2 – Understanding Context of Use

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### Days and Topics

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<td>March 15</td>
<td>Prototyping and Iterative Evaluations</td>
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Recap

1. What are the principles of user centered design (UCD)?
2. What are the three (iterative) steps in user-centered design?
3. What are the key concepts of Activity Theory?
4. Name three principles of Activity Theory?
Forward

- So, you want to design this system that shall help me figure out when my boss is best available for 5 minutes.
- Following UCD, you want to first analyse “context of use”
- Following activity theory, you understand this to mean “understand the current activity”
- … and how the tool that you are going to design will change the activity (in the iterative evaluate stages)
Today

**Tools** for understanding context of use
- Observations
- Interviews

**Contextual Design – Work Modelling**
... as conceptual framework for concretising what aspects of activities are relevant for software design

**Storyboards**
... as low-tech representation for communicating both status quo and core solution idea.
Learning Goals

After today’s lecture you should
1. Remember and understand principles of observations and interviews as tools to gain insight into activities
2. Remember and understand the aspects of activities that are considered relevant in Contextual Design
3. Remember and understand storyboards as low-tech representation suitable for quick communication of status-quo

After today’s assignment you should
1. Be able to carry out observations and interviews as tools to gain insight into activities
2. Be able to represent investigated activities in its relevant aspects according to Contextual Design
3. Be able to represent investigated activities as storyboard that communicates a need for (technological) support
TOOLS: OBSERVATIONS AND INTERVIEWS
Observation

1. Investigator observes <whatever is of interest>
2. Investigator protocols what is observed
Plan an observation I

What is the **object(ive)** of the observation?

- What information entities are you in particular interested in? (a specific activity, a particular type of interaction, the behaviour of a single person vs. a population, etc.)
- Is it more important to observe many subjects/activities/contexts a little bit (breadth) or a few subjects/activities/contexts in detail (in-depth)?

Does the observation take place **in the field or in the lab** (in a natural or artificial situation)?
Plan an observation II

Gain **co-operation of subjects** – Should you make observed **people** aware of observation?

- Depends a bit on context – the more personal observations are, the more specific you need to be. This will be different if you observe a single person in her home, than if you observe mass movements in a train station.
- Are there any laws regarding observation (in particular taking video and audio recordings, but also ethics on research methods!)?
- What do you tell subjects about what and why you are observing?
Plan an observation III

Data collection

• What kind of data will you collect? With what techniques (hand-written notes, video, audio, photo)? Temperature measurements, etc.???
  • In case of hand-written notes, you may want to prepare templates that structure what you note!
    • Lines where you count occurrences
    • Lists of categories for activities (so maybe you do not note down concrete observations but categorise them immediately)
    • Specific questions that you rate for pre-defined occurrences, etc.

• Make sure that you have the resources to analyse collected data later on!
Implement an observation I

Run a pilot

- In every empirical work, do a pilot, and plan for changing your plan after the pilot

In case you decided for it: Make people aware of observation (+ consent form possibly).

Be unobtrusive

- Try not to disturb the activity/interaction/situation you are observing
- … but it is important that you understand what you are observing. Be curious! When you think you are not disturbing any more, clarify what you have not understood!
Implement an observation II

**Take fotos:** Even if you only make notes, or audio recordings – take quick pictures that serve to remind you later on of the exact situation.

**Observation vs impression**
- Write down impressions after an observation – these should be quick (not an analysis), and clearly separated from what you observed.
Analysis and Reporting

Analysis

Data Management
• How long, where and how safe to store the data?

Reporting
• What reports do you need to create? Did you promise the participants a report?
Observations are…

Overall: **qualitative**

**AS-IS:** Observations gather data about how things are currently done, about the current situation, current stakeholders…

**Time-consuming:** Observations take time, analysis of notes, videos, tape recordings, etc. take time

**Obtrusive:** Observations may disturb observed subjects, may even change observed practice, …
Semi-Structured Face-2-Face Interviews

1. An interviewer talks face-2-face with an interviewee
2. The interviewer has an interview guideline (contains questions that shall be asked)
3. Between questions, the interviewee talks freely, and the interviewer asks for clarification or elaboration, but lets the discussion run freely
Plan an interview I

What is the **objective** of the interview?
- What information are you in particular interested in?

Prepare the **interview guideline**
- How do you introduce yourself and the objective of the interview?
- What concrete questions do you want to ask?
- **Work on phrasing key questions** (simple, short, concise, concrete, not suggestive, neutral, …)
- Work on the sequence of questions! Start with simple questions that let the interviewee develop a “rhythm”.
Plan an interview II

Recruitment

• Who do you contact? Who has the information you need?
• How do you contact people? (personal invitation, newsletter, ..)
• Is recompensation for time (travel?) necessary?

Prepare interview setting

• How long does an interview take?
• Where do interviews take place?
Plan an interview III

Data collection

• How do you record the interview? (Tape recording, manual notes…)
  • In case of hand-written notes, you may want to prepare templates that structure what you note – at least write down all questions with enough space to add notes to them.

• Make sure that you have the resources to analyse collected data (transcripts!) later on!
Implement an interview I

Run a pilot

• In every empirical work, do a pilot, and plan for changing your plan after the pilot

Interview – **Sequence of Steps**

1. Intro
2. Consent Form
3. Interview

**Interview vs impression**

• Write down impressions and thoughts after an interview – these should be quick (not an analysis), and clearly separated from what you asked.
Analysis and Reporting

Analysis

Data Management
• How long, where and how safe to store the data?

Reporting
• What reports do you need to create? Did you promise the participants a report?
After enough observations/interviews…

… consolidate

… identify common pain points: What is the problem?

… identify measures of success: How would you know, the problem is solved / the situation is improved …?

… brainstorm solution ideas

… envision how solutions would integrate into activity and change activity
When is my boss available?

Would you do an observation or an interview?
Plan for both!
CONTEXTUAL DESIGN
Contextual Design

Is a practical method of user-centered software design. It follows principles of:
• A system’s goal is to support practice
• Field work is necessary to elicit practice
• Participation is key to good design
• Use concrete representations of current (and envisioned) work practice – Contextual Design

Work Modeling
Contextual design – Work Models

Capture aspects of “work” (activity) that need to be known by software designers

1. Communication and coordination between people (flow model)
2. Detailed sequences of steps for relevant tasks; strategies for approaching tasks; underlying goals of people (sequence model, goal models)
3. Culture and policies (culture model)
4. Physical environment (physical model)
5. Artefact that are used and created (artefact model)
When is my boss available?

Draft the respective models!
Sequence Model and Goals

**Intent/Objective:**
- Need boss for 5 minutes
- Boss has not answered resp. email for 2 days

**Trigger:**
- Boss has not answered resp. email for 2 days
- Looks up boss's calendar
- Identifies end of meeting
- Confirms w. secretary that meeting actually takes place
- Waits in front of elevator
- No one comes out
- Asks secretary to call immediately in case
  - Waits
  - Jumps up and runs to door of boss
Flow Model

Boss

direct comm.

inconvenient!

Vikiona
- writes paper, proposals...
- emails with staff, members,
customers, students...
- meets with staff members.

Secretary
- helps prepare meetings of boss
- observes boss' office

Synchronization
Cultural Model

Boss
- does not want to be disturbed in meetings (important people)
- rarely has time to answer emails
- calendar is full of Todos, potential and real appointments

Secretary
- sometimes knows more about boss's time/availability than is in calendar
- but her work is interrupted with constant questions

Viktoria
- needs short info from boss from time to time
- ... and typically it is urgent
- not always sure how to interpret calendar of boss
Physical Model
Artificial Model

Shared Calendar

Monday Tuesday Wednesday Thursday Friday

Overlaps, what does empty mean? Boss not here? No space!

What does empty mean? Boss not here?

D Blockout Time?

Picture of waiting area

Other?
STORYBOARDS
Storyboard

Focus on overall picture
Tells a story (concrete user, concrete setting, concrete flow of interaction – one instance, not a generic description)
Illustrates
  – Pain point: What’s the problem?
  – Measure of success: How will users recognise that with the new system works better?
  – Vision: How will the overall interaction process look like (sequence of activities)?
    • (This use of storyboards already belongs to “Design/Implement” activities!)

Representation: Textual or visual
Storyboard Examples

- **Pain point**: Never know when boss is in office / available
- **Measurable success**: Know exactly when boss is in office
- **Vision (part of the “Design” stage)**:
  - Status display based on user groups, where status can be “boss is alone”, “boss is in internal meeting”, “boss is in external meeting”, “boss is not here”
  - Notification based on user groups if meeting members move towards door and there are at least 15 minutes to the next meeting
Readings

Recommended Reading
Karen Holtzblatt and Hugh Beyer, Contextual Design at
https://www.interaction-design.org/literature/book/the-encyclopedia-of-
human-computer-interaction-2nd-ed/contextual-design

Further Reading
Wu & Tremaine (2004), Knowledge Worker Adoption of Time Management
Tools: Satisfaction and Perceived Effectiveness. In: Proceedings of the
http://aisel.aisnet.org/cgi/viewcontent.cgi?
article=2009&context=amcis2004

Peter Atteslander, Methoden der empirischen Sozialforschung, ESV –
Erich Schmidt Verlag, speziell Kapitel 3 (Beobachtung) und 4
(Befragung)