User Testing and Evaluation

Data Gathering

Interviews:
— Props, e.g. sample scenarios of use, prototypes, can be used in interviews
— Good for exploring issues....
— But are <u>time consuming</u> and may be infeasible to visit everyone

Focus groups:
— Group interviews
— Good at gaining a consensus view and/or highlighting areas of conflict
— But can be dominated by individuals....

Data Gathering

Questionnaires:

— Often used in conjunction with other techniques

— Can give quantitative or qualitative data

— Good for answering specific questions from a large, dispersed group of people

Data Gathering

<u>Direct observation:</u>

— Gain insights into user tasks

— Good for understanding the nature and context of the tasks

— But, it requires time and commitment from a member of the design team, and it can result in a huge amount of data

<u>Indirect observation:</u>

— Not often used in requirements activity

— Good for logging current tasks

Problems with data gathering

- Identifying and involving users: managers, developers, customer reps?, union reps?, shareholders?

- 'Real' users, not stakeholders or professional testers: traditionally a problem in software engineering, but better now

Problems with data gathering

- Communication between parties:
  - —within development team
  - —with customer/user
  - —between users... different parts of an organisation use different terminology

- Domain knowledge distributed and implicit:
  - —difficult to dig up and understand
  - —knowledge articulation: how do you walk?

- Availability of key people

Interviews

- **Unstructured** - are not directed by a script. Rich but not replicable.

- **Structured** - are tightly scripted, often like a questionnaire. Replicable but may lack richness.

- **Semi-structured** - guided by a script but interesting issues can be explored in more depth. Can provide a good balance between richness and replicability.

Interview Questions

- **Two types:**

  - **Closed questions** have a predetermined answer format, e.g., 'yes' or 'no'
  - **Open questions** do not have a predetermined format

- **Closed questions are easier to analyze....**

- **Avoid:**
  - Long questions…
  - Compound sentences - split them into two
  - Jargon and language that the interviewee may not understand
  - Leading questions that make assumptions e.g., why do you like …?
  - Unconscious biases e.g., gender stereotypes

Surveys and Questionnaires

- Questions can be <u>closed</u> or open…

- **Closed questions** are easier to analyze, and may be done by computer…

- Can be administered to **large populations**…

- <u>Paper, email and the web</u> used for dissemination..

- <u>Sampling</u> can be a problem when the size of a population is unknown as is common online…

Questionnaire Design

- The impact of a question can be influenced by question <u>order.</u>

- Do you need different <u>versions</u> of the questionnaire for different populations?

- Provide <u>clear instructions</u> on how to complete the questionnaire.

- Format – Ex. Strike a balance between using white space and keeping the questionnaire compact.

- Decide on whether phrases will all be positive, all negative or mixed.

Question and Response Format

- 'Yes' and 'No' checkboxes…

- Checkboxes that offer many options…

- Rating scales

  - Likert scales

  - Semantic scales

  - 3, 5, 7 or more points?

- Open-ended responses

Encouraging a good response

- Make sure <u>purpose of study is clear</u>
- Promise <u>anonymity</u>
- Ensure questionnaire is <u>well designed</u>
- Offer a <u>short version</u> for those who do not have time to complete a long questionnaire
- Follow-up with emails, phone calls, letters
- Provide an incentive
- 40% response rate is high, 20% is often acceptable…

Advantages of online questionnaires

- Responses are usually received quickly
- No copying and postage costs
- Data can be collected in database for analysis
- Time required for data analysis is reduced
- Errors can be corrected easily
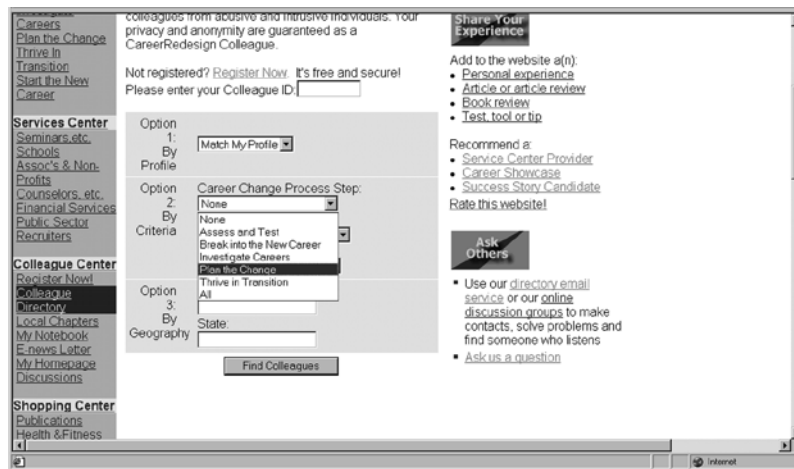
Problems with online questionnaires

- Sampling is problematic if population size is unknown
- Preventing individuals from responding more than once
- Individuals have also been known to change questions in email questionnaires

Observation

- Direct observation in the field
  - Structuring frameworks
  - Degree of participation (insider or outsider)
  - Ethnography
- Direct observation in controlled environments
- Indirect observation: tracking users' activities
  - Diaries
  - Interaction logging

Direct observation in a controlled setting

- Think-aloud technique

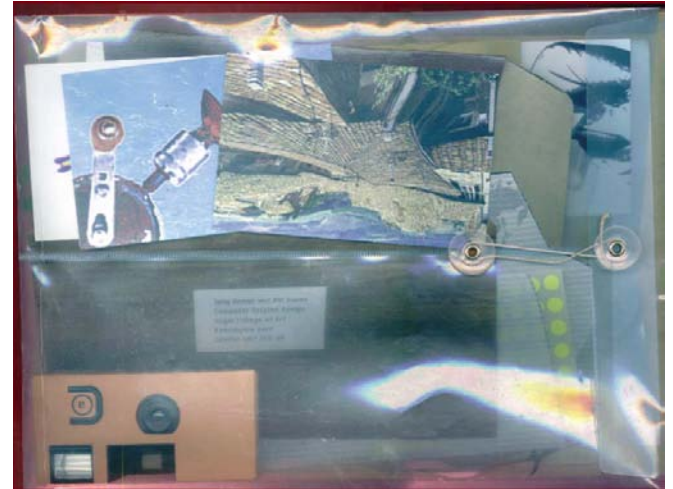# Indirect observation

- Diaries
- Interaction logs

Choosing and combining techniques

- Depends on
  - The focus of the study
  - The participants involved
  - The nature of the technique
  - The resources available

Data Interpretation and Analysis

- Start soon after data gathering session

- Initial interpretation before deeper analysis

- Different approaches emphasize different elements e.g. class diagrams for object-oriented systems, entity-relationship diagrams for data intensive systems