Human Computer Interaction (HCI)

Week 8: Prototyping

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Week 8 Outline

- Prototyping Overview
- Prototyping Techniques
- Prototyping Activity

Prototyping Overview

Prototyping Experiences

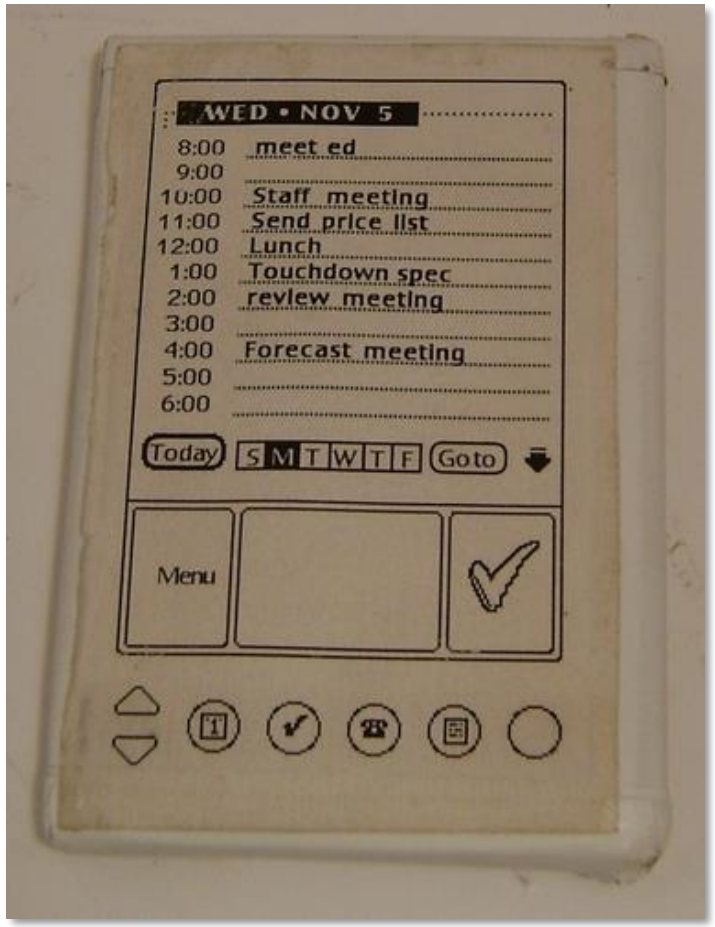
A **prototype** is an early sample, model, or release of an interactive product built to test a concept and to get feedback from others.

An **experience prototype** is implemented to convey an experience with an interactive product.

1. Help others develop an understanding about the essence or essential factors of an experience
2. Explore and evaluate ideas, and get feedback
3. Communicate issues and ideas about a proposed new experience

Marion Buchenau and Jane Fulton Suri. 2000. Experience prototyping. In *Proc. DIS 2000*. ACM, New York, 424–433. DOI: https://doi-org.ezp01.library.qut.edu.au/10.1145/347642.347802

Prototype Example: Jeff Hawkins' PDA prototype



- A screen mockup printed on wood and a stylus (low fidelity prototype)
- Jeff used the prototype for 1 week throughout the day to explore the novel experience of digital notes and calendaring



http://www.computerhistory.org/collections/accession/102716262

Prototype Fidelity

Fidelity is the degree of exactness to which a model reproduces the real thing



Low fidelity prototypes

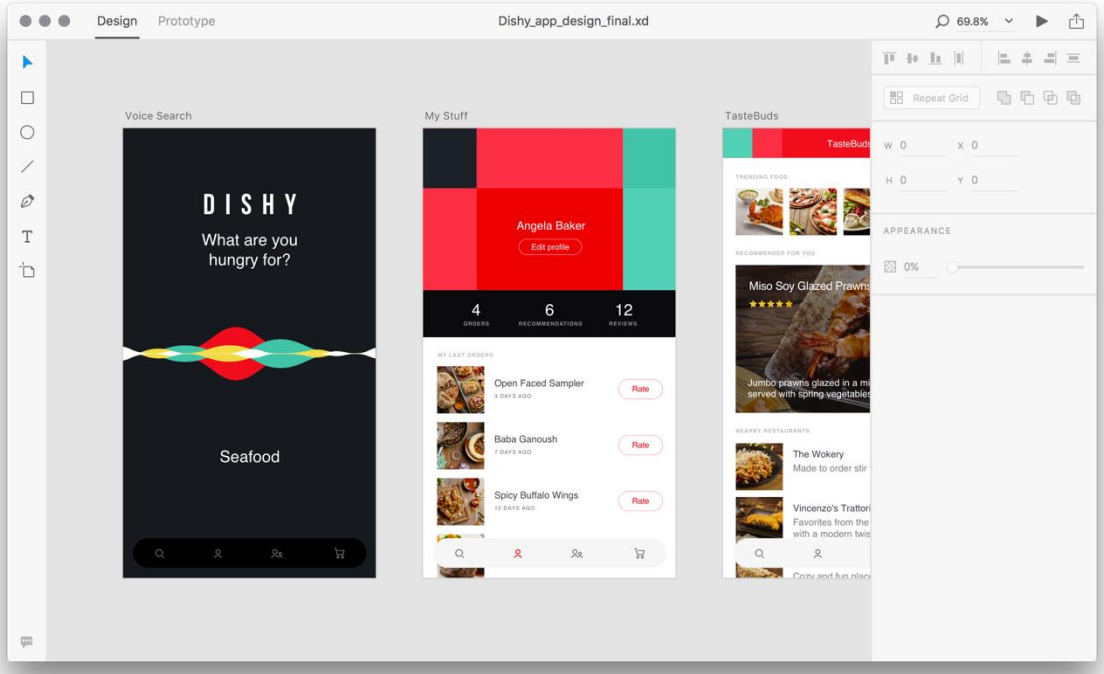
- Use a medium which is unlike the final medium, e.g. paper, cardboard
- Are quick, cheap and easily changed

High fidelity prototypes

- Uses materials that you would expect to be in the final product
- Prototype looks more like the final system than a low-fidelity version

Think-Pair-Share: Experiences with Prototyping

1. Have you prototyped something before?
2. Have you used any prototyping tools before?
3. What tool/s did you use?
4. What was your experience like?



https://blogs.adobe.com/creativecloud/making-adobe-xd-redefining-beta/

Prototyping Techniques

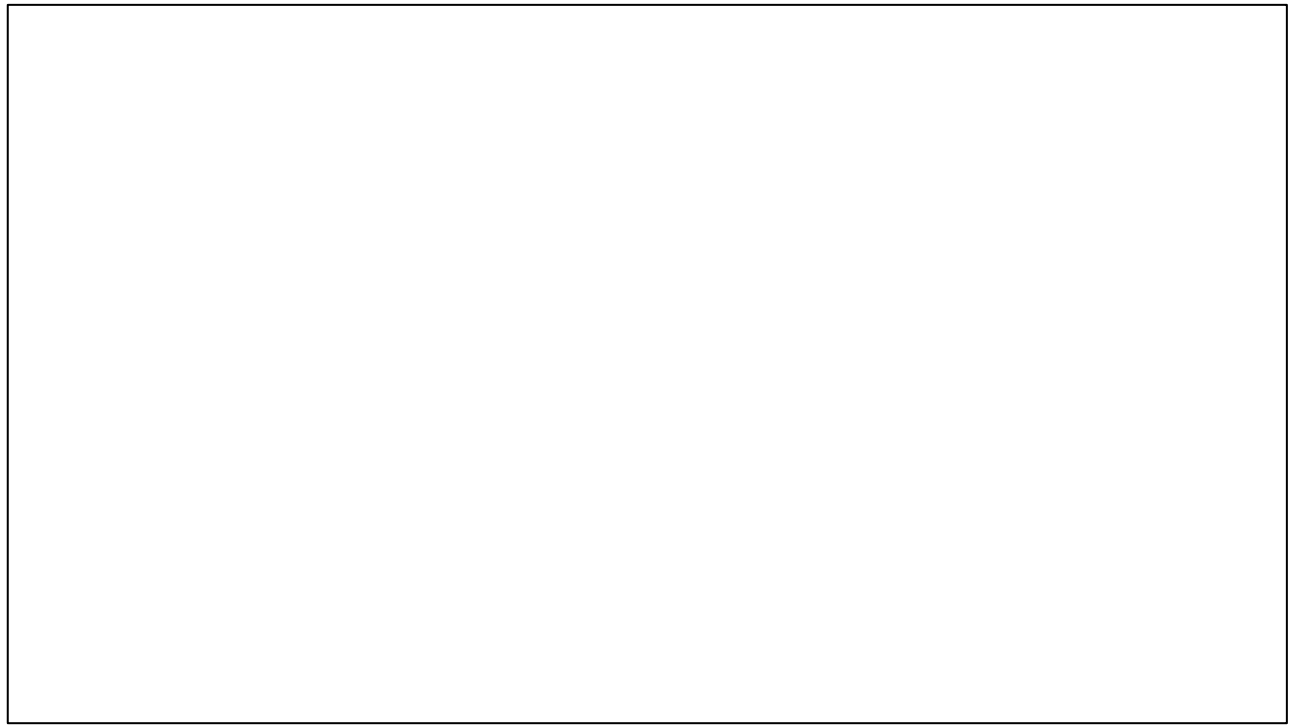
Prototyping Techniques for CW2

For CW2, you will select one of the two sketched ideas to develop into an interactive prototype. You can create a:

- Paper prototype
- Interactive Wireframe
- High-fidelity prototype
- Wizard-of-oz prototype
- Video prototype

Paper Prototype

- Easy to produce and change
- Require a human facilitator (known as the human computer)



Usability test with paper prototype

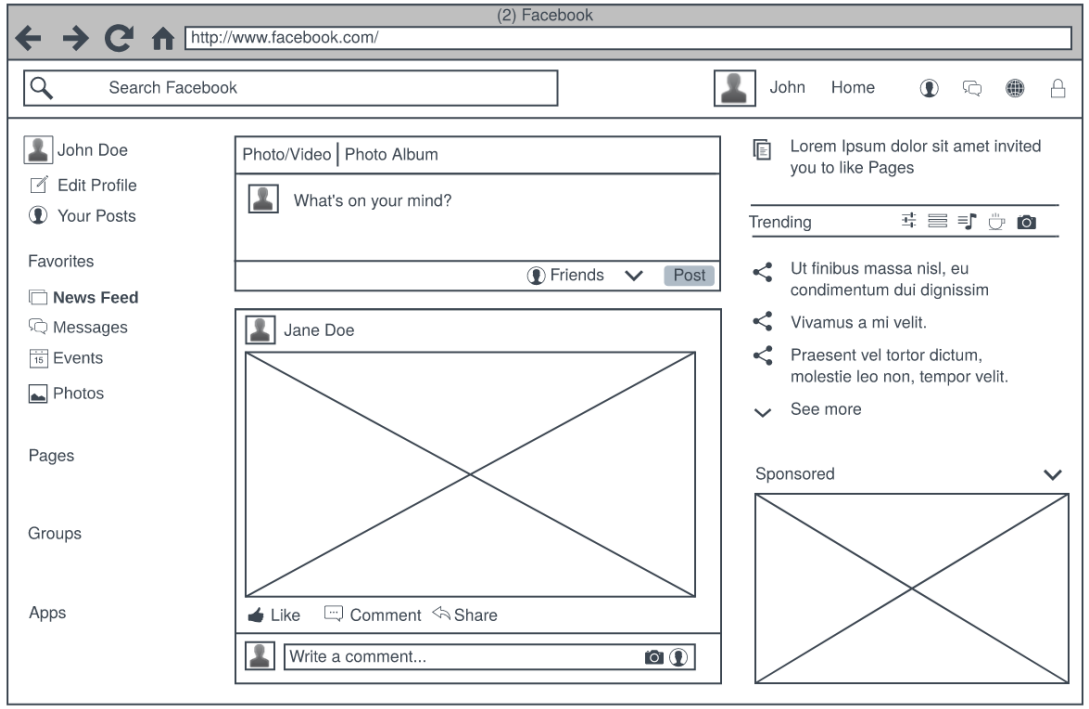
- https://youtu.be/yafaGNFu8Eg

Interactive Wireframes

- Like a blueprint for a house
- Focus on information, layout and interaction, without the distraction of colours and fonts

Tools:

- Balsamiq: https://balsamiq.com/
- Figma



Example: Data Visualisation Platform for Cotton Growers

- The initial concept of the platform was for cotton growers to be able to visualise the number of birds and bats on their farm, however growers have only a general interest in this information.
- The main interest in the platform is its potential for pest management, which stems from the drive not to use pesticide or insecticide sprays on the cotton for both environmental and economic reasons.
- The insect-eating bats are the main point of interest in engaging growers in the wider platform. There is potential to use this interest to build more awareness of both the bats and birds on the farm and the actions growers could take that would lead to greater numbers of these species, further encouraging responsible farming practices.

Sensor View

- This dashboard displays a map view of the farm with markers to indicate where the sensors are placed.



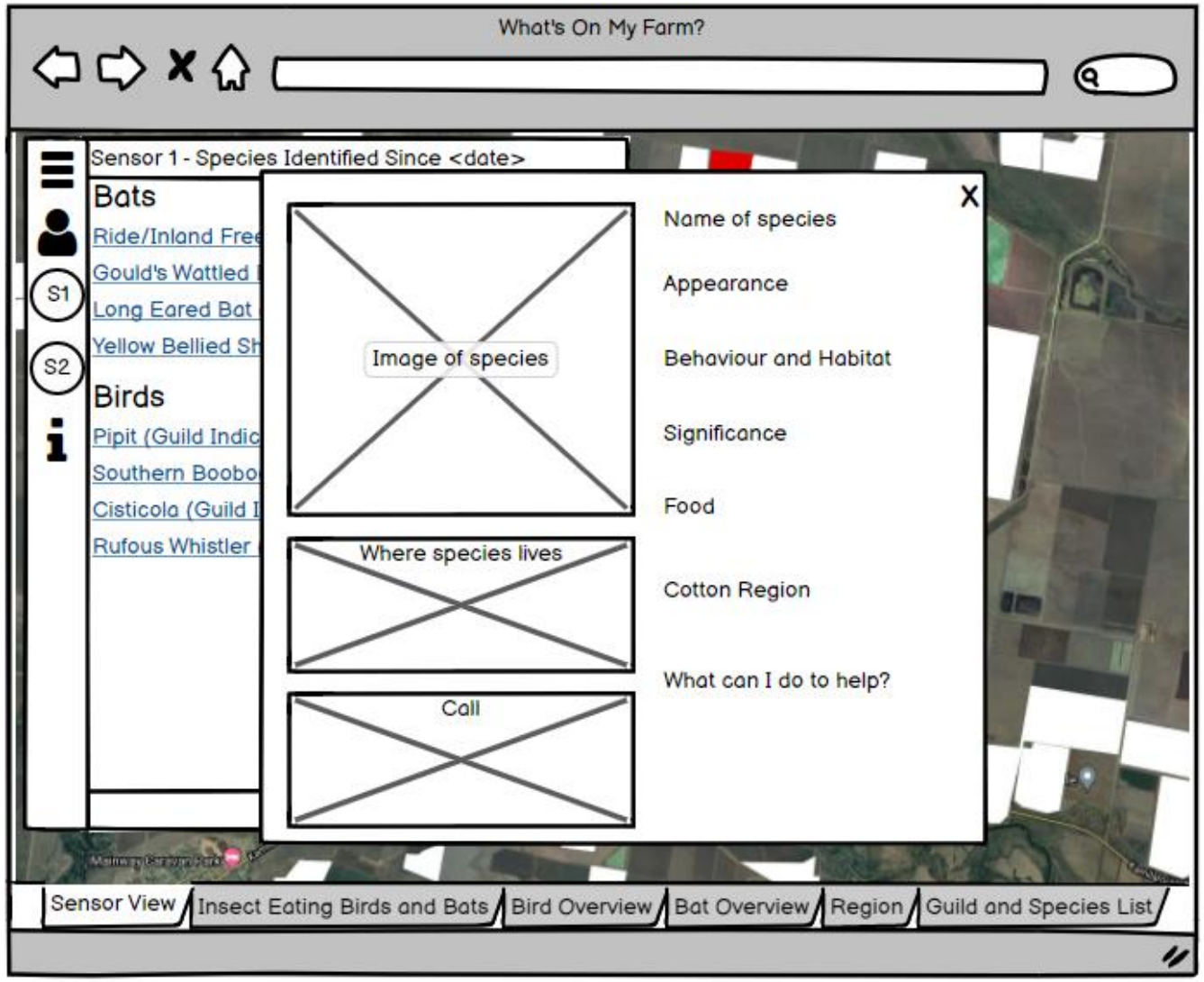
Sensor View

- When a sensor is clicked, a list of the species detected on that sensor will appear.



Sensor View

- When the species name is clicked, a pop-up will appear with information about that species. Information layout is displayed similar to the Birds on Cotton Farms PDF, specifically the Indicator Species Overview.



Insect Eating Birds and Bats

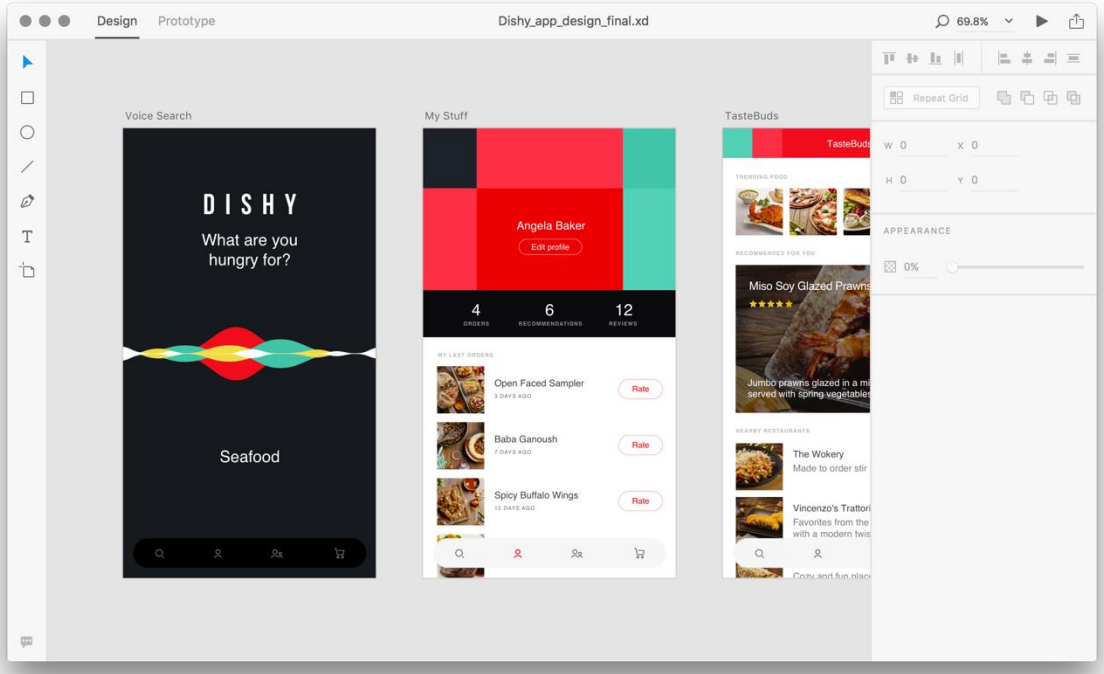
Dashboard contains graphs with the following information:

- Number of insect-eating bird species.
- Number of insect-eating bat species.
- Insect-eating bat activity – line graph.
- Insect-eating bat activity – bar graph with species listed, include species present and absent so growers are able to learn about species that are absent. When the species name is clicked, a pop-up will appear with information about that species similar to the Sensor View.



High Fidelity Prototype

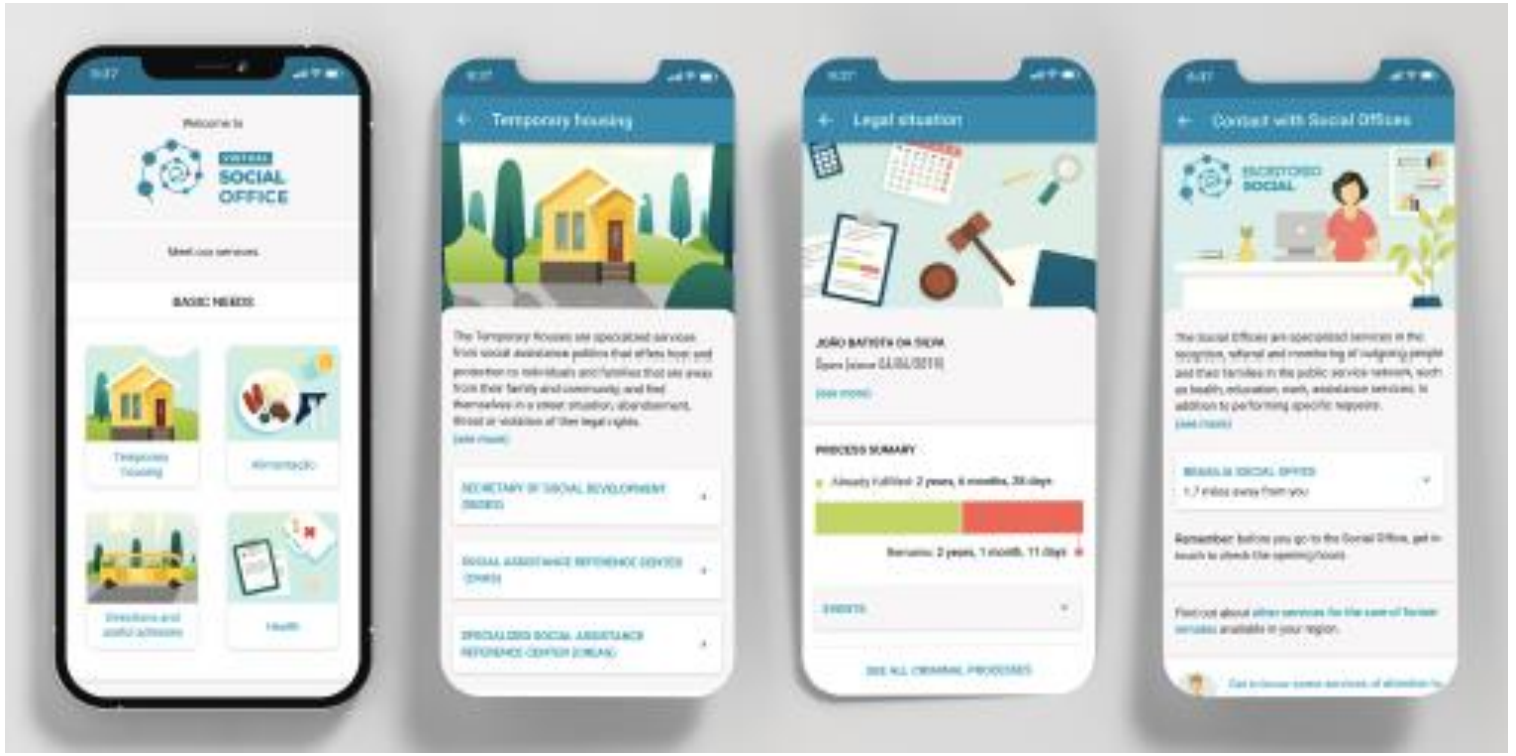
- Look and behave like the final product
- Interactive: click from screen to screen
- Focus on interaction and look & feel
- Share prototypes with users or clients for testing
- Tools: Figma



https://blogs.adobe.com/creativecloud/making-adobe-xd-redefining-beta/

Example: App for Former Inmates





https://www.researchgate.net/publication/367001321_Using_Design_Thinking_to_Break_Social_Barriers_an_Experience_Report_with_Former_Inmates

Generative AI for High-Fidelity Prototyping

- Generative AI tools can help turn design ideas, sketches and wireframes into interactive, high-fidelity prototypes
- Enables rapid iteration when experimenting with different layouts, interactions and visual styles
- Quickly create prototypes that can be explored and evaluated
- Using AI in Figma:
  - Figma AI: generate and refine interface designs, layouts and visual elements
  - Figma Make: generate functional, interactive prototypes from text prompts or existing designs

Using Figma AI in your prototyping process

- GenAI can support different stages of prototyping without replacing your own design decisions
- How might you use Figma AI?
  - Start with your own designs
  - Refine your interface
  - Explore alternatives
  - Develop your prototype
  - Evaluate and iterate

Critically Evaluating AI-Generated Prototypes

- AI can generate aesthetic interfaces in very little time, but does that mean it is good design?
- Human-centred design: does the prototype reflect actual user needs and research findings, or assumptions made by AI?
- Design fixation: does the generated design encourage us to accept familiar interface patterns rather than explore alternatives?
- Usability and accessibility: does the interface follow HCI principles? Is it usable by people with different needs and abilities?
- Design agency: who is making the design decisions – you or the AI?
- Ethics and privacy: what data are you sharing with the tool?

Example: The Messaging Kettle





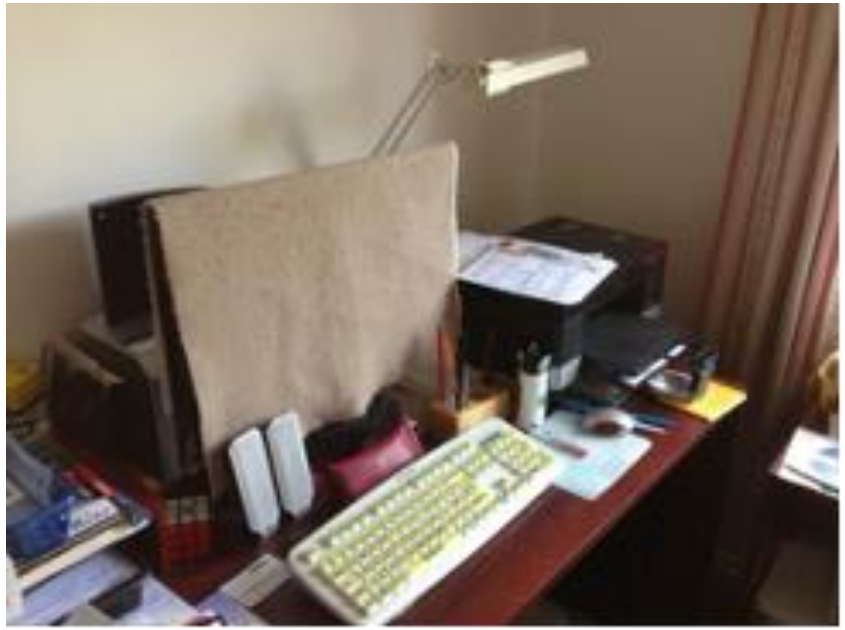
Ambe, Aloha Hufana, Alessandro Soro, Daniel Johnson, and Margot Brereton. "From collaborative habituation to everyday togetherness: a long-term study of use of the messaging kettle." *ACM Transactions on Computer-Human Interaction (TOCHI)* 29, no. 1 (2022): 1-47.

The Messaging Kettle

- Designing technology with older adults

- Problem
  - Maintaining long-distance social connection
  - Frustrations with existing technologies

- Method
  - Contextual interviews
  - Object interviews with older adults in their homes
  - Discussion of social routines, activities with others and alone, technology use, favourite things, values and culture







Photos from Margot Brereton, all rights reserved

Tea Making Habits







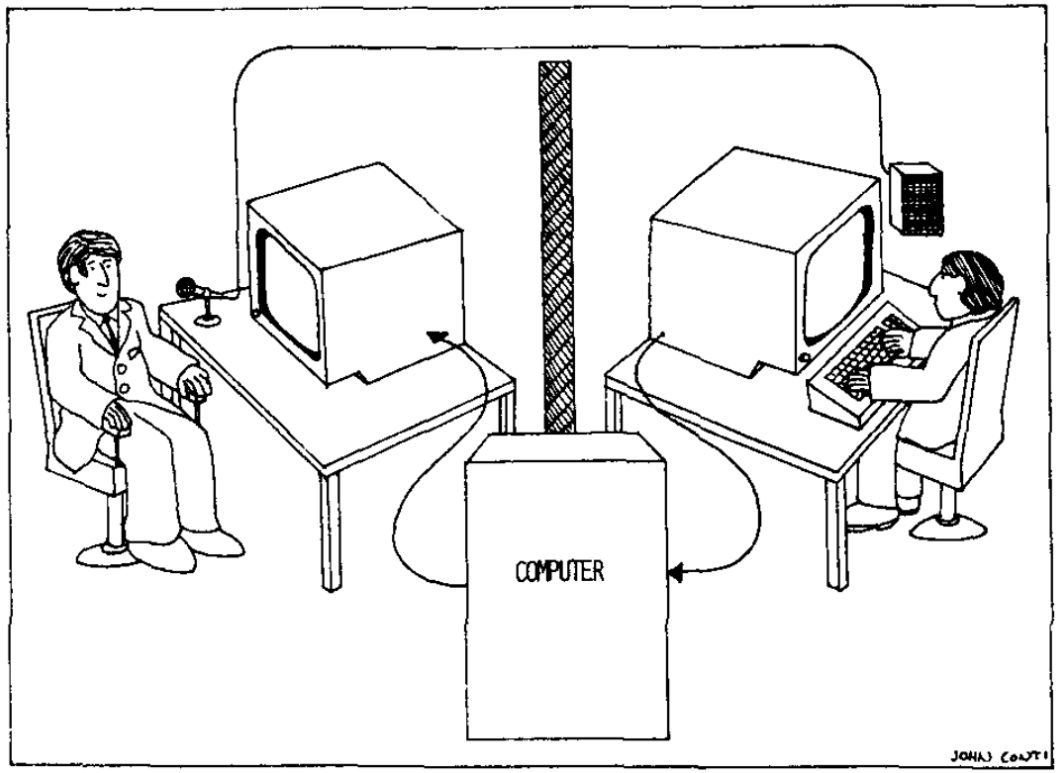
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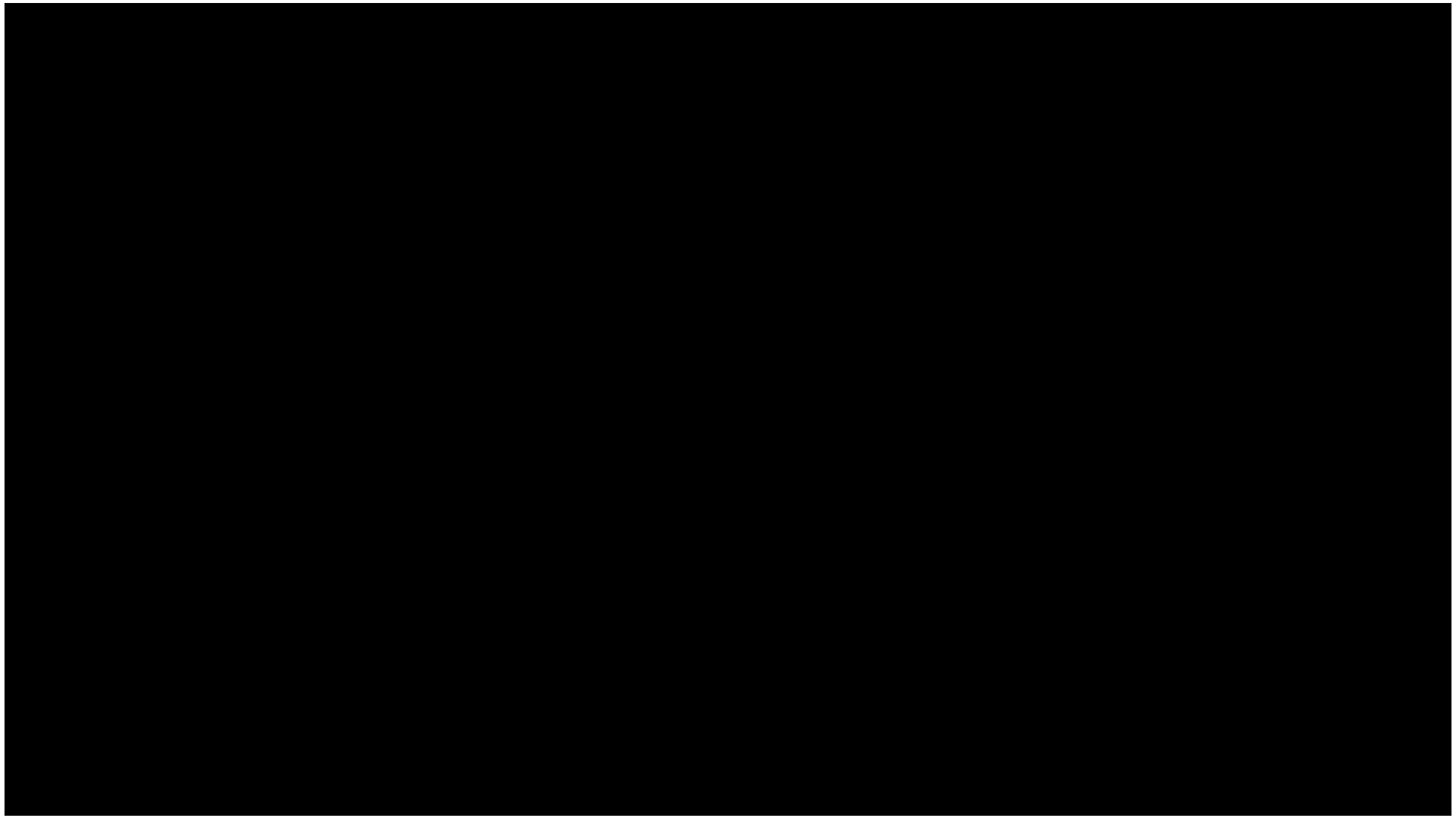
Wizard-of-Oz Prototype

- The user thinks they are interacting with a computer, but a developer is responding to output rather than the system
- Example: experience of listening typewriter (1980)



https://dl.acm.org/doi/pdf/10.1145/2163.358100

Example: Robotic Ottoman



https://vimeo.com/114106164

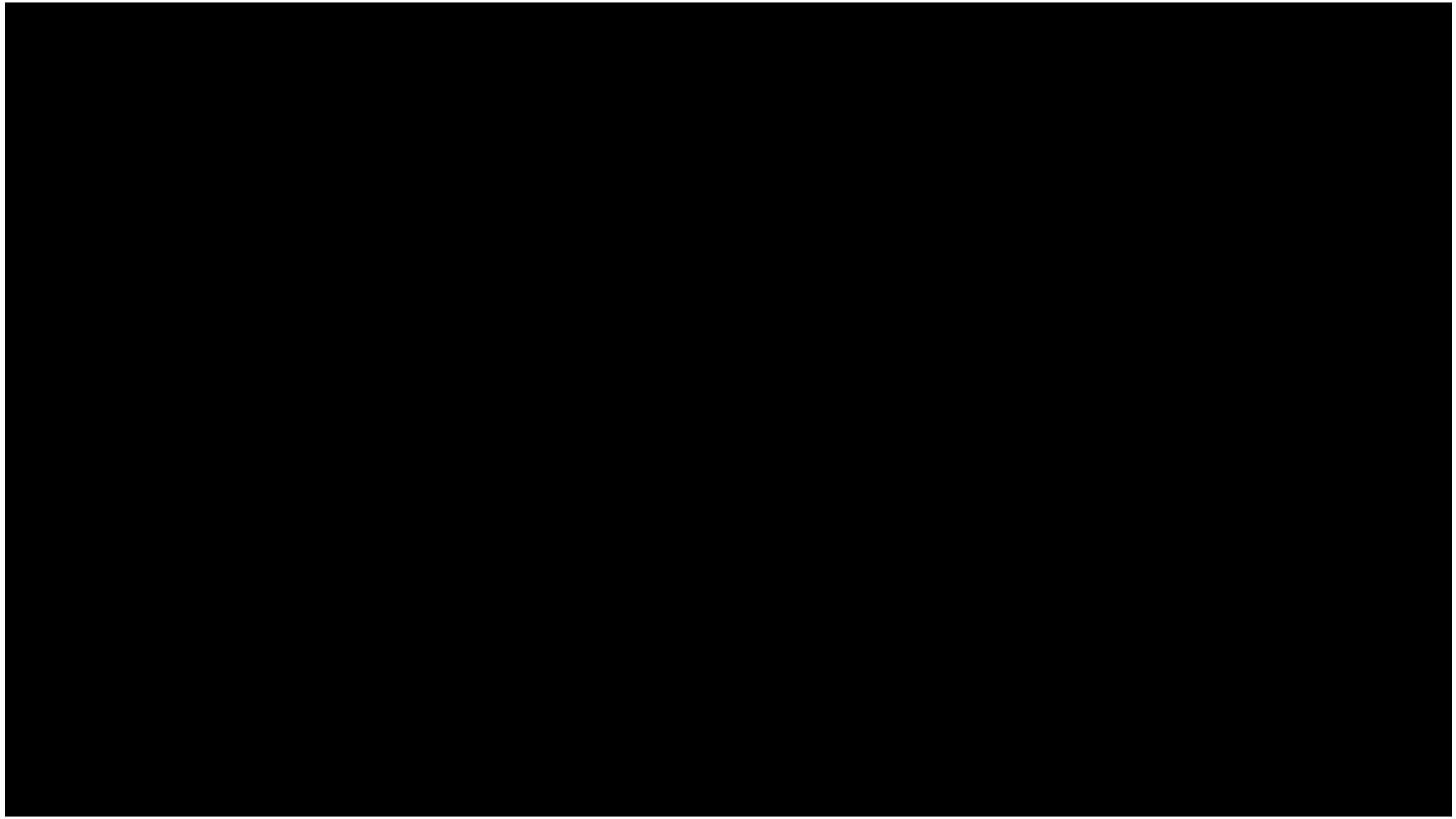
Simulated Experience

- Humans simulate functionality as in Wizard-of-Oz prototype to create a real experience
- The difference is that participants are aware that the system is simulated (no deception)
- Example: recipe recorder

Video Prototype

- Create a video to convey the interaction and experience with your prototype
- 2-3 minute video showing a user interacting with the prototype in a real-world context
- Tells a story that:
  - Describes context
  - Demonstrates the prototype functionality and how people interact with it
  - Conveys the experience of using the prototype
- Not a marketing pitch or selling your prototype

Example: Uninvited Guests by Superflux



https://vimeo.com/128873380

Video Prototype Tips

- Create a storyboard to prepare your video: shots, actions, interactions and narration
- Identify the locations, actors and materials you will need to film the video prototype
- Rehearse the scenario before you film
- Create a high-quality video recording – can use your phone or a camera
- Edit the video snippets into a final narrative - review and refine your edits to create a clear and succinct video

Video Prototype Resources

- Creating a storyboard:
  - Sketching the User Experience: The Workbook Chapter 4.4
  - https://doi.org/10.1016/B978-0-12-381959-8.50024-9
- Video editing tools:
  - iMovie
  - Adobe Premiere
  - PowerPoint

Figma Tutorial

Figma Activity

1. Sign up for Figma Education account using your university email: https://www.figma.com/education/
2. Design a simple mobile app screen that helps university students keep track of their daily tasks
   - Create your screens and interactions
   - Refine using Figma AI

CW2

1. **Review** your 2 sketches and select 1 to prototype, remember to consider:
    a. **Experience**: will it enhance the experience of your participants?
    b. **Innovation**: is the design idea novel?
    c. **Insight**: what will you learn from its deployment?
    d. **Feasibility**: can you build a prototype to test it?
2. Consider the prototyping techniques and which one would work best
3. In next week's workshop, we will create an initial paper prototype of one of your design suggestions

Any questions?