

# Ethnographic fieldwork under industrial constraints: Towards Design-in-Context

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## ABSTRACT

In this paper, we discuss ethnographic fieldwork as a research technique for user centred design in the industry. We take a look at the original meaning of fieldwork in ethnography, and discuss how ethnographically inspired fieldwork can enrich research and data gathering in a participatory design setting.

The ethnographer in his 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'?

We present five cases of video based research techniques from our own practice as examples of a participant observation research strategy, and discuss how it is possible to move beyond observation.

The ethnographer seeks to understand the world as it is. The designer wants to change it through introducing new products. Is there a way to study the changes to come? Of involving users in design in their own work context?

We will introduce what we have termed 'Design-in-Context' through two cases of user involvement.

## Keywords

Participatory design, design-in-context, field study, ethnographic fieldwork

## 1 FIELDWORK AS RESEARCH

The last 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 US, full-

fledged partnerships have grown (Suchman 1995). The nature of these partnerships differ, but they all have in common the goal of analysing 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 is, that it is designed in the doing, as (Wolcott 1995) puts 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.*"

### 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. Differently from any ordinary participant, who engages in activities appropriate to a social situation, he/she will go beyond ordinary engagement in order 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). 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 our 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).

So much for the overall attitude and the 'doings' of a genuine ethnographic fieldworker who works in social contexts. But what about short term research visits? What if you have to work under time constraints, if your design project doesn't allow you to 'hang around, talk to folks, and try to make sense of what is going on'? And what about when your 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 field study might have become a genuine participant. The ethnographer returns to 'his/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/her' culture.

In a similar way the designer might feel attracted to a 'super-user', e.g. 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. Fieldwork in participatory design is often performed by ethnographically untrained HCI specialists who behave as ethnographers at their best - just in a much shorter time.

From a user centred design point of view design is a creative, exploratory activity where the designers try to conceptualize, formalize and express (verbally, visually) their ideas of future work practice e.g. 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 rumours 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). Experienced ethnographic fieldworkers, like norwegian anthropologist Fredrik Barth, advise 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 theorising at home)"* (Sperschneider 2000).

Herein meet problems of methodology and theorising, 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).

## 2 FIELDWORK TECHNIQUES FOR USER INVOLVEMENT

The following five video based research techniques drawn from our own work practice shall demonstrate some examples of different approaches for an ethnographically-inspired strategy for participant observation research. The order demonstrates our overall desire to intensify user engagement and user centredness in the design process. As well it 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 the users, and ask for a record of what they see in their field. The boundaries between users and designers become blurred.

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

Whether or not the ethnographers ideal is to 'go native', it could also be a desirable goal for the designer. When we move beyond the usability lab towards the co-design lab, we need to reconsider some of the basics of our participatory design approach. We need to look again to what we referred to when we drew inspiration from the ethnography genre for formulating a Design-in-Context approach.

### SITUATED INTERVIEW: TELL ME WHAT YOU DO

The researcher interviews a user on location using qualitative interview techniques. You might have brought along a questionnaire; but you won't force its structure. Some questions formulated in advance will work in the situation you meet, 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.



*Interview with a french chemical plant operator on the use of valves. (1 h visit)*

**SIMULATED USE: SHOW ME HOW YOU SHOULD DO IT**

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



*German heating installers mount a pump on our premises. (1 day workshop)*

**ACTING OUT: SHOW ME YOUR NORMAL PROCEDURE**

Often users follow regular procedures in parts of their jobs. When asked, they’ll often be happy to guide you around to show you explicitly what their working procedures are. While the user acts out his/her work at particular places you observe staged work routines. Acting out is about specific life situations as seen by users.



*Japanese refrigeration mechanic demonstrates his daily round. (1 h visit)*

**SHADOWING: LET ME WALK WITH YOU**

The designer follows the users in their daily routine. This doesn’t work with a pre-formulated questionnaire, but you might work with a guiding hypothesis. You even might provoke the user with a mock-up in a situation you have anticipated before, but you won’t limit yourself in learning.



*We follow danish water treatment plant operators. (1 day visit)*

**APPRENTICESHIP: TEACH ME HOW**

The designer steps into the user’s role. You are interested in learning about work routines by doing it yourself. As the user teaches you as his/her apprentice, you can draw on an insiders perspective. Having observed and tried the work yourself, you can reformulate questions you have brought along on location. You might even do this in collaboration with the user, who will in a way become a co-designer.



*A danish designer tries out a manufacturing work procedure. (1 h visit)*



### 3 DESIGN-IN-CONTEXT

Working with user centred design in an industrial company challenges the usability expert to do ethnographic fieldwork considering time constraints and tight project budgets. Nevertheless, in the User Centred 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.

With two case stories we will describe how we have used the ethnographic inspiration to move design activities into the field in design projects. We have used the term Design-in-Context 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 Centred Design group was involved in designing a new flowmeter concept with a portable service tool for process operators at a waste water plant.

The Design-in-Context session involved two designers and two users and it lasted two hours. We had prepared five simple foam mock-ups, emphasizing different features of the flowmeter concept we found interesting from a design point of view. We showed the mock-ups to the users at the plant, and asked them to select their favourite mock-up and explain why they selected this "tool". After they had explained why they favoured certain tools, we 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.



*Waste water plant operators picks a favorite design mock-up*



*In the plant, the operators improvise a work scenario with the mock-up*

From this moment on the roles of the designers and the 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.

In a setting like this we don't direct the users to follow a scenario we describe. The scenarios are created by the users themselves 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 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 2000).

#### 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 and Buur 2000) In the vision project the User Centred Design group focused on how the user's work environment and its instrumentation would look like in a future waste water plant. What kind of requests would the users come up with for products to accomplish the future water cleaning processes? (Buur and Bødker 2000)

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*" waste water 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 waste water 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 waste water 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 where a process operator shows an apprentice his/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 in order 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 and especially the third session with the on-site video encouraged the 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 e.g. designer and process operator. It worked because everybody was engaged in producing a video expressing their design ideas about future components and work practices.

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

## 4 DISCUSSION

We have illustrated the general principles of ethnographical fieldwork with examples of how ethnography has influenced participatory design settings in the User Centred 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: he/she invites the informant into

his world - for various purposes, e.g. film editing, transcription, translation, and accurate field note analysis, and he/she engages with them in their universe. What develops is a real design collaboratorium where the emphasis is on contextualisation.

The lack of a universal fieldwork recipe draws attention to processes. Any new design project requires to rethink a field-work/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, we have 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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