Early Stage Prototyping

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Hall of Fame or Shame?

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

Misused Metaphors!

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!
Outline

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

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

Design Process: Exploration

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

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)

- Low-fi prototyping
- Wizard of Oz technique
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)
  - 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.
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 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
  - 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

• Web Sites

Next Time

• Heuristic Evaluation
• Reading
  – Lewis & Rieman 4.3-4.4
  – Nielsen HE chapter (read 5 links under “Heuristic Evaluation”)