Mockups & Scenarios: Human-Computer Interaction

- refine problem definition
- enhance requirements specification
- validate requirements
Human-Computer Interaction

- Person’s Task
- Person’s Experience
- System’s Interface
Functionality Isn’t Enough

• For an interface to be a success, it must provide the right functionality, at the right time, in the right place, and in the right form from the user’s point of view.
• Such interfaces are called usable.
• Example: if we are designing an ATM, we should be able to justify each user action:
  – Insert card?
  – Enter PIN?
  – Press Quick Cash key?
  – Press Okay?
  – Remove card?
  – Remove money?
  – Remove receipt?
Testing Mockups and Scenarios

• The cognitive walkthrough is a way to test the usability of interactive software.
• The cognitive walkthrough focuses on
  – Task(s)
  – Interface
  – Learnability (one kind of usability)
• The cognitive walkthrough may be used
  – without “real” uses
  – before a system is implemented
Cognitive Walkthrough Procedure

- Define the inputs to the walkthrough.
- Convene the analysis.
- Walk through the action sequences for each task.
- Record critical information.
- Revise the interface to fix the problems.
Performing the Cognitive Walkthrough - Pt. 1

- Define the inputs to the walkthrough.
  - Identification of the users.
  - Sample tasks for evaluation.
  - Description (mockups) or implementation of the interface.
  - Action sequences (scenarios) for completing the tasks.

- Convene the walkthrough.
  - The facilitator maintains the pace of the discussion.
  - A scribe keeps two lists:
    » problems (and suggested solutions)
    » assumptions (about tasks and users’ experience)
  - The participates walk through (discuss) the tasks with respect to the interface (mockups) and action sequences (scenarios); they try to tell a credible story.
Performing the Cognitive Walkthrough - Pt. 2

• The participants walk through (discuss) the tasks with respect to the interface (mockups) and action sequences (scenarios); they try to tell a credible story.
  – What is the user trying to achieve at this point? (What’s their “goal”? Why is it their goal?
  – What actions are obviously available in the interface?
  – Does the label for the correct action match the user’s goal?
  – If the user performs the correct action, will they get good feedback and not try to undo or redo the action?
Performing the Cognitive Walkthrough - Pt. 3

- Record critical information.
  - The credible success (or failure) story.
  - Assumptions (about tasks and users’ experience).
  - Problems (and suggested solutions)

- Revise the interface to fix the problems.
Table Width Example
Getting Ready

• Users
  – We want the Tables feature to be usable with little or no training by people familiar with earlier versions of MS Word

• Tasks
  – The user wants to change the width of a column in an existing table.

• Interface (Mockups)
  – We have screen dumps of an existing prototype (3.X)

• Action Sequences (Scenarios)
  – Select the column
  – Choose “Cells” from the “Format” menu
  – Type “2.5in” into the “Width” field
  – Click “OK”
Action: Select the Column

- What’s the user’s goal, and why?
  - They want to indicate which column to format.

- Is the action obviously available?
  - Drag-select should be known to an experienced user. (Note: the alternative of clicking the “hot” area at the top of the column is not obvious!)

- Does the action or label match the goal?
  - No label here, but the action’s effect should be known by experienced users.
  - However, another action also matches: putting the cursor in the column (which is what you would do to format a paragraph).

- Is there good feedback?
  - Yes, column itself (rectangle) highlights.
Action: Choose “Cells”

• What’s the user’s goal, and why?
  – They’ve selected the column, now they want to specify its correct width, because that’s their basic task objective.

• Is the action obviously available?
  – This is a menu item, so there shouldn’t be any problem finding it.

• Does the action or label match the goal?
  – Format matches... but how about Cells? This looks like a very serious mismatch. And what’s worse, there’s an Edit Table item, which is a good match — but it’s the wrong action!

• Is there good feedback?
  – Yes, a format dialog box appears, including a “Width” field.
Action: Type “2.5in”

• What’s the user’s goal, and why?
  – Their task is to change the width of the column, and there’s a “Width” field highlighted, so specifying the width is what they’ll try to do now.

• Is the action obviously available?
  – The highlighted field should be fairly obvious. There aren’t many other options.

• Does the action or label match the goal?
  – “Width” is a good match... but why “2.5”? And how will the user know not to type “in”?

• Is there good feedback?
  – The number shows up, but its effect isn’t obvious (standard practice in Mac dialog boxes, of course).
Action: Click “OK”

• What’s the user’s goal, and why?
  – They’ve specified the width, so now they’d like to apply that specification and get back to the Table itself.
  – But ... they haven’t seen any feedback, so they’re not sure they’re done. And they may spend some time looking for other things that should be clicked... like Apply, maybe?

• Is the action obviously available?
  – No problem.

• Does the action or label match the goal?
  – No problem — an experienced Mac user knows that “OK” will apply the dialog box.

• Is there good feedback?
  – Yes — dialog box goes away, column width changes.
Example Wrapup

• **Action 1**
  – requires a little bit of learning, but it’s easy to get at through trial and error. If the user doesn’t select the column, they might just change the width of a single cell, but they could probably recover.

• **Action 2**
  – is a real loss. We think many users will fail to choose “Cells,” and there are other, attractive options that will lead them down the garden path when they try to explore.

• **Action 3**
  – is OK, but we have suggestions for making future releases easier to use by avoiding the need to enter numeric parameters.

• **Action 4**
  – is probably OK.
Several Usability Attributes
Nielsen, 1993

- **Learnability**
  - allows users to began work quickly
- **Efficiency**
  - enables a high degree of productivity
- **Memorability**
  - does not require retraining when use is infrequent
- **Errors**
  - mistakes are infrequent, easy to recover from
- **Satisfaction**
  - enjoyable to work with
Heuristic Tests

• Simple and Natural Dialogue
• Speak the User’s Language
• Minimize the User’s Memory Load
• Consistency
• Feedback
• Clearly Marked Exits
• Shortcuts
• Good Error Messages
• Prevent Errors
• Help and Documentation
Optional References

- **Usability Engineering**
  by J. Nielsen

- **The Cognitive Walkthrough Method: A Practitioner’s Guide**
  by C. Wharton, J. Rieman, C. Lewis, and P. Polson

  Chapter 5 of *Usability Inspection Methods*
  edited by J. Nielsen and R. Mack
  John Wiley & Sons, Inc., 1994