

The DESIGN of EVERYDAY THINGS

DON
NORMAN

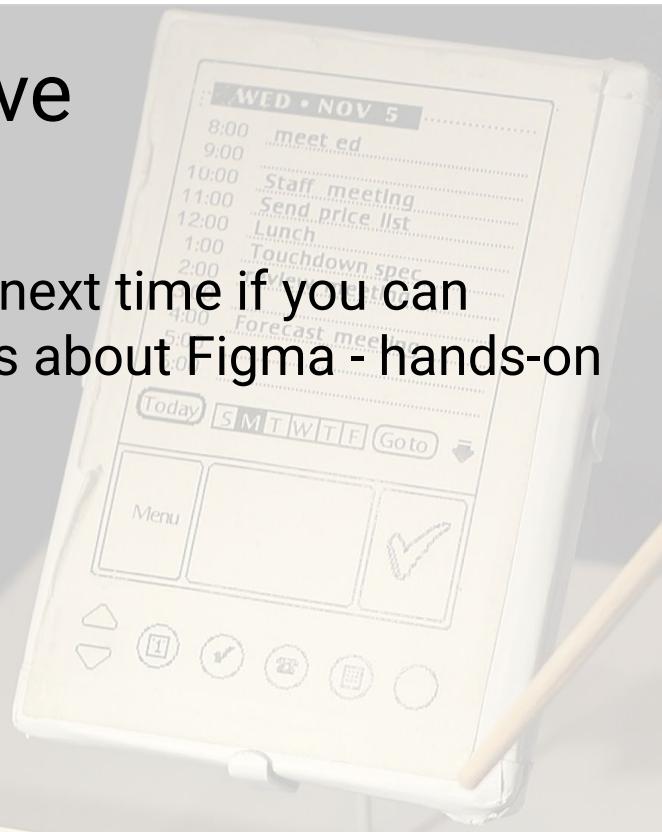
Prototyping

User Interface Development
EECS 493 - Winter 2025



Administrative

- Bring a laptop next time if you can
 - Next time is about Figma - hands-on



PalmPilot wooden model
Joffrey

Administrative

- The two bake-offs and the final presentations are required attendance (4 classes)
- We will take exceptions for absences of these lectures for illness, religious reasons and job interviews with proof.
- Penalties for non-attendance will be clarified on Piazza shortly.

Administrative

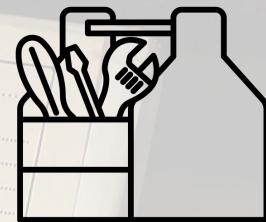
- Change - next week's practitioner's panel will **not** be required attendance.
- It will be similar to lecture participation, except if you miss practitioner's panel, the in-class form that has a QR code will not accept submissions after the class period.
- Same 80% policy - you can still get full attendance grade if you participate well in the rest of the lectures.

Questions?



Class progress

Building a toolbox for human-centered software design and development



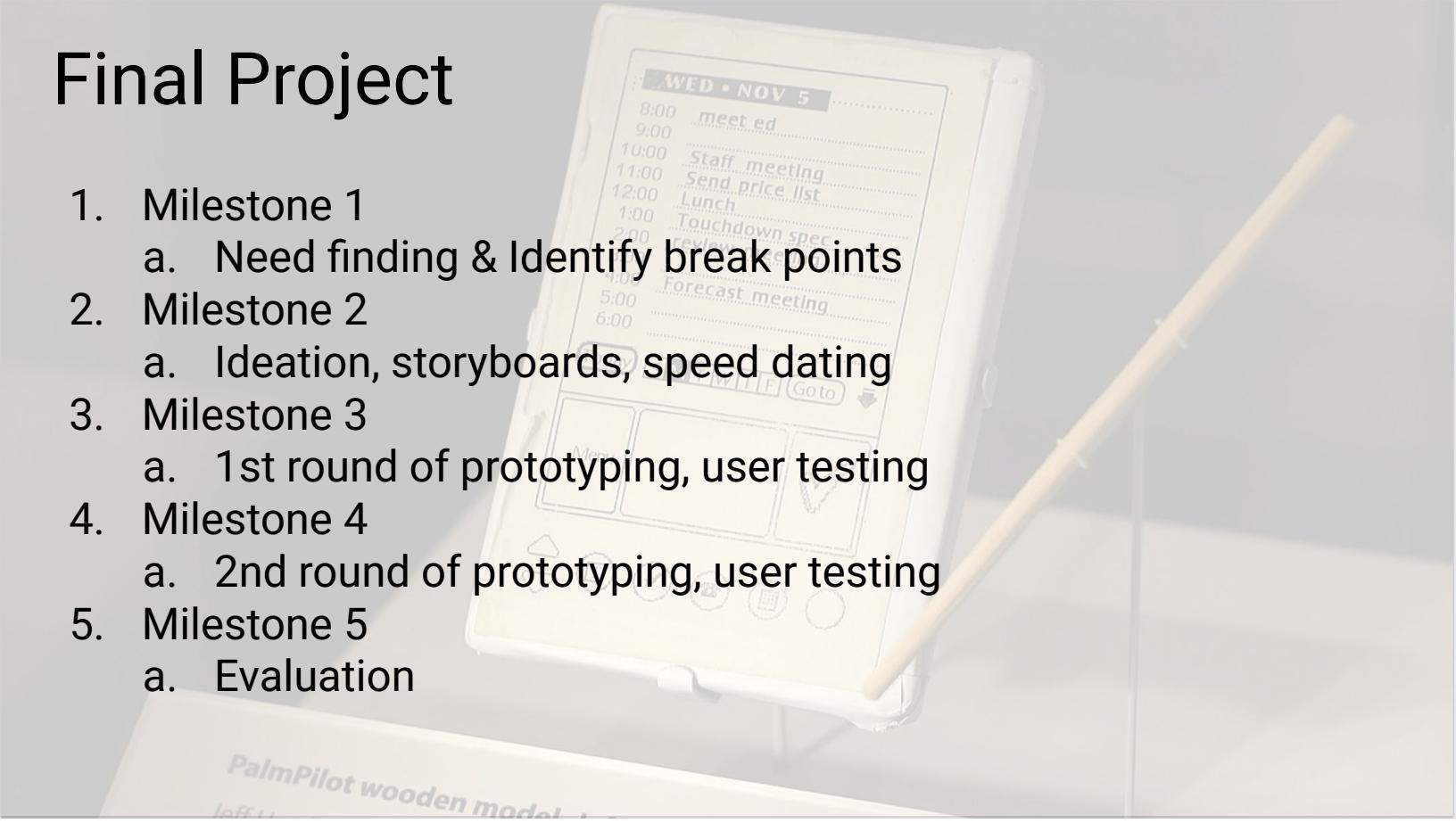
1. User research
 - a. Assignment 1, Final Project all milestones
2. Web programming
 - a. Assignment 2, 3, 5
3. Design and prototyping
 - a. Assignment 4, Final Project milestones 3-4



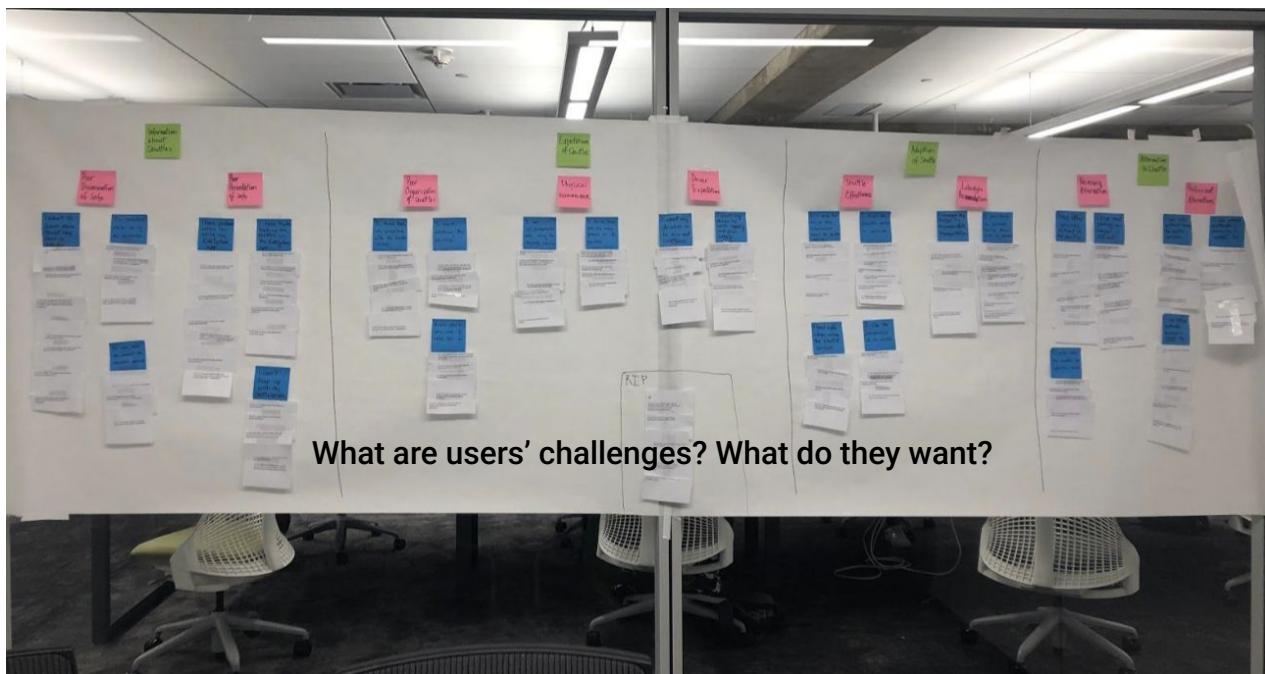
PalmPilot wooden model
Joffrey

Final Project

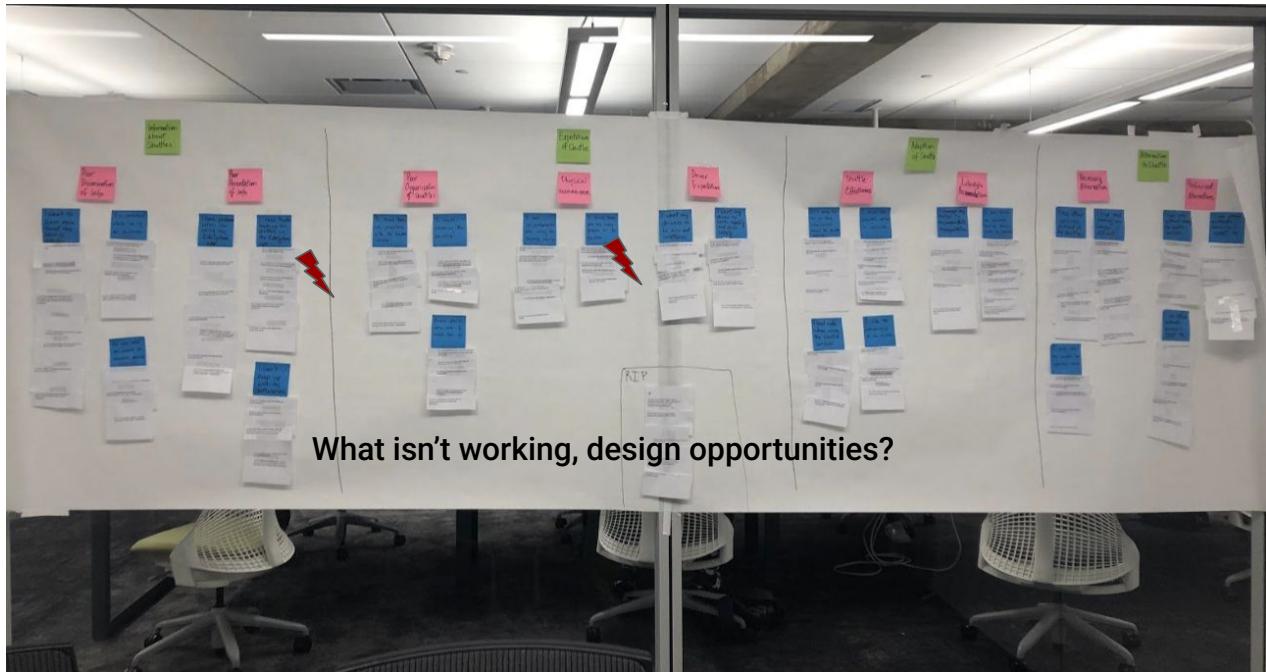
1. Milestone 1
 - a. Need finding & Identify break points
2. Milestone 2
 - a. Ideation, storyboards, speed dating
3. Milestone 3
 - a. 1st round of prototyping, user testing
4. Milestone 4
 - a. 2nd round of prototyping, user testing
5. Milestone 5
 - a. Evaluation



Final project milestone 1



Final project milestone 1



Questions?

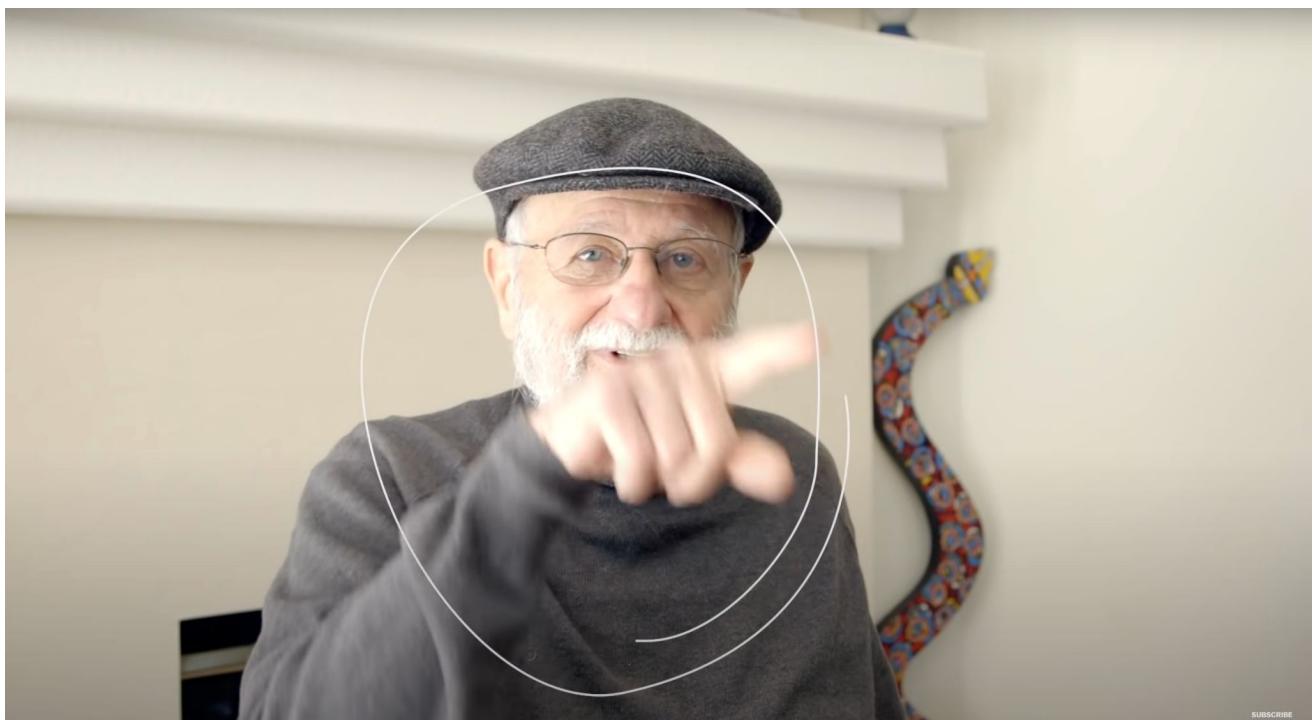


PalmPilot wooden model
Ioffe

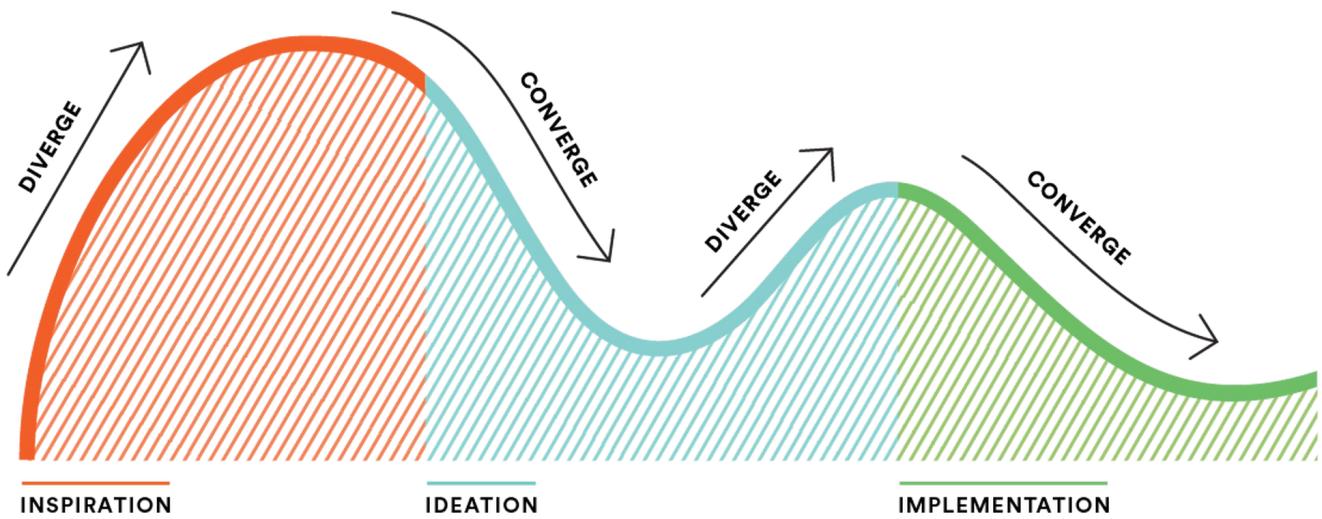
Prototyping Techniques



Iterative Approach - good idea



IDEO



<https://www.ideo.org/approach>

4 Phases of Human-Centered Design

- **Need finding** → Conduct research about customers who will use the product being developed/improved
- **Ideation** → Generate potential solutions
- **Prototyping** → Build a mockup of each potential solution
- **Testing** → Have sample of individuals from target population use prototype in order to test design suitability



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What is a prototype?

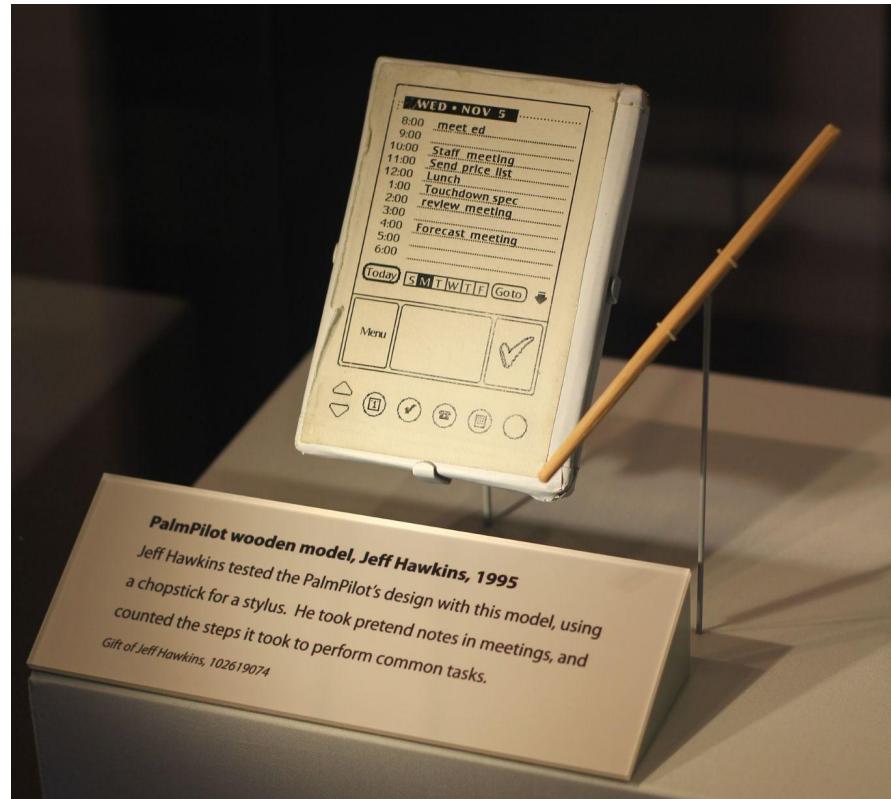
- a series of screen sketches
- a storyboard, i.e. a cartoon-like series of scenes
- a Powerpoint slide show
- a video simulating the use of a system
- a lump of wood (e.g. PalmPilot)
- a cardboard mock-up
- a piece of software with limited functionality written in the target language or in another language

The power of prototyping



In 2000, Palm sold nearly 8 million units and had a 76% share of the PDA (personal digital assistant) market.

The power of prototyping



It started as a piece of wood.

Jeff Hawkins, the designer carried a piece of wood with him.

So, want to check what's on your calendar? No problem, pull out your block of wood.

This enables him to answer
“what are the tasks that you would actually use this for?”

Why prototype?

- Evaluation and feedback are central to interaction design
- Stakeholders can see, hold, interact with a prototype
- Team members can communicate effectively
- You can test out ideas for yourself
- It encourages reflection which is critical for designers
- Prototypes answer questions, and support designers in choosing between alternatives

Types of prototypes

- Sketches
- Paper prototypes
- Physical mock-ups
- 'Workbench' build
- One-off production
- Small-batch production
- Release-ready

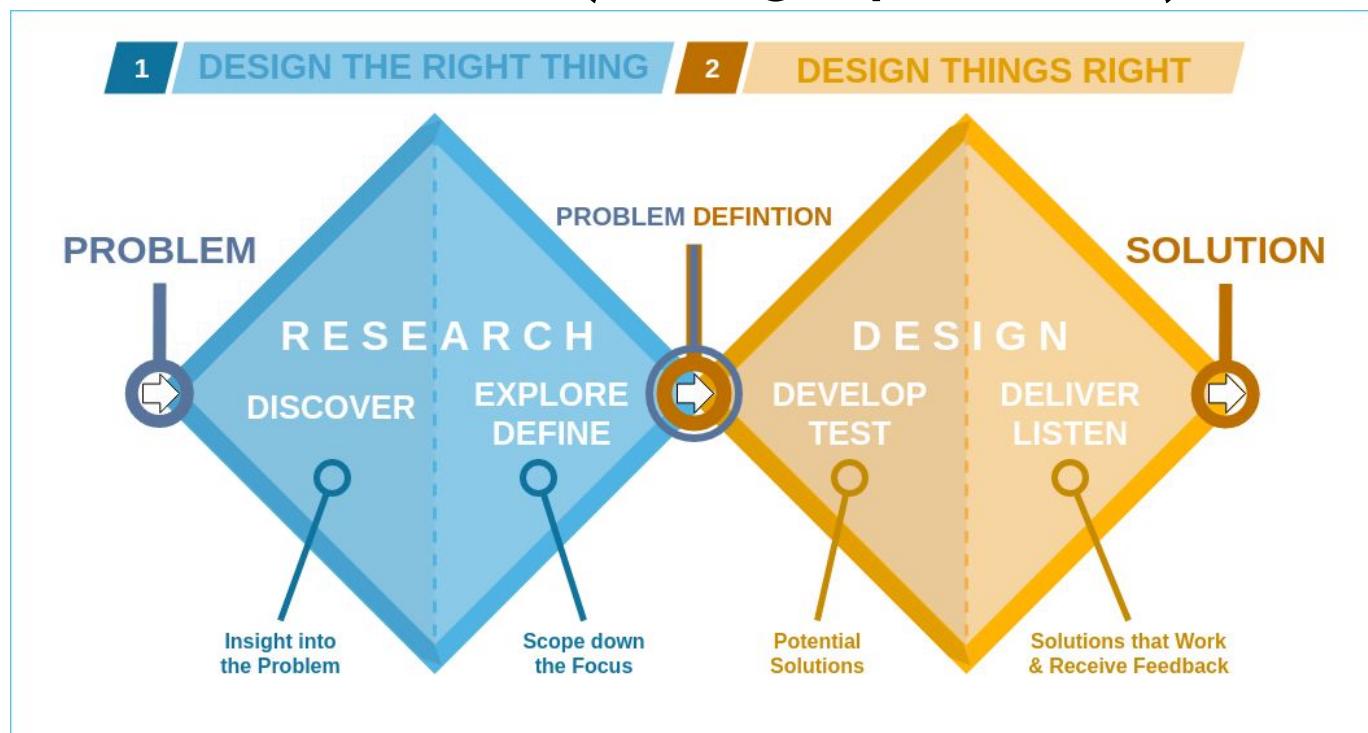


Ideation vs. Prototyping

As you move from Ideation to Prototyping, your focus is shifting:

- From **building the right thing**
- To **building the thing right**

Double Diamond (design process)



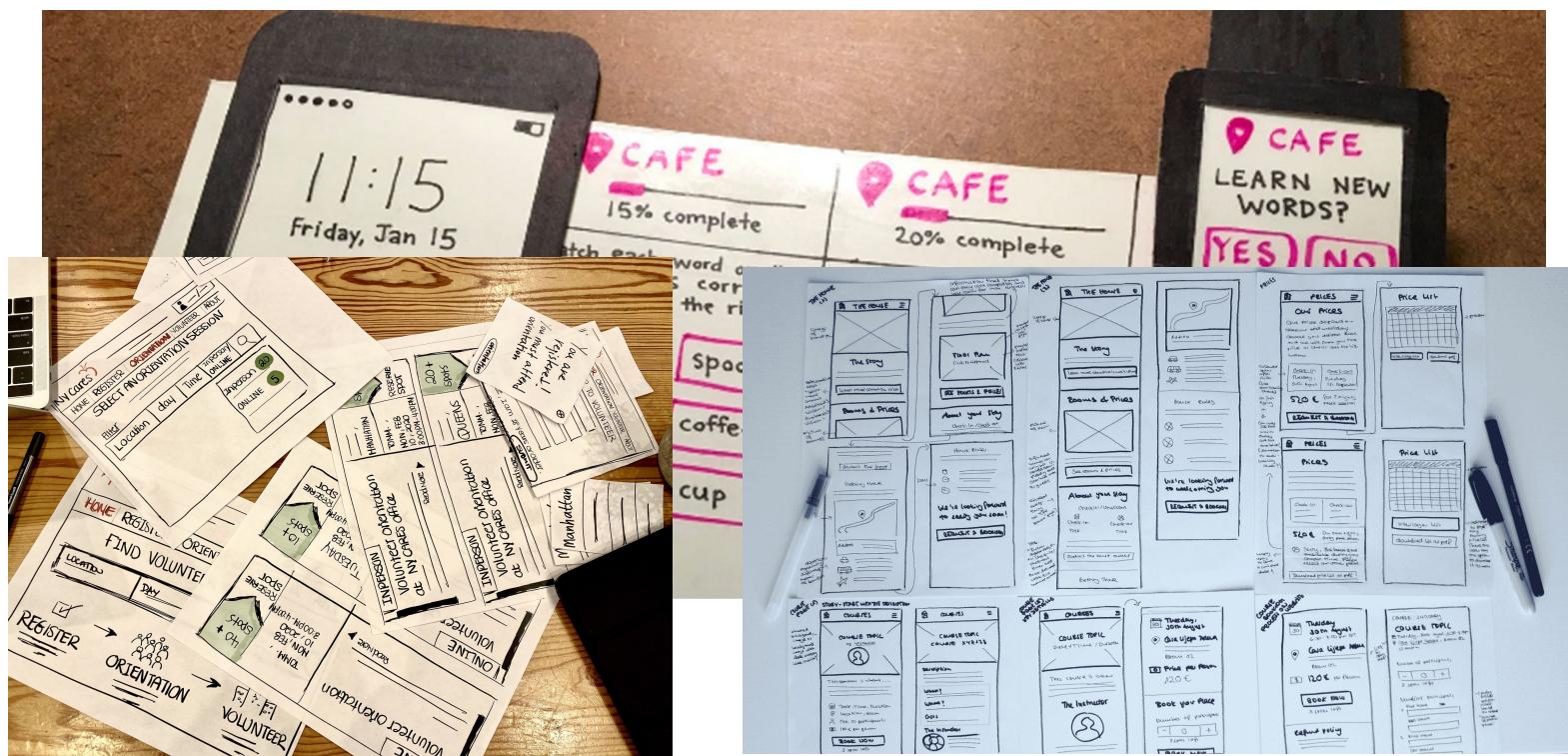
Prototyping

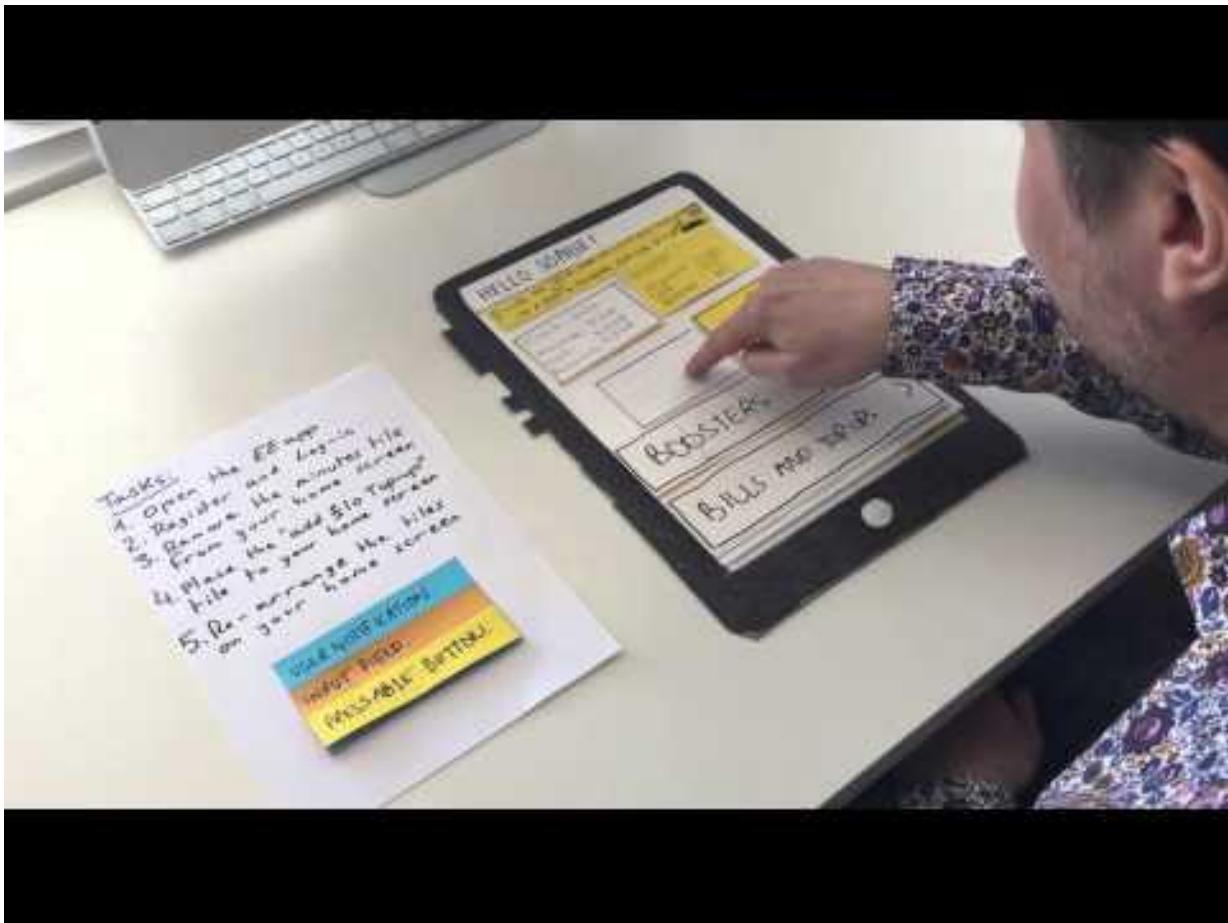
- Low-fidelity prototyping
 - Paper prototypes, wireframes, wizard-of-oz, mockups
- High-fidelity prototyping
 - Detailed screen design

Low-fidelity Prototyping

- Uses a medium which is unlike the final medium, e.g. paper, cardboard
- Is quick, cheap and easily changed
- Examples:
 - Paper prototype
 - Wireframes
 - ‘Wizard-of-Oz’ (e.g., for AI capabilities)
 - Mockups

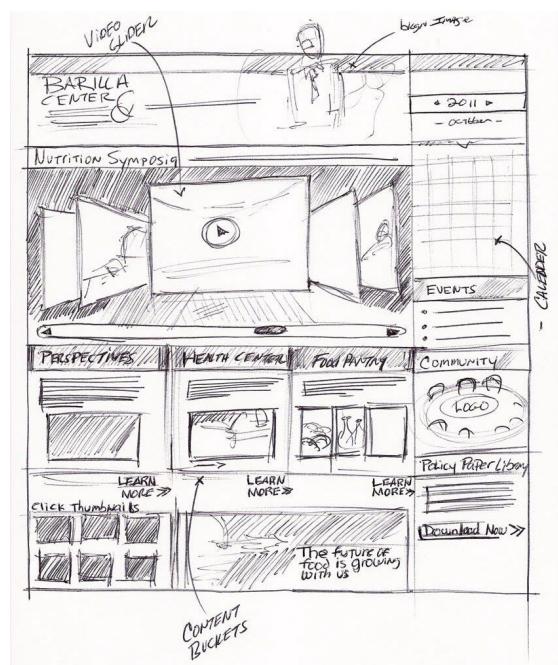
Paper prototype



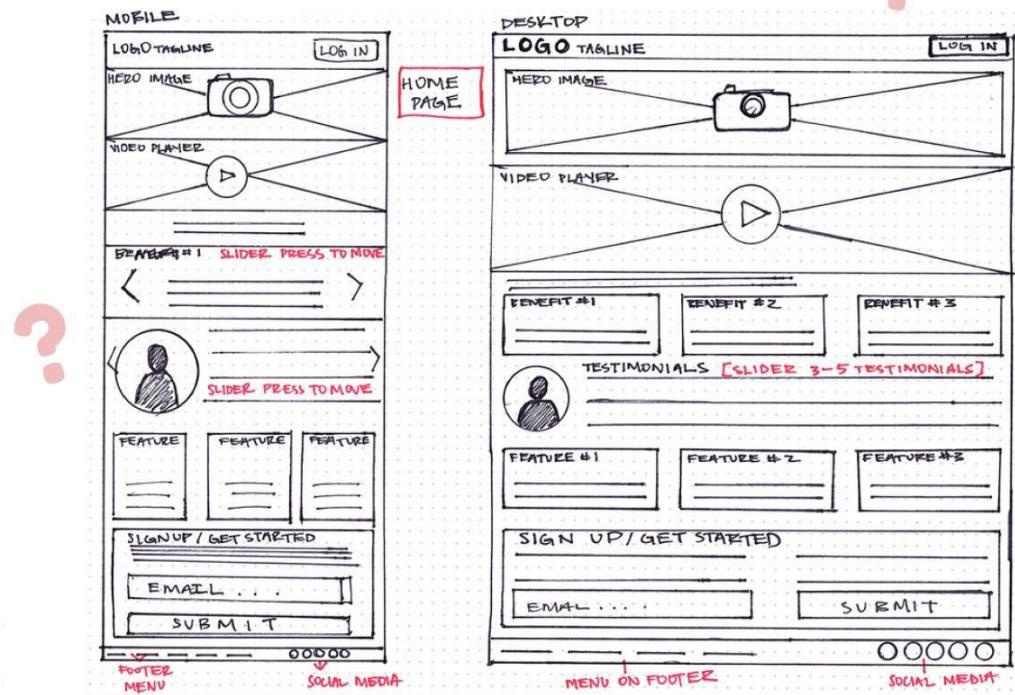


Wireframing (fidelity may vary)

- Visual representation of user interface without any branding / aesthetics
- Think of it as a “floor plan” for building your interface
- Useful:
 - Communicating functionality to different stakeholders
 - Giving designers starting point
 - Reference points for functional specifications



Wireframe



A promotional image for Balsamiq Cloud. On the left, there is a portrait of a smiling woman with dark hair, wearing a pink cardigan over a black top. To her right, the text 'Cloud Intro' is displayed in large, bold, black letters next to a red smiley face icon. Below this, the word 'WITH' is written vertically, followed by the name 'Val' in a stylized, handwritten font. On the right side of the image, a computer monitor displays the Balsamiq Cloud landing page. The page has a dark background with a red header bar. The Balsamiq logo is at the top, followed by the text 'Balsamiq Cloud' and 'Fast, Approachable, Collaborative Wireframing'. There is a 'Start Trial' button and a field for 'Your company email'. Below the main form, it says 'Also Available for Desktop' with icons for Mac and Windows. A quote from Mike Solt, Entrepreneur, is shown: 'I've looked elsewhere but Balsamiq continues to get me in the way less than anything else I've tried.' A small photo of Mike Solt is next to the quote. Another quote from Nicole Sundstrom is partially visible on the right: 'Using Balsamiq, I...'. The overall design features horizontal red and white stripes at the bottom.



Survey: Lo-fi vs. Hi-fi



www.yellkey.com/keep

Which of the following is correct about the different types of lo-fi prototyping methods (sketches, wireframes, mockups, wizard-of-oz, etc)? (Select all that apply) *

- In order to do the best job, we need to use most, if not all, of the lo-fi prototyping methods.
- I always need to use wireframes after using paper prototypes, since paper prototypes help me narrow down ideas.
- The goal of lo-fi prototyping is to create cheap, quick, and easy prototypes that enable us to get user feedback to improve our design.
- The lo-fi prototyping methods are independent, we can pick and choose which ones make sense for our application.

Which of the following is correct about the relationship between low-fidelity versus high-fidelity prototype? Select all that apply. *

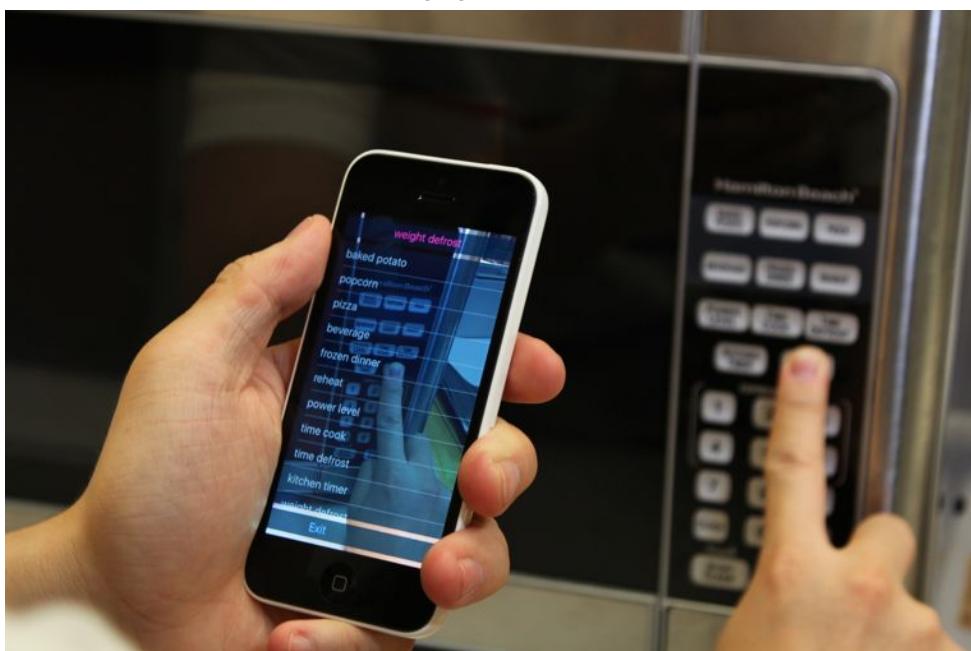
- It is always better to first do a low-fidelity prototype versus a high fidelity prototype because we need to know the basics of user interaction.
- Lo-fi prototypes, if done well, could give us everything we need to understand user interactions with the system.
- The transition between lo-fi and high-fi prototyping is a linear process.
- Lo-fi prototypes could provide us with valuable data and help us evaluate high-level characteristics of the system that could inform us on how to build a high-fi prototype.

Lo-fi prototyping: Wizard-of-Oz

- Have a “wizard” (human being) interact with users for certain functionality (e.g., AI capabilities)
- Users don’t know that humans are behind the scenes
- E.g., if you are building a conversational agent, use a “wizard” behind the scenes to chat with you
 - How do users react?
 - What kind of behavior do users expect from the system?

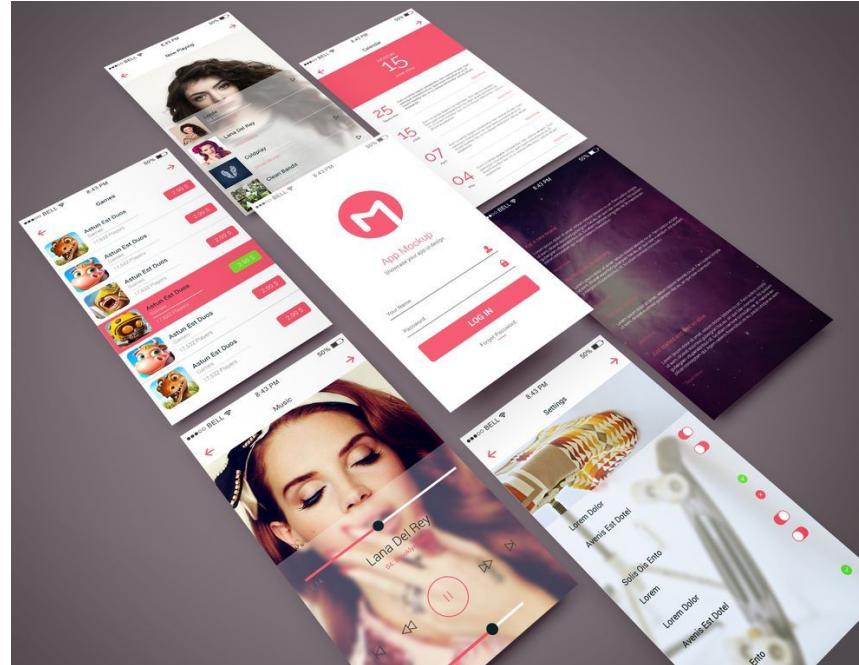
Lo-fi prototyping: Wizard-of-Oz

Example of VizLens: an appliance reader for blind people



Mockups

- Similar to a wireframe (not clickable), but now add in visual elements
- Closer to getting towards hi-fi prototype



<https://uxplanet.org/wireframe-mockup-prototype-what-is-what-8cf2966e5a8b>

What are lo-fi prototypes good for?

- Design and planning (most common use)
 - Moves some assessment into design
 - Get “into” the system quickly
- Assess functionality to be supported
 - Ensures you cover major tasks
 - How does functionality match what the user is trying to do
-

Moving from Lo-fi to Hi-fi prototyping

- Start with a low-fidelity prototype
- Iterate
- Test with 'example' users
- Iterate (mid-fi)
- Test with real users
- Iterate (high-fi)
- More iterating
- Keep iterating...



High-fidelity Prototyping

- Uses materials that you would expect to be in the final product.
- Some high-fidelity prototypes are interactive and may have data flows (canned or not canned)
- Prototype looks more like the final system than a low-fidelity version.

High-fidelity Prototyping

- For a high-fidelity software prototype, common environments including Figma, InVision, LiveCode.
- Danger that users think they have a full system...

Compromises in prototyping

- All prototypes involve compromises
- For software-based prototyping, maybe there is a slow response? sketchy icons? limited functionality?

Survey: Methods Selection



www.yellkey.com/set

Your team is building an online meeting platform that provides better support for * meeting participants to take notes. After storyboarding, you decided on a list of functionalities that your platform will provide. Your goal now is to figure out the task flows of your platform, and the transitions between different tasks.

- Observation because the goal is to observe how users take notes during online meetings.
- Semi-structured interview because the goal is to let users share their experiences about their note taking behaviors during online meetings.
- Prototyping because a prototype is necessary for further development and evaluation of the platform.

Your design team is building an AI-powered robot to help cultivate curiosity in kids. Before the AI capabilities are complete, you want to make design decisions on how kids could interact with the robot. *

Which of the following prototyping methods would you use?

- Wireframe
- Wizard-of-oz
- Paper prototypes
- Mockups

Your design team is interested in developing technologies to support collaborative learning in 8th grade classrooms. You brainstormed 50 ideas and wanted to quickly test which ideas teachers like or not like. *

Which of the following is the best description of which method to use and why?

- Wireframe because teachers need a visual representation of the user interface to understand its functionality.
- Wizard-of-oz because it gives teachers initial experience of the different characteristics of the technologies to support collaborative learning in classrooms.
- Storyboards because it allows the team to get rapid feedback on teachers' reactions on the ideas.
- Paper prototypes because it's cheaper and quicker compared to wireframes and is especially useful for feedback at early stages of development.

Tools

- Balsamiq



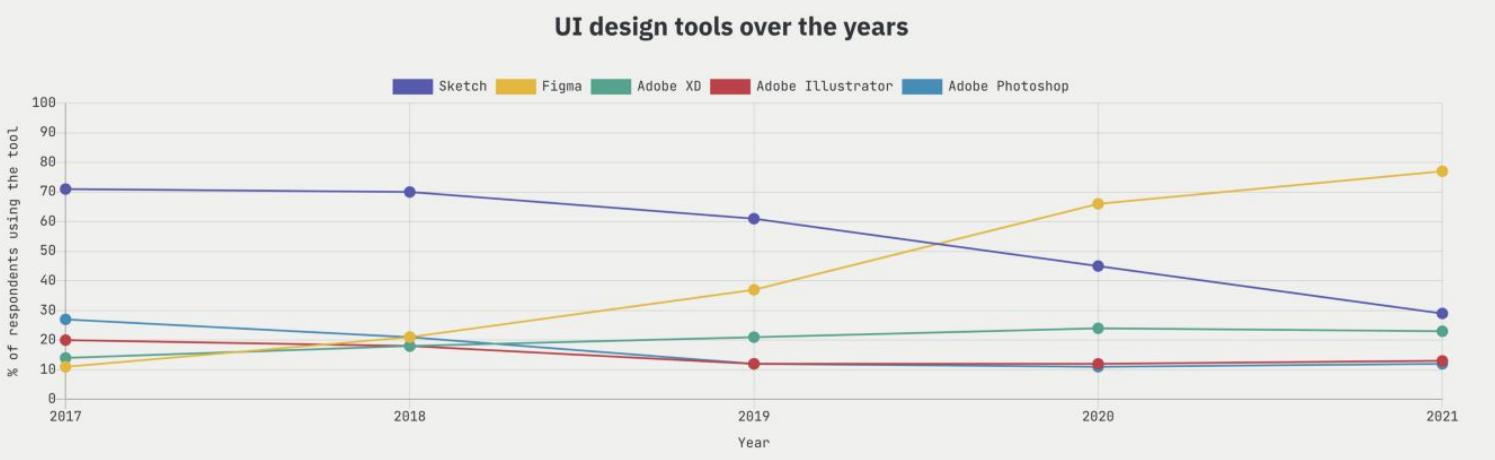
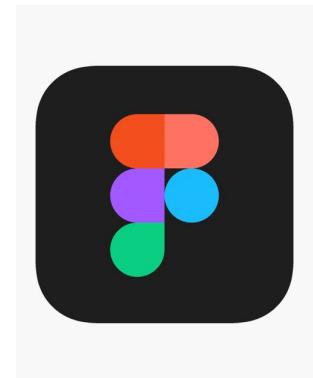
- InVision



- Sketch



- Figma



Logistics

| | | | |
|-------------|---|--------------|---|
| Feb 10 - 16 | L10: Iterative Prototyping and Design L11: High-fi Prototyping & Figma | Discussion 5 | Quiz 3 due Tue Feb 11 11:59pm Milestone 1 due Sun Feb 16 11:59pm |
| Feb 17 - 23 | L12: Industry Practitioner's Perspective No lecture Thursday | Discussion 6 | Midterm Exam Feb 20th 6-7:30pm |