Gathering Data to Understand User Needs

Lecture 3
Reading: chapter 7.4
Dr. Kristina Lapin
Vilnius University
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?
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Notes plus camera</th>
<th>Audio plus camera</th>
<th>Video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>Paper, pencil, and camera are easily available</td>
<td>Inexpensive, hand-held recorder with a good microphone</td>
<td>More expensive. Editing, mixing, and analysis equipment needed</td>
</tr>
<tr>
<td>Completeness of data</td>
<td>To get what note taker thinks is important and can record in the time available.</td>
<td>Complete audio recording but visual data is missing. Notes, photographs, sketches augment recording but need coordinating</td>
<td>Most complete data, especially if more than one camera is used, but coordination of video material is needed.</td>
</tr>
<tr>
<td>Disturbance of users</td>
<td>Very low</td>
<td>Low, but microphone needs to be positioned.</td>
<td>Medium. Camera needs to be positioned. Care needed to avoid Hawthorne effect.</td>
</tr>
<tr>
<td>Reliability of data</td>
<td>May be low. Relies on making a good record and knowing what to record.</td>
<td>High but external noise, e.g. fans in computers, can muffle what is said</td>
<td>Can be high but depends on what camera is focused on</td>
</tr>
<tr>
<td></td>
<td>Rich descriptions can be produced</td>
<td>Critical discussions can be identified.</td>
<td>Critical incidents can be identified and tagged.</td>
</tr>
</tbody>
</table>
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

Recording | Interview | Questionnaires | Observations
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

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

- What 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 od 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 unstructured interviews, 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

- A few easy questions to defuse tension if it has arisen

A closing session

- The interviewer than asks for 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

• **Twi 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
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
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’.


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