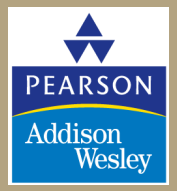
Chapter 8:
Usability Testing

The Resonant Interface
HCI Foundations for Interaction Design
First Edition

by Steven Heim



Chapter 8 Usability Testing

- What is Usability?
- What is Usability Testing?
- Design the Test
- Prepare for the Test
- Perform the Test
- Process the Data

What is Usability?

- Usability is the measure of the **quality** of a user's experience when interacting with a product or system. *(Usability.gov, 2006)*

- Usability is a **quality** attribute that assesses how easy user interfaces are to use. *(Nielsen, 2003)*

- The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use. *(ISO standard 9241-11, 1998)*

What is Usability?

- **Ease of learning**—How fast can a user learn to accomplish basic tasks?
- **Efficiency of use**—How fast can an experienced user accomplish tasks?
- **Memorability**—Can a user remember enough to use it effectively the next time?
- **Error frequency and severity**—How often do users make errors, how serious are these errors, and how do users recover from these errors?
- **Subjective satisfaction**—How much does the user *like* using the system?

What is Usability?

- **Quality of experience**
  - Excellence of user experience
  - Nielsen's ease of use

- **Error Frequency/User Satisfaction**
  - Quantitative analysis
  - Qualitative analysis

What is Usability Testing?

- A usability test is a structured process used to explore the interaction between an objective participant and a proposed design
- Paper and pencil (paper prototype)
  - Heuristic evaluation
  - Cognitive walkthrough
- Usability Lab (functional prototype)
  - Formal testing with subjects

What is Usability Testing?

- Attributes common to most usability tests:
  - The goal is to improve a product.
  - Participants are real users.
  - The participants do real tasks.
  - Participants are formally observed.
  - The data are analyzed.
  - Recommendations for improvement are made.

Dumas and Redish (1999)

What is Usability Testing?

- A usability test has three basic components:
  - **Participants—**Actual users who are asked to perform realistic and representative tasks using a proposed design
  - **Design—**May be a fully functioning prototype or a simple paper prototype
  - **Tester—**There might be only one tester or there might be a testing team

What is Usability Testing?

- Constraints on Usability Testing
  - **Time**
    - Design
    - Prepare
    - Administer (an hour to an hour and a half)
    - Analyze the results
  - **Finance**
    - Equipment and software
    - Laboratory time
    - Recording media
    - Participant compensation
    - Refreshments

What is Usability Testing?

- Constraints on Usability Testing
  - **Personnel—**Formal usability tests require at least four people.
  - **Laboratory—**To perform a formal usability test, a dedicated laboratory is required.

What is Usability Testing?

- Human Subjects Protocols
  - You must be fully aware of the regulations imposed by the various institutions and regulatory bodies that pertain to your experimental design
  - The U.S. Department of Health and Human Services Web site
    - *http://www.hhs.gov/ohrp/*

What is Usability Testing?

- **Advantages**
  - Minimize help desk calls
  - Increase product loyalty
  - Provide benchmarks for future products
- **Limitations**
  - Artificial context
  - Not definitive of product acceptance
  - Skewed sample of users
  - Not always efficient

What is Usability? – *Phases of a Usability Test*

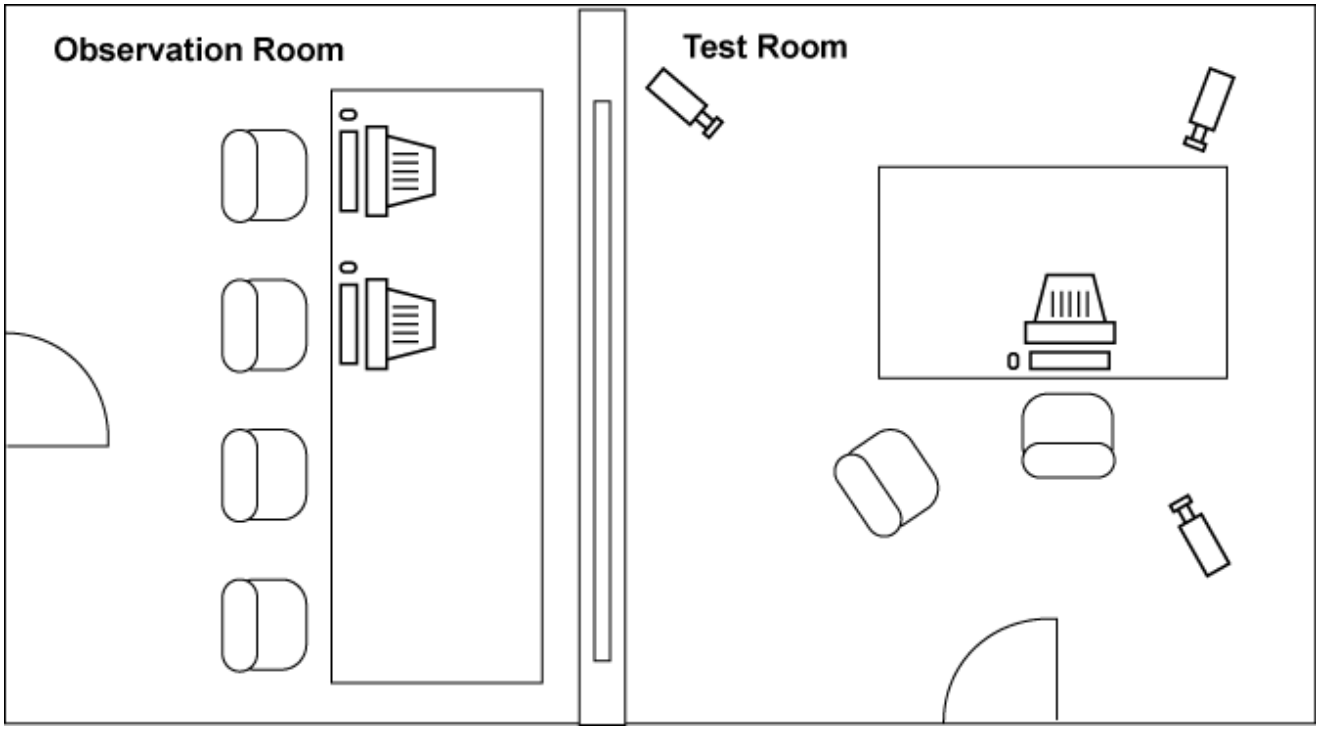
- Design the Test
- Prepare for the Test
- Perform the Test
- Process the Data

Design the Test

- Why: Define the Purpose
- What: Define Your Concerns and Goals
- What: Define the Tasks
- What: Create the Scenarios
- What: Define the Measurements
- How: Define the Test Method

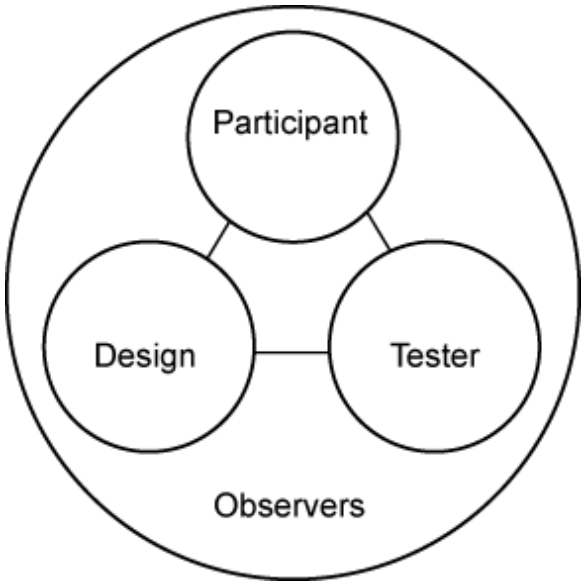
Design the Test

- Where: Determine the Location of the Tests



Design the Test

- Who: Select Participants, Testers, and Observers



Design the Test

MAXIM

Participants should be real users

MAXIM

You do not always need to test a great many users

- The people you recruit should have the following basic characteristics:
  - Availability
  - Responsiveness
  - Objectivity

Design the Test

- Tester roles include the following:
  - Administrator
  - Moderator
  - Data logger
  - Technician
  - Prototype expert
- Potential observers include the following:
  - Other design team members not involved in the test
  - Clients
  - Programmers responsible for the final product

Prepare for the Test

- When: Create a Test Schedule
  - Project level
  - Test preparation level
  - Test execution level
  - Task execution level

Prepare for the Test

- Writing Scripts
  - Greeting the Participant
  - Preliminary Interview
  - Providing Instructions
  - Monitoring the Test
  - Debriefing the Participant
- Running a Pilot Test
  - Be organized
  - Be presentable

Perform the Test

- Test Phases
  - Pre-Test
    - Greet the participant.
    - Have the participant sign the informed consent form.
    - Have the participant fill out any pre-test questionnaire.
    - Proceed with scripts.
  - During the Test
    - Maintain a log or observation check list for each task.
    - Create a problem list to capture anything that is not covered by the check list.
    - Notate problems and jot down any hypotheses that occur to you about the problems.

Perform the Test

- Test Phases
  - Post-Test
    - Debrief the participant.
      - post-test questionnaire
      - verbal interview
    - Thank the participant and provide compensation.
    - Collect, summarize, and organize test data.
    - Reset the room for the next participant.

Process the Data

- Activities Performed on the Day of the Test
  - Collecting Data
  - Summarizing Data
  - Organizing the Material
- Follow-Up Activities
  - Categorizing
  - Analyzing
    - Quantitative Data
    - Qualitative Data

Process the Data

- Documenting
  - Identify problems
    - Severity
    - Frequency
    - Errors of omission
    - Errors of commission
  - Prioritize problems
  - Theorize reasons
  - Theorize solutions
  - Identify successes
  - Identify areas of uncertainty