

Chapter 7:

Analysing work processes and interaction

Overview

- 1 Focus groups
- 2 Ethnography
- 3 Task analysis
- 4 Diary studies



Focus groups → informal group, focus specific topic, group discussion.

A Focus group is an informal group gathering with typically 6 to 12 people that focus on a specific topic and have a group discussion as means of communication. During the session, you collect qualitative data from the group to indicate how people think and feel. You collect opinions, attitudes, feelings, perceptions, and ideas and you get examples and rich descriptions.

→ Qualitative data

The goal is to understand why people act or react in a certain way. That helps you to make important design choices. It can be used in different project phases but it's not suitable for a formal evaluation (due to its qualitative character). You typically use focus groups when you are generating ideas for a new product/ a product improvement, if you do a comparison of two or more candidate designs for a product or if you explore and generate a hypothesis for a study.

→ Not Good.

Advantages

- Wide range of information
- In-depth information (Why user...)
- Possibility to explore related topics or go into more detail
- Cheap and easy to do

Disadvantages

- Sampling of participants is not random nor representative
- The moderator plays a significant role and can influence the results
- No quantitative information can be gathered
- Findings cannot be easily generalized

→ No Quant.

→ No Generalization

When you create a focus group, it is important to select people appropriately. Set a balance between similarity and productive heterogeneity. Remember that the focus group is usually not representative of the general population (you might miss essential things).

- Don't mix people that are at different levels in the company hierarchy
- Don't mix people that have very opposite views
- Don't set up a group where everyone has the same views, some diversity is useful
- Too small groups don't generate a discussion, too large groups don't allow to involve all participants.

Consider having different focus groups to get information from different viewing angles (e.g., One group with men and one with women, one group with managers and one with sales staff). Expected group dynamics and behavior should allow a constructive discussion.

Planning a focus group discussion

- Organize an appropriate location and time slot (1-2 hours)
- Prepare a set of open-ended questions and discussion points (4 to 10 questions)
- Set questions to allow group dynamics and spontaneity
- Invite participants individually and explain the concept of the focus group and its purpose
- Prepare material that makes the discussion more tangible (e.g. Product prototypes, concept video)
- Prepare for recording the session

Running a focus group session

- Moderator keeps the group focused and the discussion moving
- Start with an introduction and provide name tags to participants
- Explain the rules of the discussion (e.g. confidentiality)
- Start with simple non-controversial questions
- Pose open-ended questions
- Avoid questions that lead to specific answers
- Allow for diverse opinions and for equal opportunities in the discussion
- Encourage each participant to express their own point of view
- Consensus between participants is not required
- Capture or record the session (video, audio, notes)



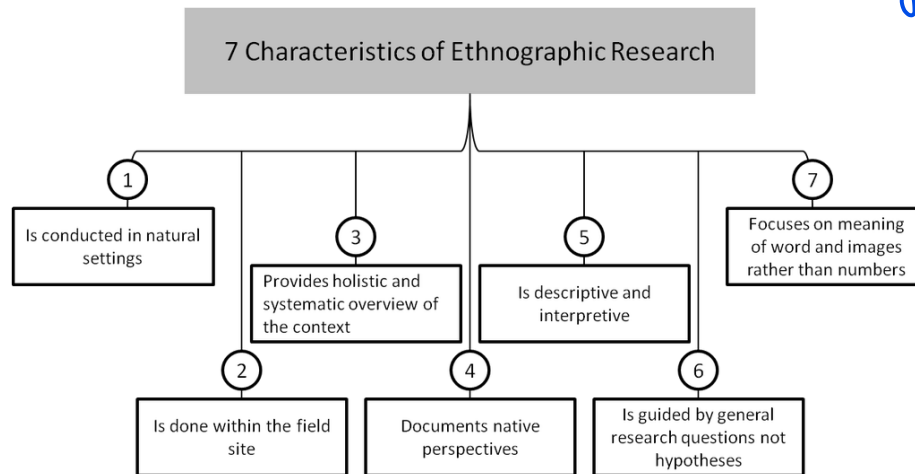
Imagine you have the following project to do...

- Football championship web page for mobile device access (textual live reporting)
- Micro-payment service on a website
- Information website on social benefits of the city council of Erlangen
- Introduction of advertising on the university main website
- Pay-per-view provision of adult content on mobile devices
- Streaming video (e.g. selected TV shows) on a mobile phone

- ➔ Should focus groups be used?
- ➔ What focus groups would be appropriate?

Ethnographic

→ Immerse into culture over long time & study.



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See: https://medium.com/@sean_82431/ethnographic-research-is-the-key-to-really-understanding-your-customers-needs-f31e89f26b43

Another possibility to analyze the design space is using ethnographies. Traditional ethnographers immerse into other cultures over an extended period (weeks, months, years) and thereby **study and understand the culture**. Ethnographic observations in HCI are a means of data collection, usually by observing potential users over a period of hours, days, or weeks.

The goal is to acquire information that is required to create user interfaces and interaction mechanisms suitable. Of course, there is also a risk associated with it, for example, a misinterpretation of the observations (often due to a lack of insight). Another problem is that you might change people's behavior and disrupt processes (Hawthorne effect) and miss important facts. Some problems occur infrequently, which means that there is a possibility that they don't occur during the observation.

The Ethnographers need to understand the context of **how people are working to learn about what the user is doing, what the requirements are and what a good solution for the requirements would be**. They need to understand work practices and why certain tasks are performed. The method allows to understand how people work and why work is done in a certain way.

→ When someone is observing ; it is disrupted.



To come up with a user interface for the train that is attached to the tractor it is a good idea to actually visit and talk to workers in this specific environment instead of just thinking about the work environment. Then you will realize that it is important that people can work with the user interface with thick gloves, when it is raining and when the visibility is low etc.

The time of contextual interviews should be limited. The observer must be prepared before the interview.

- Prepare a set of questions beforehand (e.g. what do you want to know from the user)
- Tell people what you are doing
- Use capture (audio/video) if your communication partners agree
- If applicable, capture (take photos/ video) material they use in their work (e.g. a manual, a checklist, post-its around the screen)
- Be noisy and ask for details
- If possible, feed back summaries of what your interview partner told you (to minimize misunderstandings)

There are different frameworks to guide the observation:

Goetz and LeCompte (1984)

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?

Minimal set to observe:

The person: Who?
The place: Where?
The thing: What?

who
where
what.

Robinson (1993)

Space: What is the physical space like?
Actors: Who is involved?
Activities: What are they doing?
Objects: What objects are present?
Acts: What are individuals doing?
Events: What kind of event is it?
Goals: What do they accomplish?
Feelings: What is the mood of the group and of individuals?

Guidelines for ethnographic observation in HCI (Shneiderman, chapter 3)

Preparation

- Understand the current system in the context of the organization and culture – don't be ignorant
- Describe the goals of the observation and prepare questions
- Get permissions for observations and interviews

Context

Goals
permission

Field Study

- Establish contact, talk to people
- Observe, interview, and collected data in situ
- Document observations

Analysis

- Compile data, summaries and quantify
- Provide interpretation of the data
- Refine the goals and record issues about the process

Reporting

- Describe findings – possibly for different audiences

For the observation there are different data collection techniques:

Paper and pencil

- Cheap and easy but unreliable
- Make structured observations sheets/ tool

Audio/ video recording

- Cheap and easy
- Creates lots of data, potentially expensive to analyze
- Good for review/ discussion with the user

Photos

Computer logging

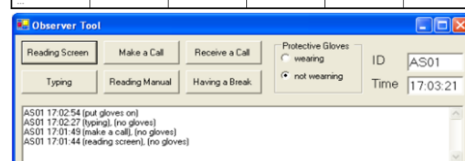
- Reliable and accurate
- Limited to actions on the computer
- Include functionality in the prototype/ product

User notebook

- Request the user to keep a diary-style protocol

Example of observation sheet

time	typing	reading screen	consulting manual	phoning	...
14:00		X		X	
14:01	X		X		
14:02	X				
14:03	X				
14:04				X	



Example of video observation glasses



Video observation can be used if you have the permission of every participant. The observation is done with one or more cameras that provide pictures of regions that are important to the task. You can get different viewpoints simultaneously. One camera that is overlooking the workplace, one that is looking from the screen to the user and one that is capturing what the user sees. This camera could be embedded into glasses to allow the observer to see "through the eyes" of the user. The consent from all captured persons must be obtained.

To do a video observation, the user should be present. It makes sense to use this observation technique in dangerous environments, when many users interact and the tasks are complex, when only selective data is required and for tasks that are done very quickly or hard to observe.

The analysis of the raw material is very time consuming. It can take 3h to 20h to label and annotate a 1h recording manually. To speed up the analysis, the captured video material should be automatically annotated (time stamped) and correlated with other events (e.g. only look at the video from the moment when a "new mail arrived" notification is issued till the user enters the email client)

detect interactions of interest.

To ease the analysis, it is helpful to automatically detect interactions of interest, e.g.

- When did the person leave the room?
- When did the person get something out of the shelf?
- When did the person meet another person?
- Where did the person go?

This information can be obtained using sensor systems like RFID-Tags and readers, activity sensors or location tracking systems. The technology should be selected depending on the requirements. Currently, most of these technologies are very new or still research prototypes.

Using cameras, sensors (e.g., motion, touch, RFID, etc.), logfiles of the interactive devices (e.g. key-logger, application logger) or by logging all the data (video, sensors, key input) with time stamps, video scenes that are of interest, can be found.



- Get me all video scenes that show what the user is doing before she/ he switches to application X
- Show me all sequences where users must input a password

Task Analysis

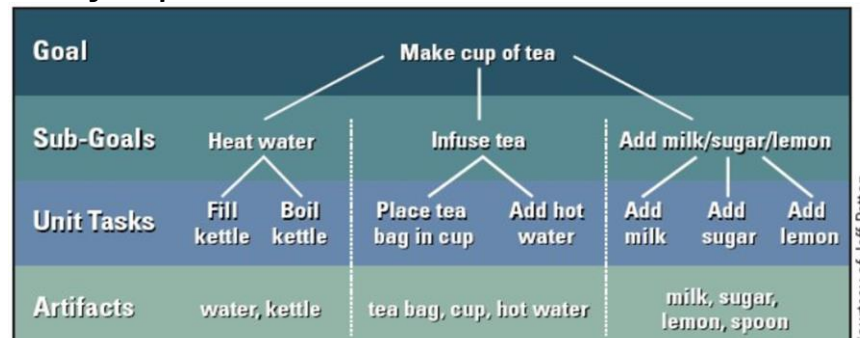
what you observe, not mental model

In task analysis you want to analyze all action that are performed by a user. It is about what you can observe and not really about the mental model. There is no single way to do that. Typically, you have some design recommendations in your design space, and you get more granularity and details and an ordering of actions.

Setting up a video projector:

- Unpacking the projector and placing it on the table
- Connecting the power cable to the projector and the socket
- Connecting a data cable between projector and computer
- Switching on the projector
- Waiting for the projector to be ready
- Switching the computer to dual screen mode

Making a cup of tea:



You must ask yourself some high-level questions:

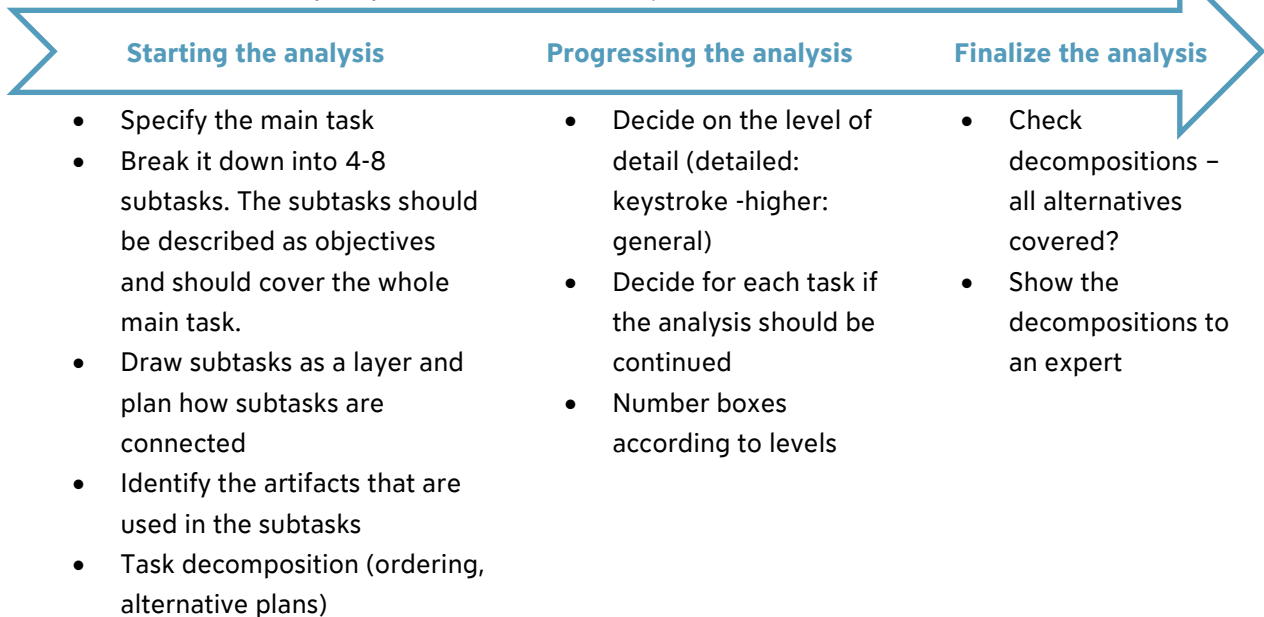
- How do users know their goal is attainable?
- How do users know what to do?
- How will users know they have done the right thing?
- How will users know they have attained their goal?

Start

Progress

Finalize

In a hierarchical task analysis, you conduct several steps:



To limit the tasks that you want to consider you need to define a threshold based on the probability of the task and cost in case of failure.

If (failure cost(task) * probability(task)) < threshold: do not further consider this task.



For a detailed discussion on task analysis (hierarchical task analysis, knowledge-based analysis and entity-relationship based technique, see Dix et. AI – chapter 11)

Diary studies

Categories: Fill in at End of Day

Day: Tues-9/15

I.D.: 7

Activity Log: Fill in Every Half Hour

Time	Activity	Talk. In Person	Talk. Phone	Meetings	File, Organize	Fill in Forms	Copy, Paste	E-Mail	Word Process	Spreadsheet	Other Compute	Breaks/Personal	Reading	Class
8-8:30	Get coffee													
	Checked e-Mail													
8:30-9	Planned garage about car													
	More e-Mail													
9-9:30	Met with student													
9:30-10	AI Class													

Figure 1. The beginning of a diary log sheet for one day. The participant records activities on the left as the day proceeds. The researcher assigns categories during the end-of-day debriefing.

In diary studies, people are asked to keep a diary or journal, of their interactions with a computer system, any significant event, or problems during their use of a system, or other aspects of their working life. The user is typically asked to record the date and time of an event, where they are, information about the event of significance and ratings about how they feel. An interesting alternative for making diary entries is to give users a tape recorder and a list of questions, so that users don't need to write things down as they encounter them.

only 1 imp event
& rating of feel.

tape recorder
instead of a
diary.



Think about:

- What is a diary study good for?
- What are potential problems with this study type?
- How can technologies such as voice recorders, cameras, mobile phones help?

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What is Contextual Enquiry? <https://infodesign.com.au/usabilityresources/contextualenquiry/>