CSE440: Introduction to HCI

Methods for Design, Prototyping and Evaluating User Interaction

Lecture 10:
Paper Prototyping

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DESIGN
USE
BUILD

PAUL G. ALLEN SCHOOL
OF COMPUTER SCIENCE & ENGINEERING

What we will do today

Review the course assessment results

Peer-Feedback exercise in preparation for the upcoming Design Review

Paper Prototyping

Testing Paper Prototypes

Upcoming

Oct 29	Oct 30	Oct 31	Nov 1	Nov 2
Reading 2: Storyboarding and Video Prototyping	Paper Prototyping 11:30 - 12:50 | OUG 141	2g - Design Review Nigini's office hours 10:00 - 12:00 CSE 218	Testing 11:30 - 12:50 | OUG 141	Section 10:30 - 11:20 | PAR 112 11:30 - 12:20 | OUG 136 1:30 - 2:20 | MGH 295 2:30 - 3:20 | MGH 295 2h - Getting the Right Design
Nov 5	**Nov 6**	**Nov 7**	**Nov 8**	**Nov 9**
Nigini at CSCW 3a - Paper Protoype	Nigini at CSCW Heuristic Evaluation 11:30 - 12:50 | OUG 141	Nigini at CSCW 3b - Heuristic Evaluation	Nigini at CSCW Accessibility 11:30 - 12:50 | OUG 141 Reading 3: Usability Testing	Nigini at CSCW Section 10:30 - 11:20 | PAR 112 11:30 - 12:20 | OUG 136 1:30 - 2:20 | MGH 295 2:30 - 3:20 | MGH 295 3c - Usability Testing Check-In

Activity (20 minutes)

Sit with your team in a table with a second team you don't meet on Fridays.

- Tell them about your project
- Then present the design and the tasks you want to focus on.
- GOAL: Discuss these choices with your peers and get feedback.

Each team will have 10 minutes!

Activity (20 minutes)

Focus on the following questions:

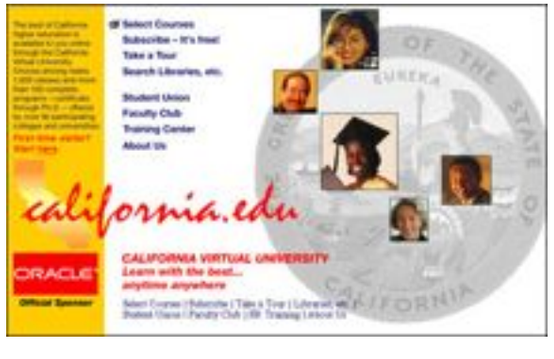
1. Why did you choose this design and these tasks?
   Try to convince the other group that this choice makes sense!
   If they don't agree, you should rethink your 2g assignment :)
2. What makes the design better suited for your target group?
3. Why are these tasks more compelling than others?
4. Are there any other possible tasks that you have not considered?

Prototyping

Fidelity in Prototyping

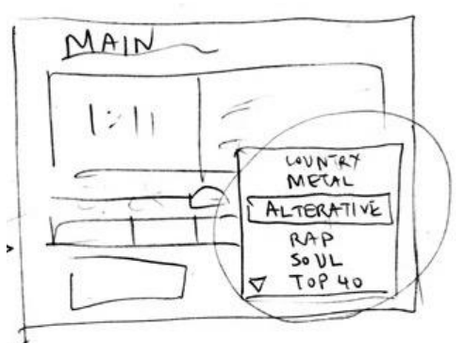
High Fidelity

Prototypes look like the final product



Low Fidelity

Designer sketches with many details missing



High-Fidelity Prototypes

Time and creativity

- Require precision (e.g., must choose a font)
- Specifying details takes time
- Can lose track of the big picture

Perceptions of a person reviewing or testing

- Representation communicates “finished”
- Comments often focus on color, fonts, alignment

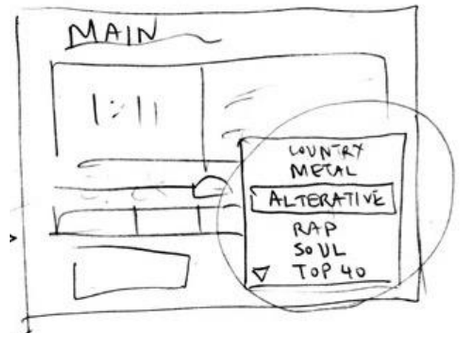
Low-Fidelity Prototypes

Traditional methods take too long

- Sketches → High-fidelity Prototype → Evaluate → Iterate

Instead simulate the prototype

- Sketches → Evaluate → Iterate

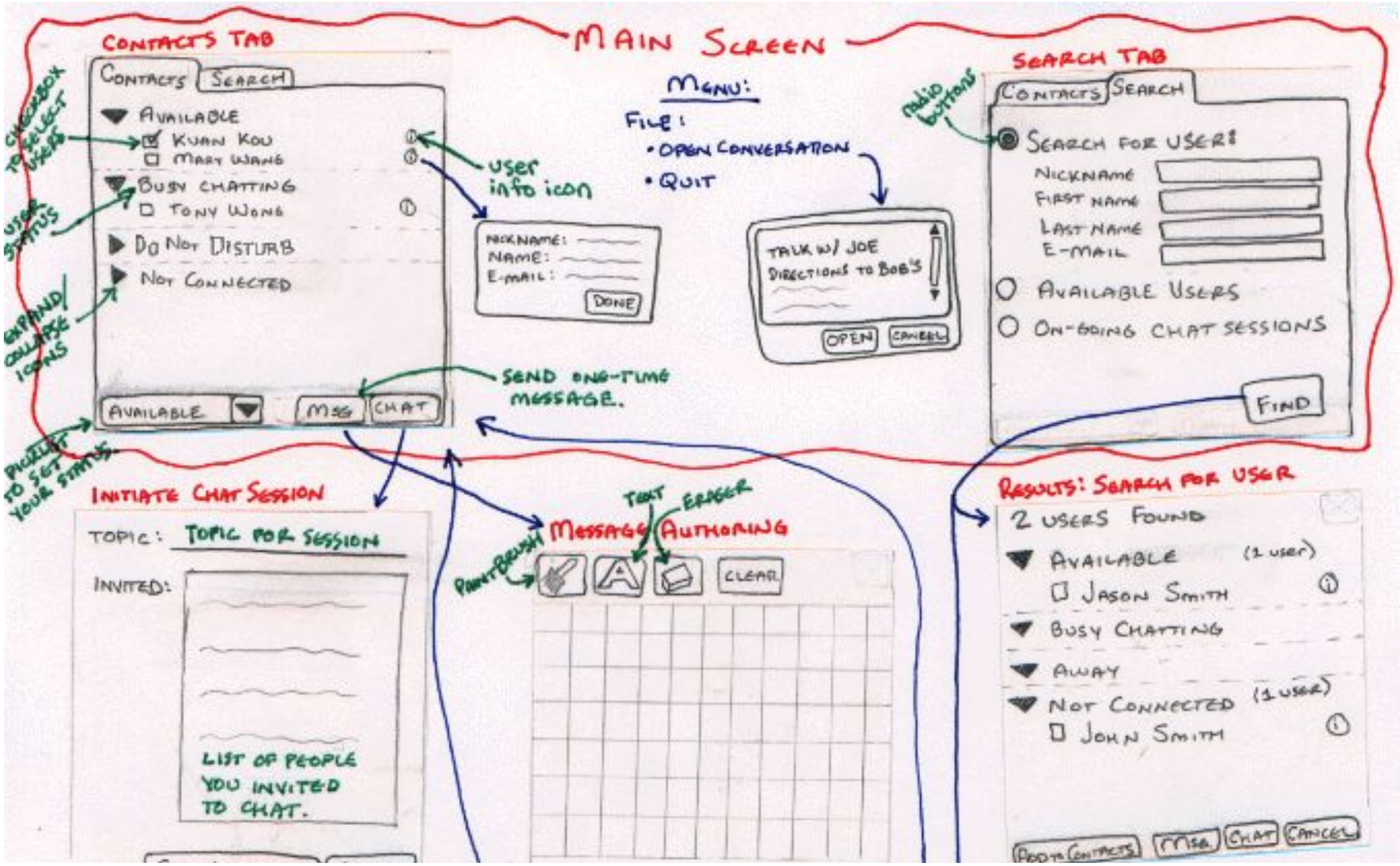


Sketches act as prototypes

- A designer “plays computer”
- Other design team members observe & record

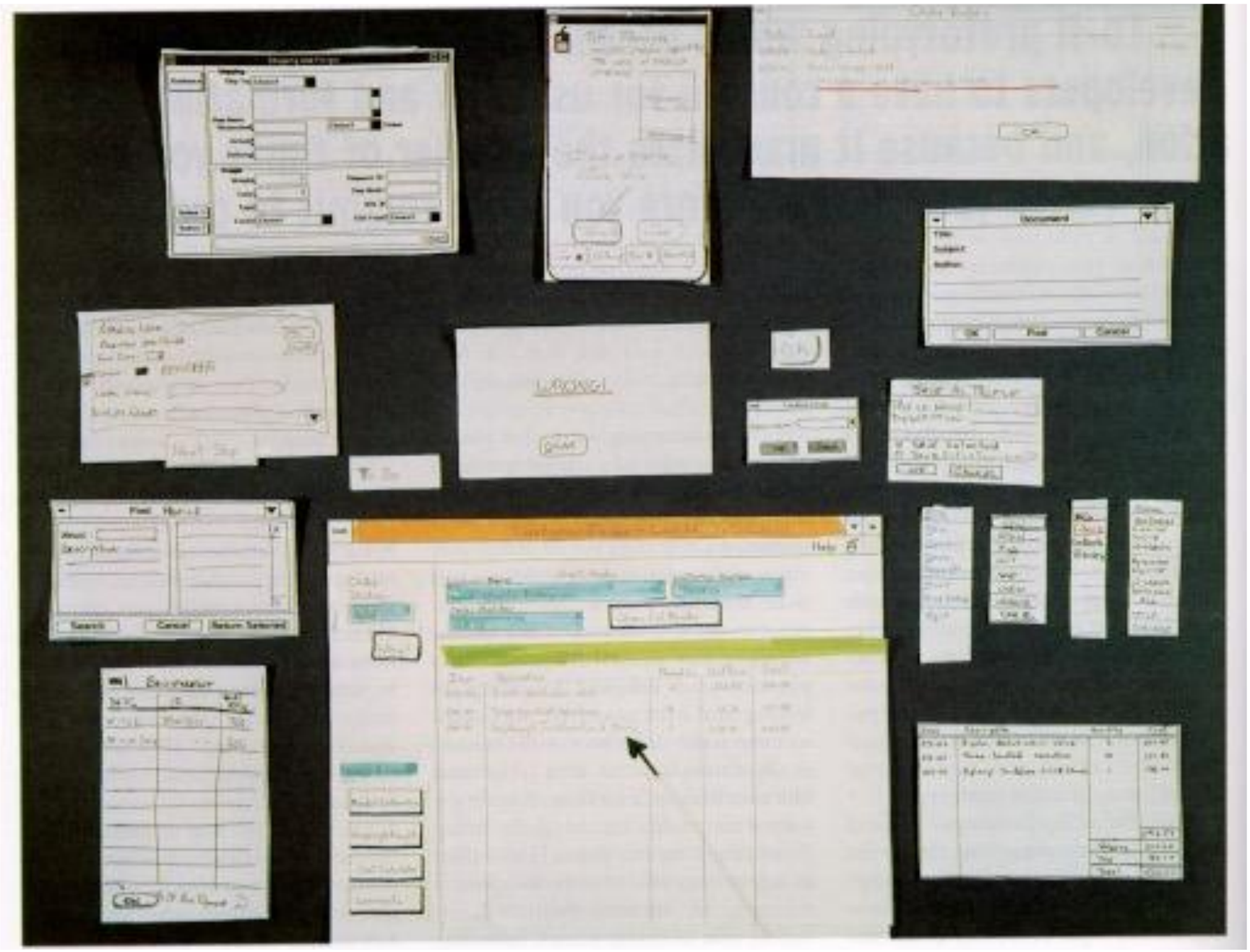
Kindergarten implementation skills reduce barriers to participation in design and testing

Low-Fidelity Prototypes & Sketches

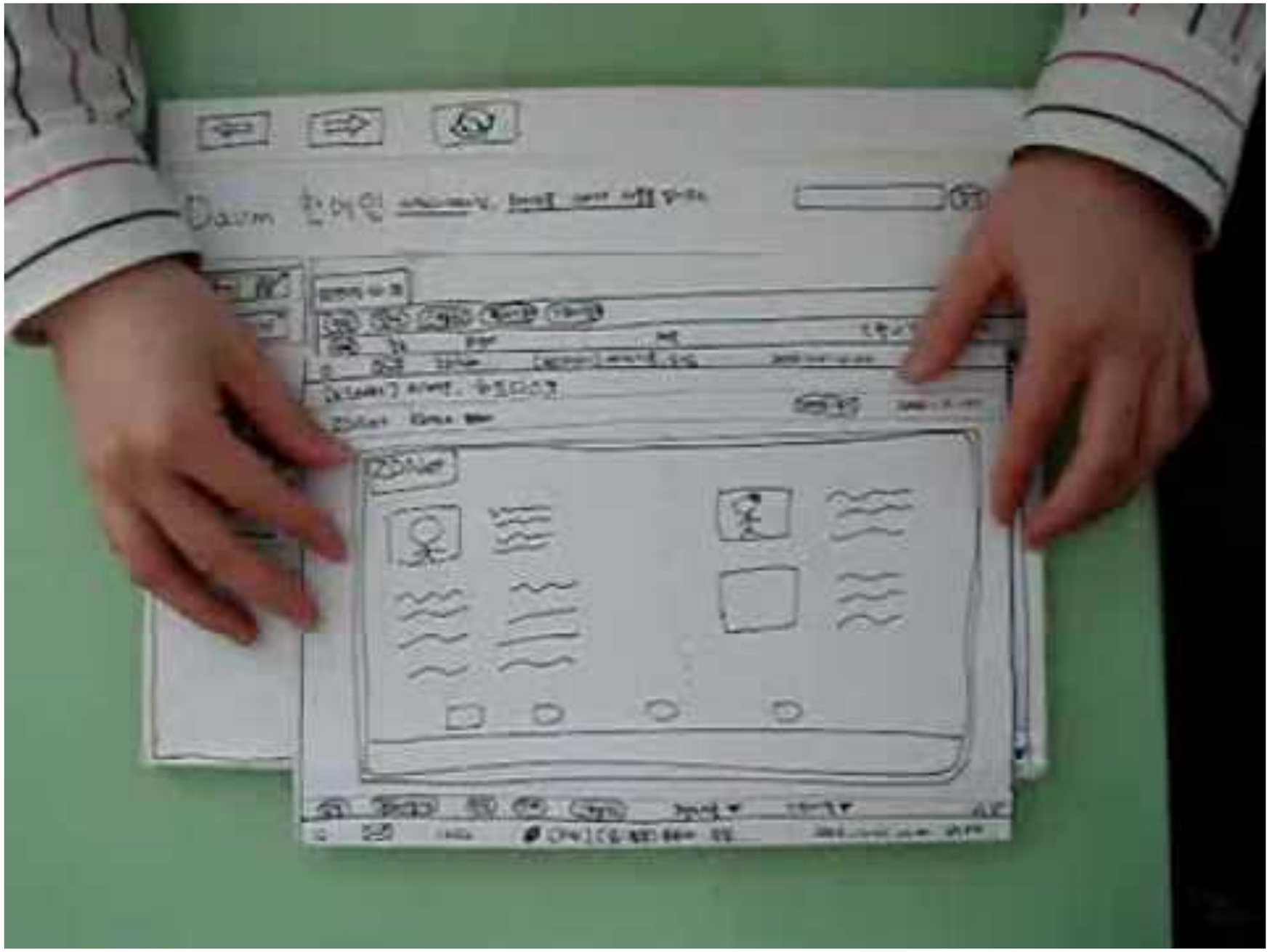


Remember how Sketches should be quick, cheap, easy to change, and open for critique?

Paper Prototype



Paper Prototype - Example



Basic Materials

Heavy, white paper

Index cards

Post-its

Tape, stick glue, correction tape

Pens and markers in many colors and sizes

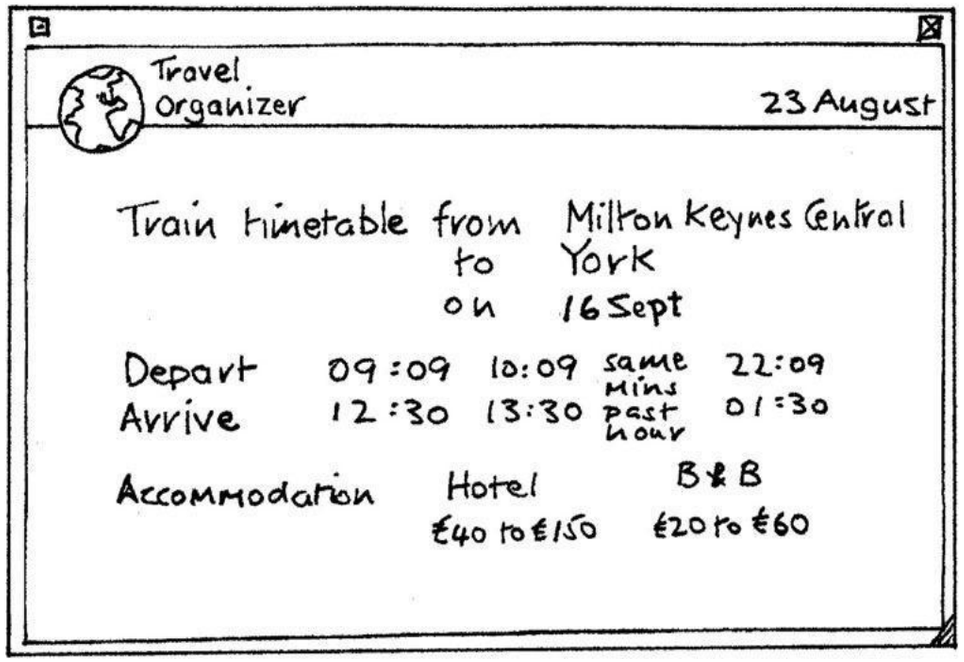
Overhead transparencies

Scissors, knife

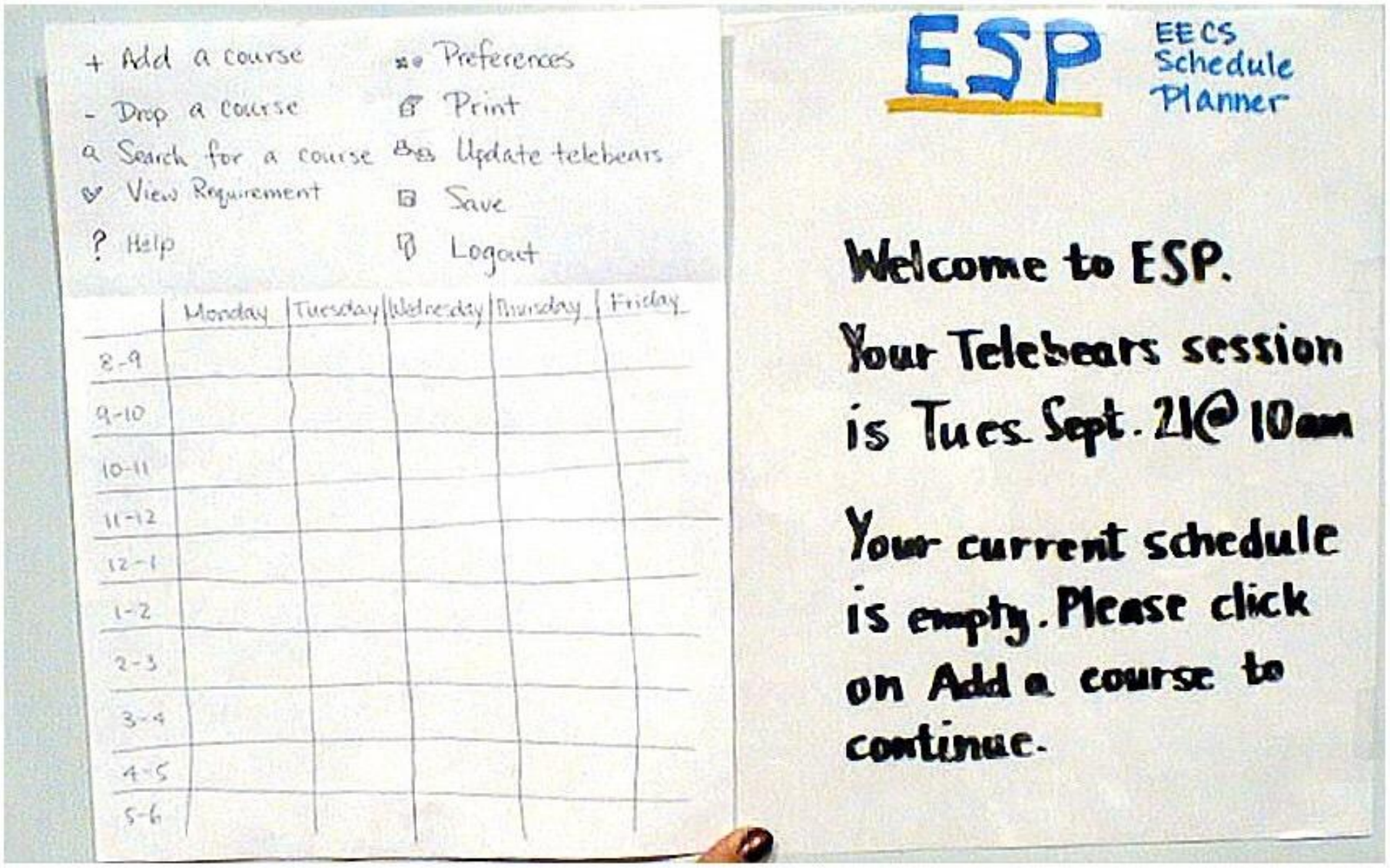
Index Cards

Good to represent computer screens

Often used in website development



Compose interface from different pieces



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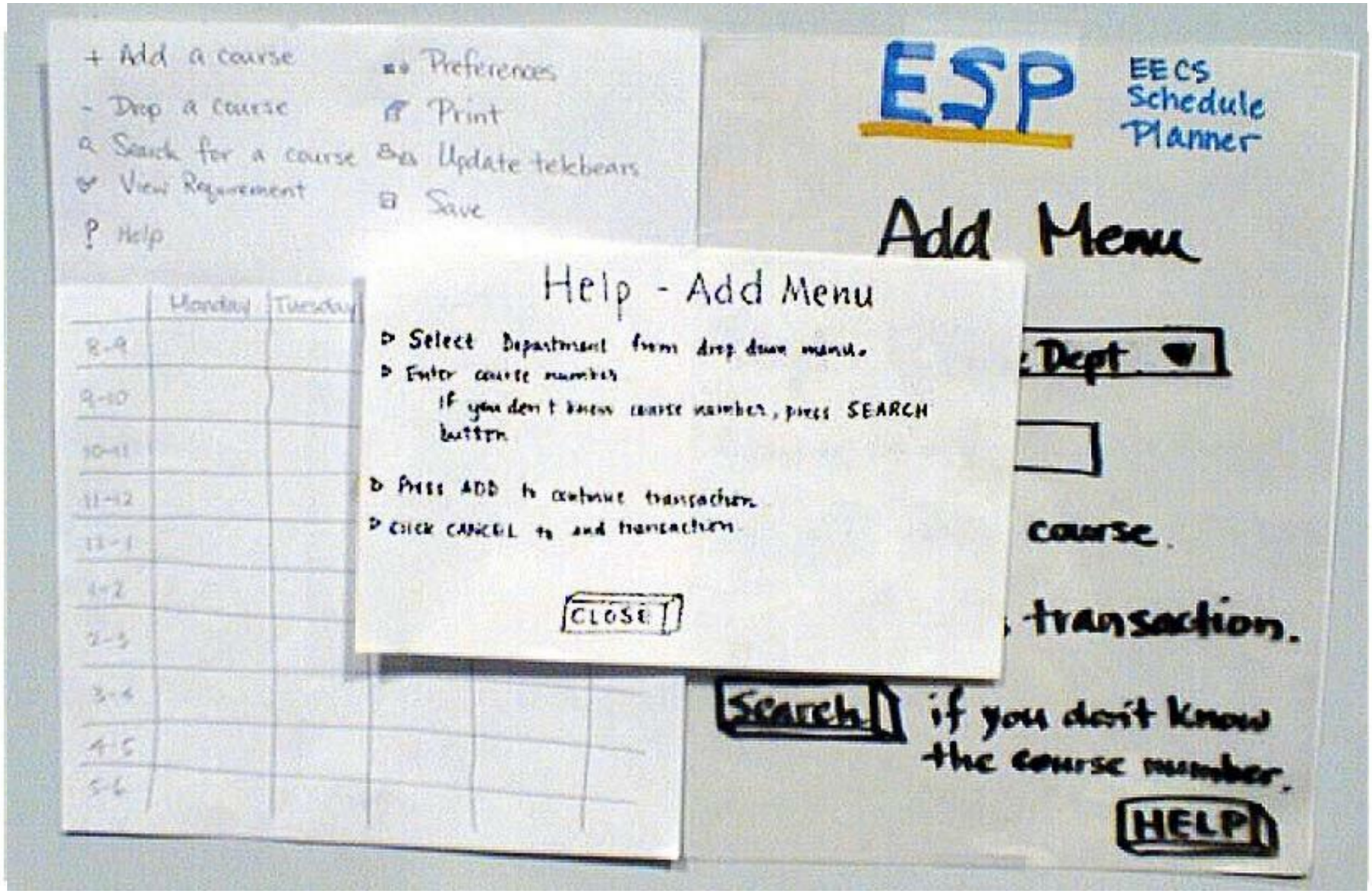
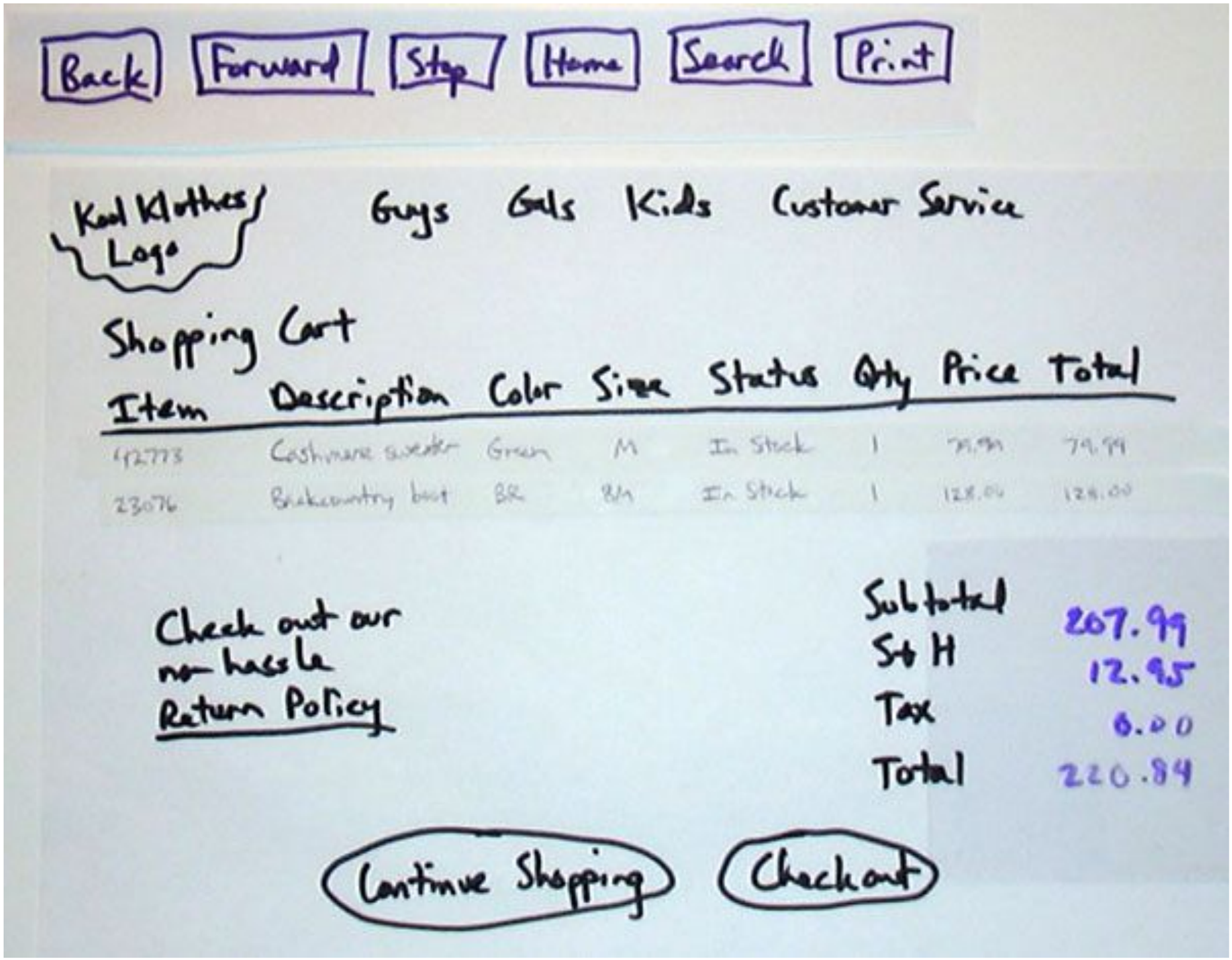


Use Transparencies



Constructing the Prototype

Set a deadline

- Do not think too long
- Instead build it, then learn and iterate as you go

Put different screen regions on cards

- Anything that moves, changes, appears/disappears

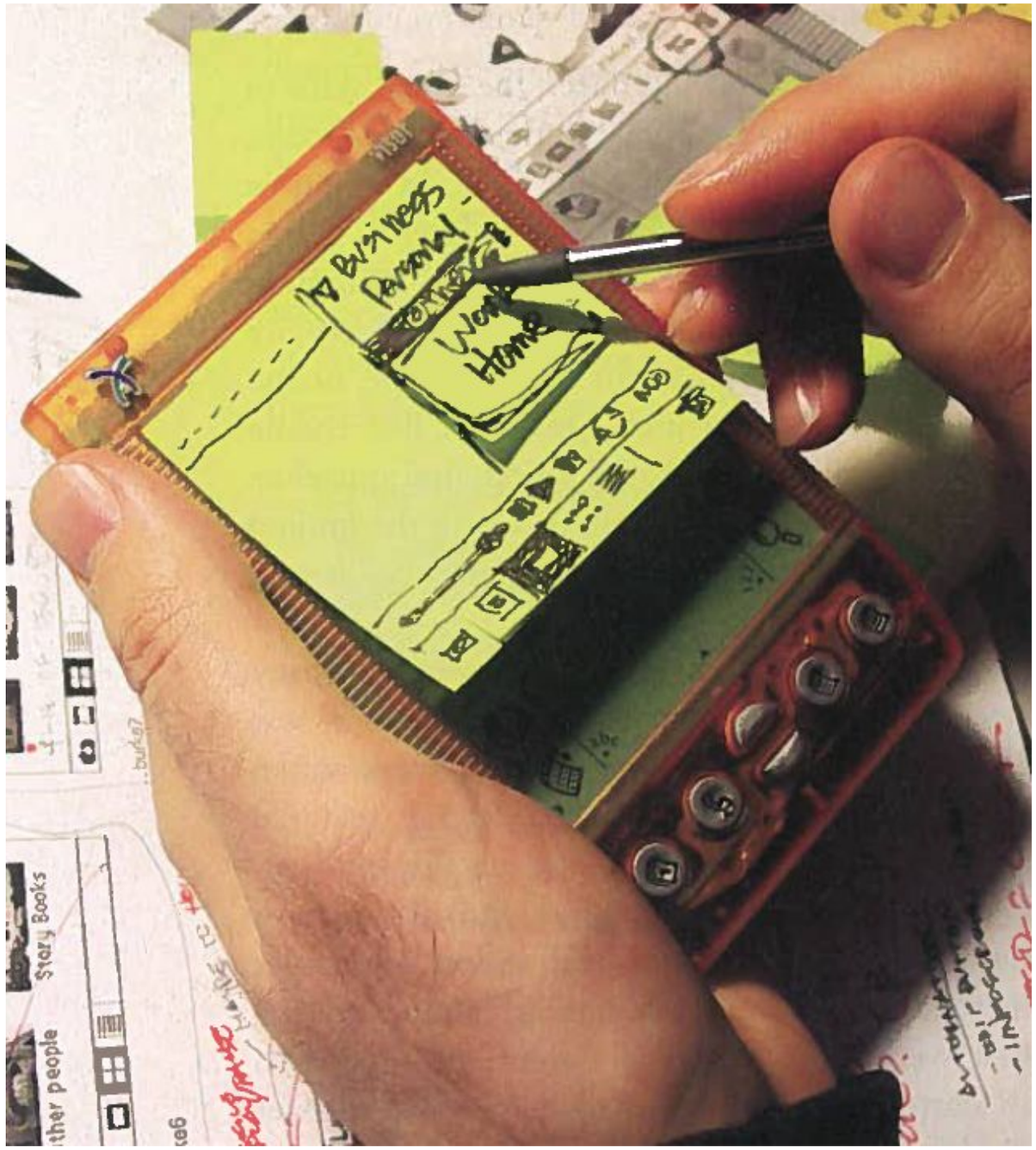
Ready responses for actions

- Have those pull-down menus already made
- Planned tasks can guide this

Use photocopier to make many versions

Start by thinking of your Tasks

Remember Your Target Platform Constraints



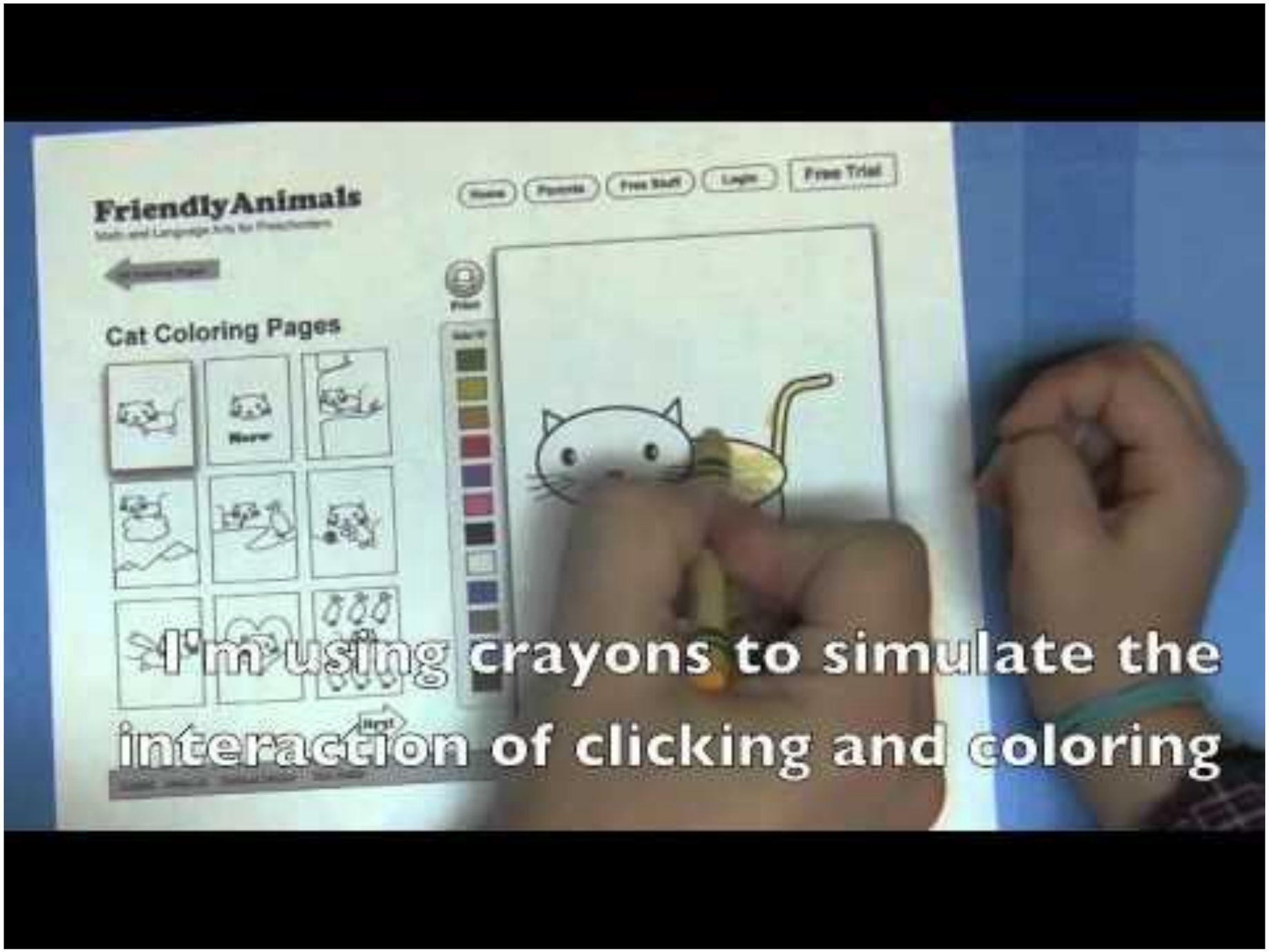
Advantages of Paper Prototypes

Forces you to think through potential solutions

Facilitates discussion of solutions with other designers and stakeholders

Allows testing!

Paper Prototyping in Action!



What caught your attention there?

Why Usability Test?

Find and fix problems in a design

- Removes the expert blind spot
- Obtain data to inform changes
- Uncover unexpected behaviors

Drives changes, sometimes innovations

In the long run, this is a win-win

- Both improves design and saves money

Deciding What Data to Collect

Process data

- Observations of what people do and think
- Focused on improving this process

Summary, statistical, or bottom-line data

- Summary of what happened (time, errors, success)
- Focused on measurement

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Which one is more useful at the prototyping stage?

Stages of a Usability Test

Preparation
Introducing the Test
Conducting the Test
Debriefing
Analyzing the Data
Creating the Report

Preparing for a Test

Select your participants

- Friends and family are not your design targets
- Understand background, consider recruiting questionnaire

Prepare tasks and paper prototype

Practice to avoid “bugs” in your prototype

Task-Based Usability

Set up an overall context

"We are interested in improving people's ability to save, update, and use contacts in their mobile phones."

Then prescribe tasks

1. Try to find the contacts list in the phone
2. View the contact information for John Smith
3. Change John Smith's number to be 555-555-5555

Tasks can be chained to naturally lead to the next

Usability Test Proposal

A report that contains

- Objective description of System,
- Environment and Materials,
- Participants, Methodology,
- Tasks, Test Measures

Work through it with colleagues to debug test

Reuse when presenting final report

Introducing the Test

Address Feelings of Judgment

"Today we are interested in learning about X. That's where you come in!"

"I did not develop X. I just want to know what the problems are with X."

"It is X being tested here, not you."

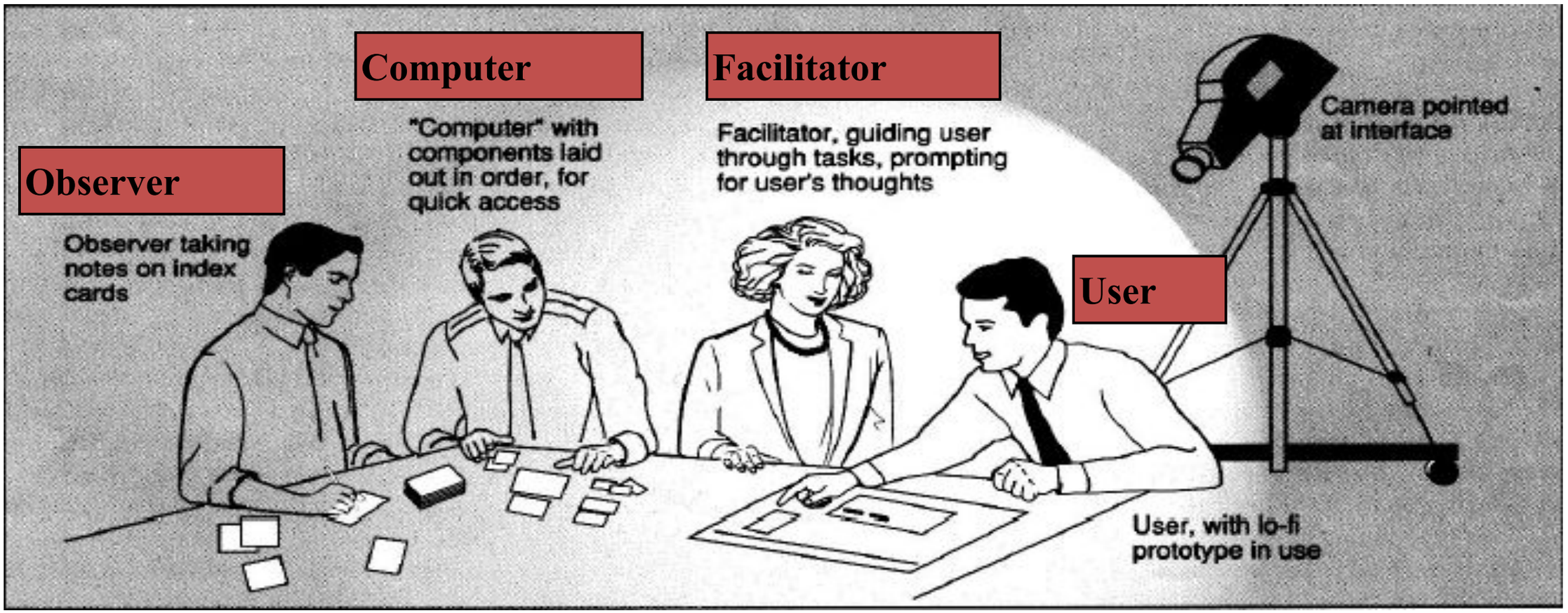
Introducing the Test

Set Expectations for 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?"

Conducting a Test



Think-Aloud Prompts

“Tell me what you are trying to do.”

“Please keep talking.”

“Tell me what you are thinking.”

“Are you looking for something? What?”

“What did you expect to happen just now?”

“What do you mean by that?”

Insight Problems

When people are trying to figure something out, talking aloud can prevent needed “insight”

If your participant is really baffled, it might not be the best time to prompt them to keep talking

- Wait for a natural break, and then ask “What were you thinking just there?”

Retrospective talk-aloud

- Record session, talk through immediately afterward

Good to keep in mind

Remember the purpose of this test

- You would not be there to help “in real life”
- You want to see if they can figure it out
- You want to see how hard it is
- You want to see how catastrophic the outcome is

But you do not want to punish the person or completely undermine the rest of the session

- Note any help you provide as a major failure
- Do not allow observing engineers to help

Debriefing

Give them more details about what you were interested in discovering, with their help

Answer any questions they have

- Now you can show them how to accomplish the tasks, talk about what you learned from the test

Thank them for their time

- Appropriate to give some compensation

Analyzing and Reporting the Results

Summarize the data

Make a list of critical incidents

- can be positive and negative
- include references back to original data
- try to judge why each difficulty occurred

Sort and prioritize findings

- what does data tell you
- what are the important results
- anything missing from test

Ethical Considerations

Testing is stressful, can be distressing

make sure they know they are NOT the ones being tested.

You have a responsibility to alleviate

make voluntary with informed consent

avoid pressure to participate

let them know they can stop at any time

make collected data as anonymous as possible

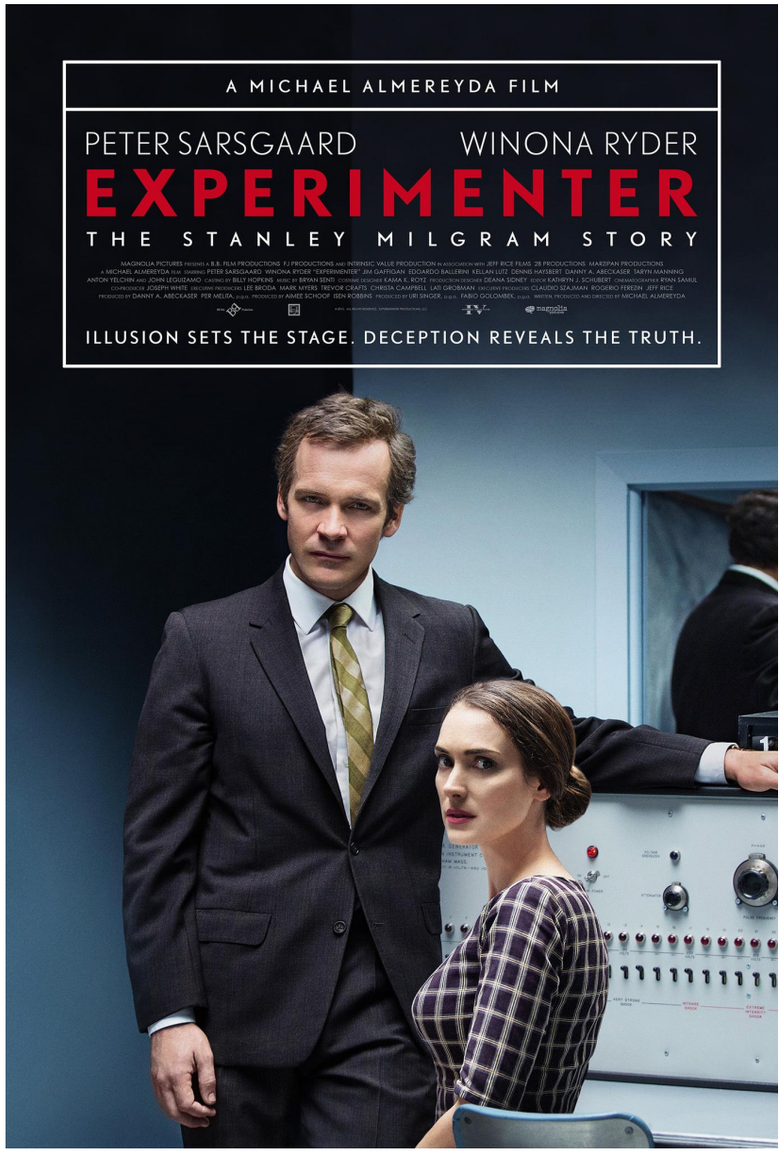
Human Subjects Approvals

Research requires human subjects review of process

This does not formally apply to your design work

But understand why we do this and check yourself

Companies are judged in the eye of the public



Task Design is Important

The goal of a test is to figure out how a person interacts with an interface in the wild...

There are two possible explanations for why a test does not find significant problems:

The interface does not have significant problems

The test itself has significant problems

Bad: Artificial Subgoals

People using the design “in the wild”
may not necessarily form these same subgoals

The task should give one top-level goal, people should form their subgoals while pursuing this

Now you want to choose the type of paper you want to print your document on. Lets imagine that Bin “B” has the paper you want to print your paper on, please complete this task.

Now set the darkness of your copies to about 50% dark. After setting the darkness, you decide you want to print 2 sides of copies on two sides of paper. Please complete this task.

Bad: Artificial Ordering

With an artificial ordering of information or subgoals, people might not proceed in this order

The ordering might also be biased towards the layout of the interface, which would conceal any problems with finding the appropriate control

- Enter in 10 copies, with lightness set to 10%.
- Choose 1 sided to 2 sided, use paper source bin A.
- Cover sheet needed, using paper bin B for cover sheet.
- Set stapling feature on and collating on.
- Start printing.

Bad: Giving the Answers

Tells the person what terminology the interface uses, which they might not otherwise know

lighten = contrast, sorted = collated?

> You are a teacher and are trying to make 40 copies of a one-sided magazine article that is 10 pages long for your class tomorrow. Due to the large number of copies, you print the article double-sided, in other words 10 page article would be printed on 5 sheets of paper. Due to the high contrast of the article, you must lighten the copy, in other words change the contrast. You then want the copies to be collated and stapled.

Good: Giving Context

Giving realistic context through scenarios
can reduce the artificiality of the task

It’s your first day in the office, starting a new job. You would like to make some copies of several documents that your boss gave you to browse through. Your colleague in the next cubicle tells you that you need an access code to make copies. The code is 5150. You walk over to the copy machine at the end of the hall and realize that it is not the Xerox copier that you are accustomed too... Make 2 copies of the “Company Annual Report”.

Consider: Under-Specified Tasks

Many realistic goals are under-specified, as people have only a general idea what they want

By under-specifying the task, you can elicit realistic confusion and decision-making

You just finished fixing up the old hot rod in the garage and now its time to sell her. Make a couple copies of the pictures you took to send into the used car sales magazines. It’s ok that they’re in black and white but maybe you should lighten them up a bit. Your account billing code is 5150.

Task Design Summary

Task design is difficult and important

Poorly designed tasks mask interface failures

If you are not confident in your task descriptions, have others help you “debug” them before testing

Ask me something!