

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation!

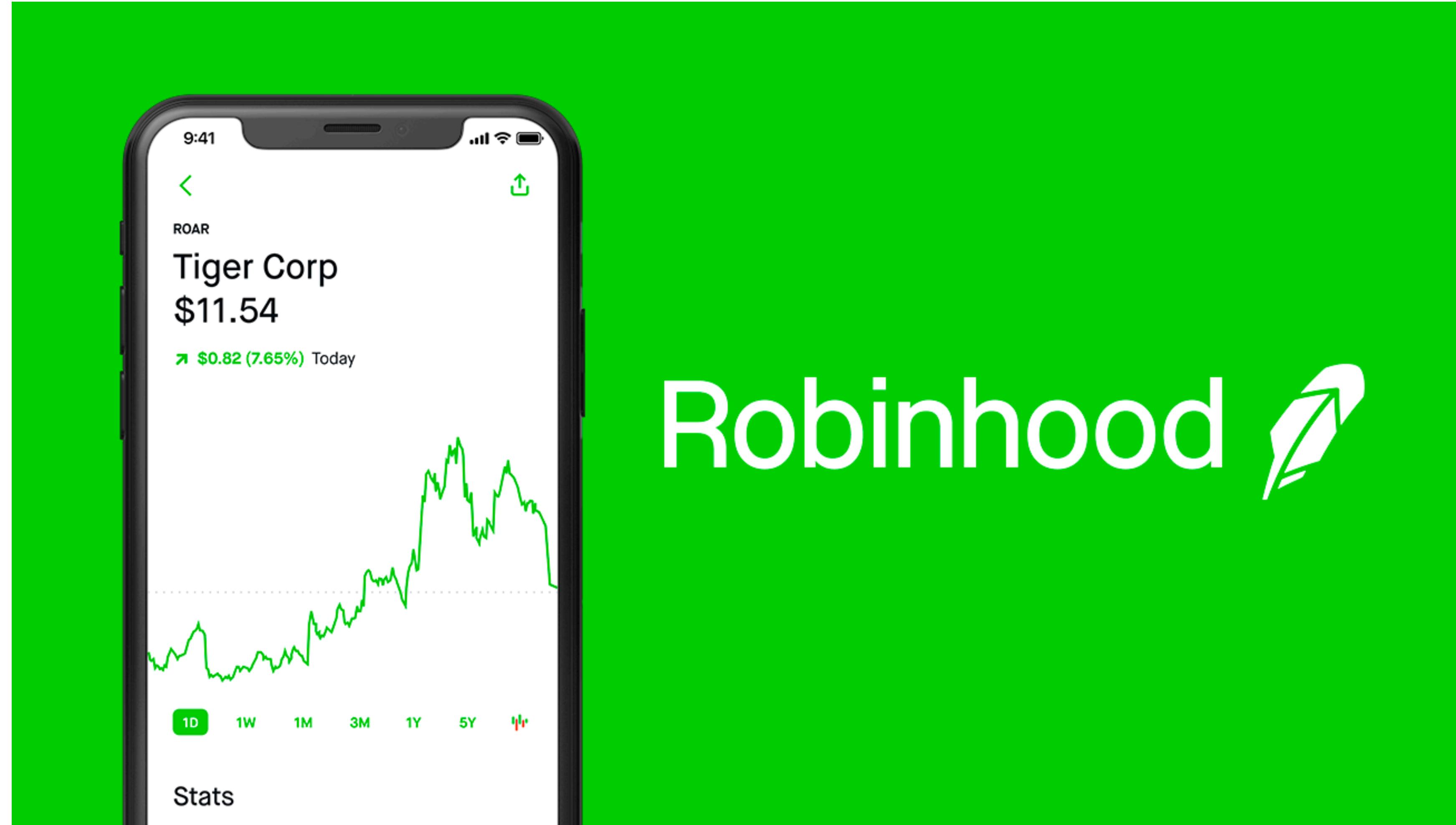
Lecture 12: Paper Prototyping

Instructor: Amy Zhang, 11/9/2021

Today's Topics

- UI Hall of Fame and Shame
- Paper Prototyping
 - How to make paper prototypes
 - Tips for good paper prototypes
 - Testing paper prototypes
- Work on making your paper prototypes (3a)!

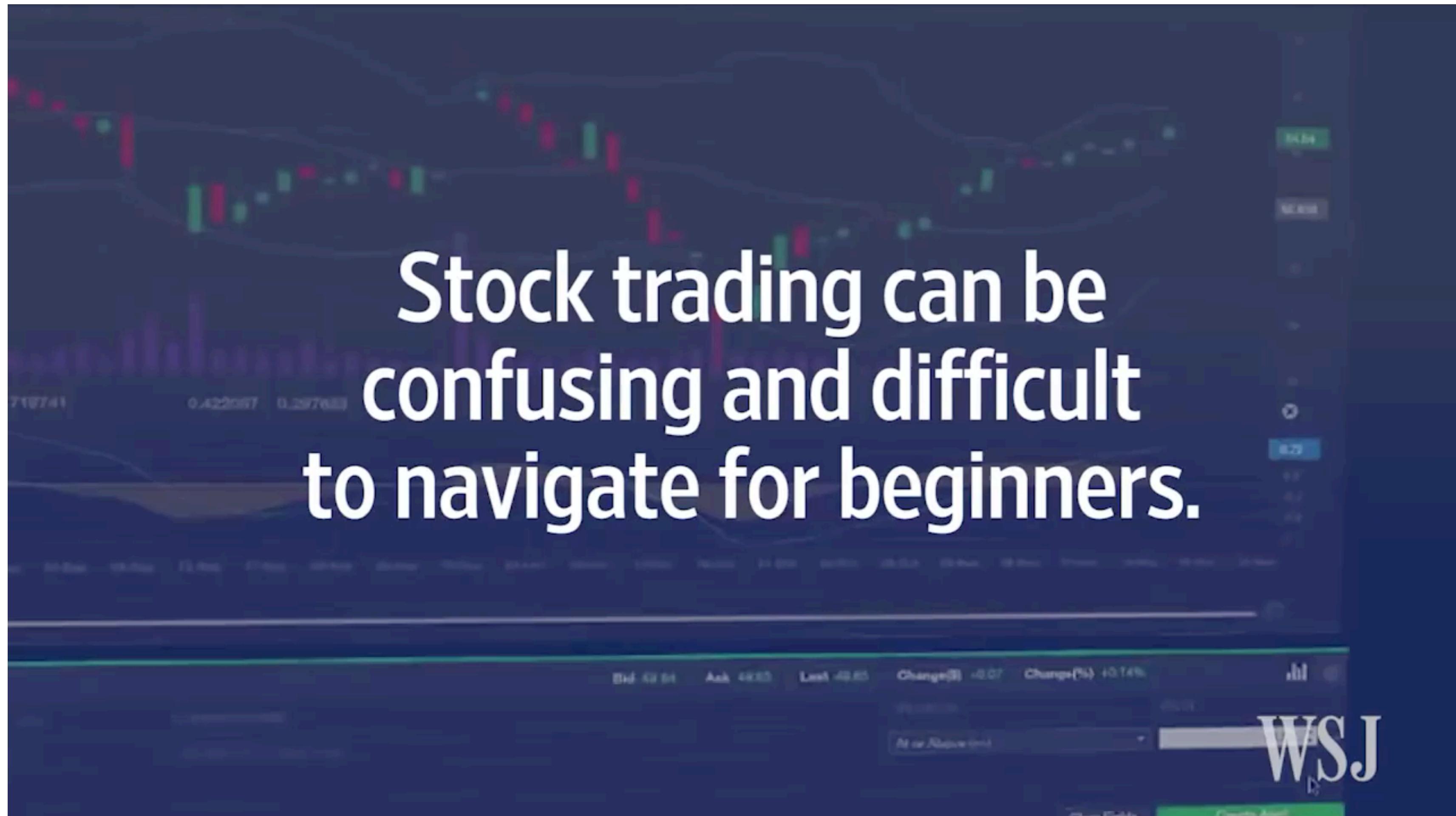
UI Hall of Fame and Shame



Robinhood

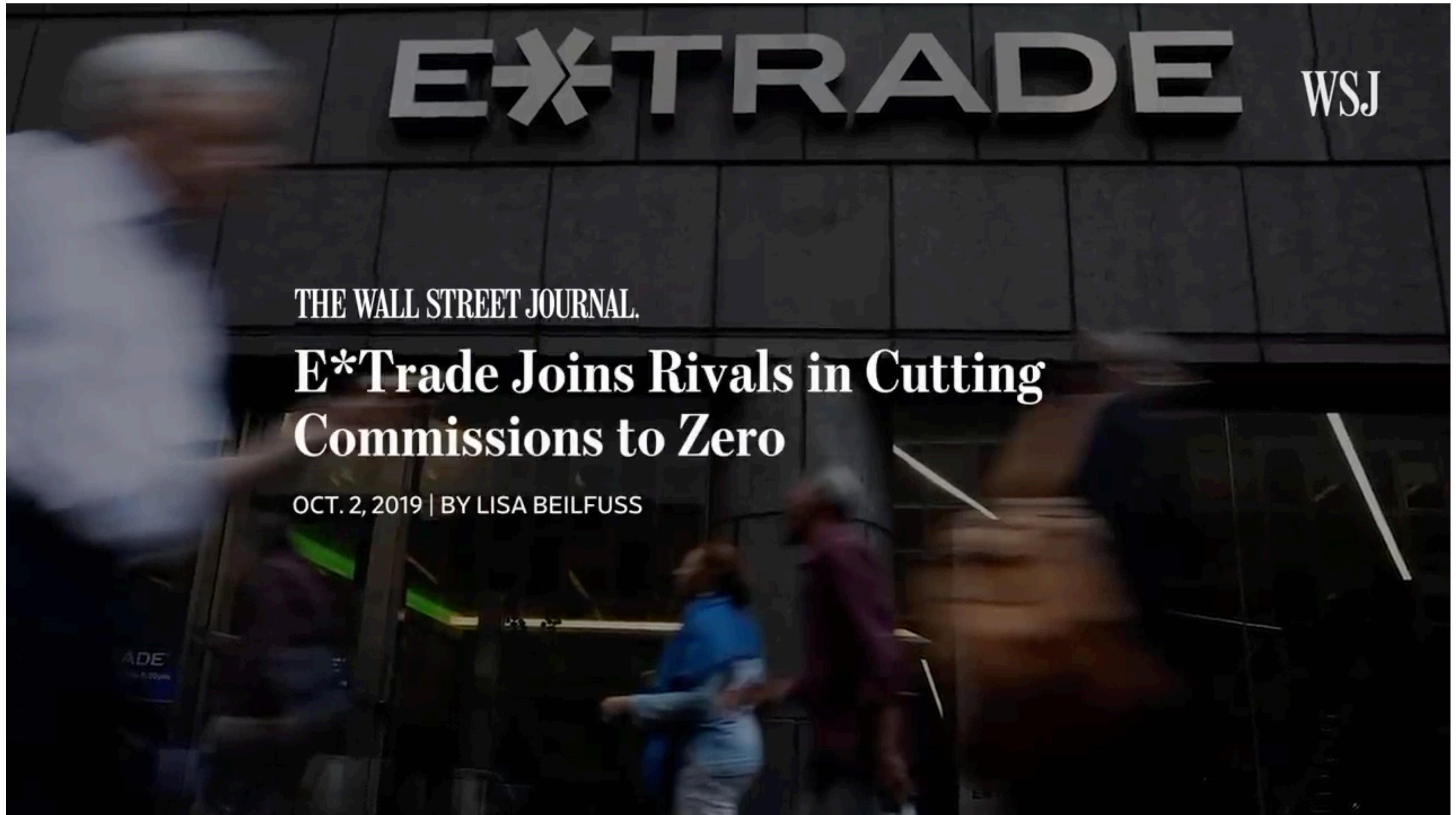


Drawing on our ethics discussion last Thursday, let's talk about the ethics of design for a tool like Robinhood!



This app is framed in terms of **social good** - it is a tool targeted at beginner traders that democratizes trading by lowering barriers.

It also has won **design awards** for its usability.



THE WALL STREET JOURNAL.

E*Trade Joins Rivals in Cutting Commissions to Zero

OCT. 2, 2019 | BY LISA BEILFUSS

We prize usability in design. This app is highly learnable and intuitive. But can a technology be **too** easy to use that it becomes dangerous?



WSJ

We are expanding our educational content related to options trading. We have added information on early options assignments to our help center and we will be hiring an Options Education Specialist to further enhance education related to our options offering.

VLAD TENEV & BAIJU BHATT, ROBINHOOD CO-FOUNDERS

How **safe** is this app? On the one hand, there are confirmation dialogs and ways to review and edit your trades before you execute them.

As designers, do we have **responsibility** to steer people towards “good” decisions?

Browse

Search companies...

Popular Lists

- 100 Most Popular
- Top Movers
- Upcoming Earnings
- Crypto
- Cannabis
- Healthcare Supplies

The Wall Street Journal 42m ↗

Kodak Loan Disclosure and Stock

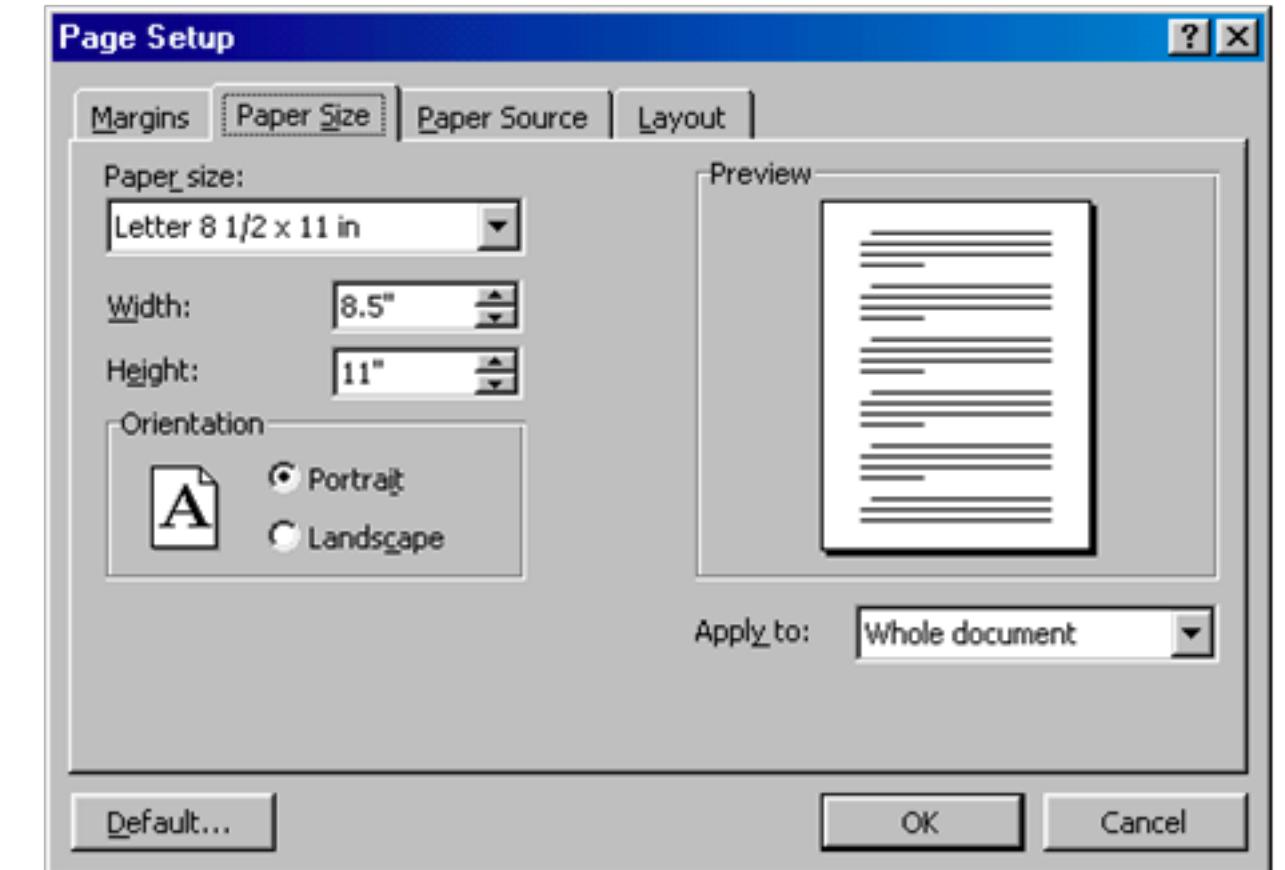
Even if we have good intentions at the outset, how can **misaligned incentives** result in problematic designs (such as gamification)?

Paper Prototyping

Fidelity in Prototyping

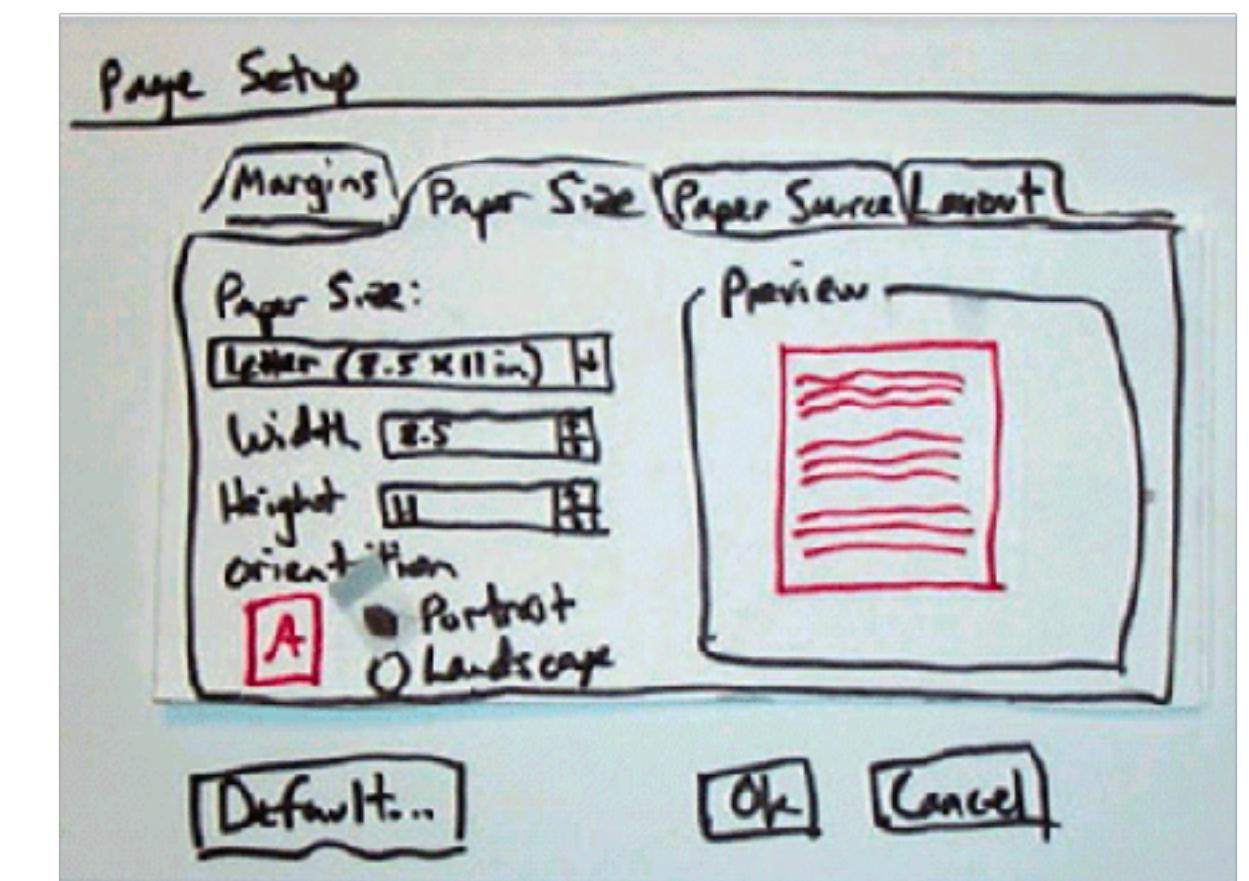
- **High Fidelity**

- Prototypes look and feel more like the final product



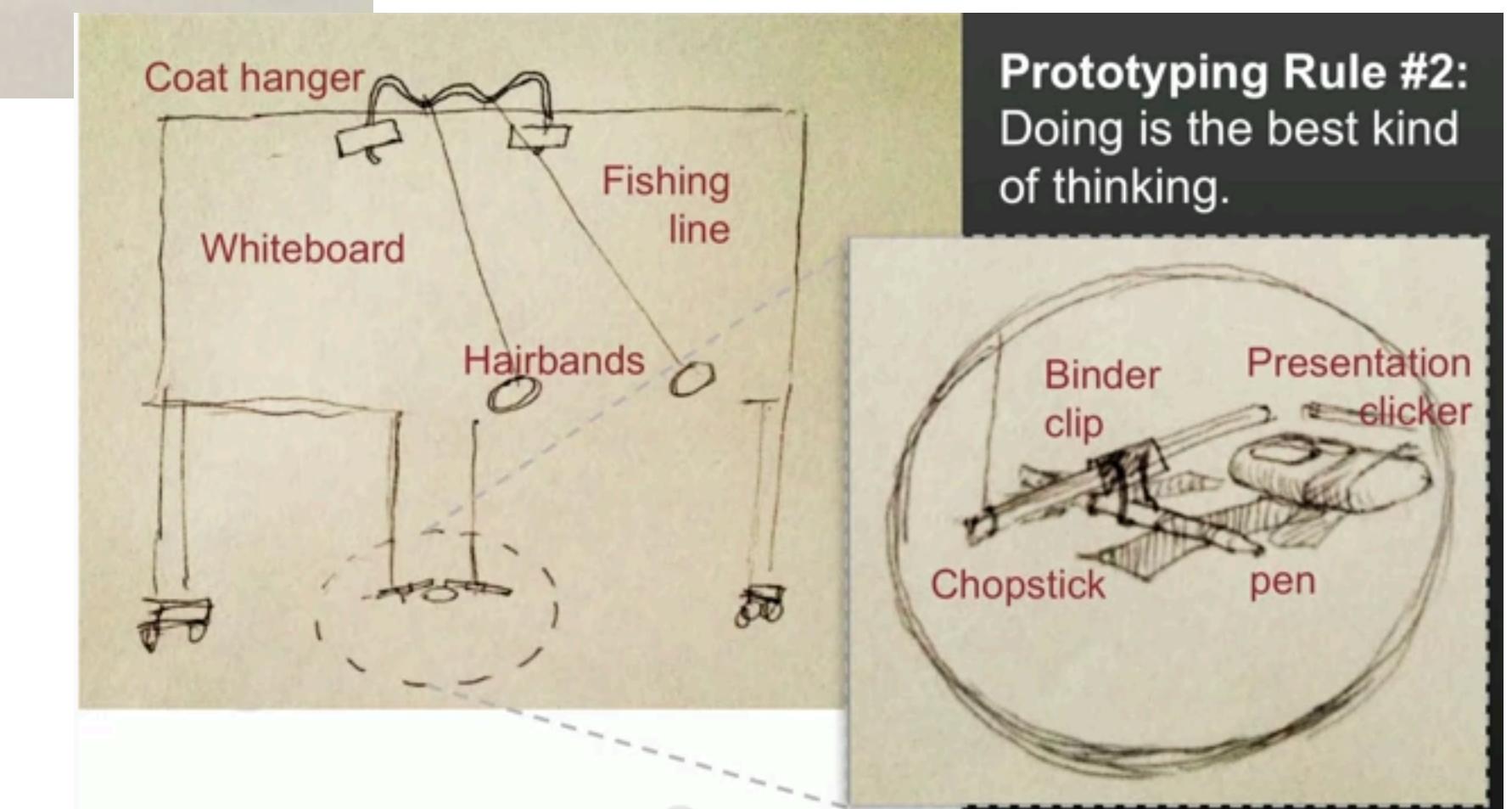
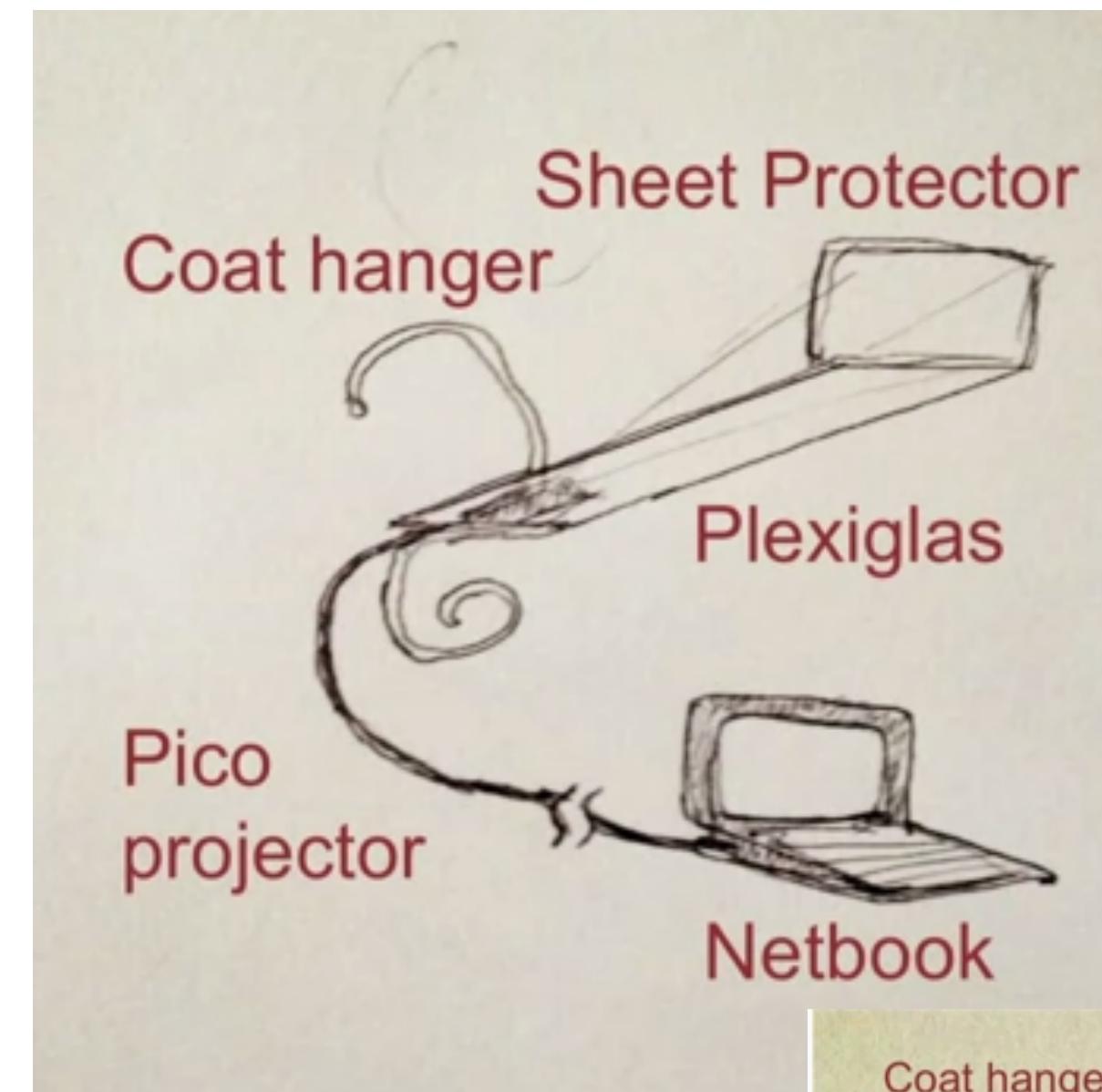
- **Low Fidelity**

- Designer sketches with many details missing

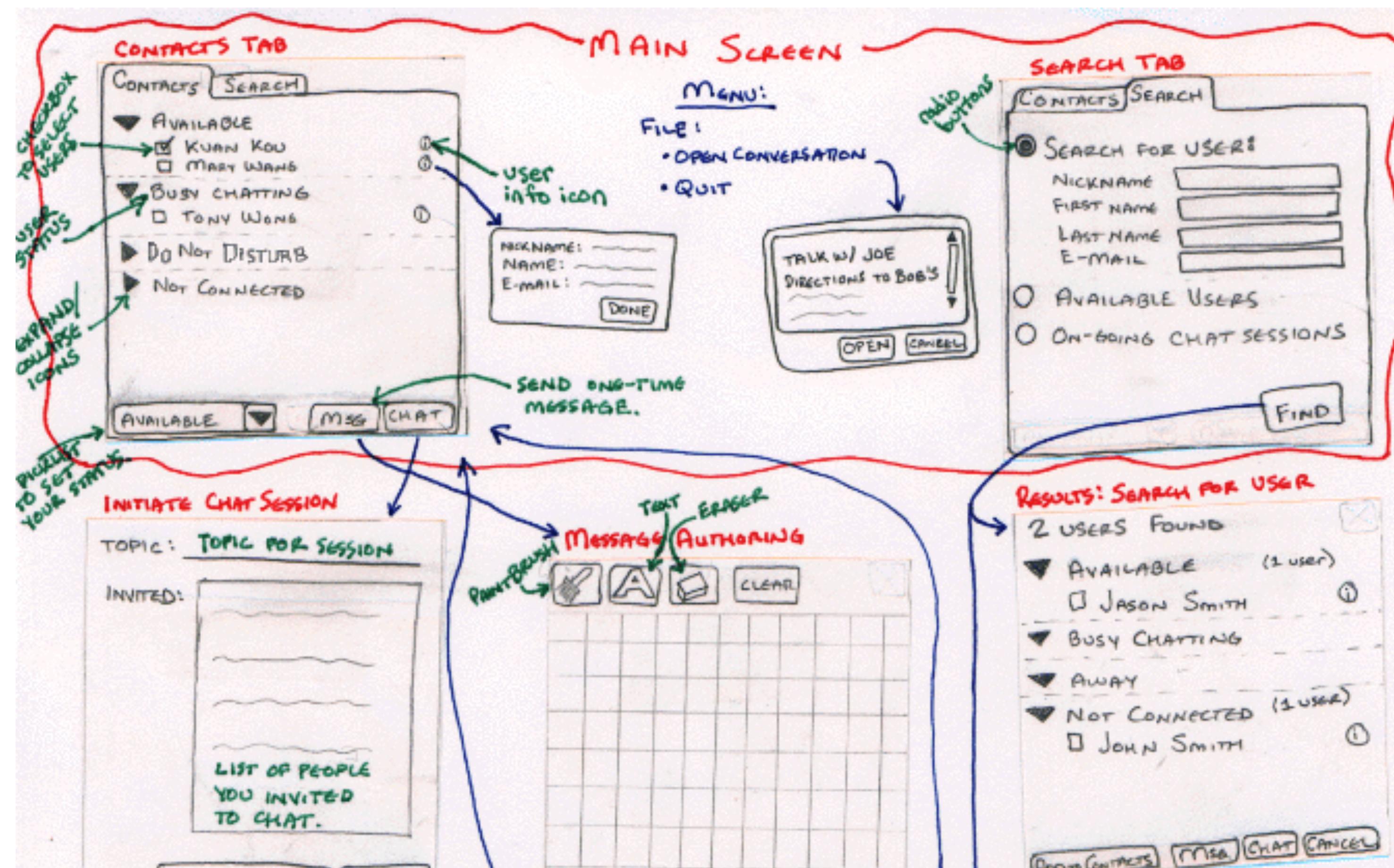


Why Prototype?

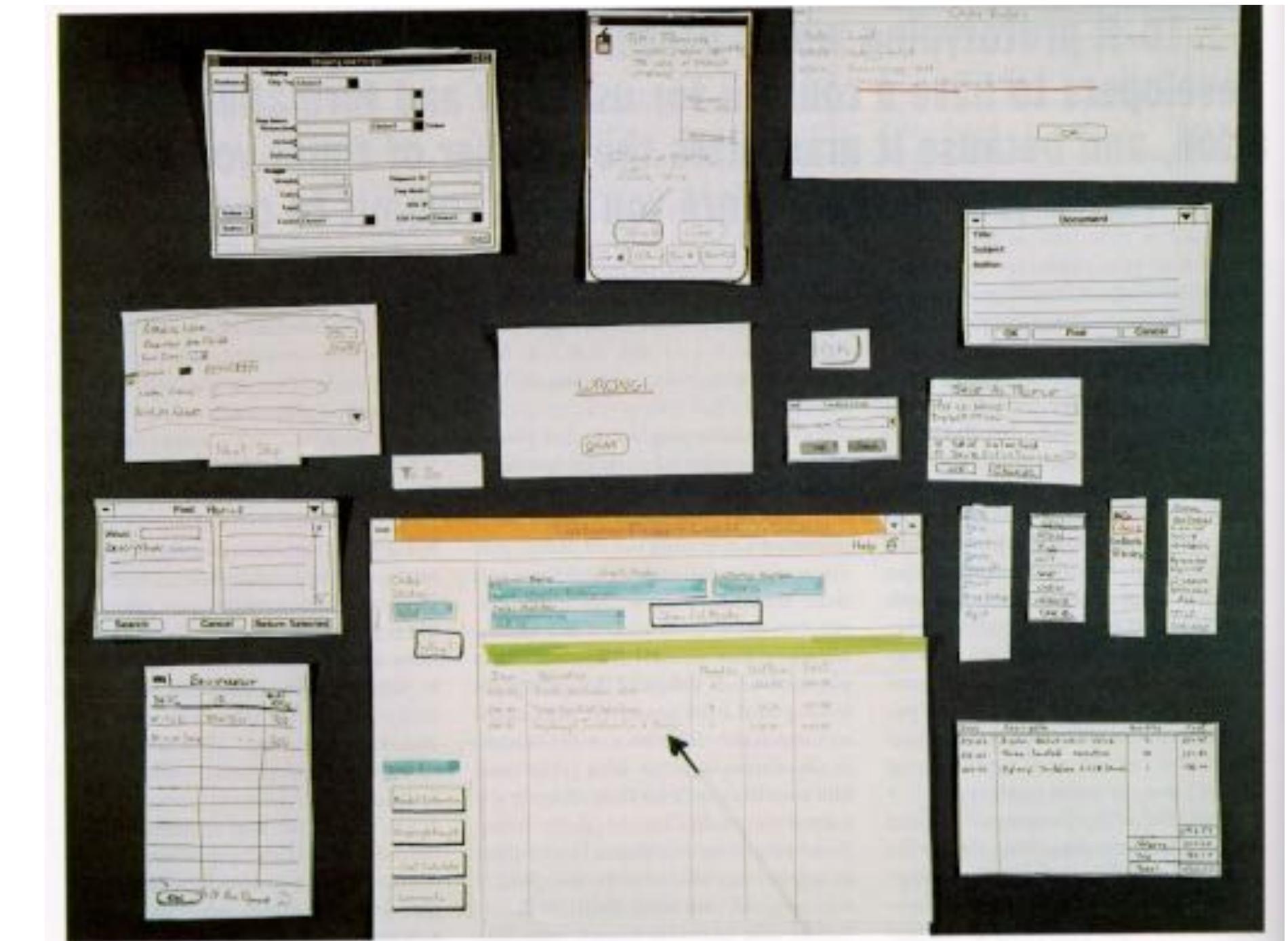
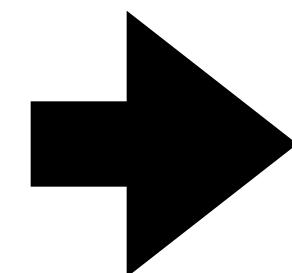
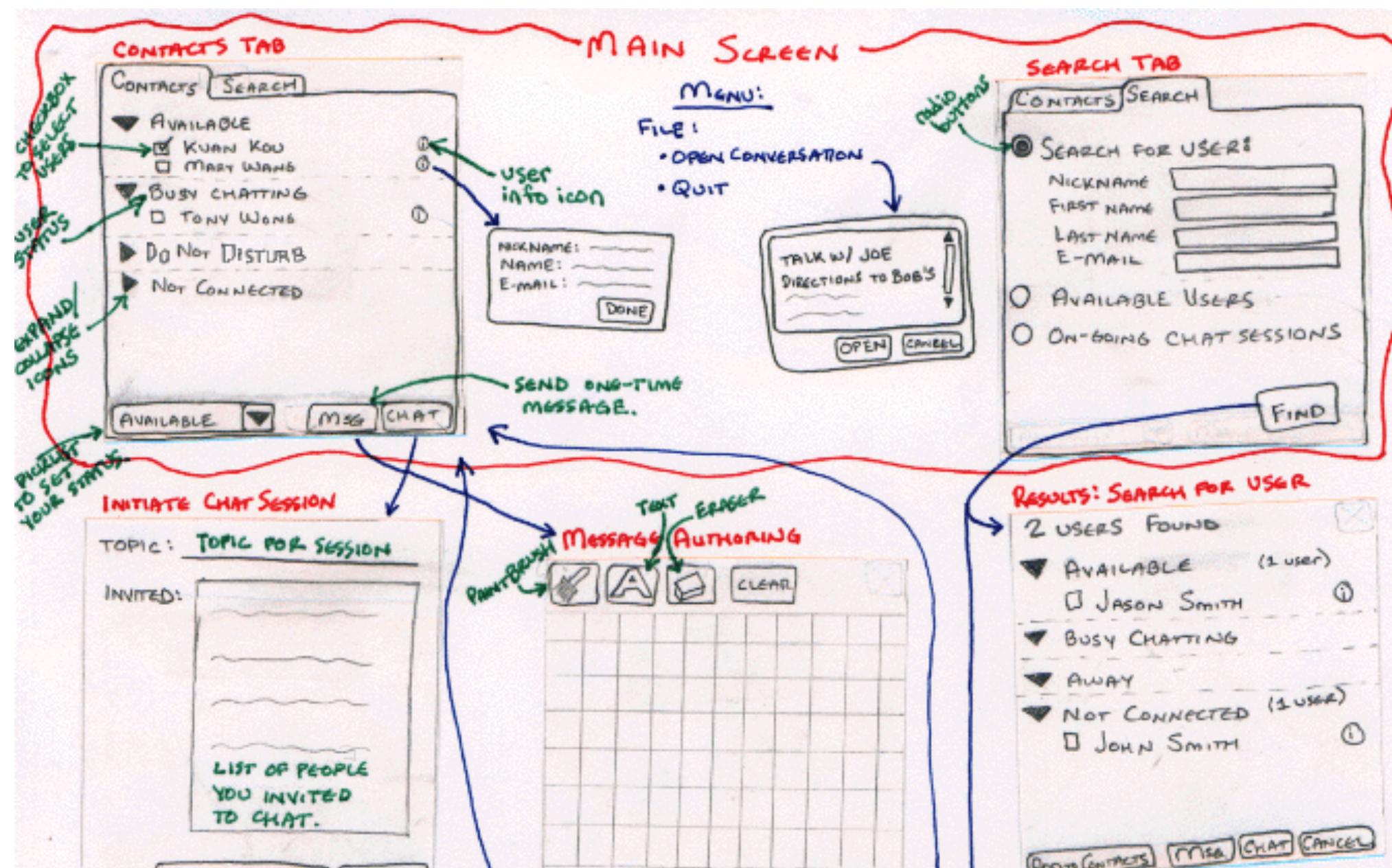
- Get feedback earlier, cheaper
- Experiment with alternatives
- Easier to change or throw away



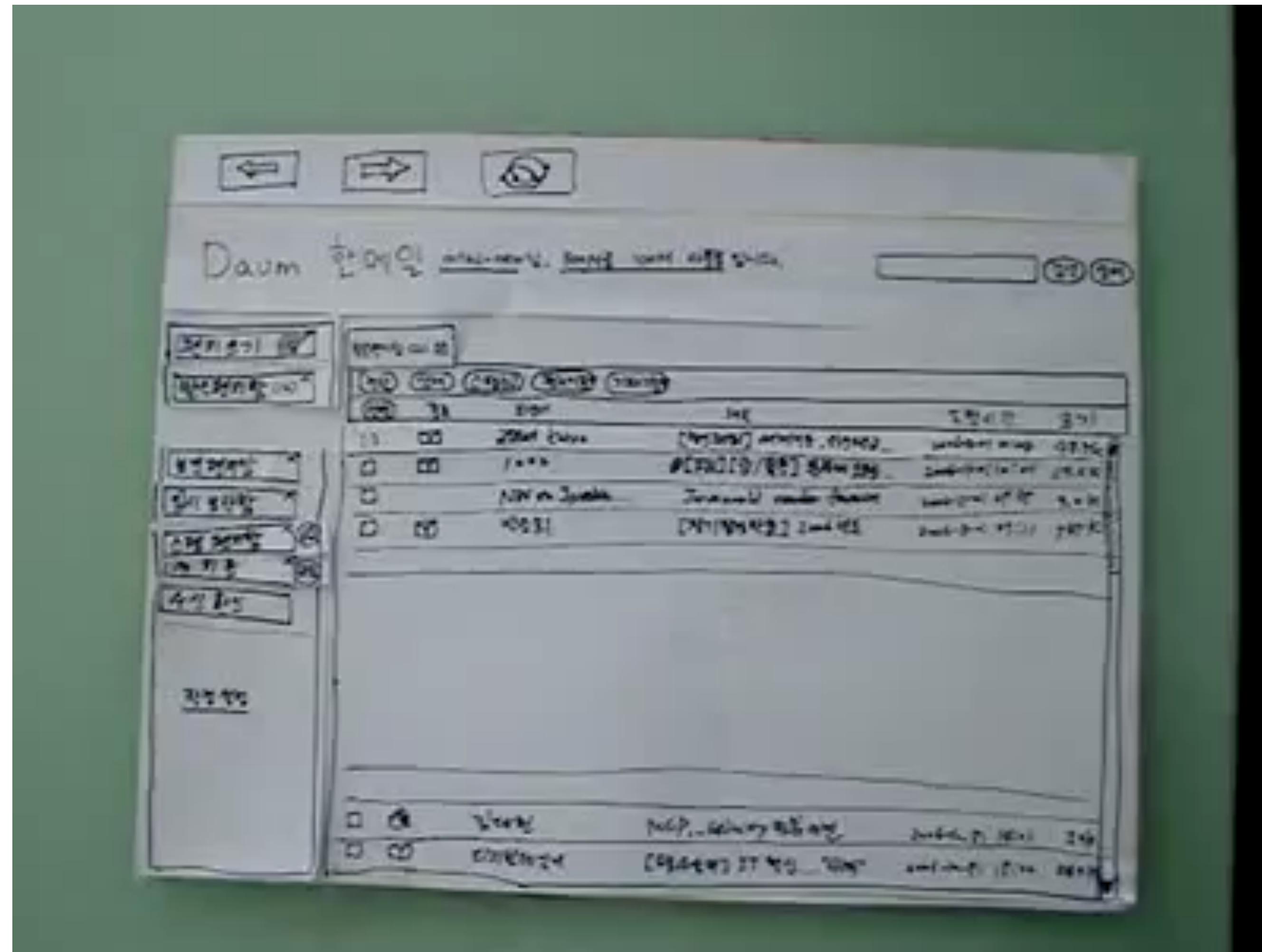
Sketches (low fidelity)



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?

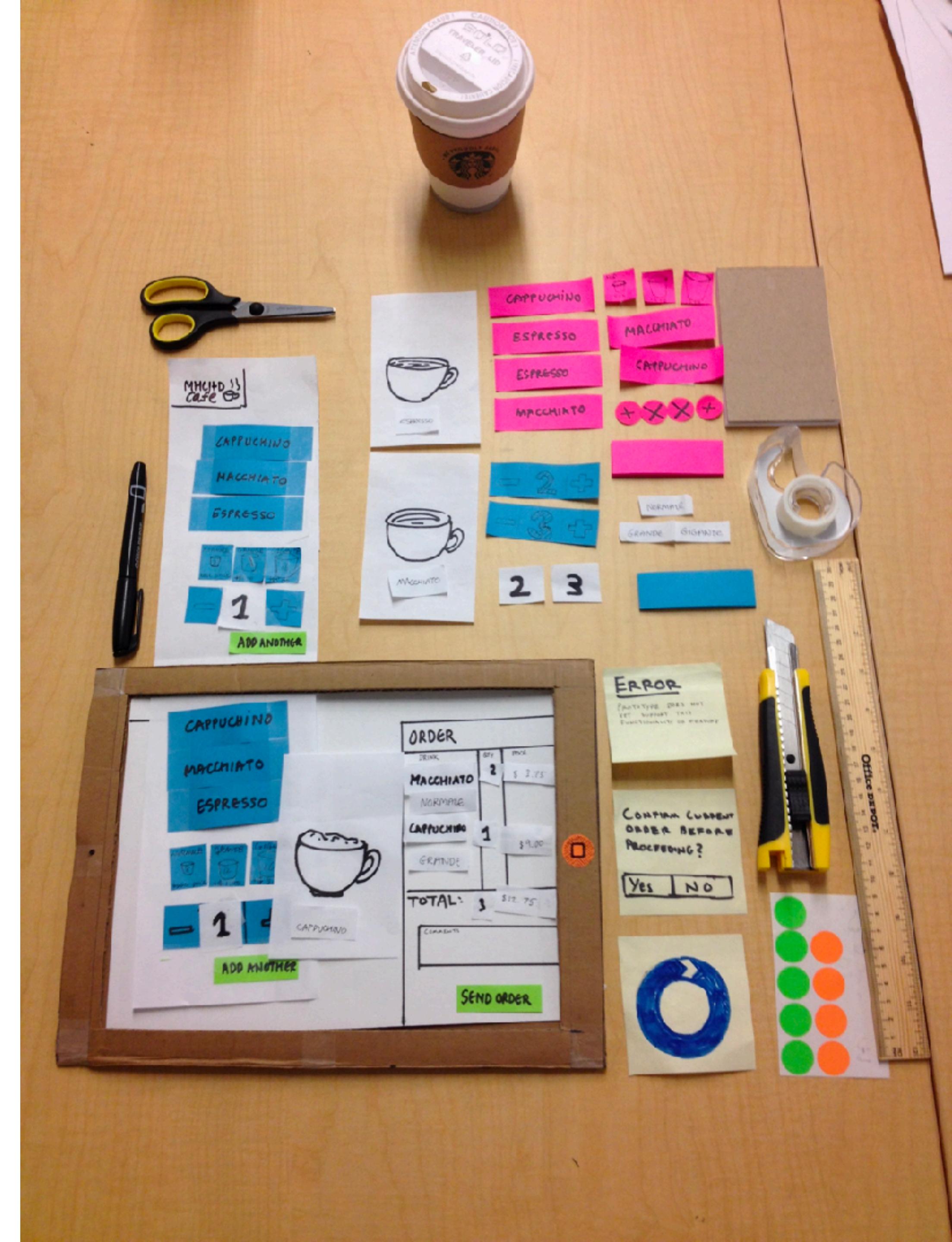
- You can still make it quickly
- Easier to change
 - Easy to make changes between user tests, or even during a user test
 - No code investment - everything will be thrown away (except the design)
- Focuses attention on the big picture
 - Designer doesn't waste time on details
 - User makes more creative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



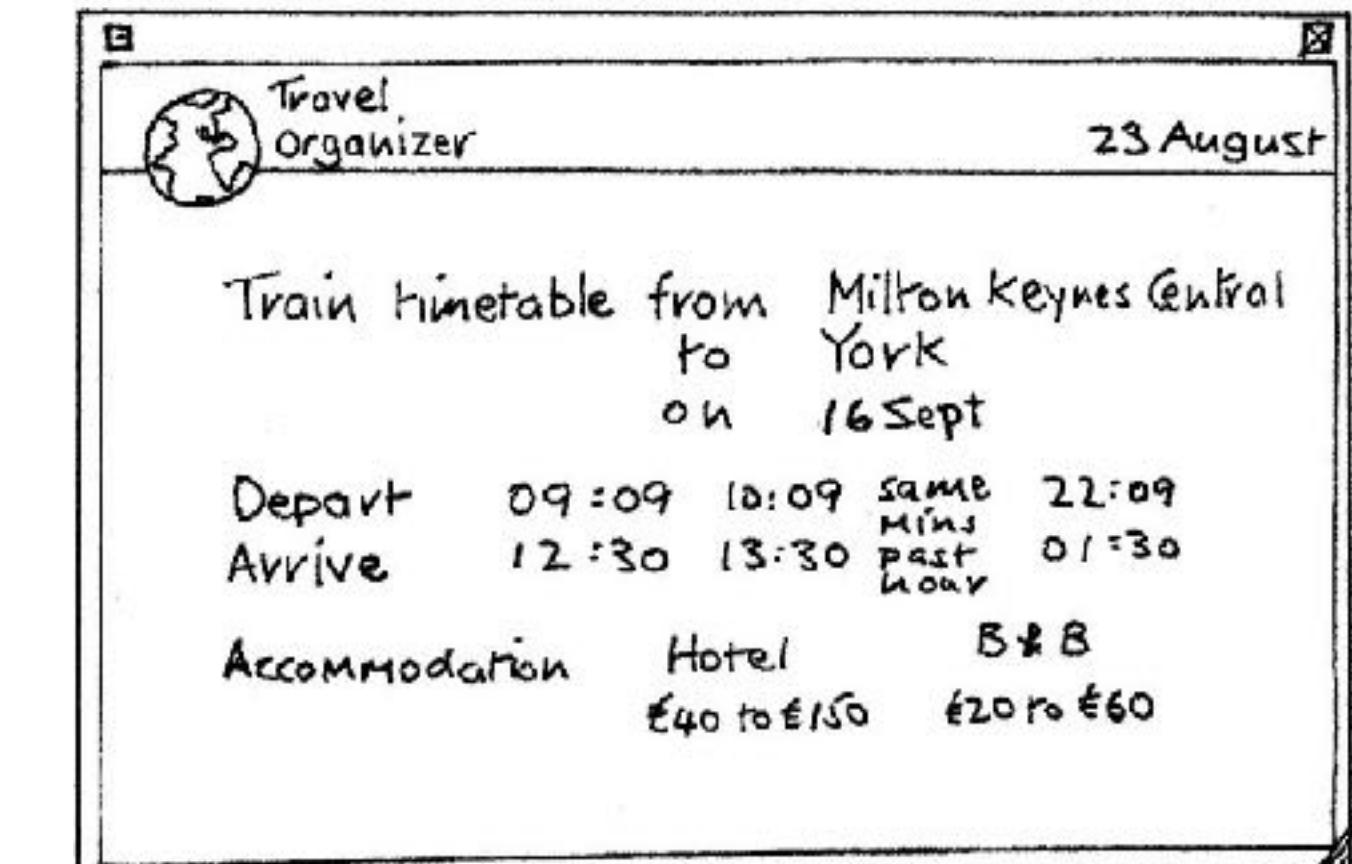
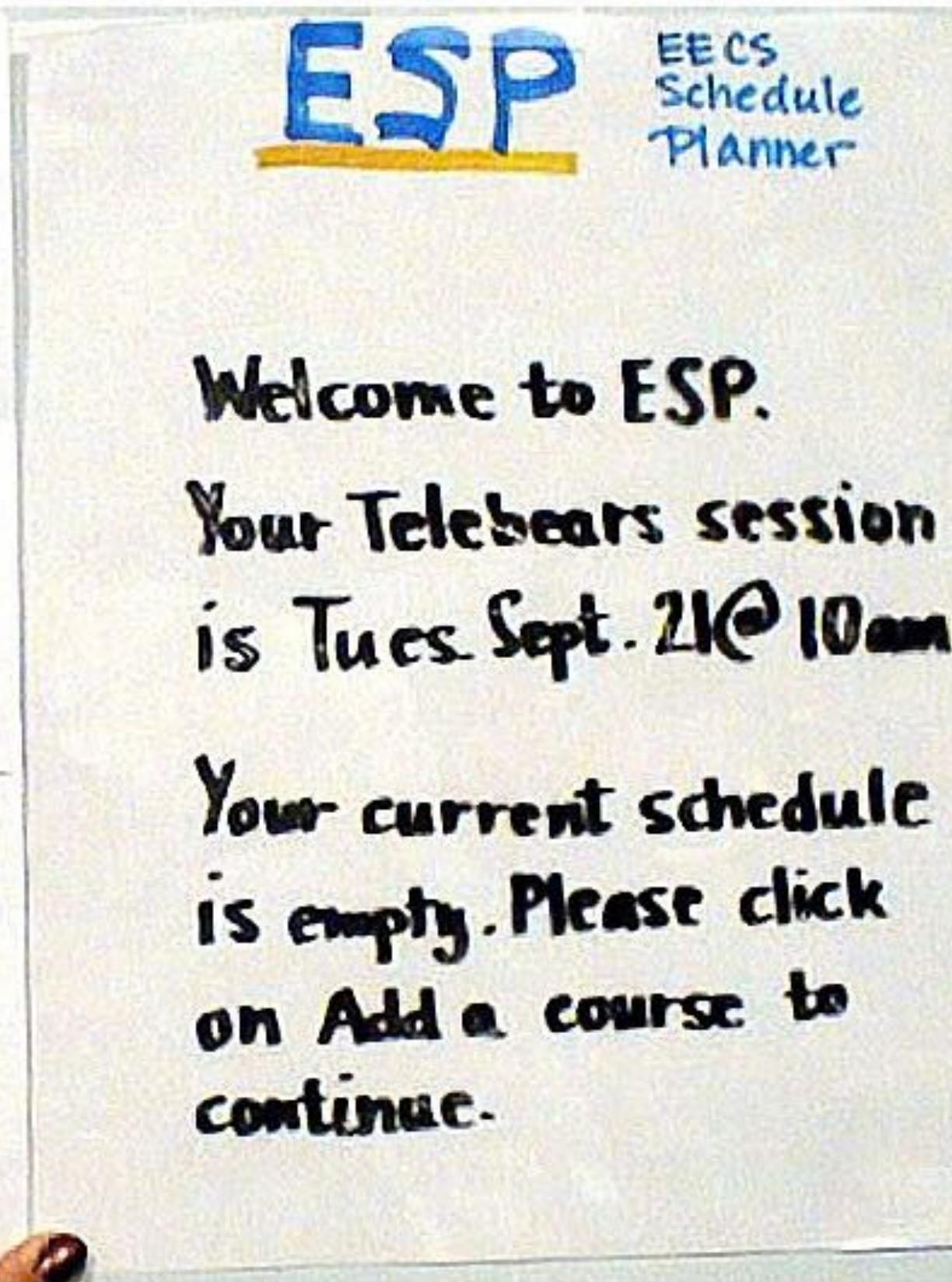
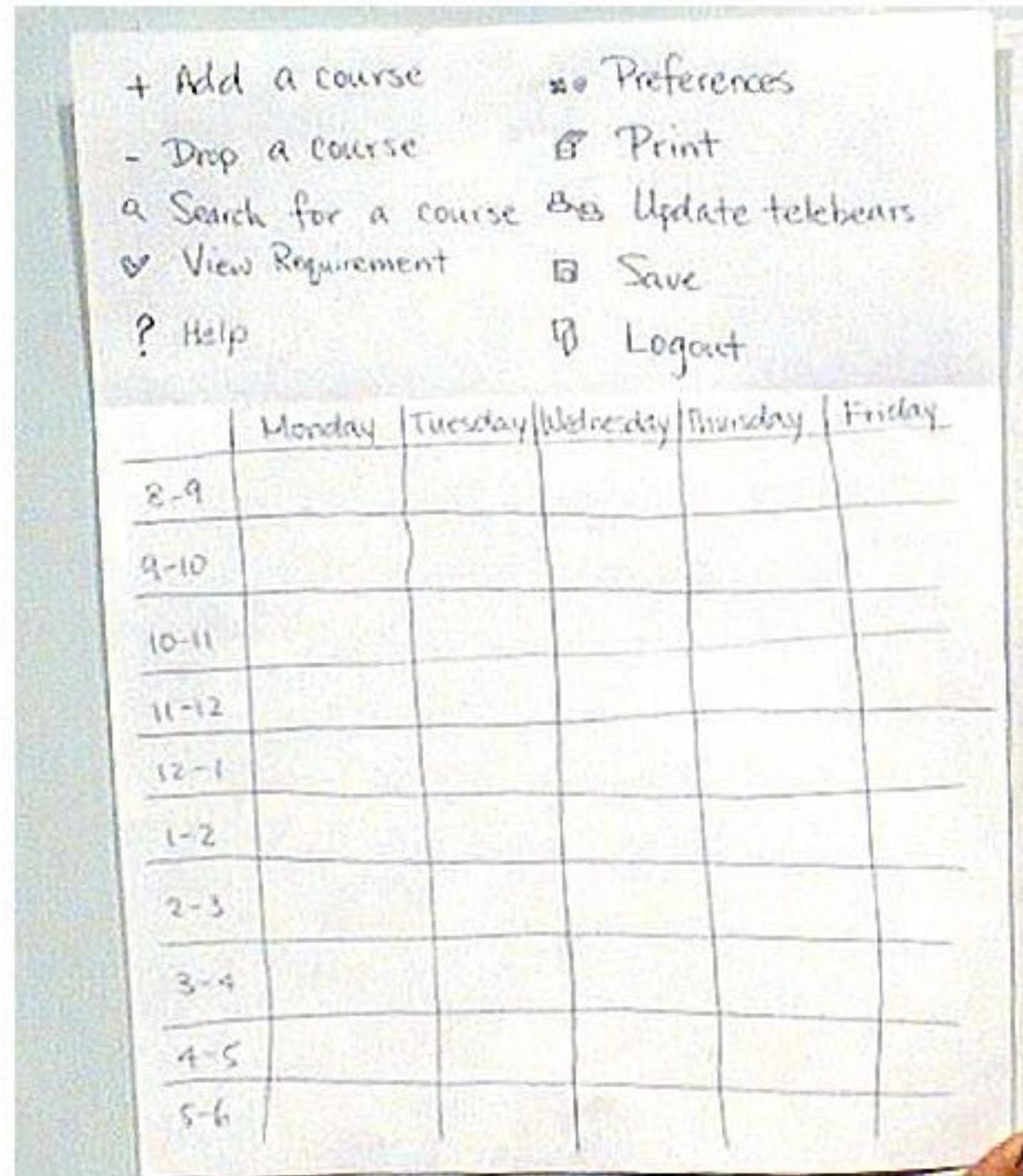
How to make paper prototypes

Basic Materials

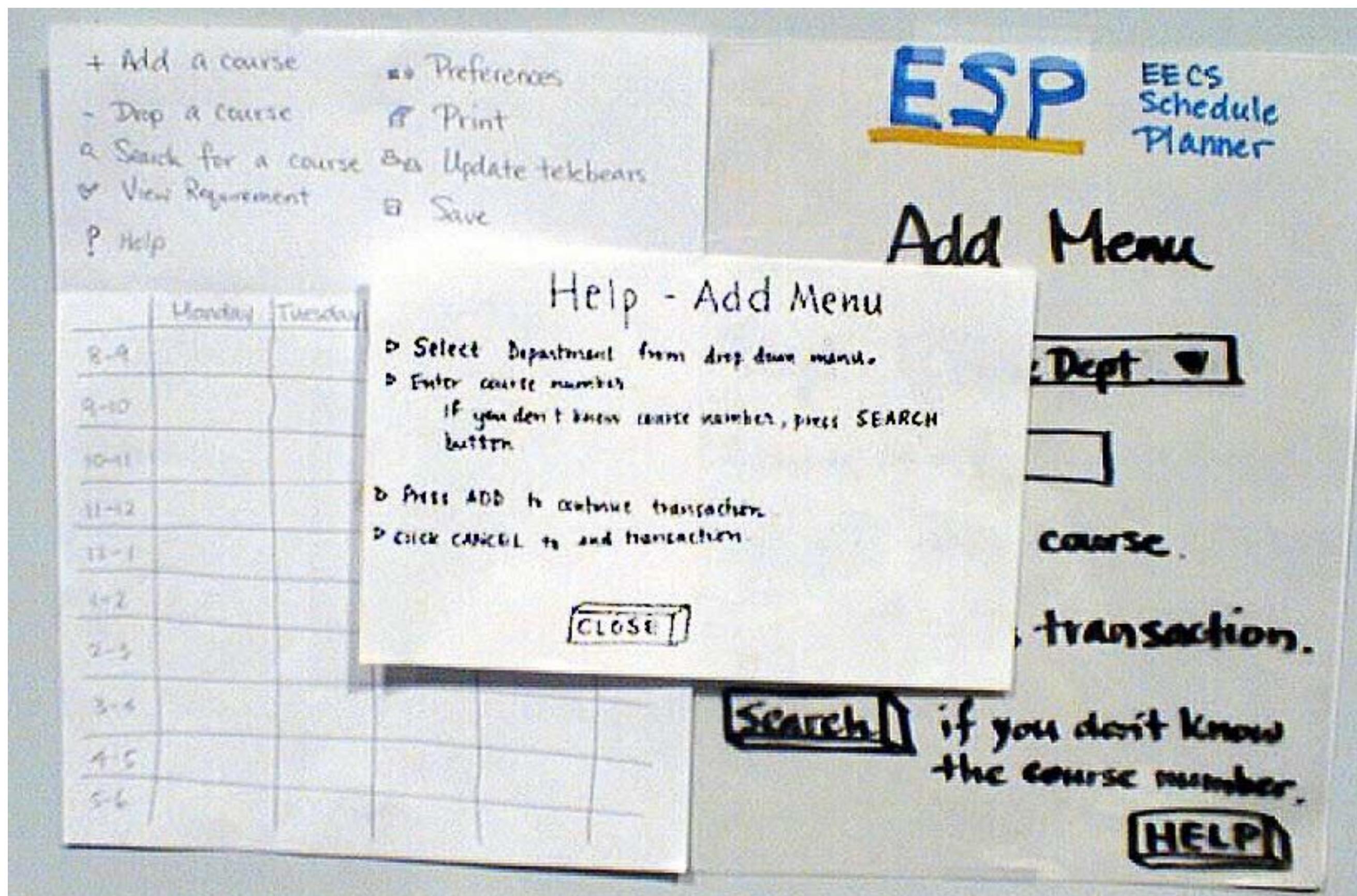
- Poster board, butcher paper, and/or printer paper
 - for background, window frame
- Index cards, post-its
 - for different views to swap in and out, menus, dialog boxes
- Tape, stick glue
 - for keeping pieces fixed
- White correction tape
 - For text fields, checkboxes, short messages
- Overhead transparencies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



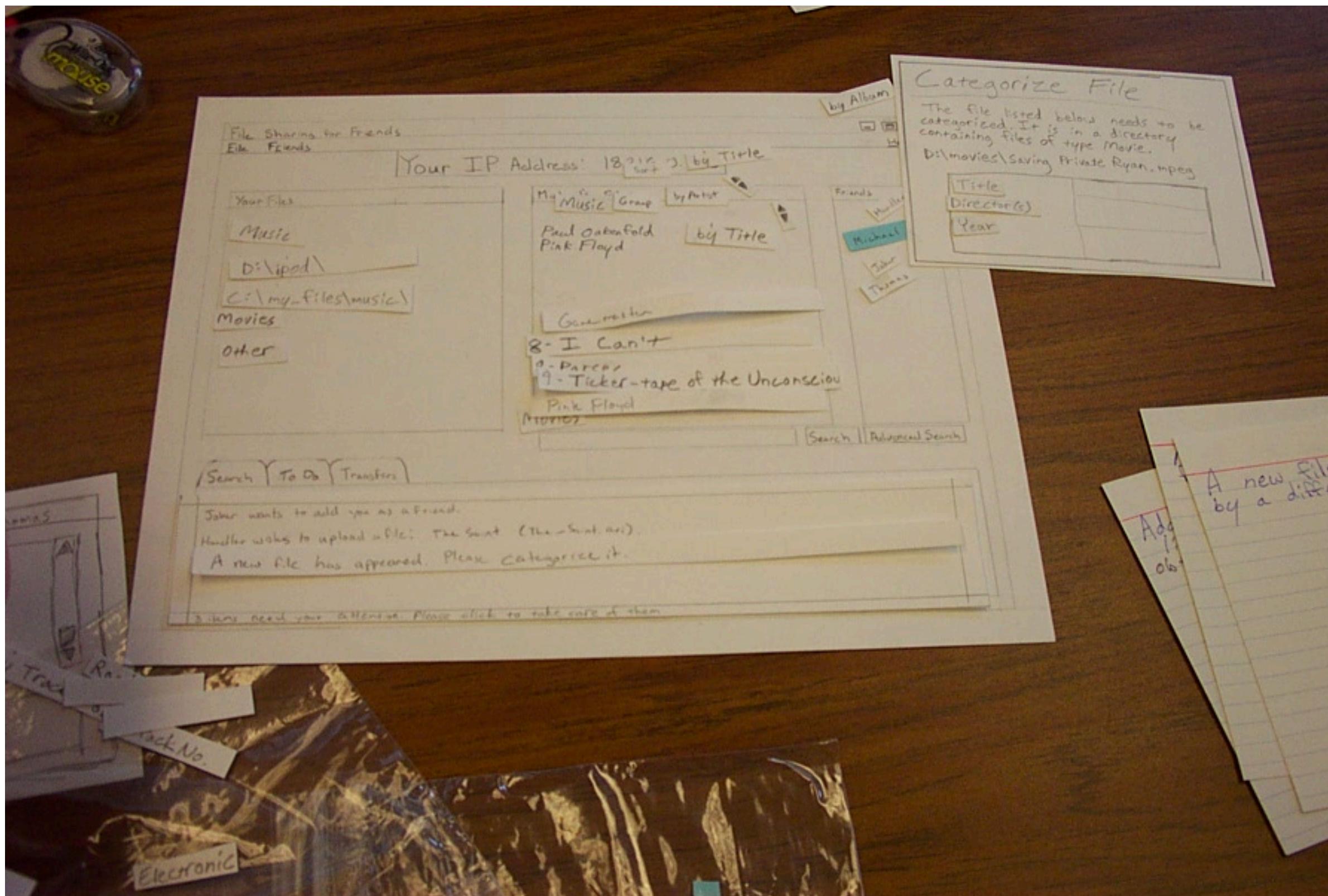
Compose interface from different pieces of paper



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

Back Forward Stop Home Search Print

Kool Klothes
Logo

Guys Gals Kids Customer Service

Shopping Cart

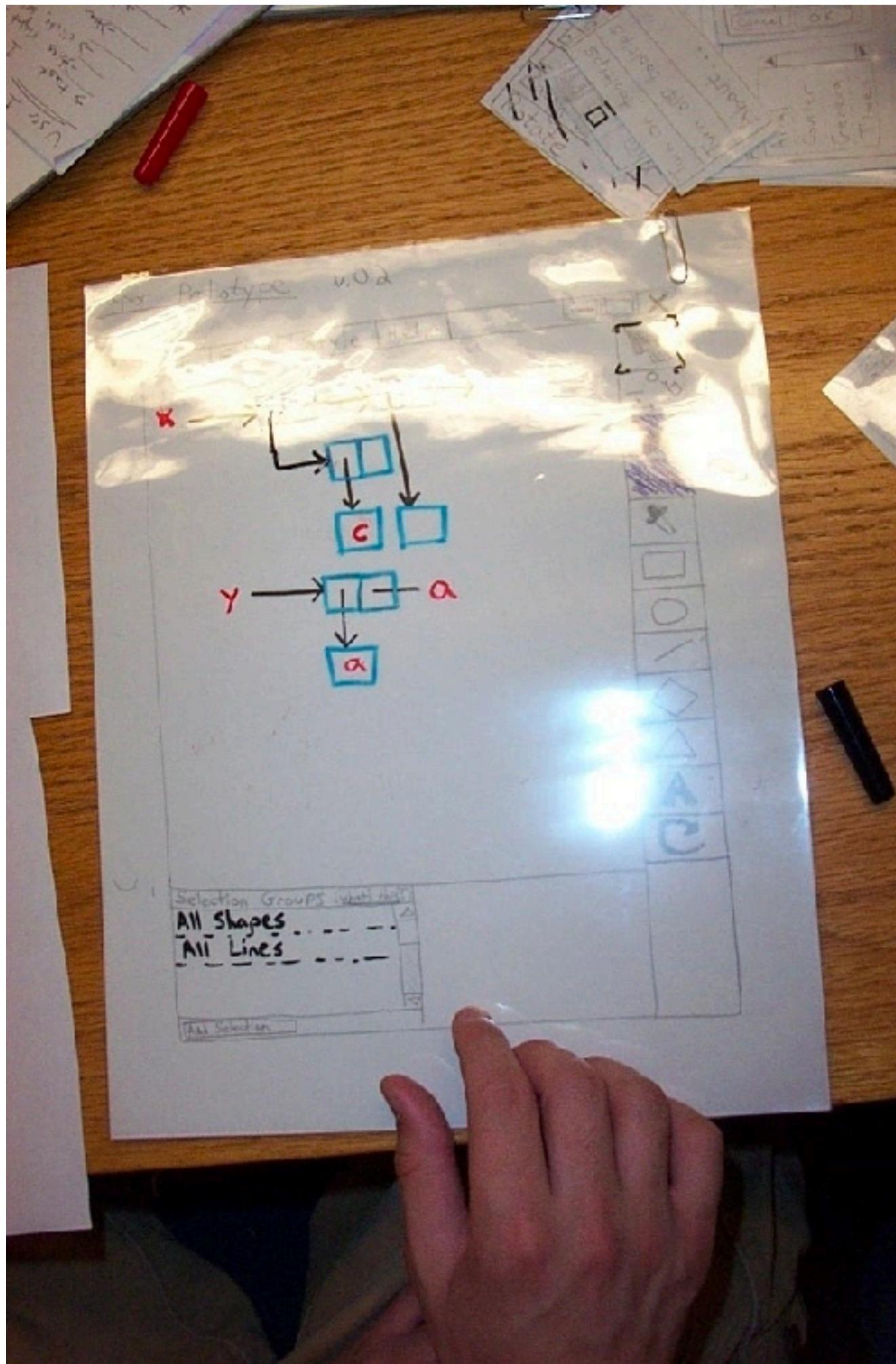
Item	Description	Color	Size	Status	Qty	Price	Total
42773	Cashmere sweater	Green	M	In Stock	1	\$69.99	\$69.99
23076	Brickcountry boot	BR	8M	In Stock	1	\$28.00	\$28.00

Check out our
no-hassle
Return Policy

Subtotal 207.99
S+H 12.95
Tax 6.00
Total 220.94

Continue Shopping Checkout

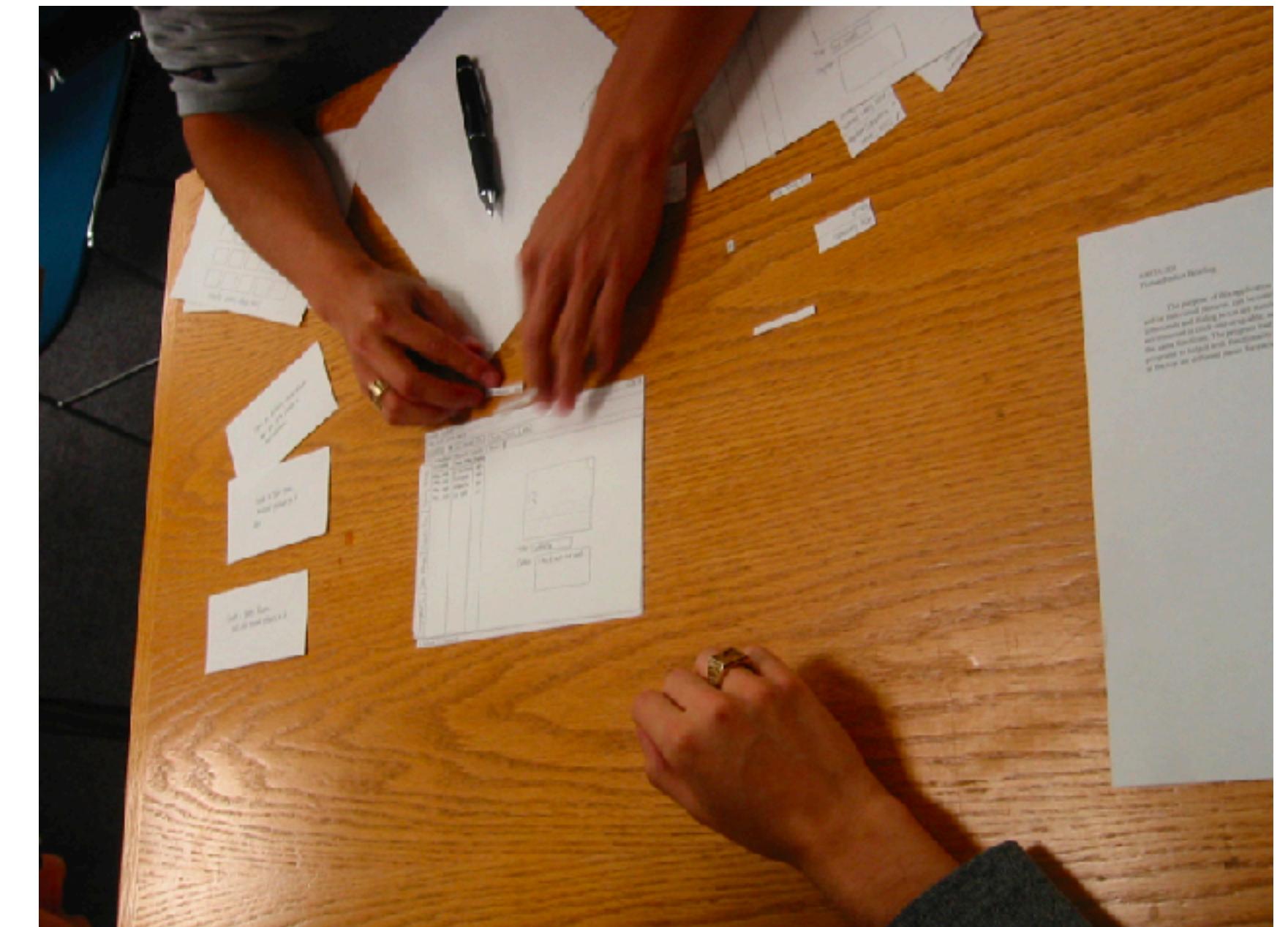
Write on transparencies to “type” or dynamically change the UI



Tips for good paper prototypes

Make it larger than life

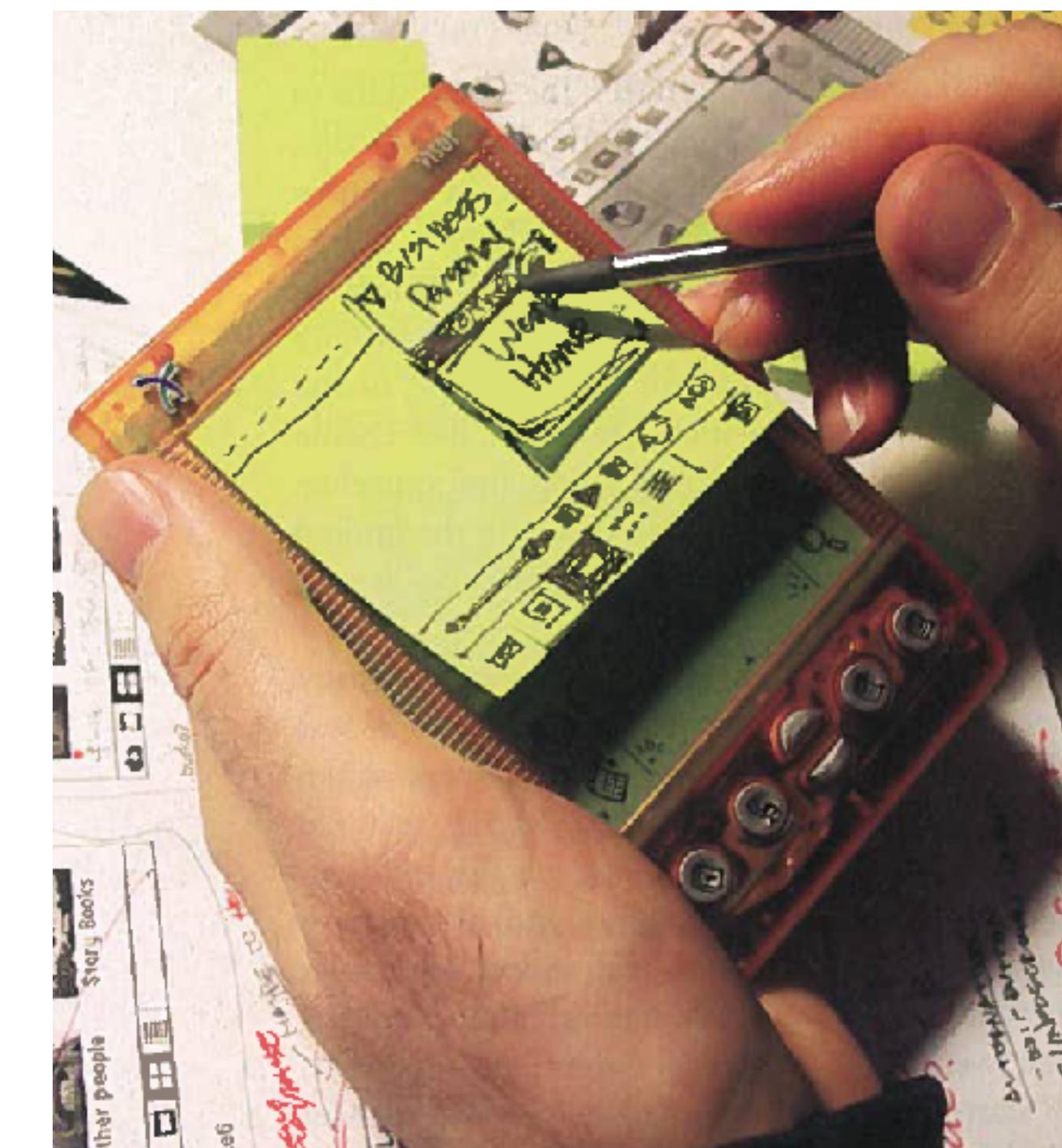
- Remember - fingers are bigger than a mouse pointer
- People usually write bigger than 12 point font
- Easier to see from a distance, like across a table
- Lots of tiny pieces of paper are a hassle



too many tiny pieces to wrangle

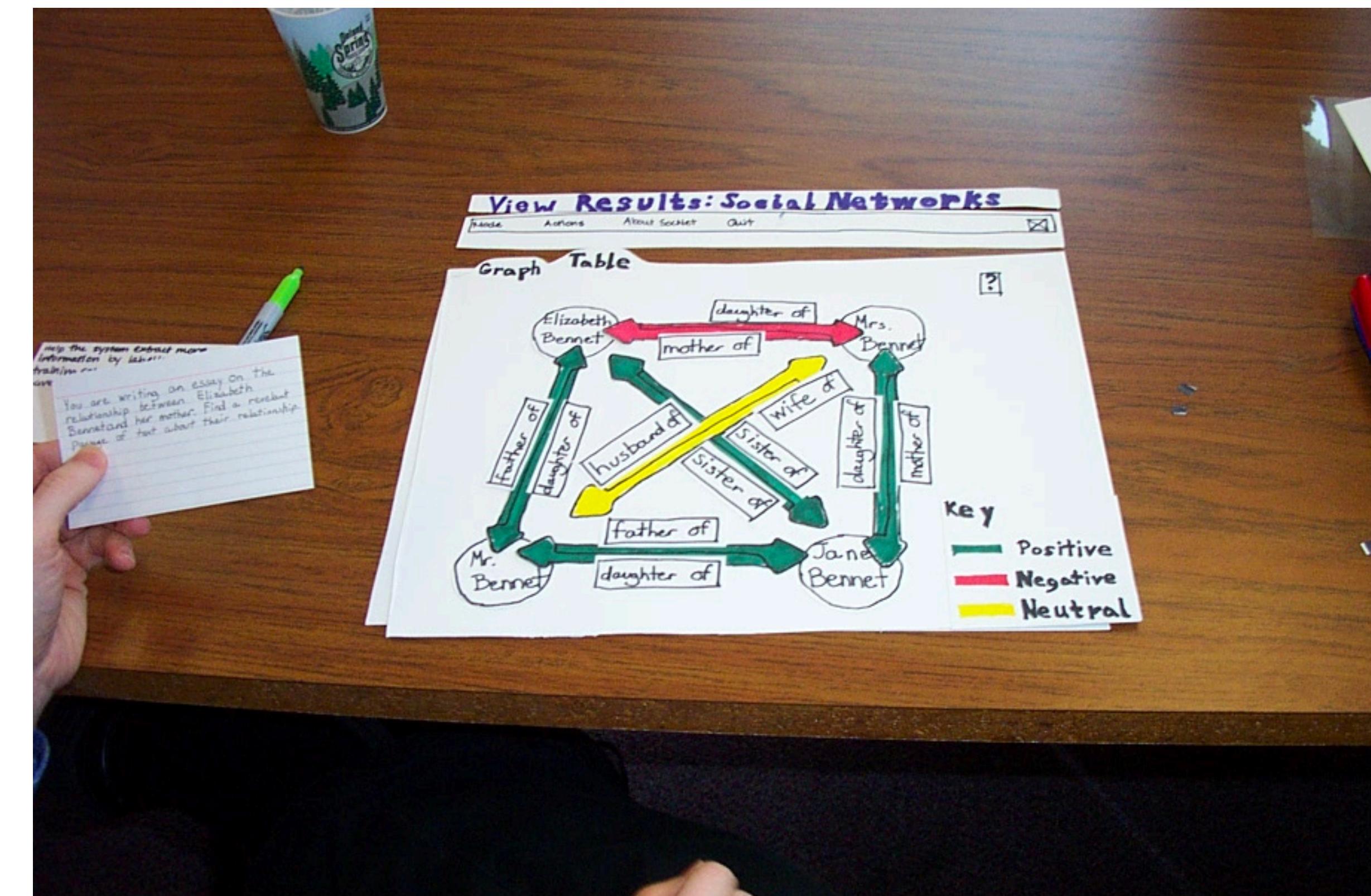
...while remembering your target form constraints

- 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



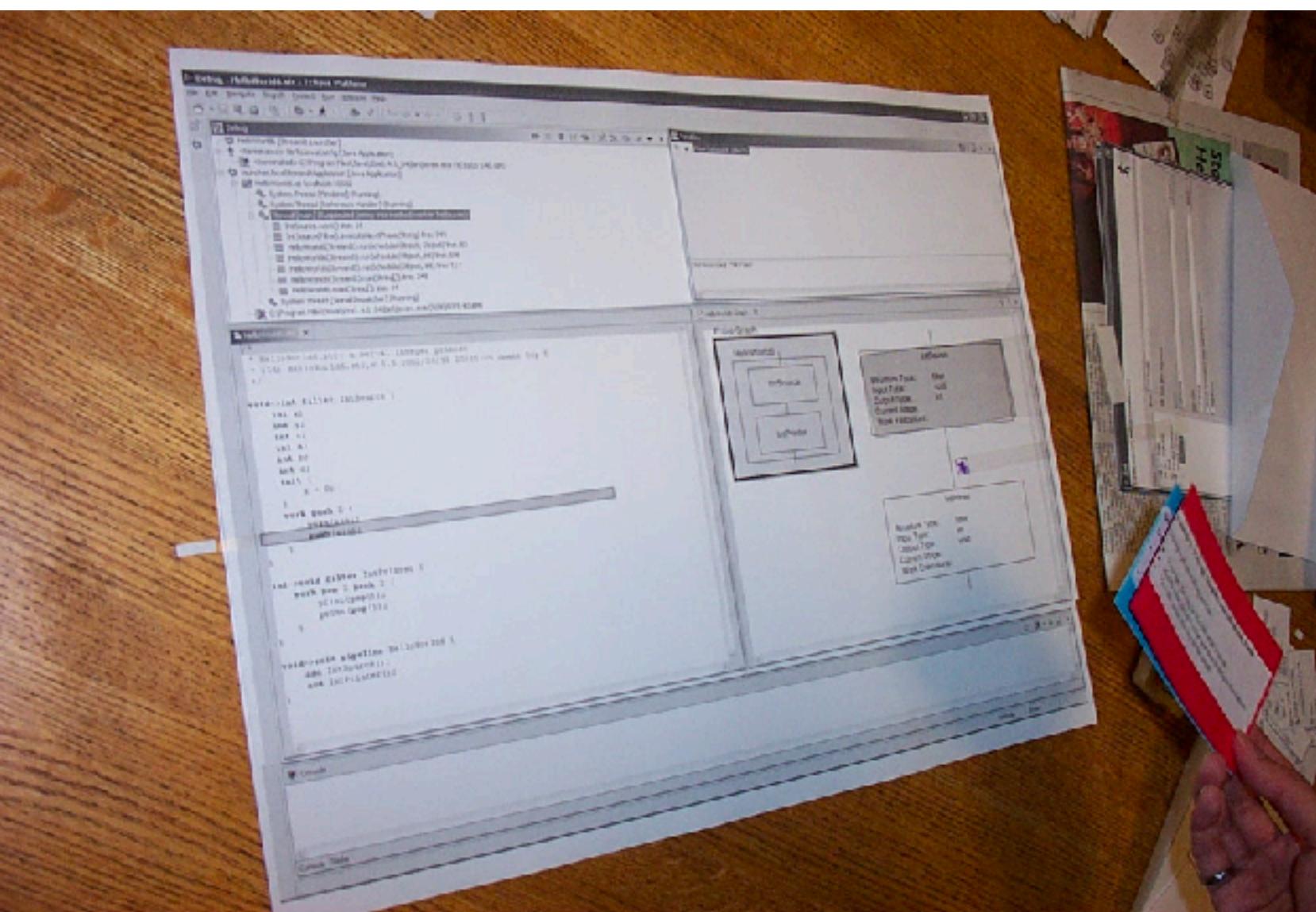
Write/sketch using darker and thicker marker, not pencil

- 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

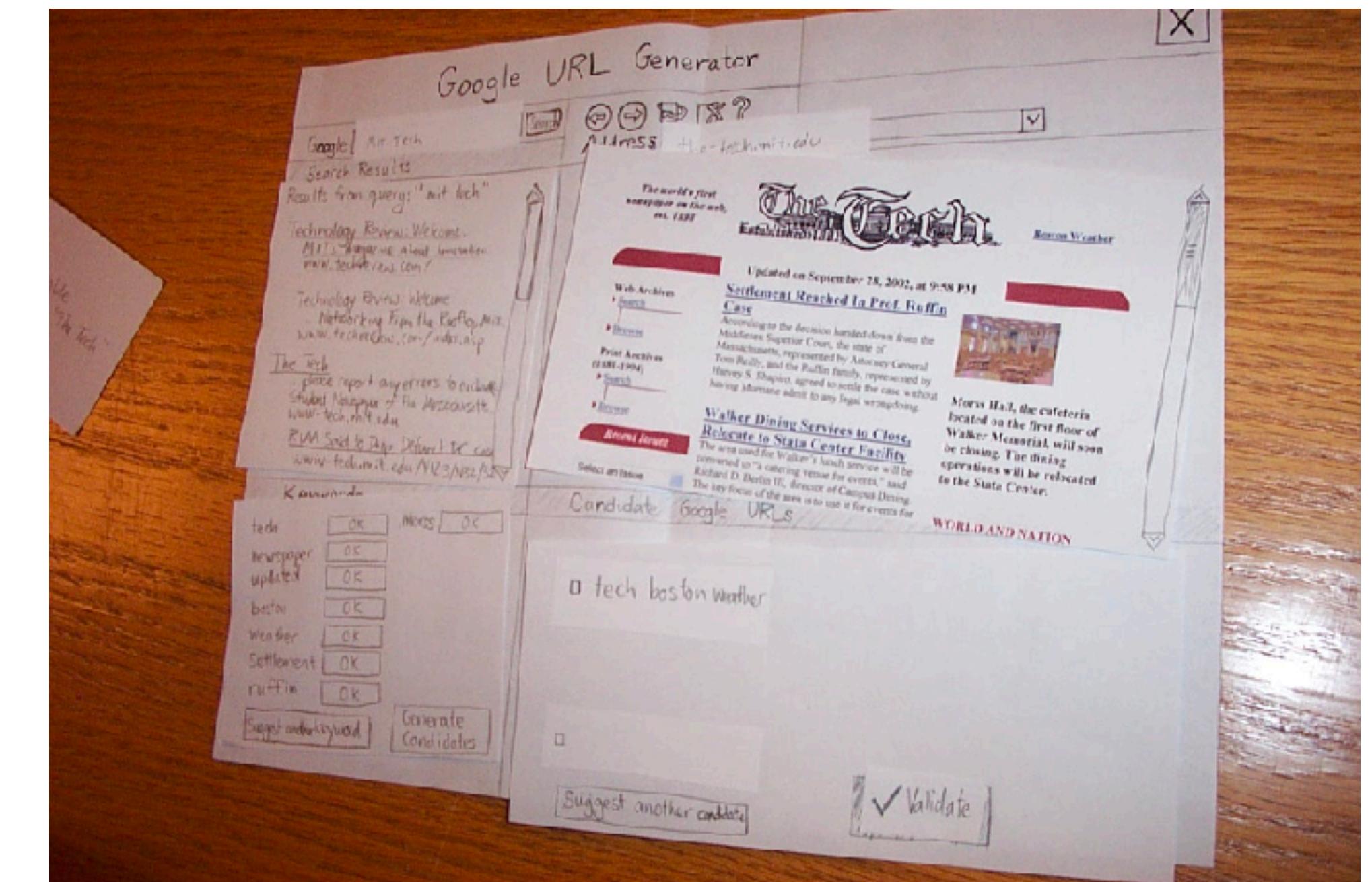


Sometimes including printouts can be useful/faster than sketching

- 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

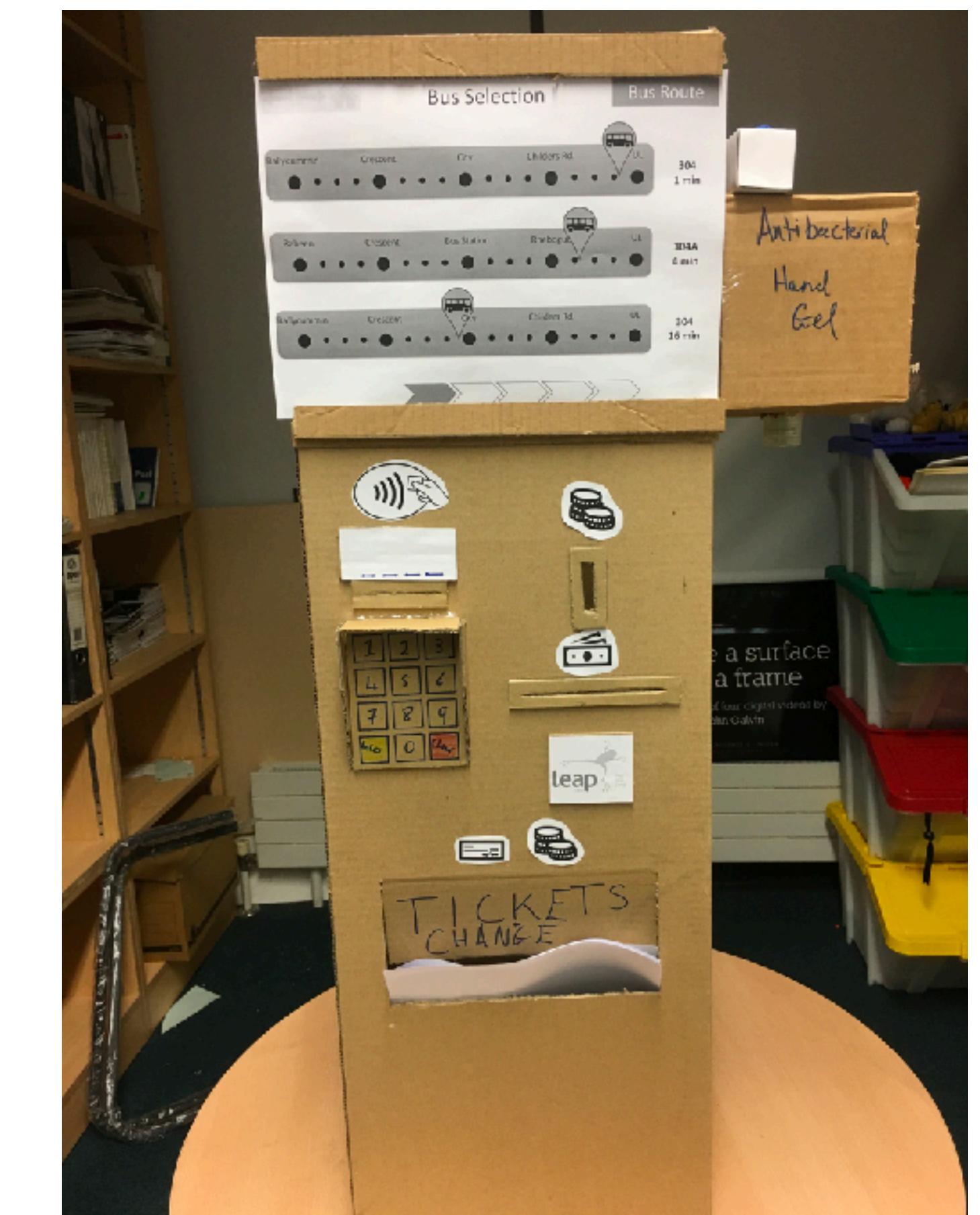


better!

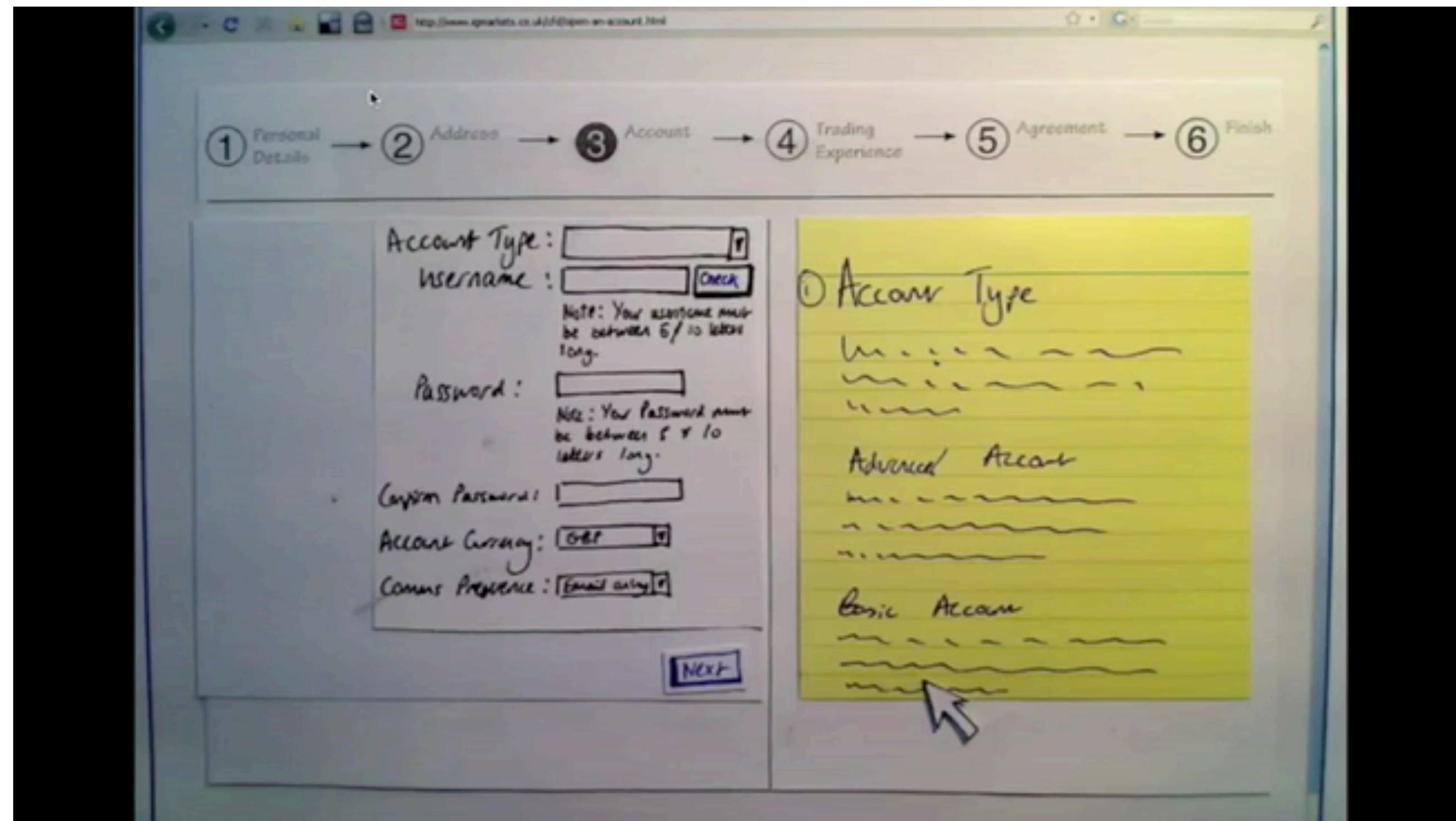
Time-saving tips

- 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

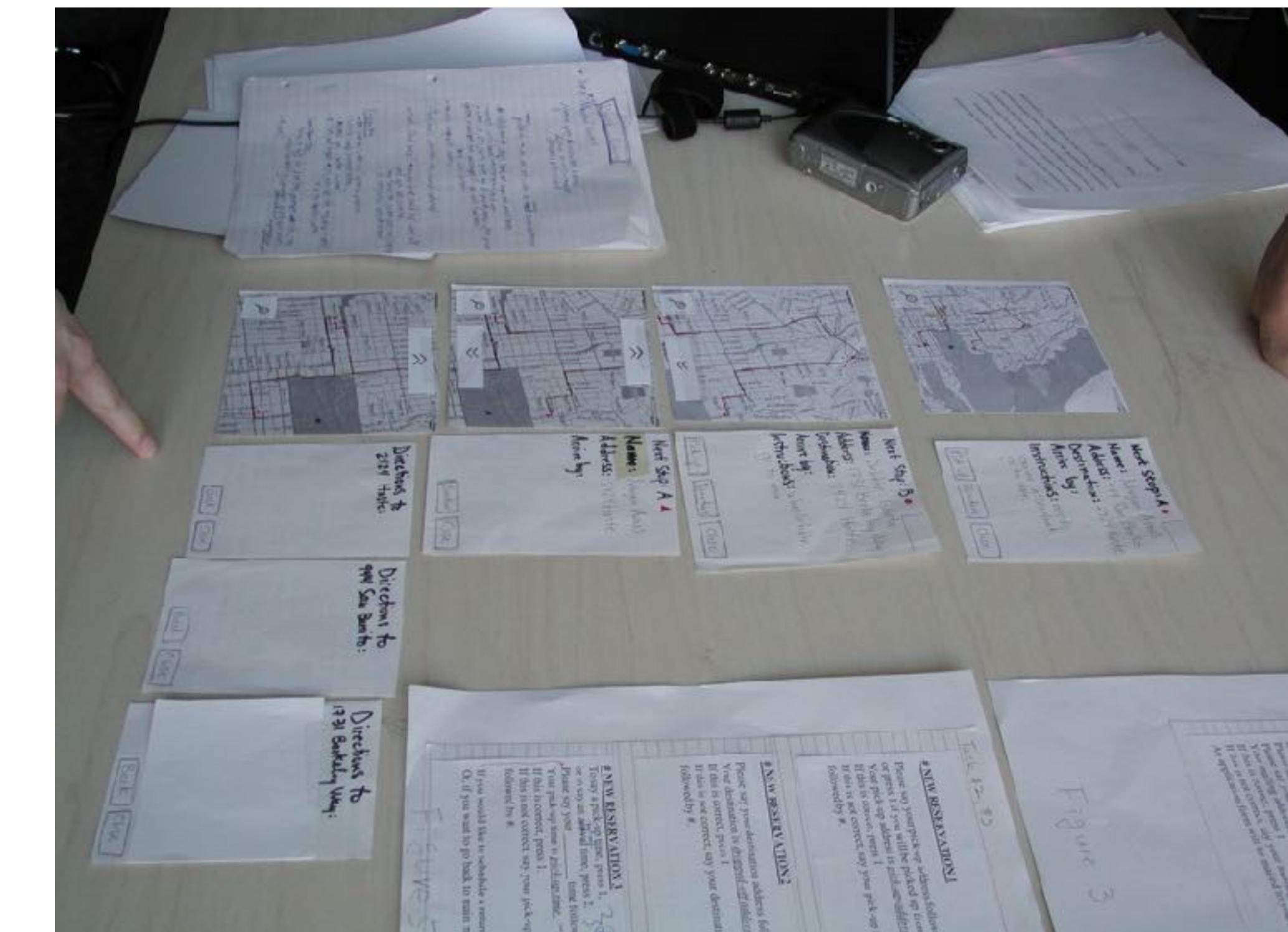


3 min stretch break!

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.

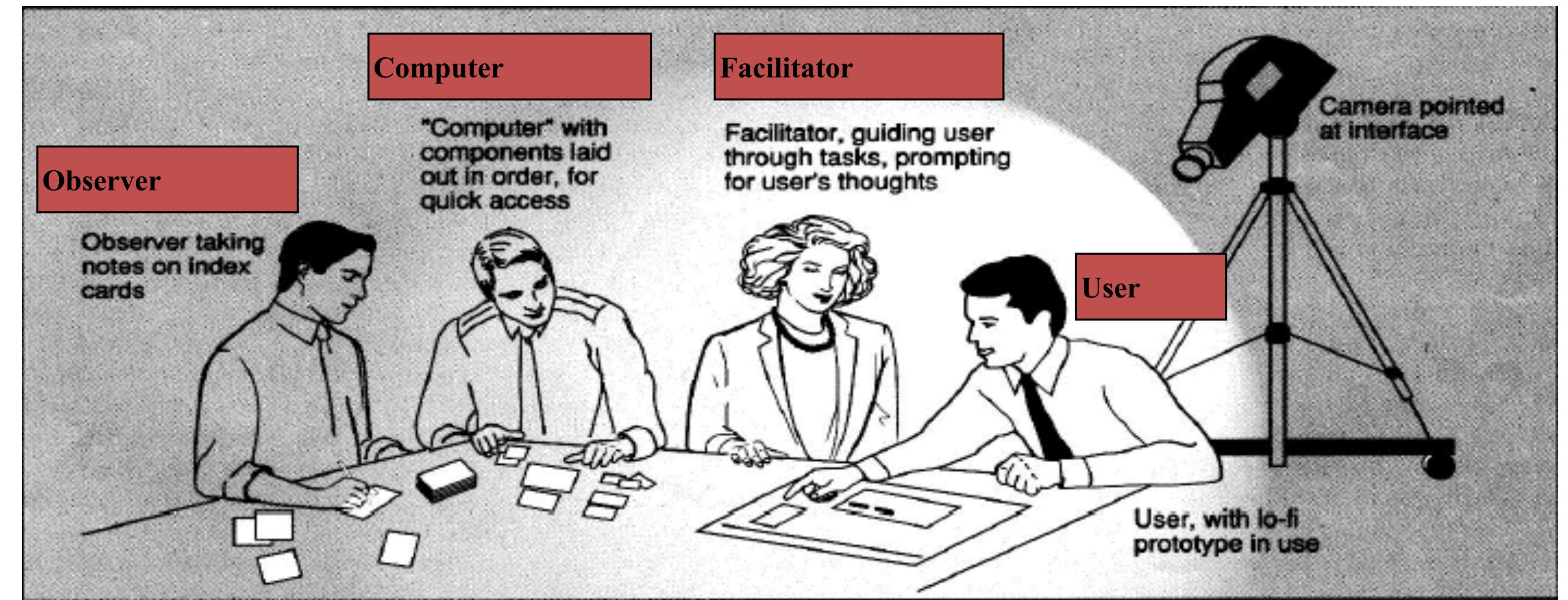


Preparing for a Test

- 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
 - Give 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
- **Next Tuesday**, you’ll do a pilot user test with another group! Then you’ll take the feedback to improve your user test, and on Thursday, you’ll do it “for real” with a different group!

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.*”

Activity!

- We're going to watch a user study in action.
- Answer the questions in the form as they come up: <https://tinyurl.com/438pkvbd>

Introducing the test to a user



Activity Question 1
(answer in the form):

Name as many **good strategies** that you can find that the study facilitator did while introducing the test to the user.

<https://tinyurl.com/438pkvbd>

Conducting the User Test

For the usability test, I am using a paper prototype

Activity Question 2
(answer in the form):

Name as many **good strategies** that you can find that the study facilitator did while conducting the test.

<https://tinyurl.com/438pkkybd>

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

Work time on 3a (paper prototype!)

- Consider the **two primary tasks** you landed on for your storyboard. This is what you'll implement in your paper prototype.
 - Do not worry about implementing less crucial things like account creation (unless it's important for your task). You can just skip forward/speak aloud what would happen for things you don't implement in detail.
 - We have some materials for you to use!
 - Also start to think about your user study. What will you say to participants?
- No lecture on Thursday (Veterans Day)
- On Friday, you'll continue working on your paper prototype, so bring what you have thus far. We'll bring materials again but bring your own if you think you'll want to use something special.
- Next **Monday at 11AM**, 3a is due.
- Next Tuesday, you'll run a **pilot user study** with another group! Take stock of what happened and then on Thursday, you'll run a "real" user study with a group that will be performing a heuristic evaluation (more on that later).