



Gathering Data to Understand User Needs

Lecture 3
Reading: chapter 7.4
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Overview

- Five key issues of data gathering
- Data recording
- Interviews
- Questionnaires
- Observation
- Choosing and combining techniques

Five key issues

1. Setting goals

- Decide how to analyze data once collected

2. Identifying participants

- Decide who to gather data from
- Probability sampling and non-probability sampling
- Saturation sampling – access to all members

3. Relationship with participants

- Clear and professional
- Informed consent when appropriate

4. Triangulation

- Look at data from more than one perspective

5. Pilot studies

- Small trial of main study

Data recording



- Notes, audio, video, photographs
 - Choice depends on the context, time available and the sensitivity of the situation.
- Notes plus photographs
 - Handwritten notes – flexible and less intrusive than typing,
 - Can be tiring to write, observe and listen at the same time
- Audio plus photographs
 - Audio – less intrusive than video
 - Attention to the interviewee rather than to taking notes
- Video
 - Requires additional planning

What to choose?

- Imagine you are employed to develop a new computerized garden system planning tool to be used by garden designers.
- Goal: to find out
 - how garden designer use an early prototype as they walk around their clients' gardens
 - sketching design ideas, taking notes and asking the clients about
 - what they like and how they use the gardens
- What are the advantages and disadvantages of the 3 approaches to data recording in this environment?

Criterion	Notes plus camera	Audio plus camera	Video
Equipment	Paper, pencil, and camera are easily available	Inexpensive, hand-held recorder with a good microphone	More expensive. Editing, mixing, and analysis equipment needed
Flexibility of use	Very flexible. Unobtrusive.	Flexible. Relatively unobtrusive.	Needs positioning and focusing camera lens. Obtrusive.
Completeness of data	To get what note taker thinks is important and can record in the time available. Problem with inexperienced evaluators.	Complete audio recording but visual data is missing. Notes, photographs, sketches augment recording but need coordinating	Most complete data, especially if more than one camera is used, but coordination of video material is needed.
Disturbance of users	Very low	Low, but microphone needs to be positioned.	Medium. Camera needs to be positioned. Care needed to avoid Hawthorne effect.
Reliability of data	May be low. Relies on making a good record and knowing what to record.	High but external noise, e.g. Fans in computers, can muffle what is said	Can be high but depends on what camera is focused on
	Rich descriptions can be produced	Critical discussions can be identified	Critical incidents can be identified and tagged

Interviews

- Conversation with a purpose
- 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

Running the interview

- *Introduction* – introduce yourself, explain the goals of the interview, reassure about the ethical issues, ask to record, present any 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, e.g., switch recorder off.

Interview with children

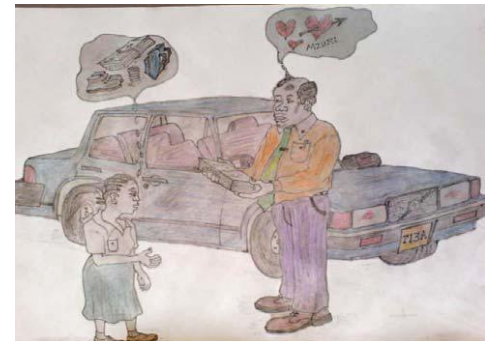
- Children think and react to situations different from adults
- Sitting 4-year-old down in a formal interview
 - is unlikely to result in anything other than a wall of silence
- Recording pose a problem:
 - Children have a tendency to perform in front of the camera
- Child-friendly methods
 - Images, e.g. smileys and chat.



Smilometer: Read ir kiti, 2002

Example: a story-based interactive digital platform

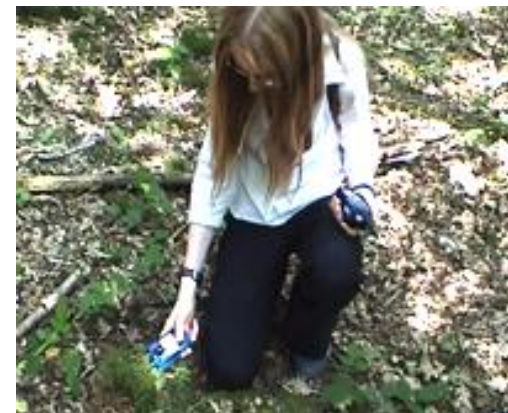
- Duveskog et al. (2009) designed a platform to educate children about HIV and AIDS in Tanzania.
- Project group included:
 - secondary school pupils, university counseling students, HIV counseling experts and experts in ICT.
- Pupils were interviewed, students produced drawings to illustrate their stories, then tested the platform



Duveskog, M., Bednarik, R., Kemppainen, K., Sutinen, E. (2009) [Designing a Story-Based Platform for HIV and AIDS Counseling with Tanzanian Children](#), IDC 2009, June 3–5, 2009, Como, Italy.

Example: Ambient Wood

- Investigates the use of ubiquitous computing and mobile technologies to support learning.
 - Children explored the inhabitants in a woodland area.
 - Each child was given PDA and mobile probing tool
 - The data collected displayed on the PDA
 - Children's position was monitored and location-specific data was sent to their PDA, e.g. When they walked past a specific plant



Focus groups

- Frequently used in marketing and political campaigning.
- 3-10 people involved and discussion is led by trained facilitator
 - Participants are selected to provide a representative sample of the target population
- Benefit: diverse or sensitive issues can be raised investigating community issues
- Drawback: what they say is not always what they do

Focus group: problems

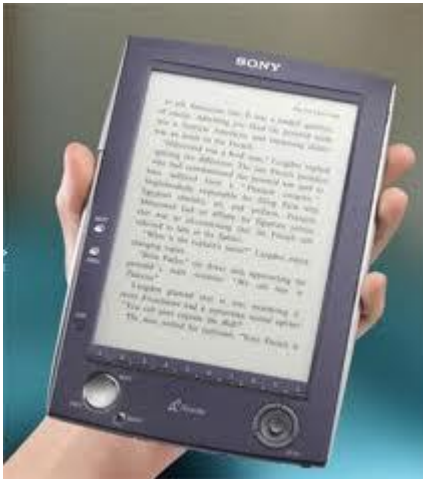
- Whar they say is not always what they do
 - People sometimes give the answers that they think show them in the best light
 - They may forget how long they spend on a particular activity
- So, can we believe all the responses we get?

Planning and conducting an interview

- Developing interview questions
 - Open – for exploratory sessions
 - Closed – when the possible answers are known in advance
 - structured interview usually consists of open questions,
 - while a structured – closed
 - Semistructured – a combination of both

Example

- How appealing are reading devices to people over 65?



Sony e-reader



Amazon Kindle



Apple iPad

Data gathering session

- The goal: to seek opinions whether e-readers would appealing to people over 65
- Suggest ways of recording the interview data.
- Suggest set of questions.

Questions

1. Have you used an e-reader before? (Explore previous knowledge)
Interviewer checks box ☐ Yes ☐ No ☐ Don't remember/know
2. Would you like to read a book using an e-reader? (Explore initial reaction, then explore the response)
Interviewer checks box ☐ Yes ☐ No ☐ Don't know
3. Why?
If response is 'Yes' or 'No,' interviewer says, 'Which of the following statements represents your feelings best?'
For 'Yes,' interviewer checks the box
☐ I don't like carrying heavy books
☐ This is fun/cool
☐ It's going to be the way of the future
☐ Another reason (interviewer notes the reason)
For 'No,' interviewer checks the box
☐ I don't like using gadgets if I can avoid it
☐ I can't read the screen clearly
☐ I prefer the feel of paper
☐ Another reason (interviewer notes the reason)
4. In your opinion, is an e-reader easy to handle or cumbersome?
Interviewer checks box
☐ Easy to handle
☐ Cumbersome
☐ Neither

Data gathering session

- Based on results of unstructures interview developers have found that two important acceptance factors are:
 - whether the device can be handled easily;
 - whether the typeface and appearance can be altered.

Running the interview

An introduction

- Interviewer introduces himself, explains why the interview is being done, reassures interviewees regarding any ethical issues, asks if they mind being recorded

A warm-up session

- Non-threatening questions, i.e. Demographic information

A main session

- Questions presented in logical sequence

A cool-off period

- Ask a few easy questions to defuse tension if it has arisen

A closing session

- The interviewer thanks the interviewee;
- Switches off the recorder or puts the notes away signaling that the interview has ended

Other forms of interview

- Telephone interviews

- Much in common with face-to-face but it is not possible to see the interviewee's body language or facial expressions

- Online interviews

- Emails, chats, video conferencing

- Retrospective interviews

- Reflects on an activity or a data gathering session in the recent past
- May be conducted to check that the interviewer has correctly understood what was happening

Enriching the interview process

- Neutral meeting room
- Props - devices for prompting interviewee, e.g., a prototype, scenario



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 structure

1. Many start by asking for basic demographic information

– Gender, age, place

PART 1

Name: _____ Contact #: _____

Email: _____ Mailstop: _____

Your current position: _____

Number of years in this position: ____

If you are a manager of people, how many people are in your group: ____

Questionnaire structure

- 2. Relevant experience

How much experience have you had with the following types of computers and computer devices?

Mac	___ Years	___ Months	
PC or Compatible	___ Years	___ Months	
Laptop	___ Years	___ Months	
Mainframe	___ Years	___ Months	Type: _____
Mouse	___ Years	___ Months	Manufacturer: _____
Trackball	___ Years	___ Months	Manufacturer: _____

About how many hours a week do you use a computer?

At home: _____ At work: _____

What type of computer do you use?

At home: _____ At work: _____

Do you use Microsoft Windows?

Yes ___ No ___

What Windows applications have you used?:

Product name:

1.	___ Years	___ Months
2.	___ Years	___ Months
3.	___ Years	___ Months

What do you typically use your computer for?

___ Games and Pleasure	___ Graphics
___ Accounting/Finance	___ Data storage (i.e., data bases)
___ Word Processing	___ Other _____
___ Decision Support	___ Other _____

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.
- 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
- If mailed, include a stamped addressed envelope
- Follow-up with emails, phone calls, letters
- Provide an incentive
- 40% response rate is high, 20% is often acceptable

Find poorly designed features

2. State your age in years ☐

3. How long have you used the Internet?
(*check one only*)

☐ <1 year
☐ 1–3 years
☐ 3–5 years
☐ >5 years

4. Do you use the Web to:

purchase goods ☐
send e-mail ☐
visit chatrooms ☐
use bulletin boards ☐
find information ☐
read the news ☐

5. How useful is the Internet to you?

Administering questionnaires

- Two issues
 - Reaching a representative sample
 - Ensuring a reasonable response rate
- For large surveys
 - Respondents are selected using sampling techniques
- Interaction designers commonly use small samples, less than 20 users
- 40% response rate is good
 - Much lower rates are common

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

The screenshot shows a web application interface with a sidebar on the left containing navigation links: Careers, Plan the Change, Thrive in Transition, Start the New Career, Services Center (Seminars, etc., Schools, Assoc's & Non-Profits, Counselors, etc., Financial Services, Public Sector, Recruiters), Colleague Center (Register Now!, Colleague Directory, Local Chapters, My Notebook, E-news Letter, My Homepage, Discussions), and Shopping Center (Publications, Health & Fitness). The main content area has a header with a disclaimer: "colleagues from abusive and intrusive individuals. Your privacy and anonymity are guaranteed as a CareerRedesign Colleague." Below this is a registration prompt: "Not registered? [Register Now](#). It's free and secure! Please enter your Colleague ID: [input field]". The search section includes three options: Option 1 (By Profile) with a "Match My Profile" dropdown, Option 2 (By Criteria) with a "Career Change Process Step" dropdown (showing "None", "Assess and Test", "Break into the New Career", "Investigate Careers", "Plan the Change") and a "Thrive in Transition" dropdown (showing "All"), and Option 3 (By Geography) with a "State" input field. A "Find Colleagues" button is at the bottom. On the right, there are sections for "Share Your Experience" (Add to the website a(n): Personal experience, Article or article review, Book review, Test tool or tip), "Recommend a:" (Service Center Provider, Career Showcase, Success Story Candidate), and "Ask Others" (Use our directory email service or our online discussion groups to make contacts, solve problems and find someone who listens; Ask us a question). A "Rate this website!" link is also present.

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

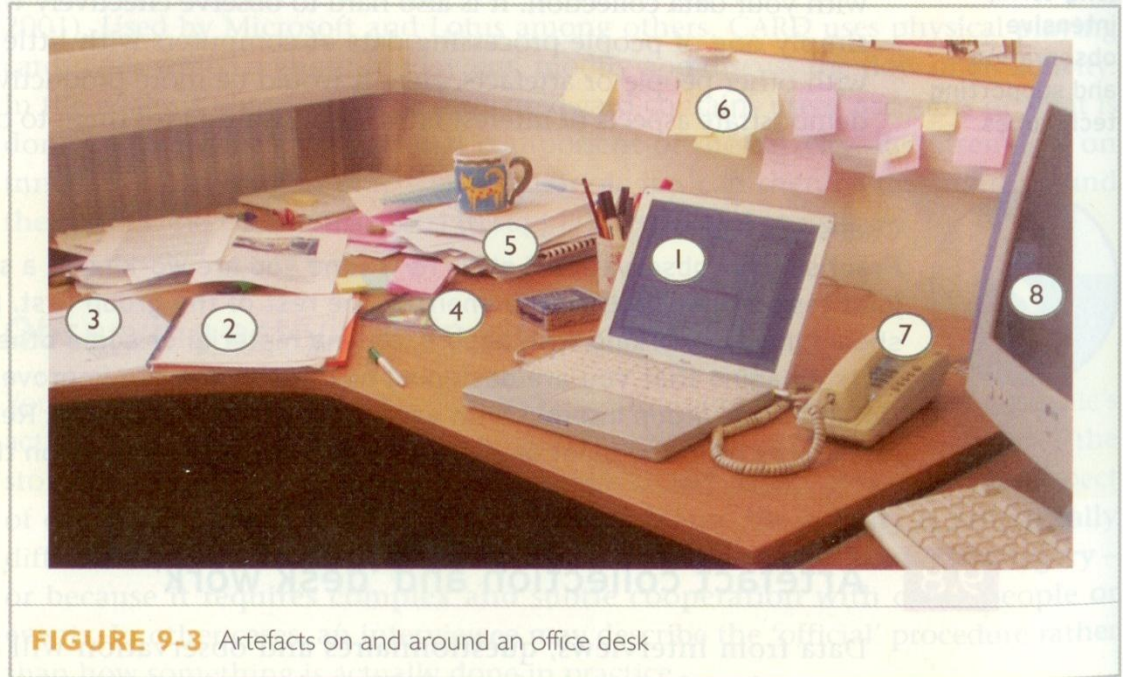


FIGURE 9-3 Artefacts on and around an office desk

Observation

- Indirect observation: tracking users' activities
 - Diaries
 - Interaction logging
 - Distant observation



Structuring frameworks to guide observation

- - *The person*. Who?
 - *The place*. Where?
 - *The thing*. What?
- The Goetz and LeCompte (1984) framework:
 - *Who* is present?
 - What is their role?
 - *What* is happening?
 - *When* does the activity occur?
 - *Where* is it happening?
 - *Why* is it happening?
 - *How* is the activity organized?

Ethnography (1)

- 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 along a scale from 'outside' to 'inside'
- Analyzing video and data logs can be time-consuming
- Collections of comments, incidents, and artifacts are made

Ethnography (2)

- 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



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 issues are different

An ethnographic project for you ...

- Join www.ActiveWorlds.com or go to another chat room of your choice
- ActiveWorlds is a 3-D chatroom environment in which you can visit different environments and chat with the people that you meet there
- To use ActiveWorlds you will need to check the instructions that they provide and download the appropriate software to run on your computer

- Select one of the worlds to visit and choose an avatar (a graphical personification) to represent you.
- Spend one to two hours doing an ethnographic study.
- Use one of the frameworks discussed in the previous slides to guide you and write a one or two page report about your study.
- Also notice and report on any usability issues you encounter and on user experiences in this environment.

Direct observation in a controlled environment

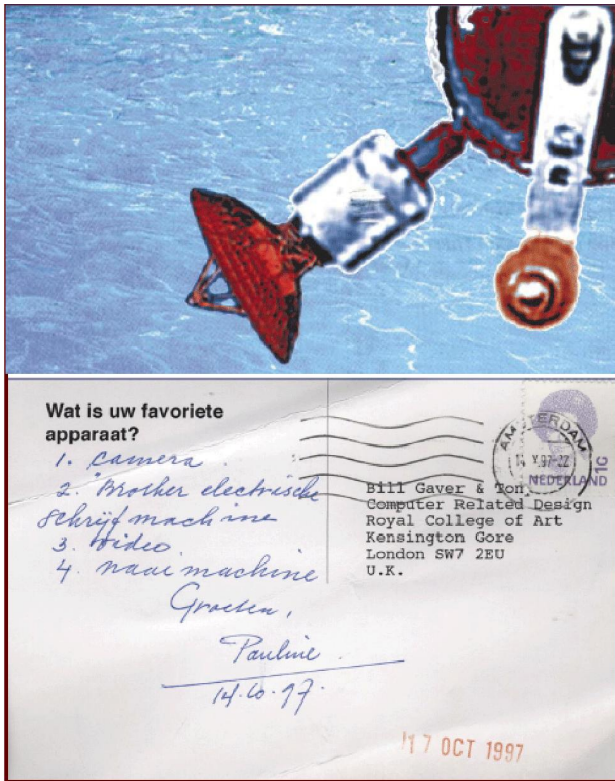
- Think-aloud technique

Indirect observation



- Diaries
- Interaction logs
- Web analytics

Cultural probe



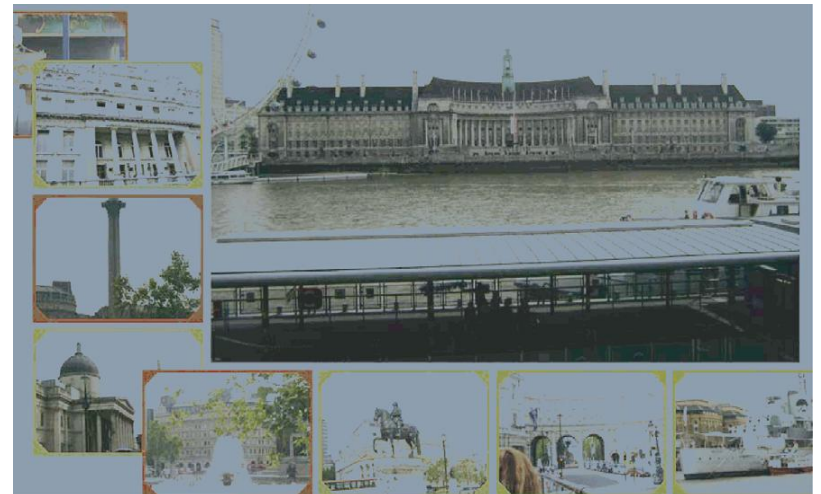
Postcard used as a 'cultural probe'.

Source: Gaver, W.W., Dunne, T. and Pacenti, E. (1999) *Cultural Probes*, Interactions, 6(1), pp. 21–29. © 1999 ACM, Inc.

From Benyon, *Designing interactive systems*, Pearson Education, 2005.

Choosing and combining techniques

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



Summary

- Three main data gathering methods: interviews, questionnaires, observation
- Five key issues of data gathering: goals, choosing participants, triangulation, participant relationship, pilot
- Interviews may be structured, semi-structured or unstructured
- Questionnaires may be on paper, online or telephone
- Observation may be direct or indirect, in the field or in controlled setting
- Techniques can be combined depending on study focus, participants, nature of technique and available resources