Early Stage (lo-fi & med-fi) Prototyping

Prof. James A. Landay
Computer Science Department
Stanford University
Winter 2021
February 3, 2021

Interface Hall of Fame or Shame?

Good
- shape indicates function
- so simple that instructions fit in 1 image
- fun!

Bad
- dripping water?
- too much noise
- still takes too long

Interface Hall of Fame!

Good
- shape indicates function
- so simple that instructions fit in 1 image
- fun!

Bad
- dripping water?
- too much noise
- still takes too long

Can We Do Better?

Good
- integrate hand dryer into sinks...
Hall of Shame!

Good
- beautiful alternative to the competition
- generally reliable
- turn by turn directions are efficient, clear & function well in general

Bad
- despite any aesthetics, the data is wrong, sparse, meaning it does not perform the one task it should do well - getting from A to B

Good alternative to the competition & generally reliable. Turn by turn directions are efficient, clear & function well in general.

Bad
- despite any aesthetics, the data is wrong, sparse, meaning it does not perform the one task it should do well - getting from A to B.

Hall of Shame!

Apple crowd sourced data
The UI for problem reporting is well designed
With so many users have potential to fix data rapidly → it has gotten much better!

A clear example of where no matter how good a design may be, without its most important function in this case, correct data, the interface is useless.

Potentially Hall of Fame

Potentially Hall of Fame

Early Stage (lo-fi & med-fi) Prototyping

Prof. James A. Landay
Computer Science Department
Stanford University
Winter 2021
February 3, 2021
Outline

• Sketching vs. Storyboarding
• Prototyping
• Low-fi prototyping
• Conducting a low-fi test
• Medium-fi prototyping

Sketches & Storyboards

• Where do storyboards come from?
  - film & animation
• Give you a “script” of important events
  - leave out the details
  - concentrate on the important interactions

Sketches & Storyboards in UX Design


What is a Prototype?

“A prototype is an early sample or model built to test a concept or process or to act as a thing to be replicated or learned from.”

– Wikipedia

CS147 definition: a working representation of a final artifact

Types of Prototypes

Prototypes are concrete representations of a design

Prototype dimensions

- representation: form of the prototype
  - off-line (paper) or on-line (software)
- precision: level of detail (e.g., informal or polished)
- interactivity: watch-only vs. fully interactive
  - fixed prototype (video clips)
  - fixed-path prototype (each step triggered by specified actions)
  - open prototype (each path triggered by specified actions)
  - evolution: expected life cycle of prototype
    - e.g., throw away or iterative

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
Hi-fi Prototypes Warp

- Perceptions of the tester/reviewer
  - representation communicates “finished”
  - comments focus on color, fonts, & alignment
- Time
  - encourage precision
  - specifying details takes more time
- Creativity
  - lose track of the big picture

Why Use Low-fi Prototypes?

- Traditional methods take too long
  - sketches → prototype → evaluate → iterate
- Can instead simulate the prototype
  - sketches → evaluate → iterate
  - sketches act as prototypes
  - designer “plays computer”, others observe & record
- Kindergarten building skills
  - allows non-programmers to participate

Hi-fi Prototypes Warp

Why Use Low-fi Prototypes?

Hi-fi Prototypes Warp

Why Use Low-fi Prototypes?

Hi-fi Prototypes Warp

Why Use Low-fi Prototypes?
**Administrivia**

- **Assignment #5 – Low-fi Prototype & Pilot Usability Test**
  - 15-20 rough sketches of different design realizations
  - Everyone on team contributes
  - Use different modalities (e.g., visual, speech, watch) or different input techniques (gestures, tap, etc.)
  - Will do some of this in studio this week
  - Pick top 2 realizations & storyboard more
  - Pick best realization & add details to storyboard
  - Build low-fi prototype of the best & test it w/ at least 3 target (non-Stanford) participants

- **Web sites directories will be created for each team by this weekend**
  - Each team needs 1 person to fill out this form by Friday
  - Start to get sites up there this weekend!
  - Should have all your work through mid-grading until near end of quarter
  - TAs will send you your directory path/name on web.stanford.edu

**Grading on Assignment #2**

**POV, HMW, EP Assignment #2**
- A2 Group Presentation:  
  - ✓: 0%  
  - ✓: 16%  
  - ✓+: 75%  
  - +: 10%
- A2 Individual Presentation:  
  - ✓: 0%  
  - ✓: 11%  
  - ✓+: 75%  
  - +: 15%
Administrivia: Video Hints

- Under 2 minutes (90 seconds better)
- Add credits at end
  - Team/project name
  - Your names (first name & last initial)
  - “CS 147 – Winter 2021”
  - Won’t count in your time limit

Constructing the Model

- Set a deadline
  - don’t think too long - build it!
- Draw a window frame on large paper
- Put different screen regions on cards
  - anything that moves, changes, appears/disappears
- Ready response for any user action
  - e.g., have those pop-up dialogs, etc. already made
- Use printer/scanner to make many versions
Preparing for a Test

- Select your “customers”
  - 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 to avoid “bugs”

Conducting a Test

Four Roles

- 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
- Observers – take notes & recommendations

Conducting a Test

Evaluating Results

- High level questions about your design
  - does it address the problem you want to solve?
  - is this the right realization of your solution?
- Sort & prioritize observations
  - what was important?
  - lots of problems in the same area?
- Make changes & iterate
  - even iterate between tests
Advantages of Low-fi Prototyping

• Takes only a few hours
  - no expensive equipment needed

• Can test multiple alternatives
  - fast iterations
  • number of iterations is tied to final quality

• Almost all interaction can be faked (Wizard of Oz)

Problems with Low-fi Prototypes

• “Computer” inherently buggy
  • timings not accurate

• Hard to implement some functionality
  • pull-downs, feedback, drag, viz

• Won’t look like final product
  • sometimes hard to recognize widgets

• End-users can’t use by themselves
  • not in context of user’s work environment

Interactive Lo-fi Tools

Balsamiq Mockups
http://balsamiq.com

POP
https://marvelapp.com/pop

Remote Testing of Low-fi Prototypes

1. Participant runs & records prototype (e.g., Balsamiq/POP) on their phone [hardest]
   - user records interaction by recording screen on iOS/Android
   - you record zoom meeting while participant speaks aloud
   - https://uxdesign.cc/moderating-ux-research-with-zoom-1d4e89614277

2. Participant runs zoom on their phone while you screen share prototype [moderate]
   - user taps on items & verbalizes aloud
   - you control prototype & record meeting
   - https://uxdesign.cc/moderating-ux-research-with-zoom-1d4e89614277

3. Participant runs prototype [easiest]
   - user runs your prototype (e.g., Balsamiq/POP) on their own phone
   - you record zoom meeting of their screen as captured by laptop camera
   - https://medium.com/@beparticular/were-still-hugging-our-laptops-8c7f22ed800e

Fidelity in Prototyping:

Instagator

Low-fi

Medium-fi
What do we like about this prototype?

What do wish could be improved?

The feedback you get is different

Summary

• Prototypes are a concrete representation of a design or final product
• Low-fi testing allows us to quickly iterate - get feedback from users & change right away

Further Reading

Prototyping
• Books
  - Paper Prototyping: The Fast and Easy Way to Design and Refine User Interfaces, by Carolyn Snyder, Morgan Kaufmann, 2003
• Articles
  - “Prototyping for Tiny Fingers” by Marc Rettig, in Communications of the ACM, 1994

Next Time
• Lecture
  - Watch, Critique, & Vote on Concept Videos (CS 147 Film Festival)
• Reading
  - none
• Project
  - 15-20 sketches of 3-5 design realizations in studio...
    - Pick the top two & storyboard those
    - Pick the top 1 & build/test low-fi prototypes using 3 key tasks for next week’s studio presentation
  - Recruit representative participants now!