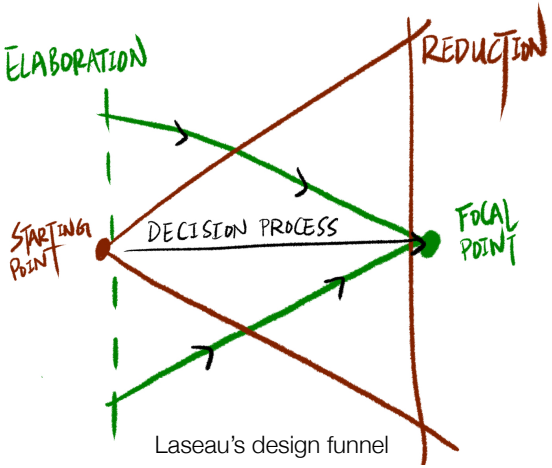
IDEA GENERATION

GOAL

To develop ideas based on user research findings that help visitor interact with other visitors or staff, while maintaining the tranquility of exhibition hall.



Examples of design concepts in 10+10 Method



Laseau's design funnel

10 PLUS 10 METHOD METHODOLOGY ←

Process

- I individually brainstormed ***10 competing ideas without judging***.
- I ***reduce the no. of design concepts*** by reflecting on my sketches. The most promising ideas were kept for group discussion.

Critique

- This method helped be ***dive into the design funnel***, It increased the chance to get to better ideas.
- But it ***can be hard to generate*** that many ideas in short period of time.

CONCEPT DEVELOPMENT I

GOAL

To refine the ideas with group members and develop the ideas further

STORYBOARDING →

Process

- I prioritized important timestamps & funnelled down to 3 milestones:

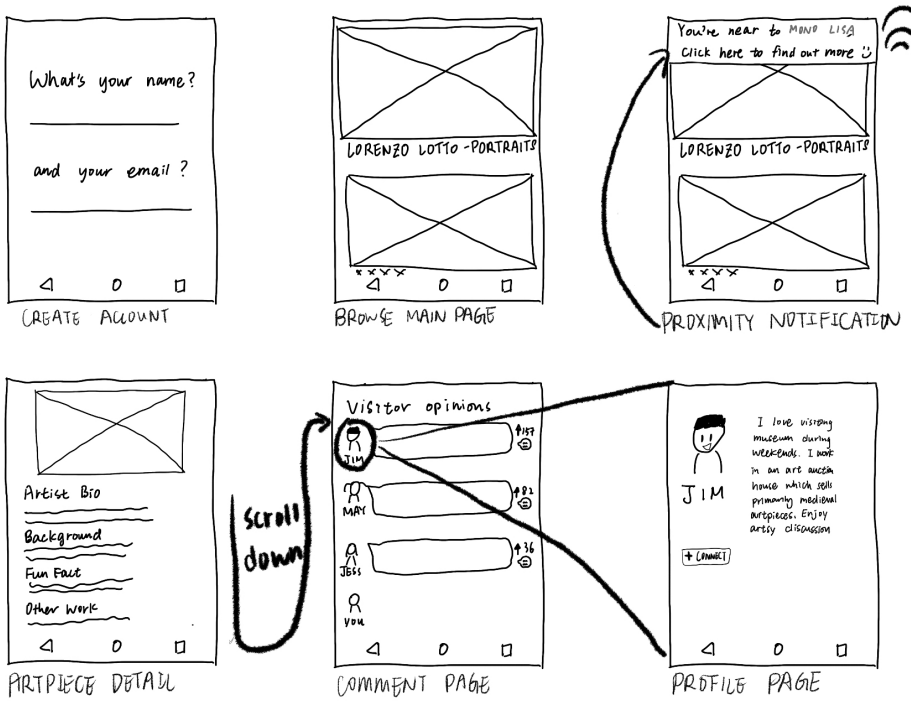
1. ***when users discover the museum web app by themselves***
2. ***when users discover interesting visitor in app***
3. ***proximity alert when approaching artwork***

- Then, I developed the entire user flow around these 3 milestones.

Critique

- It helps me ***build empathy*** & think in the shoe of a user.
- It helps me ***understand interaction*** flow of the prototype.
- It is also useful when I need to ***explain the idea to other*** designers and users, as it helps them to understand in a more vivid manner.
- The ***video making*** of my group follows this storyboard.
- Storyboarding is ***enjoyable***…who doesn't like story? :)

CONCEPT DEVELOPMENT II



LOW-FIDELITY WIREFRAME

Process

- After storyboarding and group discussion of important features, I drawn several wireframes for the web app. Here is one example of my wireframes.

Critique

- Wireframing ***saves a lot of time*** in concept development process.
- Thus, I am ***less emotionally attached*** to it and I am open to any adjustment.

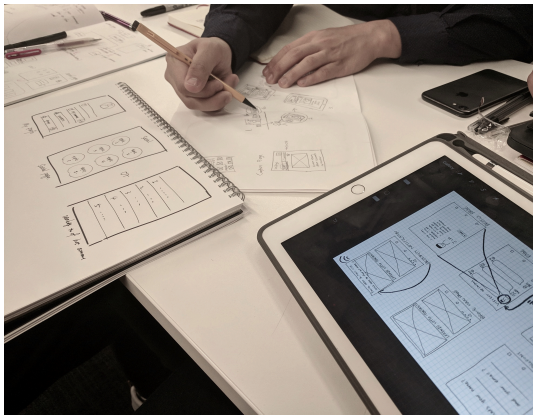
PARALLEL DESIGN

Process

- We employed parallel prototype development by having each member to develop our own variations of the web application.

Critique

- Good for ***generating many ideas simultaneously***. I did not discuss the design with group mates before I design my interface that, ***every design is original and unique***.
- We could ***compare and discusse*** our designs together to formulate our first design iteration.



Analysis of parallel design interface

TESTING & DESIGN ITERATION

USABILITY TESTING

Process

- I was the moderator in the usability testing session. I explained the concepts with the aid of paper prototype made by my group member.
- I observed how the tester explored the prototypes. Their feedback informed the preference of whole-screen notification than notification banner.
- Thus, I adjusted design in the mockups on the right.

Critique

- Paper prototype ***saves time*** and allows ***room for tester to imagine*** scenarios.
- ***Lacks interactivity, can't show accurate user flow.***

Alternatives

- Use ***digital wireframe*** that can show interactivity

HIGH-FIDELITY MOCKUPS

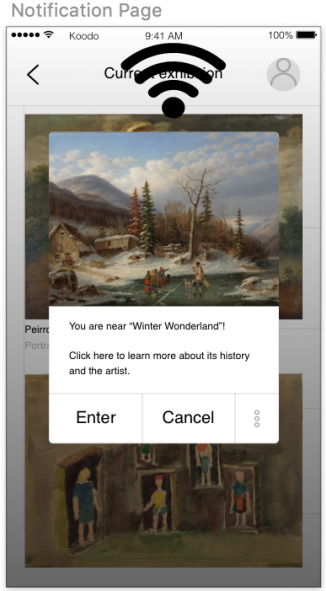
Process

- I turned parts of my wireframe into mockups, following color codes decided with my group.

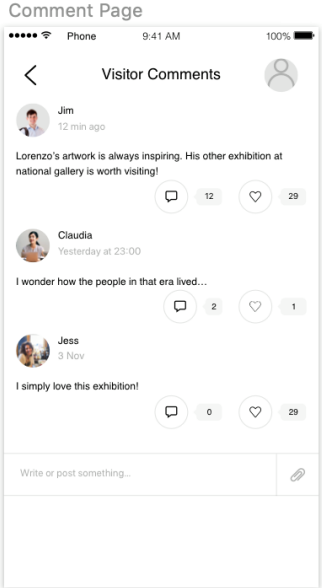
Critique

- ***More realistic & intuitive to*** users than wireframes
- However, high-fidelity may ***shift testers focus from usability to aesthetics.***

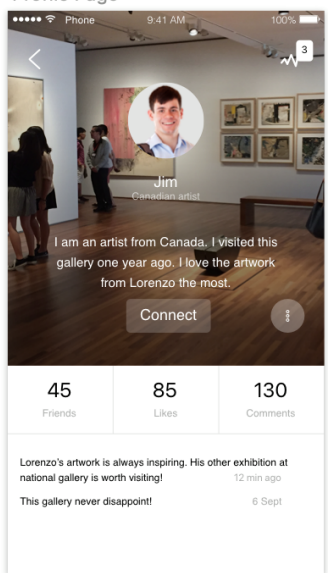
Notification Page

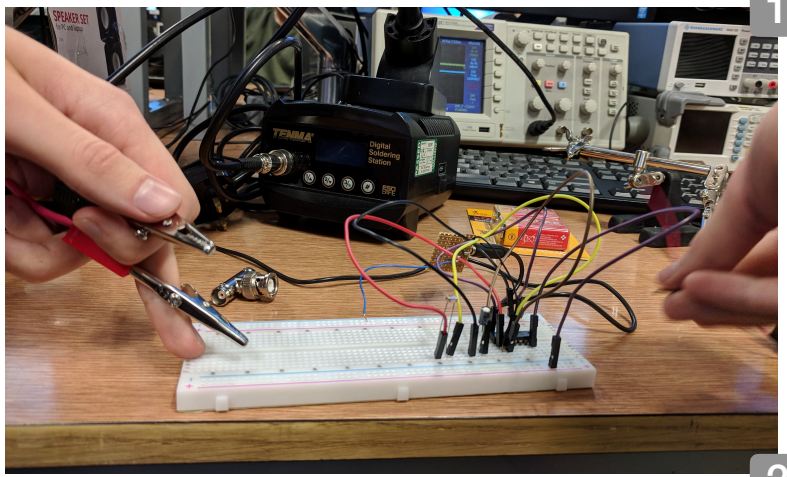


Comment Page



Profile Page





1

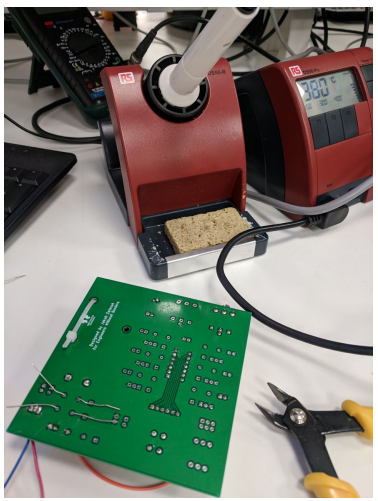
PROTOTYPE BUILDING ←

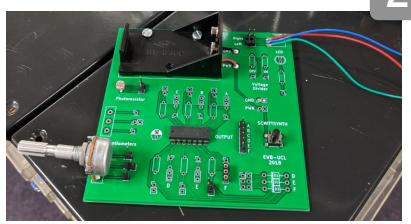
GOAL

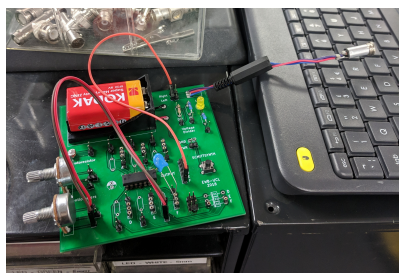
To fabricate a sound synthesiser prototype for my target user - experimental musician

PROCESS

- Firstly, I ***experimented circuit*** for sound synthesiser ***with different materials*** (e.g. graphite) ***on breadboard*** **[1]**.
- Then, I practised physical fabrication techniques such as soldering, drilling during the assembly of electronic components **[2]**.
- I ***assembled electronic components*** on a circuit board designed by Jakub, a mechanical engineering student. I overcame my novelty to the subject and the malfunctioning soldering machine, that it was very fulfilling to complete the prototype.

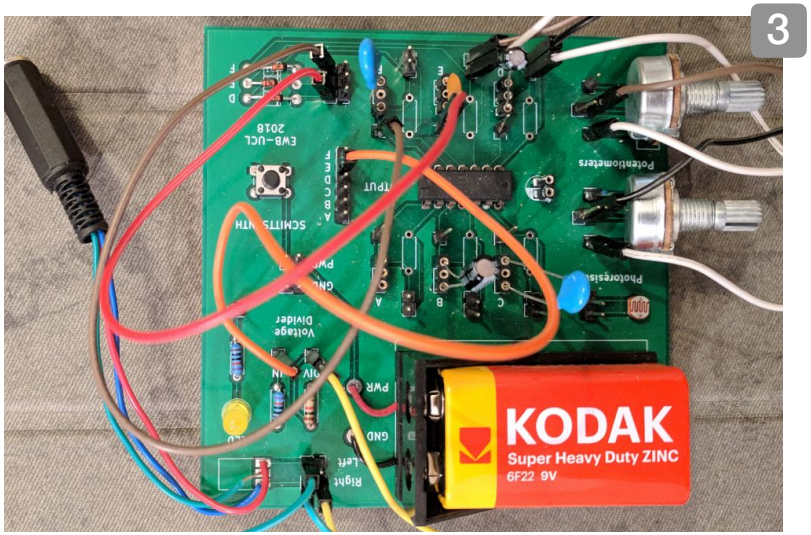






2

The prototype allows user to ***adjust pitch and modulate sequence with potentiometers, photo-resistor, and capacitors***, other components include resistors, LED and aux cable **[3]**.



3

USER RESEARCH & USABILITY TESTING →

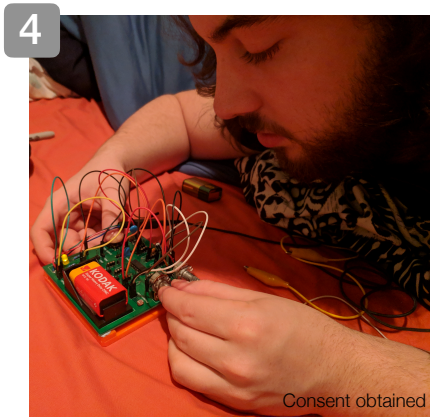
GOAL

To evaluate the synthesiser prototype with musician.
To understand the pain points while using the sound synthesiser.

PROCESS

- I invited an experimental musician to ***test this circuit board prototype*** **[4]**.
- The user reported instability of board, his lack of mental model during first use due to the complex circuit structure.
- To ***understand the habits and workflow*** of the musician better, I recorded his daily workstation setting **[5]**.
- I also observed experimental music workstation by other musicians in experimental music festival **[6].**

The above ***feedback and observation informed further development*** in the next page. I decided to build a base for the prototype and write graphical explanation for synth usage.



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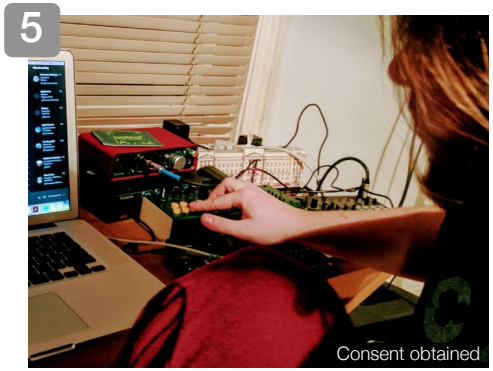

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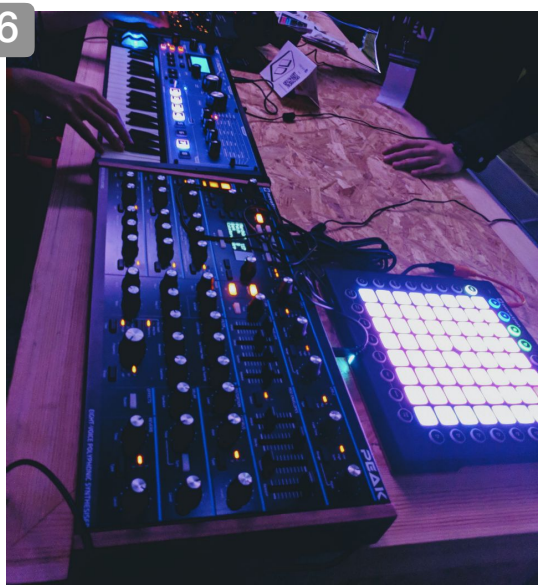


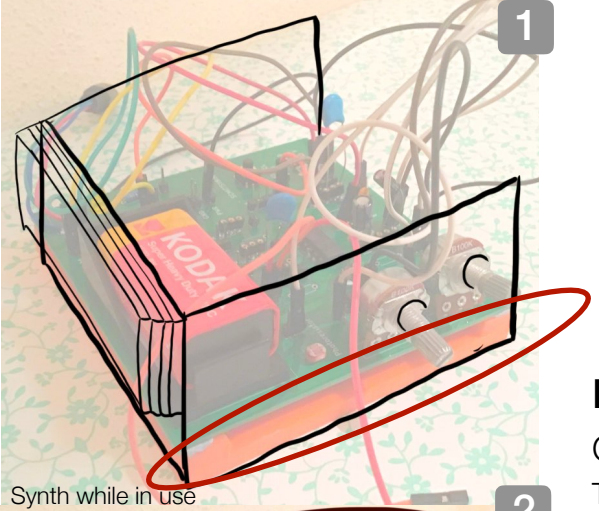
6

Sound synthesiser fabrication 2

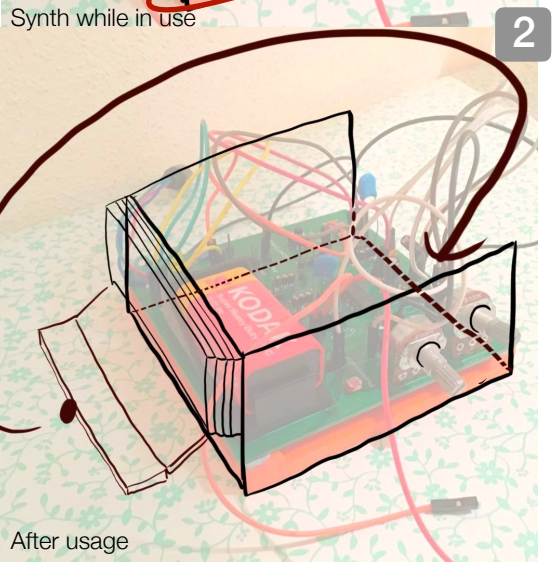
"too complicated to start with"

"I love it but it's fragile to carry around"

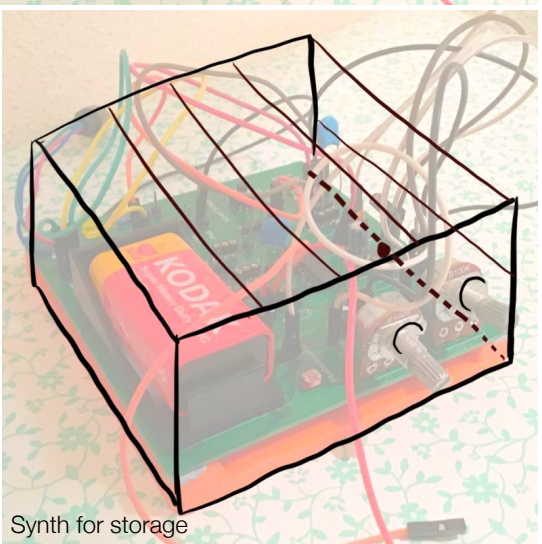
Quotes from interview with an experimental musician



Synth while in use



After usage



Synth for storage

DESIGN IMPROVEMENT

GOAL

To further develop the synth based on user research and feedback collected.

PROCESS

Designing accessory for Synth ←

- I decided to build a base for the prototype that serves two purposes 1) ***stabilise the synth***, 2) ***simplify transportation***. These are crucial because:

1. it is impractical for musician to use an unstable machine during performance. Therefore, the synth is elevated (the circled acrylic base) **[1]**.
2. musicians travel frequently, an easy to transport instrument is essential, therefore the wooden box **[2]**.

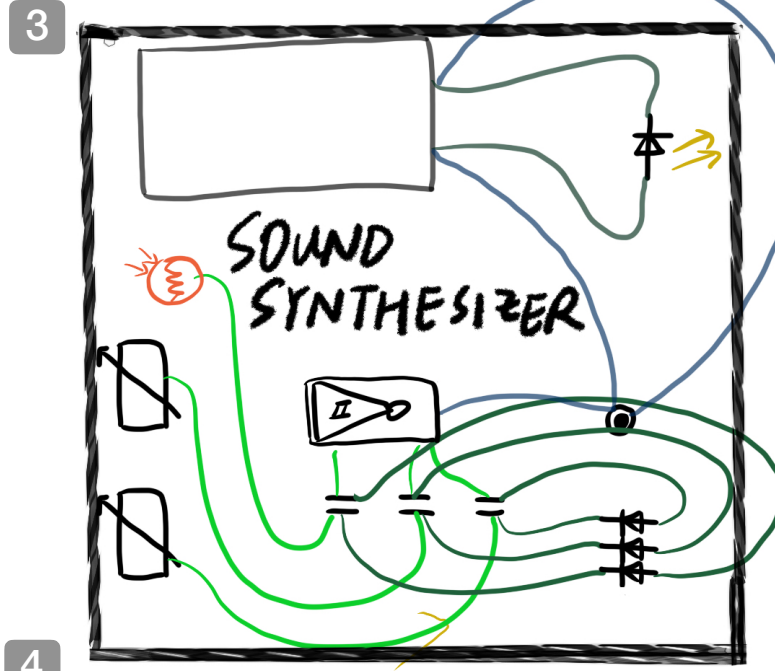
Manual guide →

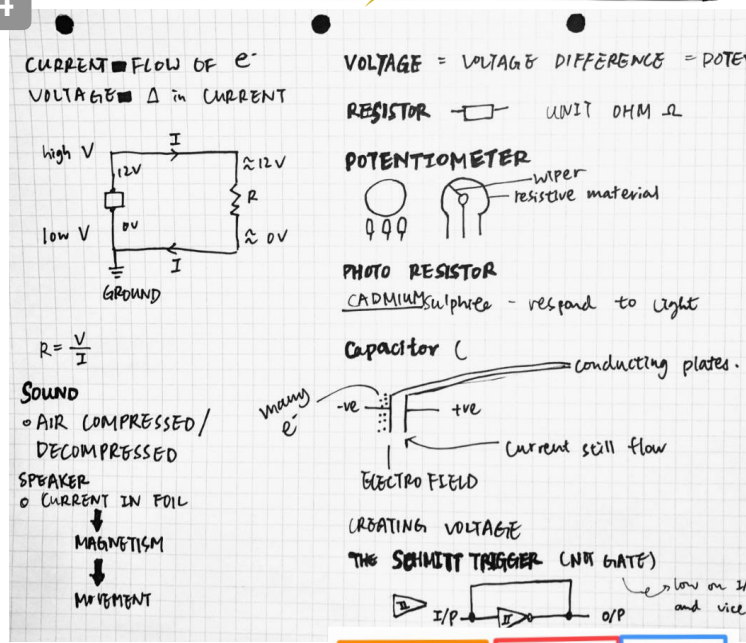
- Due to the ***high perceived complexity*** during first use of the synthesiser, I explored ways to simplify things.

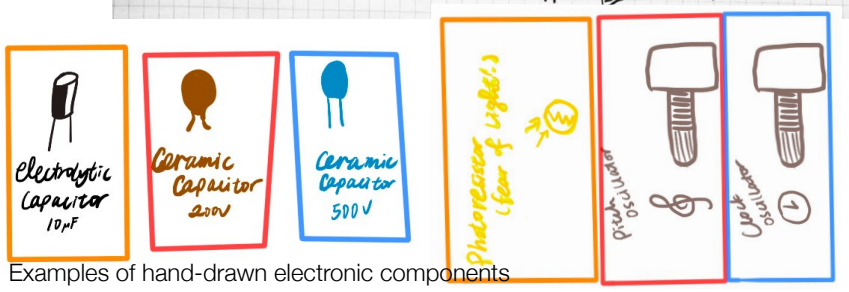
1. I represented the synth in quasi-circuit diagram that ***shows musician's points of interest*** **[3]**.
2. I ***sketched and wrote explanation*** for electronic components used in the circuit **[4]**.

Critique

- ***Further testing*** required for both the prototype and manual guide. Design should be ***reiterated and re-fabricated***.







Examples of hand-drawn electronic components

CRITICAL INTERFACE ANALYSIS

GOAL

1. To highlight the critical parts of ticket machine.
2. To criticise the existing design in terms of accessibility and mental model of the interface.
3. To design a new interface.

METHODOLOGY

Expert Review

Process

- I assessed the current interface according to ***usability heuristics*** and ***HCI research***, as well as ***my experience*** of purchasing train tickets in different countries **[3]**.

Critique

- I examined the design with heuristics in mind to ***uncover ergonomic issues*** and ***non-compliance with design principles***.
- Yet, the results are ***based on my knowledge only***,
- ***More expert reviews from different practitioners might help.***

METHODOLOGY

Observation

Process

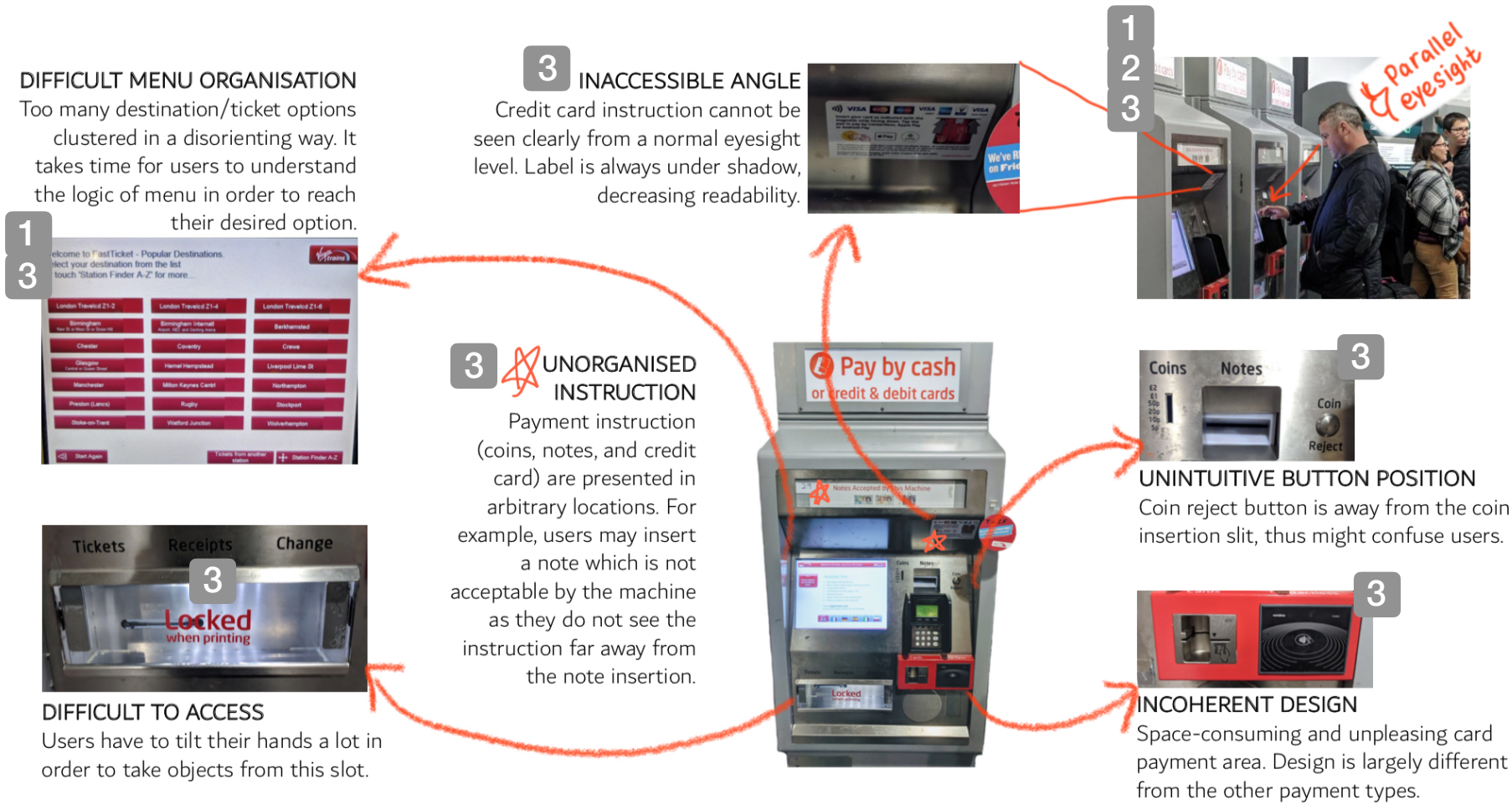
- I observed how commuters purchase tickets.
- Time spent on each purchase, component which users focused on most **[1]** were recorded.
- I also observed the body posture and facial expression of users to understand any obstacles they encountered **[2]**.

Critique

- Observation in real-life helped me *understand* ***how users interact with the interface naturally***, instead of merely imagining what other users would behave from my own perspective.
- Yet, observation might be ***biased by my interpretation***.

Alternatives

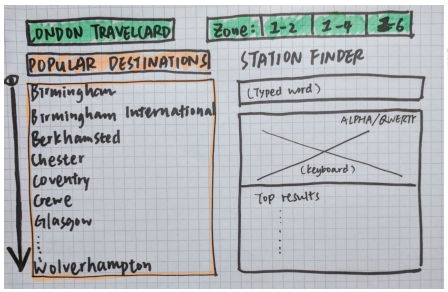
- Use ***interview to yield deeper insight*** by letting users explain the rationale behind their action.



Redesign of ticket machine at Euston station 2

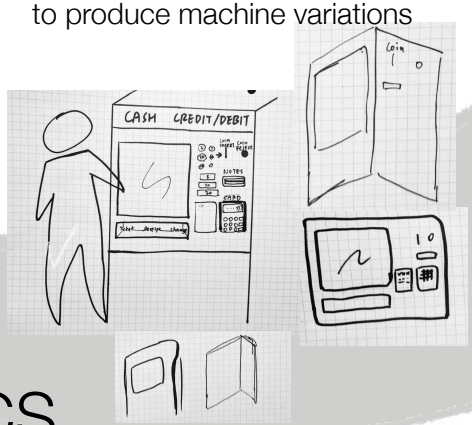
1

- Initially focused on designing a better GUI



2

- Turned to ***parallel iterative design*** to produce machine variations



3

- ***Experimented other ways*** of station selection than the GUI.
- Map representation received much positive feedback from colleagues.

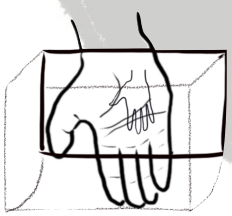
DESIGN WITH HEURISTICS

The designs below follow heuristic design principles.

6

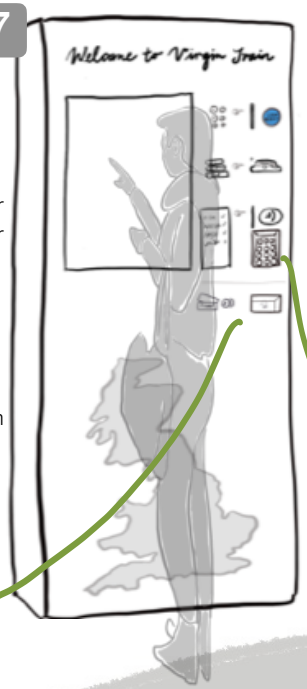
VISUAL EXPLANATION
Use of shape & numbers in coin/note representation allow users to recognize coin more easily. It is especially useful for international travelers who are unfamiliar with different sterling coins/notes.

COHERENT PANEL FOR EXPLANATION & ACTION
Explanation of payment methods on the left side of this panel, while payment actions on the right side.



EASY OBJECT RETRIEVAL
Collection slot is now reduced in size. Its curvature allows users to grab coins/tickets naturally without tilting their hands too much.

7



ITERATIVE DESIGN PROCESS

Parallel prototyping →

Process

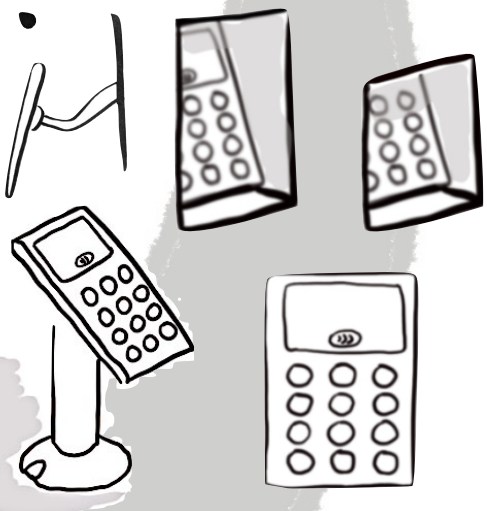
- ***Developed variations*** of credit card payment area ***before idea refinement*** **[4]**.
- ***Criteria to eliminate ideas:***

1. functionality (both chip & contactless mode)
2. aesthetics (fit in the whole design)
3. affordances (user knows how to use it)

Critique

- Multiple ideas allowed me to ***combine features from different designs***
- More likely to reach a ***better design than merely sticking onto one*** initial design.
- Might be hard to produce

4

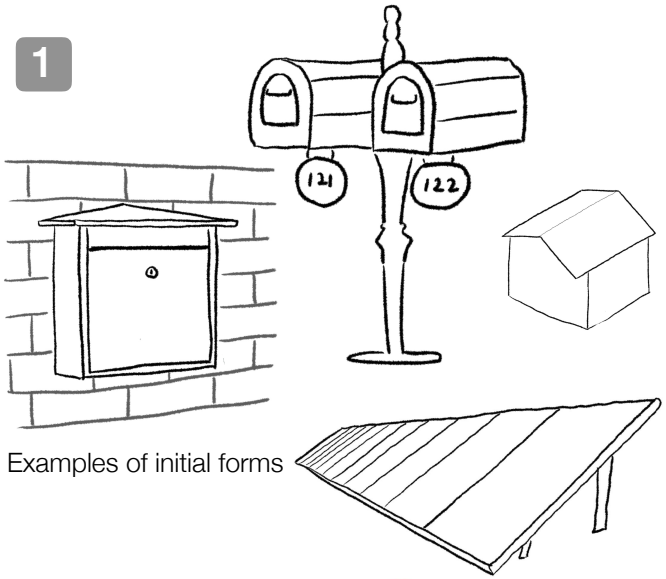


5

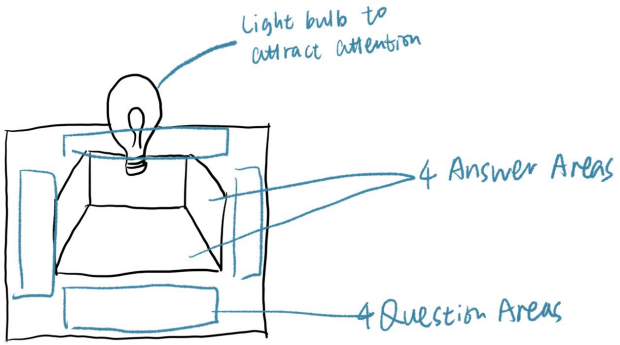
Idea refinement
Combined previous two designs.
Credit card information now easily visible.

Tangible survey for neighbourhood community 1

1



Examples of initial forms



Example of survey design

GOAL

To design a physical survey that is engaging and eye-catching to my target audience (residents), so as to gather opinions towards solar energy usage in a neighbourhood community.

PROCESS

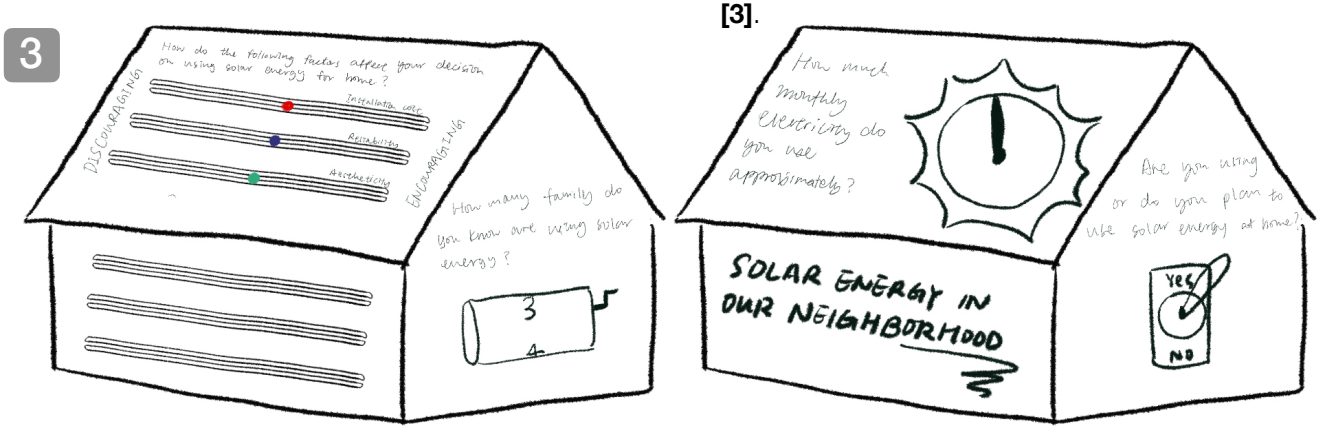
Ideation

- I ***researched solar energy adoption*** in London neighbourhood communities that public are generally aware of the technology.
- Therefore I assume basic solar energy knowledge in respondents.
- I then ***sketched ideas*** for the physical form of the survey. The ideas revolve around neighbourhood and solar energy **[1]**.
- My idea started with a postbox, as posting has similar connotation to submitting a response. Then I explored different form factors of a postbox.
- Had the idea of using a hut as the base of the tangible survey, but was still considering other forms as shown in the sketches.

Idea evaluation

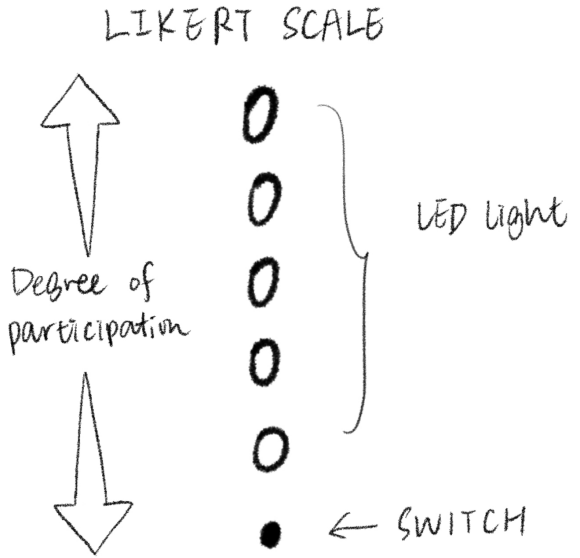
- I explored different ***physical representation of responses*** **[2]**. The ideas also are relevant to solar energy and electronics.
- I assigned sample questions to these representation, then I ***evaluated each options based on criteria*** such as flexibility for different kinds of questions, affordances etc.
- After ***idea reduction***, I came up with a sketch of a survey house **[3]**.

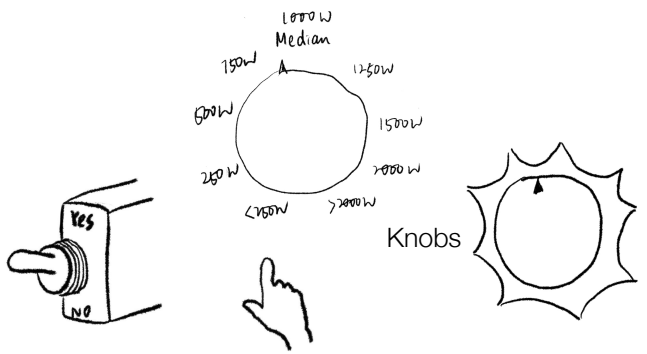
3



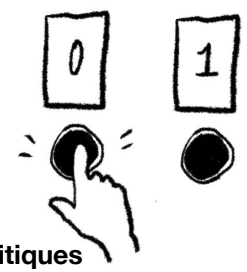
Sketches of the survey house

2



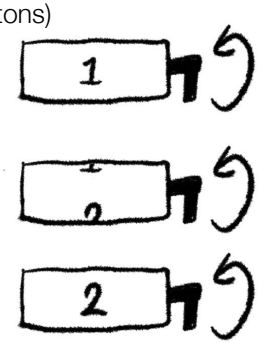


Examples of response design
(Linear scale, switch, knobs, buttons)



Critiques

- Harder to anticipate time required to get to the desired number.
- Cannot decrease number easily with only one button.



Critiques

- More fun and engaging.
- Time required can be easily estimated.

Tangible survey for neighbourhood community 2

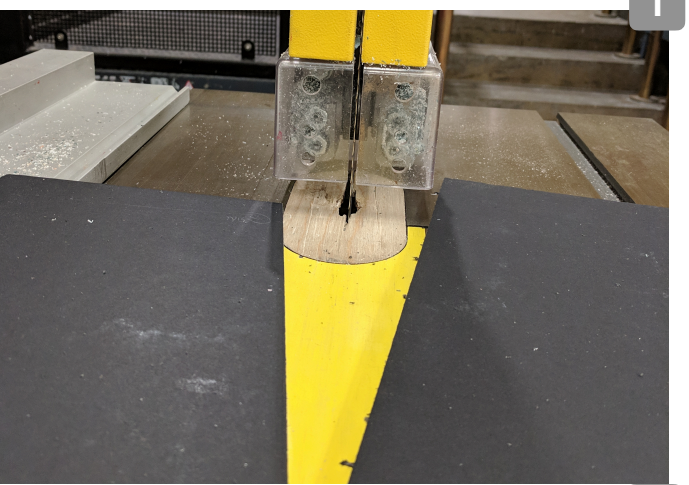
GOAL

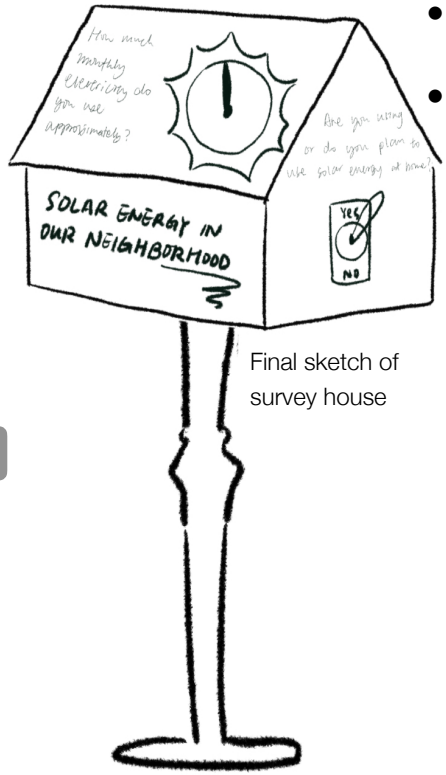
To fabricate the survey design and improve design along the process

PROCESS

Prototyping

- I learnt how to use different machine tools to cut plastic or wood **[1,6]**.
- During the process, using blue tack in the entire prototype allowed me to make rapid changes **[2]**.





Final sketch of survey house

User-friendly Annotation

- The survey postbox can be viewed from various angles.
- So it might be hard to navigate at the beginning.
- I ***improve the final design*** with annotation to guide respondents in filling in the survey **[7]**.

Interaction technique

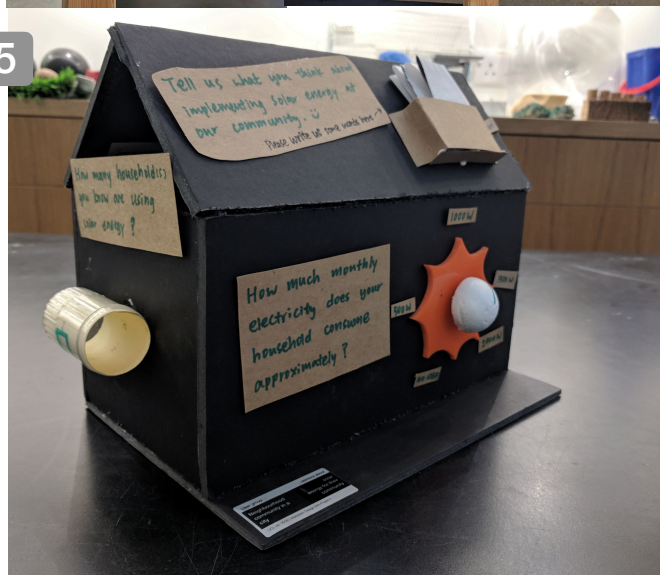
- Engaging with respondents by an open-ended question.
- Respondents follow the arrow to 'post' the response into the box **[3]**.

Metaphorical design

- The linear scale mimics tiles/ woods on house surface. This idea was to echo with the neighbourhood environment.
- The coffee stirrers ***resemble the desired materia***l, and they are ***easy to work with*** the other materials (such as push pins) **[4]**.

Form factor selection

- Acrylic, plastic, paper, foam and cardboard were used **[5,6]**.



OTHER PRACTISED TECHNIQUES

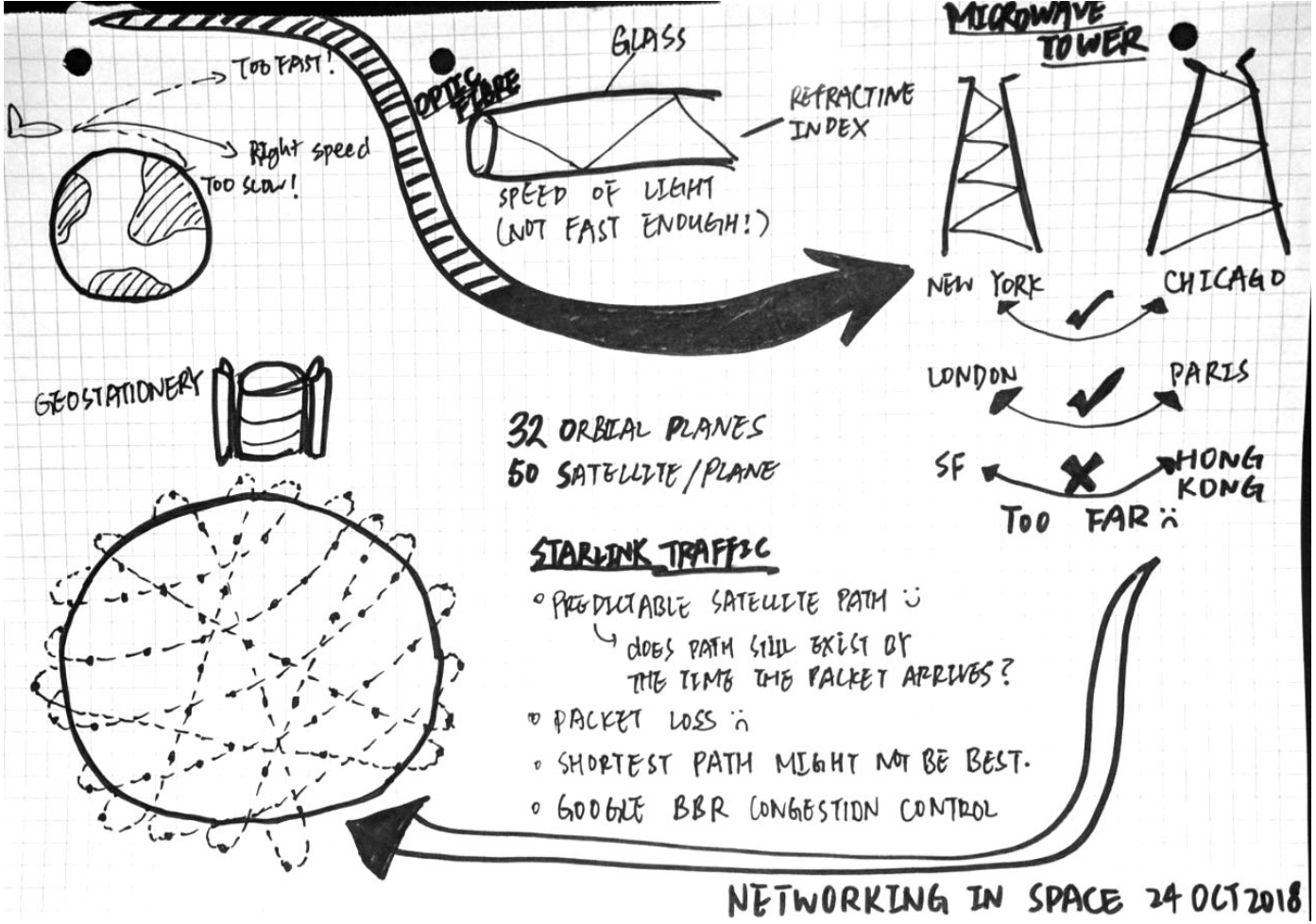
SKETCHNOTING →

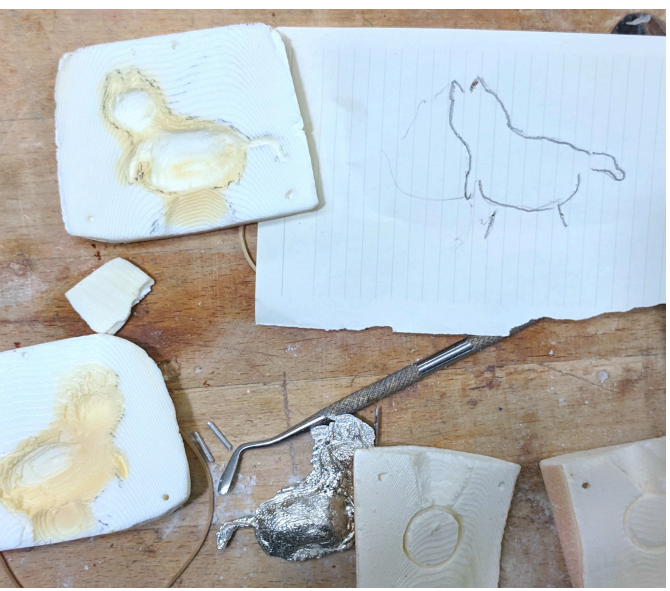
Process

- I practised sketch-noting by pen and on tablet.
- Here is one example when I was in a seminar for space networking.

Reflection

- This technique is very powerful as it ***improves memorability*** many-folds. I still remember vividly what was presented just because I sketch-noted.
- One caveat is that sometimes I ***may get too into the sketching than actually noting***. A balance between the two is needed.





CUTTLEFISH CASTING ← →

Process

- I tried out moulding with dried cuttlefish board and sculpting tools.
- I created two nearly symmetrical mould by hand, then secured them with binding wire.
- Lead-free pewter was poured into the mould to form the final shape.
- The product was then polished.

Reflection

- This technique is ***fast and robust***, as I can directly manipulate the cuttlefish board with the tools shown.
- However, it is ***not suitable for complicated figures***…such as a cat.
- Cuttlefish board is also ***limited in size***.