Mockups & Scenarios: Human-Computer Interaction

ICS 121

Problem Definition

Validation

Requirements
Specification

Validation

Architectural Design
Specification

Verification

Requirements
Change

Validation

Implementation
and Integration

Testing

Operation
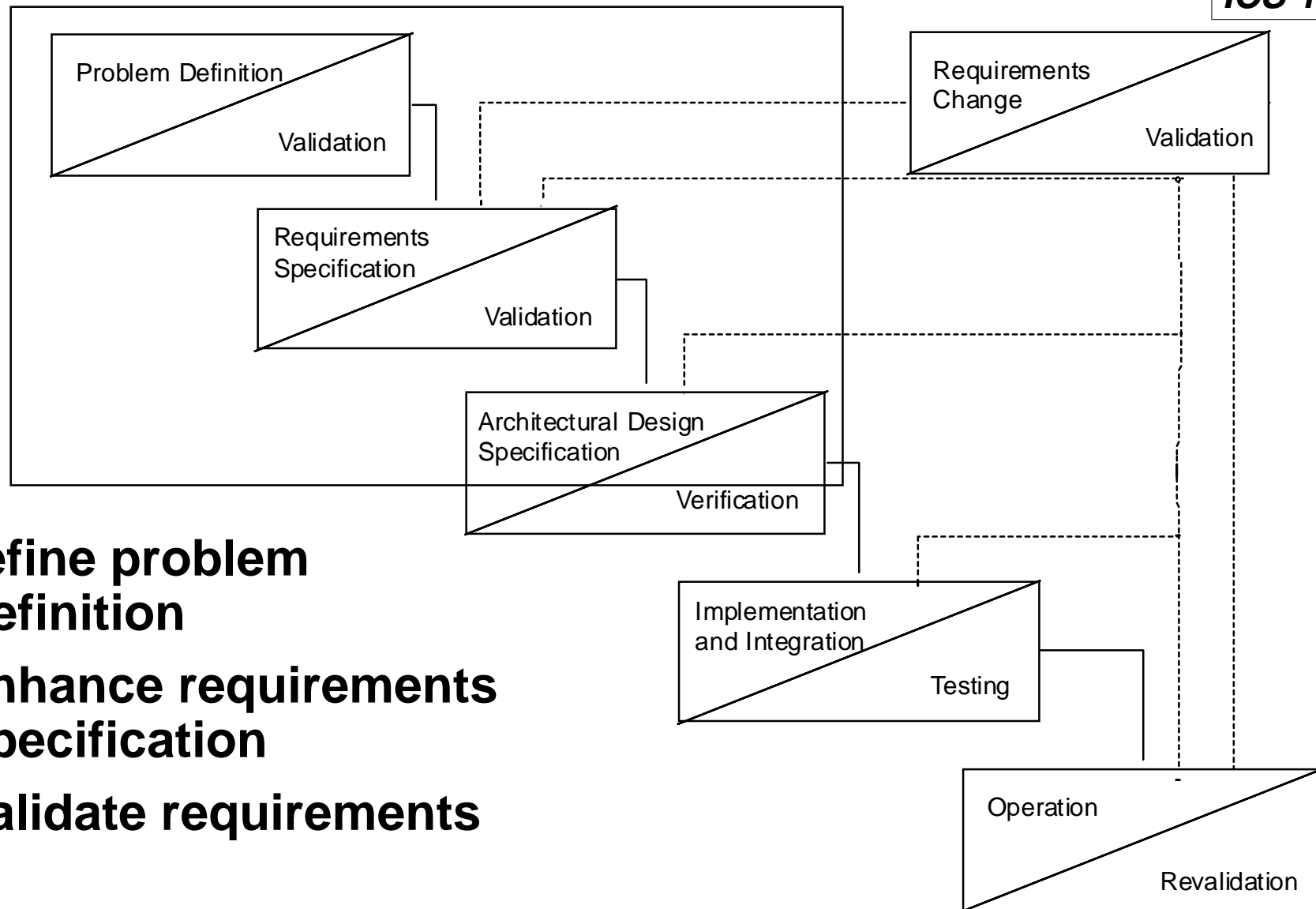
Revalidation

- **refine problem definition**

- **enhance requirements specification**

- **validate requirements**

Human-Computer Interaction

- **Person's Task**
- **Person's Experience**
- **System's Interface**

CURRENT TASK

PRIOR EXPERIENCE
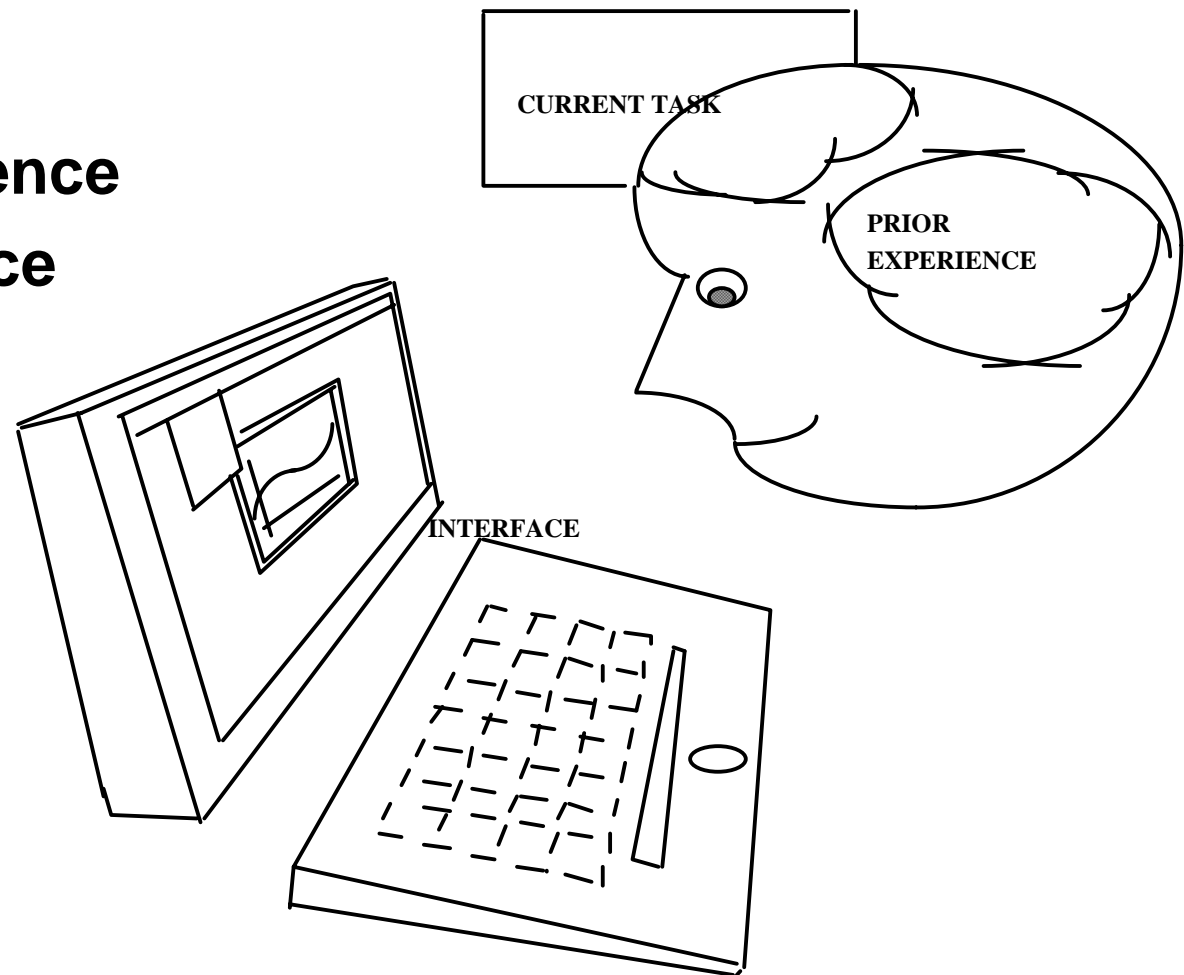
INTERFACE

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

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- **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 <u>not</u> 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
  Academic Press, 1993.**

- **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**