A New Role for Anthropology? – Rewriting "Context" and "Analysis" in HCI Research

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ABSTRACT
In this paper we want to reconsider the role anthropology (both its theory and methods) can play within HCI research. One of the areas anthropologists can contribute to here is to rethink the notion of social context where technology is used. Context is usually equated with the immediate activities such as work tasks, when and by whom the task is performed. This tends to under represent some fundamental aspects of social life, like culture and history. In this paper, we want to open up a discussion about what context means in HCI and to emphasize socio-structural and historical aspects of the term. We will suggest a more inclusive analytic way that able the HCI community to make "better" sense of use situation. An example of technology use in a workplace will be given to demonstrate the yields this kind of theoretical framework can bring into HCI.

Author Keywords
Anthropology, context of use, ethnography, socio-cultural, socio-structural.

INTRODUCTION
The use of technology is not a given; rather, we use tools and technology to interact with each other and/or cooperate with each other in various social contexts. Human-Computer Interaction (HCI) research emphasizes the importance of understanding the social context in which this interaction occurs. The role of ethnography, other than as a research methodology, within HCI has been to point out the importance of understanding the social context, the routines of users' workday, its practical management and organization. However, the use of ethnography in HCI-research and particularly in design is not unproblematic as the ongoing discussions about the role of ethnography suggests. For example, designers and developers tend to use ethnography instrumentally as a form of data collection in order to identify and solve problems. Results of ethnographic analyses are expected to feed directly into the interests and issues on the technology development. This is due to a misunderstanding of ethnography's role in social science (Anderson 1994; Dekker and Nyce 2004; Forsythe 1999). The way ethnography has been used in HCI has been questioned and criticized (e.g. Anderson 1994; Bader and Nyce 1998; Dourish 2006; Forsythe 1999; Nyce and Bader 2002; Nyce and Löwgren 1995; Räsänen and Linqvist 2005).

It is time to rethink the role anthropology (both its theory and methods) can play within HCI research. Today in the HCI community anthropology is generally equated with ethnography. This is unfortunate because anthropology can provide the HCI community with an interpretive agenda one that can help strengthen traditional HCI research. What the concept context means within the HCI research is something we have more or less taken for granted. There it often refers to the immediate context in which work and system development occurs and/or where a certain technical artifact or a computer is used. Underlying this definition of context is something like an empiricist agenda where context essentially "disappears." Here events and actions are given priority and are regarded as significant because they can be counted. To reduce the social world (context) to a series of actions, no matter how complex or situated, ignores the constitutive power that socio-cultural context has for individual actors.

The more we know about the socio-cultural and historical circumstances the users live in and act on, the better the chances that we can design technologies that support the users' everyday work. What we are suggesting here is the need for a more analytical, more inclusive way of understanding technology, its design and implementation. This, we believe, would be the contribution anthropology can bring to the field of HCI community.

We start with an introduction to ethnography then turn to how the social context has been defined in HCI. Next we will demonstrate what this analytical "turn" can contribute to the study of technology use in the workplace.

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ETHNOGRAPHY IN HCI

Ethnography started to appear in HCI in the 1980's. Ethnography's original role in IT research was critical one, drawing attention to failings of conventional forms of research to capture the differing perspectives of use situation (Crabtree 2004). It pointed to and stressed importance of the daily routines of users' workday, its practical management of organizational contingencies "the taken-for-granted, shared culture of the working environment, the hurly-burly of social relations in the workplace, and the locally specific skills (e.g., the 'know-how' and 'know-what'), required to perform any role or task" (Anderson, 1994: 154). The formal models, and methods common within HCI at the time were found to be "incapable of rendering these dimensions visible, let alone capturing them in the detail required to ensure that systems can take advantage of them" (Anderson, 1994: 154). It also became obvious that one reason for why computer applications fail is insufficient attention to the social circumstances of work (Hughes, King, Rodden and Andersen 1994; Suchman 1987/1990). Ethnography was thought to be a method that would give access to these dimensions.

However, the use of ethnography in HCI-research and particularly in design is not unproblematic (e.g. Bader and Nyce 1998; Nyce and Bader 2002; Nyce and Löwgren 1995). Designers and developers tend to use ethnography instrumentally to identify and solve problems. It has been "reduced to a realistic strategy, it collects things and 'answers' questions. In the design-and-development community, what a 'problem' is takes an instrumental, pragmatic turn. In particular, what a 'problem' is and how to 'solve' it get reduced to a series of practical interventions and practical outcomes" (Nyce and Bader 2002: 35). This again reflects the legacy of an ethnography whose role is to handle event(s) and action(s) in order to "predict" outcomes. Ethnography here is reduced to a useful method to gather, understand and specify end-user requirements in order to inform the systems design. "Instead of focusing on its analytic aspects, designers have defined it as form of data collection. They have done this for very good, design-relevant reasons, but designers do not need ethnography to do what they wish to do" (Anderson 1994: 151).

There is often a gap between accounts from the field and how this "information can be of practical use to system developers" (Schmidt 2000: 141). Even if designers work closely with users and representatives of ethnography and psychology in the particular setting, "the objectives of the experiment are clearly defined and the technological options identified and bounded in advance" (Schmidt 2000: 148). The "traditional" ethnography does not necessarily fit the requirements and ways to work in a design project. For example, requirement analysis is reductionist in character, which in some important ways sets it apart from ethnographical analysis (Crabtree and Rodden 2002). There are differences between an "adequate account" for the purposes of social science and one for the purposes of design with intention to contribute to the development of the occupational practices in question (Crabtree 2004; Crabtree and Rodden 2002; Shapiro 1994).

Within HCI research ethnomethodology (Garfinkel 1967/2002) has been promoted as the kind of ethnographic approach what is needed in design (Crabtree 2004). There had been within HCI a tendency to confuse or equate ethnomethodology with ethnography. Those who followed Garfinkel held to epistemological beliefs about facts and sciences that were congruent with HCI of the time: These were largely derived from academic psychology of the time. However taking this position on fact and epistemology weakened the kinds of ethnography practiced in HCI (Nyce and Lowgren 1995). It reduced ethnography to a kind of empirical exercise and this lessened the kinds of contributions ethnography has been able to make to the study of man-machine operations. Whatever criticisms one wants to make of ethnography, as practiced in HCI, it offered an opportunity to better specify design practice; the results then, in turn improve the innovation and invention of the future (Button and Dourish 1996; Crabtree 2004; Crabtree and Rodden 2002).

This is true, to a greater or lesser extent, of all three kinds or "strands" of ethnography practiced in HCI today. The first is what could be termed the British school, practiced by sociologists who following Durkheim tend to regard ethnography as a research method that when properly employed, can capture "facts" that can lead to strong statements about what kinds of technological and design interventions will "work". The work done on air traffic controllers exemplifies this strand. The second strain has already been outlined. This strain tends to follow Garfinkel and treat ethnography as a kind of "exhaustive" data collection method. This strand tends to focus on the microparticular, often using techniques borrowed from socio-linguistics. This approach is often found in computer-supported cooperative work (CSCW) research. It seldom makes statements about "facts" collected, except to note that more work, more adequate microanalysis in fact, will be required before any authorative statements about design can be made. Both strands tend to equate context with "place", i.e., the category itself is treated as relatively unproblematic. They focus on moment-by-moment action of each human actor and tend to neglect or underestimate the influence of others who are not present (Charlmers 2004; Giddens 1984/2004). The third strand argues for the need for "strong" ethnography – one which follows Weber not Durkheim, emphasizes interpretation not discovery and what ethnography can tell us not only about the practices of others but our own. The approach is concerned not only about the production of the society but also its reproduction as series of structures (Anderson 1994; Bader and Nyce 1998; Chalmers 2004; Dekker and Nyce 2004; Dourish 2006; Giddens 1984/2004; Nyce and Bader 2002).

These distinctions, while significant, tend to be lost in design and development. Having said that, it needs to be acknowledged that starting from such entry points can diminish the returns ethnography or any other analytic inquiry based tradition of field research can make to the problem at hand.

Recently, the idea of informing design, a key belief of HCI has been strongly questioned. Dourish (2006) criticizes the politics and conditions under within which the ethnographic work is done in HCI. By "forcing" ethnography to work towards "implication for design", it misplaces and misconstrues the ethnographic enterprise. In short how to get ethnography to "work" and "work well" within system development has not yet been resolved. Dourish suggests that ethnography (that is the ethnography that goes beyond the "implications for design") has a critical role to play in system design; it provides models for analyze settings and what is going on there. In addition, it may also uncover constraints or opportunities in particular design practices and therefore help to shape research strategy (Dourish 2006; see also Nyce 2005). One of the areas social scientists such as anthropologists can contribute to is the articulation of social context where technology is used. It seems appropriate to draw from that experience, especially since the social context is at core of HCI and CSCW research. Ethnography properly conducted can open up what social context "means" in general terms and how it should be taken into account in a particular design and development project. In this paper we will suggest an analytical position that is in line with social science traditions such as social and cultural anthropology. We suggest that this analytical frame will enable HCI community to "make sense" of use situation. It is this connection between social science and context we want to stress and elaborate on here. Bringing back to HCI more analytic understandings of what context is will help HCI practitioners both "deepen" and "expand" their own research agendas. This, we believe, would be the contribution anthropology can bring to the field of HCI research. However, let us first see what social context seems to mean in HCI community.

THE NOTION OF SOCIAL CONTEXT IN HCI

Within HCI and related research areas such as CSCW the concept of social context has much been discussed and debated. There are several reasons for this. It became obvious that one reason for why systems fail is the insufficient attention to the social context where the technology is used, for example at work (Hughes et al. 1994). Human activities involve practices and relations that become meaningful and can be understood in a particular setting and context, and these need to be studied and understood (e.g. Ball and Ormerod 2000; Blomberg, Giacomi, Mosher and Swenton-Wall 1993; Blomberg, Burrell and Guest 2003; Dourish 2001a; Nyce and Löwgren 1995; Suchman 1987/1990). New technical opportunities such as falling costs, sizes, and power requirements have opened possibilities for computers packaged in a variety of devices. These changes also emphasize the need and importance to understand and pay attention to the notion of context. However, what context means, what is included and left out when we talk about context, and its role in research on interactive systems is still somewhat unclear.

Depending on our research focus, we choose how context is defined. Within the multidisciplinary research area of HCI the different disciplines tend to bring in their various understandings of what this concept means. How the term is defined reflects the different disciplinary backgrounds such as psychology, computer science and anthropology we find in HCI. Some of the starting points for approaching the notion of context include different research areas and positions such as learning (e.g. Chaiklin and Lave 1993) and context-aware computing (e.g. Dourish 2001a, 2001b, 2004; Dey, Abowd and Salber 2001; Chalmers 2004). Development of several methods and techniques, such as contextual design (Wixon and Holtzblatt 1990) and weak and strong ethnographic methods reflect the need for understanding context in which users act (Nyce and Bader 2002; Preece, Rogers and Sharp 2002; Spinuzzi 2000).

It is difficult to precisely define the concept of context. It is "slippery", a concept "that keeps to the periphery, and slips away when one attempts to define it" (Dourish 2004: 29). However, there have been attempts at clarifying the term for handling the different kind of needs in the HCI research and practice. Schilit and Theimer (1994) acknowledge the changing environments influence computer use and find the location information necessary for users and applications. User's location, environment, identity and time specifications when the application is used are aspects found in the early context definitions (Dey et al. 2001). There are also debates over specificity. Dey et al. (2001), for example define the context as "any information that can be used to characterize the situation of entities (i.e., whether a person, place, or object) that are considered relevant to the interaction between a user and an application, including the user and the application themselves" (Dey et al. 2001: 106). Having said that, in the HCI literature context is typically limited to "place", i.e., the location, identity, and state of people, groups, and computational and physical objects.

The notion of context in HCI (particularly in context-aware computing) has dual origins (Dourish 2001a, 2004). It is a technical notion that offers "system developers new ways to conceptualize human action and the relationship between that action and computational systems to support it" (Dourish 2004: 20). Many HCI approaches also rest implicitly or explicitly on divergent social science traditions. Because this has been seldom acknowledged, it is worth taking some time to trace out how HCI has appropriated various definitions of context, especially in relation to studies of work and technology.

Context and situated action

One of the most influential social analyses of context in HCI research is Suchman's (1987/1990) analysis of social action based on ethnomethodology, an analytic approach to social analysis developed by Garfinkel (1967/2002). This approach focuses on the practical, everyday, ordinary achievements and actions of members of a particular society rather than focusing on structural constructions and principles or categories like culture and society. Garfinkel's point about the need to decouple social theory from observation reflects a particular moment in time. But the manner in which this was "translated" into HCI has meant that field studies in HCI have been largely atheoretical, mainly descriptive and not very strong analytically (Anderson 1994; Forsythe 1999). Suchman (1987/1990) applied Garfinkel's strictures to the dominant formal planning model within the computer science at that time. Suchman showed that people's interaction with technology (in her study a photocopier) exhibited moment-by-moment, improvised character. She suggests that "however planned, purposeful actions are inevitably situated actions", they are "taken in the context of particular, concrete circumstances" (Suchman 1987/1990: viii). Suchman did point out the situated nature of action but her analytic project essentially stopped there. Garfinkel wanted to specify the logic that underlay and informed particular situations. In other words, Suchman never took the next step, i.e., to make statements about the principles that inform social action. Having said that, her work is a welcome critique of positivist/empiricist accounts of human social action (Dourish 2004). Even today the concern for and importance of the social context in system design is often motivated by Suchman's research on "situated actions." It remains an open question however whether Suchman ever does more than equate context with interaction. Further, it seems that Suchman treats context as nothing more than the total sum of actors' actions.

About the same time Lave (1988) started to write on "social anthropology of cognition" and focused on the cognition as a complex social phenomenon outside the laboratory. Lave focuses on the practice of mathematics in a range of common, everyday settings, for example individual's grocery-shopping in a supermarket. In this study Lave also explores the notion of context and uses the notion "arena" to explain where the activity takes place. A supermarket is an example of an arena, whereas a "setting is generated out of a person's grocery-shopping activity and at the same time generates that activity. Lave (1993) argues that persons acting and the social world where the activity take place cannot be separated. Therefore the activities of a person cannot be analyzed in isolation. The context should be "viewed as a social world constituted in relation with persons acting" (Lave 1993: 5). But again Lave's borrowing from Goffman and Garfinkel needs to be considered carefully. Reducing the social world to an arena where only individuals and individual performative acts "count" tends to reinforce the idea that the only thing that is worth studying is action itself. It also diverts one from asking some fundamental questions about what informs and renders meaningful each "performance." This reduces the social world and context to series of individual unrelated "acts" or "events." The result is that the social world is seen only as something that is "made up as we go along." This in turn neglects the role that elements like structure, history and culture have in rendering a social world meaningful to those who inhabit it.

Context and embodied action

Dourish (2001a, 2004) argues against the positivist design tradition where context is often presented as being identical to environment or setting – one that consists of a set of features that can be encoded and made available to software systems much the same way as any activity can be encoded. What Dourish argues against here is the assumption that it is possible without significant analytic work to capture, represent and model context in a system. Rather, he wants to broaden the notion of context and argues that context cannot be equated with interaction. In effect Dourish like Weber wishes to remind us that there is a link between action and meaning, that these together inform what we mean by context and that structure, history and culture, not just individual action constitute, inform and influence what context means for those who both participate in and study it. Again following Weber, the basis for understanding context lies in lived experiences, context is something that people do, as outcome of "embodied practice" or "embodied interaction" (Dourish 2001a).

Through practice we can resolve the problems of context, Dourish suggests. An embodied action approach to interface design, Dourish believes, would allow us to "uncover, explore, and develop the meaning of the use of the technology as it is incorporated into practice" (Dourish 2001a: 239). It is not clear for example that the manner in which Dourish wishes to rewrite practice, away from descriptivism and towards embodiment, is sufficient to make context "disappear" as an empirical or an analytic problem. The issue remains how to tie meaning to context in ways that are not as reductionistic as what Dourish proposes.

Situated and embodied approaches to the social context of technology use are, in our opinion, widely used within HCI research. There are several other ways of understanding context that are not discussed here. For instance there is a behaviouristic view in which the context of activity is caused by environmental configurations, see further for example Barker's framework on "behavior settings" (cited in Lave 1988: 149). The cognitive psychology approach much used within HCI is only noted here, for further reading see Lave (1988) as well as Chaiklin and Lave (1993). Another theory used in the HCI research is the Soviet cultural-historical research tradition, commonly called activity theory. According to the activity theory persons are engaged in socio-culturally constructed activity, which defines the context. "Contexts are activity systems.

An activity system integrates the subject, the object, and the instruments […] into a unified whole" (Engeström 1993: 67; see also Greenberg 2001; Nardi 1996). Some like Nardi have argued that this framework by refiguring both the objects of social analysis and social analysis itself can finesse seemingly refractory problems like context. Others believe that these problems are not intractable, do not need to be treated as such and regard them instead as central, even necessary, to how we think about the social order (Nyce 2005).

Extending our approach

How the term social context is defined reflects differences in intellectual and research paradigms. Agreement on a single definition of the term t may not even be possible (Goodwin and Duranti 1992/1997; Dilley 2000). However, the tradition of inquiry, which HCI has appropriated from the social sciences, has tended to equate context with various notions of action and activity. What underlies these traditions is a positivist/empiricist agenda where actions are significant because they can, eventually be counted and what can be counted can by itself explain what is going on in a particular social context. However, to reduce the social world to a series of actions, no matter how complex or "situated", reduces the constitutive power that context has for individual actors and their specific actions. Within HCI, we do not seem to ask enough questions about what gives a particular context the significance and meaning it has for those involved in it. The HCI community does not seem to be overly concerned about how actions and practise are constituted. Questions we have more or less ignored include; what structures inform practice? What is left out when we argue that human action alone produces context?

Socio-cultural and historical aspects of context are important here since action is almost always bounded in historical context, where previous, mutual knowledge of actors play a crucial role (Bourdieu 1984/1996, 1993; Giddens 1979/1990). In HCI, Chaiklin and Lave (1993), and Dourish (2004) have acknowledged the role that cultural and historical elements play in everyday practice. In Nyce and Löwgren (1995) and Nyce and Bader (2002) this is carried a bit further. They discuss how the fundamental categories (such as practice and change) are often taken for granted leaving out cultural as well as historical features. In their analysis, the authors examine the participatory design tradition and point out that it stands on and reflects Nordic traditions of cooperation and collaboration in the workplace. Chalmers (2004) also notes historical elements of context.

In anthropology there is an attempt to understand each society, phenomena or practice as a whole, in more inclusive terms "to throw light on the varied interconnections among ideas and practices" (Hannerz 2001: 516). The approach has informed anthropological research since Malinowski's fieldwork on Trobriand Islands in the 1920's. "Holism" refers to the idea that any and all aspects of a society are more or less interrelated components (Malinowski 1922/1961). What this means is human action and institutions, if they are to be understood, need to be placed in their cultural, social and historical context. Malinowski points out the importance of understanding the parts as well as the whole; regardless of one's main analytical interest, e.g. economic life, constant reference has to be made to "social organization, the power of magic, to mythology and folklore, and indeed to all other aspects as well as the main one" (Malinowski 1922/1961: xvi).

Such an analysis requires situating behaviors and meaning in their "total" social, historical and cultural context. Since Malinowski what holistic implies has been re-defined and so have the kinds of projects anthropologists take on. Yet anthropologists continue to ask questions like these. However, can any study really be holistic? Is it possible to achieve a holistic view of any social, cultural phenomena? How this question gets answered also reflects a number of research issues such as the focus of the study, time limits and financial resources as well as the fact that each analysis and interpretation is partial and limited by the researcher's perspectives and goals as well as the audience being addressed. But too often these arguments seem to confuse holism with completeness (reaching the end of an analytic project) and exhaustiveness. The idea of wholeness itself has also been criticized (Kuper 1992). Most people do not picture their society or culture as systematic wholes, but rather as kinds or parts of knowledge and tradition that are invoked for specific reasons at a particular time and place.

This brings us into a central problem in social sciences; how to connect in analysis the various layers such as individual and society perspectives? What social elements (forces, motives, causes, consequences) characterize the relationships between the individuals and society? According to Giddens, perhaps the most important contribution the social sciences can make to intellectual discourse is to rework conceptions of human being and doing, i.e. social reproduction and social transformation (Giddens 1984/2004). However, "micro" and "macro" levels of analysis are often kept separate in the social sciences. Giddens argues that there is no necessary conflict between the two perspectives; one is not more fundamental than the other. Pitting them against each other implicates that one needs to choose between them. This "unhappy division of labour" (Giddens 1984/2004: 139) tends to separate analysis and theoretical standpoints, which Giddens believes is unfortunate and he puts forward structuration theory as a solution to this problem.

When Giddens talks about structure, he does not mean those Durkheimian "facts" and features of social life that define what can or cannot be done. Rather he is concerned with what is "internal" to individuals both in memory and embedded in social practices, i.e., those "conditions of social action that are reproduced through social action" (O'Brien 1998: 12). Social action (forms of conduct) is

situated in and reproduced through time and space – both of which are organized independently; for Giddens structure is both generative and transformative. It is both the "medium and outcome of the practices they recursively organize" (Giddens 1984/2004: 27).

Giddens believes all human beings (actors) are knowledgeable, reflective individuals (agents) who can and propose social change. They know what they are doing in their everyday lives, the conditions and consequences of their action. They can also discursively describe what they do and why (however, the description is not required or necessary in order to conduct the day-to-day situations). The knowledgeablility of human actors however is restricted by unconscious as well as unacknowledged conditions and unintended consequences of their actions (Giddens 1984/2004). The term structuration captures both the routine sense of practices as well as the continuation and justification of them. Analysis of day-to-day life is therefore essential to analysis of the reproduction of institutionalized practices. However, everyday activities should not be treated as the "foundation" of social life, but rather as "connections [that should] be understood in terms of an interpretation of social and system integration" (Giddens 1984/2004: 282).

THE NUMBER OF OPERATORS WORKING

Let us use an example to suggest how social context might be "expanded" in HCI research. The following vignette is an observation the first author made during her fieldwork in a Swedish call centre workplace, the Police Contact Centre. The Police Contact Centre in Stockholm is located on three separate islands in the archipelago with management and headquarters on mainland. The Contact Centre is a distributed workplace, i.e. an arena where approximately 45 staff members belong to one organization sharing the same primary work task; to handle telephone reports from the general public concerning committed crimes, not ongoing crimes.

One morning in October 2002, Kerstin was sitting at a work desk next to the researcher's desk. There was a telephone, a computer screen, a keyboard and a mouse on her desk. There was also a notebook, pens and papers, and a pile of damage reports of graffiti found in buses, underground trains and station areas in Stockholm. That morning Kerstin was assigned to register the reports of graffiti, in a police computer application. Kerstin was doing this work one report at a time. There was a display on the telephone. Kerstin looked at the display and to herself made a comment on the high number of incoming telephone calls as well as the low number of persons logged in. She looked around her in open-plan office and turned back to the damage reports and her computer. Now and again she glanced at the telephone display. After awhile she put a sheet of paper on the telephone to cover the display and hide the information (the number of operators logged in, the number of incoming calls). Some time went by and she continued to work on the damage reports using her computer. Then, again Kerstin paid attention to the telephone. She removed the paper and looked at the display. She sighed deeply and looked around her in the open-plan office. Then she covered the display again and continued to work on the graffiti reports. Now and again Kerstin lifted the sheet of paper and checked the display as she continued to work on her graffiti reports.

More than action

We will now attempt to unpack what seems to be going on in the previous vignette. Kerstin's actions, as any other actions and practices need to be understood in relation to time, location and setting. Following Giddens, some questions immediately come to mind. What is the moment-to-moment action here? What does structure mean to one's informants like Kerstin? Do we need history or culture, two central structural properties, to understand what is going on here? Can we infer (discover) what that is through workplace observation alone? A related question is what kind of discovery procedure, or analysis or interpretive operation, will enable us to make sense of "what's 'really' going on here?" Finally, can we learn from this example about the design, development and implementation of work technology?

The telephone is probably the most used working device in the Police Contact Centre. All incoming telephone calls regarding the crime reports from the general public are distributed through the same automated call distribution system to a free operator regardless where she/he is. The display on the telephone showed the total number of incoming telephone calls from the general public placed in queue to the operators in the Contact Centre. It also showed the total number of operators logged in to the call distribution system and ready to receive telephone calls. As long as she/he was logged in to the call distribution system, it "handed" the operator telephone calls. The system allowed operators five minute "breaks" after each finished telephone conversation. The number of telephone calls queuing is regulated in proportion to the number of available operators. Generally speaking, the higher the number of operators the higher the number of telephone calls accepted into the call distribution system. The display on the telephone showed the most current information of the number of calls as well as number of operators accepting calls.

When asked, Kerstin explained it was important to keep herself up to date about the work loads of others in the Contact Centre. She did not like to do other work when the number of incoming telephone calls was high. That morning she had raised a general question about what work really counted. Could filing graffiti reports, she had asked, really be more important than answering incoming telephone calls? Later, Kerstin and her fellow staff members explained that the checking on the queue had

much to do with "responsibility towards the work tasks" and that this helped insure that "the work was done."

Kerstin was not the only informant to monitor the telephone display. Everyone else in the Contact Centre did the same while they wrote or read e-mails or were engaged in a conversation with someone else. If they noticed that the number of incoming telephone calls increased, they would start to take telephone calls. When the number of incoming calls is high, it most likely means long waiting times and some degree of irritation for the persons calling. This in turn creates a stressful situation for the staff, because callers often start their conversation with complaints about how long they had to wait. In spite of this, there are reasons for not being logged in the call distribution system. One of them is, as seen here, other work tasks. For number of reasons an employee needed to log out of the call distribution system in order to complete a report for police. The regular (at that time) five minutes delay between the telephone calls was not always enough time for employees to complete this task.

Once the operator logged out, i.e. left the call distribution system, information on him/her was no longer available on the telephone display. For Kerstin and her fellow staff members at the same location this was not a problem. They saw each other anyway and that way could keep on apprised of person's whereabouts. At the other two locations (the three Contact Centre sites share the responsibility for processing calls made to the police), it was not always clear what happened regarding call queuing. Did an operator at another site quit working? Posted, shared information about staff and working hours often did not answer the questions operators had at a particular moment. This information could not be obtained in any other way. Several times during the fieldwork it occurred that the staff wondered what was happening on the other two sites when the number of operators shown on the telephone display was low. It had also happened that the staff from one site called another to ask, "What is going on [there]?" Those who received the telephone calls did not appreciate this. What underlay, it seemed, these conversations was different sometimes divergent understandings of work and work responsibilities.

Not knowing what was going on the other two sites, especially why the number of in logged operators was sometimes low, was an issue that came up again and again at the Contact Centre. The question was also raised at semi annual joint workplace meetings, conferences for all the Contact Centre staff. At one meeting, it became clear that this issue was a sensitive one – one that raised the spectre of control and surveillance. However, the staff concluded, "We must trust each other." At this meeting, they also raised a number of related work issues. The five minutes delay between the telephone calls, staff argued, is sometimes too short a time to finish up a report before the next call arrives. Telephone displays staff added did not always show accurate information, which pointed to another question of trust, i.e. trust regarding technology.

Out of sight – the bigger picture

In every workplace employees create ways of finding out what is going on, who is doing what and who is available for a discussion and/or lunch. The telephone is an important tool in the Contact Centre, not only as equipment for making and receiving telephone calls. The numbers on the telephone display represented current information regarding the workload. This information and the way it was interpreted became a kind of thermometer – one that said volumes about the climate at the workplace. The telephone became an instrument staff used to plan, make sense of and prioritize work. It was also used to checking on [in Swedish kolla, ha koll] to interrogate and "control" each other. While checking on someone has a somewhat positive meaning in this context, issues related to accountability and surveillance was present there too. At the time, for all Contact Centre employees, these were important, unresolved issues. The fact they came up as in discussion at a joint workplace meeting with a tight time schedule shows how important they were at the time.

"Out of sight, out of mind" [Syns du inte, finns du inte] was a flashing text-slogan on an advertisement board on Fridhemsplan in Stockholm a few years ago. The problem the telephone display raised for the Contact Centre employees was that it made their work, all their work "visible". In effect, their work was never out of sight, out of mind. As a result, work, especially the work of others, not only could be inventoried but interrogated as well. In open-plan office these issues, especially how to balance control and trust, are complex enough. They are compounded in the Contact Centre because both work and responsibility is "spread over" four geographically dispersed sites.

Those who work in the Contact Centre use telephone displays to "take the temperature" not just of their own particular work environment, but also of all those they collaborate with. Working and "sense making" across and between three different workplaces points to a more complex notion of context than the ones we in HCI usually invoke. It is also a kind of context that may become more common as labour and work is outsourced and internationalized. Much of what we hear today re: outsourcing falls into the categories of dogma and rhetoric. What we have with the Contact Centre is a work form, i.e. outsourcing HCI researchers have not paid much attention as of yet. Not only does the Contact Centre represent a kind of outsourcing, i.e. a movement of capital, infrastructure and labour here quite literally "off shore". It also represents a kind of internal or inverted colonialism in that the decision to outsource this work to the archipelago recapitulates a long prior history of bringing this region and its islands under state control and "into Sweden". What is at work here are just the kinds of historical, socio-structural processes HCI researchers have not acknowledged or paid

much attention to. Nevertheless they have a profound effect on work and work conditions in the archipelago.

In order to understand what a particular representation stands for, in this case what appears on staff telephone displays, it is necessary to come to an understanding of how different signs and meanings become embedded in a working day and what these signs mean. Here both use and meaning are iterative. Prior use and experience feeds into to interpretations of subsequent activity, which in turn informs and affects use again. It is not enough to treat these representations instrumentally, to be content with "unpacking" the semantic "load" they carry and acquire only in reference to the "job" itself. If we confine ourselves empirically and analytically to just this, we will miss a whole series of tacit and situated notions that we also need to unpack if we are to understand what is going on in work at specific sites.

In the early days of the Contact Centre one informant described the work; "We are very anxious about our work. We needed to fight for the work opportunities on this island." Several times, work at the Contact Centre was described as a kind of struggle. Not only was there a need to bring new economic opportunities to the archipelago. Staff also believed they had to work hard to keep jobs there. Again we can find here parallels to dilemmas found wherever outsourcing occurs. The issues outsourcing rise for those who do the work got reframed away from power, control, or even hegemony and into issues about collective and individual (moral) responsibility. Given this, no wonder staff studied their telephone displays so carefully.

At a number of levels, not all of them discursive, those whose work we study have to, to be successful, both make sense of and employ a repertoire of a tacit and situated understanding that extend beyond the "job". Further knowledge of this order of things enables what Giddens terms mutual understanding - the epistemological basis he tells us is necessary to carry out any adequate interpretive work in the social sciences. This "know-how" while embedded in and informed by history, even if only near-by history of the workplace, informants cannot directly report to us. What is implicated in this near-by history is the notion of "a living archipelago". This concept implies the modern Swedish state's commitment to improving living conditions in the archipelago. Normatively, the state's intention here is to protect and preserve the archipelago's nature and culture. What this commitment to "a living archipelago" reflects however is long-term historical debate on the place the archipelago should have in Sweden. This is not so much a debate about boundaries or regions anymore as it is one about how both the destiny and history of a particular locality is to be defined and determined. The archipelago has long played an important role in negotiation about place and power in history of Sweden. This is a debate that essentially revolves about the role central government should play within the nation and who in society determines the "order of things". As Giddens reminds us, it is, if the kinds of analysis we do are to remain "faithful" to the world in which our informants live, we cannot neglect, as HCI researchers often have done, these "larger" issues, structures and strictures.

CONCLUSION

Is it enough just to point out that "the taken-for-granted, shared culture of the working environment, the hurly-burly of social relations" (Anderson 1994: 151) exists? Or do we also have to come to an understanding, an interpretation, of these events that extends beyond acknowledging that the particular social reality we are studying is a complex one? Do we really want to have argument and interpretation "stop" once when we acknowledge that studying events of this kind is "hard to do?" Or as often said in the HCI literature "hard to capture" beyond a certain point? The critical issue is, if we "stop" here do we without realizing it, weaken both the kind of science we wish to do in HCI and the kinds of practical advice we can give designers and developers?

What anthropology gives us are ways to extend what we generally mean by social context of use. In particular, what come into view are the different layers, aspects and perspectives of our everyday life. This adds to the understanding of action, practice that is already the focus of (ethnographic) HCI research. By looking beyond the use of an artefact and the artefact itself, we can start seeing the relationship, in particular, between the agency and structure. What this offers is a way to connect "micro" and "macro" analysis. While the framework is not complete, it does provide us with analytic terminology to start talk about key issues – ones that link individual practice to the context within which these practices occur.

What we offer here, borrowing from anthropology, is an opportunity to reframe this work. If we do this, it would help us avoid the temptation to reify or empiricize social action and thus mispresent its significance. A more productive line of attack would be to try to explicate the social (re)production of action. Comparative perspectives, structuration theory, contextual analysis, the understanding of various processes, phenomena and relationships in their "holistic", "cultural" and historical context are all means to this end. This would help us meet the new challenges the HCI research is facing. If the HCI community would like to strengthen the kinds of research it carries out, HCI should, we believe, extend its analytical toolbox in these directions.

Mistaking interaction for context can turn attention all too quickly to the individual and individual actions. This encourages us to write accounts of failure and success that implicate only individual actors. To correct for this individualistic fallacy, we need to move beyond immediate situation (workplace, organization) and bring into the kinds of analysis we do "larger" historical, socio-structural processes and discourses, which both individuals and technology take part in and are shaped by. The more we know about the socio-structural and historical

circumstances the users live in and act on, the better the chances that we can design technologies that support the users' everyday work. What we are suggesting here is the need for a more analytical, more inclusive way of understanding technology, its design and implementation. This, we believe, would be the contribution anthropology can bring to the HCI community.

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