

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation!

Lecture 12: Paper Prototyping

Instructor: Amy Zhang, 2/11/2021

Today's Topics

- UI Hall of Fame and Shame
- Paper Prototyping
 - How to make paper prototypes
 - Tips for good paper prototypes
 - Testing paper prototypes
 - Ideas for remote testing
- Paired presentation of preliminary 2f plan and feedback

UI Hall of Fame and Shame

Voice Assistants! & Voice User Interfaces (VUI)



Learnability?

Safety?

Efficiency?

Ethics?

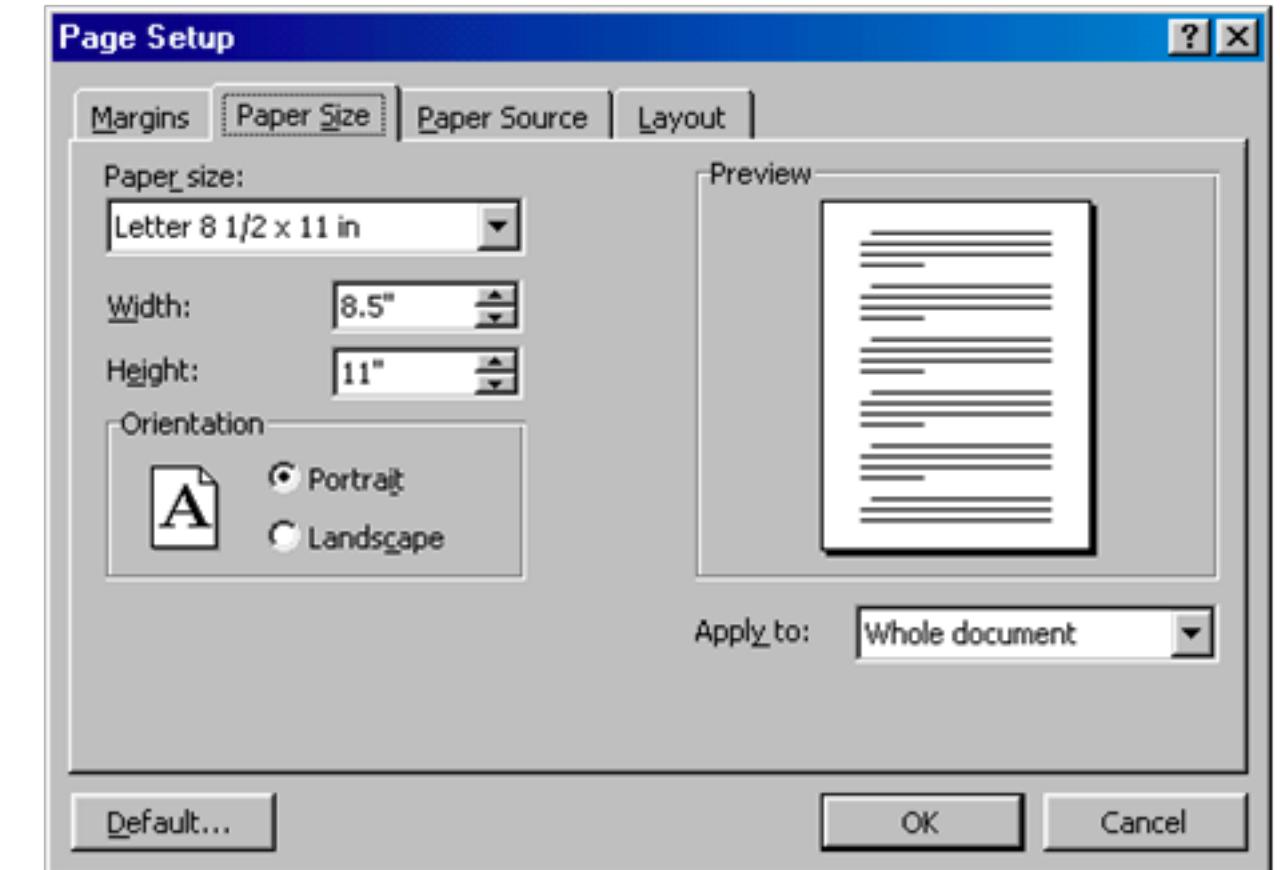


Paper Prototyping

Fidelity in Prototyping

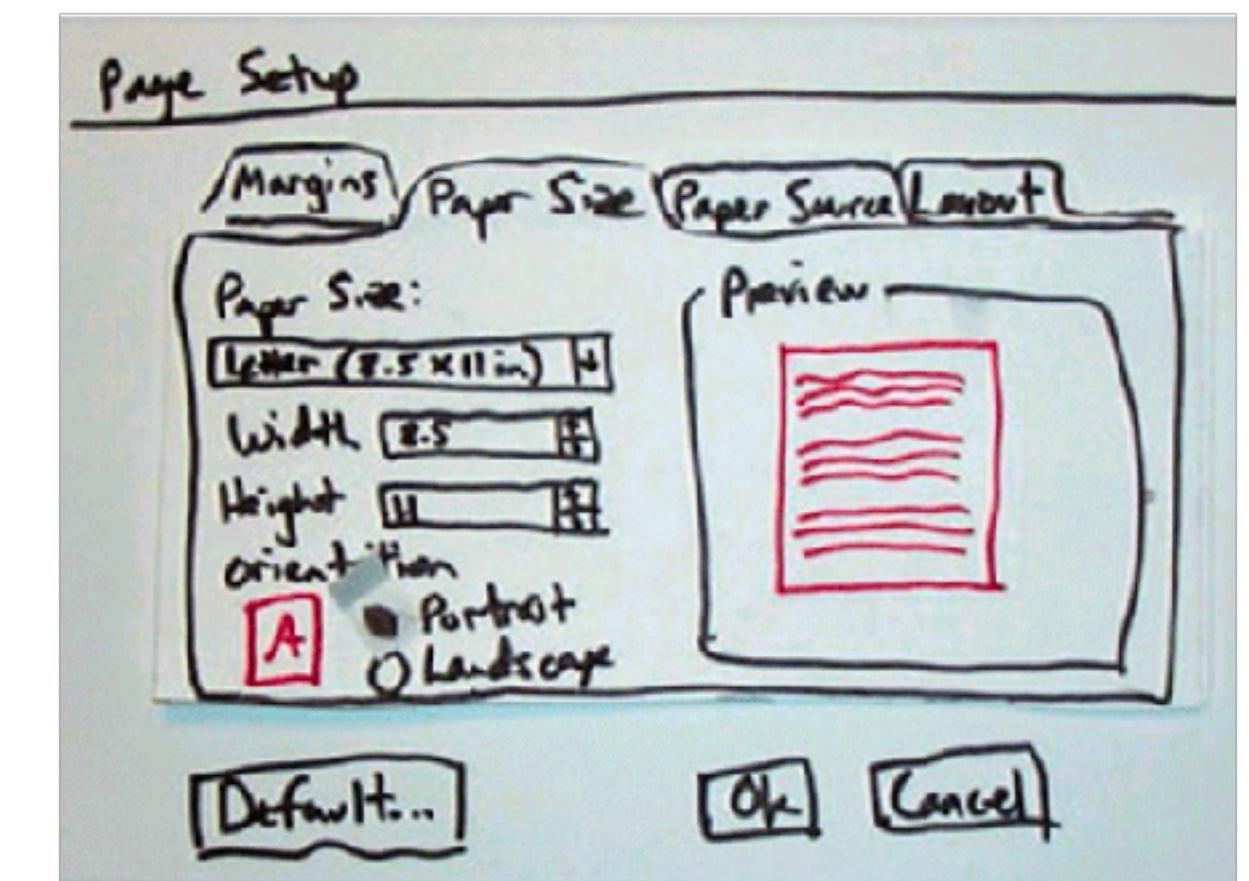
- **High Fidelity**

- Prototypes look and feel more like the final product



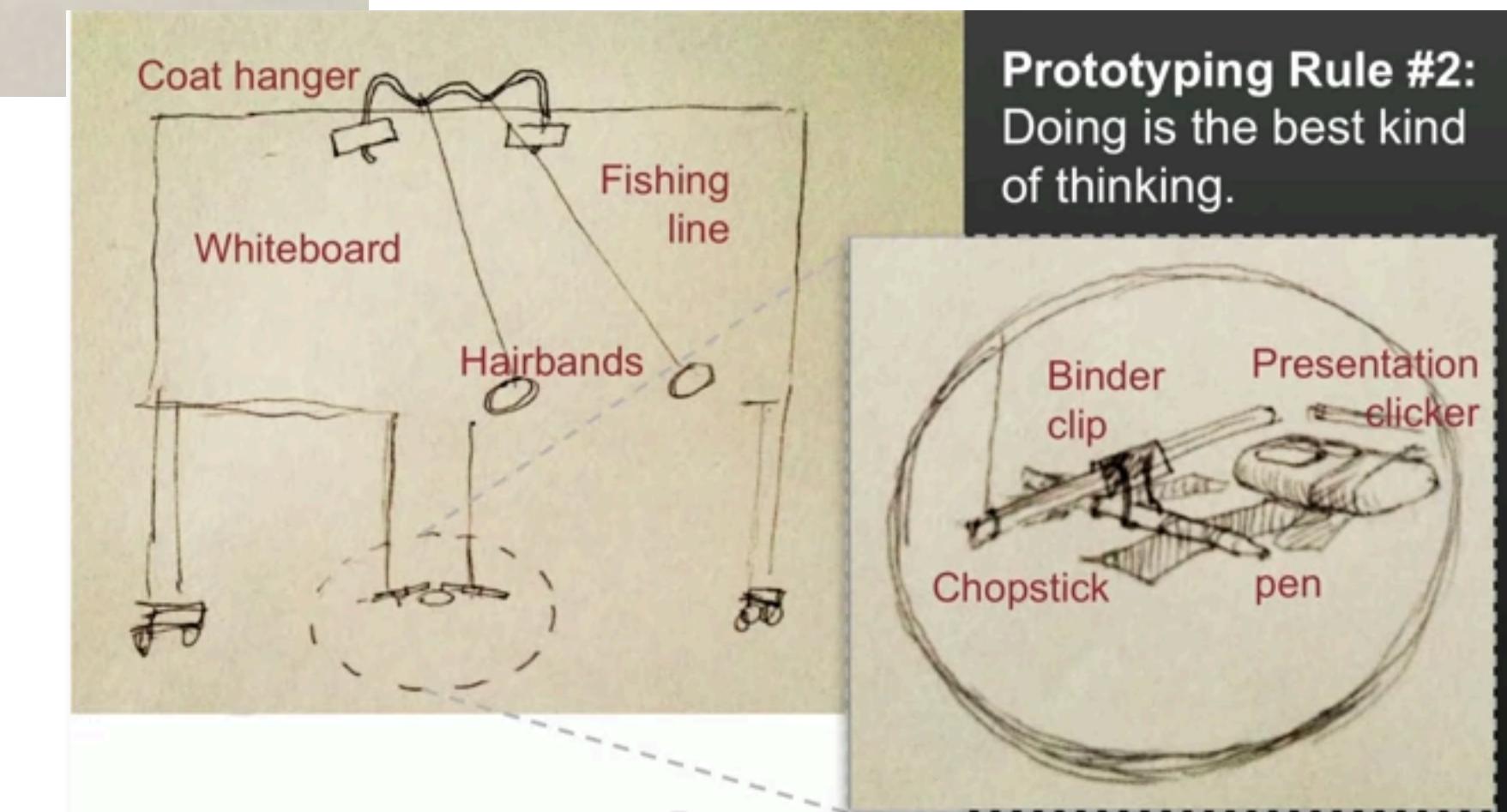
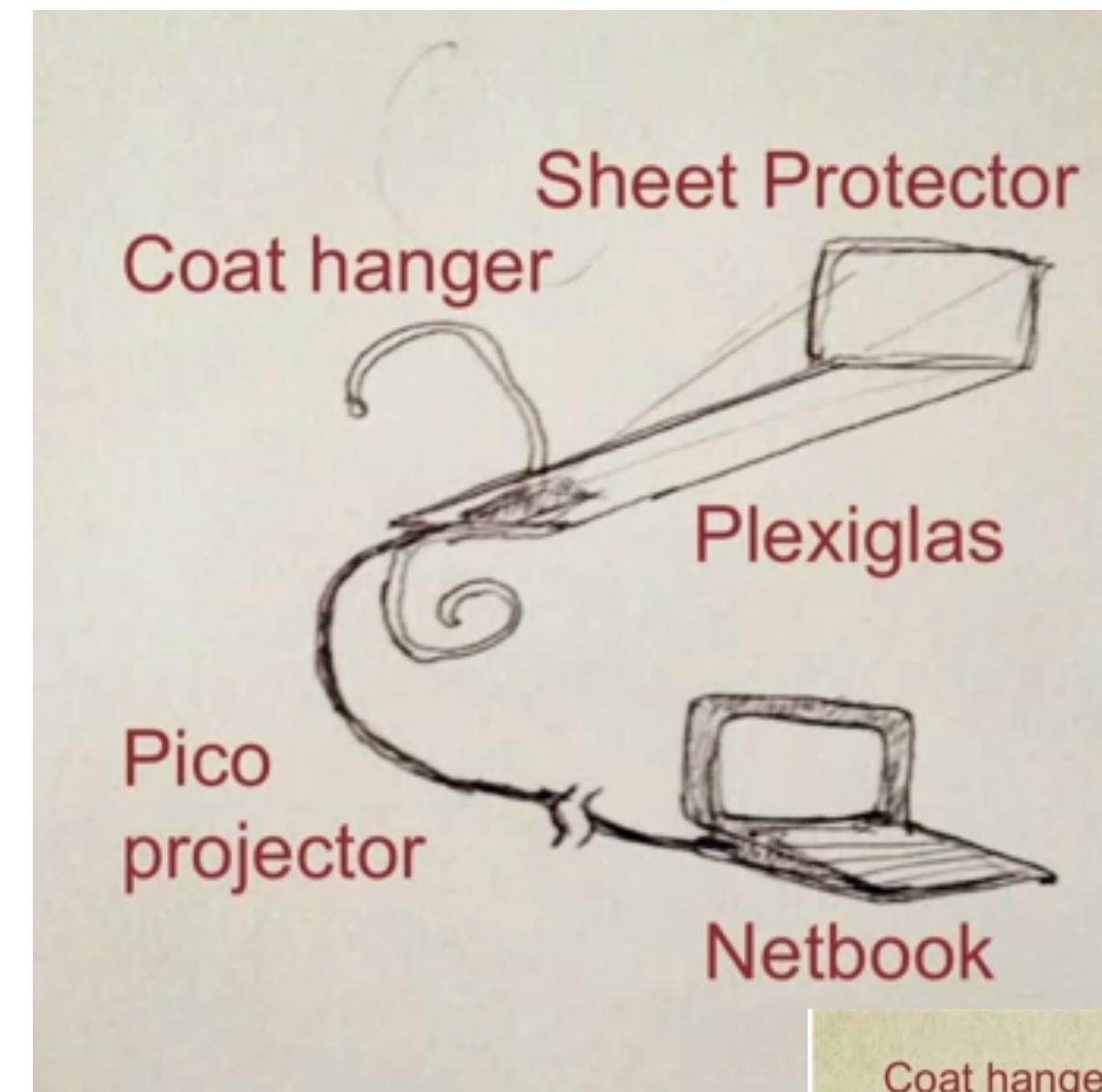
- **Low Fidelity**

- Designer sketches with many details missing

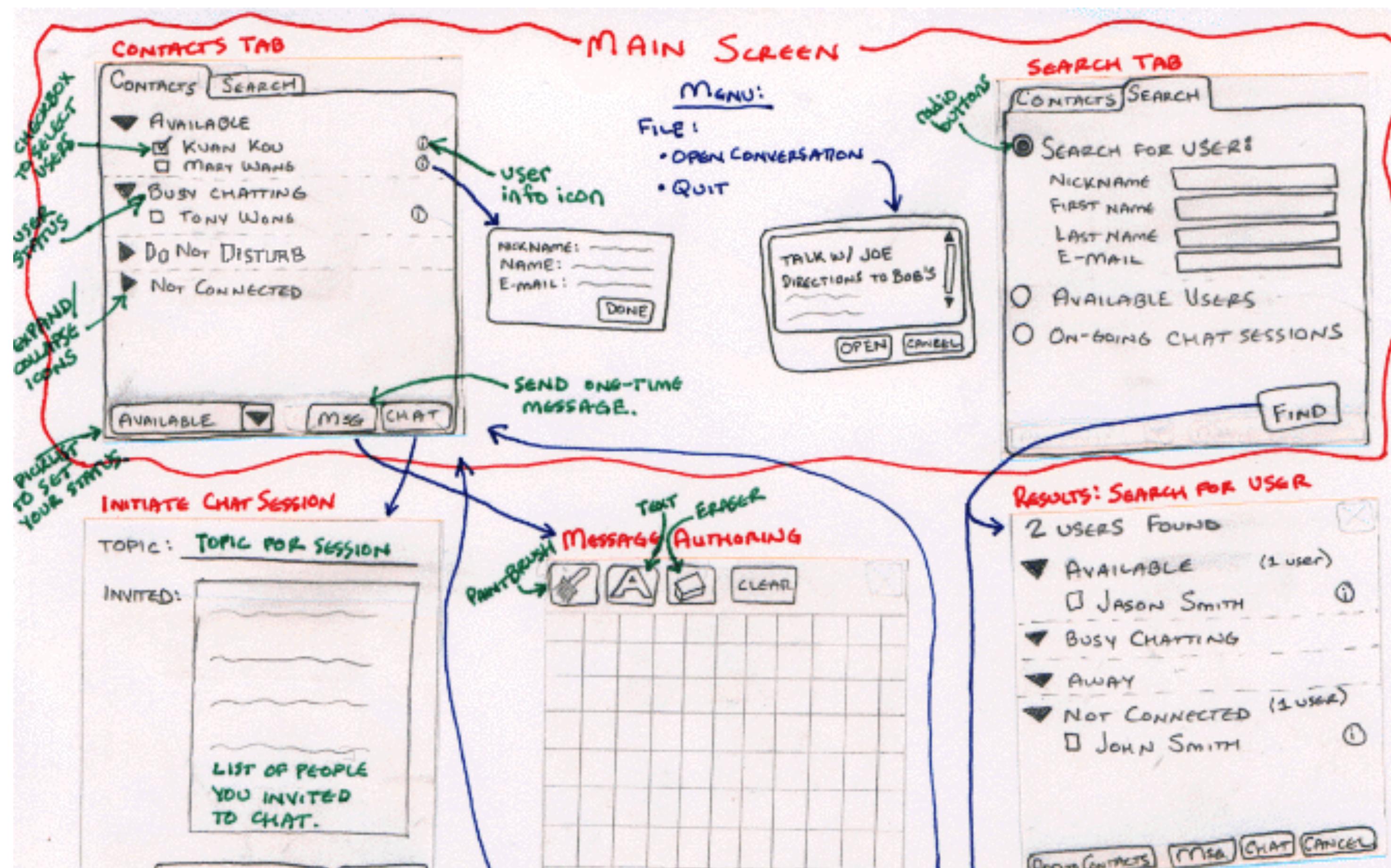


Why Prototype?

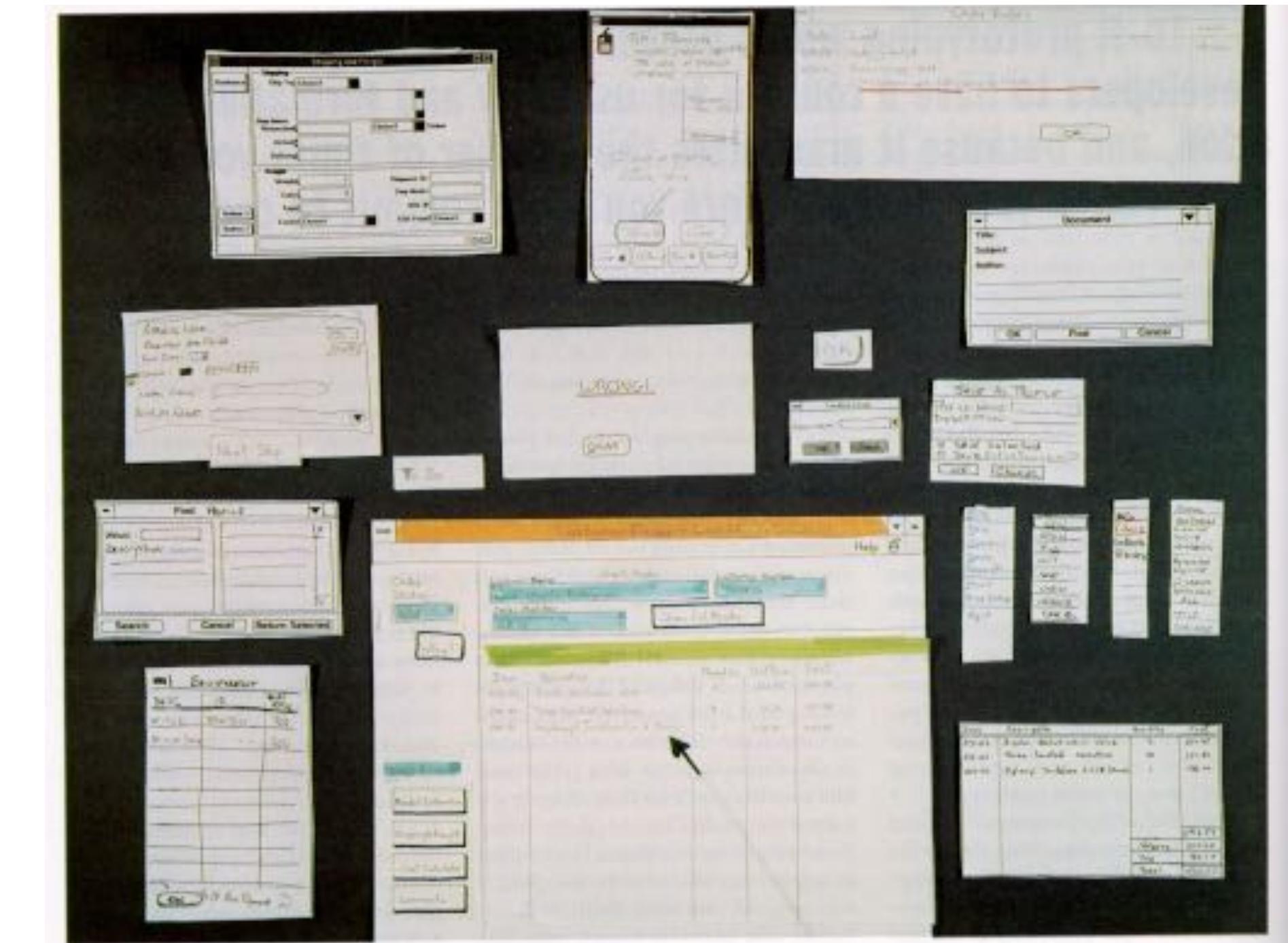
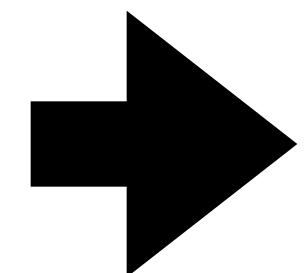
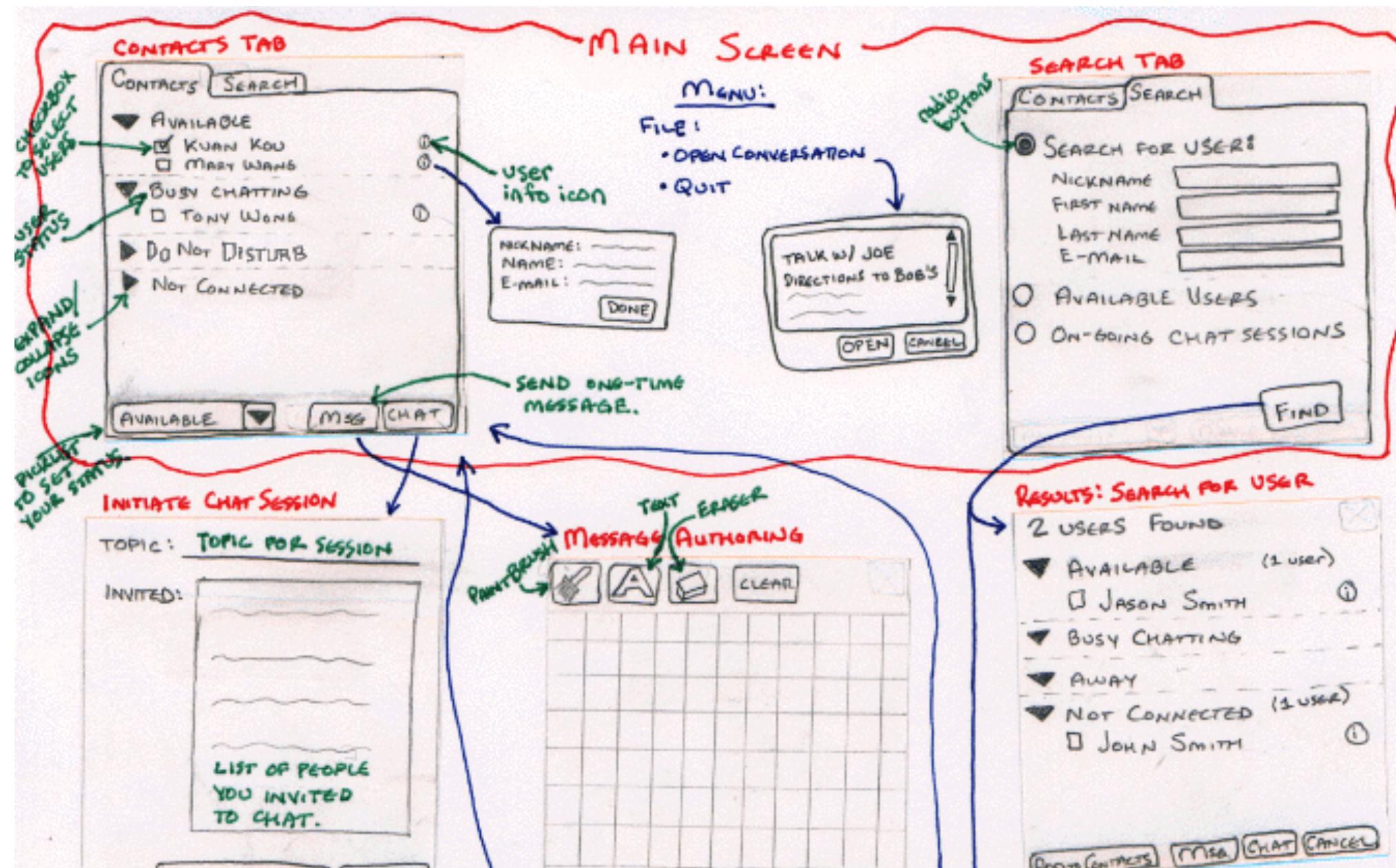
- Get feedback earlier, cheaper
- Experiment with alternatives
- Easier to change or throw away



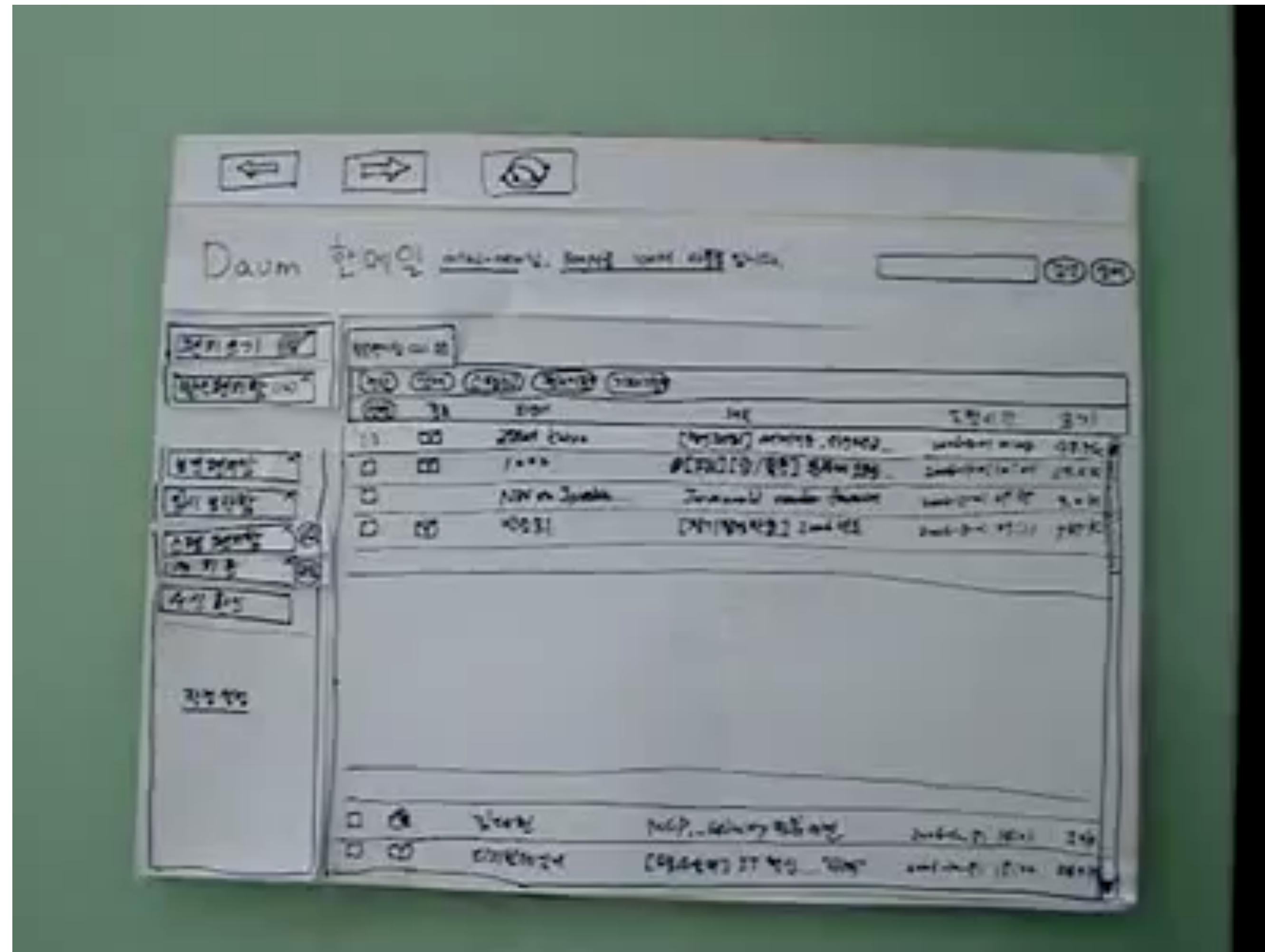
Sketches (low fidelity)



Paper Prototypes (low fidelity)



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?

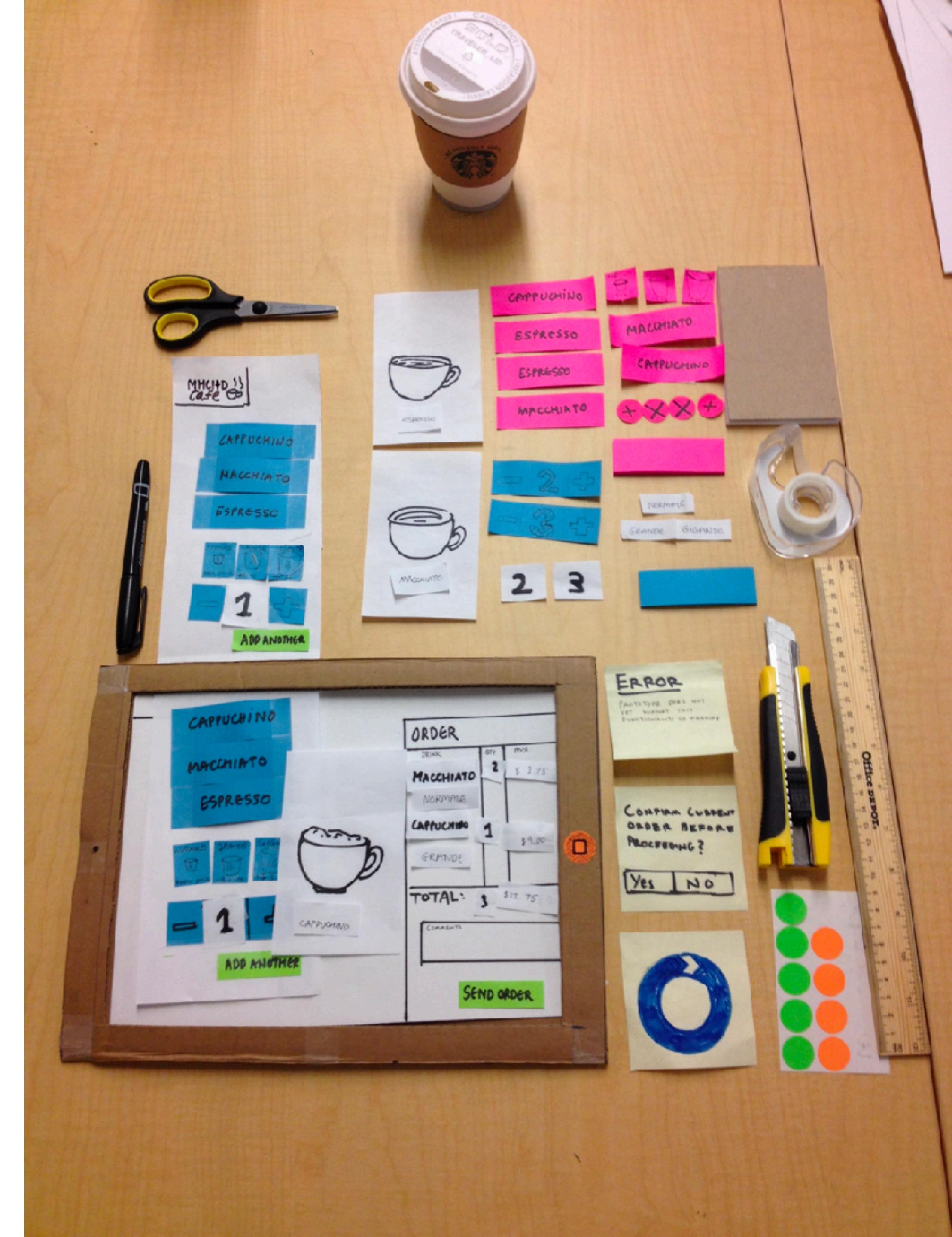
- You can make it quickly
 - Sketching is faster than programming
- Easier to change
 - Easy to make changes between user tests, or even during a user test
 - No code investment - everything will be thrown away (except the design)
- Focuses attention on the big picture
 - Designer doesn't waste time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



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



Ways you can use index cards

- 3x5 inch cards
- Each card represents a screen or part of screen
- Useful for websites

Travel Organizer 23 August

WELCOME HELEN

Where do you want to go? YORK

What date do you want to travel? 16 Sept

Which form of transport do you want? TRAIN

Do you need accommodation? YES

Travel Organizer 23 August

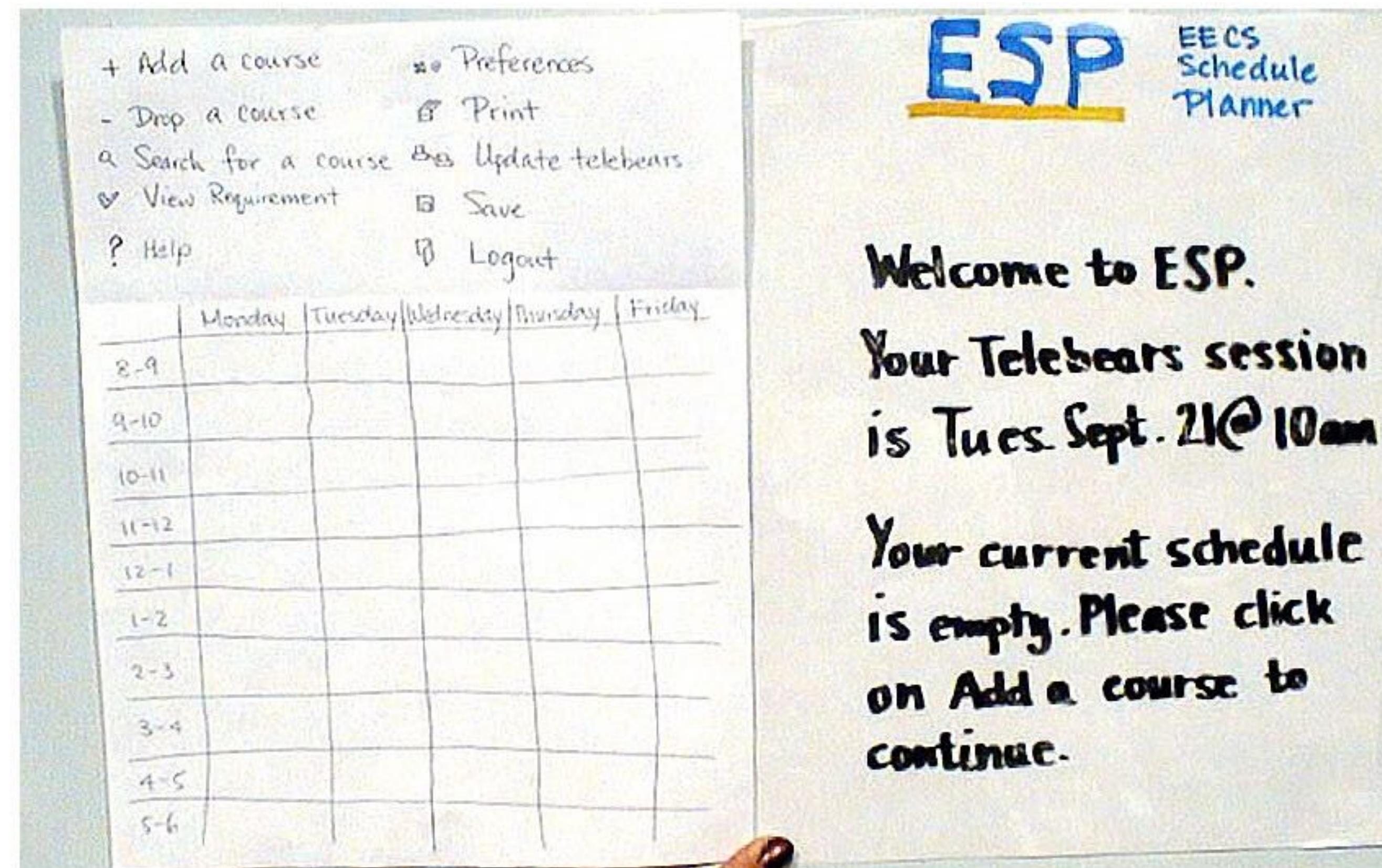
Train timetable from Milton Keynes Central to York on 16 Sept

Depart	09:09	10:09	SAME	22:09
Arrive	12:30	13:30	PAST	01:30

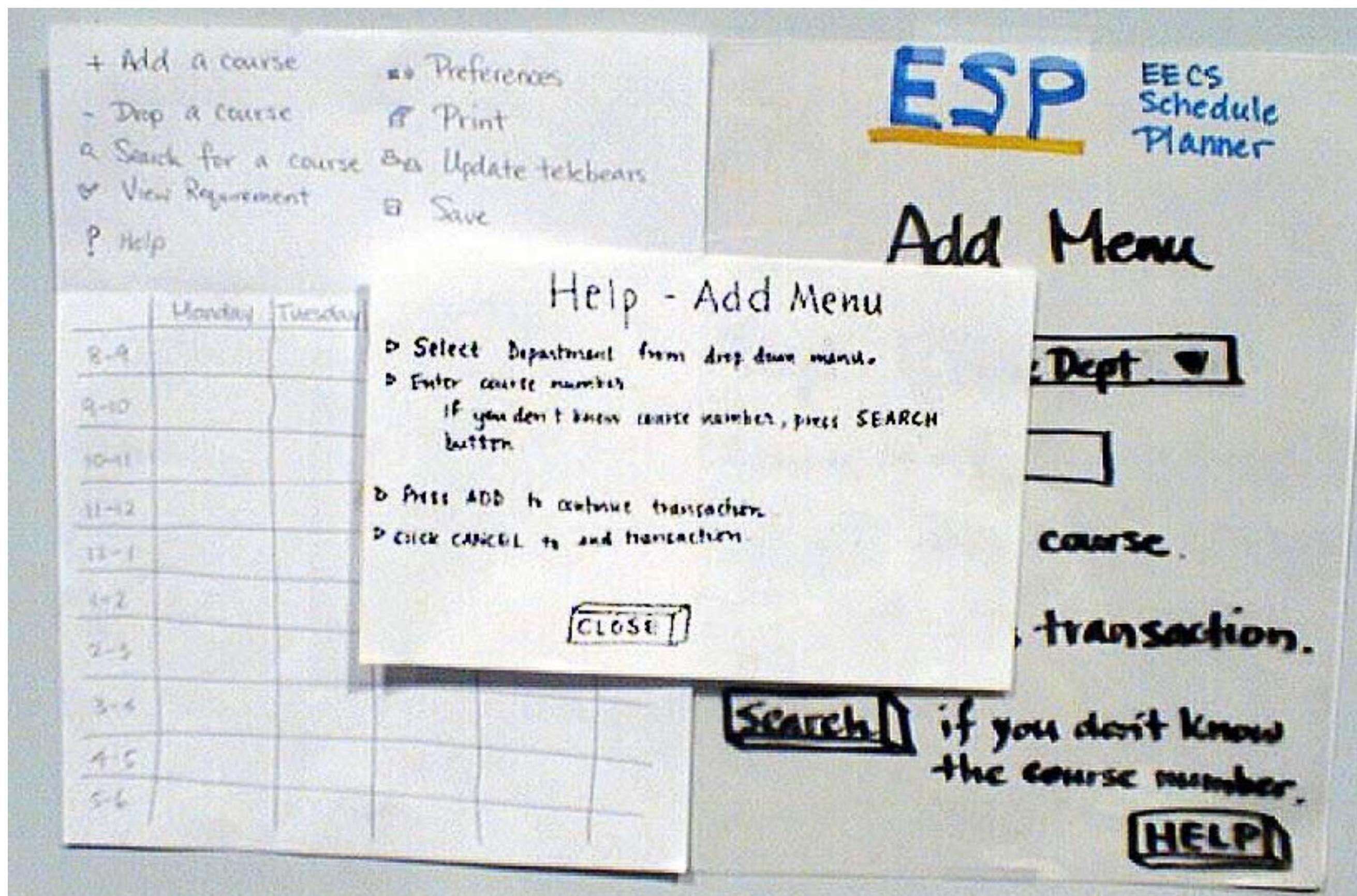
Mins Hour

Accommodation Hotel B&B
£40 to £150 £20 to £60

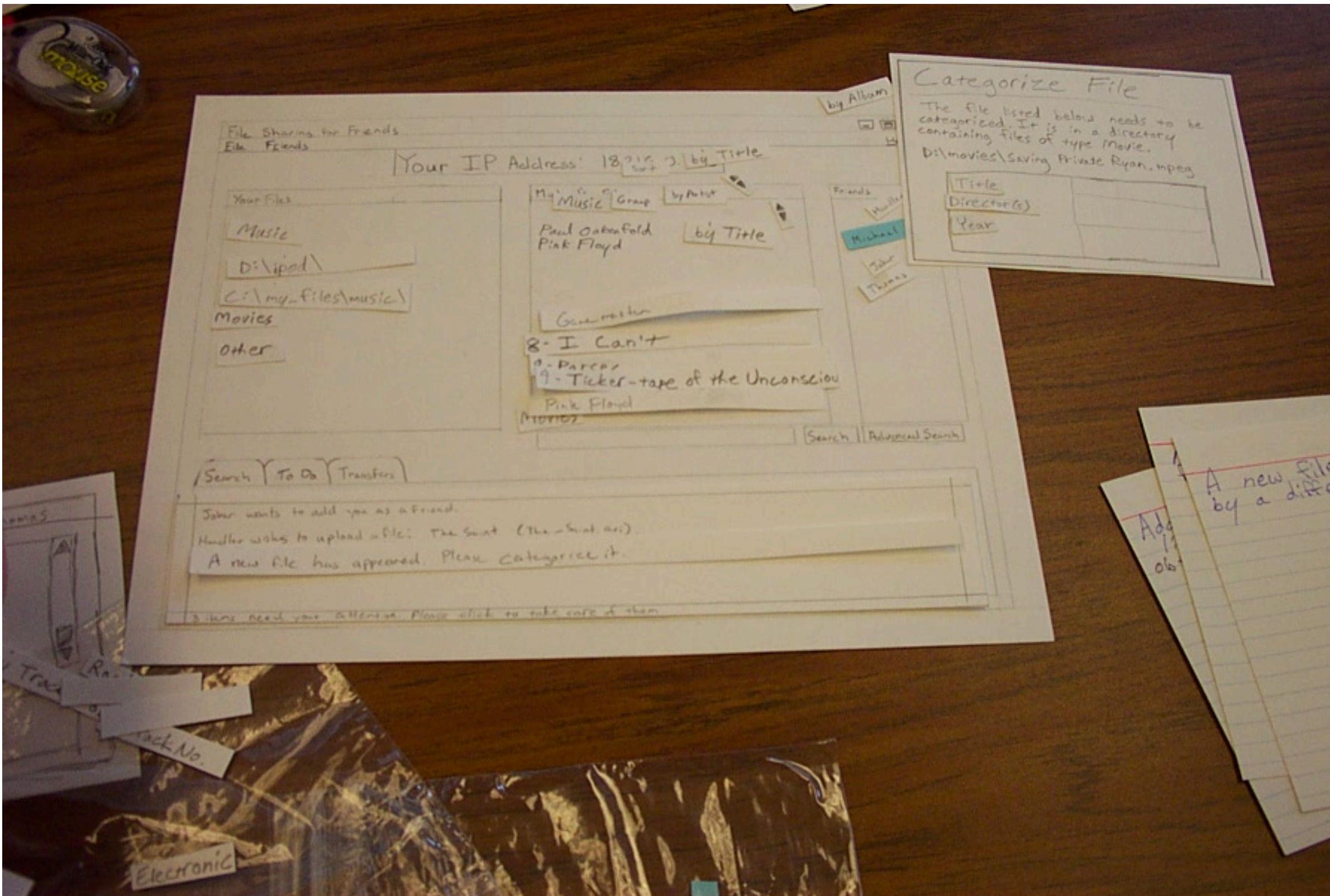
Compose interface from different pieces of paper



Compose interface from different pieces of paper



Post-it glue helps lots of little pieces stay put



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

The image shows a hand-drawn wireframe of a web-based shopping cart application. At the top, there is a navigation bar with six buttons: Back, Forward, Stop, Home, Search, and Print. Below the navigation bar, there is a menu bar with links: 'Kool Klothes' Logo, Guys, Gals, Kids, and Customer Service. A 'Shopping Cart' section is displayed, showing a table of items. The table has columns for Item, Description, Color, Size, Status, Qty, Price, and Total. Two items are listed: a Cashmere sweater and a Breakaway boot. At the bottom left, there is a link to 'Check out our no-hassle Return Policy'. On the right side, there is a breakdown of costs: Subtotal (207.99), S+H (12.95), Tax (6.00), and Total (220.84). At the bottom, there are two buttons: 'Continue Shopping' and 'Checkout'.

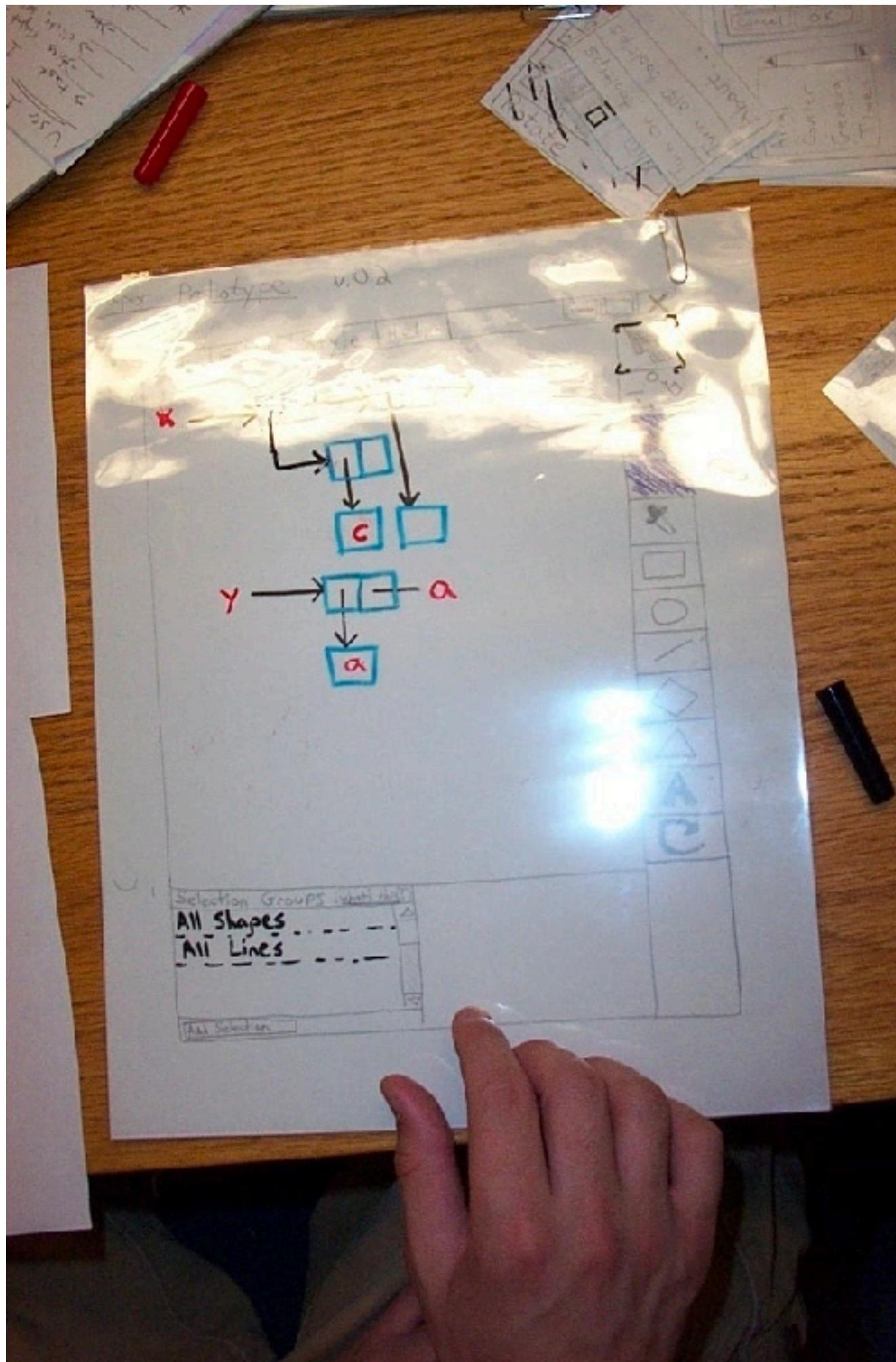
Item	Description	Color	Size	Status	Qty	Price	Total
42773	Cashmere sweater	Green	M	In Stock	1	79.99	79.99
23076	Breakaway boot	BR	8M	In Stock	1	128.00	128.00

Check out our
no-hassle
Return Policy

Subtotal 207.99
S+H 12.95
Tax 6.00
Total 220.84

Continue Shopping Checkout

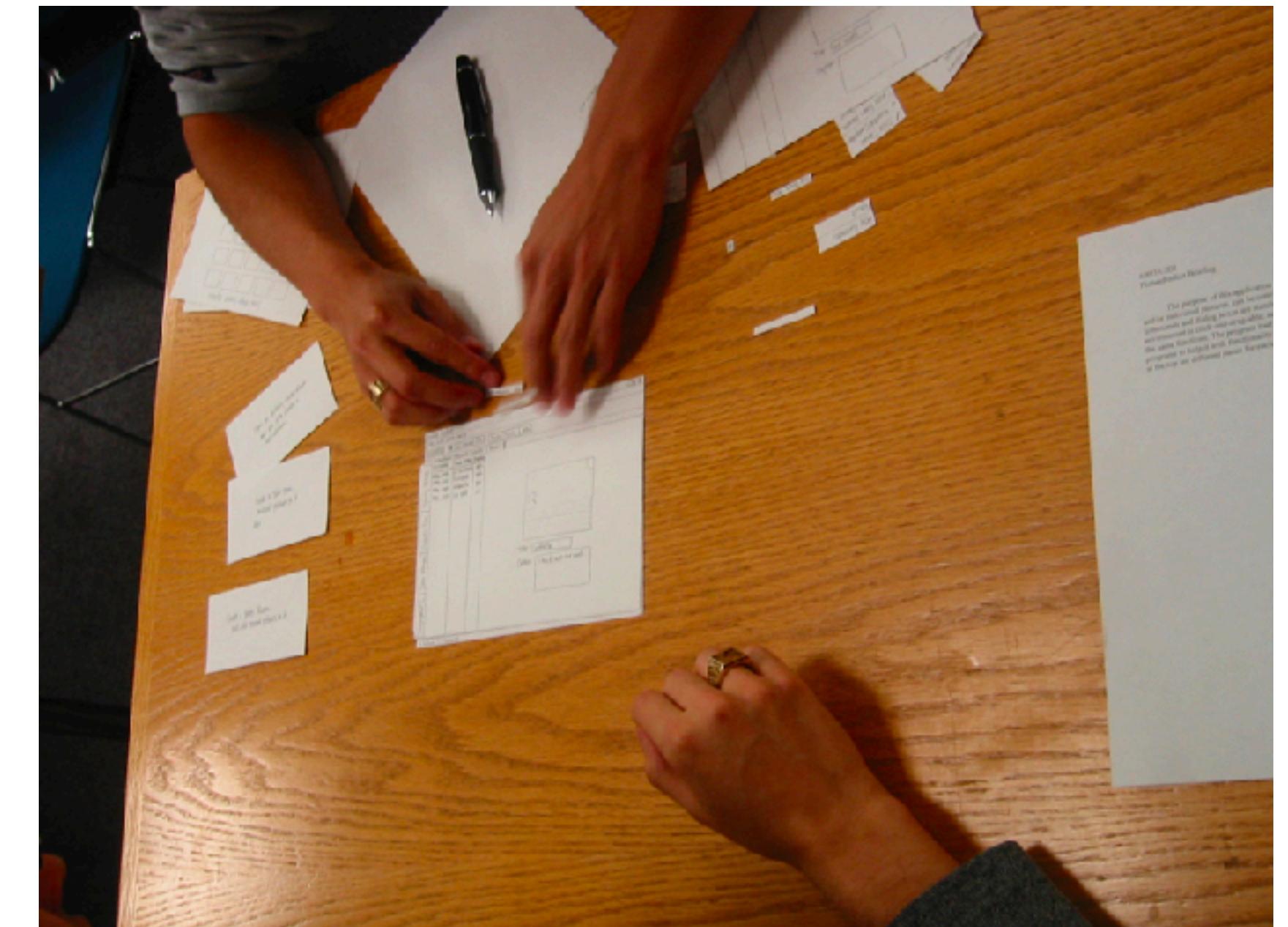
Write on transparencies to “type” or dynamically change the UI



Tips for good paper prototypes

Make it larger than life

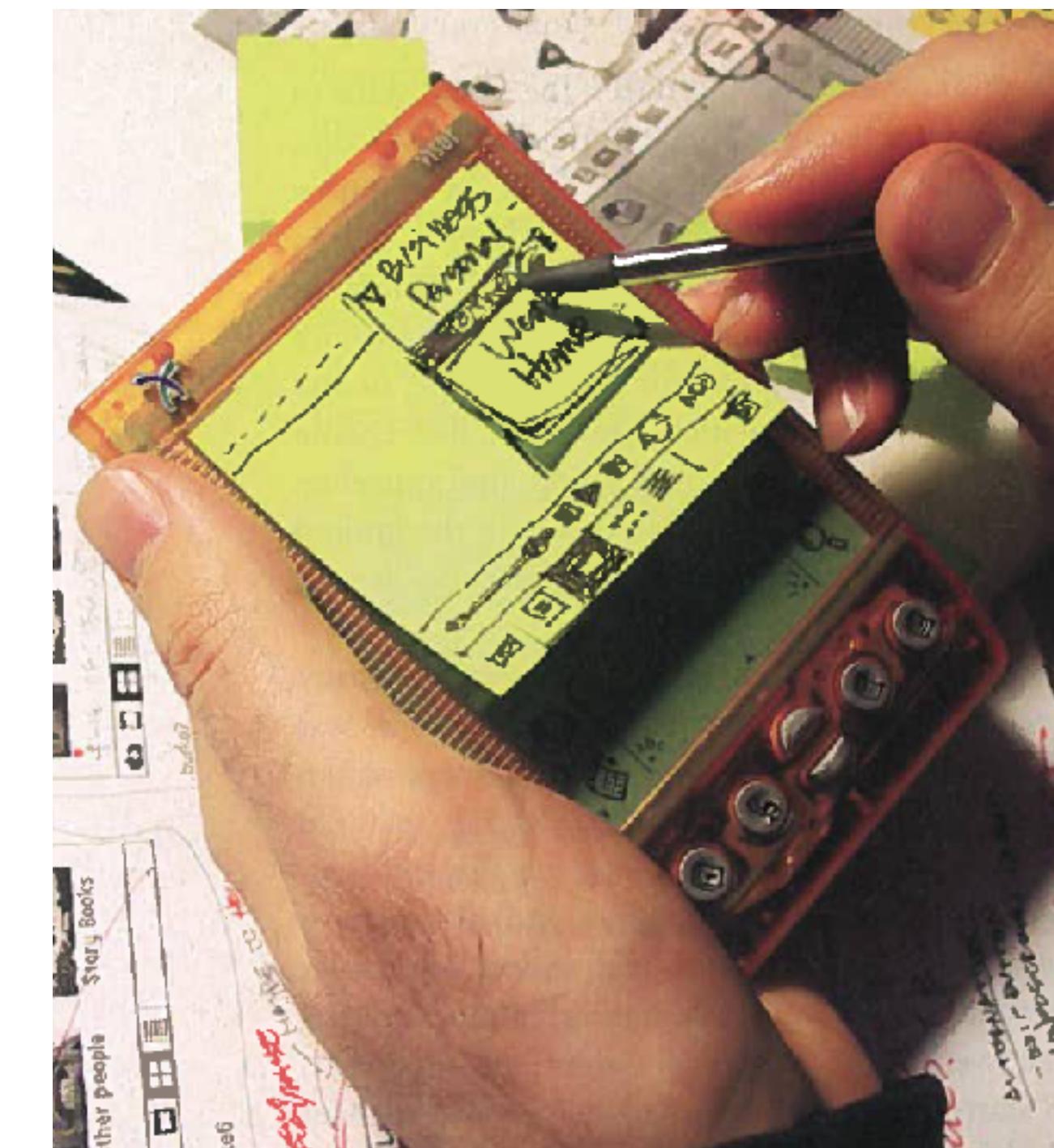
- Remember - fingers are bigger than a mouse pointer
- People usually write bigger than 12 point font
- Easier to see from a distance, like across a table
- Lots of tiny pieces of paper are a hassle



too many tiny pieces to wrangle

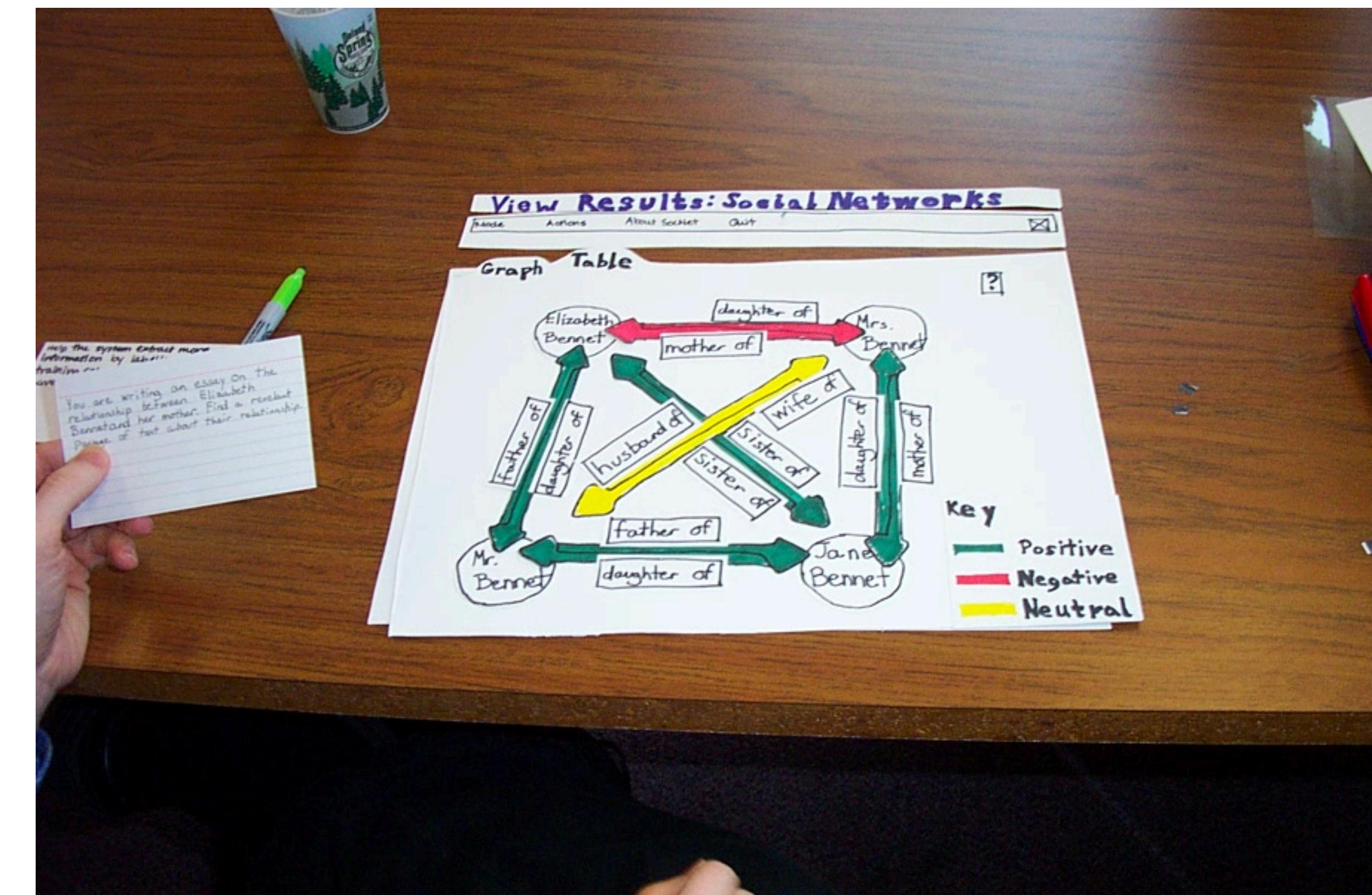
...while remembering your target form constraints

- 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



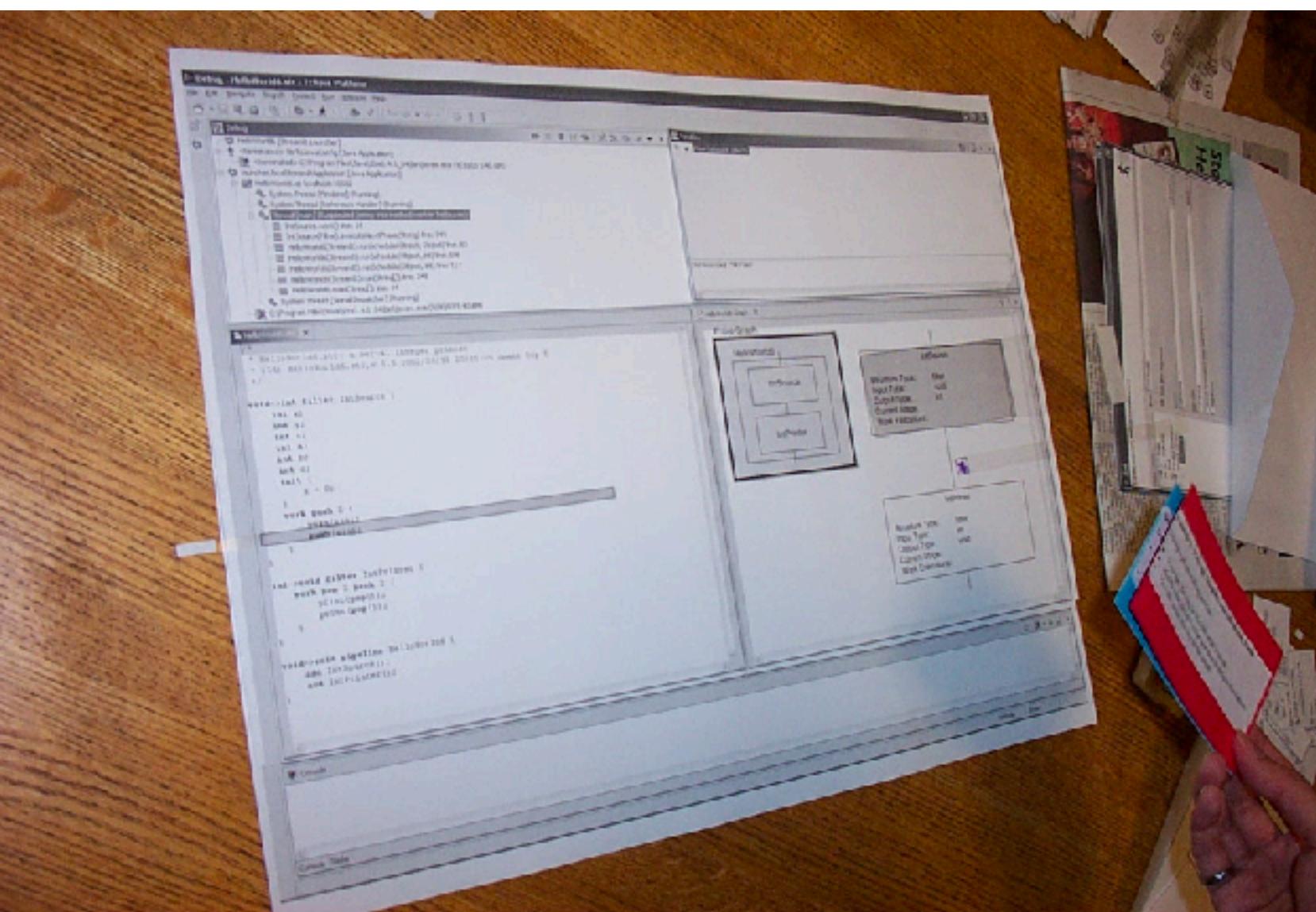
Write/sketch using darker and thicker marker, not pencil

- 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

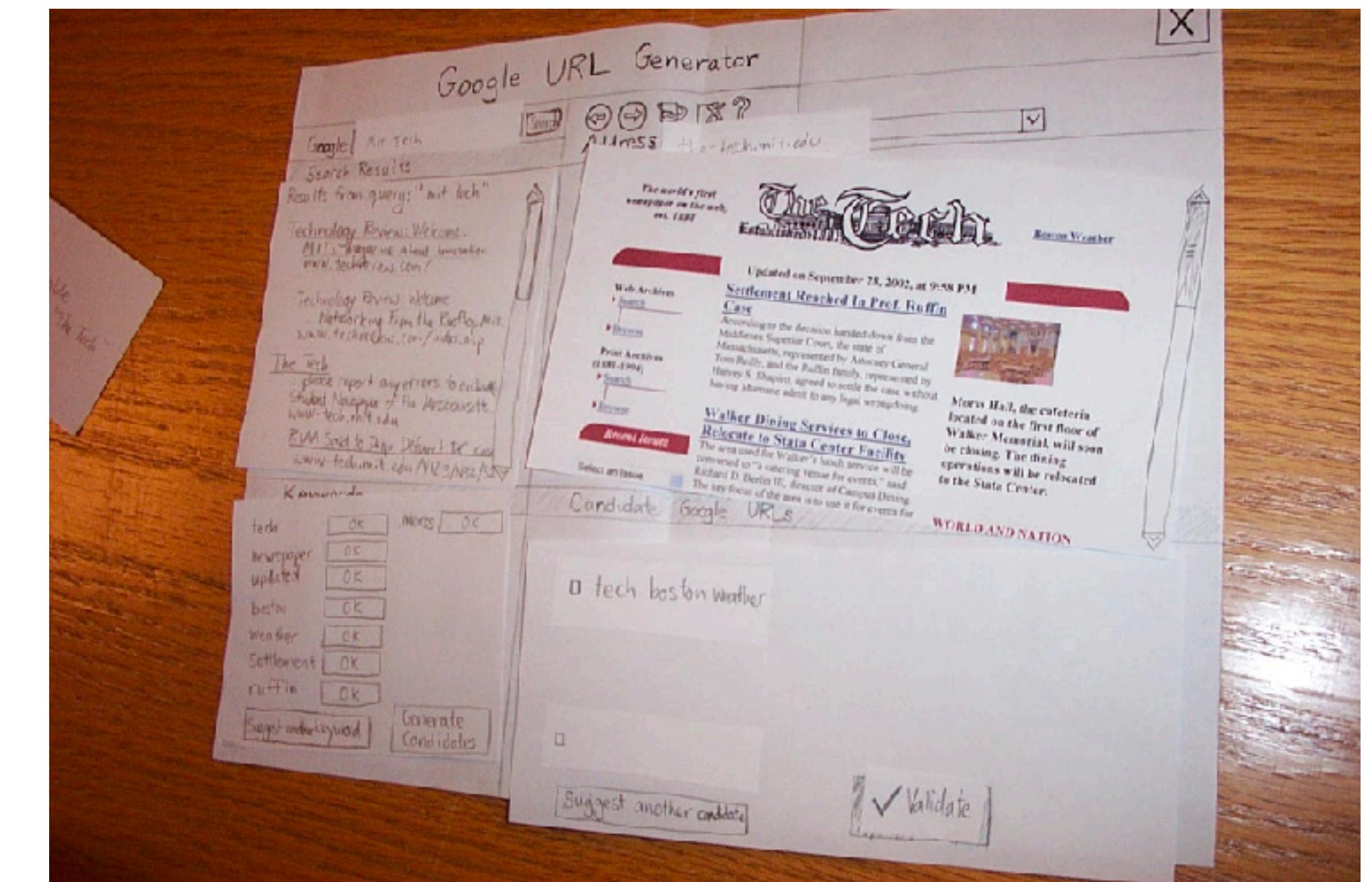


Sometimes including printouts can be useful/faster than sketching

- 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

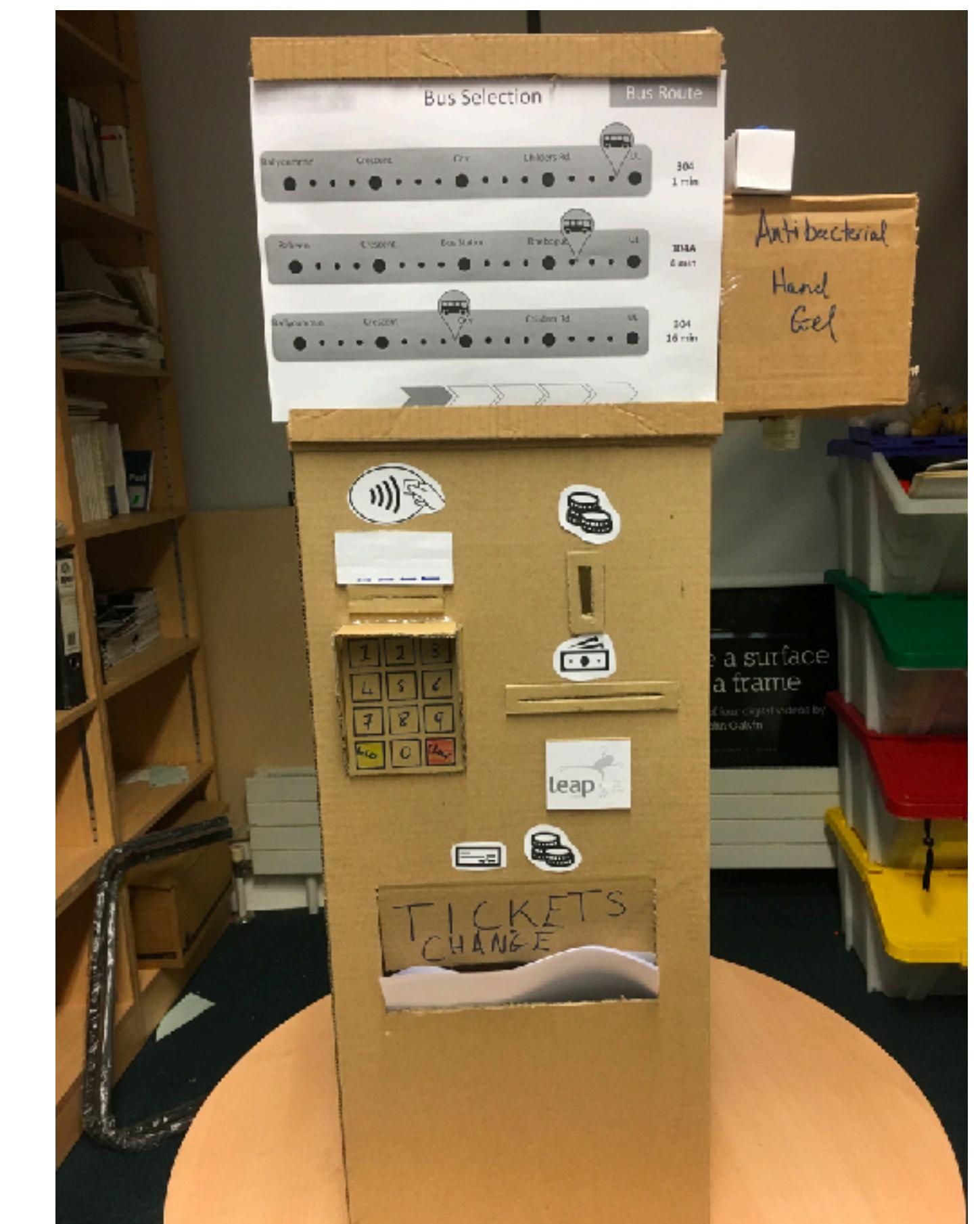


better!

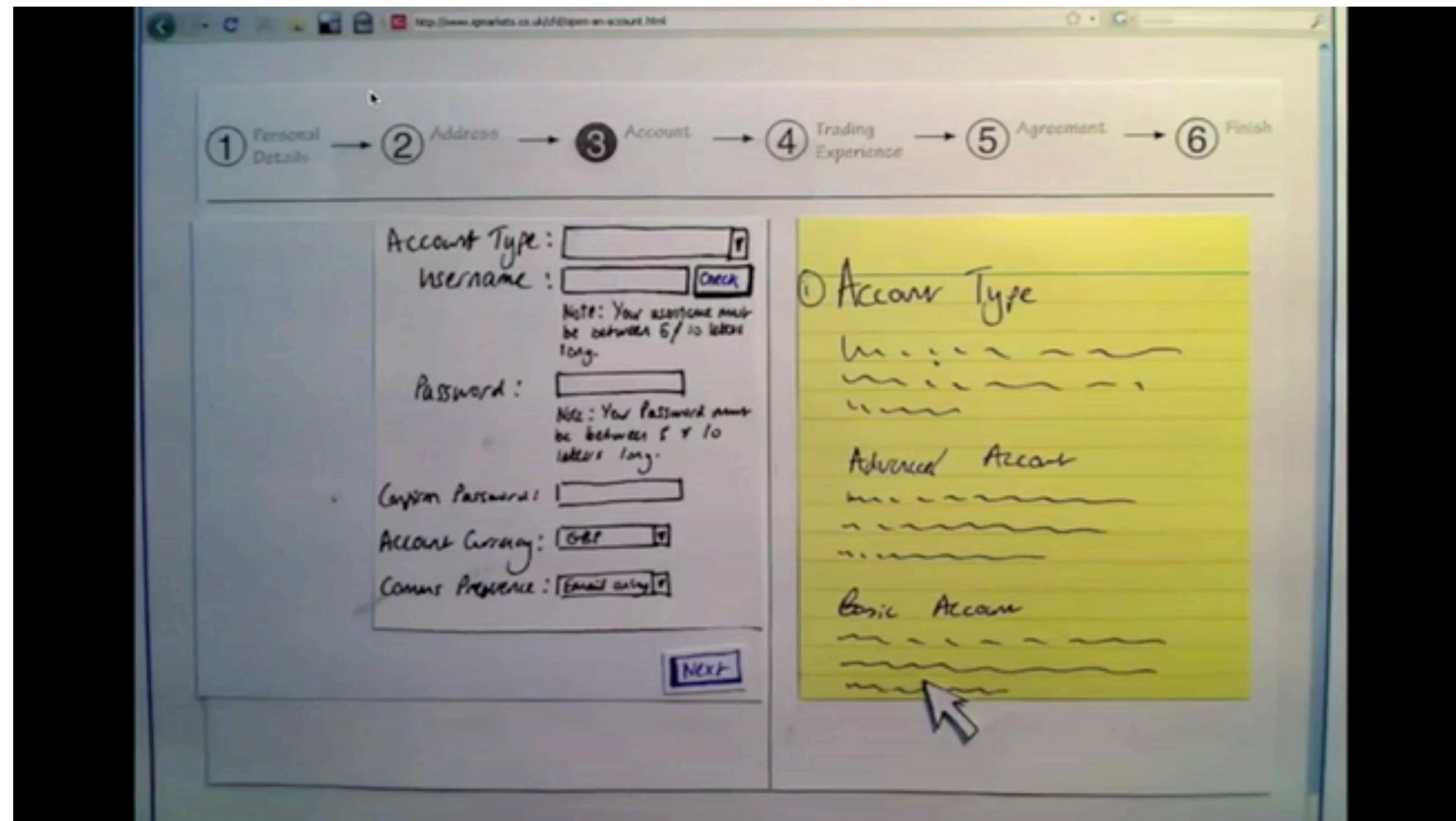
Time-saving tips

- 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



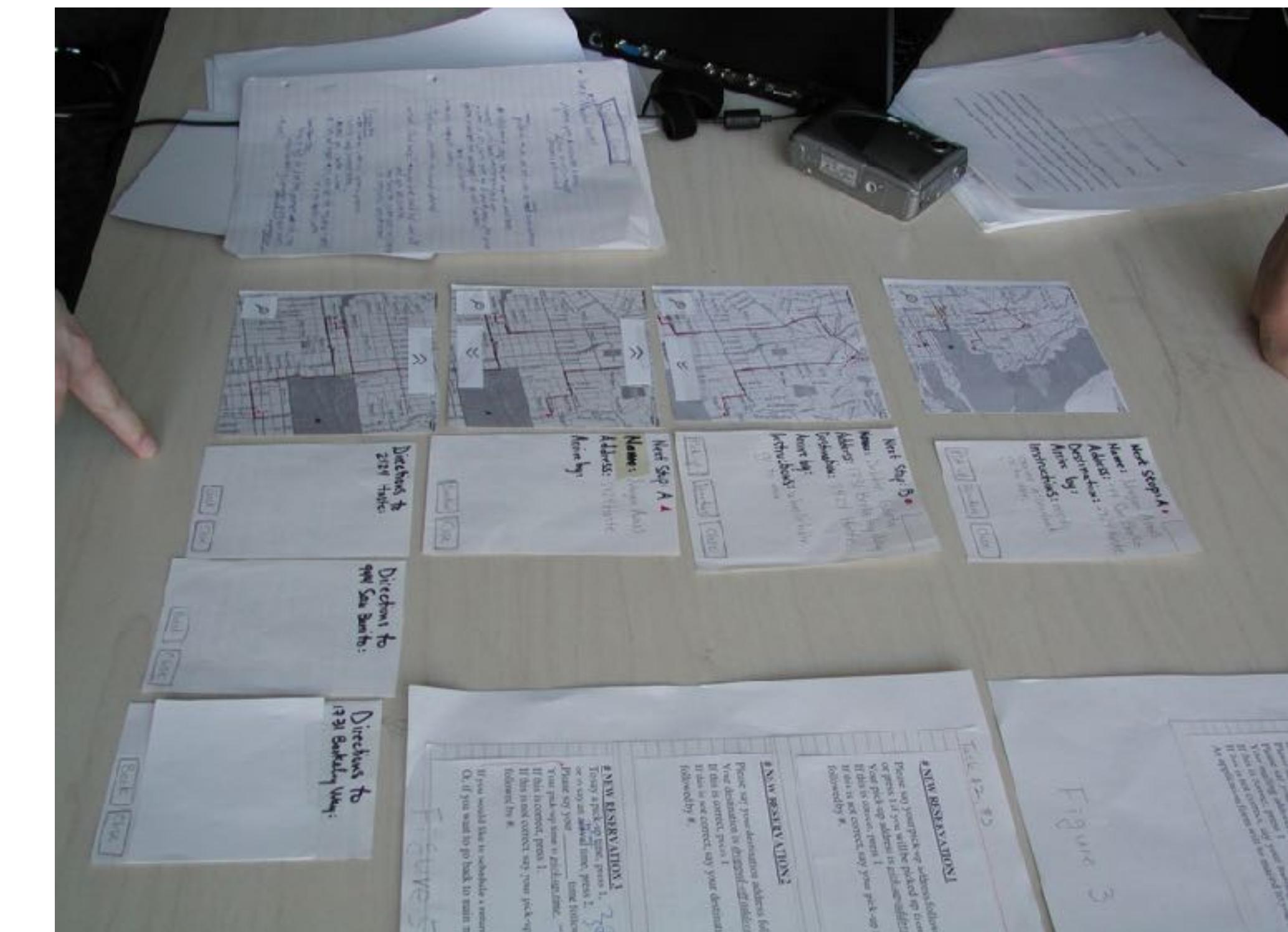
Paper prototypes for video demos



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.

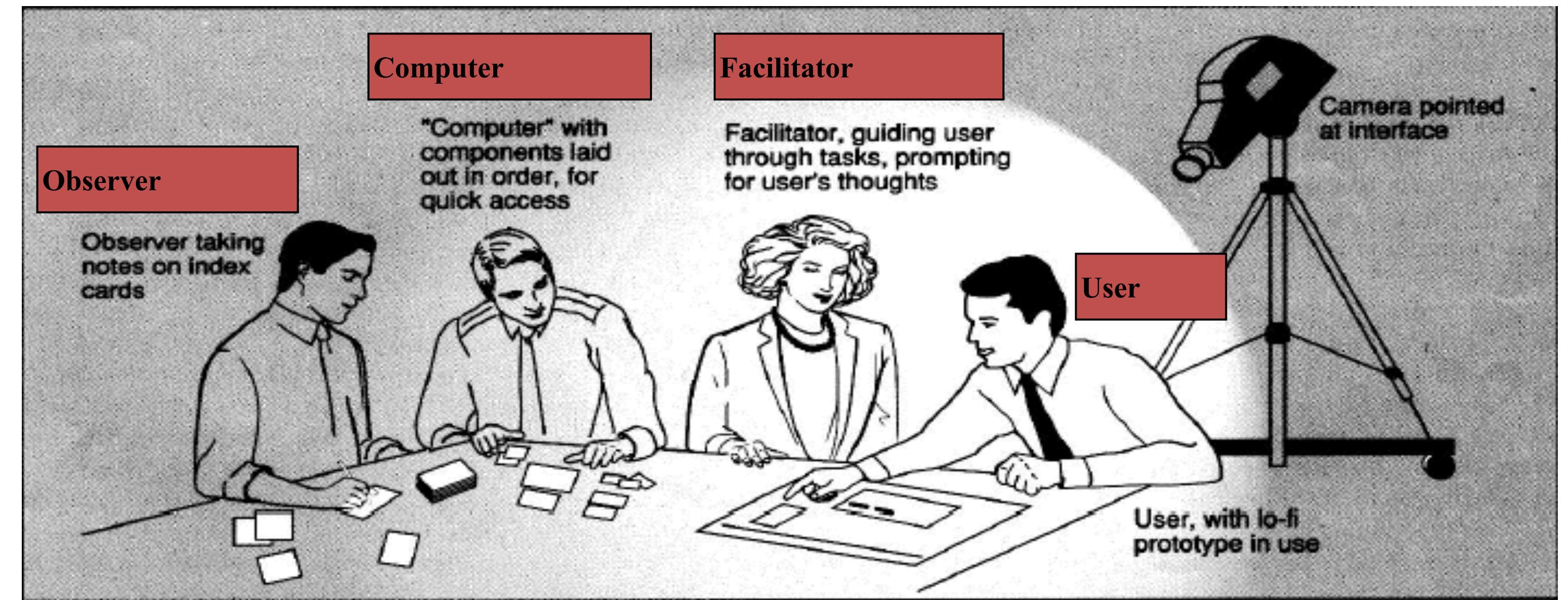


Preparing for a Test

- 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
 - 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



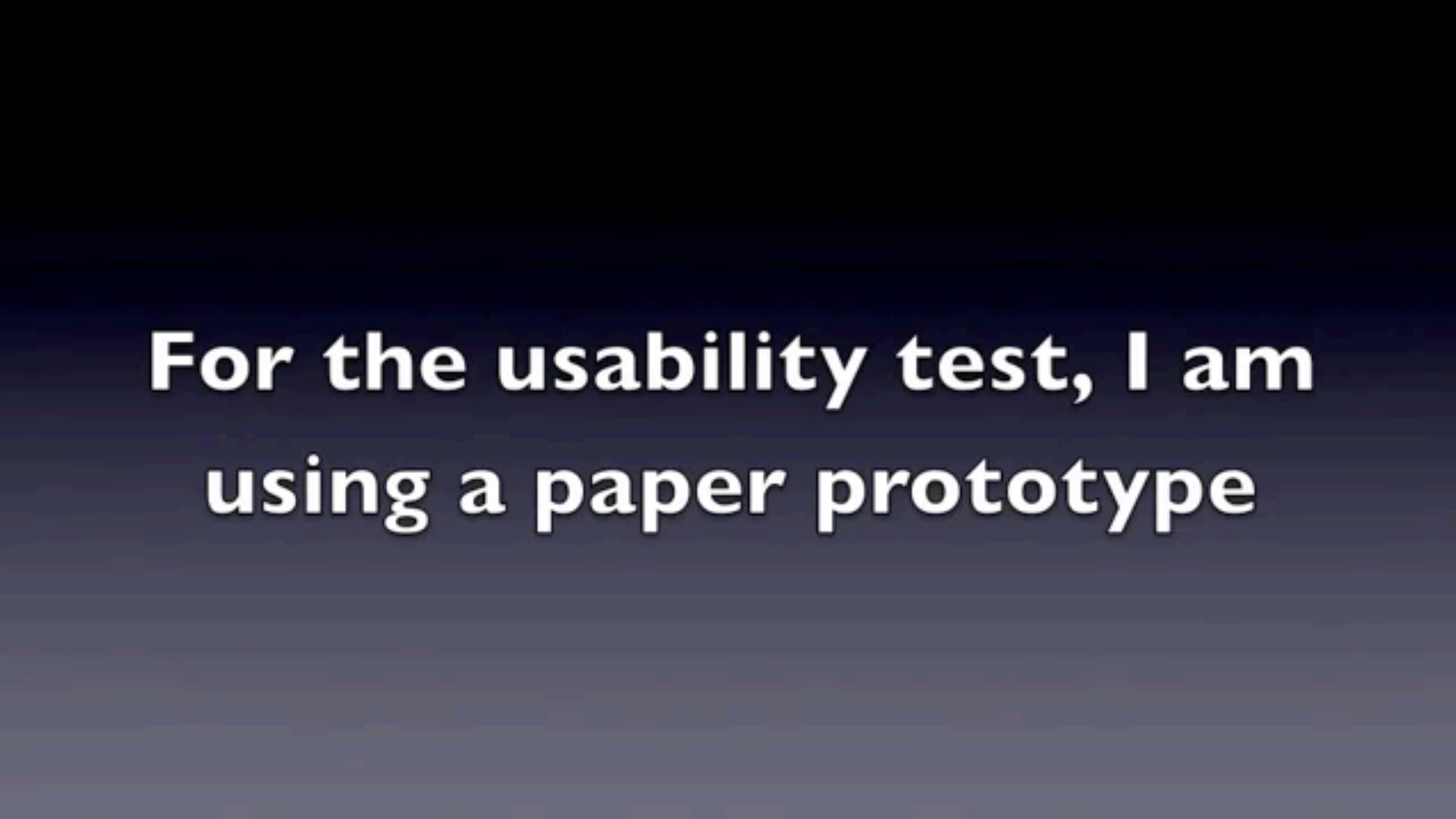
Introducing the test to a user

- **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.*”

Introducing the test to a user



Conducting the User Test



**For the usability test, I am
using a paper prototype**

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

Ideas for remote testing

Marvel App

- Download the app on your desktop
- Take photos on your phone of every view of your paper prototype and load into the app
- Configure what view to go to when users touch a region of a view

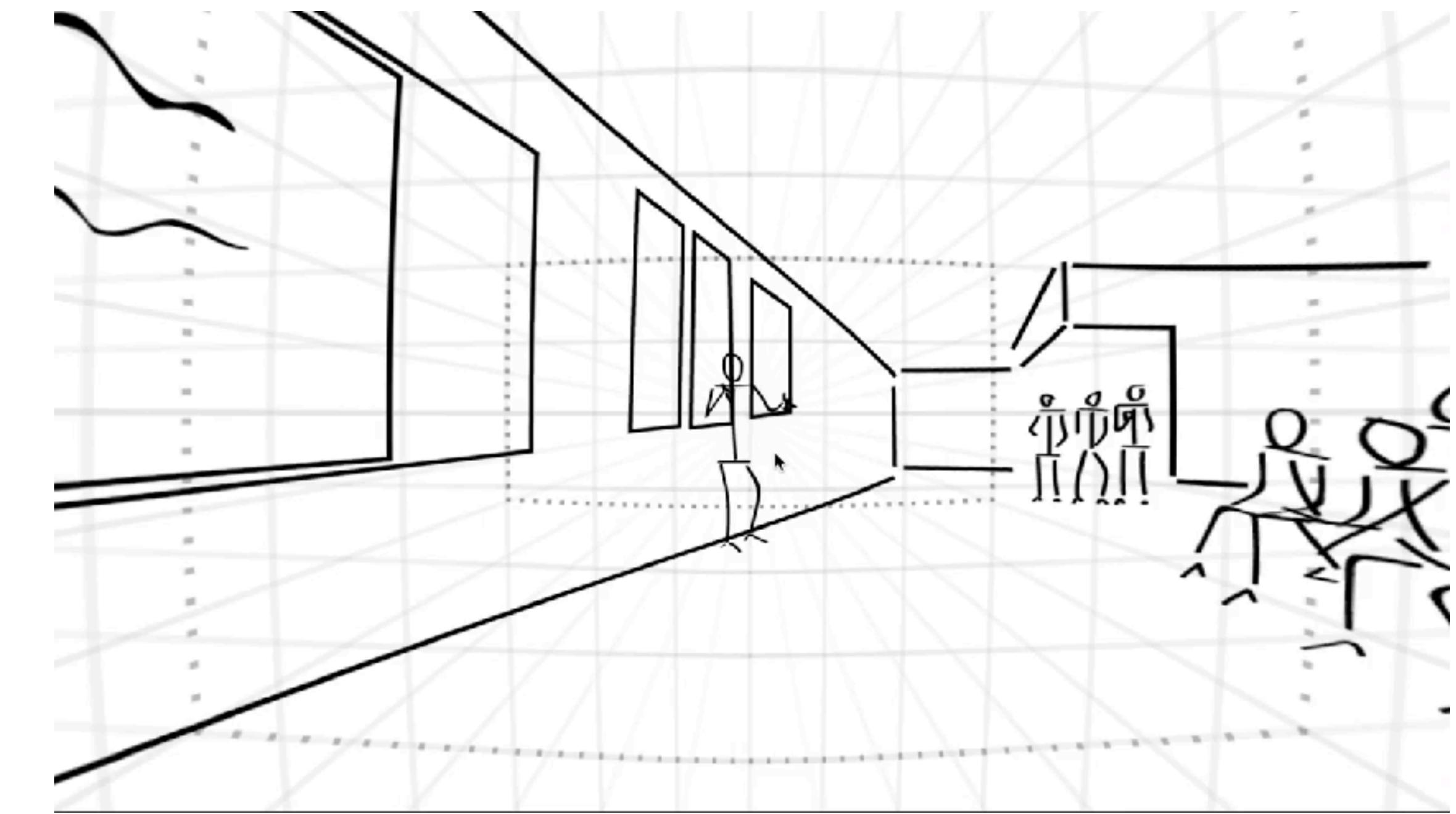
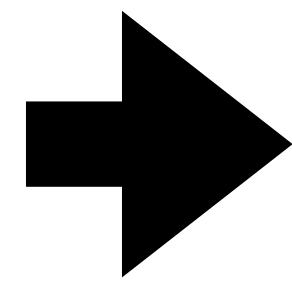
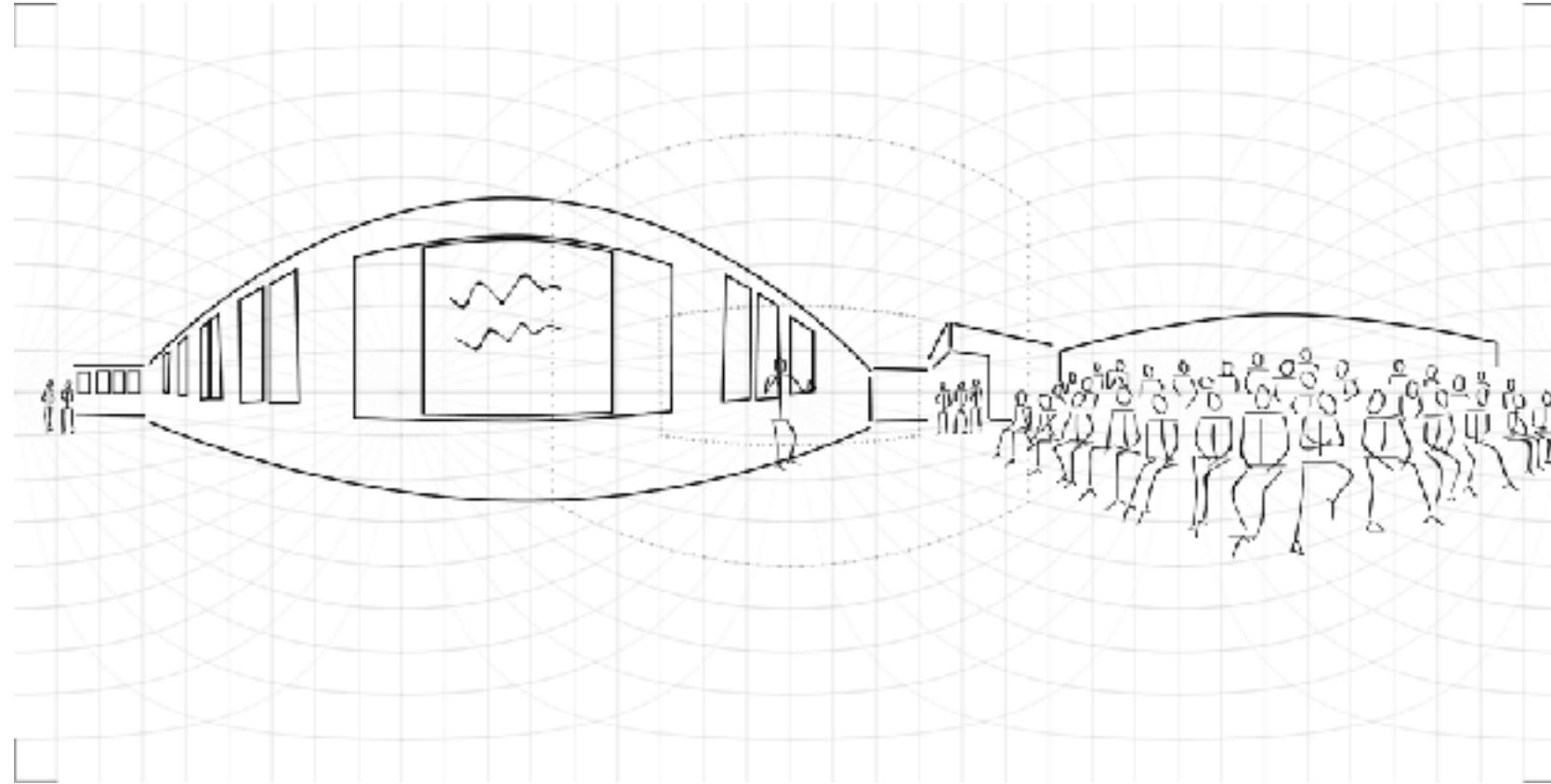
<https://marvelapp.com/>

- For this week, just work on creating your paper prototypes. Next Tuesday, we'll have some work time dedicated to trying out Marvel for Thursday's in-class evaluation



Paper Prototyping VR experiences

- I've not tried them yet but there are some interesting apps online to support this, such as PhotoSphere Viewer or GoPro VR Player, and many blog posts online with tips if you search "paper prototyping VR"



Be creative!

- If your design includes sound, you can play sounds in the background
- If there's a voice interface, someone can pretend to be the voice ("wizard-of-oz" style)
- Use cardboard to prototype 3D objects (only if the shape is important for an interaction that you're testing) and have a phone or laptop camera pointing to the object
- Ping us if you want to discuss ideas for lo-fi prototyping something!

Group presentations and feedback for 2f

- Present your final design for 2f and 2 main tasks. This is your last chance to get feedback on your design before implementation! Get feedback on tasks with an eye towards thinking how those will translate to paper prototype user tests.
- We're releasing 3a (paper prototype) and 3b (heuristic evaluation) online later today.
- Tomorrow in section is group work time on 2g and 3a (the paper prototype)
 - Since we're remote, pick one person who will be physically making the prototype (perhaps the person who has other people at home who can user test it in 3c - usability study).
 - That person should **bring supplies** to section and lecture next Tuesday.