Prototyping

SWE 432, Fall 2018
Web Application Development
Article Layout through movable windows (DADA) - drag and drop articles.

UID Wireframe

Flexible News
Sports Tech Vexan

- Even boxes?
- Different size boxes not simple from every time?

Flexible News

News Timeline

- R ere
- Addedy nde
- Clide me pen pictures
Conceptual design

• Goal: match users’ **mental model**
• Tool: Metaphor - analogies from existing system
  • Offers expectations about what system does & what can be done
• Examples
  • Email ←→ physical mail
  • Backup software ←→ time machine
  • OS desktop ←→ top of a desk
Piles - Sketches

• Created sketches to facilitate discussion and evaluation
• Example features:
  • System-created piles

User-created pile (messy)  System-created pile (Organized)
Piles - Sketches

- Created sketches to facilitate discussion and evaluation
- Example features:
  - Browsing and maintaining structure (kind of like hinge)
Piles - Legacy

- Patent issued to Apple in 2001
- 2007 (OS 10.5) introduced Cover Flow
Today

• How do we set ourselves up to build good interfaces from the start?
• What is the iterative process by which we start out with a lot of ideas, and end up with some good, end result interface?

For further reading:
http://interchangeproject.org/2013/11/02/paper-prototyping/
Wireframes
Wireframes

• Lines & outlines ("wireframes") of boxes & other shapes
• Capturing emerging interaction designs
• Schematic designs to define screen content & visual flow
• Illustrate approximate visual layout, behavior, transitions emerging from task flows
• Deliberate unfinished: do not contain finished graphics, colors, or fonts
Example
Wireframes

• Can be used to step through a particular scenario
• Focus on key screens rather than every screen
• Tools can help
  • Can be made clickable
  • Can use stencils & templates; copy & edit similar screens
Example tool - Balsamiq
Prototyping
Prototyping

• How do you know your system design is right before you invest the time to build it?
• Answer: prototyping!
  • Evaluation performed before investing resources in building finished product
  • Early version of system constructed much faster & with less expense used to evaluate & refine design ideas
## Fidelity of prototypes

<table>
<thead>
<tr>
<th>Kind of Iteration</th>
<th>Purpose</th>
<th>Types of Prototypes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ideation and sketching</td>
<td>To support exploring ideas, brainstorming, and discussion (so design details are inappropriate)</td>
<td>Sketches, fast and disposable mockups, ultralow fidelity</td>
</tr>
<tr>
<td>Conceptual design</td>
<td>To support exploration and creation of conceptual design, the high-level system structure, and the overall interaction metaphor</td>
<td>Evolution from hand-drawn paper, computer-printed paper, low-fidelity wireframes, high-fidelity wireframes, to pixel-perfect interactive mockups (to communicate with customer)</td>
</tr>
<tr>
<td>Intermediate design</td>
<td>To support interaction design for tasks and task threads</td>
<td>Evolution from paper to wireframes</td>
</tr>
<tr>
<td>Detailed design</td>
<td>Support for deciding navigation details, screen design and layout, including pixel-perfect visual comps complete specification for look and feel of the “skin”</td>
<td>Detailed wireframes and/or pixel-perfect interactive mockups</td>
</tr>
<tr>
<td>Design refinement</td>
<td>To support evaluation to refine a chosen design by finding and removing as many UX problems as possible</td>
<td>Medium to high fidelity, lots of design detail, possibly a programmed prototype</td>
</tr>
</tbody>
</table>
Interactivity of prototypes

• Scripted, click through prototypes
  • Prototype w/ clickable links to move between screens
• Live action storyboard of screens
• Simulates real task flow, but w/ static content
• Fully-implemented prototypes
  • Usually expensive to implement actual system
  • But can build key piece of system first to evaluate
Wizard of Oz

- Goal: **simulate** actual system w/out building it
  - Want user to interact **as if** they were interacting w/ real system
  - Helps explore how users would interact w/ novel interaction if it were to exist
- Example: natural command line (Good et al 1984)
  - Users typed in commands to interact w/ computer
  - Commands intercepted by hidden human who interpreted commands & executed them
Paper prototypes

- **Low fidelity** prototype w/ paper mockups
- Goal: get feedback from users early w/ very low cost interactive prototype of envisioned interaction design
Paper prototyping (1)

- Set a realistic deadline
- Gather set of paper prototyping materials
- Work fast & do not color within the lines
- Reuse existing sketches & mockups
- Make underlying paper mockups of key screens
Paper prototyping (2)

- Use paper cutouts & tape onto full-size transparencies as “interaction sheets” for moving parts, making modular by including only a small amount
- Do not write or mark on interaction sheets
- Be creative
- Reuse at every level
- Cut corners wherever possible (trade accuracy against efficiency)
- Make a “this feature not implemented” message
Paper prototyping (3)

- Include "decoy" user interface objects not needed for expected tasks
- Accommodate data value entry by users w/ blank transparencies
- Organize materials to manage complex task threads
- **Pilot** test thoroughly
Welcome to videoStage!

1. Enter a search term above.
2. Click on a video to select it.
3. Click [GO] to send selected videos to the stage.
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Evaluating a Prototype

• After team builds a paper prototype, can run an evaluation on it

• Participants:
  • User
  • Facilitator
  • Computer(s)
  • Scribe
Paper Prototype Approach

• Design the prototype
  • Work fast (sketchy)
  • Design for interactivity - use separate pieces of paper for everything, tape, post-it notes, transparencies — things that are easy to manipulate

• Prepare scenario - specific tasks
• Assign team members to roles
• Practice
Paper Prototype Approach

- Run experiment
  - Facilitator gives instructions for tasks and asks for “think aloud” comments from participant
  - Computer(s) respond to participants interactions
  - Scribe silently takes notes
  - Team members debrief participant after the experiment is over
- Analyze results, design changes, repeat
Advantages of prototyping

- Offers concrete baseline for communication between users & designers
- Provides conversation “prop” to communicate concepts
- Allows user to “take design for a spin”
- Give project visibility & buy-in with customers
- Encourage early user participation and involvement
- Give impression that design is easy to change
- Afford designers immediate observation of user performance & consequences of design decisions
Disadvantages of Lo-Fi Prototypes

• Very rough appearance - can’t be used to find detailed layout/design issues
• Does not reflect the actual speed of your system (and responsiveness)
• Human computer’s logic may be difficult to capture in code
• Limited scenarios
Variation: Concept Videos

• To get higher realism, can also create non-non-interactive concept videos
• Act out scenarios to show human context and where interactions fit in
Hi-fi design concept video example

• This video was produced (from concept to final cut) in six weeks
Conceptual Design of Transit Card Vending

• Design an interface for a machine that vends transit cards
• The machine accepts cash, coins, and credit cards
• The machine sells and reloads transit cards
• Transit cards can be loaded with:
  • Passes - valid for unlimited travel in the given period (1,7,30 days)
  • Value - Direct proxy for cash, used to pay fares
• Things to think about:
  • How does user decide to reload vs buy new card?
  • Can a card have both value and a pass on it? How does that work?