

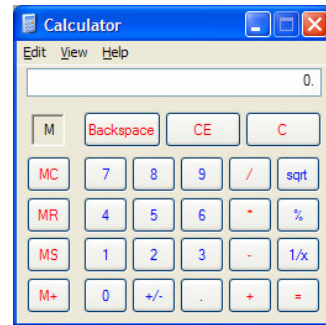
Lecture 9: Prototyping

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UI Hall of Fame or Shame?



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Today's Topics

- Paper prototypes
- Computer prototypes
- Wizard of Oz prototypes

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Why Prototype?

- Get feedback earlier, cheaper
- Experiment with alternatives
- Easier to change or throw away

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Prototype Fidelity

- Low fidelity: omits details
- High fidelity: more like finished product

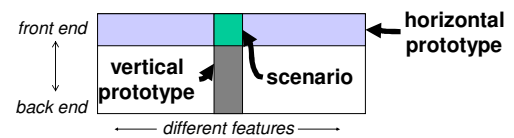
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Fidelity is Multidimensional

- Breadth: % of features covered
 - Only enough features for certain tasks
- Depth: degree of functionality
 - Limited choices, canned responses, no error handling



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More Dimensions of Fidelity

- Look: appearance, graphic design
 - Sketchy, hand-drawn
- Feel: input method
 - Pointing & writing feels very different from mouse & keyboard

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Paper Prototype

- Interactive paper mockup
 - Sketches of screen appearance
 - Paper pieces show windows, menus, dialog boxes
- Interaction is natural
 - Pointing with a finger = mouse click
 - Writing = typing
- A person simulates the computer's operation
 - Putting down & picking up pieces
 - Writing responses on the "screen"
 - Describing effects that are hard to show on paper
- Low fidelity in look & feel
- High fidelity in depth (person simulates the backend)

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Why Paper Prototyping?

- Faster to build
 - Sketching is faster than programming
- Easier to change
 - Easy to make changes between user tests, or even *during* a user test
 - No code investment– everything will be thrown away (except the design)
- Focuses attention on big picture
 - Designer doesn't waste time on details
 - Customer makes more creative suggestions, not nitpicking
- Nonprogrammers can help
 - Only kindergarten skills are required

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Tools for Paper Prototyping

- White poster board (11"x14")
 - For background, window frame
- Big (unlined) index cards (4"x6", 5"x8")
 - For menus, window contents, and dialog boxes
- Restickable glue
 - For keeping pieces fixed
- White correction tape
 - For text fields, checkboxes, short messages
- Overhead transparencies
 - For highlighting, user "typing"
- Photocopier
 - For making multiple blanks
- Pens & markers, scissors, tape

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Tips for Good Paper Prototypes

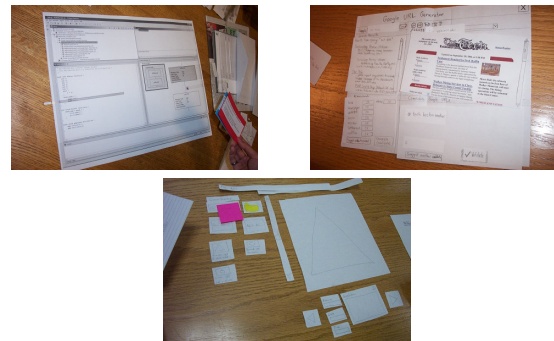
- Make it larger than life
- Make it monochrome
- Replace tricky visual feedback with audible descriptions
 - Tooltips, drag & drop, animation, progress bar
- Keep pieces organized
 - Use folders & open envelopes

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Hand-Drawn or Not?

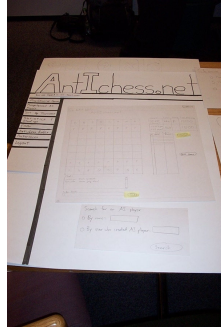
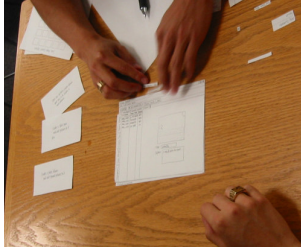


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Size Matters

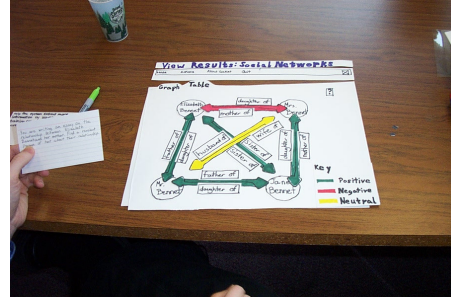


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The Importance of Writing Big and Dark

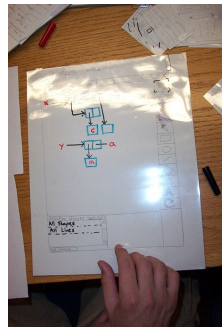
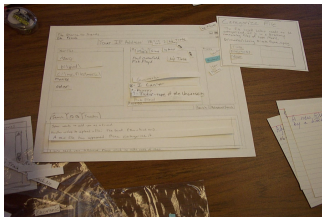


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Post-it Glue and Transparencies are Good



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How to Test a Paper Prototype

- Roles for design team
 - Computer
 - Simulates prototype
 - Doesn't give any feedback that the computer wouldn't
 - Facilitator
 - Presents interface and tasks to the user
 - Encourages user to "think aloud" by asking questions
 - Keeps user test from getting off track
 - Observer
 - Keeps mouth shut, sits on hands if necessary
 - Takes copious notes

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What You Can Learn from a Paper Prototype

- Conceptual model
 - Do users understand it?
- Functionality
 - Does it do what's needed? Missing features?
- Navigation & task flow
 - Can users find their way around?
 - Are information preconditions met?
- Terminology
 - Do users understand labels?
- Screen contents
 - What needs to go on the screen?

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What You Can't Learn

- Look: color, font, whitespace, etc
- Feel: Fitts's Law issues
- Response time
- Are small changes noticed?
 - Even the tiniest change to a paper prototype is clearly visible to user
- Exploration vs. deliberation
 - Users are more deliberate with a paper prototype; they don't explore or thrash as much

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Computer Prototype

- Interactive software simulation
- High-fidelity in look & feel
- Low-fidelity in depth
 - Paper prototype had a human simulating the backend; computer prototype doesn't
 - Computer prototype is typically **horizontal**: covers most features, but no backend

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What You Can Learn From Computer Prototypes

- Everything you learn from a paper prototype, plus:
- Screen layout
 - Is it clear, overwhelming, distracting, complicated?
 - Can users find important elements?
- Colors, fonts, icons, other elements
 - Well-chosen?
- Interactive feedback
 - Do users notice & respond to status bar messages, cursor changes, other feedback
- Fitts's Law issues
 - Controls big enough? Too close together? Scrolling list is too long?

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Why Use Prototyping Tools?

- Faster than coding
- No debugging
- Easier to change or throw away
- Don't let Java do your graphic design

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Computer Prototyping Techniques

- Storyboard
 - Sequence of painted screenshots connected by hyperlinks (“hotspots”)
- Form builder
 - Real windows assembled from a palette of widgets (buttons, text fields, labels, etc.)
- Wizard of Oz
 - Computer frontend, human backend

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Storyboarding Tools

- HTML
 - image maps
- Flash/Director
 - animation + actions
- PowerPoint
 - images + links + animation
- All these tools have scripting languages, too
 - Help orchestrate the transitions
- For high fidelity look, take screenshots of widgets from a form builder

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Pros & Cons of Storyboarding

- Pros
 - You can draw anything
- Cons
 - No text entry
 - Widgets aren't active
 - “Hunt for the hotspot”

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Form Builders

- HTML pages and forms
 - Natural if you're building a web application
 - May have low-fidelity look otherwise
- Java GUI builders
 - Sun NetBeans
 - Eclipse Visual Editor
 - Borland JBuilder
- Other GUI builders
 - Visual Basic, .NET Windows Forms
 - Mac Interface Builder
 - Qt Designer
- Tips
 - Use absolute positioning for now

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Pros & Cons of Form Builders

- Pros
 - Actual controls, not just pictures of them
 - Can hook in some backend if you need it
 - But then you won't want to throw it away
- Cons
 - Limits thinking to standard widgets
 - Useless for rich graphical interfaces

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Wizard of Oz Prototype

- Software simulation with a human in the loop to help
- "Wizard of Oz" = "man behind the curtain"
 - Wizard is usually but not always hidden
- Often used to simulate future technology
 - Speech recognition
 - Learning
- Issues
 - Two UIs to worry about: user's and wizard's
 - Wizard has to be mechanical

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