CSE 440: Introduction to HCI
User Interface Design, Prototyping, and Evaluation

Lecture 09: Paper Prototyping

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Tuesday/Thursday
12:00 to 1:20
Today

Reading 3 Due Tomorrow
Design Review Tomorrow
Report on Tuesday
Presentations on Thursday / Friday
Paper Prototypes Next Weekend
Bring Prototypes to Following Tuesday

In-Class Inspection Methods
Today

Tips on Effective Presentations

Paper Prototyping
Introduce Yourself

DisTrack
Refocus yourself

Graeme Britz - Project Manager
Max Suffel - Writer/User Researcher
Angela Suhardi - Writer/Designer
Jackie Chui - Writer/Designer
Bryan Djunaedi - Writer/Designer
The recurring subscription management tool that let’s you finally take control of your recurring services and payments.

Jen Kang • Vivian Yu • Si Liu • Brendan Lee
The recurring subscription management tool that let's you finally take control of your recurring services and payments.

Jen Kang • Vivian Yu • Si Liu • Brendan Lee
Finding

• Reimbursement is a burden...
  – More people, more difficult

• Compiling shopping list
  – mental note, notepad, or phone

• Brand and price conscious
Task

1. Making list & budgeting
2. Choosing a store & transportation
3. Shopping
4. Purchasing
5. Storing groceries
6. Managing $$$ & requesting reimbursement
Summary

- Iteration is key
- Understand how users think
- Better design ideas came from more out-of-the-box thinking
- Discretionary spending is easy but discretionary spending tracking is hard
- Users crave positive motivation
Things to Do (Tasks)

1. Ability to record running statistics such as distance run, speed, number of runs, etc.
2. Share statistics with friends
3. Create running events and invite friends
4. Send mass notifications to friends for a spontaneous run
5. Find a SmartMatch (based on various criteria) to run with
6. Write and search for reviews on the route/experience
Overall Problem: Joint Pain & Activity

- Target Audience: Athletes
  - Health conscious
  - Disciplined

- Problem: Overexertion and aggravation of injury among athletes
Running with Friends

Erica Putsche, Heidi So, Luke Chang, Linsen Wu
Contextual Inquiry - Insights

Johnson (20, undergraduate, CSE 006 Lab)
- Perception ≠ Observation
- Distracted by people talking and noise
- More focused at CSE Labs than at home

Steve (25, graduate, Mercer Court)
- Motivated by seeing people working
- Distracted by people and social media
- Takes breaks often

George (25, graduate, Odegaard Library)
- Turns notifications off while studying

Group (4 undergraduates, Yunnie Bubble Tea)
- Distracted by each other and apps
- Use headphones (music) to focus
Our three inquiries showed us:

1. People valued the insights acquired from a mood journal.
2. People thought journaling was a hassle.
3. People were interested in what triggers their mood
4. People want to share information with a mental health professional
Design 1: Running separately
May add some motivation but does not provide the full experience of running with a companion

Design 2: Coordinating running events in advance
Tasks can be accomplished using Facebook events or other similar tools

Design 3: Spontaneous Running
Tasks are unique and they also address the concerns raised in our contextual inquiries. Our chosen design also provides us with an interesting opportunity to explore personal informatics
Summary

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Having Too Much Text

If you can read it

you probably will

we probably will

Be conversational, engaged

even when not talking

Notes are fine

but do not read them
Parent Contextual Inquiry

Participants:
- Two parents whose children formerly had IEPs
- One parent with two children that currently have IEPs
- One guardian of a student with an IEP

The Process:
- “The lingo and paperwork are confusing, they come with 17 people and you are there by yourself.”

Communication:
- “right now I come in doing all the communications to get information”
Overall Problem: Joint Pain & Activity

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Contextual Inquiry

- Dancers
  - Use of entire body
  - Diverse Injuries
- Observation
  - Warmup
  - Preventative Habits
Contextual Inquiry

4 Locations
- Odegaard Library
- CSE Undergraduate Labs
- Mercer Court
- Yunnie Bubble Tea (Ave)

3+1 Approaches
- Observation + Interview (3x)
- Interview-only (2x)
- In-group Interview (1x4)
+ Online Survey (16x)
Contextual Inquiry

- People do not want to be interrupted or distracted
- Most people do not have a liquid intake plan
- People often reach for soda, coffee, or other beverages when they feel thirsty
Pictures are Good

Contextual Inquiry

Professional (20-40s)

Family

Undergrad Student
15% of Americans between the ages of 20 and 69 experience hearing loss that may have been caused by **noise at work** or during leisure activities.

Motivation of Participants

**Very noisy** work environment

**Some control** over exposure levels

**Moderately noisy** work environment

**Lacks control** of his noise exposure

Dartmouth student who is exposed to **noisy social environments** multiple days per week

**Has control** over exposure levels
We can help
Tasks

- Record mood reflections
- Discover triggers and warning signs
- Discover wellness strategies
- Planning for health
- Quick mood check-ins
- Aid your health professional
Tasks

1. Engage a work session.
2. Record digital and non-digital behavior.
3. Prompt for taking breaks.
4. Reflect on recorded data relative to time and location.
5. Find a productive work place.
6. Find and implement methods/strategies to stay focused.
Speaking of Distractions

Whether correct or not, many things distract

Plural possessive

*a posteriori*

Anything that might be sensitive
Original Tasks

Current Tasks:
- Aggregate and collect all IEP information for continuity and stakeholder accessibility.
- Encourage communication between stakeholders.
- Connect with other parents who have children with similar disabilities.

New Tasks:
- Access mini lessons to support the developmental master of IEP tasks.
- Motivational rewards system to encourage students to be active in their IEP.
- IEP videos for parents to understand how to best advocate for their child.
Initial Tasks

1. Tracking liquid intake over time (*Easy*)
2. Education on hydration (*Easy*)
3. Convenient reminders to drink water (*Medium*)
4. Smart beverage suggestions (*Medium*)
5. Finding motivation for drinking water (*Hard*)
6. Accurate dehydration detection (*Hard*)
Adjust budget between different categories.
Verb as Task

Designate spending as discretionary.
Verb as Task

Review spending **progress** compared to goals.

Account for **future** spending.

Prevent **unwanted** habitual spending.

Check if a potential purchase **fits the budget**.
Many people make **general** budgeting goals.

**Large** items are monitored.

Small items cumulative impact **not considered**.

**Challenging** setting up budgets.

Complicated input leads to **less use**.
Task: Reflect on recorded data relative to time and location

Consistency of Emphasis
Consistency of Emphasis

Task: Find and implement methods/strategies to reduce distractions and increase focus
Design 1

Pre-shopping

EA Groupshop
Hi there!
Honey Nut Cheerios is on sale! Get it now?
sale ends Oct 31st
Add to shopping list
Dismiss

SELECT LIST:

- PETER's list
- Household's list

+, Create list

Household

P
Honey nut cheerios $4.99 Private
added in Oct 30th

G
Chocolate $2.99 Public
milk
added in Oct 25th

A
Orange $5.99 Public
Juice

+, Add an item

Done
Design 1
Sensor Ball with Mobile App

Naming Designs

Tracking Liquid Intake

Education on Hydration

Convenient Reminders

Smart Beverage Suggestions
Sketch 3

Main Focus:
- Student Motivation

Key Features:
- Mini lessons accessible for the student and parent to work on
- Points awarded for completion of task on the website
- Spending points for various rewards
Design 1

Legibility of Sketches
Updated Sketch

Two Tasks
- Recurring subscription management
- Insight and informed decisions
Problem

A lack of awareness about the long-term implications of noise exposure
KACHING
Today

Tips on Effective Presentations

Paper Prototyping
Is My Design Good?

This is not a meaningful question

   It can and will be answered with “Yes”

At least consider asking:

   “What are three good things about this design?”
   “What are three bad things about this design?”

But really the answer is “it depends”

   Remember that designs are used for tasks
   We should ask this in the context of tasks
Fidelity in Prototyping

High Fidelity

Prototypes look like the final product

Low Fidelity

Designer sketches with many details missing

We have discussed the value of staying lightweight in sketching, but this also applies to prototyping.
High-Fidelity Prototypes Warp

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 $\rightarrow$ Prototype $\rightarrow$ Evaluate $\rightarrow$ Iterate

Instead simulate the prototype
  Sketches $\rightarrow$ Evaluate $\rightarrow$ 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
Sketches
Paper Prototype
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, X-Acto knife
Paper Prototype

Welcome to ESP.
Your Telebears session is Tues. Sept. 21 @ 10am
Your current schedule is empty. Please click on Add a course to continue.

“Screen” faked with pre-constructed pieces
Paper Prototype

New pieces added in response to interaction
Paper Prototype

Transparencies allow flexible use of text
Paper Prototype as Communication
Paper Prototype as Communication
Paper Prototype as Evaluation
Paper Prototype as Evaluation
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
Constructing the Prototype

Note the sketching continues
Constructing the Prototype

Planning what is needed given tasks
Constructing the Prototype
Constructing the Prototype
Constructing the Prototype

Remember your target platform constraints
Why Usability Test?

Find and fix problems in a design

- Removes the expert blind spot
- Obtain data to unify team around changes
- Uncover unexpected behaviors

Results drive 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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Summary, statistical, or bottom-line data
- Summary of what happened (time, errors, success)
- Focused on measurement

Focus on process data
- Gives overview of where the problems are
- More useful than “too slow” or “too many errors”
Not a Scientific Experiment

Focus is on improving the design

Experimental control is not as necessary
Data measurement is not as precise
Number of participants is fairly small

Changes can be made

Fix the obviously broken design
Quickly explore alternatives
Modify the focus of testing between participants
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
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
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

See the Gommol reading tips on a test session

Rettig, 1994
Talk-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?”

“Talk-aloud” is similar but distinct from “think-aloud”

Most do not know or care about the difference, so you may see the terms used interchangeably.
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
Answering Questions

Remember the purpose of this test

You would not be there “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

Tests yield many forms of data

Quantitative counts
  time, success/failure
  confusions, errors, workarounds

Observations
  notes about when, where, why, how above occur

Participant comments and feedback
  during session of via a questionnaire
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
  people can leave in tears
You have a responsibility to alleviate
  make voluntary with informed consent
  avoid pressure to participate
  let them know they can stop at any time
  stress that you are testing the system, not them
  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
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