INTERACTION DESIGN

SHARP • ROGERS • PREECE

beyond human-computer interaction
5th Edition

Chapter 8

DATA GATHERING

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Aims

- Discuss how to plan and run a successful data gathering program.

- Enables you to plan and run an interview.

- Empowers you to design a simple questionnaire.

- Enables you to plan and carry out an observation.

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Five key issues

1. Setting goals
   - Decide how to analyze data once collected
2. Identifying participants
   - Decide from whom to gather data
   - How many participants are needed
3. Relationship with participants
   - Clear and professional
   - Informed consent when appropriate
4. Triangulation
   - Look at data from more than one perspective
   - Collect more than one type of data, for instance, qualitative data from experiments and qualitative data from interviews
5. Pilot studies
   - Small trial of main study

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Data recording

- Notes, audio, video, and photographs can be used individually or in combination:
  - Notes plus photographs
  - Audio plus photographs
  - Video

- Different challenges and advantages with each type of data recording

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Interviews

Unstructured: Not directed by a script. Rich but not replicable.

Structured: 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.

Focus groups: A group interview

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Interview questions

- Two types:
  - 'Closed questions' have a predetermined answer format, for example, '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, for example, why do you like …?
  - Unconscious biases, for instance, gender stereotypes

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Running the interview

Introduction: Introduce yourself, explain the goals of the interview, reassure about the ethical issues, ask to record, and present the informed consent form.

Warm-up: Make first questions easy and non-threatening.

Main body: Present questions in a logical order

A cool-off period: Include a few easy questions to defuse tension at the end

Closure: Thank interviewee, signal the end, for example, switch recorder off.

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Other forms of interviews

Digital conferencing systems such as Skype, Zoom, email, and smartphones can be used to conduct interviews. Some advantages are:

- Participants are in their own environment so are more relaxed
- Participants don't need to travel
- Participants don't need to worry about what to wear
- For interviews involving sensitive issues, it is easier for interviewees to be anonymous
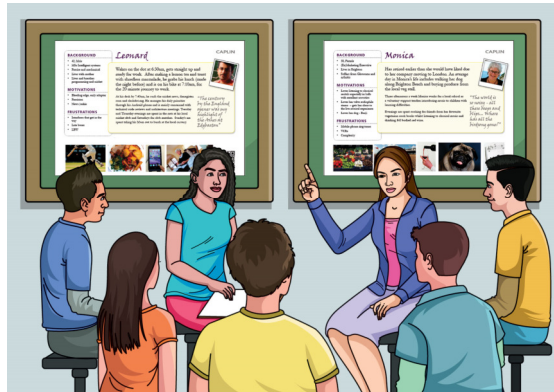
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Enriching the interview process

Props: Devices for prompting interviewee, for example, use a prototype, scenario

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Questionnaires

- Questions can be closed or open

- Closed questions are easier to analyze, and may be distributed and analyzed by computer

- They can be administered to large populations

- Disseminated by paper, email and the web

- Sampling can be a problem when the size of a population is unknown as is common online evaluation

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Questionnaire design

- The impact of a question can be influenced by question order.
- You may need different versions of the questionnaire for different populations.
- Provide clear instructions on how to complete the questionnaire.
- Strike a balance between using white space and keeping the questionnaire compact.
- Avoid very long questions and questionnaires
- Decide on whether phrases will all be positive, all negative, or mixed.

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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

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Encouraging a good response

- Make sure that the purpose of study is clear
- Promise anonymity
- Ensure that questionnaire is well designed
- Offer a short version for those who do not have time to complete a long questionnaire
- If mailed, include a stamped, addressed envelope
- Follow-up with emails, phone calls, or letters
- Provide an incentive
- 40 percent response rate is good, 20 percent is often acceptable

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Advantages of online questionnaires

- Relatively easy and quick to distribute
- 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

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Example of an online questionnaire

Questionnaire shows check boxes, radio boxes, and pull-down menus

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Problems with online questionnaires

- Sampling is problematic if population size is unknown

- Preventing individuals from responding more than once can be a problem

- Individuals have also been known to change questions in email questionnaires

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Deploying online questionnaires

- Plan the timeline
- Design offline
- Program/complete online template
- Test the survey to make sure that it behaves as you would expect
- Test it with a group that will not be part of the survey to check that the questions are clear
- Recruit participants

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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
  - Video and photographs collected remotely by drones or other equipment

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Observation

Figure 8.8 Mars Exploration Rover
Source: Reproduced by permission of NASA Jet Propulsion Laboratory (NASA-JPL).

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Structuring frameworks to guide observation

- Three easy-to-remember parts:
  The person: Who?
  The place: Where?
  The thing: What?
- A more detailed framework (Robson, 2014):
  Space: What is the physical space like and how is it laid out?
  Actors: What are the names and relevant details of the people involved?
  Activities: What are the actors doing and why?
  Objects: What physical objects are present, such as furniture
  Acts: What are specific individual actions?
  Events: Is what you observe part of a special event?
  Time: What is the sequence of events?
  Goals: What are the actors trying to accomplish?
  Feelings: What is the mood of the group and of individuals?

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Planning and conducting observation in the field

- Decide on how involved you will be: from passive observer to active participant
- How to gain acceptance
- How to handle sensitive topics, for example, culture, private spaces, and so on
- How to collect the data:
  - What data to collect
  - What equipment to use
  - When to stop observing

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Ethnography

- Ethnography is a philosophy with a set of techniques that include participant observation and interviews
- Debate about differences between participant observation and ethnography
- Ethnographers immerse themselves in the culture that they study
- A researcher's degree of participation can vary
- Analyzing video and data logs can be time-consuming
- Collections of comments, incidents, and artifacts are made

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More on Ethnography

- Co-operation of people being observed is required

- Informants are useful

- Data analysis is continuous

- Interpretivist technique

- Questions get refined as understanding grows

- Reports usually contain examples

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More on Ethnography *(continued)*

(a)   (b)

Figure 8.9 (a) The situation before MERboard; (b) a scientist using MERboard to present information

Source: J. Trimble, R. Wales and R. Gossweiler (2002): "NASA position paper for the CSCW 2002 workshop on Public, Community and Situated Displays MERBoard.

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Online Ethnography

- Virtual, Online, Netnography
- Online and offline activity
- Interaction online differs from face-to-face
- Virtual worlds have a persistence that physical worlds do not have
- Ethical considerations and presentation of results are different

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Observations and materials that might be collected (Crabtree, 2003)

- Activity or job descriptions
- Rules and procedures that govern particular activities
- Descriptions of activities observed
- Recordings of the talk taking place between parties
- Informal interviews with participants explaining the detail of observed activities
- Diagrams of the physical layout, including the position of artifacts
- Other information collected when observing activities:
  - Photographs of artifacts (documents, diagrams, forms, computers, and so forth)
  - Videos of artifacts
  - Descriptions of artifacts
  - Workflow diagrams showing the sequential order of tasks
  - Process maps showing connections between activities

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Direct observation in a controlled environment

- Direct observation
  - Think aloud techniques

- Indirect observation – tracking users' activities
  - Diaries
  - Interaction logs
  - Web analytics

- Video, audio, photos, and notes are used to capture data in both types of observations

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Choosing and combining techniques

Depends on the:

- Focus of the study

- Participants involved

- Nature of the technique(s)

- Resources available

- Time available

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Summary

- Data gathering sessions should have clear goals
- An informed consent may be needed
- Five key issues of data gathering are: goals, choosing participants, triangulation, participant relationship, pilot
- Data may be recorded using handwritten notes, audio or video recording, a camera, or any combination of these
- Interviews may be structured, semi-structured, or unstructured
- Focus groups are group interviews
- Questionnaires may be on paper, online, or telephone
- Observation may be direct or indirect, in the field, or in controlled settings
- Techniques can be combined depending on the study focus, participants, nature of technique, and available resources and time

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