USER INTERFACE DESIGN + PROTOTYPING + EVALUATION

Early Stage Prototyping

Prof. James A. Landay
University of Washington

Autumn 2012

Hall of Fame or Shame?

Southwest Airlines Home Gate
The Home of Southwest Airlines on the World Wide Web

- Direct translations
  - software telephony solution that requires the user to dial a number by clicking on a simulated keypad
  - airline web site that simulates a ticket counter

Hall of Shame!

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Misused Metaphors!

Hall of Fame or Shame?

Wiimote
By Nintendo

Hall of Shame!

The main thing that differentiated the product (movement in gaming) resulted in it being thrown at windows

- Slippery plastic meant the initial design was hard to hold onto. Later designs added the Wii "condom" rubber case and a strap
- Lack of a joystick was also an initial problem for gaming resulting in a second controller

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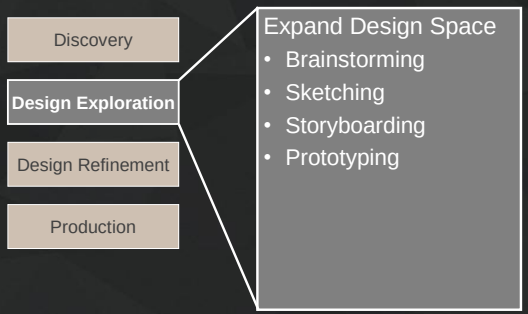
Outline

- Heuristic Evaluation Review
- Types of Prototypes
- Low-fi prototyping
- Wizard of Oz technique

Heuristic Evaluation Review

- Have evaluators go through the UI twice
- Ask them to see if it complies with heuristics
  - note where it doesn't & say why
- Combine the findings from 3 to 5 evaluators
- Have evaluators independently rate severity
- Alternate with user testing

Design Process: Exploration



What is a Prototype?

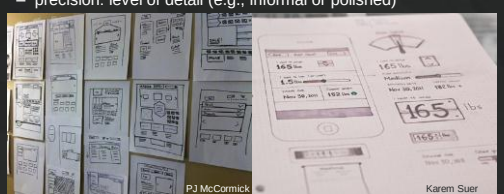
"A prototype is an early sample or model built to test a concept or process or to act as a thing to be replicated or learned from." – Wikipedia

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)



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- 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)
    - at extreme could be 1 path or possibly more open (e.g., Denim)
  - open prototype (real, but limited error handling or performance)
- 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

Why Use Low-fi Prototypes?

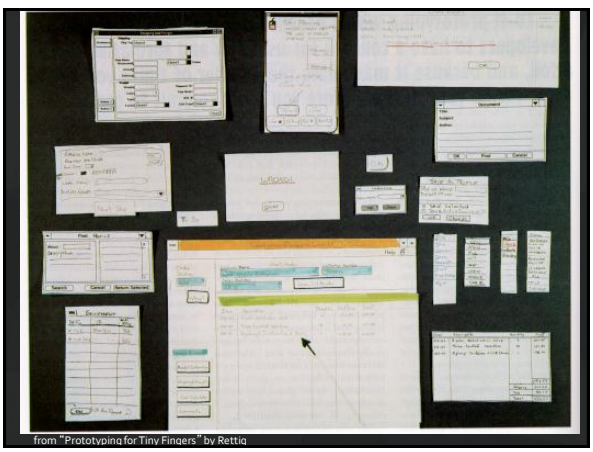
- Traditional methods take too long
  - sketches → prototype → evaluate → iterate
- Can instead *simulate* the prototype
  - sketches → evaluate → iterate
  - sketches act as prototypes
    - designer "plays computer"
    - other design team members observe & record
- Kindergarten implementation skills
  - allows non-programmers to participate

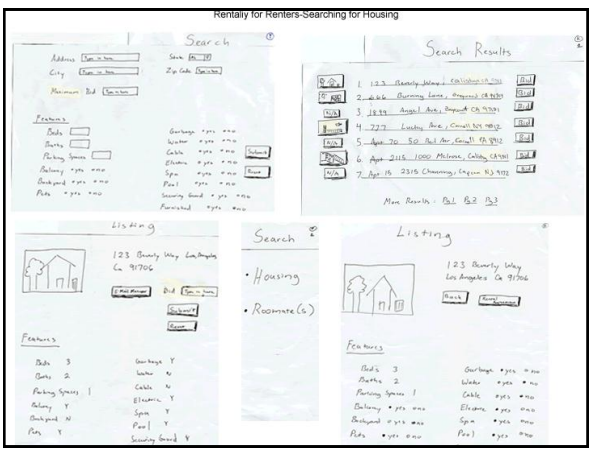
Hi-fi Prototypes Warp

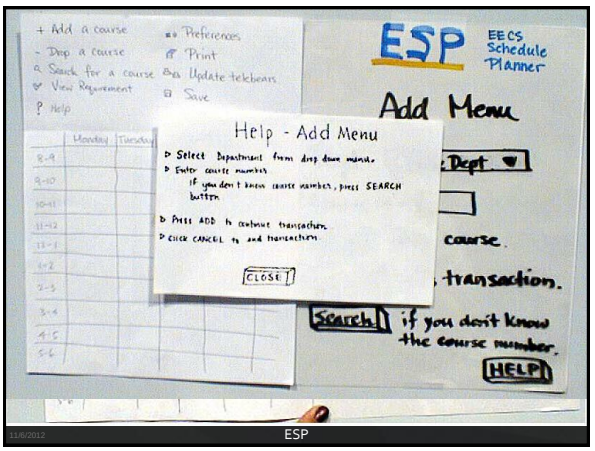
- Perceptions of the tester/reviewer
  - representation communicates "finished"
    - comments focus on color, fonts, & alignment
- Time
  - encourage precision
    - specifying details takes more time
- Creativity
  - lose track of the big picture

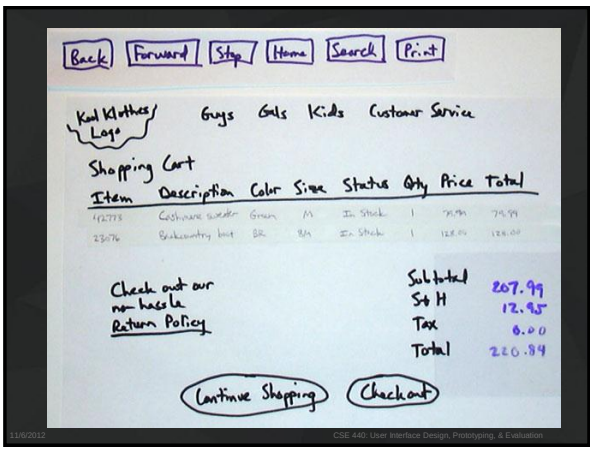
The Basic Materials

- Large, heavy, white paper (A3 or 11x17)
- 5x8 in./A5/A6 index cards
- Post-its
- Tape, stick glue, correction tape
- Pens & markers (many colors & sizes)
- Overhead transparencies
- Scissors, X-acto knives, etc.


from "Prototyping for Tiny Fingers" by Rettig



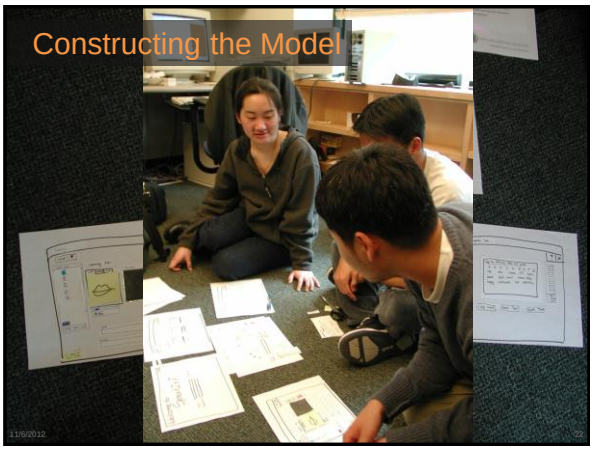




Constructing the Model

- 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 pull-down menus already made
- Use photocopier to make many versions

Constructing the Model



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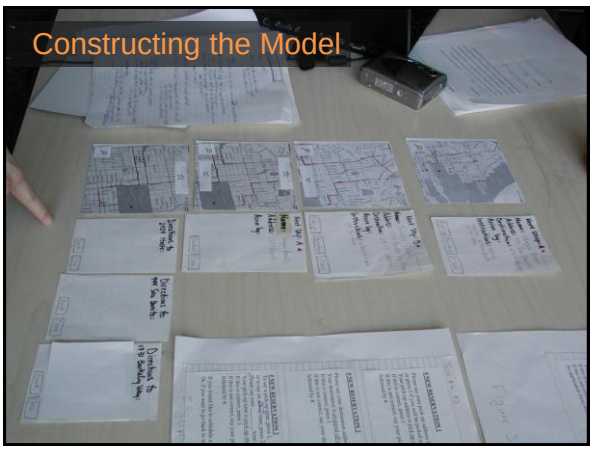

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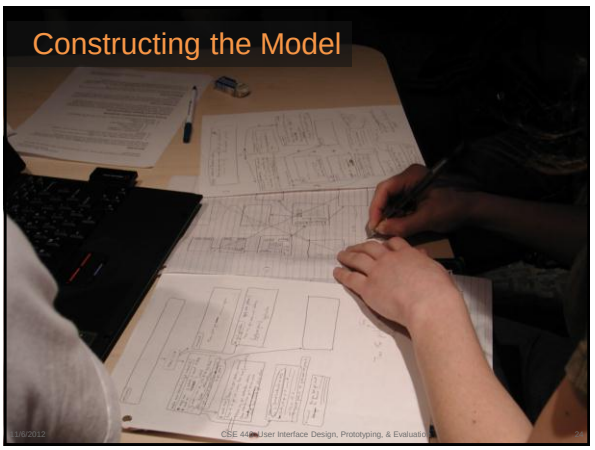

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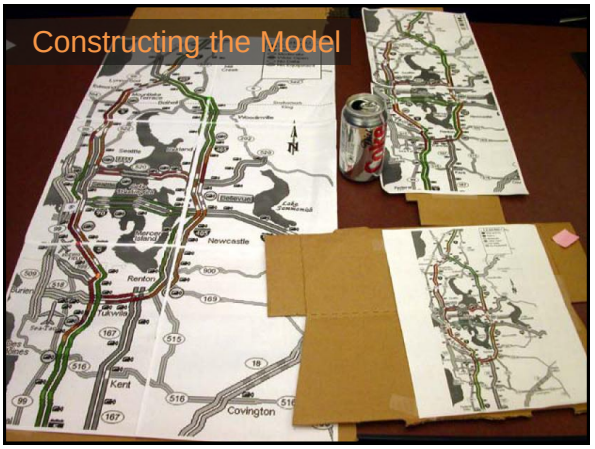

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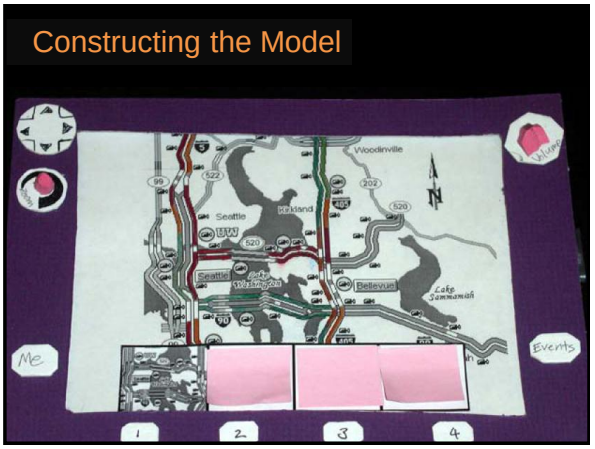

Preparing for a Test

- Select your "customers"
  - understand background of intended users
  - use a questionnaire to get the people you need
  - don't use friends or family
    - I think existing "customers" are OK (Rettig disagrees)
- 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
- Typical session is 1 hour
  - preparation, the test, debriefing
- Read the Gommol paper (1 page) for details on conducting a test

Conducting a Test

Evaluating Results

- Sort & prioritize observations
  - what was important?
  - lots of problems in the same area?
- Create a written report on findings
  - gives agenda for meeting on design changes
- Make changes & iterate

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 Technique

- Faking the interaction. Comes from?
  - the film "The Wizard of OZ"
    - "the man behind the curtain"
- Long tradition in computer industry
  - e.g., prototype of a PC w/ a DEC VAX behind the curtain

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- Long tradition in computer industry
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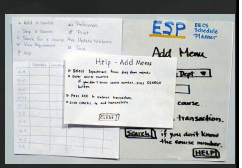
- Much more important for hard to implement features
  - speech & handwriting recognition

Problems with Low-fi Prototypes

- "Computer" inherently buggy
- Slow compared to real app
  - timings not accurate
- Hard to implement some functionality
  - pulldowns, 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



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
  - "Using Paper Prototypes to Manage Risk" by Carolyn Snyder, http://world.std.com/~uieweb/paper.htm
  - "The Perils of Prototyping" by Alan Cooper, http://www.chi-sa.org.za/Documents/articles/perils.htm
- Web Sites
  - dub Group web site, for DENIM & SUEDE downloads, http://dub.washington.edu
  - InfoDesign Toolkit, http://www.infodesign.com.au

Next Time

- Work on low-fi prototypes in class (attendance mandatory)
- Reading
  - Chapter 4 of *The Design of Sites*
  - *What do Prototypes Prototype?* by Houde and Hill
  - Optional: The Perils of Prototyping by Alan Cooper