

# Knowing Through Relations. On the Epistemology and Methodology of Being a Reflexive Insider

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**Abstract.** Empirical studies of information and communication technology (ICT) are often done by researchers who work closely with practitioners. Acquiring a role as an insider researcher gives the researcher performative knowledge of the phenomenon that is being studied. Performative knowledge can provide valuable insight into a design process, but this requires that the researcher records her practical experiences, including the sensory, and subject them to analysis. In this paper, I propose that a commitment to a relational epistemology and the positioning as a reflexive insider can open for attending to the performative knowledge gained in the field as a source of data. I will call for attending to the relation to things and places, as well as to people during fieldwork, in analysis and in writing up the research. I will draw on an ethnographic study of a pilot project in Bangladesh to discuss this.

**Keywords:** Design of ICT, ethnography, insider-research, reflexivity, relational epistemology, performative knowledge

## 1 Introduction

The study of the development and use of information and communication technology (ICT) often entails that the researcher works closely with practitioners, and thereby acquires an insider-role in the organization or project. Having a role as an insider, either formally or by association, can give access to performative knowledge [1, see also 2] of the domain that is being studied. Performative knowledge can, for instance, be knowing how an information system functions through the practical experience of using it or knowing how an infrastructure develops in an organization through experiencing how connections between things, people, and places are crafted in practice. Sensory experiences, such as sound, smell, and touch, is part of this. Such insights can contribute to valuable insights into the use and design of ICT, provided that the researcher reflects on the performative knowledge gained as an insider and is able to turn it into data. Whether and how performative knowledge is turned into empirical data is, however, a matter of epistemological commitment as well as methodological choices. While ethnography, with its emphasis on participant observation, has become a cherished methodology in design-oriented ICT research, it is often performed as in-situ interviewing with the production of verbal data only as a result. In this paper I will draw on anthropological perspectives and my own ethnographic study of the piloting of a solar electricity grid to discuss how a commitment to a relational epistemology [3, 4] and a researcher role as a 'reflexive insider' [1, 4] can open for attending to performative knowledge, including the sensory aspects of this, in studies of use and development of ICT. Much has been

written about social relations in the literature about insider research [5–7]. I will also attend to how the researcher gets to know a practice through relations to things and places. Lastly, I will discuss the challenges of subjecting performative knowledge gained through relations with practitioners to academic analysis and publishing and suggest that a self-revealing, evocative, and empathic writing style can be useful for inviting reflections about practices and design.

## **2 Being a Reflexive Insider in Design-Oriented ICT Research**

As computers became an increasingly common part of professional life during the 1980s, a body of literature investigating the relation between design and use of technologies emerged. In 1979, Rob Kling and Walt Scacchi [8] made the then-novel observation that while computers are designed to be a time-saving and problem-solving technology, they generate their own special problems. They noted that many of the problems associated with computing arose from the way the technology was embedded in complex social relationships. Instead of viewing computers as tools, they proposed an understanding of computers that expanded beyond the physical device and “included a diverse set of skills, organizational units to supply and maintain computer-based services and data and sets of beliefs about what computing is good for and how it may be used efficaciously” [8 p.108]. The emerging attention to the social character of computing called for incorporation of social science methodologies in the toolbox of ICT researchers. Ethnography became cherished because it provides methods and concepts for turning experiences gained from being part of a group into research data.

While gaining access to the field is often a major hurdle for social scientists who do ethnography, ICT researchers are often eagerly included as insiders because of their de facto or assumed technical skills (see [9] and [10] for reflections about this). What can be known by being an insider researcher does, however, not only depend on the access one gets as an insider but also on how one engages this insider position. Just as an anthropologist can lose the necessary analytical distance by “going native”, an ICT researcher can become so immersed in problem-solving that she lapses into a “tool view” and foregoes the opportunity to reflect on the practices and processes through which an information system or device is constituted. Even if the researcher manages to pay attention to social and organizational aspects, doing ethnography is easily reduced to moving around with informants as they go about their daily tasks and using this an opportunity to do in-situ interviews. Doing this will favor verbal accounts of practice over participant observation as empirical data, and opportunities for contributing with valuable insights into the design of ICT will be lost. Doing research as an insider in a team can give access to performative knowledge of practice, but reflexivity is necessary in order to be able to articulate this knowledge. In the following, I will elaborate on researcher roles and reflexivity.

### **2.1 Researcher Roles and Reflexivity**

Design-oriented ICT research often entails acquiring an insider-role in an organization or project. By ‘insider-role’ I mean a role that entails an overlap between the researcher’s and the informants’ tasks and commitments. An example is a researcher who is not only studying the process of developing an information system

but also contributing to its development through practical tasks like writing code or through detecting and assessing solutions to emerging problems. Michael Rosen [11] argues that doing research as an insider in an organization or a project can potentially give access to knowledge that is derived from not only “performing the actions of a task, but also engaging in the social relations in which the task is embedded” [11 p.16]. David Mosse [1, 4], who has written an ethnography of the development aid industry based on his experience as a consultant in the British development agency DFID, highlights how shared sensemaking between the practitioners and the ethnographer is a key element in gaining performative knowledge of professional practice. With ‘reflexive insider’ I refer to a researcher who articulates and analyses the performative knowledge gained through an insider-role.

Action research [10, 12–14], engaged scholarship [15, 16] and insider ethnography [1, 5, 11, 17] are examples of labels that refer to insider-roles in research. The insider-role is, however, not merely a matter of choice of research methodology. John Van Maanen and Deborah Kolb [6] distinguishes between primary and secondary access to the field. Primary access to the field is granted through negotiations with gatekeepers, such as management. Secondary access to the field concerns the role that the researcher develops in relation to the informants. Reciprocity is of great importance. Ethnographic fieldwork and insider-research of other kinds rely on the informants' hospitality and willingness to invite the researcher to participate in their daily activities. Being able to give something valuable in return, whether this is practical help, strategic advice, or being an attentive listener, is important for sustaining the informants' generosity in this regard. In the case of design-oriented ICT research, researchers are often practicing reciprocity through making their professional skills available [see for instance 9, 10]. However, there are also other ways of acquiring an insider-role in this kind of research. A researcher without the appropriate technical skills might be assigned a role as a kind of apprentice, or as a kind of secretary that can be trusted to keep meeting minutes and do other kinds of documentation. While non-expert insider roles do not require that the researcher shares the professional skills of the informants, it does, however, demand some ability to engage with the professional knowledge of the informants in a meaningful manner [see 18 for a discussion of hybridity in applied anthropology].

The issue of secondary access does nevertheless concern more than the researcher's ability to engage in reciprocity. It also concerns the capacity to establish and maintain interpersonal relationships, such as showing commitment and reliability and behaving in a trustworthy manner [6]. These less tangible capabilities will determine whether the researcher will be granted access to the field beyond formal points of entry.

Establishing secondary access to the field is a matter of forming and sustaining relationships. However, forming tight connections with one group will often entail obstructing the possibility of access to other groups. A researcher who is frequently seen eating lunch with the management might have trouble getting access to employees further down in the hierarchy. Hence, rather than understanding the relational work in the first phase of fieldwork as a matter of gaining secondary access, it can be more aptly conceptualized as constructing the field [19–21]. This conceptualization will tune the researcher into attending more closely to how the relations that are formed facilitates certain forms of knowing the community or phenomenon that is being studied and excludes other. Such reflection is important as methodological considerations, but attending to how and why relations emerge and unfold can itself be an entry to insight about the community, phenomenon, or practice that is being studied.

Establishing relationships with practitioners, sharing some of their tasks and commitments, and learning to apply their sensemaking are elements of being a reflexive insider. Yet, gaining performative knowledge is not only a matter of social

relations and cognitive frames. It also entails the ability to reflect on the sensory experiences of participating in the practice that is studied.

## 2.2 Attending to the Sensing Body

Attending to sensory experiences is conventional in some strands of design-oriented ICT research, such as participatory design and Human-Computer Interaction. ‘Reflection-in-action’ [22], ‘knowing-in-action’ [2], and ‘tacit knowledge’ [23] are some of the central concepts used. In other fields of design-oriented ICT research, such as information systems (IS) research, the sensory aspects of living with technology have received much less attention. At the turn of the century, Claudio Ciborra [22] argued that the attention to situatedness in information systems research, advocated by Lucy Suchman [26] among others, was overtly focused on cognitive processes. He argued that the emotional state is an inseparable part of situatedness [24, 25], and advocated closer attention to the role of emotions in information systems design. However, with his focus on emotions, Ciborra does not to any significant extent attend to the sensing body. He focuses on mood, in the sense of emotional state, rather than on affect, in the sense of the physical experience of emotions. More recently, Mads Bødker [27] has called for a focus on embodiment in information systems research. He asks: “in Walsham [28] we find a distinction between ‘outside’ and the ‘involved’ researcher, but we are left without a reflection on the embodied presence and engagement of action research – where, we might ask, is the engaged *body*?” [27 p.2]. He argues that attending to the bodily experience of taking part in the practice that is being studied instead of focusing merely on what informants say about what they are doing, is important in research aiming to inform the design of technology. Further, he suggests that we think about fieldwork as ‘sensory apprenticeship’, and proposes data generation that facilitate the “felt qualities of being and being-with technologies,” such as using ‘walk alongs’ as a method. A sensory focus in information systems research should, he argues, be accompanied by new modes of representing research. This could be visual, acoustic, poetic, or mobile modes (he suggests “soundwalks” and “smellscape”) [27]. While I do support Bødker’s call for innovation in the representation of research, I am also wary that attention to the sensory aspects of engaging with technology be sequestered to untraditional, and arguably obscure, modes of representation. I will argue that the sensory aspects of being with technologies should rather be treated as empirical data on the same level as verbal data, and be represented in conventional academic text. I will argue that embracing a relational epistemology can facilitate this.

## 2.3 A Relational Epistemology

I support Ciborra’s and Bødker’s call for challenging the dominating focus on cognitive processes and verbal accounts. As ICT researchers often work alongside practitioners in projects, I want to promote the opportunity of being a reflexive insider who attends methodologically to the performative knowledge they gain from participating in practice. This is a matter of methods, such as writing detailed fieldnotes about practice. It is also a matter of embracing a relational epistemology. This entails that what you come to know as an ethnographer cannot be separated from the relationships through which you have generated this knowledge [3, 4]. The anthropologist Kirsten Hastrup distinguishes between knowledge that is posited as

‘object knowledge’, which works by way of objectification, and ‘relational knowledge’, which attaches itself to relations between people or between people and objects [3 p.456]. Arguably, the position of relational epistemology is covered by the label ‘interpretive’, which is often used in design-oriented research such as Human-Computer Interaction (HCI) and Computer Supported Cooperative Work (CSCW) [29]. I will argue, however, that embracing a relational epistemology is productive because it draws attention to the performative knowledge of being with people, things, and places while ‘interpretive’ emphasizes the cognitive knowledge generated from making sense of such experiences.

Embracing a relational epistemology will necessarily call for an inductive methodology, where the data generation is guided by how relationships form and unfold in the field. This includes relations with people, but also relations to things and places. In the following, I will explore this through an example from my ethnographic study of the piloting of a solar electricity micro-grid [30].

### **3 Gaining Performative Knowledge of Infrastructuring – an Empirical Example**

The “Green Bangla project” was a partnership between University of Oslo and a Bangladeshi telecom company I call “Deshi Phone”. It was a pilot project that aimed to develop a system for electrification that would utilize the existing infrastructure of mobile towers to produce solar electricity for remote villages. In Bangladesh, as well as in many low-income countries, the mobile network infrastructure covers areas where the national electricity grid has not reached. Many mobile towers in remote areas are powered with solar electricity, and by adding an additional set of solar panels to a mobile tower, it can potentially produce sufficient electricity to operate a micro-grid for nearby households and businesses. Deshi Phone’s motivation to pilot this system was twofold. Maintaining mobile coverage in remote areas is expensive. If the customers in these areas do not have access to electricity, they will not be able to use their phones, and as a consequence, the return on investment in the mobile network will be low. Deshi Phone also understood the pilot project as an initiative of corporate social responsibility, and as a consequence providing electric lights to households was prioritized over providing mobile charging facilities. University of Oslo has for many years conducted action research on health information systems for low-income settings. The lack of electricity access is an obstacle to the scaling of this system to remote areas, and the pilot project was seen as an opportunity to develop a solution to this problem. After having identified a suitable village and gained the permission of the decision-makers there, the project partnered with a local entrepreneur who would be responsible for the day-to-day management of the grid and be compensated by free electricity and a cut of the monthly electricity fees paid by the connected households.

#### **3.1 Developing a Researcher Role**

I did an ethnographic study as a member of the project team and participated in the piloting of the micro-grid between 2010 and 2015. In this period, I spent six months in Bangladesh distributed on several trips. For the first half year, the micro-grid functioned well. For the next three years, the electricity system was riddled with frequent breakdowns of technical as well as operational character. Two attempts of

redesigning the grid turned out to be not successful, and the grid that had initially connected 136 households with electricity to power one lightbulb each was dismantled in January 2015.

My successful application for a Ph.D. fellowship marked my primary access [6] to the field. Since the pilot was a partnership between Deshi Phone and University of Oslo, 'Ph.D. student' was one of the predefined roles of the project, in the same way as 'solar electricity engineer'. In this role, I was expected to conduct research to be used in a Ph.D. thesis, and also to be an insider in the project, in the sense of committing to the goal of developing an electricity system and participating in some of the tasks necessary for achieving this goal. Finding tasks where I could make a meaningful contribution to the project would be important not only for fulfilling the expectations to me as a pilot team participant but also for being included in the arenas that were important for me as a researcher. I soon experienced that time was a scarce resource in the Deshi Phone headquarters. Due to this, my offer to write meeting minutes and prepare documents and presentations was a welcome contribution that also increased my opportunity to participate in meetings. While I did not have previous experience with solar electricity systems, I have worked in the telecom industry and was familiar with the part of the pilot that concerned this. I have even for a short period worked in Deshi Phone, so I started the fieldwork with some previous knowledge of the organization. My knowledge of the industry and the company enabled me to produce adequate documents, and in return, I was included in discussions and decision-making processes.

Getting access to conduct research in the village, which I call 'Haorbari', was very important to me. As an ethnographer, I would ideally spend longer periods in the village, but for various reasons, this turned out to not be feasible. One of the reasons had to do with my role as an insider in the pilot project. In a discussion about the trade-off's between conducting research as an observer and as an insider researcher, Michael Rosen [11] highlights trust as one of the main factors to consider. Once an ethnographer becomes positioned as an insider in an organization, he or she will be part of the politics of that organization, and cannot be expected to be trusted by informants in the same way that a researcher with an outsider position may be. I found that every conversation I had in the village would be directed to me as a pilot team participant, and hence someone potentially able to decide whether the electricity grid would be expanded or not. My initial plan was to study how the electricity grid changed daily life in the village, but the role that was assigned to me in the village obstructed this plan. As a consequence, I decided to turn my attention to the process of developing the electricity infrastructure. While I would not have to conduct an ethnographic study of the village, I still needed to acquire some knowledge about the community and to do interviews with different types of people. My ability to do this hinged on the hospitality of Bidyut, the entrepreneur who did the day-to-day management of the grid. My visits to the village turned out to be both a source of tension and an asset for Bidyut.

When I visited the village, I usually stayed two or three days. On several of these trips, I was accompanied by a field assistant who helped me with my inadequate Bangla. Sometimes when we returned from our walks in the village, I noticed that Bidyut seemed disgruntled. One day he vented his frustration and said that by roaming around in the village and talking to people, I harmed the respect he enjoyed in the village. I realized that my informal interviews could be understood by him as well as others as an attempt to assess Bidyut's performance as a grid operator. I felt guilty about having acted in a way that could jeopardize Bidyut's reputation, but as a Ph.D. fellow, I also felt obliged to do methodologically sound data gathering. For this reason, I could not allow Bidyut to fully control my selection of people to interview. Bidyut and I came to an agreement that I would always tell him where I was going,

and I took care to convey that Deshi Phone and University of Oslo were satisfied with the work Bidyut did in the project.

While my research activities in the village were a source of tension for Bidyut, my presence was also an asset to him. Bidyut was not only an entrepreneur but also a local politician. Being a broker of resources from outside the village is important for acquiring a position as village elite in Bangladesh [31, 32]. Sitting behind the counter in his shop and walking in the market, I impersonated Bidyut's connection to Deshi Phone and a foreign university. In between my visits, Bidyut made me as well as other pilot team members present in the form of photos on the wall and on the desktop of a computer that was available to his customer.

### 3.2 Reflexively Constructing the Field

The analysis of ethnographic data is intertwined with writing, from choosing what to write and not write in the field journal, via drawing on literature to write out preliminary analyses, to choosing an overall framing while writing up the story. Patterns and discrepancies in an ethnographic material emerge through writing [33]. In the following, I will describe how writing field notes was central in the process of constructing the field.

When I planned my research project, I had two main aims. I wanted to contribute to the design of a concept for rural electrification, and I also wanted to study the changes that access to electricity brings to a community. My initial understanding of my role as an insider researcher was that this would give me access to the field, which I understood as the village where the grid was to be piloted. In addition, I envisioned that I could contribute to the design of the electricity system with knowledge about economic conditions, societal organization, household practices, and other important issues. Applying Hastrup's [3] distinction between 'object knowledge' and 'relational knowledge', I find that I sought object knowledge about rural electrification and its consequences.

Based on my previous experience from international development, I did not expect that building an electricity grid in a village and making it work would be smooth sailing. Nevertheless, I was not quite prepared for the length and depth of the stretch between the plans that we developed and the practice of acting on these plans. Neither was I prepared for the emotions that developing an electricity system would stir in me in me as well as others involved, nor how this would influence the process. This included enthusiasm and joy of creating something that could improve people's lives, but also frustration and feelings of shortcoming and shame when we were not able to live up to the expectations of ourselves as well as others. Enthusiasm and joy were important drivers for getting the grid up and running in the first phase of the project. In the later stages, the increasing frustration caused tensions and conflicts that threatened the sustainability of the electricity system. I wrote about this in my field journal, along with notes about technical details, budget, and village organization. At first, I approached the notes about interpersonal relations and emotions as reflections about the experience of doing fieldwork. One example is a passage in my field journal that I wrote after my first visit to Haorbari.

My field assistant and I spent the night in the village's administrative building. After retreating under the mosquito net in the large, naked room, I could not fall asleep, even though I was exhausted. It wasn't only the howling of the packs of dogs roaming around in the village that kept me awake. More than that, it was a pressing feeling of anxiety and a bodily sensation of alarm. I tried to reason with myself that I was totally safe and had nothing to worry about, but whatever my mind tried to invoke, my body was terrified. When I wrote about this after my return to Dhaka, I

was ashamed that I had not been braver. However, writing about the experience forced me to dwell on it instead of yielding to my impulse of suppressing it. My first articulations of the experience were concerned with a feeling of lack of control. I traced this to an episode that had taken place in Bidyut's shop earlier that night. Many people had come to see me. They had revealed high expectations to the future development of the grid, and I had felt that my attempts at curbing these expectations were not entirely successful. Some had talked about how members of the market committee were opposed to the project because it could potentially alter the power equilibrium in the market. Bidyut had told me that he was worried about his personal safety in the case someone would be injured by electric shock. The complex political, economic, and physical relations that the newly implemented electricity grid was about to form with Haorbari emerged in my consciousness. It also dawned on me that these relations were not quite under control.

This articulation of a lack of control highlighted that there existed multiple interpretations of the pilot project and different agendas for its development. I wondered how the pilot project could deal with this multiplicity. A combination of a pragmatic consideration that my insider-role was an obstacle to my initial plan of doing a village study, and a realization that understanding how multiple interpretations and agendas could co-exist would be crucial for developing a sustainable electricity system, led me to define the pilot project itself as the unit of analysis. I started applying an analytic sensitivity to the work that was done to hold the electricity system together as a physical, economic and organizational structure. I looked for a conceptual lens that could help me analyze this work, and I found infrastructure literature [e.g., 34, 35], and in particular Star and Bowker's text about 'how to infrastructure' [36] to be helpful. With this lens, I changed my understanding of the occasional friction between the Deshi Phone employees, Bidyut, and me from being merely obstacles to being occasions to get insight into different enactments of the electricity system. I did, for instance, approach the conflict between Bidyut and me about my interviewing as an occasion to understand how he used his connections to University of Oslo and Deshi Phone to enact the electricity system as a political object, geared towards consolidating his position as businessman and politician. The Deshi Phone employees and I sometimes disagreed about what should be prioritized in the project and under which circumstances it would be reasonable to shift priorities. This compelled me to both reflect on my own enactment of the pilot project as research, and on how the Deshi Phone employees were subject to an internal audit through a system of Key Performance Indicators (KPIs). One of them did, for example, have a KPI on the monthly electricity fees to be paid by the households. If a significant number of the households did not manage to pay their fee, it would have consequences for how he was rated in Deshi Phone's performance system. Hence, electricity fee payment was high on the list of priorities for him.

When road erosion caused by the monsoon rain delayed our travel to the village, I reflected on the lack of attention to the local landscape in the planning of the pilot. These reflections triggered ideas for how we might accommodate fluctuations of the landscape into infrastructuring. The problems that the project team had with finding a mobile charging system that could be integrated into the electricity grid became more than a practical problem; it also became an occasion to explore issues of standardization of technology.

By attending to the unfolding relations between me, the other people involved in the project, the places where we did our infrastructuring, and the things that were involved in this, I was sensitized to aspects of infrastructuring that would otherwise have not been so easily seen. The following example of what is happening as a list of 'action points' travel from the Deshi Phone headquarters to the village is an illustration of this.



### 3.3 Making Action Points

*This is how my week looks! I have meetings back-to-back every day!* Tariq, one of the Deshi Phone employees, shows me the calendar on his mobile phone. The calendar is divided into 30-minute units, and most of the slots from 9 am to 5- 6 pm are filled up with meeting invitations. It is a Monday in March 2012, and Tariq has squeezed in a meeting with Masud, one of the other pilot team members from Deshi Phone, and me. We use one of the small, glass-walled meeting rooms in the office landscape where the Technical Division resides. The seats of the barstools are hard and slippery and invite brief information exchange rather than prolonged discussions.

When we have conference calls with our colleagues in Oslo, Masud or Tariq need to book one of the meeting rooms that are equipped for this. These meeting rooms do not have glass walls, and they have chairs that are comfortable to sit in for a long time. Yet, these rooms also seem to be governed by the 30-minute structure revealed by Tariq's calendar. Each room has a small display by the door, which shows who has booked the room and when the next booking starts. Unless the booking is made well in advance, it is hard to find a free slot for an hour or more.

When I am in Oslo and my colleagues and I have conference calls with Dhaka, we usually meet in advance so we can go through the agenda together and align our views. When the desktop phone rings, we push the loudspeaker button and take turns leaning towards the receiver when we have something to say. We start by stating who is in the room and exchange some pleasantries to establish an amiable atmosphere for the meeting. Since we cannot see each other, we cannot rely on facial expressions and body language to maintain a good ambiance. Sometimes the sound quality is bad, and our different English accents don't help. I find that simple, short sentences work best for getting a message across. When the sound is particularly bad, I close my eyes to shut out visual impressions so I can put all my efforts into the hearing.

Contested issues are not easily included in this careful and choreographed form of conversation. Without the possibility for calibrating the wording according to facial expressions and body language, we risk amplifying conflict rather than sorting out disagreements. Similarly, the conference calls do not provide many resources for exploring hunches. The beating around the bush that could get a hunch confirmed or discarded is difficult to do in an environment that encourages straightforward statements and questions. Mutual exploration of ideas is another form of collaboration that is difficult to manage in the conference calls. This is partly due to the practical challenges of avoiding talking all at once when one doesn't see each other. It is also due to the difficulty of establishing an atmosphere that encourages the sharing of ideas as well as critique when we cannot monitor reactions as we speak.

In the headquarters, our activities are organized according to hours and minutes. Time is a scarce resource available in 30-minute chunks that may be combined into longer sessions. The conference call environment appeals to the auditory sense and limits the possibilities for other kinds of sensory engagement. The complexity of interventions in the village has to be reduced to a form of representation that fits the 30-minute units of the conference call room, and rendered in a description thin enough to pass through a voice channel to Oslo. The output of the conference calls is often a list of 'action points'; a list of tasks to be done. What happens to the action points when we bring them out of the headquarters?

### 3.4 Talking Through Action Points

It is February 2013, and the micro-grid is in a bad shape. There have been many electricity outages, and despite high demand we have not been able to deliver outlets for mobile charging. Now we have managed to put a plan together that includes mobile chargers, and we are ready to proceed with the implementation. I am relieved that we are finally on our way to Haorbari to present the plan to Bidyut. In the car, time is outside of our control. We might spend hours in a traffic jam, and factory workers on strike might block the road so we have to take a detour. We have ample time to think and to talk to each other. After a while, I turn to Anwar, one of the engineers, and tell him how happy I am that we have finally found a way of providing outlets for mobile charging. Anwar replies that he didn't see the mobile chargers included in the budget that is negotiated with the vendor. The vendor representative Biplob confirms this; his company has not agreed to include mobile chargers in the deal. For the rest of the car ride, I worry about how this will be received in the village.

Late in the evening we arrive in the district town where we will spend the night before traveling the last stretch to Haorbari by boat. After dinner, we meet in one of the hotel rooms to go through the schedule for the day after. I sit in an armchair, while the men lounge on the bed, some of them smoking. I am eager to end the session quickly because it is getting late and we have to leave at seven in the morning. To my dismay, what I would like to be a brief recap of the action points turns into a brainstorming session about how to improve the operation of the Green Bangla system. Biplob, the vendor representative, has several objections to our plans, and his interference annoys me. I feel that he is pulling our plan apart without regards for the work it has taken to put it together. *We cannot sit here close to midnight in a hotel room and discuss issues that are already decided!* I exclaim angrily. The thought of yet again facing Bidyut and the grid customers without a detailed plan for the overdue restructuring makes me tired to the bone, and I want Biplob to stay out of this whether or not his suggestions are sound. We discuss for a while and finally agree that we will present the plan for the technical restructuring for Bidyut as it is, but that the new operational model will need some more work. When I go to bed, I cannot decide whether I am happy about how this turned out or not. I am relieved that we have avoided yet another loop of sketching, discussing, and deciding on a plan for the restructuring. At the same time, the evening's elaborate discussion about the feasibility of our plan has uncovered some serious weaknesses. I worry that the plan may, in any case, fall apart when we try to put it into effect in the village.

This story shows how plans that are forged in the headquarters come loose in response to the temporal, material, and social properties of being on the road. As for the temporal properties, time in the headquarters appears as equally sized units, and as a scarce resource. The project members negotiate who will give up which amount of time to do particular tasks, and push aside other tasks scheduled to free some time for the Green Bangla project. The limited time in the headquarters motivates structured information exchange and discussions, rather than loosely structured explorations of the tasks ahead. It encourages us to produce bullet point lists that sum up main issues rather than extensive planning documents, such as memos.

A contrast between the temporal properties of the time in the headquarters and the time on the road is that time on the road is abundant. The headquarter environment is characterized by scavenging for time. In the car, time appears as flowing towards us as hours and hours of slow traffic. On the road, we have ample time to think through the action points we have committed to. Since no one has any meetings to rush to, we can discuss the tasks ahead at length. When we have time to attend to details of the plans, we sometimes find important issues that are neglected. When we think through

the practical execution of the tasks ahead, we often identify obstacles we haven't thought about in the planning meetings. However, while we can do minor adjustments ad hoc, decisions about major issues need to be taken in the headquarters. This leaves us with an increasing gap between how the plan was envisioned in the headquarters and how we prepare to act on it.

The list of action points loosens in its joints not only due to the temporal properties of being on the road but also due to its material and social properties. In the car, we sit close to each other for many hours. To pass time, we talk about things we are interested in, relationships to family and friends, aspirations for the future, and so on. We fall asleep, and we stop for food and bathroom breaks. In the car, we interact not only in our professional roles but also as private persons. Being together for many hours in informal spaces blurs the boundaries between our private and professional roles. This makes us able to ease in on sensitive issues in the project through joking or conversation about private matters. "This is my personal opinion" is a phrase often used inside the car to mark a statement as "off the record." These "off the record" conversations are valuable because they allow us to address tensions in the project and explore solutions without putting it on a formal agenda.

### 3.5 Walking Through Action Points

It is an early September morning in 2011, and Masud and I climb into the car to drive to the boat that will take us to Haorbari. We have planned to stay one night only in the village and have a list of things we need to accomplish while we are there. After we have climbed into the car, Masud pulls out the to-do-list from his bag. *If we manage to complete all tasks by today, we can leave this afternoon instead of tomorrow!* he states optimistically. The list contains a meeting with Bidyut to discuss problems with the grid, a community information meeting, a meeting with the local bank to submit the electricity fees that have been collected the last few months, and finally some filming for a promotional video that we hope will attract more funding for the project. Masud sketches a schedule for the day so we can get everything done and still be on our way before sunset. Traveling by boat after dark can be dangerous. However, the schedule starts to unravel before we arrive in the village. Potholes and herds of cows slow us down on the road to the ferry landing. Dense carpets of water hyacinths get in the way of the boat. We have asked Bidyut to invite the household heads to a meeting at 10am, but when we finally arrive in the village, we are more than an hour delayed. It takes time for Bidyut to summon the group again. The men have other schedules to keep. Time in the village is structured according to the daylight, and although he doesn't say so, it may be that Bidyut already has had trouble convincing people to come to a meeting at 10am. Community meetings are generally held at night after the men's workday is over. Masud's hope of completing the tasks on the to-do list before sunset is overly optimistic not only because the tasks themselves are time-consuming but also because they cannot be done back-to-back. We need to adjust to Bidyut's schedule, and to the schedule of the other people that we depend on.

Completion of our tasks is not only challenged by the daily rhythm of the village, but also by the weather and the material properties of the landscape. During some visits, heavy rainfall obstructed our plans. Rain makes people reluctant to come to meetings. Rain also turns the soil into mud so walking the few hundred meters from Bidyut's shop to the mobile tower becomes an arduous journey. The mud is simultaneously slippery and sticky, pulling the feet into involuntary movements that require the right combination of force and balance to avoid falling. In the dry season, the mud is transformed into fine dust. It feels good to step into the powdery puddles with sandals, but this whirls up clouds of dust that gets into our throats and eyes. To

avoid this, we walk with careful steps in a single file at the edge of the road where the course grass binds the dust.

As we slowly walk along the paths of the village, we meet people. Some of them are grid customers, and others are not but would like to be connected to the grid. They ask questions about whether we plan to expand the grid. Some of the people we encounter do not agree with our plans and challenge our choices. Many confront us with the lack of mobile charging opportunities, and ask when we will sort this out.

The material, temporal, and social properties of traveling in a car and hanging out in a hotel room facilitate talking through the action points. In the village, we walk through them: From the ferry landing to Bidyut's shop, to the mobile tower and following the electricity line back again. As we walk through the action points, they unfold in response to the landscape and the social environment in Haorbari. The sticky or powdery soil wedges the bullet points in our to-do-list apart by resisting our attempts of walking fast to complete all our tasks before sunset. As bullet points on a paper, the action points appear as compatible with the strictly organized and scarce time of the headquarters. In response to the daylight-time of Haorbari, the action points stretch. An innocent-looking list of five bullet points can expand to unmanageable proportions.

In the village, our plans are exposed to the criticism of the grid customers and their unconnected neighbors. Sometimes they bring up issues that we haven't thought about and that make our plans unravel. Face to face with the people who will have to live with our interventions, the decisions made in project team meetings become personal. They are personal to the people we talk to, as it concerns if and when they will get a mobile charging outlet in their homes, or if their still unconnected house can expect to be included in the Green Bangla infrastructure. The choices made by the project team also become personal to us, the project members, as we are made accountable for the project team's decisions.

Another characteristic of being in the village is that we have to take many decisions without having time to reflect beforehand. When we meet people on the path, we need to reply there and then. We can say that we will have to discuss the matter in Dhaka before we can say something definite, but we still have to give some kind of response. When we talk to Bidyut on the phone, we can choose to not answer the phone, and we can end the conversation after a brief talk. When we are in the village, we have to respond immediately, and we cannot dodge difficult topics by ending the interaction. This characteristic of being in the village was most prominent on the occasions when I travelled on Bidyut's motorbike. He used these occasions to voice his frustrations with the project. Chest to back with Bidyut, our bodies rubbing as we traversed the bumpy path, I had no opportunity of feigning a distraction or being aloof. I could not take a time-out to formulate a good reply, or ask someone from Deshi Phone to deal with his concern instead, but had to respond immediately.

When we leave the village and are no longer exposed to the Haorbari environment, the action points cease to be interventions in ongoing processes in Haorbari and turn again into plans, to be evaluated in retrospect. Sitting quietly in the car for many hours, we contemplate the gap between the action points and what we managed to do. Did we allow ourselves to get too caught up in the relations in Haorbari? Removed from the immediate experience of being there, we start wondering whether we should have insisted on completing more of the tasks and resisted the demands for immediate response. Back in the headquarters, the action points become a list of tasks that are either executed or not.

## 4 Knowing Through Relations to People, Things, and Places

In the Deshi Phone headquarters, reflections on the practice of infrastructuring in Haorbari is restricted by the spatial and temporal properties that promote short and targeted meetings with unambiguous results. While we could talk about the complexity of developing the grid, the emotional and sensory aspects of crafting the necessary connections in Haorbari were not fully available in this environment. At the same time, the immediate concerns and material attributes in Haorbari pushed away the emotional and sensory aspects of the practices in the headquarters in Dhaka. Hence, moving between these environments was important for knowing what the practice of infrastructuring implies.

David Mosse [1] emphasizes shared sensemaking as a key element in gaining performative knowledge. In the Green Bangla project, a variety of issues like technical details, budgetary priorities, logistics, and village politics needed attention. With an outsider position, I could have observed how the team broke down complex information into manageable categories. As a reflexive insider, I got performative knowledge of the time-constraint, conventions of reporting, and pragmatic considerations that made the team ignore information that turned out to be important, such as information about the political dynamics in the village and information about how the flood-prone landscape would afflict the piloting. However, I also gained insight from conflicting sensemaking. This provided an entry to insight about how the emerging electricity infrastructure was differently enacted. The argument over interviewing did, for instance, give me insight into how Bidyut made sense of the project as an opportunity to consolidate his political position. Discussions with Deshi Phone employees about project priorities gave me an understanding of how they needed the project Green Bangla to be enacted as an auditable entity with measurable indicators of success.

Using the insider-role that many ICT researchers get to reflect on performative knowledge can contribute to design-insight that is difficult to get through verbal accounts or observation. A practical recommendation that can be derived from articulating how plans reveal different kinds of complexity as they unfold in response to changing environments is that infrastructure development projects can benefit from attending more closely to the constituents of the environments where planning is done. An environment characterized by abundant time and informal face-to face interaction will facilitate delving into complex matter, making creative proposals, and easing into matters of conflict. Making decisions will, on the other hand, probably be easier in short meetings with tight agendas that leave little room for distractions. Another recommendation is that project teams visit the site of intervention early on to allow preliminary proposals to unfold in response to material, temporal, and social constituents of this particular environment.

### 4.1 Writing as a Relational Practice

Doing research as a reflexive insider requires particular attention to writing. Ethnographic studies were traditionally conducted with communities who did not have access to the texts that were written about them. When ethnographers increasingly studied communities closer to home and the possibilities for communication between distant places increased, discussions about the relation between the ethnographic texts and the people described emerged, including discussions about the politics of representation [37]. For ethnographers writing from positions as insiders in an organization or project, the politics of representation poses

additional challenges. One challenge is that the researcher might be dependent on the goodwill of the organization for future funding or employment [see 7 for a discussion of this]. Another challenge concerns the transition from immersion in the field to analysis of the performative knowledge gained through participation. While the production of data is inseparable from the relationships formed in the field, the production of text implies drawing a boundary to these relationships and processing the data in dialogue with academic discourses [1]. Practitioners reading these texts will find that the categories by which they are making sense of their work appear in another context and are given other meanings. This can be experienced as a breach of trust. David Mosse has discussed this at length following a controversy about the ethnography he wrote based on his experiences as a consultant in the British development agency DFID [1, 4]. Mosse attributes the negative reception of his book among his former colleagues to misunderstandings about what he intended to say something about. The offended colleagues, Mosse argues, read the book as a statement about a single, objective truth about the project and its workings. They did not understand or accept his “interpretist view of project reality as a multiplicity of truth composed from different points of view” [1, p.942]. Moreover, they understood the text as an evaluation of the project, and not as an attempt at exploring the general theme of “the micro-social processes of policy” through a particular project [4 see also, 7]

Nevertheless, Mosse also acknowledges how publishing one perspective among many possible has problematic sides. He draws on Hastrup [3], suggesting that: “Conflicts arise when, as Hastrup puts it, *knowing* – ‘a subtle (epistemological) relationship between subject and object’ – becomes *knowledge* – ‘a (near-ontological) certainty’ (2003), separate and in public” [4 p. 951]. While the author might stress that the interpretation presented in the book is only one of many possible interpretations of the events referred to, it is nevertheless very difficult to challenge an interpretation inscribed in a widely circulated book. This can be painful for those who have alternative stories to tell but are not in the position to publish their stories.

In addition to it being a polite and respectful act, inviting informants to comment on drafts might mitigate conflicts about the published text. However, this practice can also be problematic. I have shared drafts with the project members employed at University of Oslo and worked with the comments I have got in new versions of the text. I have not, however, shared drafts with my informants in Bangladesh. Bidyut and other key informants in Haorbari do not have sufficient English skills to read and understand my texts. A short summary of my research in Bangla could not have conveyed its content since the style of writing is inseparable from the content [see 38]. Moreover, I have been reluctant to share drafts or summaries with people in Haorbari because the context of its interpretation would have been beyond my control. Katy Gardner [39] who has studied the connections between the gas company Chevron and a village in the vicinity of Haorbari, gives an example of how a text can easily be disconnected from its context and cause misunderstandings and considerable trouble. Within hours after she and her research assistants had distributed a list of research findings in Bangla, they were accused by villagers of being spies for Chevron and accused by Chevron employees of being activists masking as anthropologists. It turned out that villagers, as well as Chevron employees, interpreted the list of findings, which concerned ‘community engagement problems’, as a list of demands directed to the company. This put her research project, as well as her research assistants, at risk. Gardner observes that: “[...] our list, part of an exercise that in Sussex and Dhaka seemed an irreproachable aspect of correct methodological procedure, looks very different in the highly charged political context of Duniyapur” [39 p.190]. Similarly, I would not be able to foresee the consequences of sharing preliminary texts with people in Haorbari. Ideally, I would have discussed drafts orally with people in Haorbari, but it has not been feasible for me to return to Bangladesh after my last

period of fieldwork there in 2013. With regards to the Deshi Phone employees, I have also been reluctant to share drafts without being able to discuss them face-to-face. I suspect that my style of writing would have been perplexing to them, and that meeting physically would have been necessary for the feedback process to be an empowering experience for them. I planned to conduct a feedback workshop as part of a wrapping-up meeting in the pilot project, but this meeting never took place. The project team from Deshi Phone's side had disintegrated long before the project ended, with all but one of them having left the company. The only team member remaining in the company had withdrawn from the project and was busy with other tasks. I tried to contact one of the former project members for an interview after he had left the company, but he did not feel comfortable with being interviewed about the project when he was no longer a Deshi Phone employee.

In writing, I have been faced with the challenge of subjecting the sensemaking that emerges in a team to academic analysis and presenting this in a form that does not betray the trust of my informants. I have approached this challenge by choosing a self-revealing, emphatic, and evocative style of writing [5, 38]. An evocative and emphatic writing style seeks to conjure a sense of what it is like to be somewhere and do something and to engender an understanding in the reader of how others experience a situation rather than passing judgment on choices made. Not only is a self-revealing style appropriate for a relational epistemology where what the researcher comes to know cannot be separated from the relations she is part of [3, 4, 21], a self-revealing narrative approach can also serve as a mirror through which the readers can reflect on their own practices and their own projects [5, 40]. This way, self-revealing, evocative, and emphatically written texts can be a productive input into design processes.

## 5 Concluding Remarks

Research of the development and use of ICT is often done in close collaboration with practitioners. Being granted access to participating in the practices that unfolds in the environments of the practitioners represents a great opportunity for generating performative knowledge of the phenomenon that is being studied, and contributing with such insight into design processes. How a researcher understands and makes use of the insider position in research is, however, a question of epistemological commitments and methodological choices. In this paper, I have used an example from an ethnographic study of the development of a solar electricity micro-grid to discuss how taking a role as a reflexive insider and committing to a relational epistemology can open for treating performative knowledge as empirical data on the same level as interviews and other sources of verbal data. I argued that not only is the researcher's relationships to the people she encounters important for how the field is constructed, the relations that she forms to things and places do also matter. Lastly, I have discussed the challenges of writing academic texts based on participation as an insider in a team or an organization, and I have suggested that writing in a self-revealing, emphatic and evocative style is not only appropriate because it highlights how the research is a product of relations in the field, but also because such texts can serve as mirror for practitioners and designers to reflect on their own projects and practices.

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