Early Stage Prototyping

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Outline

- Storyboarding
- Types of Prototypes
- Low-fi prototyping

Design Process: Exploration

- Discovery
- Design Exploration
- Design Refinement
- Production
- Expand Design Space
  - Brainstorming
  - Sketching
  - Storyboarding
  - Prototyping

Sketches & Storyboards

- Where do storyboards come from?
  - film & animation
- Give you a “script” of important events
  - leave out the details
  - concentrate on the important interactions

Sketches & Storyboards
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)
- 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.
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

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

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
- Articles
  - “Prototyping for Tiny Fingers” by Marc Rettig, in *Communications of the ACM*, 1994

Next Time

- **Project**
  - work on defining project idea, tasks, and low-fi prototype in class
  - build & test low-fi prototypes for next Tuesday’s class