

PREFACE

Inquire the Way We Inquire

1 A Reflexive Turn in Design Research

A reflection on research methods is an essential part of any project related to design research. Design research has evolved into a broad and cross-disciplinary domain that is positioned at the border between computer science and the human and social sciences. It encompasses work concerned with understanding the contextual aspects of technology design and use as well as technology-enhanced experiences. Unlike most well-established scientific disciplines, however, design research is not supported by globally defined and accepted methods. This is due to the relative infancy of the field and its extensive overlap with other domains, among other reasons [cf. 1]. Several disciplines in the human and social sciences (e.g., philosophy, economics, management sciences, sociology, anthropology, and psychology) demonstrated the complexity of the interactions between uses, social activities, and technical developments. Researchers in these disciplines brought the rigor of their intrinsic questioning, their methods, and their own histories to the field. As their methods of inquiry are today appropriated and accepted by design researchers, the consequences of applying methods that were originally designed to study specific aspects – for example social aspects – to the study and the design of technology remain largely unquestioned [2–4].

As a matter of fact, research methods in design inspired by the social sciences emerge from the triangular combination of data-gathering methods, a theoretical structure that is used to analyze data, and a philosophical stance. To grasp the interplay among these elements, *reflexivity* is a powerful tool drawn from the social sciences to understand the mutually constitutive relationship between the researcher, the surrounding context, and the research process. The potential of reflexivity in design research and the study of design originates from the ethnographic tradition within anthropology that ascribes a critical—and ultimately political—sensitivity to the role of the ethnographer and to ethnography as a research method, considered a reflexive, self-conscious effort [5, 6]. The researcher has thus an active role in shaping the research field and the unit of analysis [7]. Blomberg and Karasti [8] in their seminal review of ethnography in Computer Supported Cooperative Work (CSCW) remark that the ethnographic “field site is not out there waiting to be visited; instead it is reflexively constructed by every choice the ethnographer makes in selecting, connecting, and bounding the site and via the interactions through which s/he engages with the material artifacts and the people who define the field.” (p. 389) Contributions within different areas of design studies have explicitly recognized the legacy of a reflexive approach, for example Bjørn and Boulus-Rødje [9], Parmiggiani [10], and Ribes [11] in CSCW, Jensen [12] in Science and Technology Studies (STS), and Schultze [13] in Information Systems (IS). We can also cite Malaurent and Avison’s [14] discussion of self-reflexivity in IS and Gentes’ [15] book on bridging the gap between humanities and engineering.

As reflexive practitioners engage in critical self-reflection, they recognize that the researcher is active part of the world that she is studying, inviting the researcher to explicitly elaborate on the way different social, political, and theoretical aspects “are woven together in the process of knowledge development, during which empirical material is constructed, interpreted and written.” [16, p. 9, see also 17] In their problematization of case study as a research method in STS, Beaulieu and her

colleagues [3] argue that: “[a] focus on the ‘why’ and ‘how’ (and not just on the results) of our own use of cases enables us to reflexively sketch the institutional and cultural context in which the elaboration of cases is selected as a strategy for making knowledge, and to posit benefits of using case studies in new ways.” (p. 673) Too often however, fields interested in the design of technology – including Interaction Design and Human Computer Interaction (HCI), CSCW, and IS – tend to apply research methods in an unreflexive fashion. This tendency is manifest, for example, in a lack of theoretical anchorage, blind to what those methods allow us to see and ultimately missing out on the value of our investigations [18].

2 The Papers in This Special Focus Section

The objective of this focus session is *programmatic*. We aim to propose a collective and cross-disciplinary discussion on the methodological posture of studies of design. We adopt reflexivity as an instrument to address aspects related to the impact, the scope, and the political meaning of design research, mirroring the breath of the field. In the remaining of this Introduction, we present the articles included in this special focus section in light of their contribution to promoting such a *reflexive turn* in design research.

The fundamental lesson that the papers in this special focus section teach is that a reflexive attitude on the methods used in studying, designing, and testing digital technologies is crucial on at least two levels. First, to gain understanding on the possible real-world impact of the designers’ choices and modes of thinking, and second, to train designers to understand how the world shapes and is shaped by their choices. In their paper *Inquiry When Doing Research and Design: Wearing Two Hats*, Guri Verne and Tone Bratteteig present a comprehensive conceptual and methodological framework to reflect on the consequences of the research questions asked, data collection methods, and philosophical paradigms for the outcome of research. We teach students that research should always be rigorous and relevant, namely of high enough quality to produce knowledge that is applicable outside of the research setting and in real life (for example in the case of the design of medical or other high-risk devices and infrastructures). The *relevance* of research and its relation to rigor, however, tend to be underestimated. Verne and Bratteteig contribute with an in-depth analysis of the types of questions that researchers ask in design research and their mutual relationships with the chosen philosophical paradigm (interpretive, positivist, and critical) and a variety of research strategies. Stimulating a reflection on the role of the philosophical paradigm in particular is a means towards opening up and questioning the assumptions and results not only of design research, but also the education that we provide students at IT departments. Such a reflection has, in other words, an impact on forming the digital technology designers of the future, how they will think, and what questions they will ask and deem possible answering.

A second lesson that becomes apparent from the articles in this special focus section is that a reflexive approach to research implies awareness of the epistemic potential of our data collection methods. In her paper *Knowing Through Relations. On the Epistemology and Methodology of Being a Reflexive Insider*, Hanne Cecilie Geirbo offers an account of performative knowledge gained by taking a stance as a reflexive insider in an electricity grid development project in Bangladesh. Geirbo points out that, while ethnography is often cherished as a data collection method in design-oriented research, it is often carried out by means of in-situ interviews. The potential of ethnography to inform design, Geirbo maintains, rather lays in the performative knowledge that emerges as the researcher reflexively attends to not only social relations, but also things and places on the field. In this sense, data collected as

part of participant observations has a strong potential. The contribution of design-oriented ethnographic researchers often emerges from her daily engagement with the field, rather than with given, situated tools. “An ICT researcher”, Geirbo writes, “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”. This performative knowledge that emerges from the researcher’s engagement with people, things, and places is labelled *knowing thorough relations* and is elaborated as based on relational epistemology, that takes into account the mutual shaping of people, things, and places. The paper argues that performative knowledge provides a lens to foreground the sensory and embodied experiences as empirical data in the study of design processes, their relationships and how these embodied experiences unfold. A reflexive insider is, accordingly, one who is able to articulate and analyze the performative knowledge that emerges from these embodied relations. With focus on being a reflexive insider, the paper proposes that this knowledge be turned into data, brought into research reports, and valued for its capacity to inform design decision.

A consequence of a reflexive turn in design is that the separation between, on the one hand, the ethnographic researcher (‘analyst’) and, on the other hand, the observed informants (‘actor’) is an ex-post construct per se but deserves further inquiry. This is particularly relevant for ethnographic and ethnographically inspired research strategies. In their paper *Entangled Inversions: Actor/Analyst Symmetry in the Ethnography of Infrastructure*, Charles Hahn, Andrew Hoffman, Sarah Inman, Steve Slota, and David Ribes investigate methods for ethnographic studies of information infrastructure design. The authors illustrate the reflexive dynamics that emerge as the ethnographers increasingly engage with the actors or informants they are studying. Hahn and colleagues discover that the analytical perspective of the ethnographers (or analysts) and that of the actors are very much symmetrical. In anthropological terms, the boundaries between emic and etic become blurred and sometimes seem to disappear altogether. The emerging symmetry is a practical one, in the sense that the collective practices of the actors and the analysts eventually are performative of both the ethnographic process and the field itself. The authors draw on the notion of infrastructural inversion, originally formulated by Bowker (1994) to indicate the making of science as the actors’ processes to bring infrastructure to the foreground as a matter of concern as opposed to taking it for granted. Infrastructural inversion has later been widely adopted to also indicate the analyst/ethnographer’s own endeavor to decompose infrastructure and investigate the sociotechnical assemblages that sustain it. Hahn and colleagues expand this notion by inviting future research to a more systematic meta-analysis on the way these two reflexive engagements come to meet and talk to each other. Understanding, as Hahn et al. write, how “the analyst’s topics may well become the actors’ resources, and vice versa” could be a powerful tool to make visible and explicate the contribution of ethnographers to infrastructure design to other scientific disciplines.

Finally, the consequences of our methodological choices are always political. An important contribution of reflexive research is questioning the construction of the research methods and its analytical consequences. For starters, the researcher’s focus and storytelling has consequences for making visible or invisible specific categories of stakeholders in design, including non-human stakeholders [10, 19, 20]. A reflexive approach might also enable the researcher to explore and problematize emergent power structures. In so doing, the importance of mundane and taken-for-granted work can be brought to the fore [6, 21–23]. As a result, the ethical dimension of design should be part and parcel of any reflexive account. The Scandinavian tradition in Participatory Design (PD) has long demonstrated that technology is always colored by ethical concerns, but that overly technically focused accounts fail to account for the ethical dimension and democratic consequences of design [24]. In *Rethinking the*

Accessibility of Digital Content with Perceptual Supplementation System through the Lens of an Ethics of Care, Charles Lenay and Matthieu Tixier supplement this perspective by introducing the analytical lens of ethics of care. They take a step away from the ideal project of universal accessibility based upon standards and rules (based on Kant's categorical imperative). Inspired by feminist ethical theories, in particular Joan Tronto's work [25], the authors present the ethics of care as a critical approach to the realization and negotiation of shared values. They ground this debate on the case of accessibility of digital spaces for visually impaired and blind persons. The ethics of care lens allows the authors to shift the analytical perspective from the end product of the research (the technology) to the process of designing, by constantly problematizing the way values become obdurate in the designed technology.

A focus on design as a process is also at the heart of the last paper in this special focus section. In *Sense and Sensibility: Designing a Museum Exhibit with Visually Impaired People*, Ines Di Loreto and Karine Lan present a participatory process for designing an exhibition for visually impaired people as case study to investigate how and when such practice can be considered successful. As a Participatory Action Research project stands at the crossroad between scientific investigation, design, and social change, the authors argue that to answer when and what this kind of project can be considered 'successful', it is important to reflexively analyze a participatory design action as a never-ending process. The hypothesis discussed in this paper is thus that the result of a Participatory Action Research project is more the journey that led to a design than the 'results' of a research or the 'products' of the project *per se* (them being of material or immaterial substance). Hence, the authors suggest interpreting a Participatory Design Action as a never-ending act that goes on even after the ending of the Participatory Action.

3 Future Directions

Reflexive research is not only about analyzing the existing but crucially about constructing the research objects. An orientation towards the future obliges us to not only reflect on what we have done, but also to envision the possible directions that our research should take. In addition, we need to think about how the forward-thinking, artifact-generating practice of design combines with the knowledge-generating goals of research [26, see also 27]. More in general, we need to think anew about how the different disciplines involved intersect and create new research objects by elaborating and combining tools, methods, and concepts in a novel fashion, as opposed to solely focusing on new artifacts.

Here we propose three themes against which reflexivity could be further explored in the future.

The first aspect is developing a *critical approach towards our own research*. Di Loreto and Lan show a tension between researchers belonging to different disciplines, a tension engaging a critical stance. The sociologist and the philosopher/computer scientist involved in the project described in the paper initially had quite divergent epistemological positions towards the project. While the former, as a sociologist, favored an ethnomethodological approach based on participant observations, the latter, with a PhD in computer science, sought an initial hypothesis to test. However, tensions were gradually solved through confrontation and dialogue. This example illustrates that *dialogue* is the very first tool to promote reflexivity. Often underacknowledged in published academic papers, such dialogue is constitutive of the way science is done in practice [28]. Research methodologies in the design sciences (often inhabited by heterogeneous disciplines) must therefore become better equipped to promote an explicit and ongoing conversation. Dialogue can also be part of a self-

reflection, which is performative, as Geirbo vividly illustrates, of new analytical dimensions that come to the fore as the researcher observes herself during the daily, mundane research activities.

A second aspect that we would like to bring forward, is an invitation to pay analytical attention to *labor*. As Hahn and his colleagues show, studying information system design implies a gestalt switch, or a shift of perspective from the systems as product, towards the mundane work in the infrastructure that scaffolds them [see also 21]. This perspective implies that a reflexive approach on *design qua labor* that explicitly encompasses systems maintenance, upgrade, and repair is warranted. Moreover, understanding systems not as artefacts, but as infrastructures, has profound implications towards grasping the complexity of the work involved [29]. Crucially, such an analytical lens rejects situated, short-term studies, in favor of more prolonged and in-depth ethnographically inspired engagement with infrastructure (ibid). In addition, the stress on the *labor* concept claims back the presence of real life as a part of the research setting. This is particularly important as situated research is still at the core of ethnomethodological approaches – which, however, often produce observations but never turn them into suggestions for design or future action, as these observations are sometimes ‘lost in translation’ in HCI research (where they stay as artefacts or involve lab settings) [cf. 18].

To conclude, the theme of *care* emerges as an important facet of reflexive research. In Lenay and Tixier’s paper, a focus on the ethics of care paves the ground for future research to ask the question, *how is care instrumented?* In other words, reflexive researchers should ask how they inform the design and development of specific tools (e.g., IoT) that quantify and measure care work, hence legitimize it. While instrumenting care can bring back the human aspect of e.g., *healthcare* – an aspect that has been lost with the diminishing time spent by caregivers with patients, a reflexive stance on care work cannot disregard an analysis of the broader political discourse around the instrumentation of care – which comes with strong socio-political consequences, especially in Europe. Neither this reflection should underestimate the role played by women in caregiving, as underlined by a larger part of the feminist discourse [e.g., 30], and reflect upon the role of technical instrumentation in continuing or breaking power relationships. Reflexive research on design could, in addition, unpack and problematize the way care work is increasingly inscribed into instruments and assigned to non-governmental companies delivering such instrumentation and services, while the State is gradually disengaging from its duty to take care of its citizens.

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