6.S196 / PPAT: Principles and Practice of Assistive Technology

Today: User Testing

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Kinds of User Tests

- Formative evaluation
  - Find problems for next iteration of design
  - Evaluates prototype or implementation, in lab, on chosen tasks
  - Qualitative observations (usability problems)
- Field study
  - Find problems in context
  - Evaluates working implementation, in real context, on real tasks
  - Mostly qualitative observations
- Controlled experiment
  - Tests a hypothesis (e.g., interface X is faster than interface Y)
  - Evaluates working implementation, in controlled lab environment, on chosen tasks
  - Mostly quantitative observations (time, error rate, satisfaction)

Treat the User With Respect

- Time
  - Don't waste it
- Comfort
  - Make the user comfortable
- Informed consent
  - Inform the user as fully as possible
- Privacy
  - Preserve the user's privacy
- Control
  - The user can stop at any time

Before a Test

- Time
  - Pilot-test all materials and tasks
- Comfort
  - "We're testing the system; we're not testing you."
  - "Any difficulties you encounter are the system's fault. We need your help to find these problems."
- Privacy
  - "Your test results will be completely confidential."
- Information
  - Brief about purpose of study
  - Inform about audiotaping, videotaping, other observers
  - Answer any questions beforehand (unless biasing)
- Control
  - "You can stop at any time."

During the Test

- Time
  - Eliminate unnecessary tasks
- Comfort
  - Calm, relaxed atmosphere
  - Take breaks in long session
  - Never act disappointed
  - Give tasks one at a time
  - First task should be easy, for an early success experience
- Privacy
  - User's boss shouldn't be watching
- Information
  - Answer questions (again, where they won't bias)
- Control
  - User can give up a task and go on to the next
  - User can quit entirely

After the Test

- Comfort
  - Say what they've helped you do
- Information
  - Answer questions that you had to defer to avoid biasing the experiment
- Privacy
  - Don't publish user-identifying information
  - Don't show video or audio without user's permission

Formative Evaluation

- Find some users
  - Should be representative of the target user class(es), based on user analysis
- Give each user some tasks
  - Should be representative of important tasks, based on task analysis
- Watch user do the tasks

Challenges for Assistive Technology

- Finding users
  - "representative" users? Disabilities vary too much
    - one approach: recruit users by the kinds of AT they already use (or can't use)
  - often need more than 3-5 users for good results
- Recruiting
  - helps to develop contacts and relationships
    - fosters trust, and word-of-mouth and viral marketing
  - sometimes easy to recruit: PWD are often more willing to participate in studies
  - sometimes very hard: people with "hidden disabilities" (e.g. learning disabilities) are more reluctant

Challenges for Assistive Technology

- Location
  - make sure the testing location is accessible
  - meet & escort
  - offer to pay transportation expenses
  - sometimes necessary to go to homes or workplaces
- Setup
  - user's existing AT may be specific, personal, and customized – find out what it is
    - "Uh… this isn't the assistive technology I'm used to..."

Challenges for Assistive Technology

- Energy & fatigue
  - build in extra time for users who need breaks because of the disability, medication, inefficiency of AT, etc.
  - though many will have unusual reserves of energy and patience (since learning AT requires so much of it!)
- Use a screening questionnaire when recruiting subjects
  - e.g. http://www.uiaccess.com/accessucd/ut_ppt-screen.html

Roles in Formative Evaluation

- User
- Facilitator
- Observers

User's Role

- User should think aloud
  - What they think is happening
  - What they're trying to do
  - Why they took an action
- Problems
  - Feels weird
  - Thinking aloud may alter behavior
  - Disrupts concentration
- Another approach: pairs of users
  - Two users working together are more likely to converse naturally
  - Also called co-discovery, constructive interaction

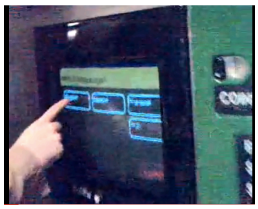
Facilitator's Role

- Does the briefing
- Provides the tasks
- Coaches the user to think aloud by asking questions
  - "What are you thinking?"
  - "Why did you try that?"
- Controls the session and prevents interruptions by observers

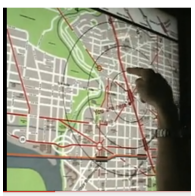
Observer's Role

- Be quiet!
  - Don't help, don't explain, don't point out mistakes
  - Sit on your hands if it helps
- Take notes
  - Watch for critical incidents: events that strongly affect task performance or satisfaction
  - Usually negative
    - Errors
    - Repeated attempts
    - Curses
  - May be positive
    - "Cool!"
    - "Oh, now I see."

Example: Think Aloud



Example: Watching for Critical Incidents



Recording Observations

- Pen & paper notes
  - Prepared forms can help
- Audio recording
  - For think-aloud
- Video recording
  - Usability labs often set up with two cameras, one for user's face, one for screen
  - User may be self-conscious
  - Good for closed-circuit view by observers in another room
  - Generates too much data
  - Retrospective testing: go back through the video with the user, discussing critical incidents
- Screen capture & event logging
  - Cheap and unobtrusive
  - Camtasia, CamStudio

Summary

- Formative user testing tries to uncover usability problems to fix in next iteration
- Facilitator and observers should play their roles correctly to maximize the value of the test