

## 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 time consuming 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

### Direct observation:

- 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

### Indirect observation:

- 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 closed or open...
- **Closed questions** are easier to analyze, and may be done by computer..
- Can be administered to **large populations**...
- Paper, email and the web used for dissemination..
- Sampling 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 order.
- Do you need different versions of the questionnaire for different populations?
- Provide clear instructions 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 purpose of study is clear
- Promise anonymity
- Ensure questionnaire is well designed
- Offer a short version 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

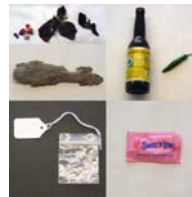


## Direct observation in a controlled setting

- 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