CSE440: Introduction to HCI
Methods for Design, Prototyping and Evaluating User Interaction

Lecture 10:
Paper Prototyping

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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

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<td>Reading 2: Storyboarding and Video Prototyping</td>
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<td>2g - Design Review</td>
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<td>Reading 3: Usability Testing</td>
<td>3c - Usability Testing Check-In</td>
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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

Welcome to ESP.
Your Telebears session is Tues. Sept. 21 @ 10am
Your current schedule is empty. Please click on Add a course to continue.
Compose interface from different pieces
Use Transparencies

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Check out our non-hassle Return Policy

Subtotal  
5% H 12.95
Tax 6.00
Total 220.84

Continue Shopping  
Checkout
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!

I'm using crayons to simulate the interaction of clicking and coloring.
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
Deciding What Data to Collect

Process data
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  Focused on measurement

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. Let’s 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 to... 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 it's 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!