

USER INTERFACE DESIGN + PROTOTYPING + EVALUATION

Early Stage Prototyping

Prof. James A. Landay
 University of Washington

CSE 440
 February 14, 2013

Hall of Fame or Shame?






Southwest Airlines Home Gate
 The heart of Southwest Airlines on the world wide web.

Direct translations

- software telephony solution where users dial a number by clicking on a simulated keypad
- airline web site that simulates a ticket counter

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Hall of Shame!






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Misused Metaphors!

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Hall of Fame or Shame?



Wimote
 By Nintendo



Hall of Shame!



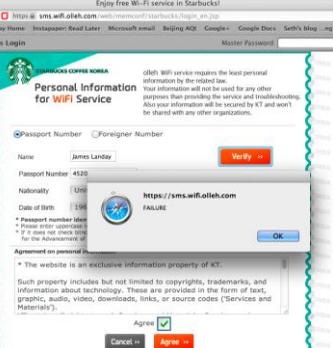
The main thing that differentiated the product (movement in gaming) resulted in it being thrown at windows

- Slippery plastic hard to hold onto. Later designs added rubber case & strap
- Lack of a joystick was initial problem resulting in a second controller



Hall of Shame!





Starbucks/Olleh WiFi

- Broken form – mouse didn't work
- Require my personal information (passport #)
- Fail on verify!
- Bad experience!

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Outline

- Conceptual Models & Interface Metaphors Review
- Types of Prototypes
- Low-fi prototyping
- Wizard of Oz technique

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Conceptual Models Review

- Conceptual models
 - mental representation of how the object works & how interface controls effect it
- Design model should equal customer's model
 - mismatches lead to errors
 - use customer's likely conceptual model to design
- Design guides
 - make things visible
 - map interface controls to customer's model
 - provide feedback

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Design Process: Exploration

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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

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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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Types of Prototypes

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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)
 - 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

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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



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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



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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 implementation skills
 - allows non-programmers to participate



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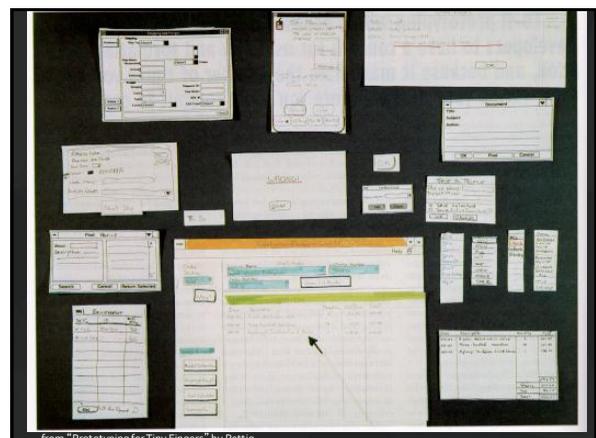
The Basic Materials

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

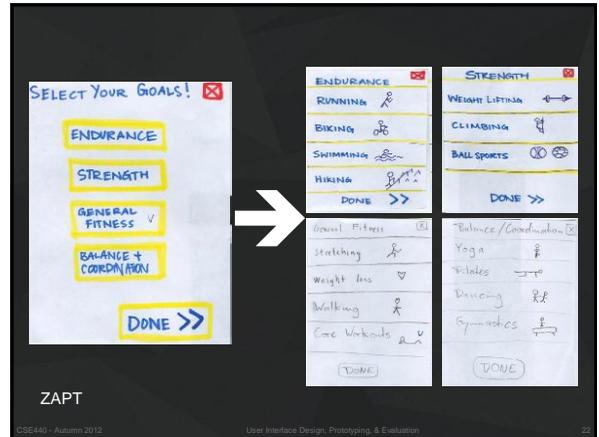
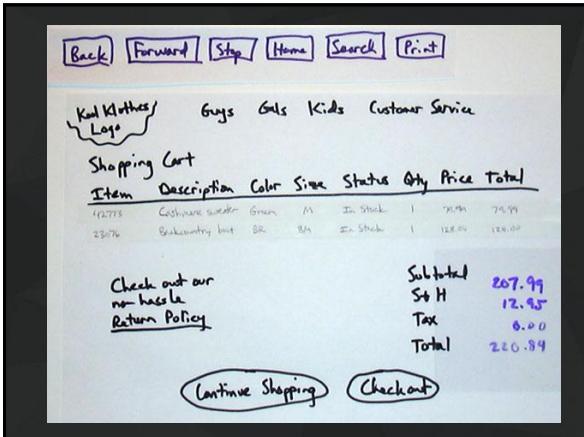
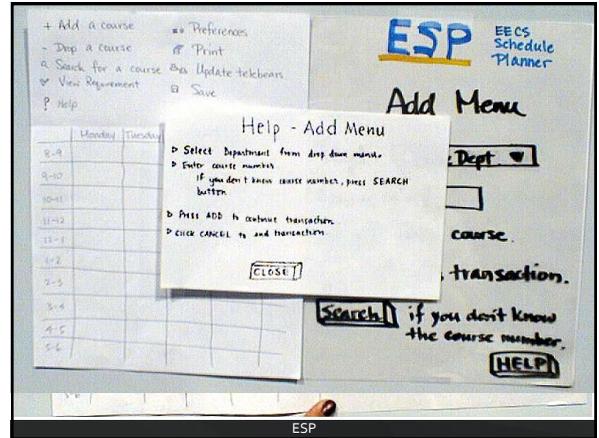
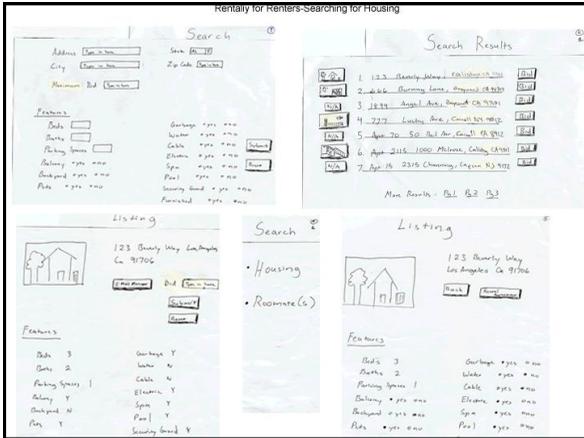


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https://www.flickr.com/photos/latitude14/91510346423/users/viviphotosteam/

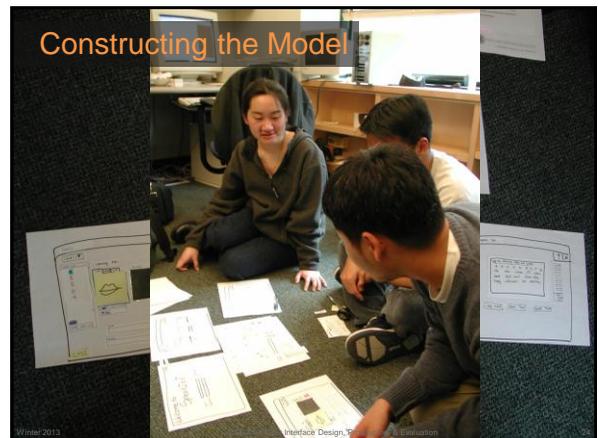


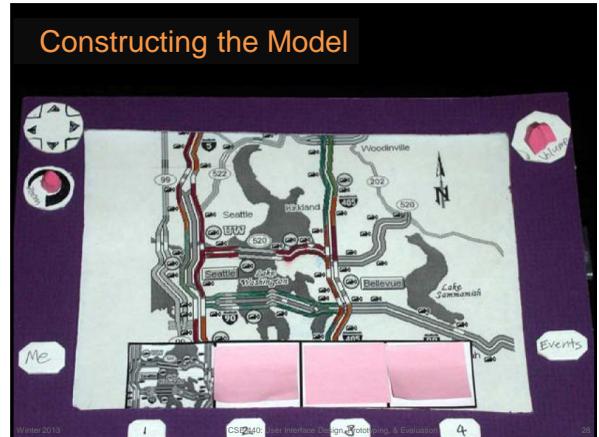
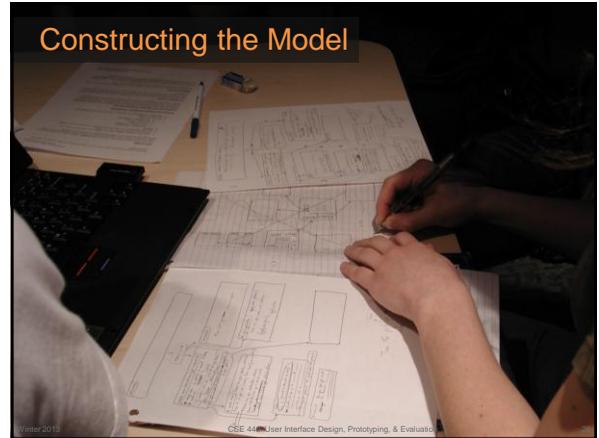
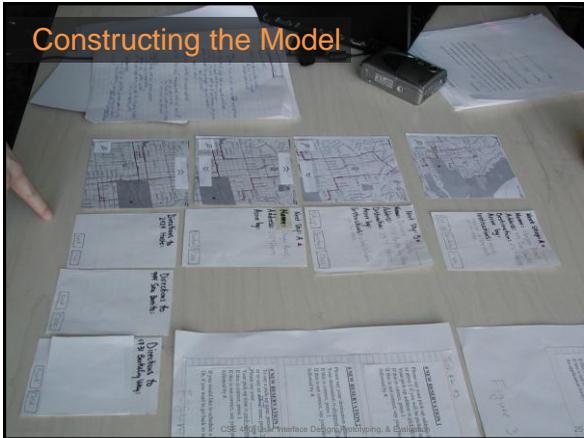
from “Prototyping for Tiny Fingers” by Rettig



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





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 Gommel paper (1 page) for details on 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

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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

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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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Wizard of Oz Technique

- Faking the interaction. Comes from?
 - the film “The Wizard of Oz”
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- Long tradition in computer industry
 - e.g., prototype of a PC w/ a DEC VAX behind the curtain
- Much more important for hard to implement features
 - speech & handwriting recognition

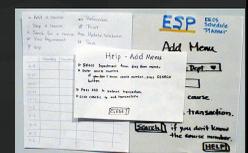
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Problems with Low-fi Prototypes

- “Computer” inherently buggy
- Slow compared to real app
 - 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



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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

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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>

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Next Time

- Heuristic Evaluation
- Reading
 - Lewis & Rieman 4.3-4.4
 - Nielsen HE chapter (read 5 links under "Heuristic Evaluation")

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