EAST WEST UNIVERSITY

CSE 428
Human Computer Interaction

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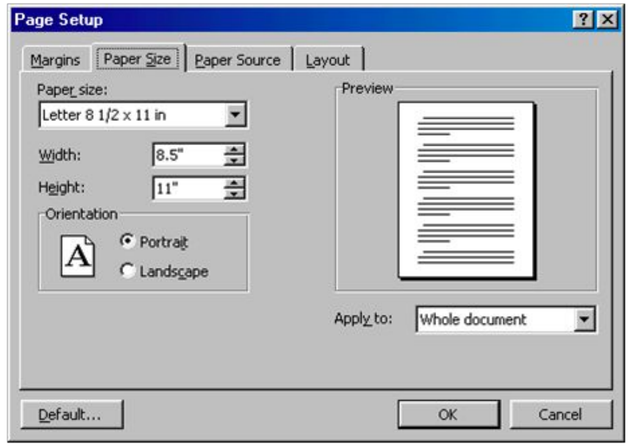
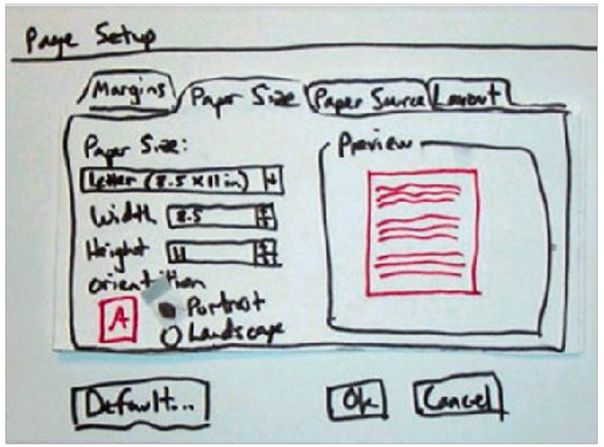
Prototyping

Fidelity in Prototyping

- **High Fidelity**
  - Prototypes look and feel more like the final product

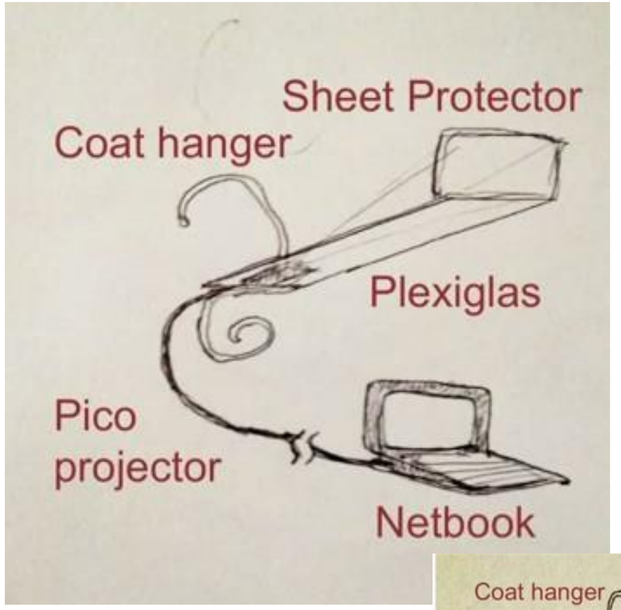


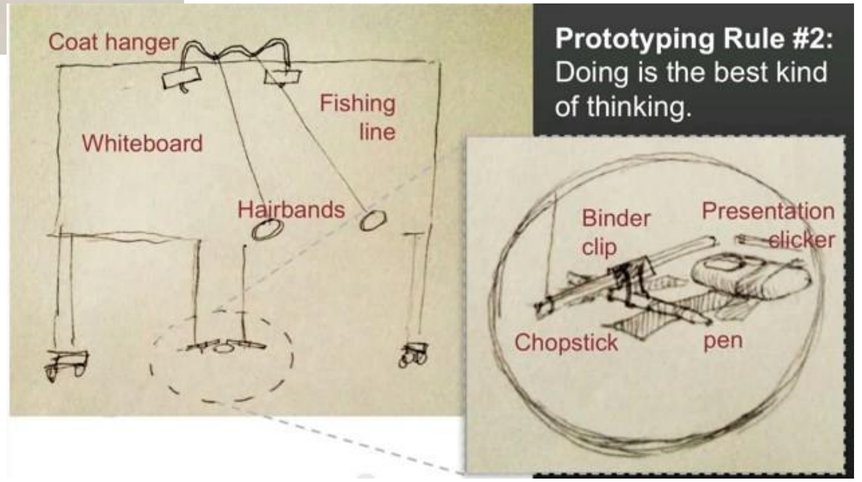
- **Low Fidelity**
  - Designer sketches with many details missing



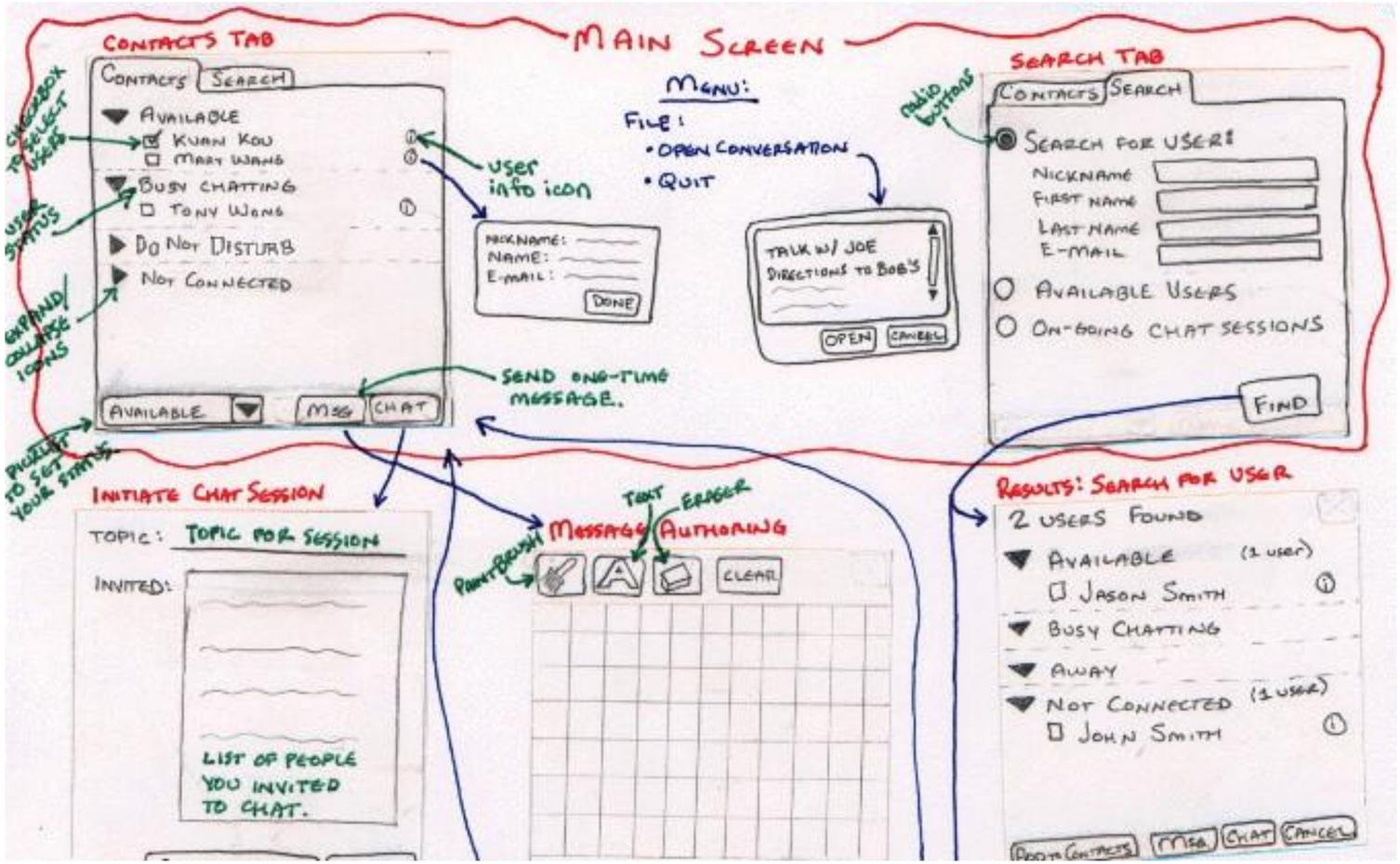
Why Prototype?

- Get feedback earlier, cheaper
- Experiment with alternatives
- Easier to change or throw away

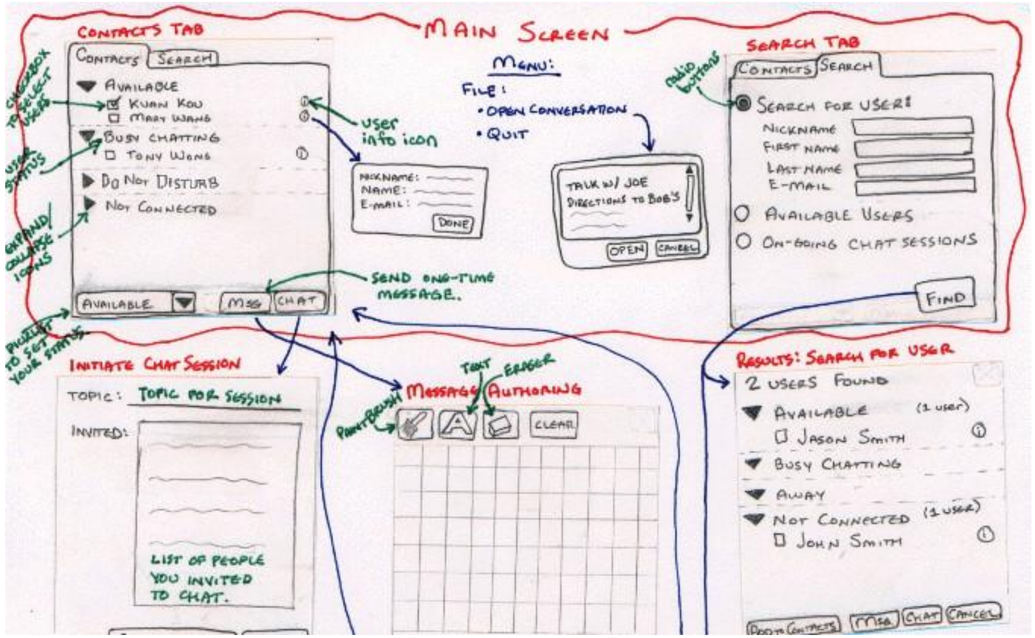


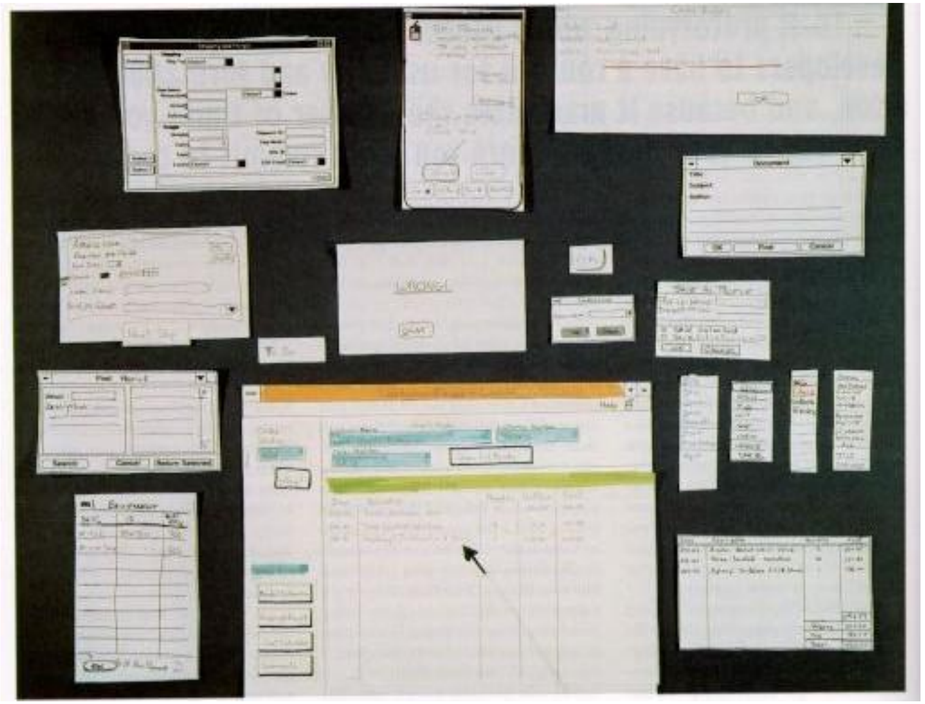


Sketches (low fidelity)



Paper Prototypes (low fidelity)





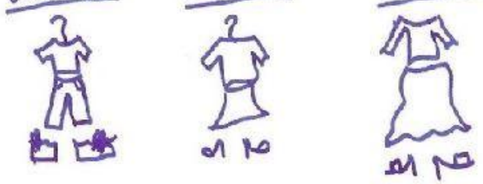
Sketching

Store for the Style-Challenged

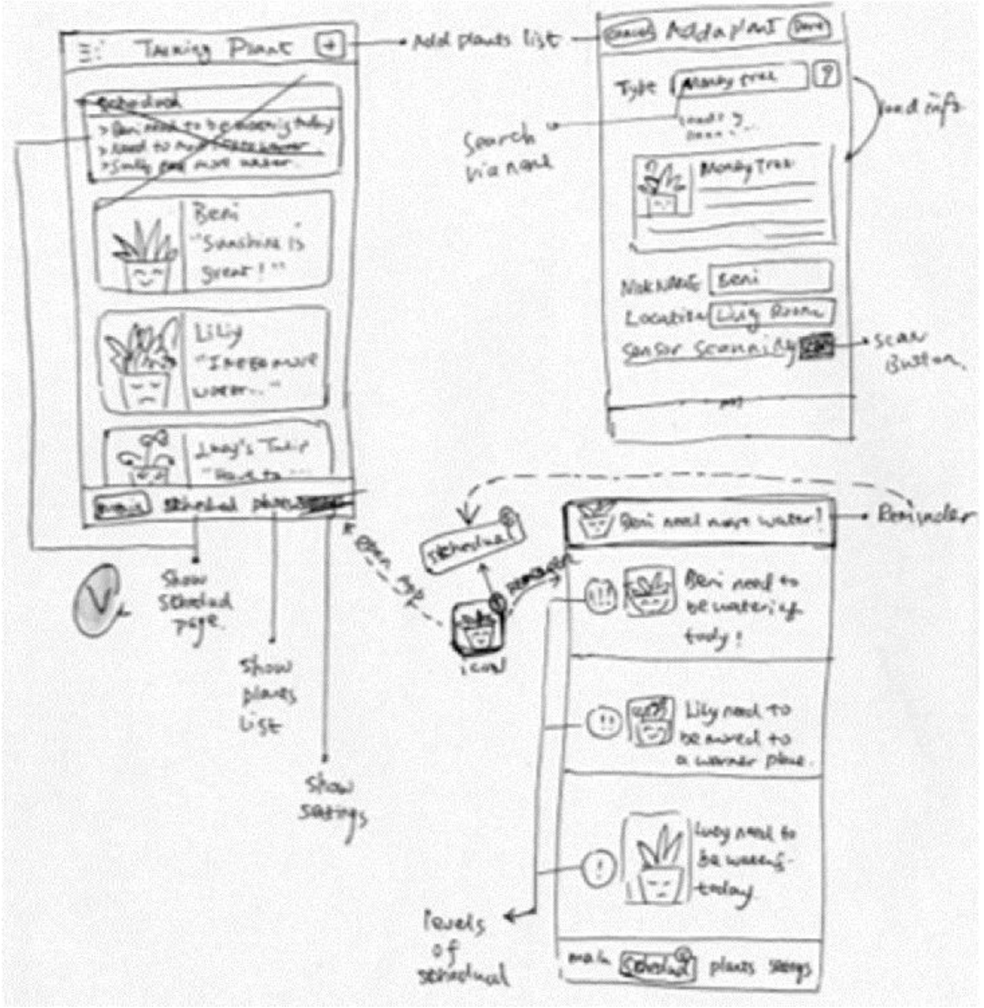
As is...

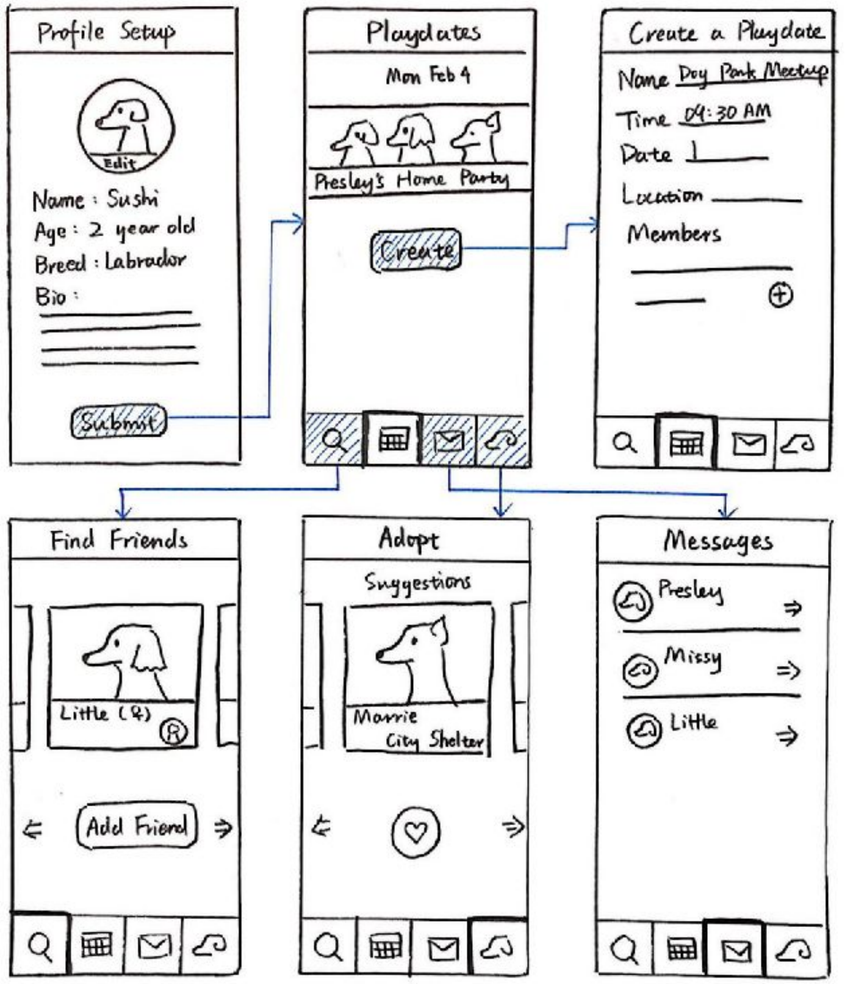
As it should be...

outfit #1 outfit #2 outfit #3



(pre-selected to match so you don't have to choose.)


Taming Plant
Add plants list
Add plant
Type
Search via name
load info
Beni
"Sunshine is great!"
Lily
Lucy's Trip
Nickname
Location
Sensor Sensitivity
scan Button
Show Schedule page
Show plants list
Show settings
Reminder
icon
Beni need water!
Beni need to be watered today!
Lily need to be moved to a warmer place.
Lucy need to be watered today
levels of schedual
plants storage

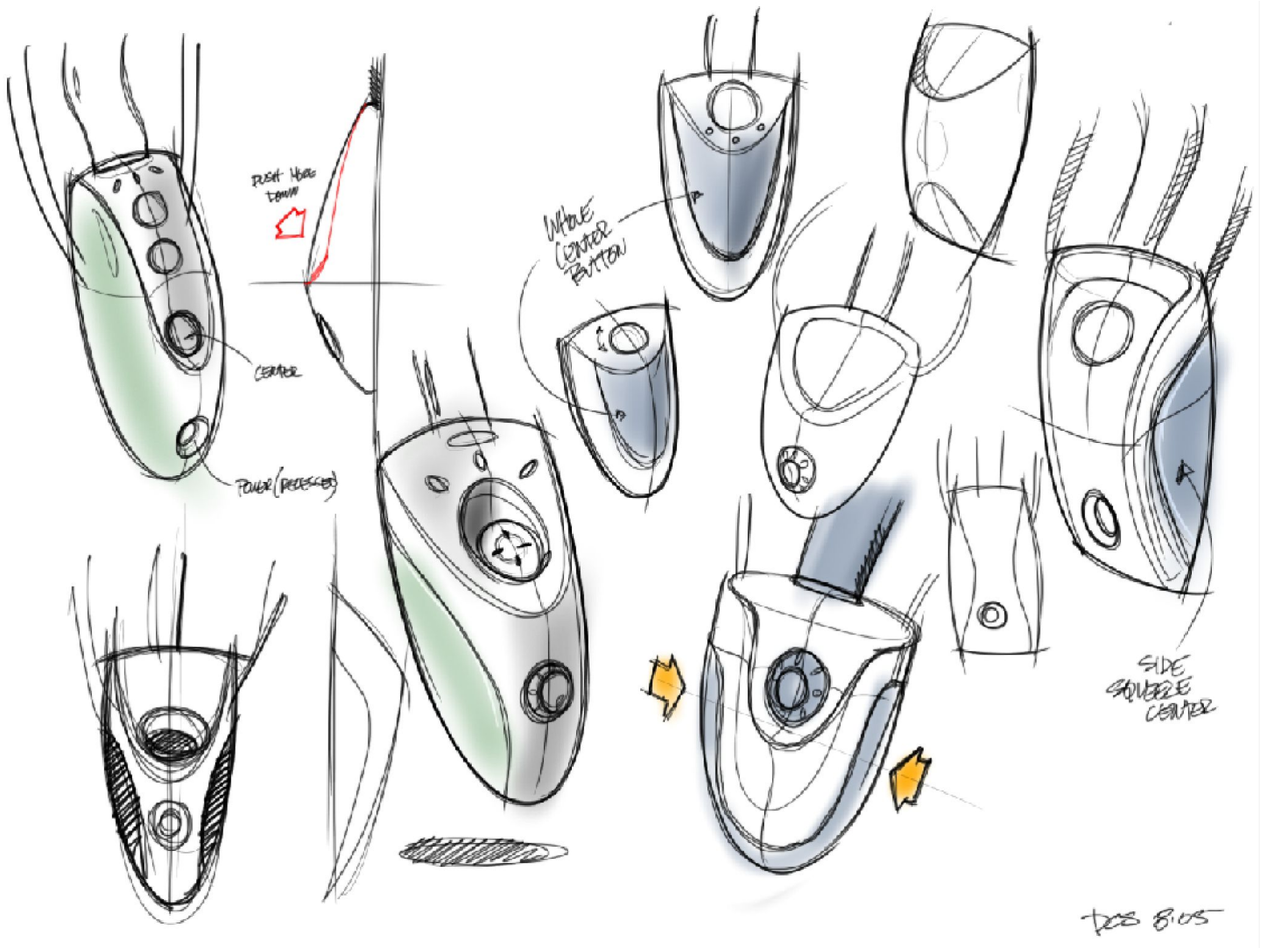

Profile Setup
Edit
Name : Sushi
Age : 2 year old
Breed : Labrador
Bio :
Submit
Playdates
Mon Feb 4
Presley's Home Party
Create
Create a Playdate
Name Dog Park Meetup
Time 04:30 AM
Date
Location
Members
Find Friends
Little (♀)
Add Friend
Adopt
Suggestions
Marrie
City Shelter
Messages
Presley
Missy
Little

Why Sketch?

- Sketching is the fastest instance of design iteration (an entire design-implement-evaluate cycle in as little as a few minutes!)
- We are still in the tightest part of the spiral in the **spiral model**
- Because it's so cheap, we can also **parallel prototype** (which you've learned is good to do)
- All these things help us **boost creativity**!
- As our ideas get more in-depth (moving towards higher fidelity prototypes), we narrow and switch to **serial prototyping**

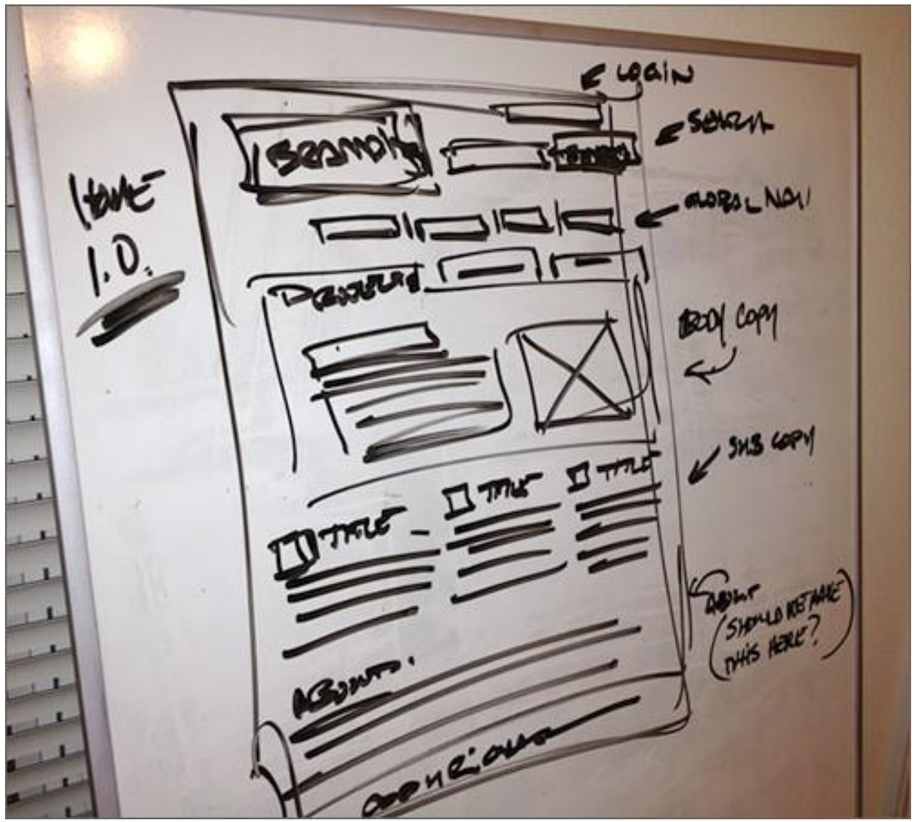
Sketching is…

A **process** that enables you to think through ideas and convey design ideas to others very early in the design phase



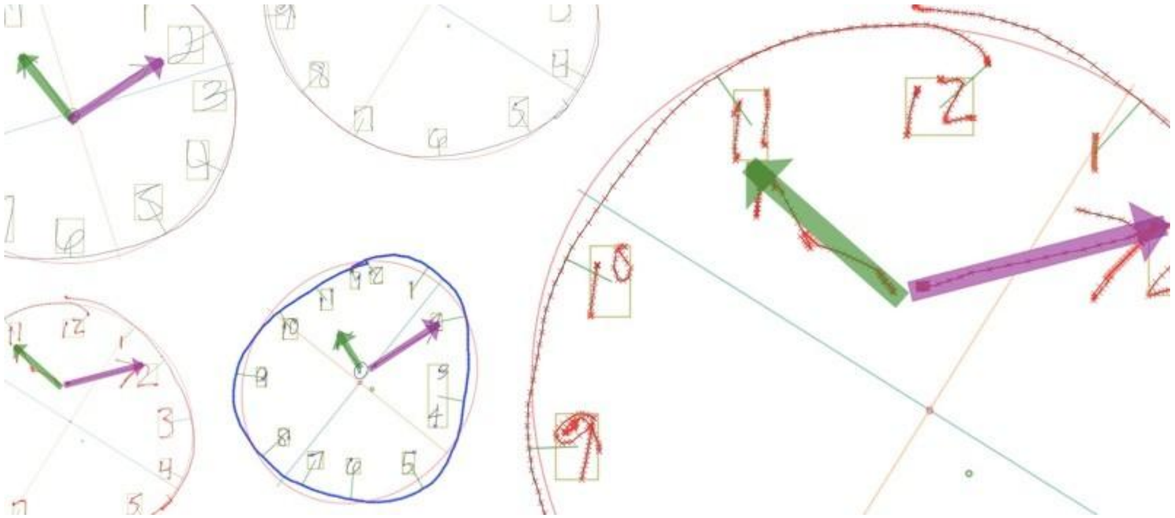
12 Important Properties of Sketches

Quick



A sketch is quick to make,
or at least gives that impression

Timely



A sketch can be provided when needed

Inexpensive

Cost must not inhibit the ability to explore a concept, especially early in design

Disposable

If you cannot afford to throw it away,
then it is not a sketch

But they are not "worthless"

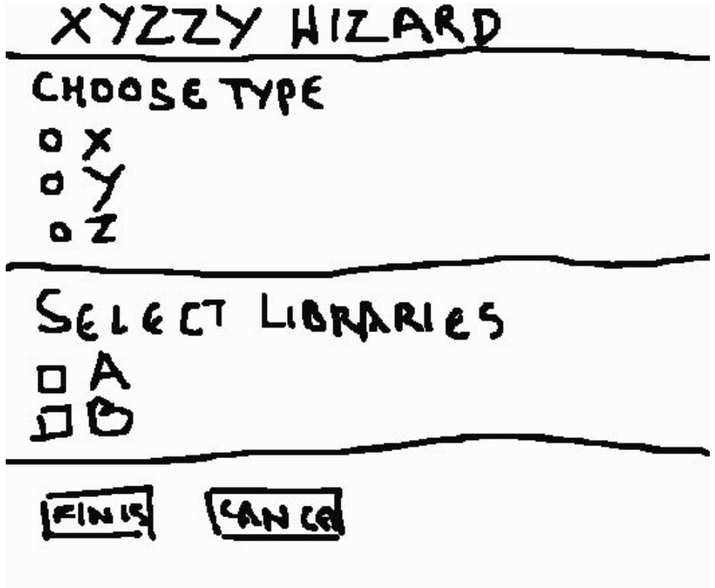
Plentiful

Sketches do not exist in isolation

Sketches are made to be compared

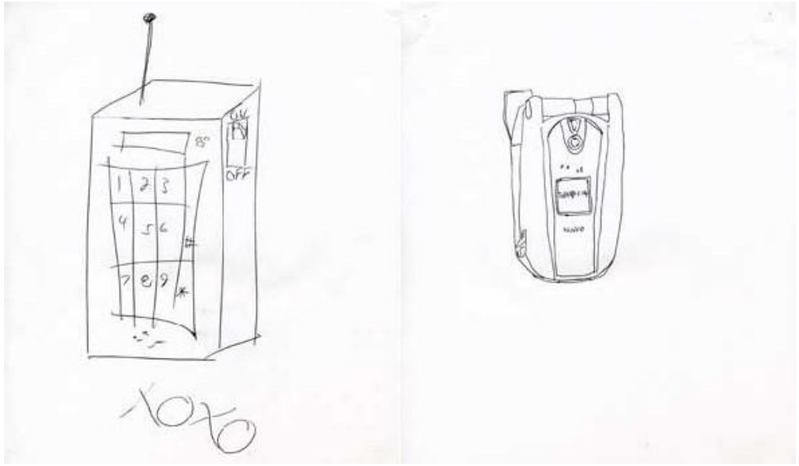
Meaning and relevance
is in the context of a
collection or series

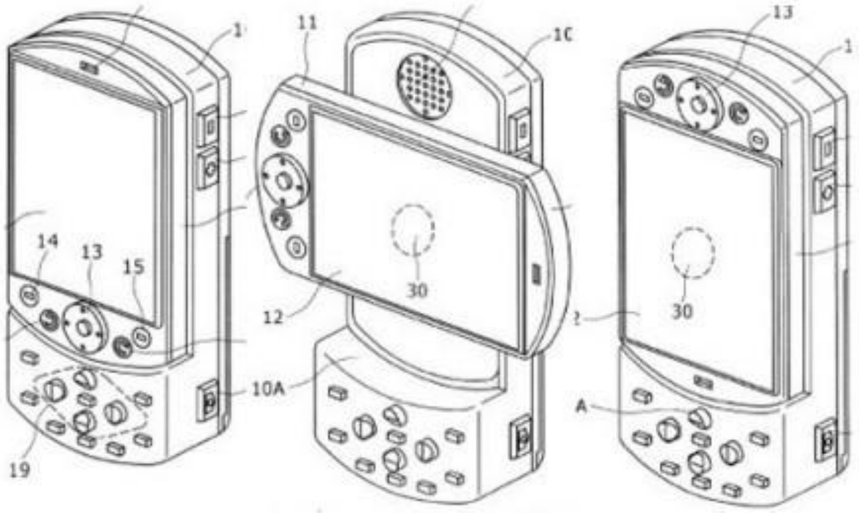
Clear Vocabulary



The way it is rendered makes it distinctive that it is a sketch (e.g., style, form)

Distinct Gesture



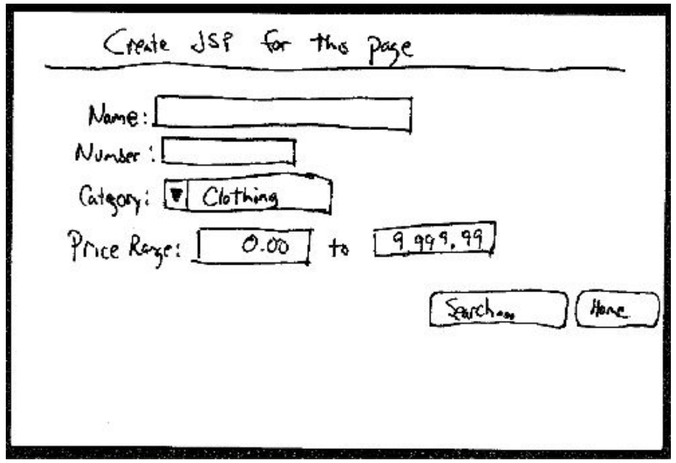


Fluidity of sketches gives them a sense of openness and freedom

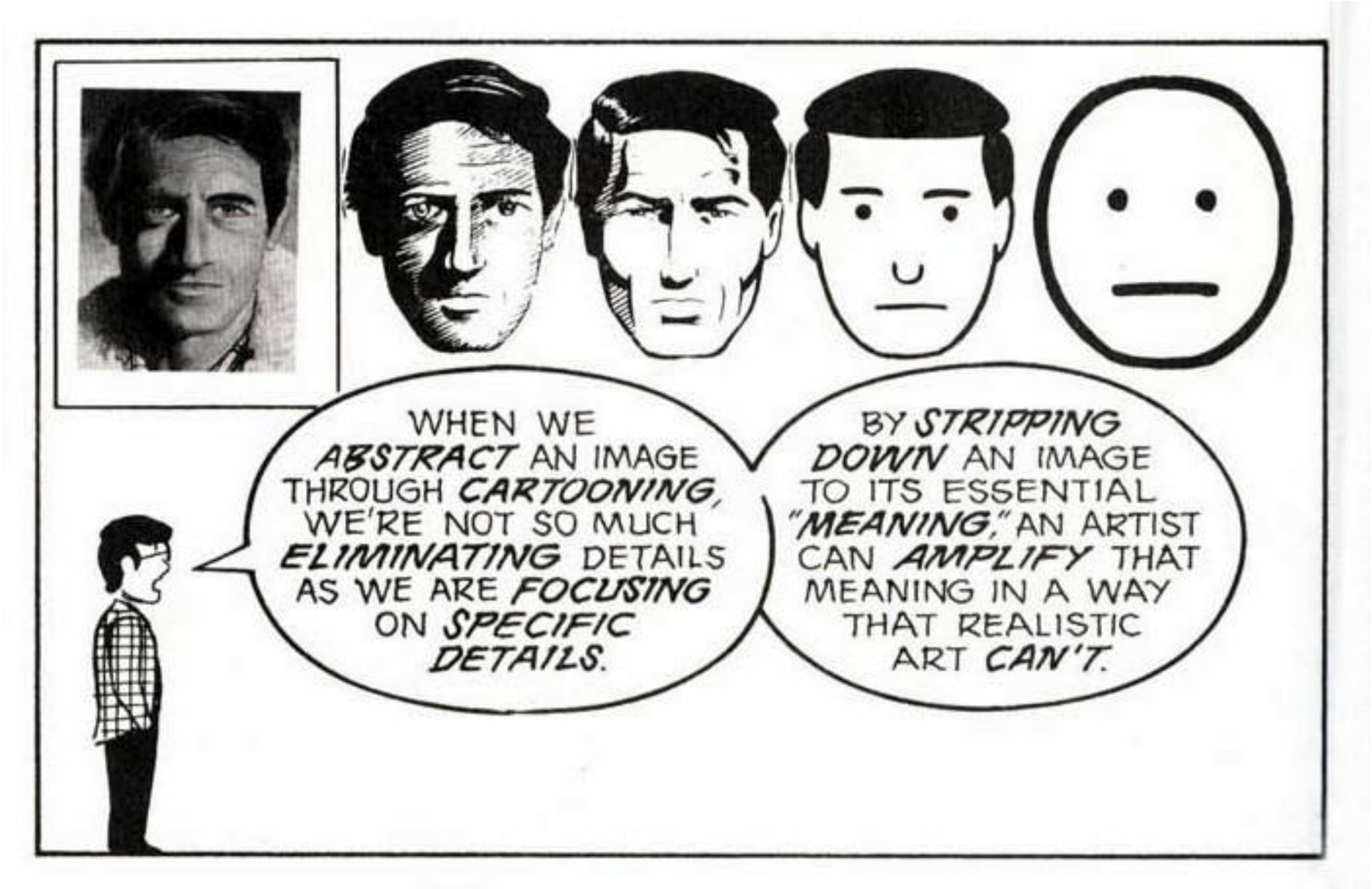
Opposite of engineering drawing, which is tight and precise

Minimal Detail

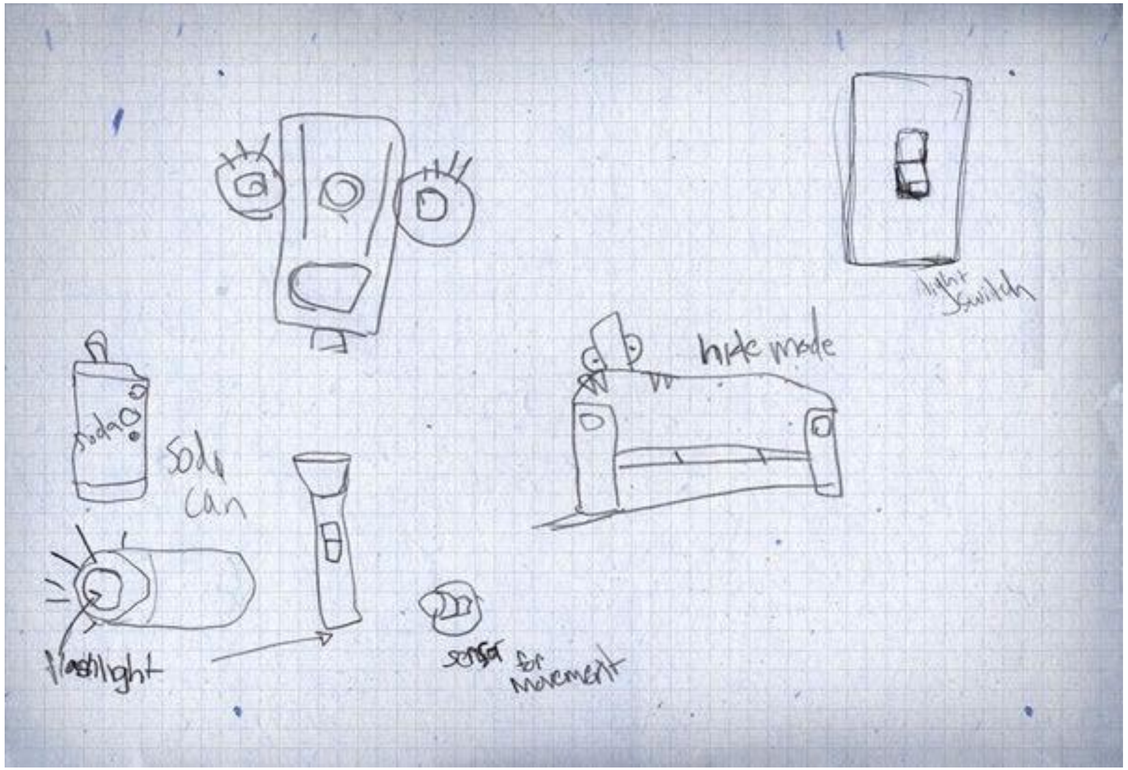
Include only what is required to render the intended purpose or concept



Minimal Detail



Appropriate Degree of Refinement



Make the sketch as refined as the idea

If you have a solid idea,
make the sketch look
more defined

If you have a hazy idea,
make the sketch look
rougher and less defined

Suggest and Explore Rather than Confirm

Sketches should act as a catalyst
of the desired and appropriate behaviors,
conversations, and interactions with others
(such as the people giving you feedback on
your sketch).

Ambiguity

Intentionally ambiguous

Value comes from being
able to be interpreted
in different ways, even by the
person who created them

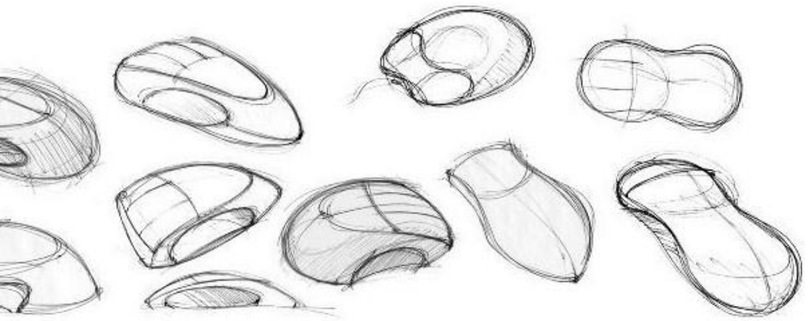
Sketches have holes

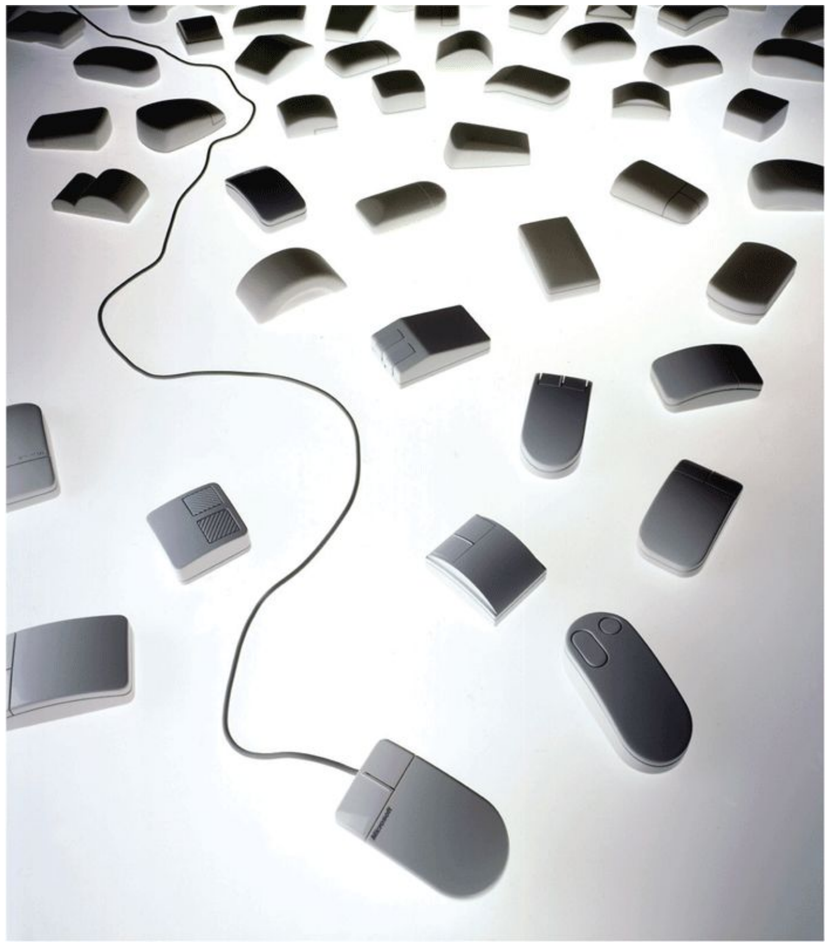
Rapid Prototyping

Moving from Sketches to Prototypes

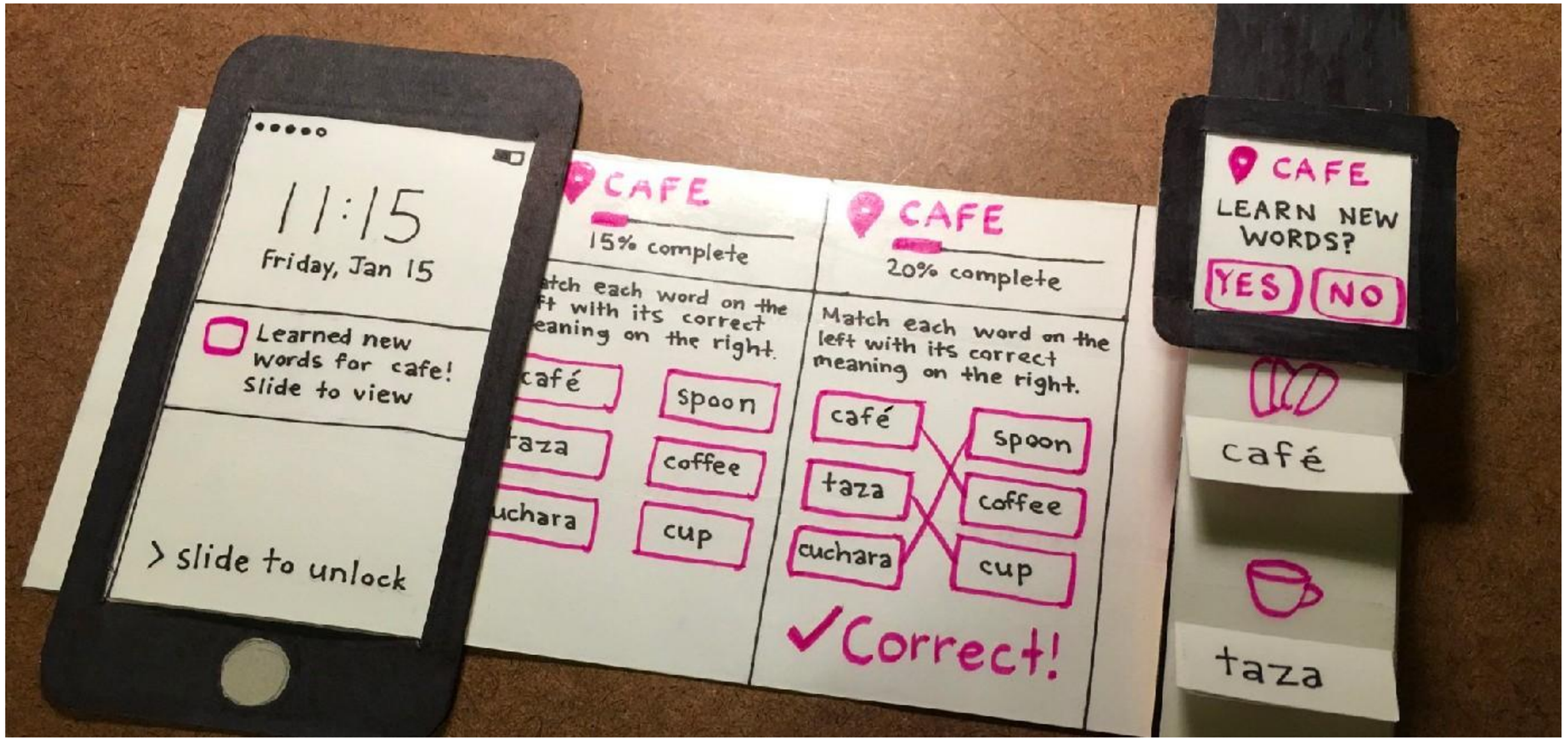
Sketch	Prototype
Invite	Attend
Suggest	Describe
Explore	Refine
Question	Answer
Propose	Test
Provoke	Resolve
Tentative, non committal	Specific Depiction

Example: Rapid prototyping the mouse

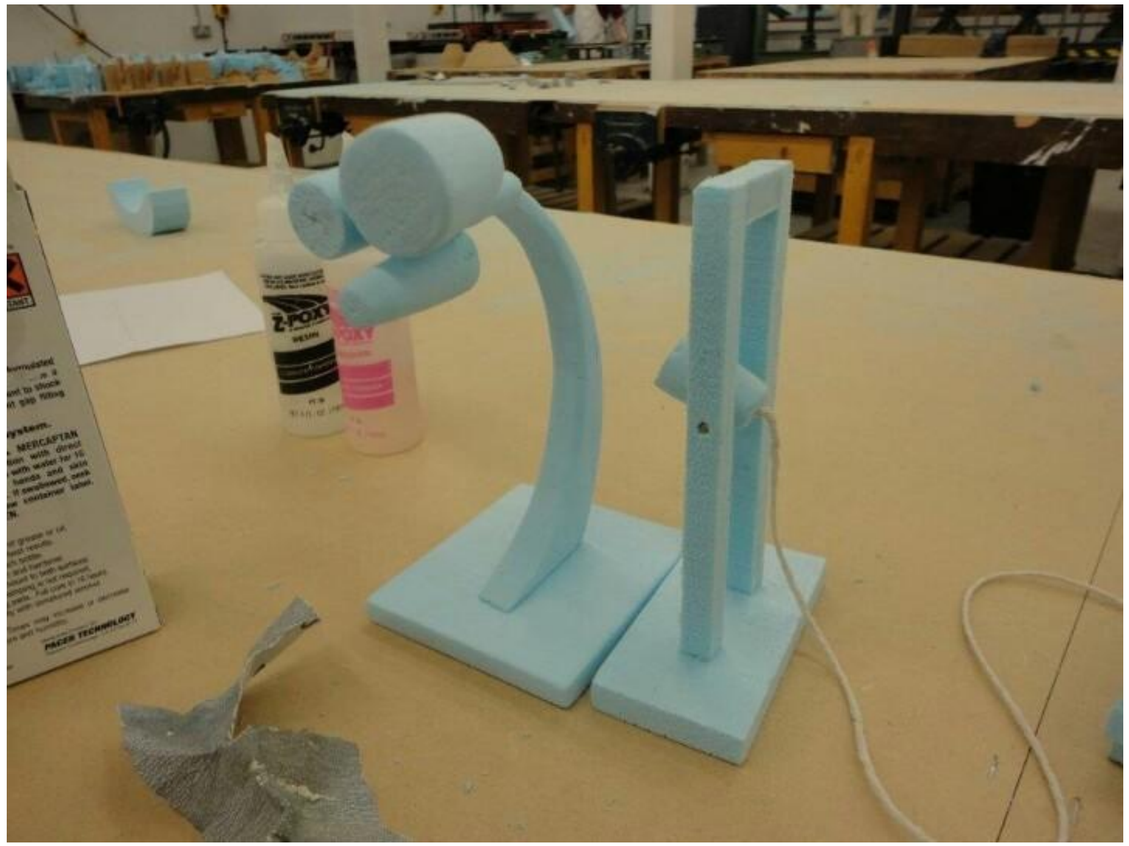




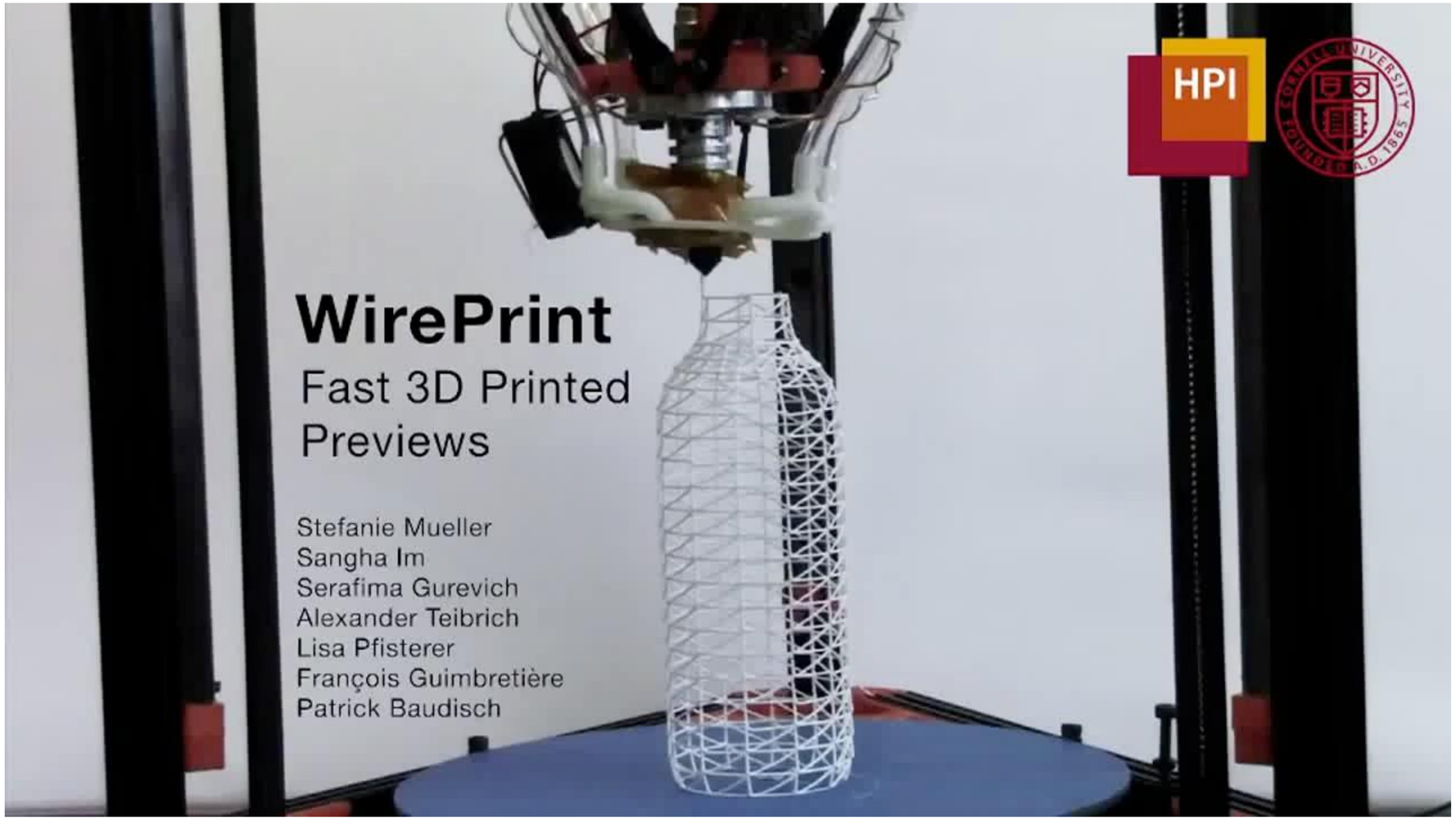
Paper Prototyping



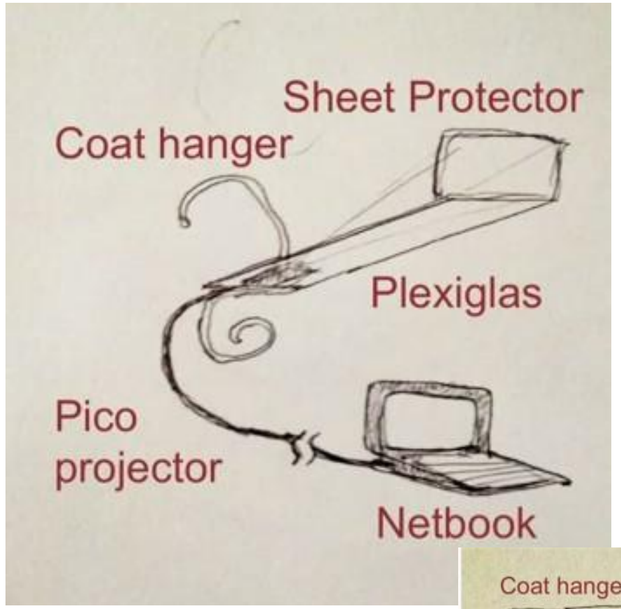
Rapid Physical Prototyping

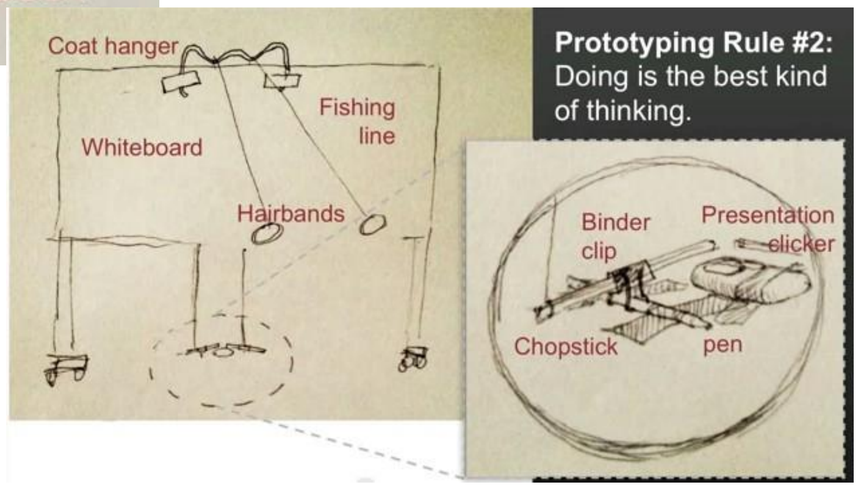


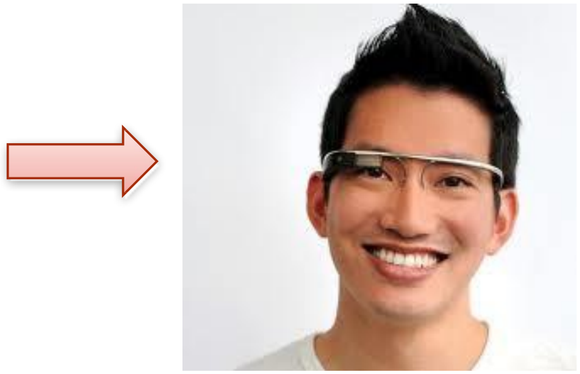
Rapid Physical Prototyping



Example: Rapid Prototyping Google Glass

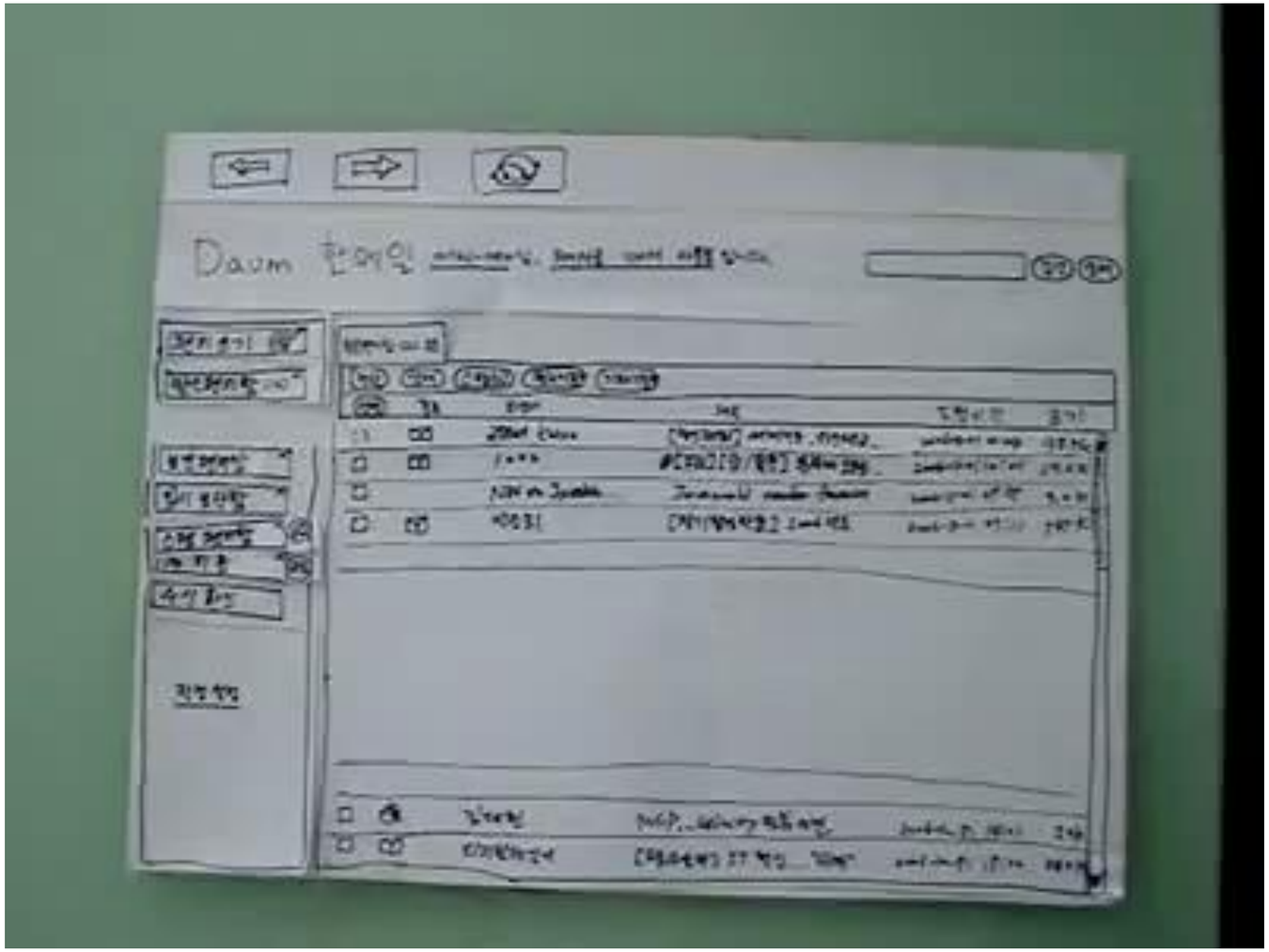






Paper Prototyping

Paper Prototypes are interactive!
So you can test them with users!

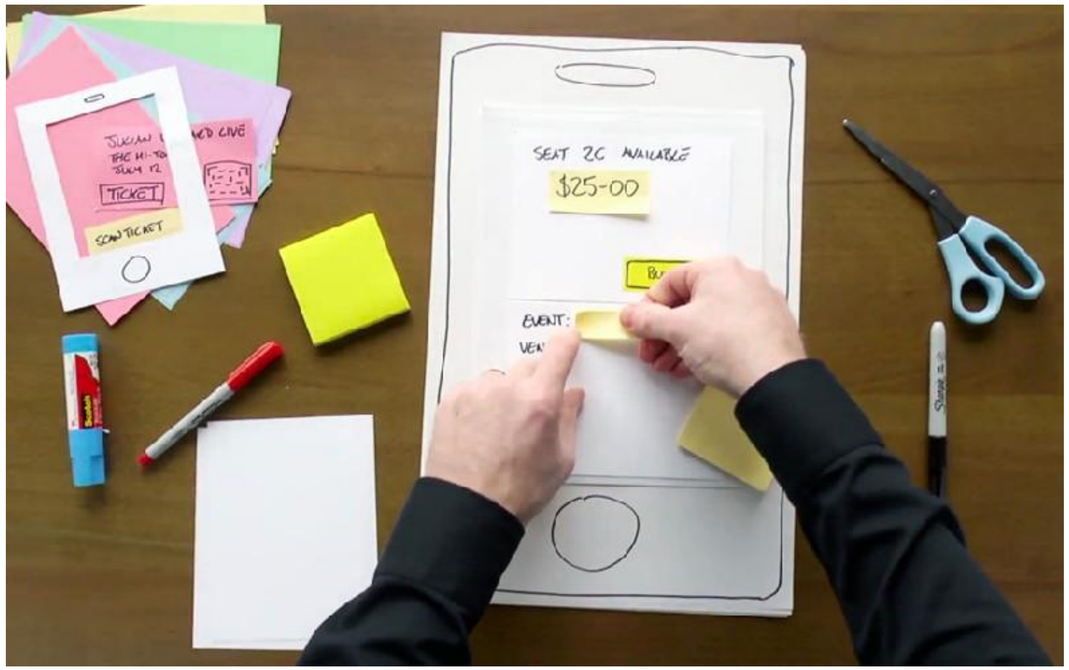


Paper Prototypes

- Different sketches of screen appearance on paper
- Interactive
  - Different pieces of paper show different views, dialog boxes, menus, etc.
  - User interacts by writing and pointing
- A person simulates the computer's operation
  - Putting down & picking up pieces
  - Writing responses on the "screen"
  - Describing effects that are hard to show on paper

Why Paper Prototype?

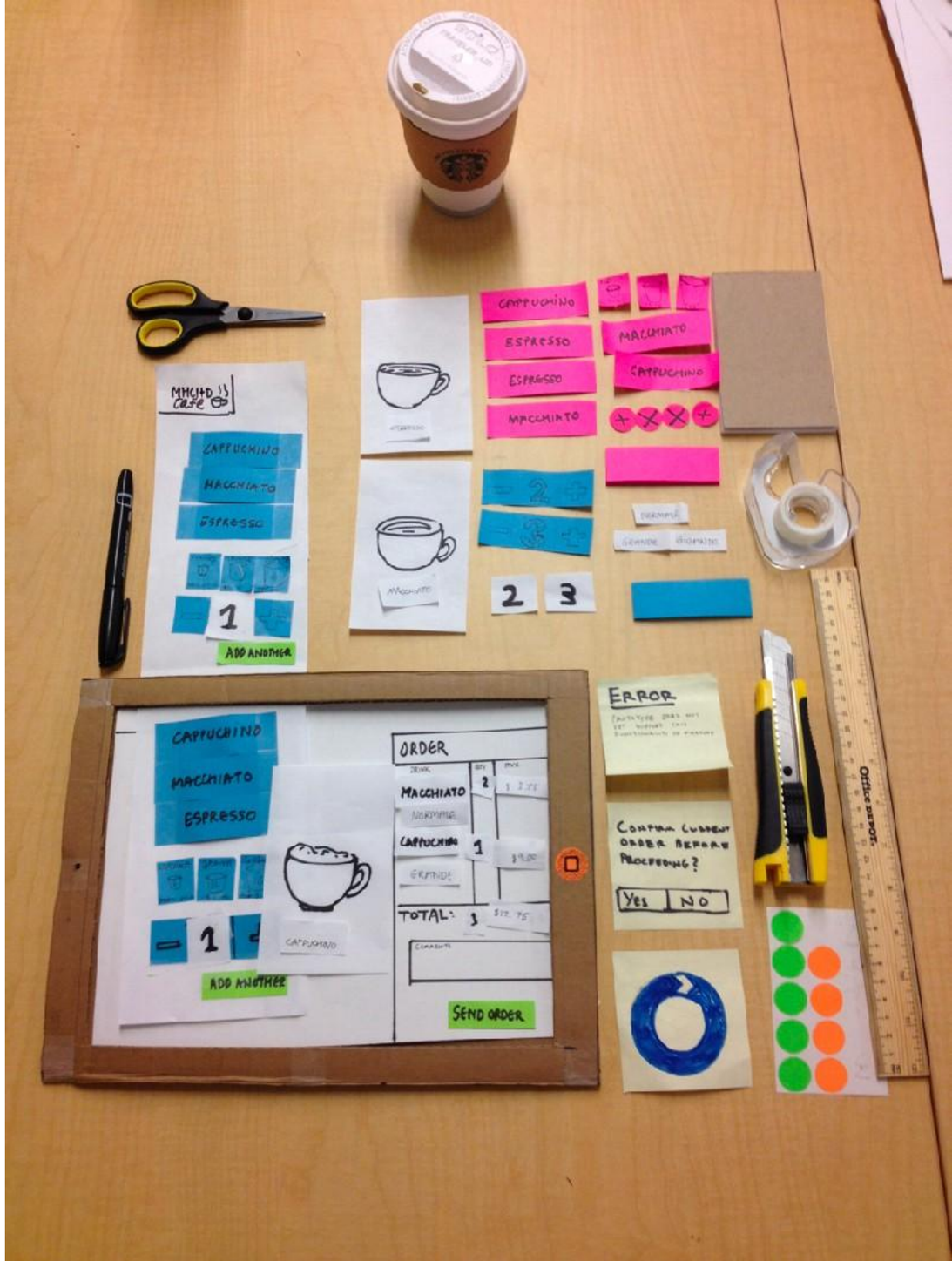
- You can still make it quickly
- Easier to change
  - Easy to make changes between user tests, or even during a user test
  - No code investment - everything will be thrown away (except the design)
- Focuses attention on the big picture
  - Designer doesn’t waste time on details
  - User makes more creative suggestions, not nitpicking
- Only kindergarten-level crafting skills are required!



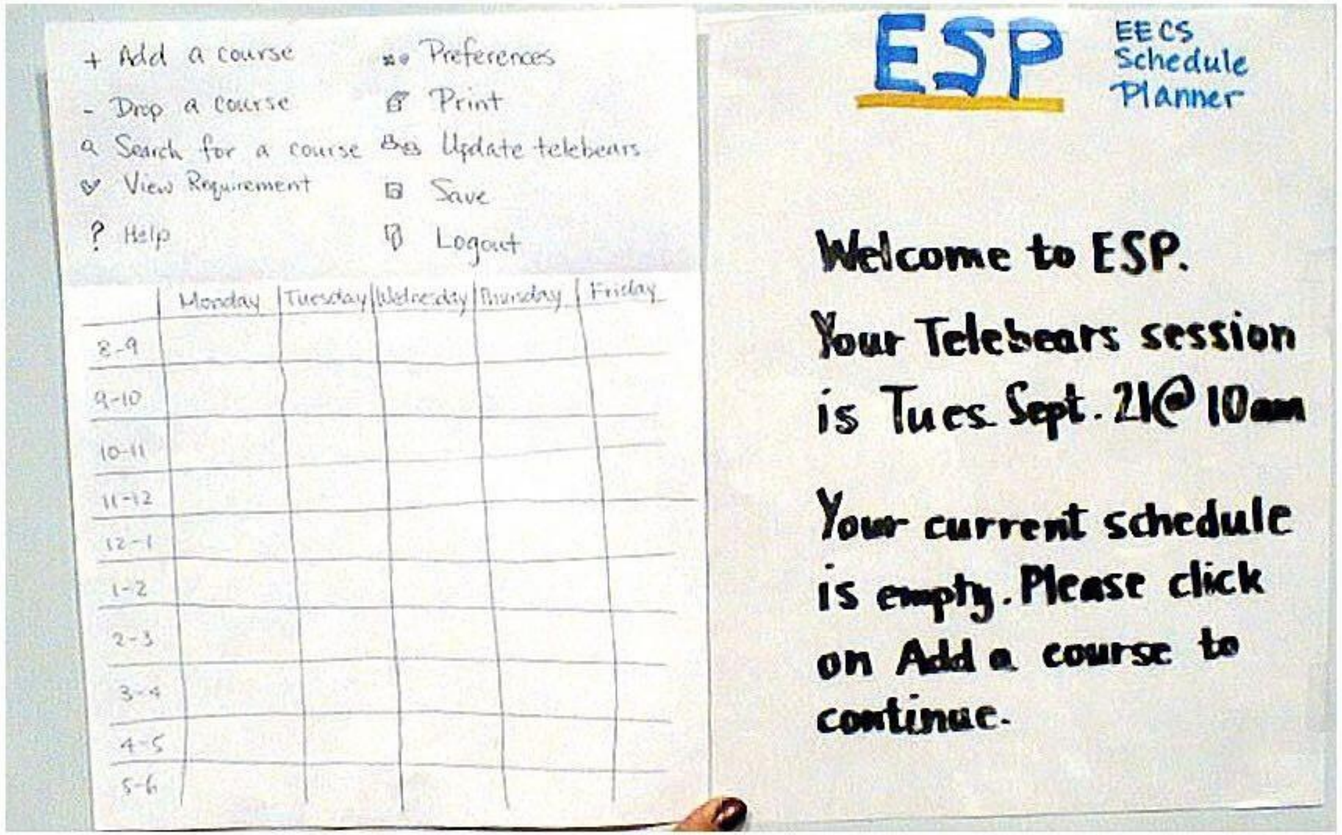
How to make paper prototypes

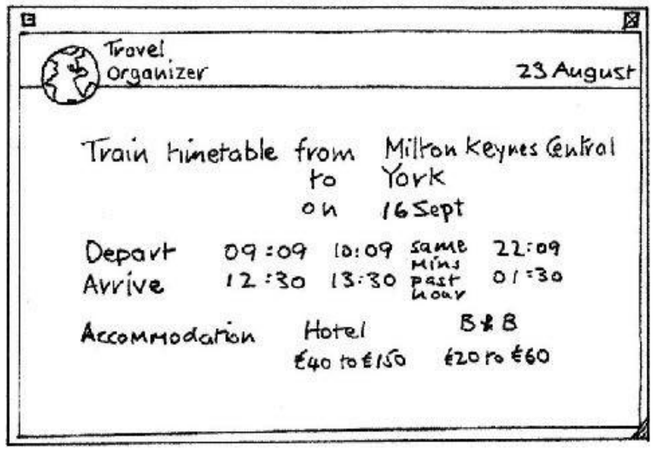
Basic Materials

- Poster board, butcher paper, and/or printer paper
  - for background, window frame
- Index cards, post-its
  - for different views to swap in and out, menus, dialog boxes
- Tape, stick glue
  - for keeping pieces fixed
- White correction tape
  - For text fields, checkboxes, short messages
- Overhead transparencies
  - for highlighting, user “typing”
- Pens and markers in different colors and sizes, scissors, stickers, rulers
- Sometimes cardboard to make thicker or 3d objects



Compose interface from different pieces of paper





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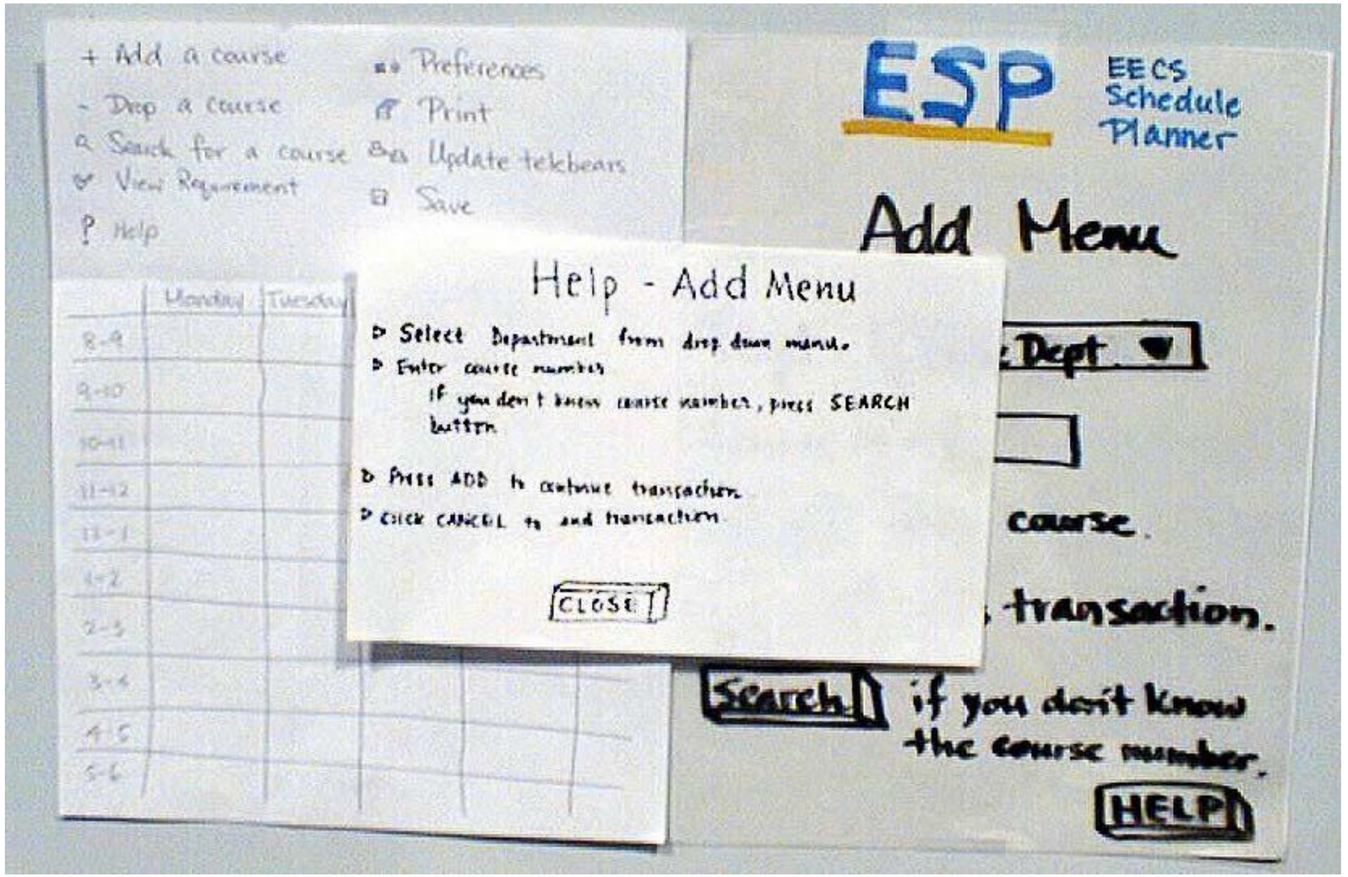
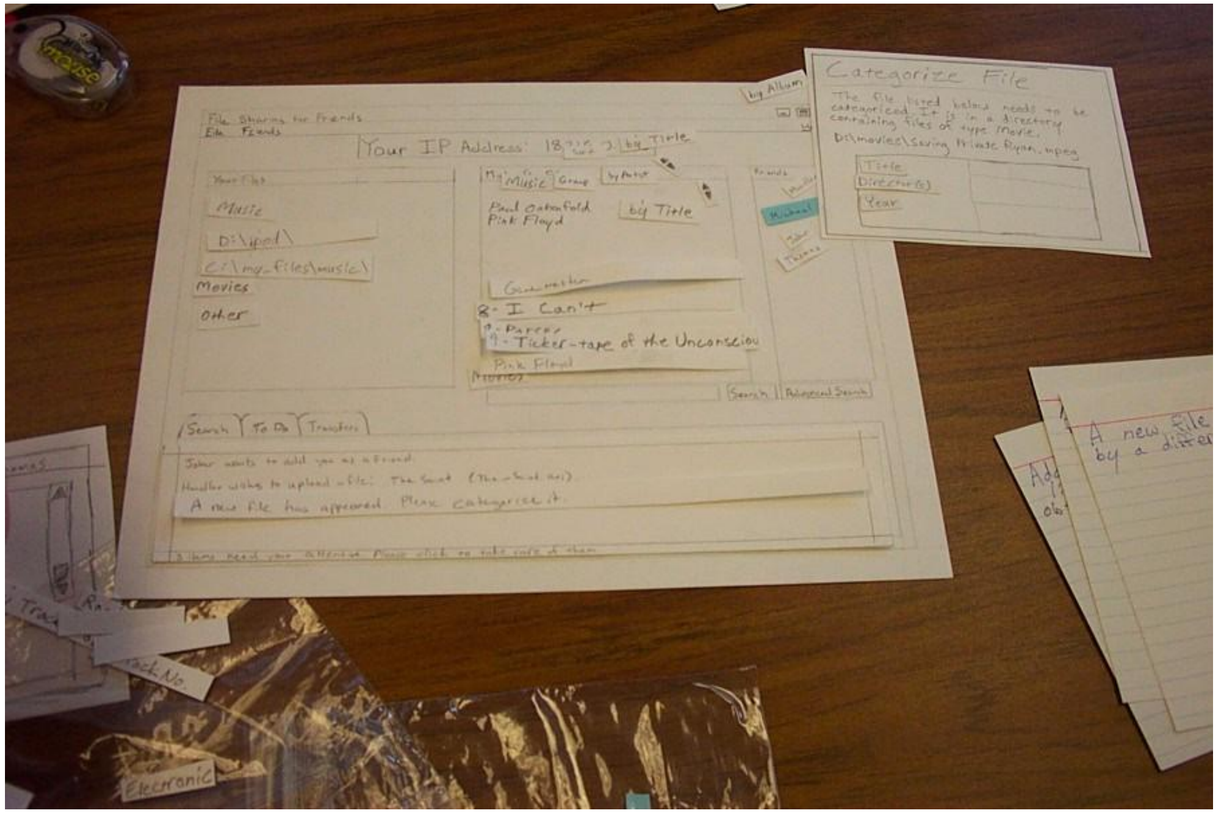
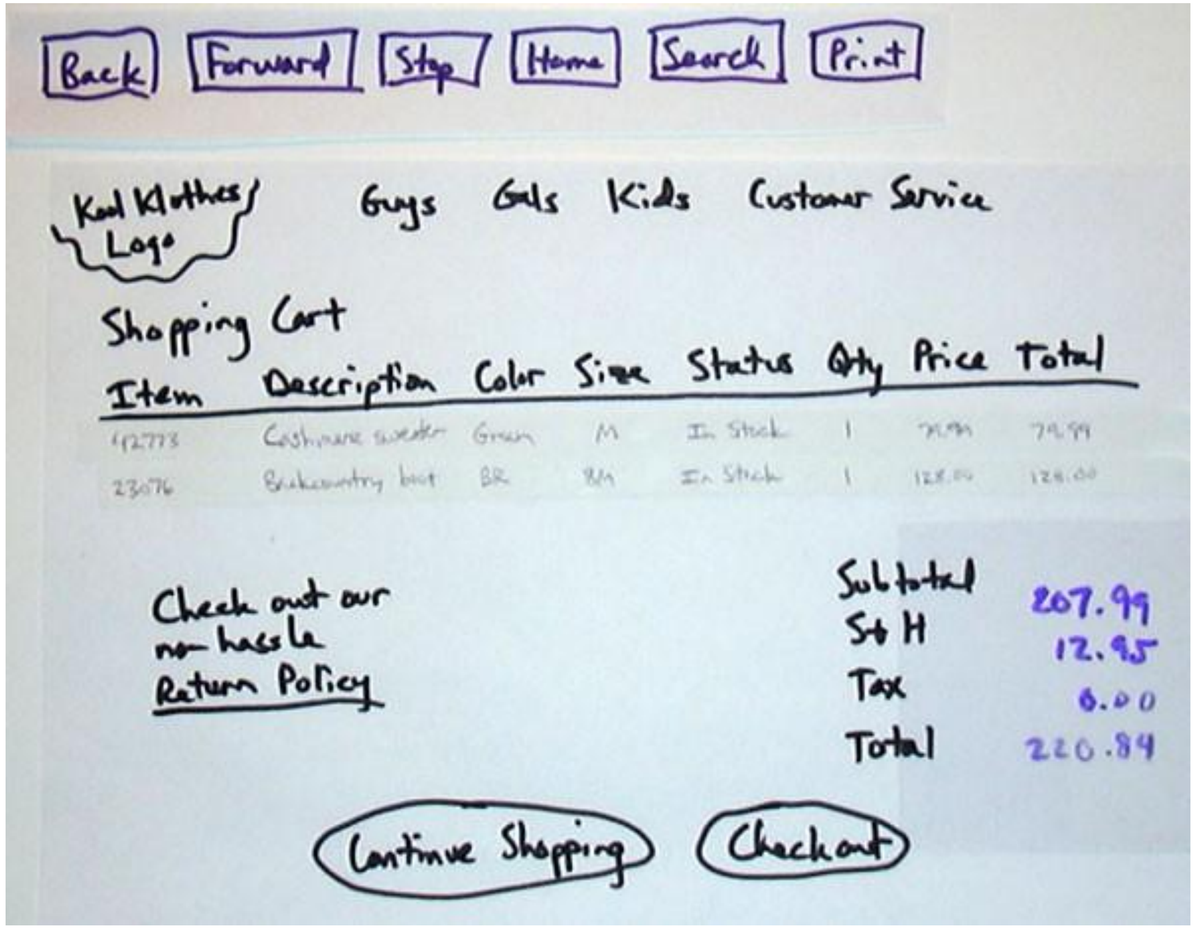


Post-it glue helps lots of little pieces stay put



Write on transparencies to “type” or dynamically change the UI



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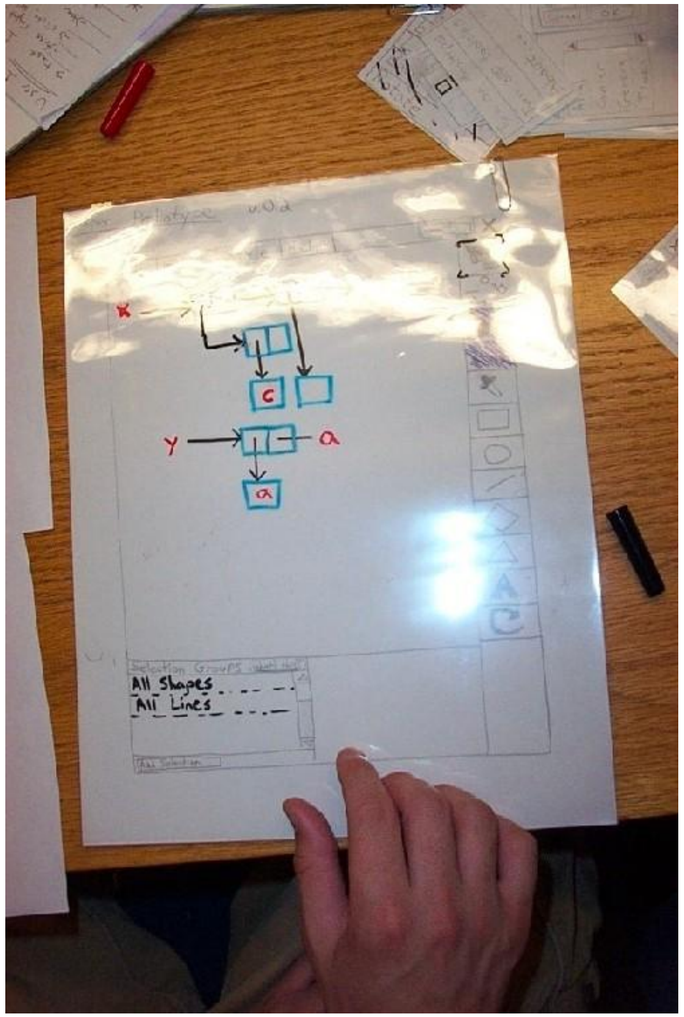
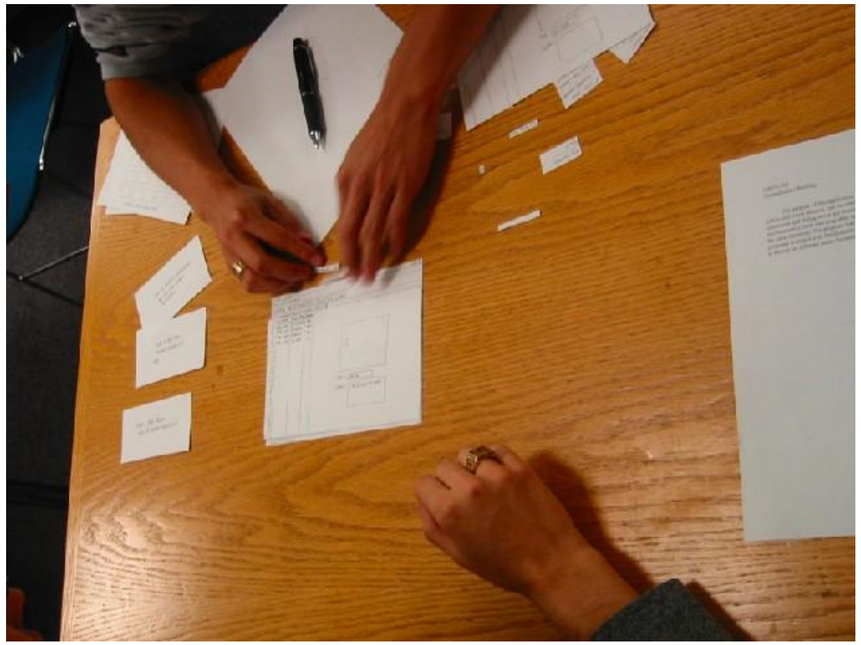


Tips for good paper prototypes

Make it larger than life

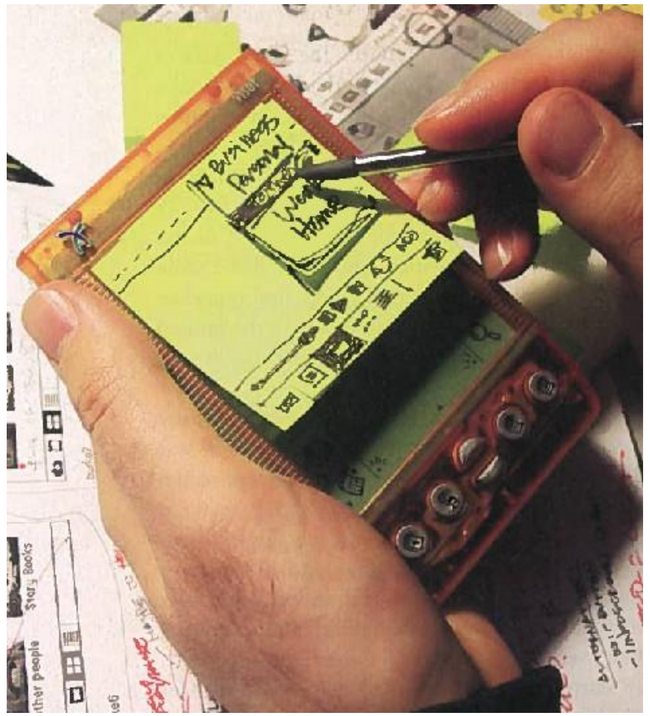
- Remember - fingers are bigger than a mouse pointer
- People usually write bigger than 12 point font
- Easier to see from a distance, like across a table
- Lots of tiny pieces of paper are a hassle



too many tiny pieces to wrangle

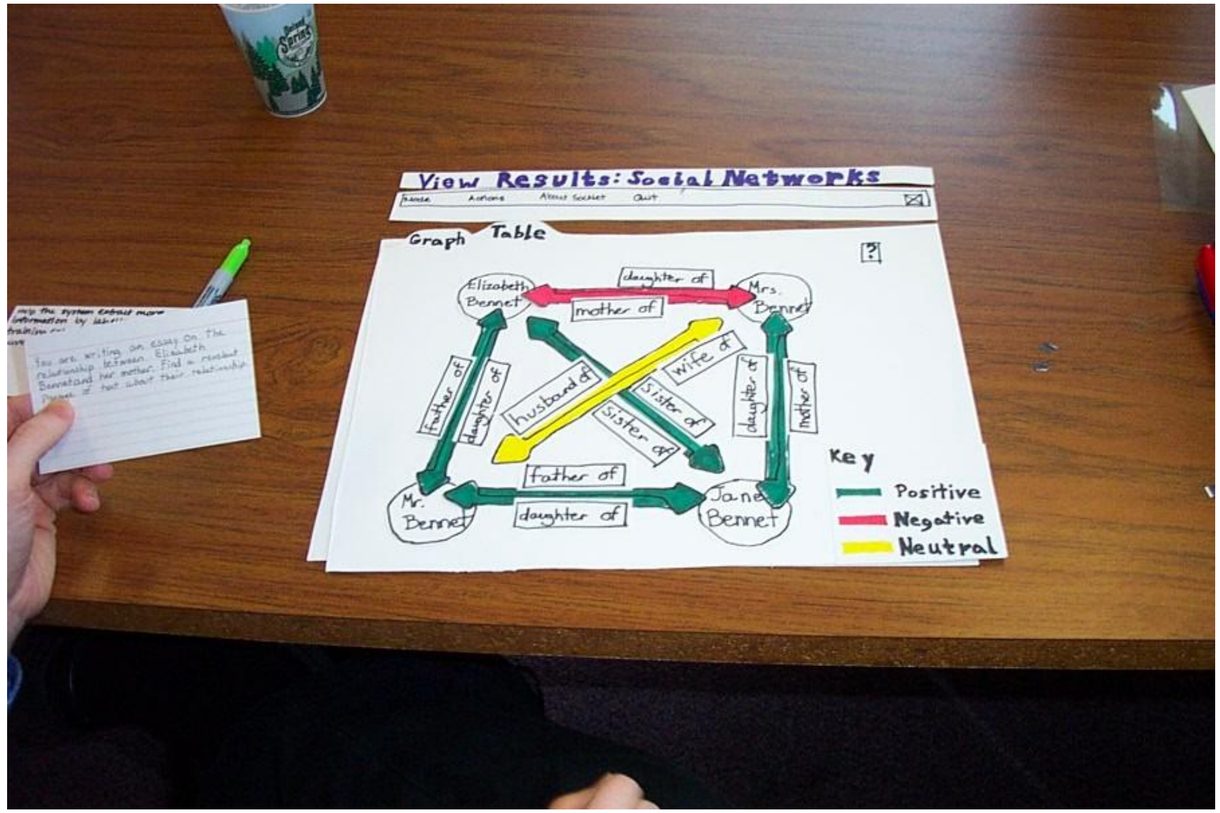
...while remembering your target form constraints

- If you are dealing with an unusually small display, you may want to keep that in mind when thinking about how many things would fit in the view



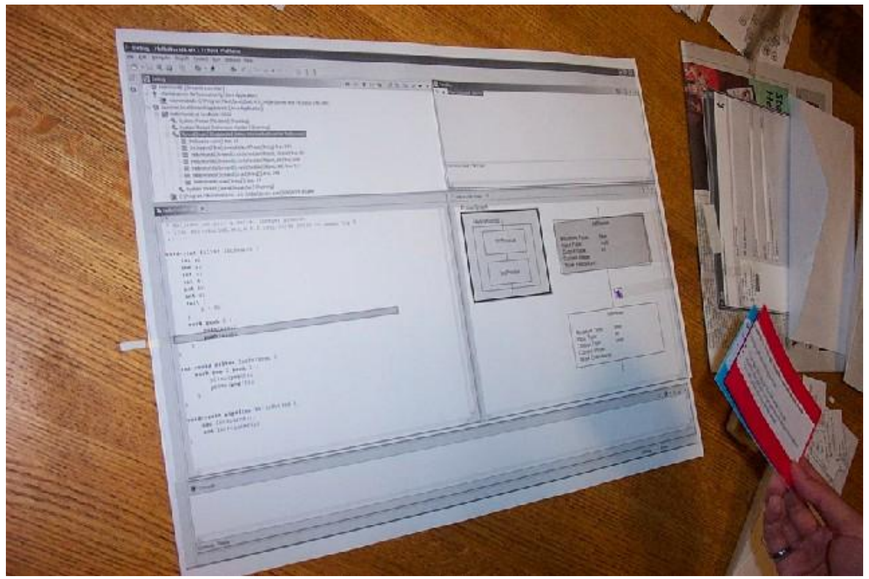
Write/sketch using darker and thicker marker, not pencil

- People are going to be looking at your paper prototype from farther away (or remotely). Pencil sketches are going to be hard to see.
- Sticking with monochrome is okay, unless color is important for conveying some part of your UI

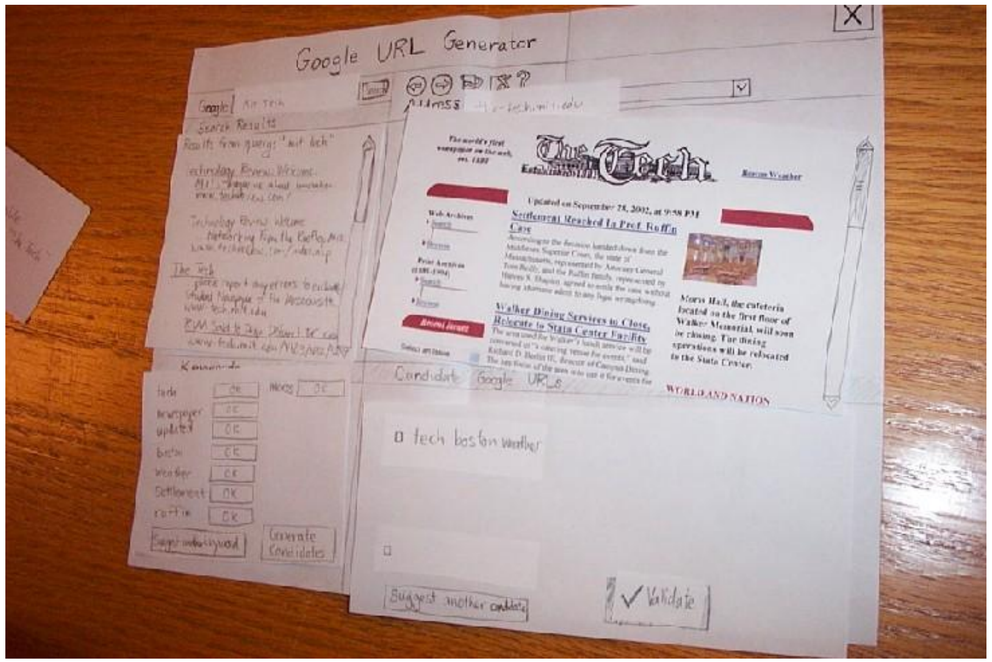


Sometimes including printouts can be useful/faster than sketching

- Don’t want to make the whole thing digital (becomes easier to nitpick)
- Can do a hybrid approach instead



too detailed and hard to read

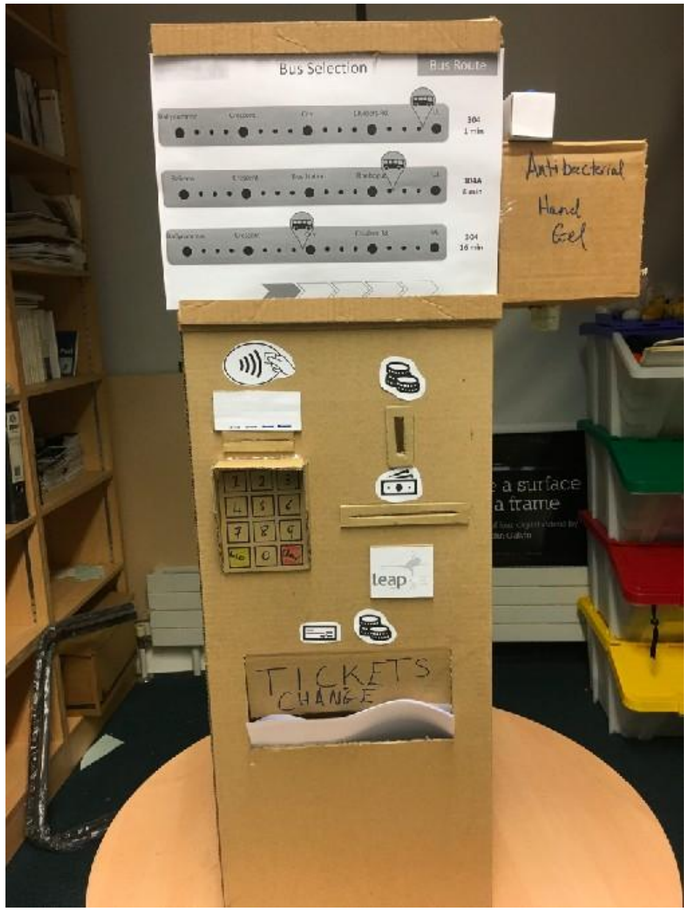


better!

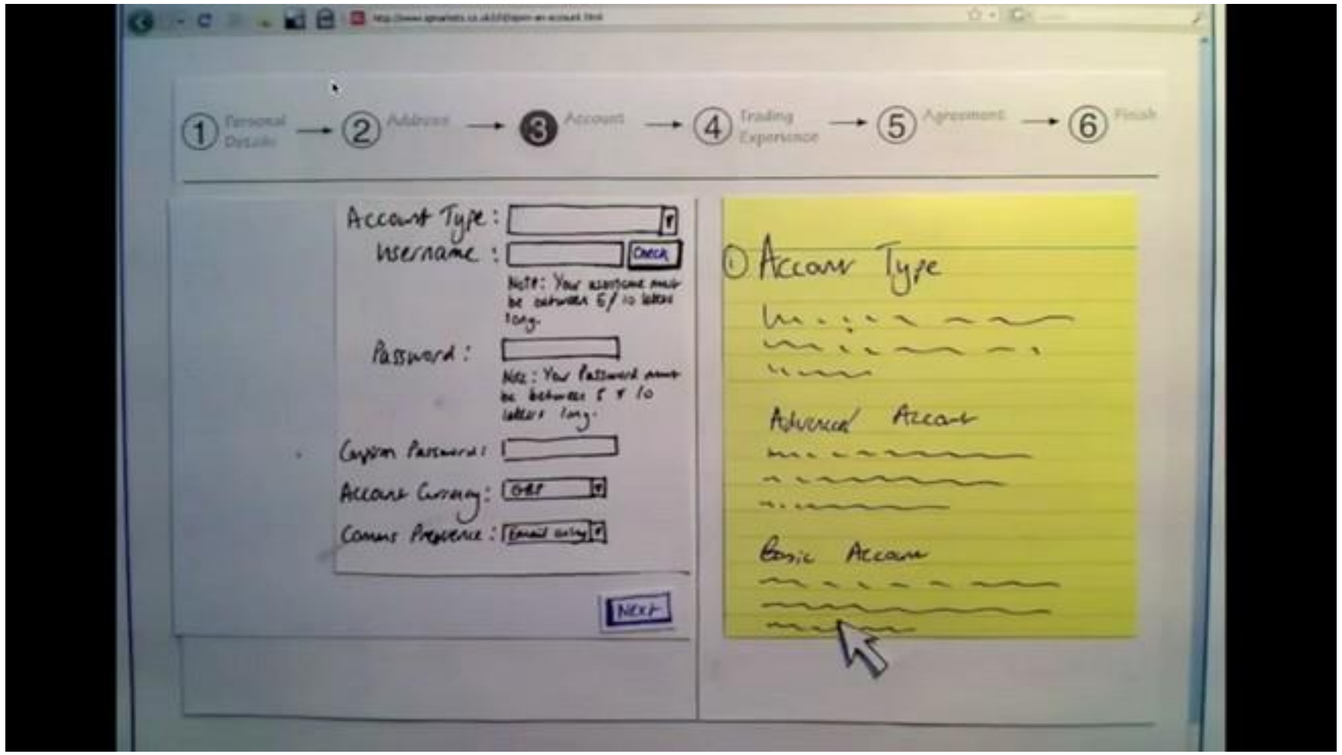
Time-saving tips

- If you have lots of little pieces, organize them
  - envelopes, plastic ziplocks, paper clips
- You can use a photocopier to save time
  - many similar sketches with slight variations
- If something is hard to convey, you can speak descriptions
  - Example: a drag & drop interface can be hard to convey
  - Animations, sliders, progress bars
  - No need to prototype these in detail unless you want to test them

You can paper prototype different form factors



Paper prototypes for video demos



Testing your paper prototype

Before even creating your paper prototype

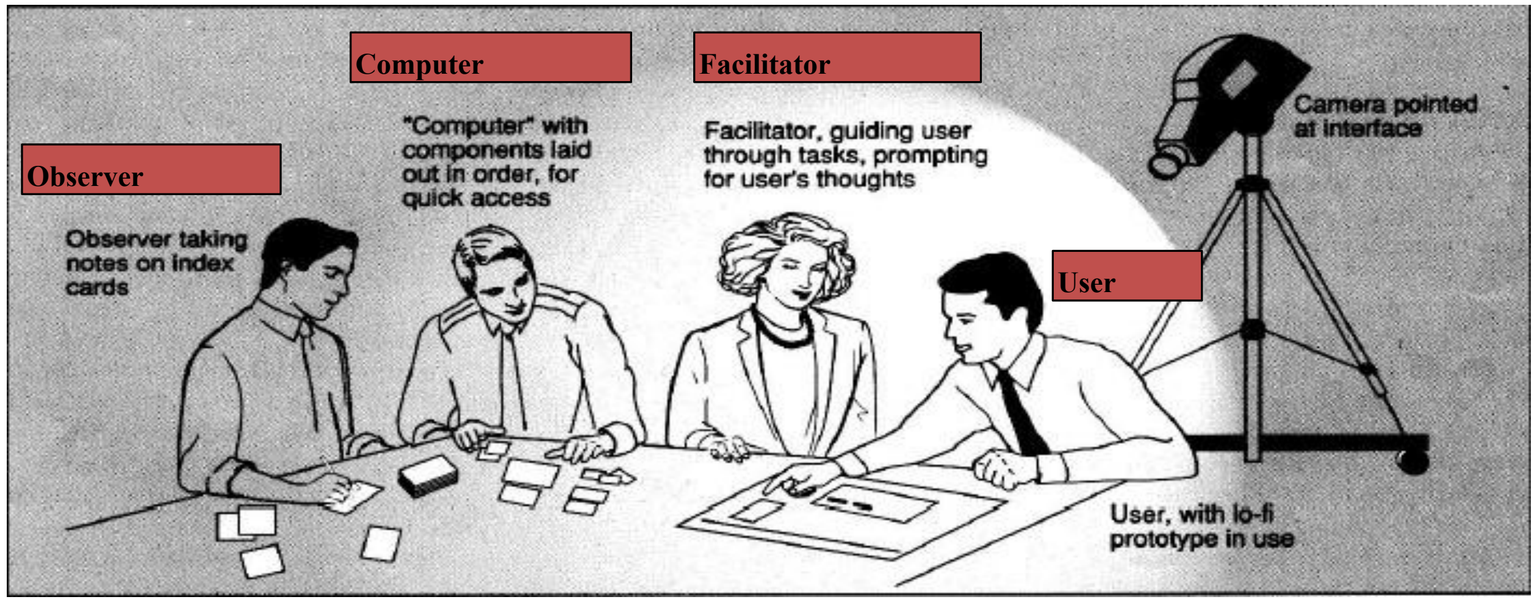
- Start by thinking of and planning out your **tasks** you want users to try before sketching
- What kind of **research questions** do you want to answer with this prototype?
- What kind of **observations** will you look for to answer those questions?
- Remember, you can change your paper prototype between user sessions (and sometimes even during them!) as you notice obvious issues or have new questions come up.

Preparing for a Test

- Prepare tasks for the users and paper prototype
  - Write down a “script” of what you’re going to say out loud to keep it constant between tests
  - Giver your testers a context for what they’re doing (like the scenarios)
- Practice to avoid “bugs” in your prototype
- Select your user participants
  - Friends and family are okay at first (and acceptable for this class) but typically you want people in your target audience

Give different people on the team roles

- “**Computer**”
  - Simulates the prototype
  - Doesn’t give any feedback that the computer wouldn’t give
- **Facilitator**
  - Presents interface and task to the user
  - Encourages user to think aloud by asking questions
  - Keeps user test on track
- **Observer**
  - Doesn’t talk
  - Takes copious notes



Introducing the test to a user

- **Address potential feelings of judgment**
  - Thank the user for being there, make them comfortable.
  - *“Today we are interested in learning about X. That’s where you come in!”*
  - *“It is X being tested here, not you.”*
- **Set expectations for the process**
  - *“It is essential you think out loud while working with X. Tell me constantly what you are thinking, looking for, wondering, confused about, surprised, and so on. If you stop talking, I will prompt you to talk.”*
  - *“I will not be able to answer your questions when you start using X. Do you have any questions now?”*
  - *“This should take about 15 minutes in total.”*

What can you learn from a test of a paper prototype?

- Conceptual model
  - Do users understand it?
- Functionality
  - Does it do what's needed? Missing features?
- Navigation and task flow
  - Can users find their way around?
  - Are information preconditions met?
- Terminology
  - Do users understand labels?
- Screen contents
  - What needs to go on the screen?

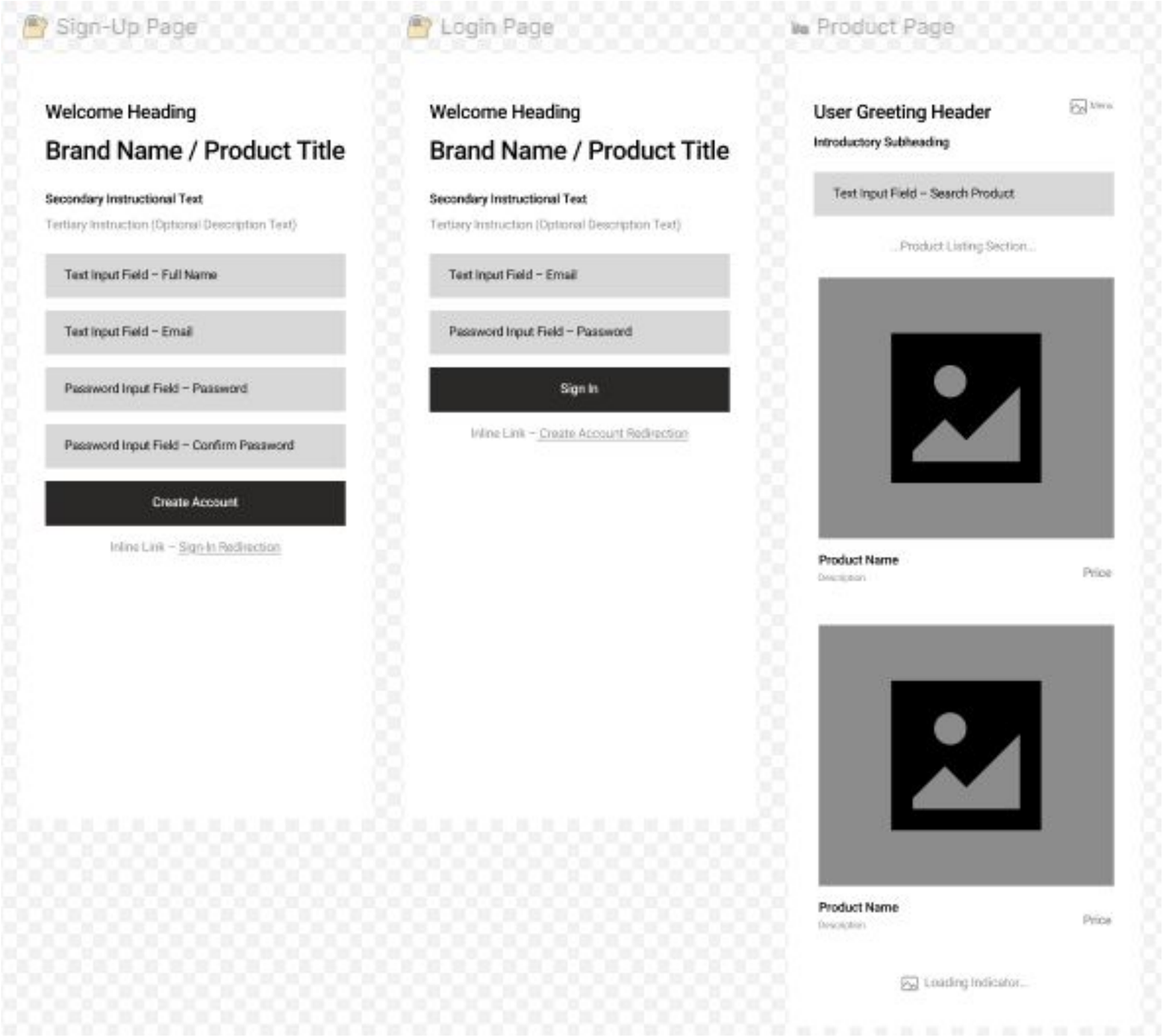
What can't **you learn from a test of a paper prototype?**

- Look: color, font, whitespace, etc.
- Feel: efficiency issues
- Response time
- Are small changes noticeable?
  - Even minor UI changes are really noticeable in a paper prototype
- Exploration vs deliberation
  - Users are more deliberate in a paper prototyping session. They're not going to quickly click around and explore as much

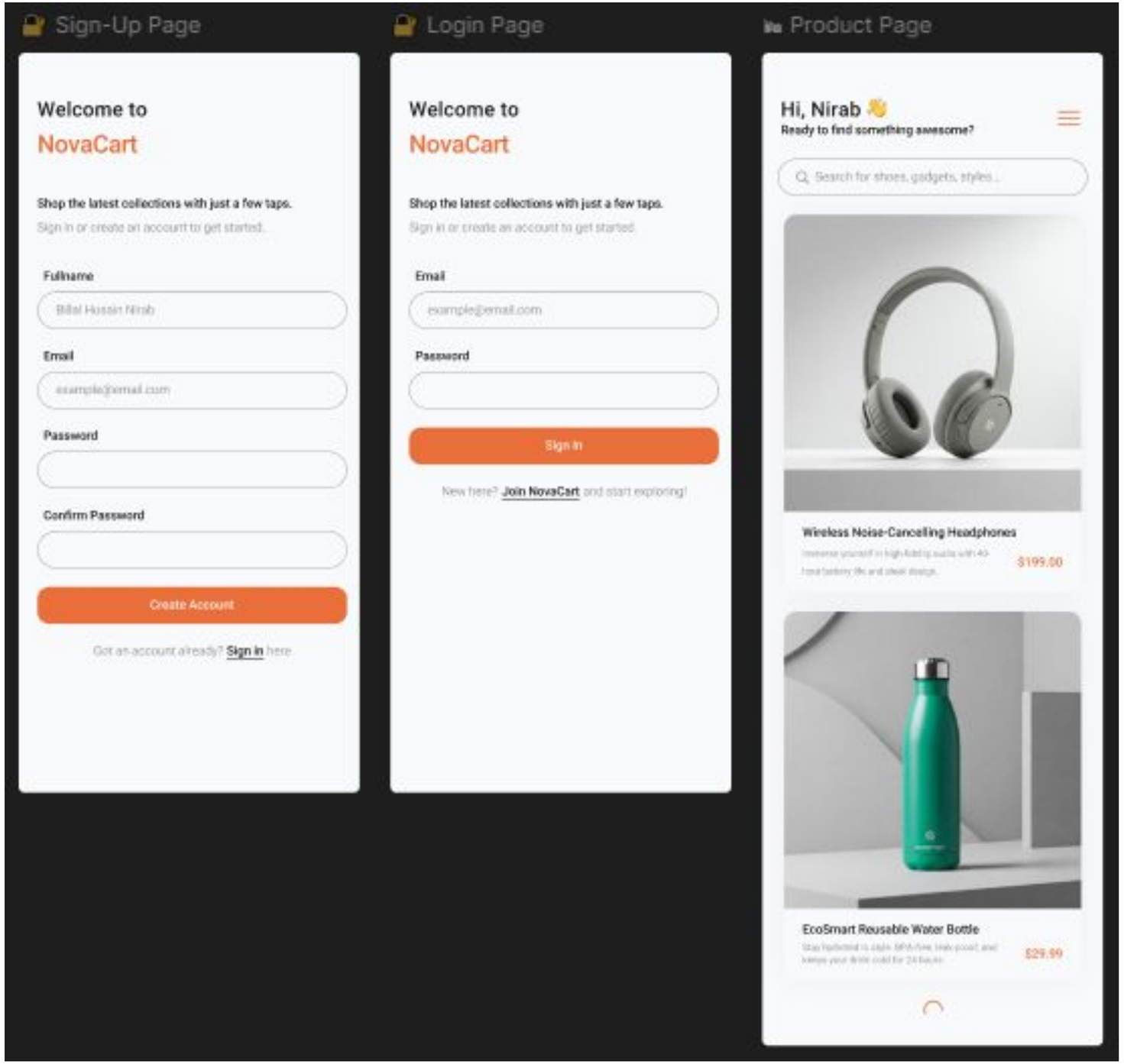
Digital Prototyping


Figma

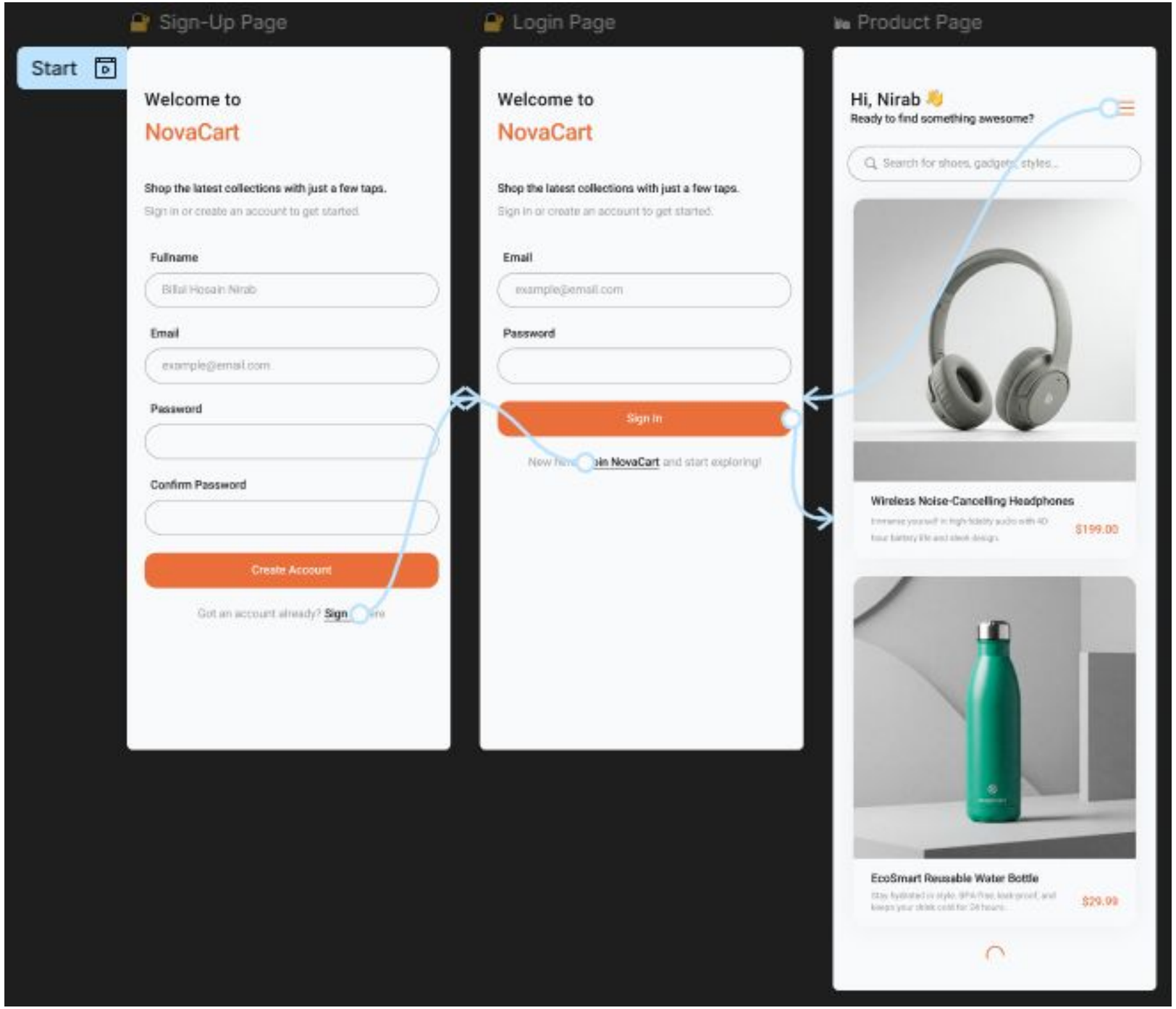
Wireframe in Figma



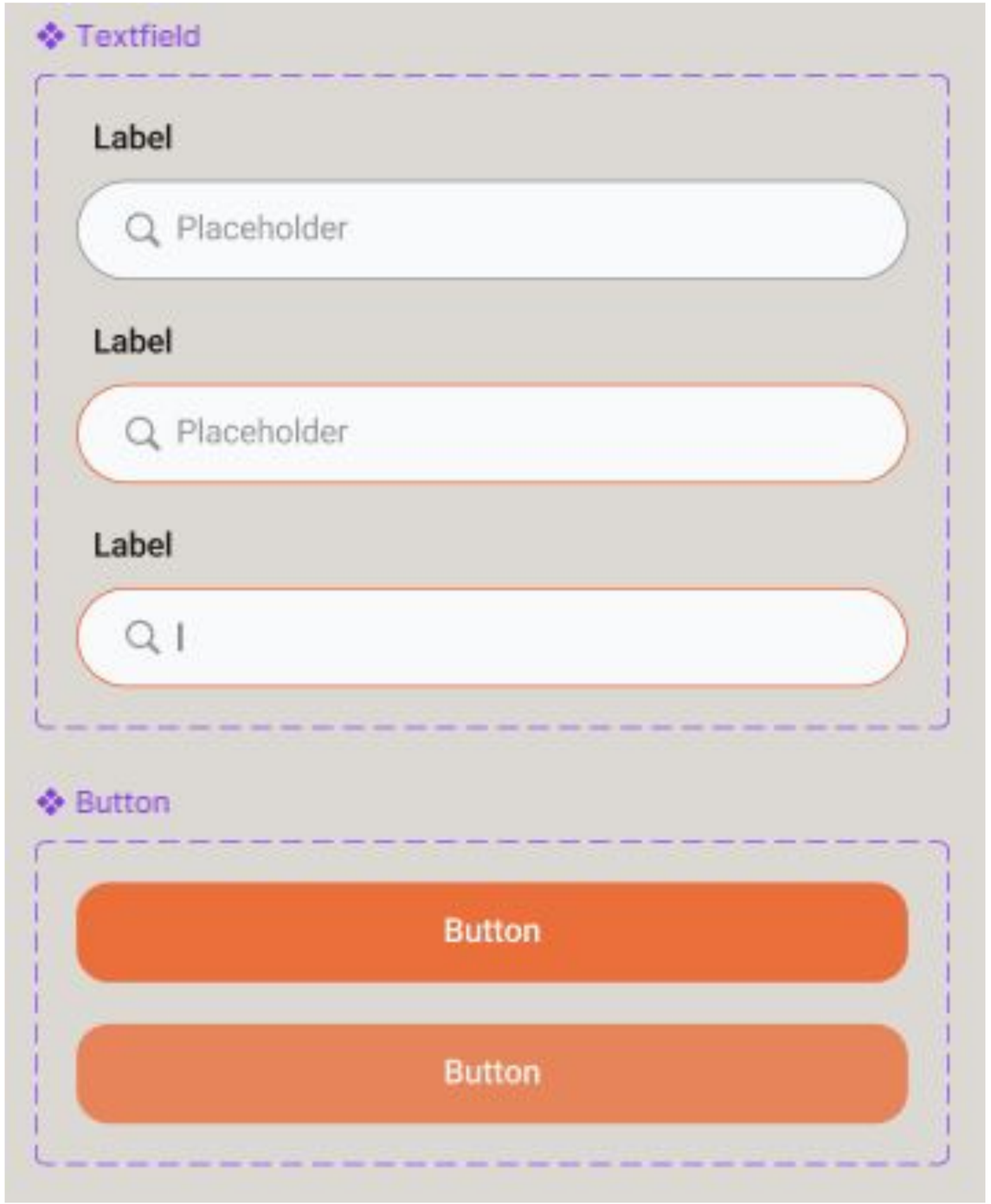
Mockup in Figma



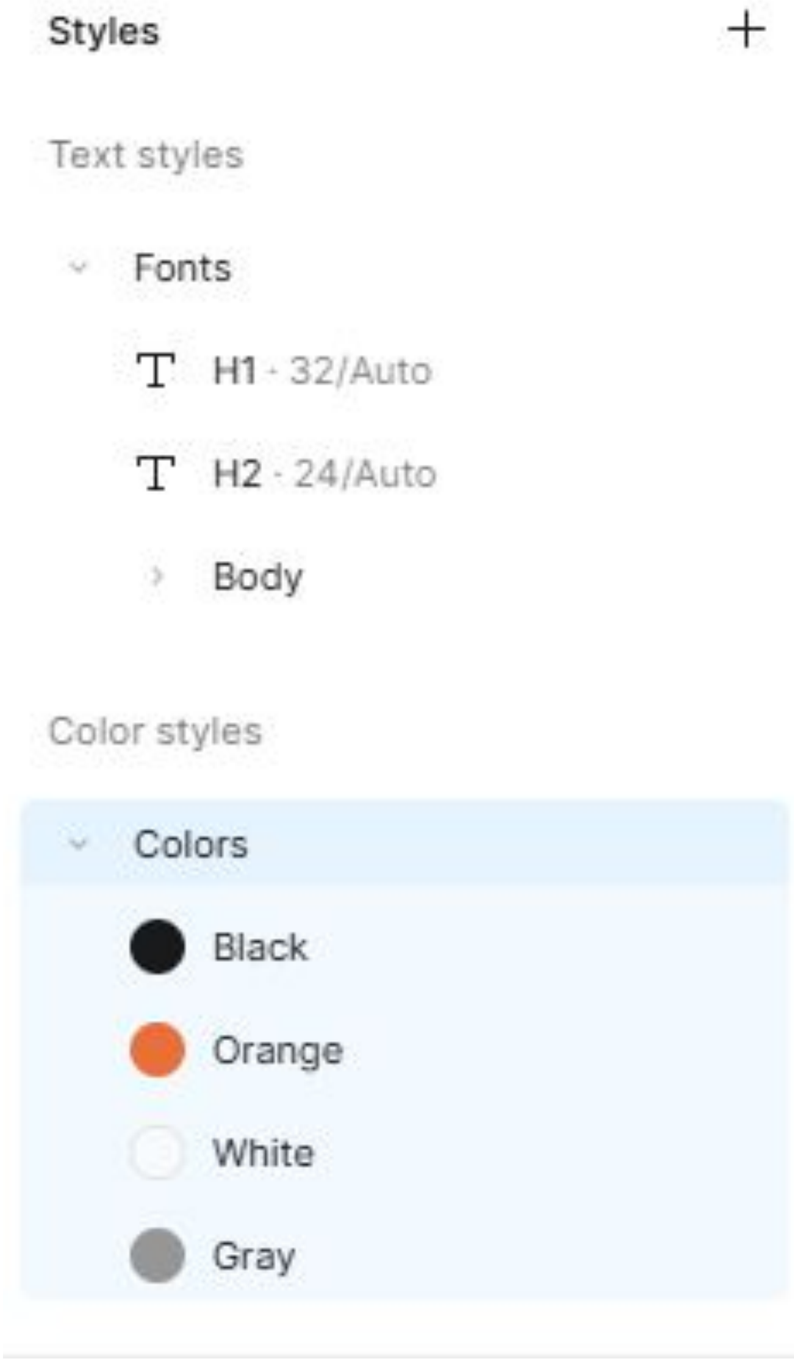
Prototype in Figma



Figma Components



Figma Styles



Style Guide


Typography
Colors
Heading 1
Heading 2
Body text - Bold
Body text - Medium
Body text - Small
Link

THANK YOU