

User Research in Designing Technology for Collaborative Interaction



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Summary & Learning outcome

The students are introduced to relevant factors for performing field research when designing technology for collaborative interaction (distinctions from dyads to communities), and three types of methods to achieve it (ethnography, artifact ecology, and network analysis).

LEARNING OUTCOME

- Students will be able to name three types of methods for doing field research in the design of technologies for collaborative interaction.
- Students will be able to describe relevant aspects of doing field research in the design of technologies for collaborative interaction in oral and visual form.
- Students will be able to apply three types of methods for doing field research in the design of technologies for collaborative interaction.

Recommended readings

- Sharp, Preece, & Rogers. 2019. Interaction Design: Beyond Human-Computer Interaction. **Chapter 8**. John Wiley & Sons. ISBN: 111954730X, 9781119547303
- Martin, David & Rodden, Tom & Rouncefield, Mark & Sommerville, Ian & Viller, Stephen. (2001). Finding Patterns in the Fieldwork. DOI: 10.1007/0-306-48019-0_3.

Content

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Why user research?

- “If there is any one secret of success, it lies in the ability to get the other person's point of view and see things from that person's angle as well as from your own.”
 - Henry Ford, 1922
- “Designers are not users”
 - Jakob Nielsen, N/N group

<https://quotepark.com/quotes/843670-henry-ford-if-there-is-any-one-secret-of-success-it-lies-in/>

<https://www.youtube.com/watch?v=gZeXyVJC-Jg>

Why user research?

General human needs give us a basic understanding, of e.g. friendships

- says nothing about a **particular user** or user groups' needs for friendship
- or in what way to support that
- That is why we need to discover **user needs**

How are user needs used?

- Guiding us to “direct” a design,
- learning more about why
- guiding us in starting to think in terms of design **ideas**.
- **formulate requirements**
- **evaluate** how a design is doing

User research concerns for collaborative interaction

Technology shape communication and collaboration between people.

In designing for collaborative interaction, it is very difficult to separate technical issues from social concerns (Ellis, 1991)

Key concerns:

- **Spatially oriented features** – focus on the physical nature of the task and the observable arrangements within the context.
- **Task oriented features** – focus on the principles of social organisation used to structure and manage the cooperative task

User research concerns for collaborative interaction: Spatially oriented

Spatially oriented - the observable arrangement of task and physical nature of the setting.

Key features:

- **Resources** - what are the various resources in the setting used to support the task taking place and how are they shared.
- **Actors** – who is involved in the cooperative task taking place and how do they orientate to each other.
- **Activities** – what are the main observable techniques for structuring activities and how are these represented.

User research concerns for collaborative interaction: Task oriented

Task oriented - the socially organised nature of tasks and how these are manifest in practice within particular settings

Key features:

- **Awareness of task**—how and through what means are those involved in the task aware of the tasks of others, how do they exploit this awareness and how do they make others aware of their own task?
- **Distributed Coordination**—how do those involved in the work coordinate their activities and what practical techniques do they use to do this?
- **Plans and procedures**—what techniques do those involved in the context use to orient their task in practice to the formal plans, procedures, representations and artefacts of tasks?

Who is the user?

- Collaborative interaction can involve
 - a few individuals, a pair, a group or groups of groups,
 - it can be within or between organizations,
 - it can involve an online community that spans the globe.
- What are the distinctions from dyads to globe-spanning communities?

Who is the user? Group

Generally, a group is defined as a relatively closed and fixed ensemble of people sharing the same 'goal' and communication.

However...

- The term 'group' is blurred and often used for any social interaction.
 - Johansen (1988) mentions "teams, projects, meetings, committees, task forces" etc. as examples of "groups".
 - Bahrtdt (1984): use the term 'group' if its members perceive themselves as a "we".
- The notion of a shared goal is murky and dubious.
 - Decision making in a group involves the interaction of multiple goals of different scope and nature (Bannon, 1989)

Who is the user? Individuals in Group

- The group members are individuals
 - with a personal background (experience, training, educational, motivation, skills)
 - and attitude towards technology, satisfaction, knowledge, values, and personality.
- Groups are not stable, they can be formed spontaneously in response to the situation.
 - In a hospital, a group (“task force”) is formed ad hoc to deal with an emergency situation.
 - Project teams - groups with a quasi-permanent character.
 - A group of friends
 - Researchers who cooperate at “arm’s length”, without direct communication and without necessarily knowing each other

Summary:

- Users of collaborative technologies are individuals with various backgrounds who identifies with one or more persons as ‘we’, and who may or may not share common goals
- We need to understand the individuals, their relations and artefacts, and the networks and ecologies surrounding them.

Who is the user? Communities of practice

People in a group are so diverse, need to find unifying factors other than e.g., age or disease.

Communities of practice

“a group whose members regularly engage in sharing and learning, based on their **common interests**. One might think of a community of practice as a group of people playing in a field defined by the domain of **skills and techniques** over which the members of the group interact. Being in the field provides members with a sense of identity – both in the individual sense and in a contextual sense, that is, how the individual relates to the community as a whole”

(Lesser, E. L. and Storck, J. Communities of Practice and Organizational Performance. IBM Systems Journal, Vol.40, No. 4 (2001).



Figure generated by DALL-E

Who is the user? Identifying stakeholders by stakeholder mapping

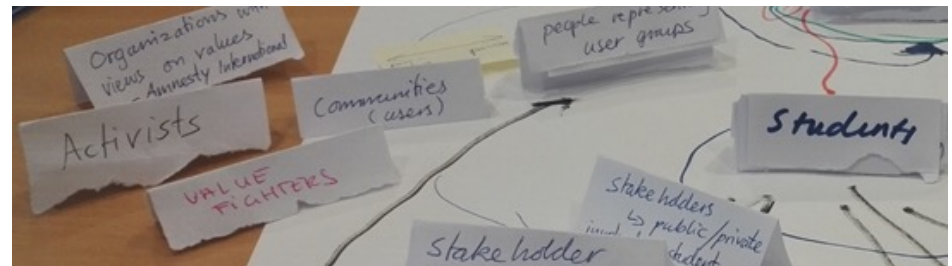
- Designing technologies for collaborative interaction poses **complex challenges**, which require a **multi-stakeholder approach**.
 - Designers should be aware of and understand all the direct and indirect stakeholders.
 - Designers require competences to explore the broader perspective on people and the societal context in which products, systems, or services will be integrated.
- In case designers lack these competencies:
 - cause unforeseen consequences, e.g. excluding specific user groups
 - design solution will be experienced as naïve
 - design will never end up in practice
- **Direct stakeholders:**
 - Groups – individuals or organizations – who interact directly with the system or its output.
- **Indirect stakeholders:**
 - All other parties who are affected by the use of the system.
 - Often ignored in the design process.
 - Example, digital medical records systems have often been designed with many of the direct stakeholders in mind (e.g., insurance companies, hospitals, doctors, and nurses), but with too little regard for the values (e.g. privacy) of a rather important group of indirect stakeholders: the patients.

Friedman et al, 2013

Who is the user? Identifying stakeholders by stakeholder mapping

How:

- Create a list of direct and indirect stakeholders
- Draw the relations between stakeholders.
- From this map, identify key stakeholders (indirect or direct), and list their most important values.
- Are there any tensions between stakeholder values?



Private photo, 2019.

User research methods: User data

Primary data

- when data is specifically collected to meet the needs set out by the brief

- Ethnographic methods
 - Qualitative data e.g. observations
 - Quantitative data e.g. questionnaire
- Artifact ecology analysis
 - The relationships of artifacts to practices, in the context of individuals or groups of people
- Network analysis
 - Connections between people

Secondary data

- when the data used has been collected from a 3rd party source such as:

- Anthropometric data (ergonomics)
 - User group data
- Published studies
 - Surveys
 - National Statistics
- Other sources
 - Usability data
 - Wearables
 - Open data

User research methods: Triangulation

- Understand context
 - Study of real situations
 - Members point of view
- 
- System interactions
- 
- Visualisations
 - Relations & participation
- Ethnographic data
 - Qualitative analysis
 - Artifact ecology analysis
- Automatic tracking data
 - Quantitative analysis
- Network analysis

User research methods

- **Network analysis**

- Large scale of use gives rise to “big data” and give insight into how and when people communicate and share information.
- but the insights are often more shallow—lacking the rich detail associated with deep study.

- **Artefact ecology analysis**

- The relationships of artifacts to practices, in the context of individuals or groups of people.
- Interviews and visual mappings

- **Ethnography**

- Observations, interviews, focus groups
- Small scale, qualitative approaches to data collection and analysis offer the opportunity to obtain very rich, deep insights about very specific phenomena —often in a bounded or limited context, and might face challenges related to generalization, verification, and validation.

Traditionally, network analysis and ethnography were separated.

➤ Now complementary:

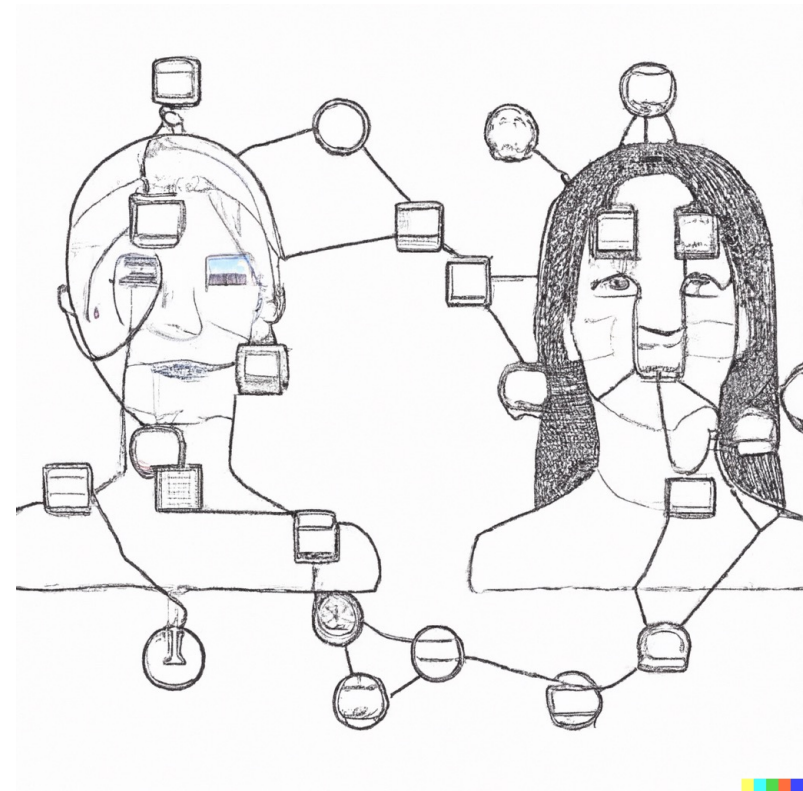
- large-scale statistical analysis for finding correlations and patterns,
- ethnography enabling us to discover what they mean and identify other patterns to look for.

User research methods: Network analysis

- When a computer network connects people or organizations, it is a social network.
- Social network analysis seek to describe
 - networks of relations,
 - prominent patterns in such networks,
 - trace the flow of information through them,
 - discover what effects these relations and networks have on people and organizations.
- A distinction is often made between
 - **Positional analysis** - the positions that individuals or units hold in a social structure
 - Similarity
 - **Relational analysis** - the interactions among those units and defines sub-groups and structure
 - Proximity
- Both help in understanding a network structure, but they describe rather different things about how the network is put together.

User research methods: Network analysis

- Method to analyze the connections across individuals or groups or organisations.
- Can be used for e.g.
 - Discussion forums
 - Mailinglists
 - Social media
 - Wikis
 - Intranets



A network of networks, with ties between individuals, and ties between network clusters.
Image generated by DALL-E.

User research methods: Network analysis

Limitations

- Not all of the interaction takes place inside the computer
 - Go for a coffee discussing the task
- Interpretation is hard without 'insider knowledge', i.e. replication is difficult
- Combination with other methods is useful – 'triangulation'

Advantages

- Focus on interaction
 - rather than on individual behavior
- Allows us to examine how the configuration of networks influences how individuals and groups, organizations, or systems function.

User research methods: Artifact ecology analysis

- Artifact ecology - the relationships of artifacts to practices, in the context of individuals or groups of people.
- Originally personal artifact ecologies (Jung 2008): “a set of all physical artifacts with some level of interactivity enabled by digital technology that a person owns, has access to, and uses”
- Later expanded to workplace and community artefact ecologies to understand the interplay between
 - place,
 - the shared technologies,
 - the members’ own technologies
 - the practices that exist, develop, or are challenged by these technologies.
- Focus on how artifact ecologies are shaped in community settings by personal and community relationships, for the purpose of design.
- Relationships between artifacts in artifact ecologies evolve dynamically over time.
- Interview and visual mapping methods



Visual analysis of artifact ecologies in programming workshops. Private photos.

User research methods: Ethnography

What people **say they do** and **what they actually do** are not always the same.

- **Ideal behavior** is what every "good" member of the community should do
- **Manifest behavior** is what people actually do.
- Asking people about their behavior will yield responses closer to the ideal than the manifest.
- People may distort, knowingly or unknowingly, accounts of their own behavior.

Some explanations of why this distinction exist:

- Everyday life is **too complex to tell** – life stories heavily reduced
- People often **not aware** of their actual behaviours
- What we know about what we do is **tacit**, unarticulated
- We might find details of everyday life too mundane or **trivial** to raise them
- Participants may be concerned with their image and report what's **socially acceptable**
- Participants respond in a certain way to **please the researchers**

(Ref: Blomberg J., Giacomi J., Mosher A., Swenton-Wall P. Ethnographic Field Methods and Their Relation to Design. Participatory design Principles and practices. Lawrence Erlbaum Associates, 1993. 123-155)

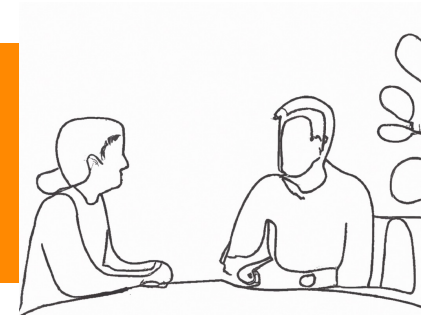
User research methods: Ethnography

- Focus on what people actually do and not solely on their accounts of behavior
- *Particular behaviors can only be understood in the everyday context in which they occur*

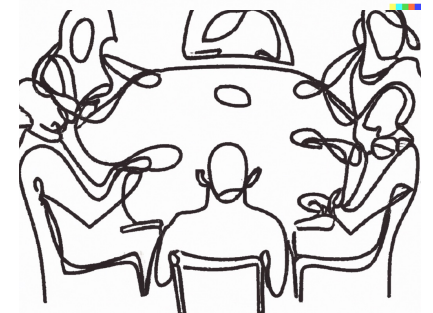
Principles:

- **Natural settings**
 - Study activities in their everyday settings
 - the forest, the office, the car, on a plane
- **Holism**
 - Focus on relations among activities and people (interactions) and not on single tasks or isolated individuals.
 - Understand social system as a functioning whole
- **Descriptive**
 - Describe before you prescribe
- **Users/members point of view**
 - As opposed to your point of view (which you already know)

User research methods: Ethnography



- Interviews
 - in depth information
- Focus group
 - in need of quick feedback on concepts/ideas
 - to collect user impressions
 - multiple points of view are desirable
- Observations
 - context of use is in focus
 - familiarize with unknown environments
 - what people actually do



Many more methods are available.

User research - Summary

- Users in collaborative interaction are individuals with various backgrounds who identifies with one or more persons as 'we', and who may or may not share common goals
- We need to understand who the users are; individuals, relations, artefacts, and the networks and ecologies surrounding them.
- User research concerns
 - Task oriented features – focus on the principles of social organisation used to structure and manage the cooperative task: resources, actors, activities.
 - Spatially oriented features – focus on the physical nature of the task and the observable arrangements within the context: awareness, distributed cognition, plans and procedures.
- Apply a mixed method approach - using only one will not provide you with all the information you need
 - Ethnography (e.g. interview, focus group, observation)
 - Artifact ecology analysis
 - Network analysis
- User research data (primary and secondary) are used for eliciting requirements, formulating the problem, design, and evaluation.

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