Hi-Fi vs. Lo-Fi Prototypes

- Prototypes
  - Get ideas for real system
  - Perform usability testing
  - Do advance demos
- Hi-Fi prototypes
  - Often use computer-based tools
  - Provide look & feel of a real system
  - Slow creation/turnaround
- Lo-Fi prototypes
  - Often use paper (and other low-tech material)-based tools
  - Provide rough approximation of a system
  - Fast creation/turnaround

Wireframe: A design artifact that expresses the basic screen contents/layout/interactivity of a UI, typically using simplified graphics
**Paper Prototype Ingredients**

- Paper
  - Construction paper
  - Index cards
  - Post-it notes
- Scissors
- Glue
  - Permanent
  - Temporary (e.g., 3M Scotch® Restickable Adhesive Glue Stick)
- Tape
  - Permanent
  - Single-sided temporary tape (e.g., 3M Scotch® 811 Removable Magic™ Tape)
  - Double-sided temporary tape (e.g., 3M Scotch® 667 Removable Double-Coated Tape)
- Markers
- Transparent overlays

**Paper Prototype Participants**

- Team
  - Designs/builds paper prototype
- User
  - Team member (during early design) or external participant (when prototype is ready) interacts with prototype
- Greeter/Facilitator
  - Team member(s) greets/guides user
- Computer
  - Team member manipulates prototype in response to user interaction, follows “program logic”
- Observer(s)
  - Team members take notes
Paper Prototype Approach

1. Design prototype
   - Work fast because it’s easy to change
   - Sketch ideas
   - Design for interactivity
     - Use a separate piece of paper for everything that moves/changes
     - Use removable tape/Post-It notes/transparencies for user input
     - Place moving components on transparencies to keep hands out of the way

2. Prepare scenario
   - Choose tasks and prepare output data

3. Assign team members roles

4. Practice

5. Recruit participants (users)
Paper Prototype Approach

6. Run experiment
   - Greeter greets participant
   - Facilitator gives instructions for tasks and elicits “thinking out loud” comments from participant
   - Computer responds to participant’s interaction
   - Observers take notes *silently* on cards
   - Team members debrief participant after experiment

Paper Prototype Approach

7. Analyze results
   - Sort and prioritize observation cards
   - Group observation cards according to
     - Issues noted
       - Lay out by problem
       - Lay out by heuristic
     and/or
     - UI components affected
       - Lay out near relevant components of UI
Paper Prototype Approach

8. Design changes
   - Discuss and agree on changes
   - Flag affected components
     - Use annotations on Post-it notes
     - Evaluate changes for consistency

9. Implement changes
10. Test the revised prototype

Paper Prototype Example

- Material from a 4170 prototyping session
Lo-Fi Advantages

- No “programming” needed!
- Fast turnaround
  - Costs less
  - Allows more iterations
- Human computer
  - Can be (re)programmed quickly
  - Cannot crash
- Changes can be made on the fly
  - Developers feel less affection for status quo because changes are easy
- Developers can work together around a common workspace
  - Large, 3D display (i.e., table)
  - Simultaneous multi-user, multi-hand input
- Rough “sketchy” appearance
  - Emphasizes content instead of appearance
    - Avoids low-level critiques of visual detail
  - Users are more willing to criticize high-level problems and less willing to blame themselves if something doesn’t work

Lo-Fi Disadvantages

- Rough appearance
  - Cannot be used to find problems with low-level appearance/layout
  - Might be misinterpreted by outside experimental participants as reflecting poorly on future product or company
- Does not reflect real response times
- Human computer may improvise logic that is hard to replicate in code
- Does not find other problems experienced only with real computer-based components
- Limited scenarios may miss many problems that occur outside those scenarios
Lo-Fi Prototype Variations: Revising an Existing UI

- Print out screen grabs of existing UI
- Use Post-it notes/overlays/… to make incremental changes
- Test as paper prototype

Lo-Fi Prototype Variations: Video Prototype

- Use webcam/phone to record sample interactions
- Create noninteractive “concept video”
- Use simple editing effects
  - Cuts
    - Allow interactions to be shown at correct speed
    - Temporally edit out human computer’s manual interventions
  - Close ups
    - Concentrate on one portion of display
    - Spatially edit out human computer’s manual interventions
- Act out your personas/scenarios to show the human context in which the interactions fit

A video about making video prototypes: Using Video to Support Interaction Design
http://www.youtube.com/watch?v=LKjfo_B9IY
Lo-Fi Prototype Variations: Video Prototype Case Study

- The Interaction Museum (http://insitu.lri.fr/imuseum)
  W. Mackay & M. Beaudouin-Lafon
- Online “exhibit” of interaction techniques and systems for HCI community
- Users
  - Browse
  - Contribute
  - Review