The participant standpoint

• Testing is a distressing experience
  – Pressure to perform
  – Feeling of inadequacy
  – Looking like a fool in front of your peers, your boss,…

(from “Paper Prototyping” by Snyder)
Ethics: The Milgram experiment

• **Was it useful?**  
  – Did we learn anything that can be broadly applied?

• **Was it ethical?**  
  – Could we have gather this knowledge by other means?
Treating subjects with respect

• Follow human subject protocols
  – Individual test results will be kept confidential
  – Users can stop the test at any time
  – Users are aware (and understand) the monitoring technique
  – Their performance will have not implication on their life
  – Records will be anonymous
    • Videos and recordings must be explicitly approved

• Use standard informed consent form
  – Especially for quantitative tests
  – Be aware of legal requirements

• Special protocol for children
Conducting the experiment

• Before the experiment
  – Have them read and sign the consent form
  – Explain the goal of the experiment
    • *In a way accessible to users*
    • *Be careful about the demand characteristic*
    • *Answer questions*

• During the experiment
  – Stay neutral
    • *Never indicate displeasure with users performance*

• After the experiment
  – Debrief users
    • *Inform users about the goal of the experiment*
  – Answer any questions they have
Managing subjects

• Don’t waste users time
  – Use pilot tests to debug experiments, questionnaires, etc…
  – Have everything ready before users show up

• Make users comfortable
  – Keep a relaxed atmosphere
  – Allow for breaks
  – Pace tasks correctly
  – Stop the test if it becomes too unpleasant

• Compensation
  – Pay participants whether they complete the study or not
Usability Study - Qualitative approach

• Gather user’s perception of the interaction
• Concerned more about *ability* to use system than how much they like it

• Methods
  – Introspection
    • *Walkthroughs*
  – Direct observation
    • *Simple observation*
    • *Thinking aloud*
    • *Constructive interaction (co-discovery)*
  – Interviews, questionnaires and surveys
Direct observation

• Observing (and recording) users interacting with the system
  – In lab or in the field
  – For a set of pre-determined tasks or through normal duties
    • Be prepared!

• Excellent at identifying gross design/interface problems

• Three general approaches:
  – simple observation
  – think-aloud
  – constructive interaction
Be prepared!

• Select the correct population
• Set objectives and tasks
  – Realistic
  – Informative
• Apply for the IRB
  http://www.umresearch.umd.edu/IRB/
• Hardware
  – Computer, video equipment…
• Software
  – Up and running, properly debugged…
• Facilitator
  – Using a checklist might be useful
  – Practice!
Creating tasks

• Describe in terms of end goals
• Specific and realistic
• Doable
• Not too long (< 5-10 minutes each)
Recording observations

- **Need a record**
  - Further analysis
  - Proof during discussion

- **Techniques**
  - Paper and pencil
    - *Simple to set up*
      - Free form
      - Coding scheme
    - *Might be biased*
  - Audio/Video recording
    - *More accurate*
    - *Time consuming to analysis*
      - Encoding is a time consuming process

From “Observing the user experience” (Kuniavsky)
# Coding scheme example

- Tracking activity in the office

<table>
<thead>
<tr>
<th>Time</th>
<th>Desktop activities</th>
<th>Absences</th>
<th>Interruptions</th>
</tr>
</thead>
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<tr>
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<td>Computer</td>
<td>Desk</td>
<td>Telephone</td>
</tr>
<tr>
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<td></td>
<td></td>
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<td>9:13</td>
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</tbody>
</table>
Simple observation method

• Evaluator observes users interacting
  – Sometime behind a half-silvered mirror

• Drawback
  – No insight into the user decision process or attitude
The think aloud method

- Subjects are asked to say what they are thinking/doing
  - What they believe is happening
  - What they are trying to do
  - Why they took an action

- Widely used in industry

- Drawbacks
  - Awkward/uncomfortable for subject (thinking aloud is not normal!)
  - “Thinking” about it may alter the way people perform their task
  - Hard to talk when they are concentrating on problem
Facilitator’s Role

• “Flight Attendant”
  – Support participant

• “Sports Caster”
  – Support designers/developers

• “Scientist”
  – Accurately collect data
The constructive interaction method

• Two people work together on a task
  – Normal conversation between the two users is monitored
    • *removes awkwardness of think-aloud*
  – Variant: Co-discovery learning
    • *Use semi-knowledgeable “coach” and naive subject together*
    • *Make naive subject use the interface*

• Drawback
  – Need a good team
Debriefing

• Post-observation interviews
  – Questions from your notes
  – Questions from users diary
  – Questions from a video footage

• Pros and Cons
  – Avoids erroneous reconstruction
    • Provide many constructive suggestions
  – Time consuming
    • But extremely valuable
Interviews

• Method
  – Pick the right population
    • *Individual or group discussion*
  – Be prepared
    • *Plan a set of central questions*
  – Probe more deeply on interesting issues as they arise
    • *Focus on goals not technology*
    • *Find the root of the problem*

• Pros and cons
  – Very good at directing next design phase
    • *Provide many constructive suggestions*
  – Subjective
    • *Do not ask leading questions*
  – Time consuming
Questionnaires and surveys I

• **Method**
  – Pick the population
    • *Demographics and sample size*
      – Between 50 and 1000 subject
  – Establish the purpose of the questionnaire
    • *What information is sought?*
    • *How would you analyze the results?*
  – Establish the means of delivery/collection
    • *On-line*
    • *Direct interaction with users*
      – Walking in the street
      – Post-user testing
    • *Surface mail*
      – including a pre-addressed reply envelope gives far better response
Questionnaires and surveys II

• Method
  – Design the questionnaire
    • Don’t forget to debug it!
  – Deliver
  – Collect and analyze the data
  – Establish the main findings
Closed questions

• Supply possible answers

Characters on the computer screen are:

- hard to read
- easy to read
  1  2  3  4  5

- Easy to analyze
- Make it more difficult for respondents
Style of closed question: Scalar

– Likert Scale

Characters on the computer screen are:

  hard to read          easy to read

  1  2  3  4  5

– Be sure to pick odd numbers of choice

  • *Often 5 or 7*
Style of closed question: Multi-choice

Which types of software have you used? (tick all that apply)
  O word processor
  O data base
  O spreadsheet
  O compiler

– Can be exclusive or inclusive

– Be sure to be specific

Do you use computers at work:
  O often                        O sometimes                        O rarely
  vs

Do you use computers at work:
  O more than 4 hrs             O between 1 and 4 hrs              O less that 1 hrs
Style of closed question: Ranked choice

Rank the usefulness of these methods of issuing a command
(1 most useful, 2 next most useful..., 0 if not used)

2. command line
1. menu selection
3. control key accelerator

Helpful to understand users preference
Open ended questions

• The user answers in his/her own words
  Can you suggest any improvements to the interfaces?
  – Good for general information
  – Difficult to analyze
    • Need for a coder
  – Can complement closed questions
Questionnaires and surveys

• Pros and cons
  – Preparation is expensive
    • Need to design and debug the questionnaire
  – Can reach a large population
    • But often a low return rate
    • Sample not necessarily representative
  – As good as the questions asked
  – Data collection can be tedious
    • Use automatic forms for large volume
Qualitative approaches outcome

• High level effects
  – Task flow problems
  – Task description problems
  – Contextual findings
    • Conflict with social pattern, ...
    • Two hands needed but only one available

• Pros and Cons
  – Apply to a real situation
    • Good external validity
  – Difficult to generalize
    • Poor control of independent variables
  – Often subjective data
Think Aloud Example: Adobe Illustrator

- Goal: Test learnability of path (i.e., curve) construction
- Assume no previous experience
- Assume basic understanding of splines – end points and control points

- Roles:
  - Me: facilitator
  - Volunteer: participant
  - Volunteer: observer/note-taker

- Tasks:
  - Draw straight line
  - Draw simple curve
  - Draw heart shape
  - Modify shape
Review: Actual Path Interaction (Creation)

- “Straight” vs. “curved” edges
- “Anchor” vs. “direction” points
- Anchors can be “corner” or “smooth” points

- Clicks generate corner points w/ straight edges
- Close path when cursor has small “o” next to it
- Click & drag to generate a smooth point with curved edge
- Alt-click to generate a corner point (i.e., separate direction lines)
- Click-Spacebar to reposition anchor point
Review: Actual Path Interaction (Editing)

• Use “Direct Selection” tool to select points or paths
• Use marquee selection to select points or paths
• Use control panel to
  – convert point type
  – join endpoints
  – delete points
• Or use variations of Pen tool to add/remove/change anchor points (with keyboard shortcuts P,+,-,Shift-C)
• And many other operations…