HCI+D: USER INTERFACE DESIGN + PROTOTYPING + EVALUATION

Early Stage Prototyping

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Computer Science Department
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Autumn 2014

October 16, 2014

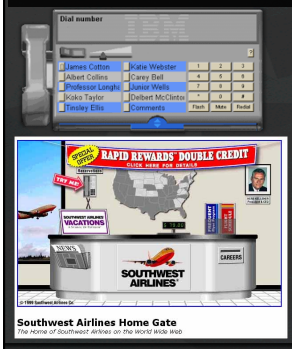
Hall of Fame or Shame?

Southwest Airlines Home Gate
The Home 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

Hall of Shame!



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Direct translations

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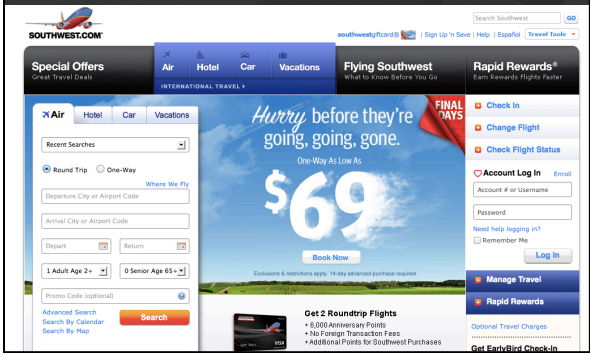
- airline web site that simulates a ticket counter

Misused Metaphors!

Improved southwest.com



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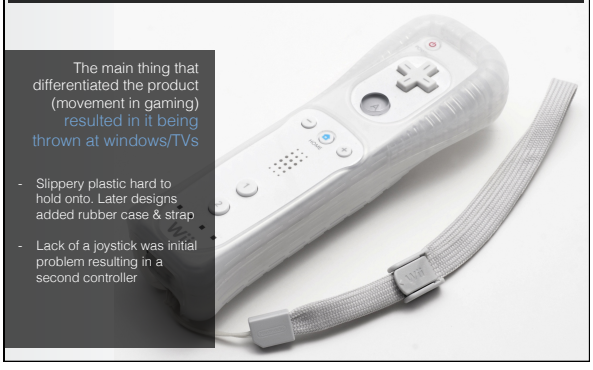

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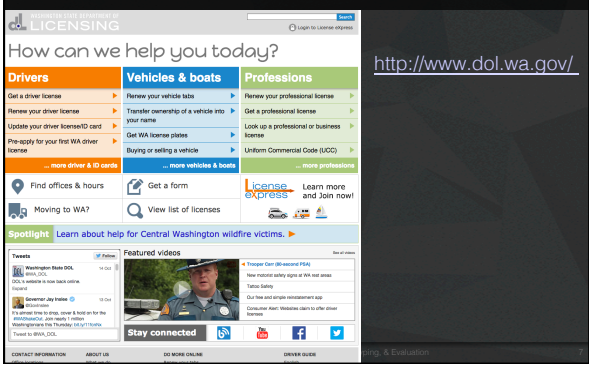
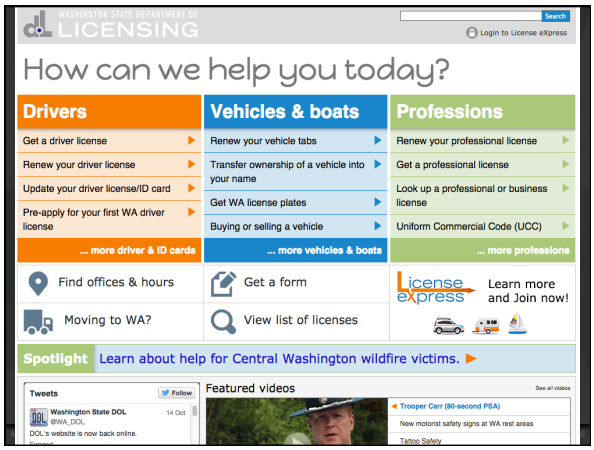
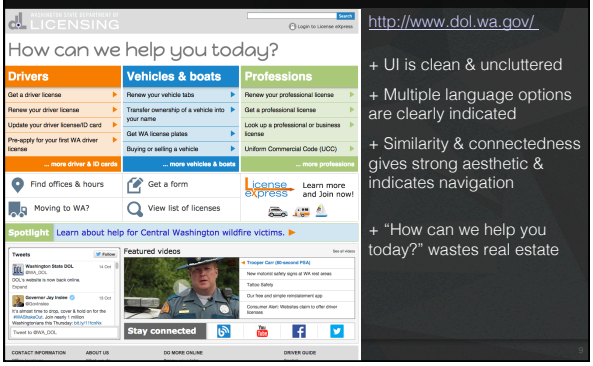


http://www.dol.wa.gov/



Hall of Fame!



http://www.dol.wa.gov/

+ UI is clean & uncluttered

+ Multiple language options are clearly indicated

+ Similarity & connectedness gives strong aesthetic & indicates navigation

+ "How can we help you today?" wastes real estate

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Outline

- Human Abilities Review
- Types of Prototypes
- Low-fi prototyping
- Wizard of Oz technique
- Part II: Project Team Meetings

Human Abilities Review

- Why is blue a poor choice for small text/objects?
  - no blue cones in center of retina, fewer of them, lens yellows w/age
- Why not use spectrally distant colors together?
  - constant refocusing (change lens shape) can cause fatigue
- Color can be helpful, but pay attention to
  - how colors combine
  - limitations of human perception
  - people with color deficiency

- Model Human Processor
  - 3 processors ?
    - perceptual, motor, cognitive
  - 3 types of memory ?
    - sensor, WM, & LTM
  - Key time to remember in MHP model ?
    - 100ms – ~cycle time, memory access time, …
  - interference can make hard to access LTM
  - cues in WM can make it easier to access LTM

Design Process: Exploration

Discovery
Design Exploration
Design Refinement
Production

Expand Design Space
- Brainstorming
- Sketching
- Storyboarding
- Prototyping

What is a Prototype?

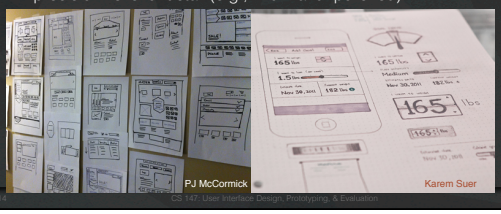
"A prototype is an early sample or model built to test a concept or process or to act as a thing to be replicated or learned from." – Wikipedia

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)



Types of Prototypes

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- representation: form of the prototype
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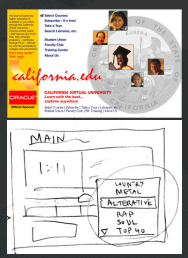
- precision: level of detail (e.g., informal or polished)
- interactivity: watch-only vs. fully interactive
  - fixed prototype (video clips)
  - fixed-path prototype (each step triggered by specified actions)
    - at extreme could be 1 path or possibly more open (e.g., Denim)
  - open prototype (real, but limited error handling or performance)
- evolution: expected life cycle of prototype
  - e.g., throw away or iterative

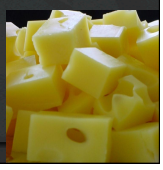
Fidelity in Prototyping

- Fidelity refers to the level of detail
- High fidelity?
  - prototypes look like the final product
- Low fidelity?
  - artists renditions with many details missing



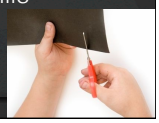
Hi-fi Prototypes Warp

- 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



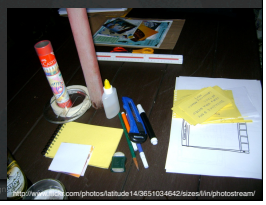
Why Use Low-fi Prototypes?

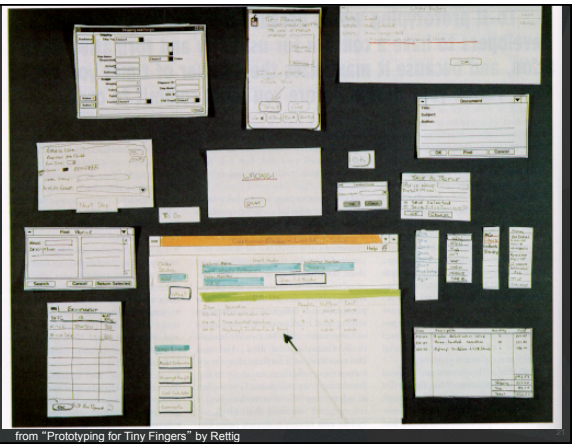
- Traditional methods take too long
  - sketches → prototype → evaluate → iterate
- Can instead *simulate* the prototype
  - sketches → evaluate → iterate
  - sketches act as prototypes
    - designer "plays computer"; others observe & record
- Kindergarten implementation skills
  - allows non-programmers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



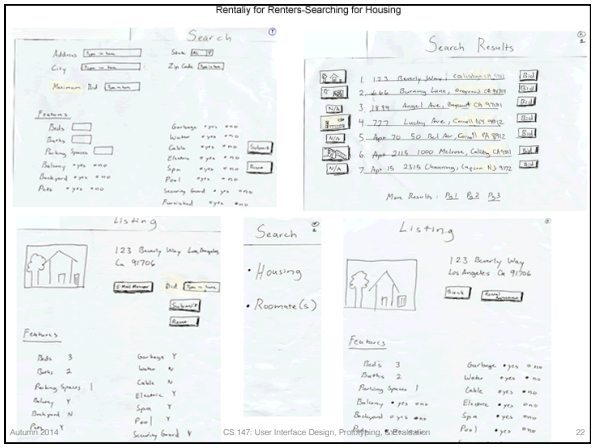
The Basic Materials

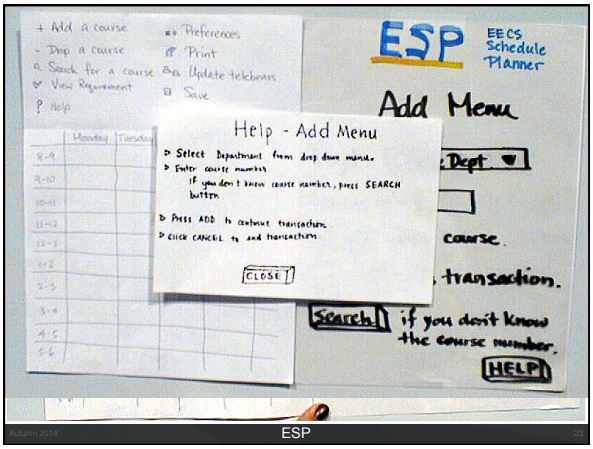
- Large, heavy, white paper (A3 or 11x17)
- 5x8 in./A5/A6 index cards
- Tape, stick glue, correction tape
- Pens & markers (many colors & sizes)
- Post-its
- Overhead transparencies
- Scissors
- X-acto knives, etc.



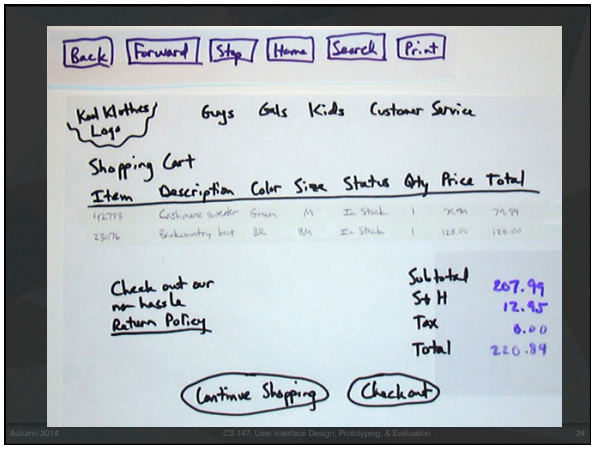


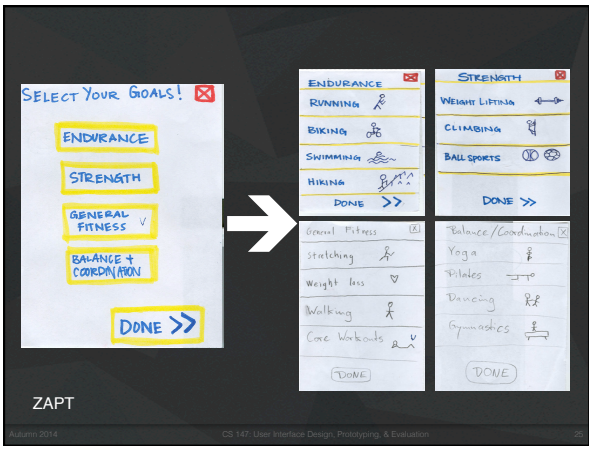
from "Prototyping for Tiny Fingers" by Rettig





ESP




SELECT YOUR GOALS!
ENDURANCE
STRENGTH
GENERAL FITNESS
BALANCE + COORDINATION
DONE >>
ENDURANCE
RUNNING
BIKING
SWIMMING
HIKING
DONE >>
STRENGTH
WEIGHT LIFTING
CLIMBING
BALL SPORTS
DONE >>
General Fitness
stretching
weight loss
Walking
Core Workouts
DONE
Balance / Coordination
Yoga
Pilates
Dancing
Gymnastics
DONE
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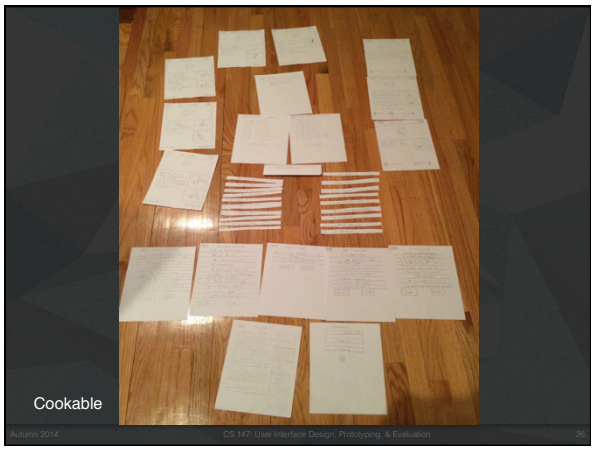
Cookable
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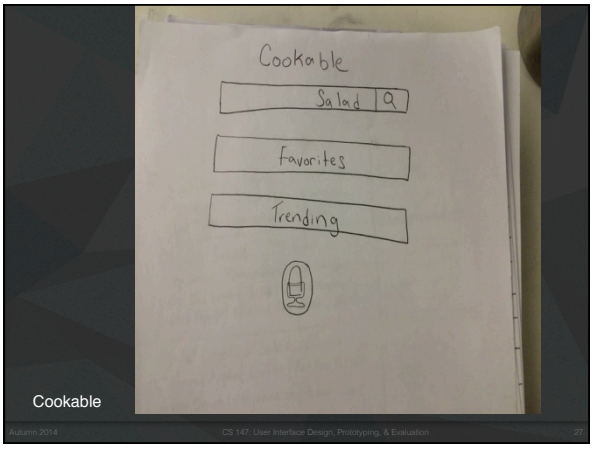
Cookable
Salad
Favorites
Trending
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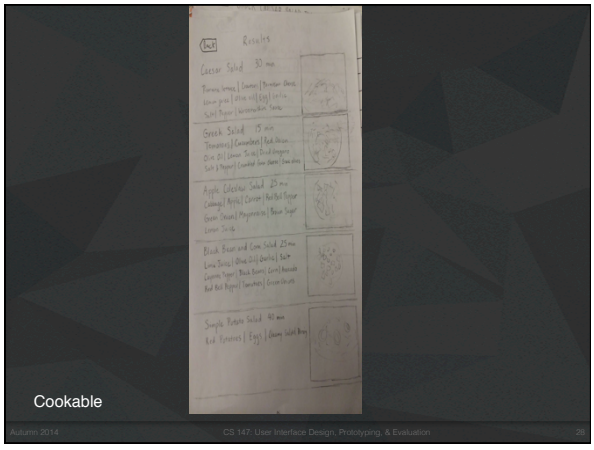
Results
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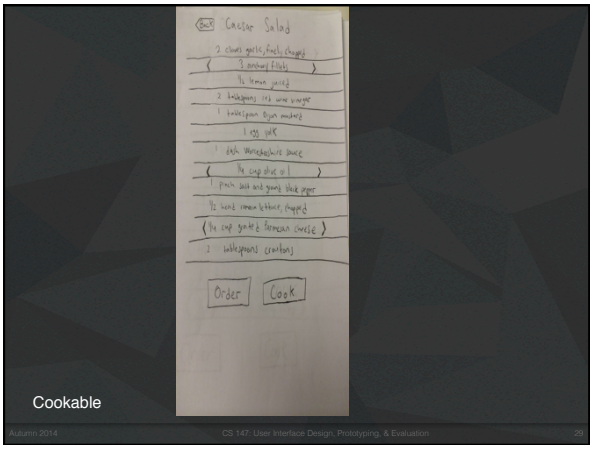
Caesar Salad
Order
Cook
Cookable
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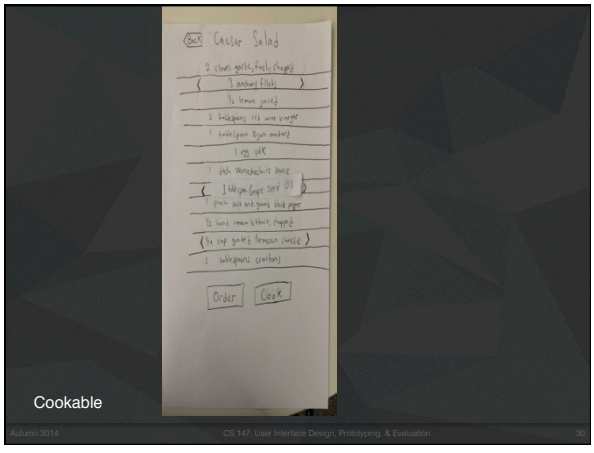
Caesar Salad
Order
Cook
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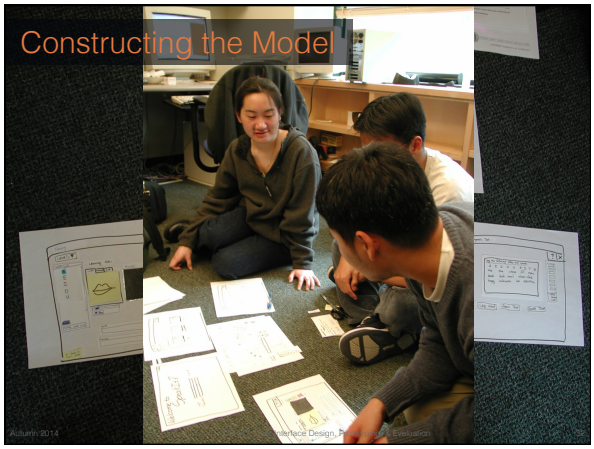
Constructing the Model

- 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/printer to make many versions

Constructing the Model



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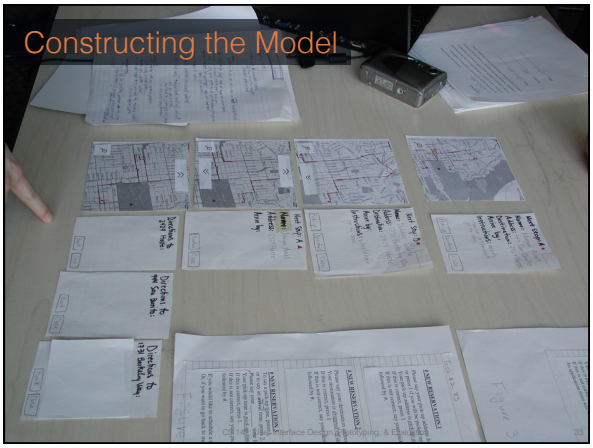

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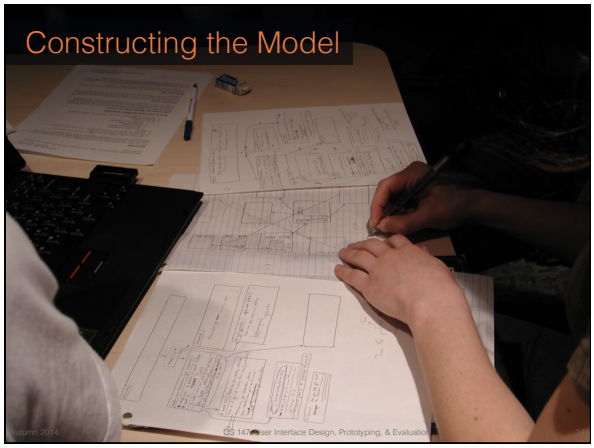

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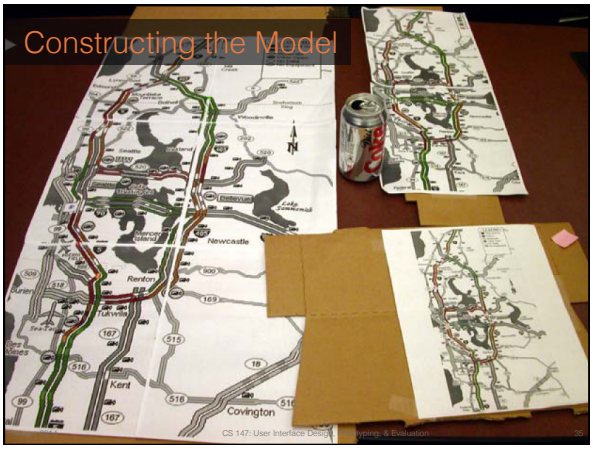
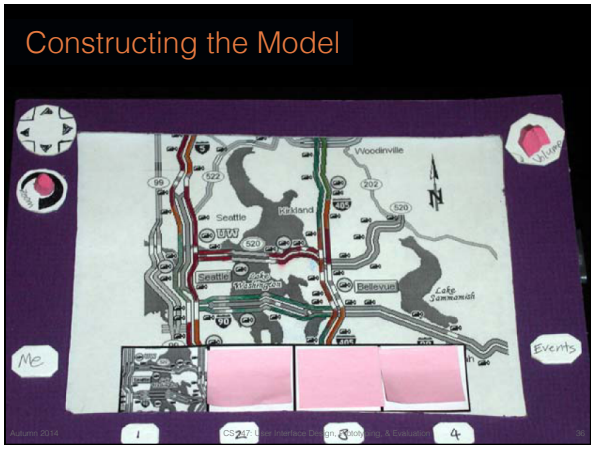


Constructing the Model



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

Conducting a Test

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  - 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

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

Your poll will show here

1 Install the app from pollev.com/app

2 Make sure you are in Slide Show mode

Still not working? Get help at pollev.com/app/help
or
Open poll in your web browser

BREAK

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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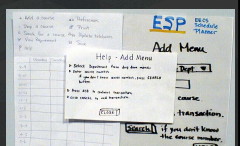
- Long tradition in computer industry
  - e.g., prototype of a PC w/ a DEC VAX behind the curtain
- Much more important for hard to implement features
  - speech & handwriting recognition

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

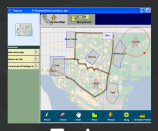


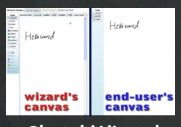
Informal UI Prototyping Tools


Outpost


Denim


Suede


Topiary



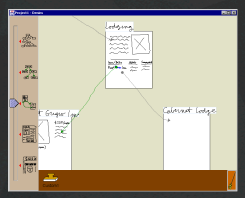
SketchWizard

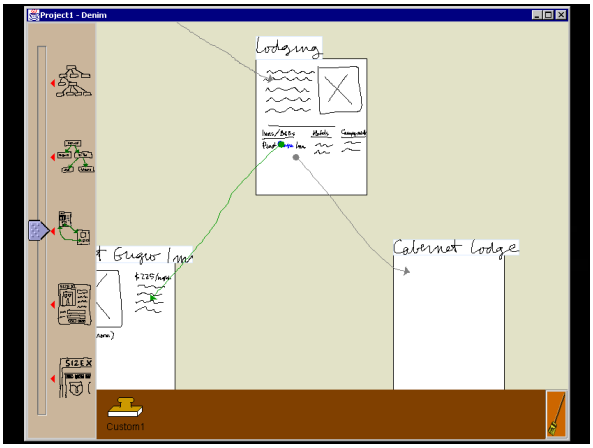
Informal UI Prototyping Tools

- Support advantages of low-fi paper prototypes
  - brainstorming
    - consider different ideas rapidly
    - do not require specification of details
  - incomplete designs
    - need not cover all cases, just illustrate important examples
- Add advantages of electronic tools
  - evolve easily
  - support for "design memory"
  - transition to other electronic tools
  - allow end-user interaction

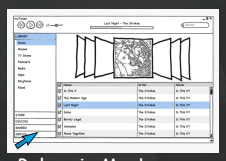
DENIM:
Designing Web Sites by Sketching

- Early-phase navigation & interaction design
- Integrates multiple views
  - site map – storyboard – page sketch

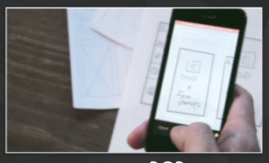




Commercial Tools



Balsamiq Mockups



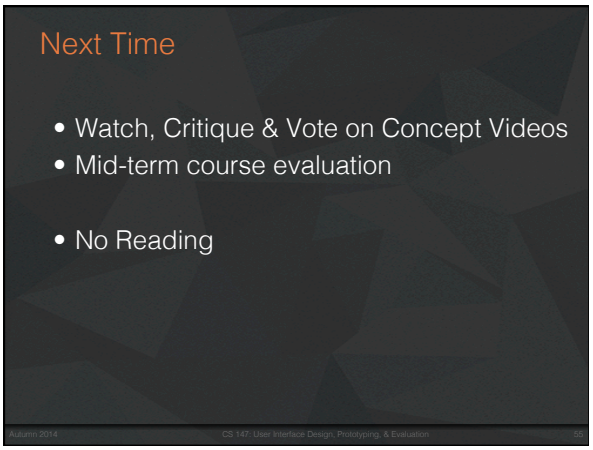
POP

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
• Watch, Critique & Vote on Concept Videos
• Mid-term course evaluation
• No Reading
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TEAM MEETINGS
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