Early Stage Prototyping

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Hall of Shame!

- 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

Misused Metaphors!

- 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

Wiimote
By Nintendo

Hall of Shame!

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

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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

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)
  - 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

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

Design Process: Exploration

Expand Design Space
- Brainstorming
- Sketching
- Storyboarding
- Prototyping

Types of Prototypes

Prototypes are concrete representations of a design
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

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

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

- Books
  - Paper Prototyping: The Fast and Easy Way to Design and Refine User Interfaces, by Carolyn Snyder, Morgart Kaufmann, 2003
- Articles
  - “Prototyping for Tiny Fingers” by Marc Rettig, in Communications of the ACM, 1994
- Web Sites
  - dub Group web site, for DENIM & SUEDE downloads, http://dub.washington.edu
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