

Ethnographic Fieldwork Under Industrial Constraints: Toward Design-in-Context

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In this article, ethnographic fieldwork is discussed as a research technique for user-centered design in industry. The original meaning of fieldwork in ethnography is considered, and how ethnographically inspired fieldwork can enrich research and data gathering in a participatory design setting are discussed. The ethnographer in his or her field seeks to "go native." But in an industrial setting, there is neither time nor resources for prolonged engagement with users. Is there a "quick and dirty" version of going native? Five cases of video-based research techniques are presented as examples of a participant observation research strategy, and means of moving beyond observation are discussed. The ethnographer seeks to understand the world as it is. The designer wants to change the world through introducing new products. Is there a way to study the changes to come, of involving users in design in their own work context? In this article, design-in-context is introduced through 2 cases of user involvement.

1. FIELDWORK AS RESEARCH

The past two decades have seen a strong interest in employing qualitative methods in design for researching users and use in design. Since about 1980, a number of collaborations have arisen between ethnographers, anthropologists, ethnomethodologists, and qualitative sociologists on the one hand, and designers, engineers, and computer scientists on the other. Especially in Britain and Scandinavia, and increasingly in the United States, full-fledged partnerships have grown (Suchman, 1987). The nature of these partnerships differ, but they all have in common the goal of analyzing the contingencies of information-based work practice as situated in particular times and places and using that analysis to inform user-centered design.

Ethnographic research has become important in the design of all kinds of new information systems. The participatory design community in particular found its major inspiration in the ethnography genre, where ethnography is conceived as “a way of seeing” (Wolcott, 1995). One of those research techniques that became most popular is the fieldwork method, often employed as “ethnographic field study.” But what is ethnographic fieldwork?

Even if the term suggests one standard technique, there are many ways of doing it. In fact, fieldwork as research is a way of doing something (Wolcott, 1995) that unites many approaches. Fieldwork is a matter of techniques rather than a rigid step-by-step “how to” prescription. The approaches to fieldwork are alternatives. They should be regarded as choices among strategies rather than selections of proper techniques to be adapted for any particular setting. The essence of qualitative research techniques is that they are designed in the doing, as Wolcott (1995) put it: “They are intended to allow researchers to follow a suitable course of inquiry rather than to dictate in advance what that course should be” (p. 160).

1.1. Fieldwork in Ethnography

In ethnography and social anthropology, fieldwork is mainly associated with the technique of participant observation. Interviewing is either a complement of participant observation or a major facet of it. The participant observer operates simultaneously both as an insider and as an outsider. Different from any ordinary participant, who engages in activities appropriate to a social situation, he or she will go beyond ordinary engagement to observe the activities, people, and physical aspects of a given situation (Spradley, 1980).

Participant observation in ethnography is best described as a way to “hang around, talk to folks, and try to get sense of what is going on” (Wolcott, 1999, p. 33). Pragmatic as it is, this advice still generally holds true, although much has since been achieved in methodological sophistication and refinement.

Nowadays participant observation and interview techniques are paired as the dynamic duo of field research. Researchers who need to exert control over what they study design their own research strategy—both before going out and while in the field. Observations are (pre-) informed by a dawning understanding as this understanding is informed by new observations. Thus, alteration of the research strategy, even while out in the field, is recommended in the literature (Spradley, 1980; Wolcott, 1995).

Today’s recipe for good ethnographic field research is as follows:

You want to go there with your mind as open as possible. You want to be surprised and you want to let yourself be surprised, and you want to put yourself where you can be as surprised as possible, and then you wonder what it is like, how does it hang together, what is the picture, and that should be your stimulus to intellectual work analysis. (Sperschneider, 2000, p. 54)

So much for the overall attitude and “doings” of a genuine ethnographic fieldworker who works in social contexts. But what about short-term research vis-

its? What if one has to work under time constraints, if the design project does not allow for “hanging around, talking to folks, and trying to make sense of what is going on?” And what about when the goal is not to study social interaction, as in the case of ethnography, but to study change, as in the case of design?

1.2. Fieldwork in Participatory Design

When it comes to time constraints, ethnography seems to be the very antithesis of design. The ethnographer goes out into the field—for months, for years, in some cases for a lifetime. Lifelong companionship with field informants is not uncommon among ethnographic fieldworkers. Starting as observing participant, or privileged observer, the ethnographer at the end of his or her field study might have become a genuine participant. The ethnographer returns to his or her people—for gathering additional empirical material, for proving a redesigned hypothesis, or simply for reasons of solidarity and social engagement. The luckiest ethnographic fieldworker even might become initiated in his or her culture.

In a similar way, the designer might feel attracted to a “super-user,” for example, of a particular plant, or a supermarket. “It’s always good to know people; and it’s always good if they know what one is after,” one might argue.

When it comes to formal principles, ethnography again seems to be antithetical to design. Design is experimental. The designer seeks to create a future practice. Ethnographically untrained human–computer interaction specialists, who behave as ethnographers at their best—just in a much shorter time—often perform fieldwork in participatory design.

From a user-centered design point of view, design is a creative, exploratory activity in which the designers try to conceptualize, formalize, and express (verbally and visually) their ideas of future work practice, for example, with new technology. In a participatory design setting, the designer (as observer) seeks to understand the user’s tacit knowledge in using and interacting with technology.

The ethnographer (as participant observer) would rather talk of studying cultural rules in use and interaction with machinery and tools. More than just a matter of nuances in terminology, the difference lies in the focus of attention (tacit knowledge about technology versus cultural rules in using machinery).

Field research in design does not assume a level of involvement comparable to ethnographic fieldwork in a social setting for studying social interaction. Data gathering requires a minimum length of time and a particular consideration of the social and cultural context. If one knows which data to be gathered, then once that is done, one soon leaves for home for refining one’s inquiry. But in one aspect, design and ethnography projects are alike: when employing qualitative methods, both refer to an ongoing process rather than to a *fait accompli* (Wolcott, 1995).

1.3. Fieldwork and Theory

What remains to be covered in conceptions about use for similarities and differences between these two disciplines is the question of theorizing about observations in the field: the question about which, when, and how theory makes an entry

into the research process. Schools of various “-isms” each suggest different entry points for theory.

What has been said about design holds true also for ethnography: Heretical tongues of flame (of course unpublished) always spread rumors of disciplines poor of theory. Teachers in both disciplines help by advising students to reserve a closing chapter of a dissertation “where a self-conscious but genuine search for theoretical implications and links begins rather than ends” (Wolcott, 1995, p. 187). Experienced ethnographic fieldworkers, like Norwegian anthropologist Fredrik Barth, advise one to think of theories in multiple rather than monothetical form. According to Barth (1994), theories ought to be “explored and played with.” Fieldwork ought to be “a stimulus to your intellectual work analysis”; “you must build your argument on what is there in [the field] and not on what you have brought along [from theorizing at home]” (Sperschneider, 2000, pp. 56).

Herein meet problems of methodology and theorizing, of design and ethnography. The fieldworker in design could well follow the ethnographic fieldworker’s advice: “One step at a time, and then you anticipate of what is to result as end product” (Wolcott, 1995, p. 193).

2. FIELDWORK TECHNIQUES FOR USER INVOLVEMENT

The following five video-based research techniques drawn from our own work practice demonstrate some examples of different approaches for an ethnographically inspired strategy for participant observation research. The order demonstrates an overall desire to intensify user engagement and user centeredness in the design process. It also tells about our sympathy with the ethnographic ideal of going native.

Experimenting further with this approach by intensifying involvement with users, one even might go so far as to hand out video cameras to users and ask for a record of what they see in their field. The boundaries between users and designers become blurred.

These examples point drastically to one of the crucial aspects for the goal of a real participatory design approach: Field studies under industrial constraints need to be considered under overall time constraints.

Whether or not the ethnographer’s ideal is to go native, it could be a desirable goal for the designer. When one moves beyond the usability lab toward the co-design lab, some of the basics of the participatory design approach need to be reconsidered. One needs to look again to what we referred to when we drew inspiration from the ethnography genre for formulating a design-in-context approach.

2.1 Situated interview: Tell me what you do

The researcher interviews a user on location using qualitative interview techniques (see Figure 1). A questionnaire might be brought along; but its structure is not forced. Some questions formulated in advance will work in the situation one meets; most will need reformulation to adjust to what is there. Being there in context means that the user can refer to important things at hand.



FIGURE 1 Interview with a French chemical plant operator on the use of valves (1-hr visit).

2.2. Simulated Use: Show Me How You Should Do It

This case draws much on the basics of the ethnographic fieldwork approach: “tell me what you think you see.” Unlike an ethnographer’s participatory observation approach, one just observes simulated use, not life as it unfolds. The case has been made up, maybe in a laboratory, maybe on location at the workshop. However, its defining characteristic is simulation (see Figure 2).

2.3. Acting Out: Show Me Your Normal Procedure

Often users follow regular procedures in parts of their jobs. When asked, they will often be happy to guide you around to show you explicitly what their working procedures are (see Figure 3). While the user acts out his or her work at particular



FIGURE 2 German heating installers mount a pump on our premises (1-day workshop).

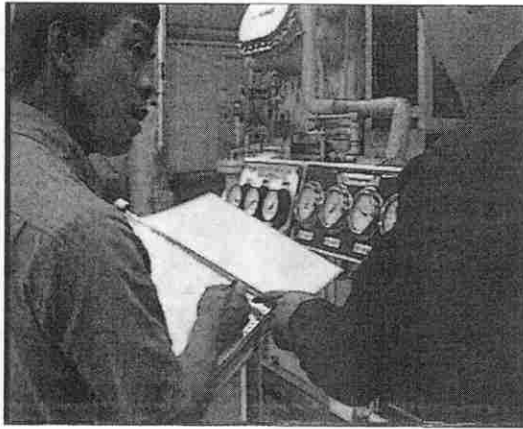


FIGURE 3 Japanese refrigeration mechanic demonstrates his daily round (1-hr visit).

places, one observes staged work routines. Acting out is about specific life situations as seen by users.

2.4. Shadowing: Let Me Walk With You

The designer follows users in their daily routine (see Figure 4). This does not work with a preformulated questionnaire, but one might work with a guiding hypothesis. The designer might even provoke the user with a mock-up in an anticipated situation without limiting his or her learning.

2.5. Apprenticeship: Teach Me How

The designer steps into the user's role. The designer is interested in learning about work routines by doing it himself or herself. As the user teaches the designer as his or her apprentice, the designer can draw on an insider's perspective (see Figure 5). Having observed and tried the work themselves, designers can reformulate questions they have brought along on location. They might even do this in collaboration with the user, who will in a way become a codesigner.

3. DESIGN-IN-CONTEXT

Working with user-centered design in an industrial company challenges the usability expert to do ethnographic fieldwork considering time constraints and tight project budgets. Nevertheless, in the User-Centered Design group at Danfoss, we have experimented with variations of fieldwork strategies, trying to compensate for some of the aforementioned problems with using ethnographic fieldwork techniques in industry.



FIGURE 4 We follow a Danish water treatment plant operators (1-day visit).

Two case studies are used to describe how we have used the ethnographic inspiration to move design activities into the field in design projects. The term *design-in-context* has been used to describe design sessions staged in the user's own work environment and based on scenarios developed by the user.

3.1. Improvised Video Scenarios on Location

The first example is from a development project at Danfoss where the User-Centered Design group was involved in designing a new flow meter concept with a portable service tool for process operators at a wastewater plant.

The design-in-context session involved two designers and two users, and it lasted 2 hours. We had prepared five simple foam mock-ups, emphasizing different features of the flow meter concept found interesting from a design point of view.

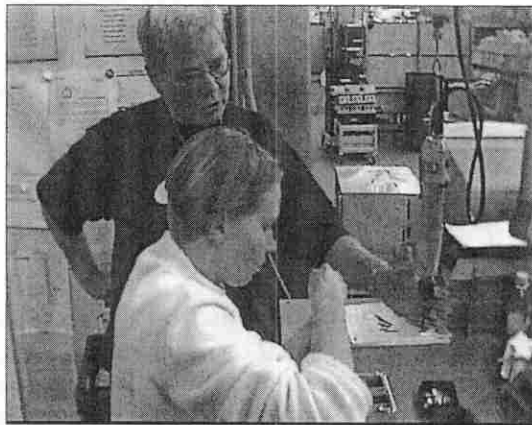


FIGURE 5 A Danish designer tries out a manufacturing work procedure (1-hr visit).



FIGURE 6 A wastewater plant operator picks a favorite design mock-up.

The mock-ups were shown to users at the plant, and they were asked to select their favorite mock-up and explain why they selected this “tool” (see Figure 6). After they had explained why they favored certain tools, they were asked if they could explore how the ideas would work in their work environment. As we walked out in the plant, we talked about where they would place the tools. The users showed us how a portable tool could be placed on a shelf inside the building while not in use, and how it should fit in their pocket when they worked outdoors.

From this moment on, the roles of the designers and users changed from those in a usual participatory design workshop, because now the users took control and set the stage for us designers. The users guided us around in their work context and showed us where they would use the tool, how they preferred to interact with it, and what the interface of the tool should show in different work situations (see Figure 7).

In a setting like this, we do not direct users to follow a scenario we describe. The users themselves create the scenarios as they guide us in their work context using simple foam mock-ups as design props. Despite their very primitive and simple looks, the foam mock-ups play a very important role as “something to think with” while the users explore and follow new ideas and as they design new concepts for future tools and new use situations. For a more detailed description of a similar case at Danfoss, see Binder (1999).

3.2. Co-Design Game and Moviemaking

The second example is a user workshop that took place in a vision project at Danfoss, with the aim of exploring water components for the future (Pedersen & Buur, 2000). In the vision project, the User-Centered Design group focused on how the user’s work environment and its instrumentation would look like in a future wastewater plant. What kind of requests would users come up with for products to accomplish future water-cleaning processes (Buur & Bødker, 2000)?



FIGURE 7 In the plant, operators improvise a work scenario with the mock-up.

The design event was a full-day user workshop in which 30 process operators, developers, marketing people, designers, and usability experts participated. They were divided into three teams and started with a design game in a meeting room at the company. The aim of the first design game session was to build a “state-of-the-art” wastewater plant, with its different water components represented by foam pieces on a map of a plant layout game board.

In the next session, the teams built the instrumentation of a future wastewater plant, using the same game pieces but with an empty game board instead of the plant layout.

The third session took place at a nearby wastewater plant. The three teams produced an on-site video showing a future scenario with the ideas from the design game. Each team was given a video camera, foam “props,” tape, and markers to design the components used in their future scenario. To get them started, we suggested that they imagine a situation in which a process operator shows an apprentice his or her future procedures. As the teams tried to establish the future plant layout from the game board, they started to discuss and explore the solutions in further detail to somehow visualize their design ideas and discussions for the video. At the end of the day, the teams presented their ideas (the movie and future plant layout) to the other participants.

This user workshop, especially the third session with the on-site video, encouraged participants to collaborate in a co-design event. Although the participants had different professional backgrounds and languages, during the day they developed a common design language throughout the design game and the design solutions. This helped all participants to understand today’s practices and to envision and explore new work practices in a real-use context. The co-design event narrowed the gap between the different professionals and their competencies, for example, designer and process operator. It worked because everyone was engaged in producing a video that expressed their design ideas about future components and work practices.

Thus the roles of the observer and the user blurred during the co-design event, in which everyone designed and tried to understand work practice in a real-use context.

4. DISCUSSION

This article has illustrated the general principles of ethnographical fieldwork, with examples of how ethnography has influenced participatory design settings in the User-Centered Design group at Danfoss A/S. With inspiration from the ethnographic fieldwork method, we have intensified user involvement in industrial practice and have moved from "pure" user observation to involving users in design-in-context sessions.

Design-in-context is collaborative: Users participate in workshops in the designer's domain, and designers engage with users out in the field. They do like the modern ethnographer: They invite the informants into their world—for various purposes, for example, film editing, transcription, translation, and accurate field note analysis—and they engage with them in their universe. What develops is a real design collaboratorium in which the emphasis is on contextualization.

The lack of a universal fieldwork recipe draws attention to processes. Any new design project requires rethinking a fieldwork or research strategy that once was applicable. Applying video techniques for both gathering data and exploring change seems to be a promising way to provoke new products for future use situations.

Even though industrial time constraints seem antithetical to "real" ethnographic fieldwork, our work has shown that much can be achieved in just a few hours.

Doing fieldwork is not a question of one particular technique; one must adapt methods to what is there.

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