Low-Fidelity Prototyping

CS160: User Interfaces

John Canny

Topics

- Creating a Low-Fi prototype
- Video Prototyping
- Wizard of Oz prototype testing

Lo-Fi Assignment (Oct 25)

This includes a video prototyping component.

Cameras will (probably) be handed out Friday. Check assignment on wiki for confirmation.

Creating a Low-Fi Prototype

Why Do We Prototype?

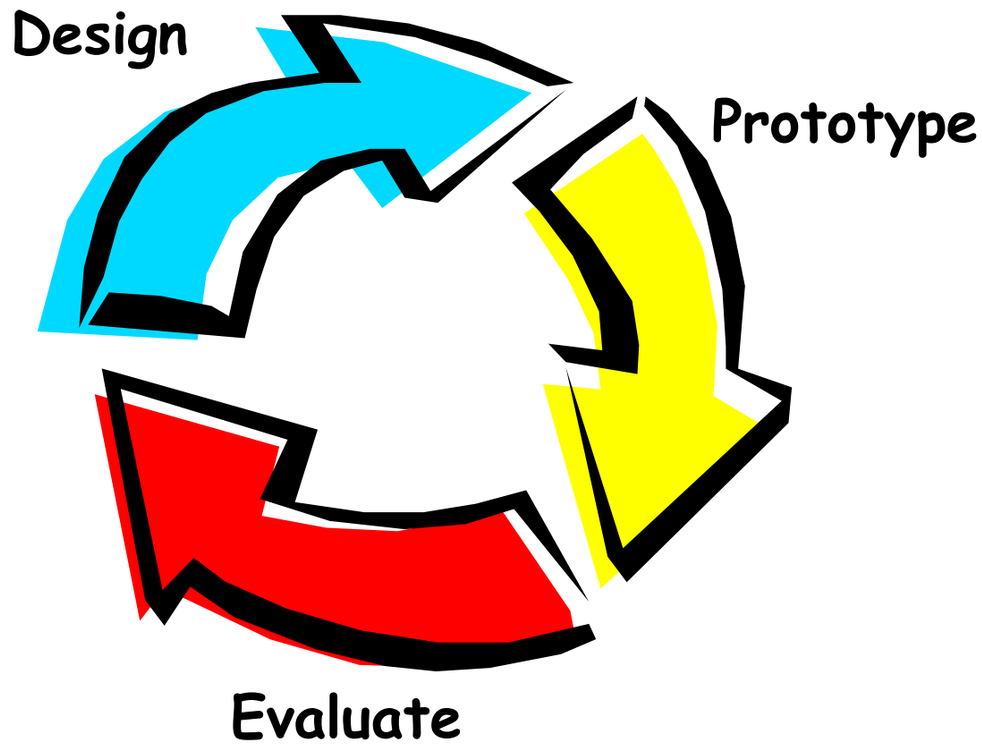
Get feedback on our design faster

- saves money

Experiment with alternative designs

Fix problems before code is written

Keep the design centered on the user



Fidelity in Prototyping

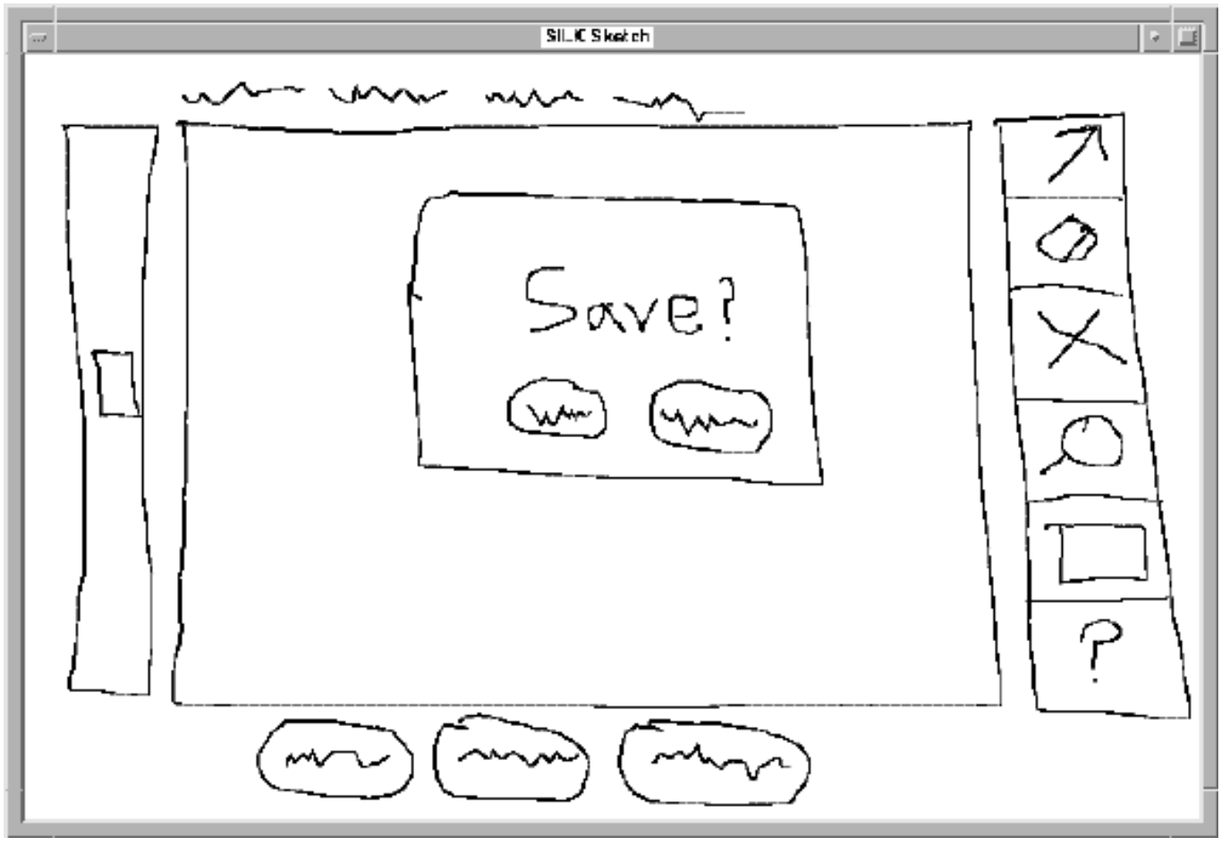
Fidelity refers to the level of detail

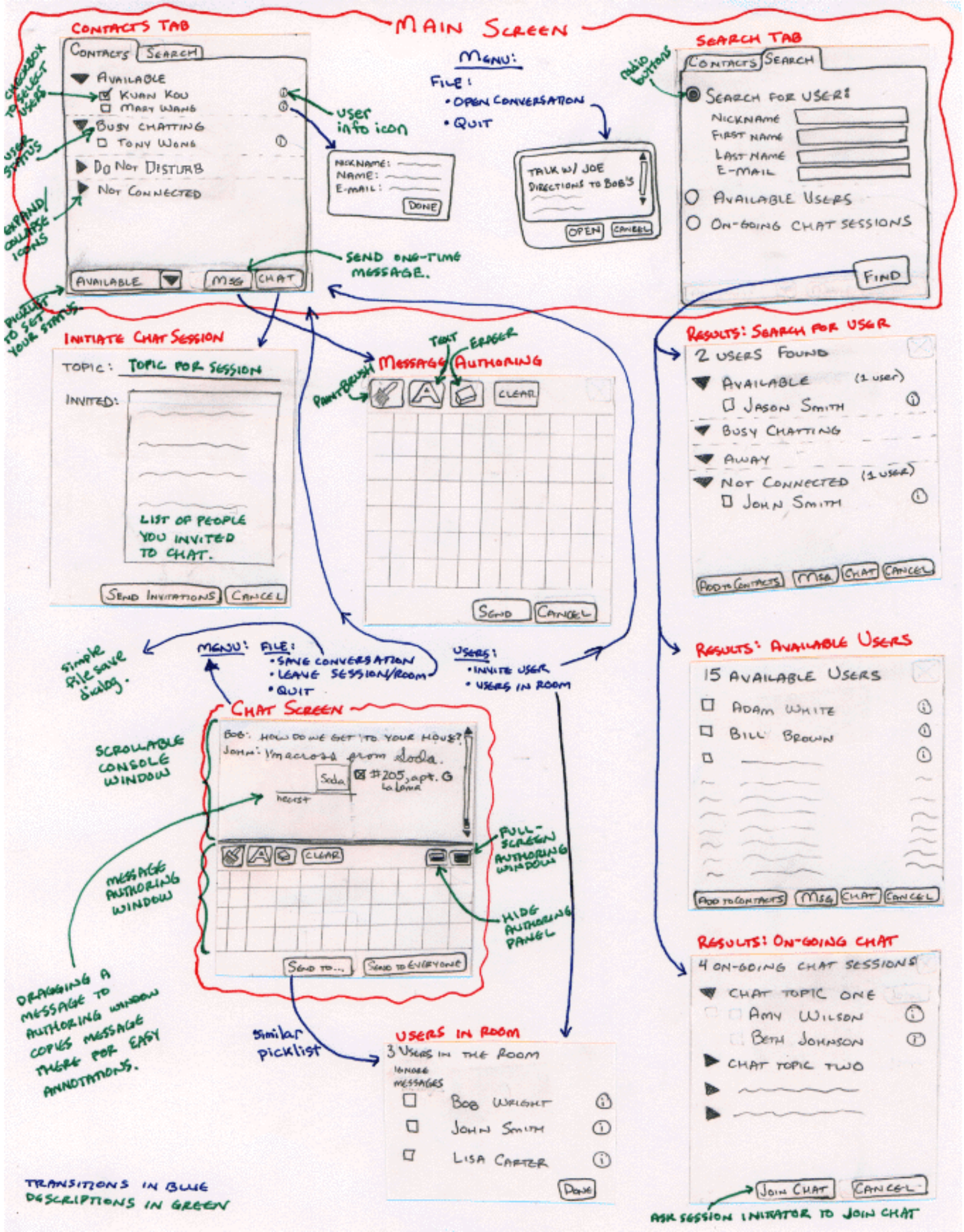
High fidelity?

- Prototypes look like the final product

Low fidelity?

- Artists renditions with many details missing





Ink Chat System

Color Coding

Black: page content
Red: page titles
Green: annotations
Blue: links

Hi-Fi Disadvantages

Distort perceptions of the tester
- Formal representation indicates "finished" nature
- People comment on color, fonts, and alignment

Discourages major changes
- Testers don't want to change a "finished" design
- Designers don't want to lose effort put into creating hi-fi design

Materials

Large, heavy, white paper (11 x 17)

5x8 in. index cards

Post-it notes

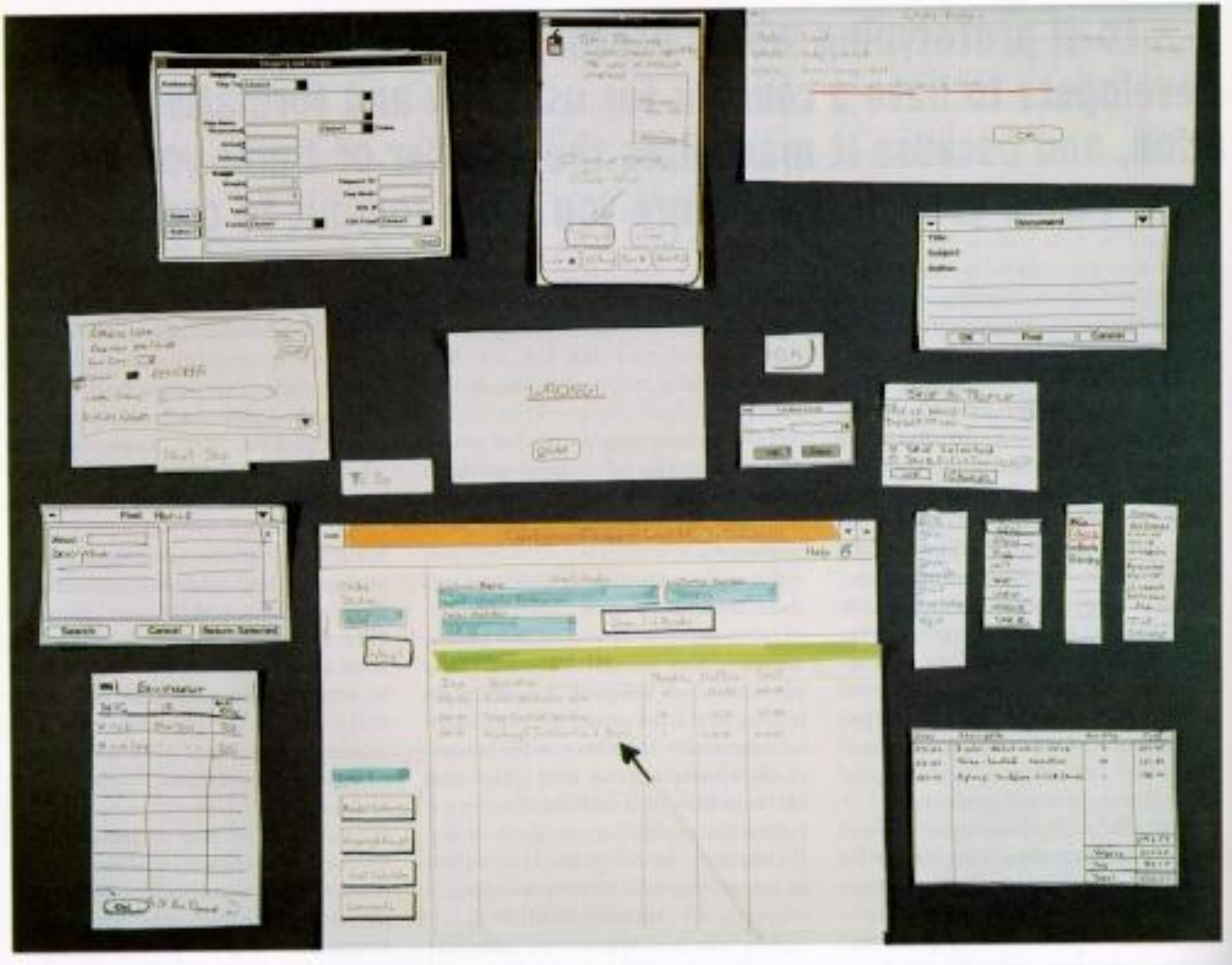
Tape, stick glue, correction tape

Pens & markers (colors & sizes)

Transparencies (including colored)

Colorforms (toy stores)

Scissors, X-acto knives, etc.



+ Add a course
- Drop a course
Search for a course
View Requirement
? Help

Preferences
Print
Update telebears
Save
Logout

	Monday	Tuesday	Wednesday	Thursday	Friday
8-9					
9-10					
10-11					
11-12					
12-1					
1-2					
2-3					
3-4					
4-5					
5-6					

ESP

EECS Schedule Planner

Welcome to ESP.

Your Telebears session is Tues Sept. 21@ 10am

Your current schedule is empty. Please click on Add a course to continue.

+ Add a course
- Drop a course
Search for a course
View Requirement
? Help

Preferences
Print
Update tekbears
Save

	Monday	Tuesday
8-9		
9-10		
10-11		
11-12		
12-1		
1-2		
2-3		
3-4		
4-5		
5-6		

Help - Add Menu

- Select Department from drop down menu.
- Enter course number
  If you don't know course number, press SEARCH button
- Press ADD to confirm transaction.
- Click CANCEL to end transaction.

CLOSE

ESP EECS Schedule Planner

Add Menu

Dept

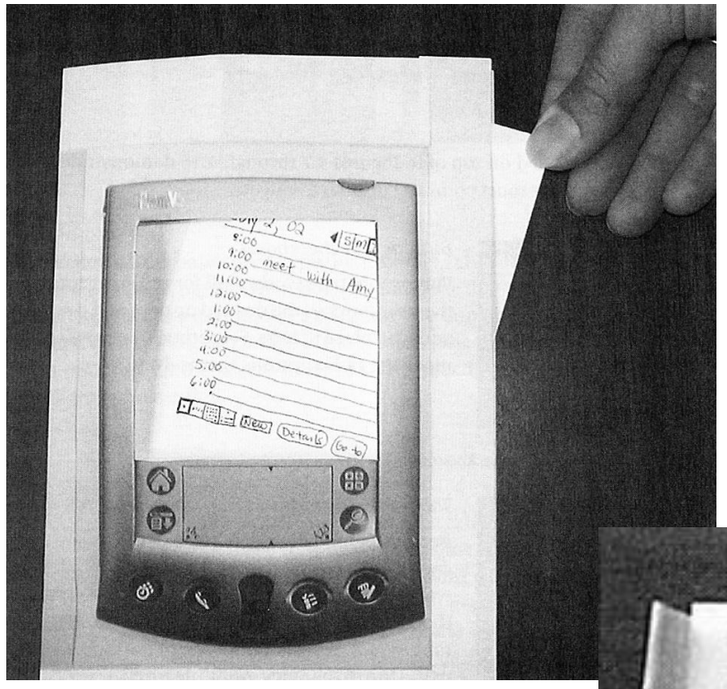
course.

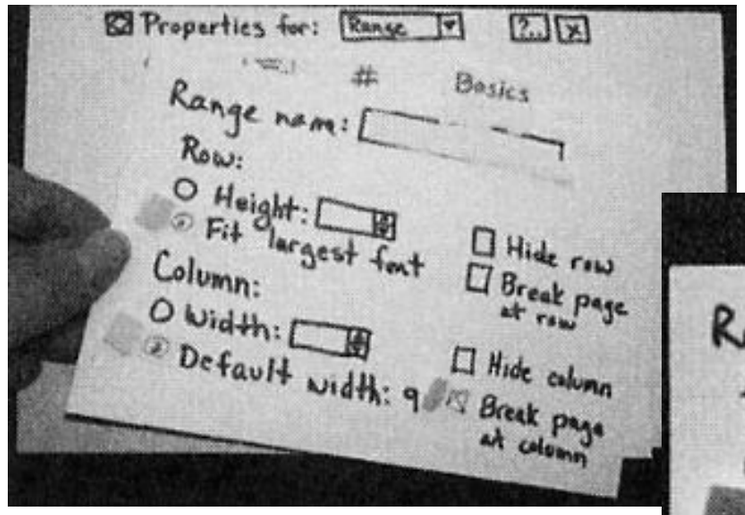
transaction.

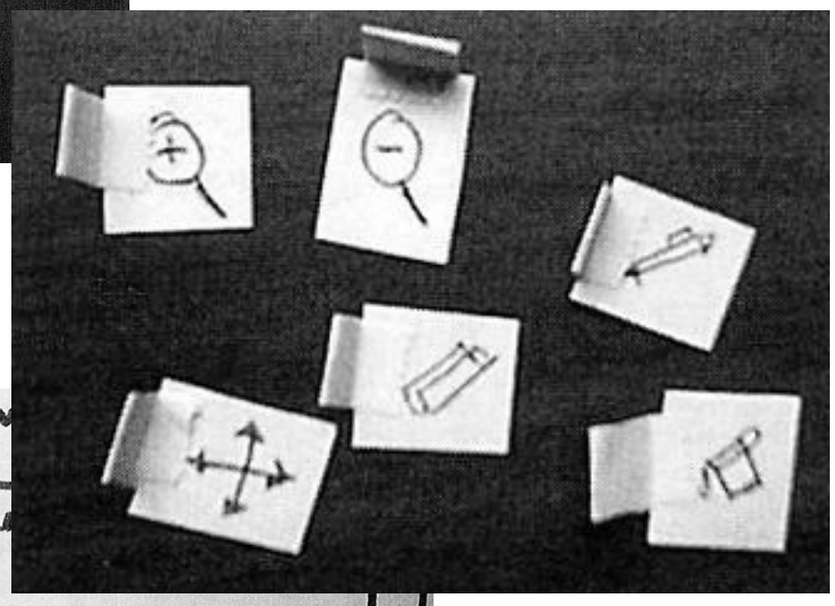
Search if you don't know the course number.

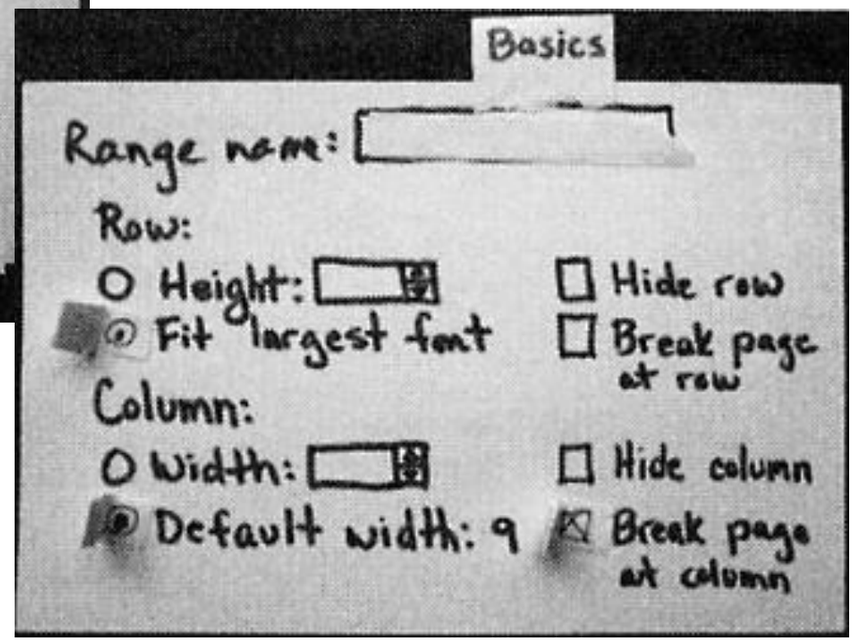
HELP

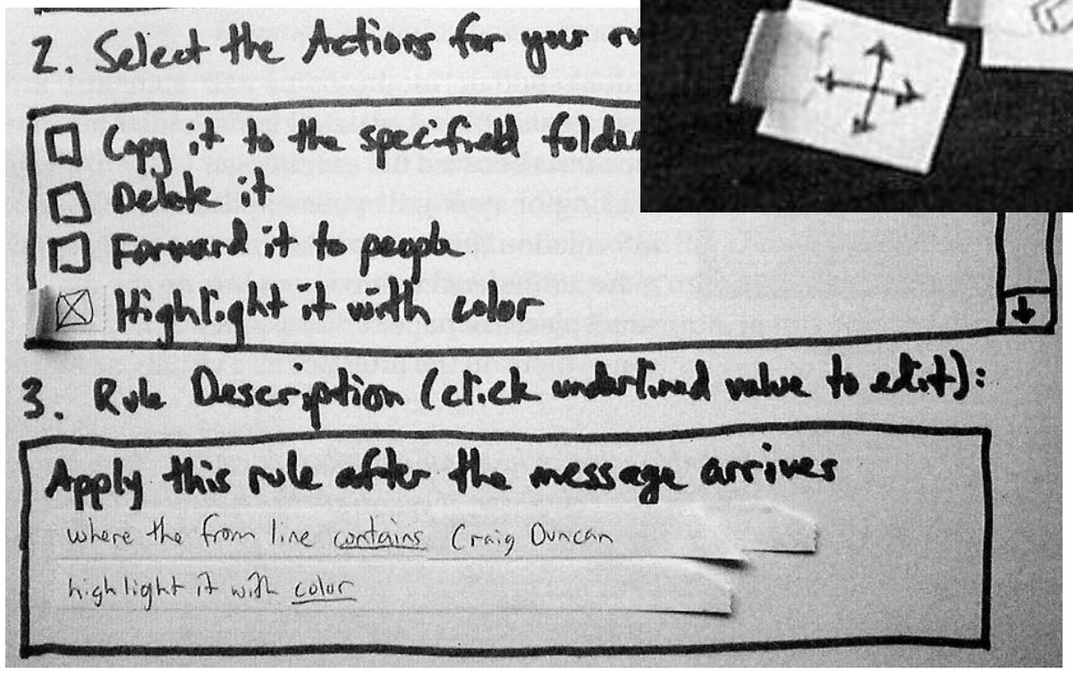
Interface Elements

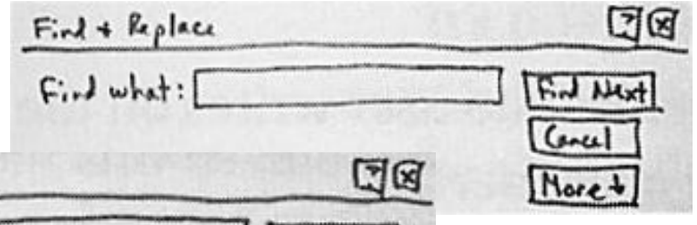


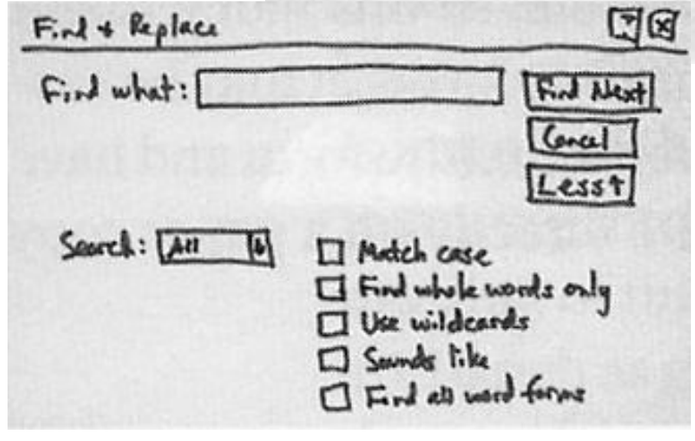












Constructing the Prototype

Set a deadline

- Don't think too long - build it!

Draw a window frame on large paper

- **Draw at a large size, but use correct aspect ratio**

Put different screen regions on cards

- Anything that moves, changes, appears/disappears
- Use greek-ing to indicate text if necessary

Ready response for any user action

- e.g., Have those pull-down menus already made

Use photocopier to make many versions

Exercise

Build a paper version of Tip Calculator

See how many ways you can rearrange and change the design

Video Prototyping

Video Brainstorming

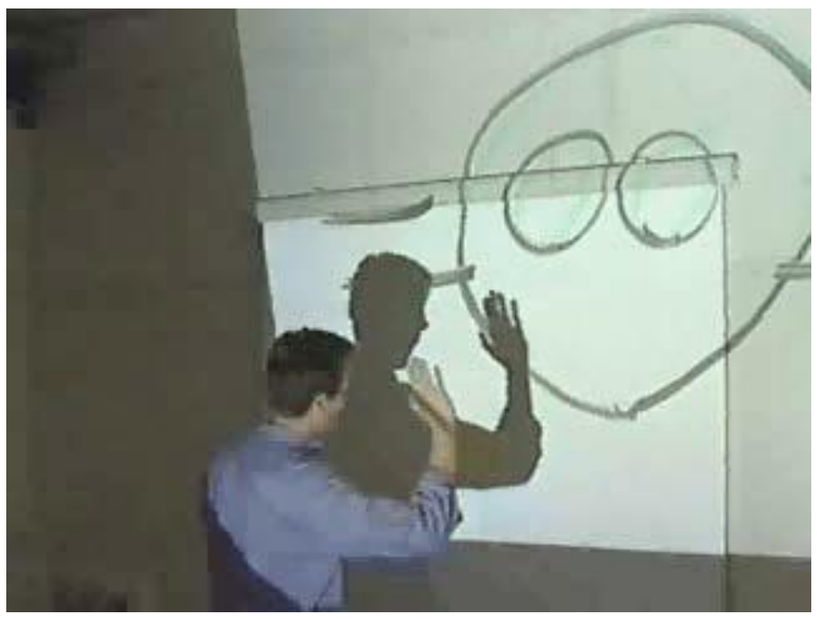
Participants act ideas out in front of a video camera

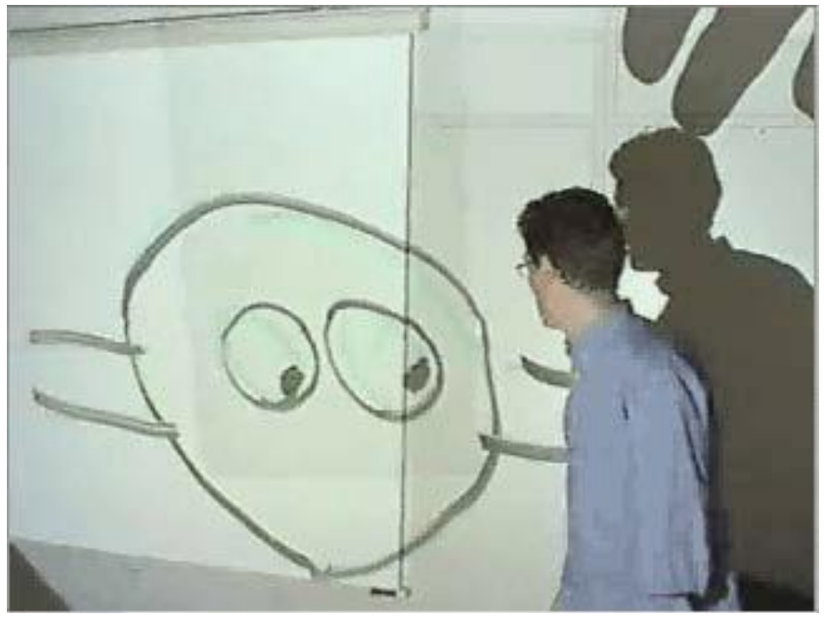
Goal is to create as many new ideas as possible

- each should take 2-5 minutes to generate & capture
- run standard brainstorming session first for ideas

Advantages

- video easier to understand later than notes
- participants actively experience interaction & preserve record of the idea





Video brainstorming of an animated character in *Prototyping Tools & Techniques* by Beaudouin-Lafon & Mackay. Character follows user with its eyes.

Forms of Video Prototypes

Build on paper prototypes

Use existing software & images of real settings

Narration optional (but required for your assignment!)

- Explain events while others move images/illustrate interaction

With good storyboards, should be able to create video prototype in 1 hour

A

FONDU NOIR
BRUIT DE CLÉ + DE PORTE

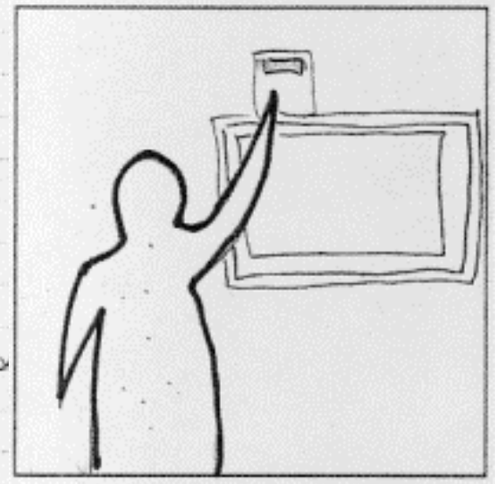
B

SCENARIO

DECORS Moniteur

CAMERA

OBS

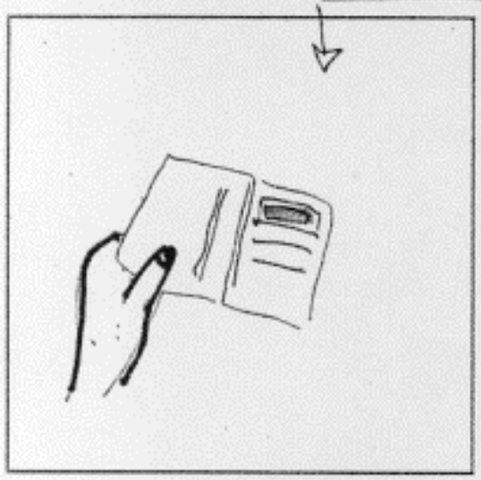


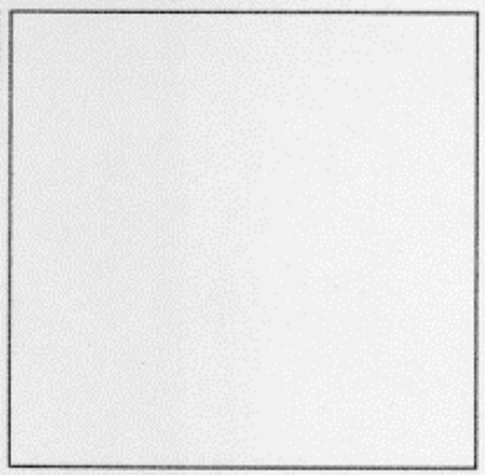
SCENARIO

DECORS FEEDBACK ECRAN.

CAMERA

OBS



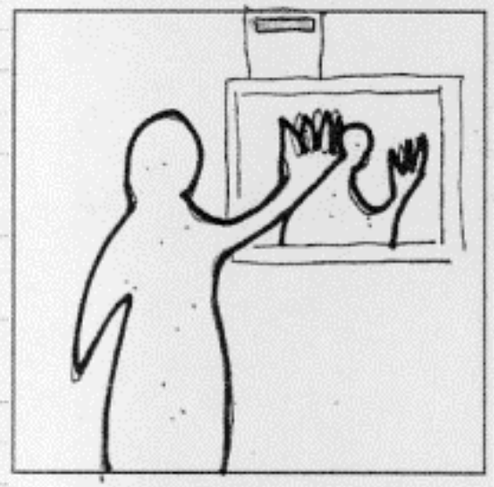


SCENARIO

DECORS Sort

CAMERA

OBS

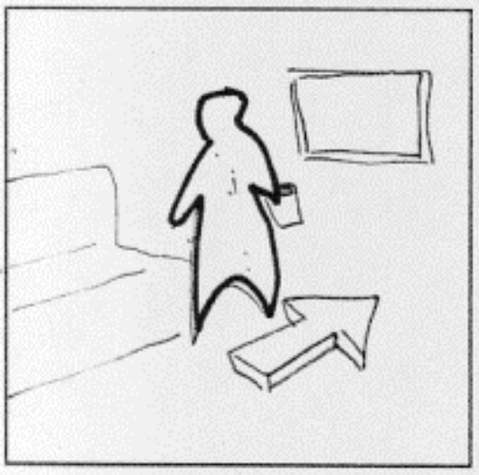


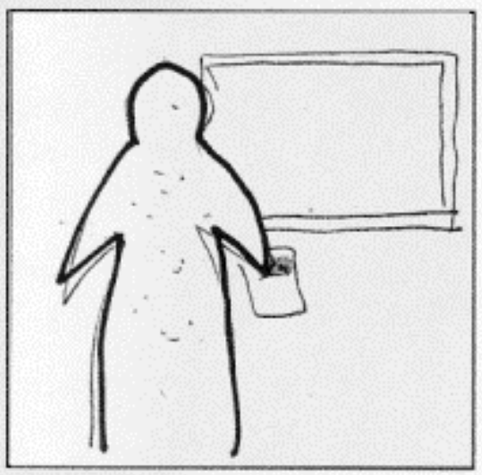
SCENARIO GRIMACE 1

DECORS

CAMERA

OBS ⚠ VOIR BOUQUIN SHOOTER VUE DE FACE POUR INCRUSTATION



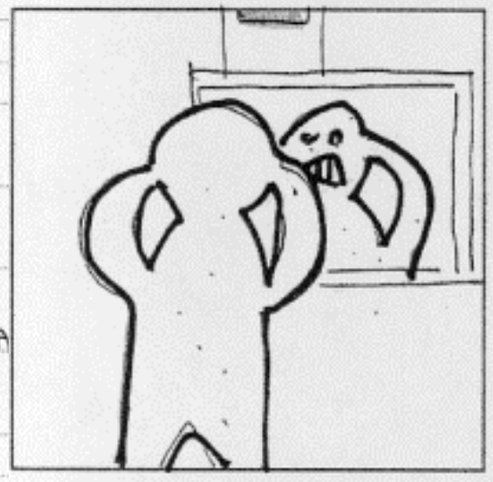


SCENARIO

DECORS CAVE

CAMERA

OBS



SCENARIO

DECORS GRIMACE 2.

CAMERA

OBS

Creating a Video Prototype

1) Review field data about users & work practices
2) Review ideas from video brainstorm
3) Create use scenario in words
4) Develop storyboard of each action/event with annotations explaining the scene. Put each element on a card.
5) Shoot a video clip for each storyboard card
   – Avoid editing in the camera – just shoot in storyboard order
   – Hold last frame of a section/shot for 1s
6) Use title cards to separate clips (keep it onscreen for 3s)
   - if you make an error, rewind to last title card & reshoot

Cluster

- Andy Hou and Kevin Chiu: Univ. of Washington

Tips & Tricks

Add structure to better explain context

- begin with a title
- follow with an "establishing shot"
- create series of closeup & mid-range shots, interspersed with title cards
- place a final card with credits at the end

Use colored paper title cards -- aids edit/search of video

Stop-motion lets images appear & disappear based on interaction

- e.g., illustrate pop-up menu by recording clip of user pressing button, pause camera, add menu, restart camera

Be careful about taking video out of the original design setting for ethical reasons (context matters)

SAM ANIMATION

Tufts UNIVERSITY | Center for Engineering Education and Outreach

Welcome to SAM Animation

Check out the new "How to use SAM" Podcasts in the About SAM page

SAM Animation is software designed to give students the power of making stop-action animations to share their ideas and understanding. The environment provides a unique experience for students to grapple with challenging problems in mathematics, science, engineering, and more as they engage in the process of generating animations. SAM is very much a project in development and thus feedback, discussion, and ideas are welcome.

Download SAM

Download
1.0.0

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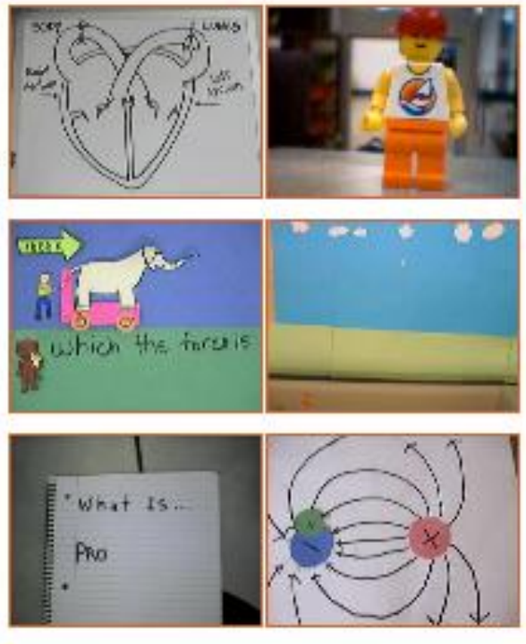


CONNECTRODE

NEW GAME

RULES

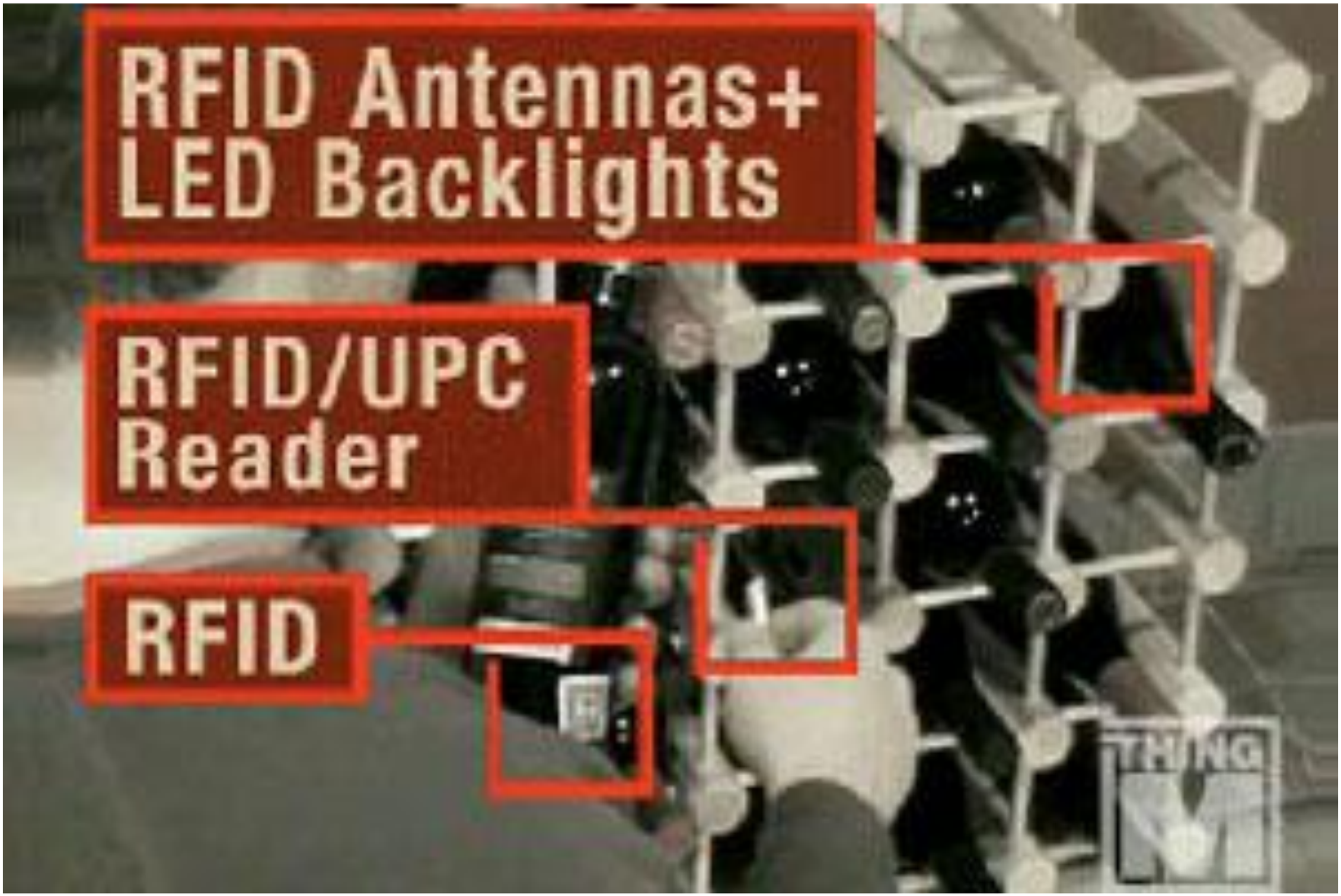
OPTIONS

MANAGE LESSONS

QUIT

CS160 SP09 Ian Hilderth, Mark Dhillon, Greg Leshner, Nalditya Ku

Higher Fidelity Videos



Exercise

Make an instructional video for your Tip Calculator (work with a partner if necessary).

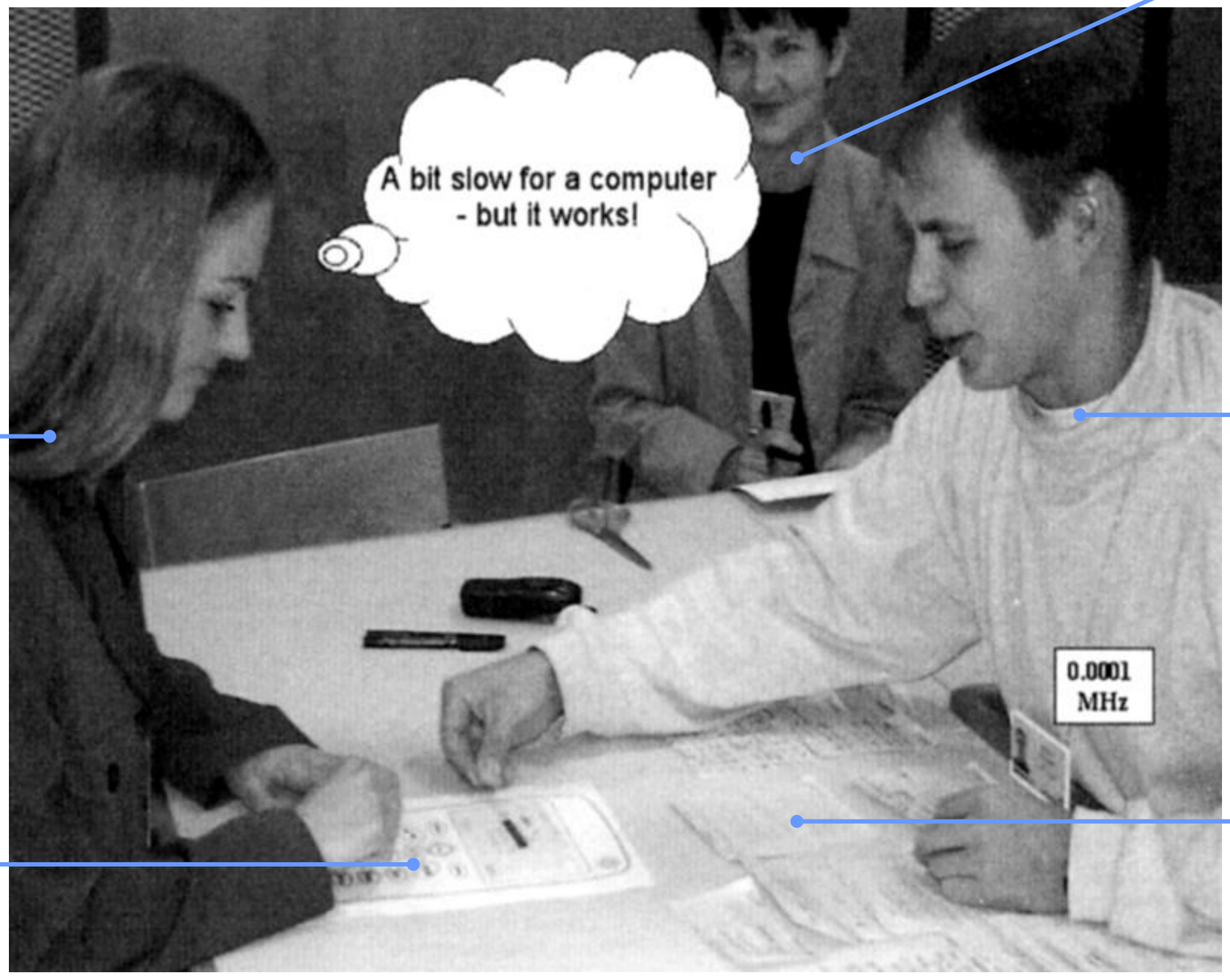
Write a script first. Emphasize any special features in the design.

You should be able to find a video recorder (e.g. camera-phone). If you really can't, make a paper prototype camcorder ☺ and use that.

Wizard of Oz Prototype Testing

SIMS 213 Project: Telebears redesign

Observer
(or video camera)



User

"Computer"

Interface

Interface elements

Preparing for a Test

Select your participants

- Understand background of intended users
- Use a questionnaire to get the people you need
- Don't use friends or family

Prepare scenarios that are

- Typical of the product during actual use
- Make prototype support these (small, yet broad)

Practice running the computer to avoid "bugs"

- You need every menu and dialog for the tasks
- All widgets the user might press
  - Remember "help" and "cancel" buttons

Conducting a Test

Three or more testers

- **Greeter -** Puts users at ease & gets data
- **Facilitator -** only team member who speaks
  - Gives instructions & encourages thoughts, opinions
- **Computer -** knows application logic & controls it
  - Always simulates the response, w/o explanation
- **Observer(s) -** Take notes & recommendations

(Greeter can serve other roles)

Typical session should be approximately 1 hour

- Preparation, the test, debriefing

Conducting a Test (cont.)

Greet

- Get forms filled, assure confidentiality, etc.

Test

- Facilitator explains how test will work
  - Performs a simple task
- Facilitator hands written tasks to the user
  - Must be clear & detailed
- Facilitator keeps getting "output" from participant
  - "What are you thinking right now?", "Think aloud"
- Observers record what happens
  - Avoid strong reactions:, frowning, laughing, impatience – biases the test
- **Designers should not lead participants**
  - Let users figure things out themselves as much as possible
  - Only answer questions if user remains stuck for a long time

Conducting a Test (cont.)

Debrief

- Fill out post-evaluation questionnaire
- Ask questions about parts you saw problems on
- Gather impressions
- Give thanks

Critical Incidents

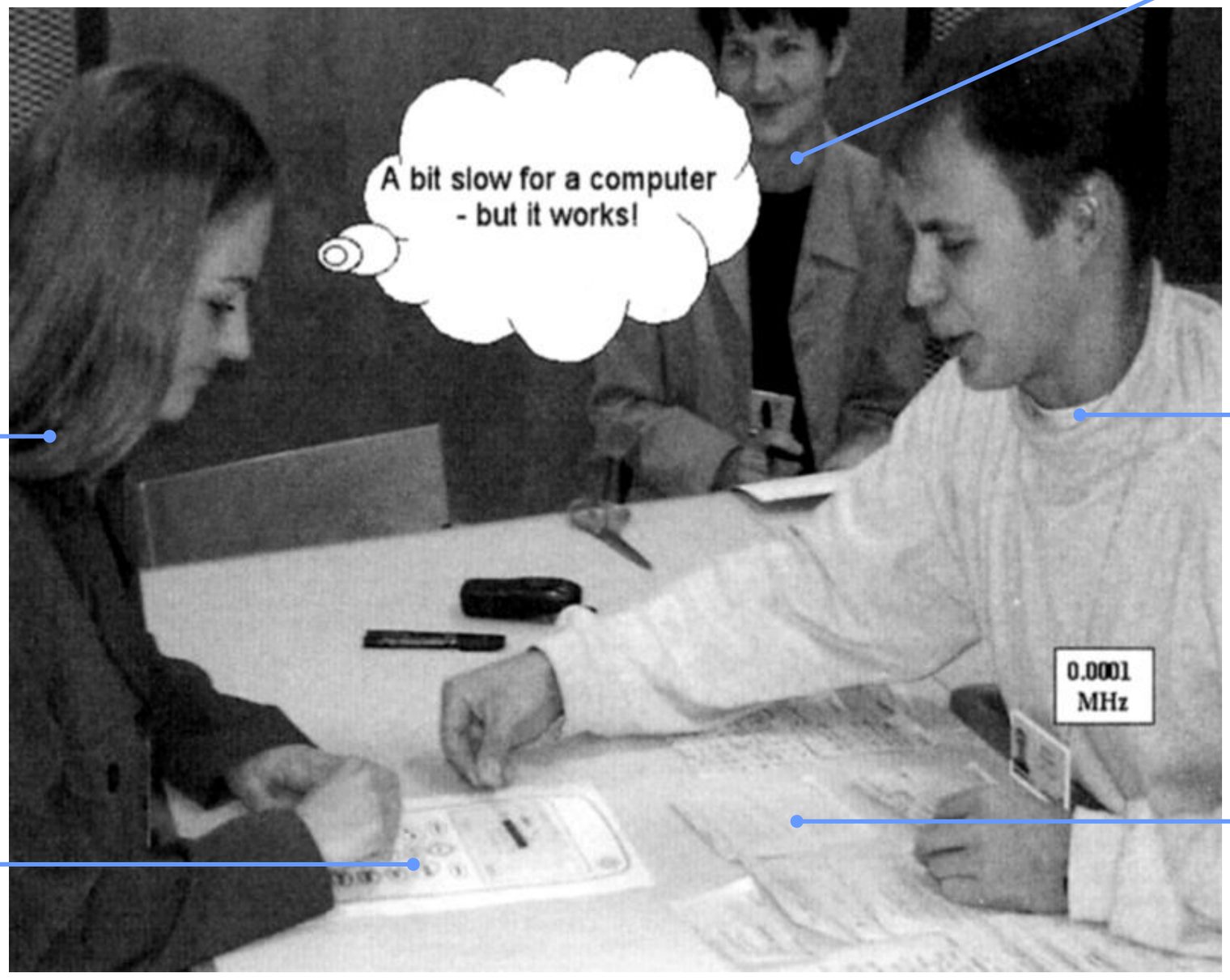
- Critical incidents are unusual or interesting events during the study.

- Most of them are usability problems.
- They may also be moments when the user:
  - got stuck, or
  - suddenly understood something
  - said “that’s cool” etc.

Using the Results

- Update task analysis and rethink design
  - Rate severity & ease of fixing problems
  - Fix both severe problems & make the easy fixes
- Will thinking aloud give the right answers?
  - Not always
  - If you ask a question, people will always give an answer, even it is has nothing to do with the facts
  - Try to avoid leading questions

Observer
(or video camera)



User

"Computer"

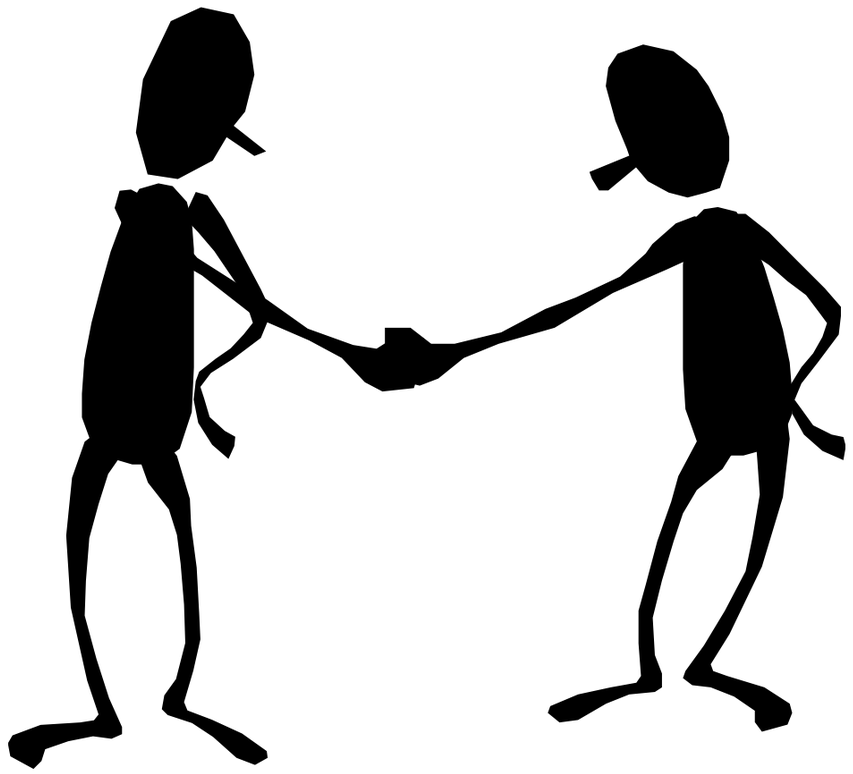
Interface

Interface elements

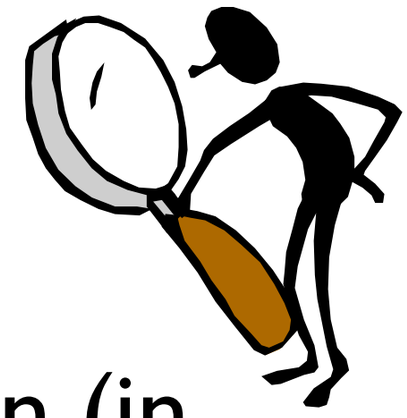
10 steps to better evaluation

1. Introduce yourself

   some background will help relax the subject.



10 steps



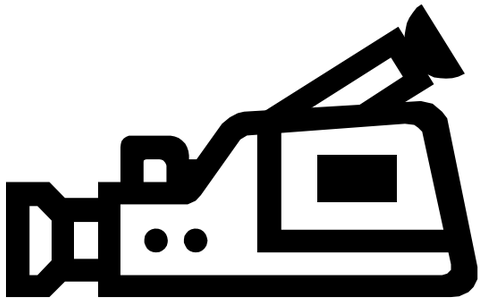
2. Describe the purpose of the observation (in general terms), and set the participant at ease
   - You're helping us by trying out this product in its early stages.
   - If you have trouble with some of the tasks, it's the product's fault, not yours. Don't feel bad; that's exactly what we're looking for.

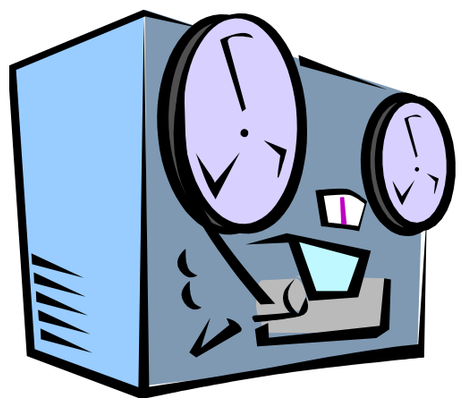
10 steps (contd.)

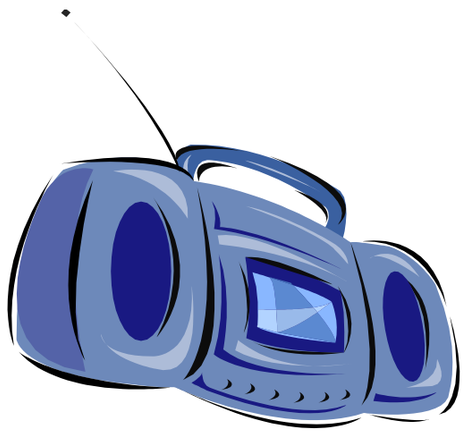
3. Tell the participant that it's okay to quit at any time, e.g.:
   - Although I don't know of any reason for this to happen, if you should become uncomfortable or find this test objectionable in any way, you are free to quit at any time.

10 steps (contd.)

4. Talk about the equipment in the room.
   - Explain the purpose of each piece of equipment (hardware, software, video camera, microphones, etc.) and how it is used in the test.

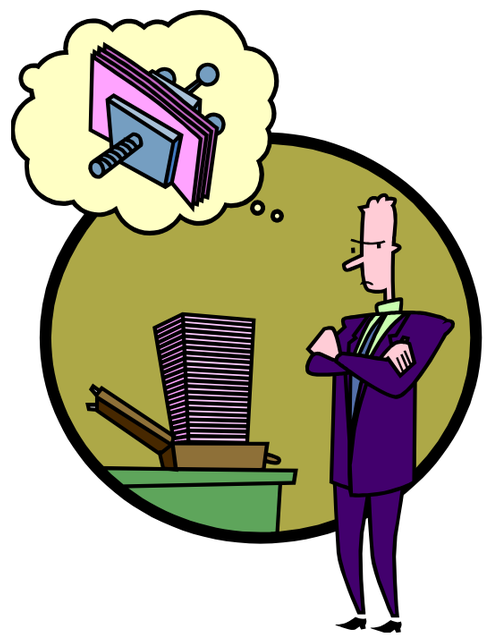






10 steps (contd.)

5. Explain how to "think aloud."
   - Explain why you want participants to think aloud, and demonstrate how to do it. E.g.:
   - We have found that we get a great deal of information from these informal tests if we ask people to think aloud. Would you like me to demonstrate?



10 steps (contd.)

6. Explain that you cannot provide help.

10 steps (contd.)

7. Describe the tasks and introduce the product.
   - Explain what the participant should do and in what order. Give the participant written instructions for the tasks.
   - Don't demonstrate what you're trying to test.

10 steps (contd.)

8. Ask if there are any questions before you start; then begin the observation.

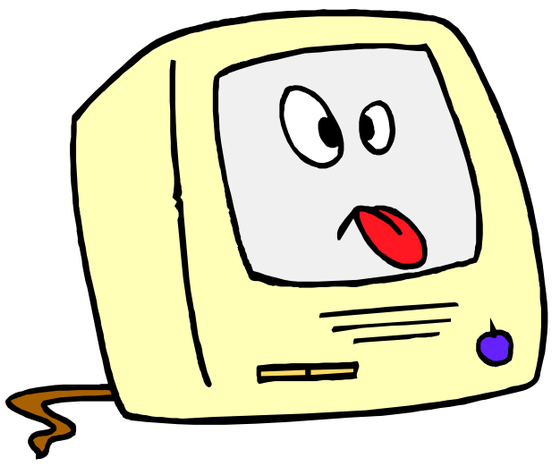
10 steps (contd.)

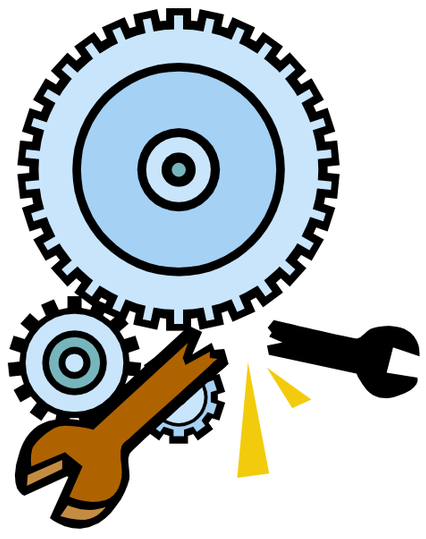
9. Conclude the observation. When the test is over:
   - Explain what you were trying to find.
   - Answer any remaining questions.
   - discuss any interesting behaviors you would like the participant to explain.

10 steps (contd.)

10. Use the results.

- When you see participants making mistakes, you should attribute the difficulties to faulty product design, not to the participant.





Drawbacks of Lo-Fi Prototyping

Evolving the prototype requires redrawing

- Can be slow (but reprogramming usually slower)

Lack support for "design memory"

Force manual translation to electronic format

Do not allow real-time end-user interaction

Exercise

Airport “wayfinder” for travelers

Problem statement:

When passing through airports, people often have difficulty finding the services they need. The availability of these services, as well as how to get to them, is not obvious, which can result in missed flights, weary travelers, and a stressful customer experience.

Target persona: Angela, ~31, business traveler

- Wants to travel without hassle
- 30 minute layover in unfamiliar airport
- What might she want to do in this time?
- What kind of interface would support her tasks?

Constraints

- PDA/Smart phone hardware
- Wireless infrastructure available
- Low resolution location information available

Exercise

Work with your project group

Your tasks

- Brainstorm about Angela's goals
  - What does she want to do at the airport
  - What information does she need
  - What kind of interface will support her tasks
- Create an initial low fidelity prototype
- Debug the interface with users from another group
  - Does the interface meet Angela's needs?
  - Is the interface hassle-free?
  - Is the interface confusing or difficult?

Summary

Informal prototypes allow you to design (and test!) before writing code.

Rapid evolution and elimination of many problems happens in this phase.

Paper+ink is the traditional tool

Solution from Cooper Design

Angela taps here to view a list of the types of services available in the airport.

Services in the selected category are listed here. The location closest to her appears at the top of the list.

To choose a destination, Angela taps her choice in the list.

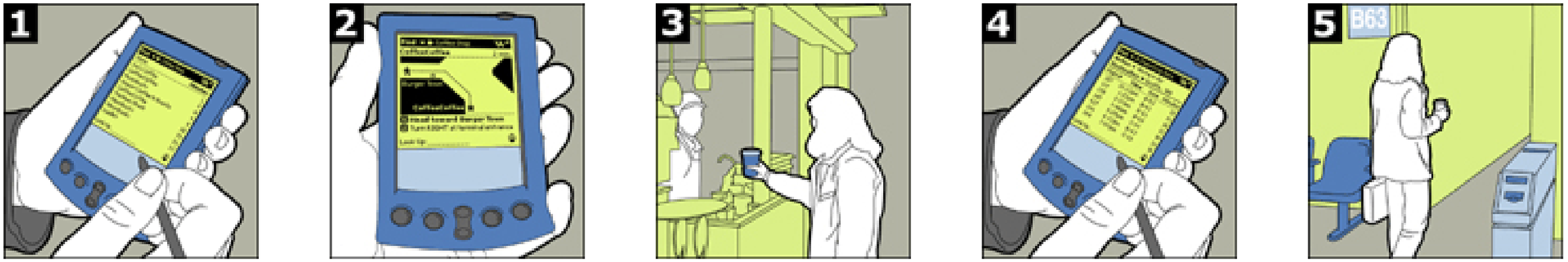
Or she can write the name of the service she is looking for here.

After making a selection on the List screen, Angela sees the Map screen, which shows her position, her destination, and the major landmarks on her route.

Angela can navigate by looking at the map, or by following the simple written directions below.

As she moves along her route, the appropriate direction moves to the top of the list.

Cooper Design's storyboard



Summary

- Creating a Low-Fi prototype
- Video prototyping
- Wizard of Oz prototype testing