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Reflections on Socio-Informatics: Design for Social Practices

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The Rocky Road to (the Appreciation of) Swamp

A Theoretical Framing for Socio-Informatics

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I am pleased and honoured to be here – I have been hanging around the Socio-Informatics for quite a long time, for 20 years or something like that. In the beginning Volkmar Pipek finished indeed his PhD under my supervision, but my part was more like an organizational advancement than a substantial contribution, more like helping in an administratively difficult situation. And he surprised me with the content of his PhD, I would not have had much help for him anyway. Since then, I have been following the development of Socio-Informatics in Siegen mostly with envy – how they get all that money and how they can be so productive. And how yet another time they branch out into different direction and start to contribute and go to different kinds of conferences and journals and so on.

Volker asked me to deliver a theoretical talk on Socio-Informatics and I selected the title: “The rocky road to (the appreciation of) swamp”. What do I mean by that? I borrowed the point from Claudio Ciborra, who in his book “Labyrinths of information (1) has an index entry for “swamp”. In the book it means “everyday life”: he talks about everyday life that is also a swamp and what and how systems are designed for swamp – Claudio could well serve as the patron saint of Socio-Informatics. Now Socio-Informatics has made an attempt to develop an approach and

methods for designing systems for this swamp/everyday. As the everyday is seen in CSCW research, through the CSCW lens.

CSCW research in general has not had much interest in developing methods beyond studying a case or seeing what is there; the participatory design has been more active, they have much more on the design side. But what is important is that the Information Systems community, where understanding the swamp should be its bread and butter, they have not taken it seriously, exactly as Volker discussed in the introduction. And that would be a story of itself, the failure of the Information Systems discipline to really address the big questions of design. But we have to deal with what we have. Volker asked if it is necessary to ask core questions. Let's go to the deep questions of life and ask those questions. Can there be deeper questions than what is actually the nature of whatever we attempt to research and design? And how, whatever it is, can be designed? And how it can be studied? And is there a correlation of results? Is it relevant or rigorous? Or can it be both at the same time? And these are the questions every discipline should ask.

I think that in the whole ICT community and especially in our section, which is not the technical and has been trying to understand what happens with humans and organizations, we haven't been so keen on asking those questions. Let's try to follow the evolution I have seen to happen. An earlier presentation here discussed what was happening in the German situation, but I saw this much earlier, when I started my master's studies in the 70s. There were three different research communities in IT: Computer Science, which was interested in what is inside the computer; Software Engineering interested in how to professionally develop software systems, and Information Systems, which was interested in systems in organization and how technical system can serve organizational managerial needs. At that time Human Computer Interaction was emerging. The community was not really yet there in the 1970s, but it was emerging.

What we want to address here now started when we had eventually a community on Human Computer Interaction and another on Information Systems. This was the situation in the early 80s. We started then to recognize that there is something that falls between those two communities, that there was something which cannot be grasped if one puts on either organization eyeglasses or individual/cognitive eyeglasses. And interesting things and troubling things and complicated things happen when we try to design for whatever there is, and that was the problem. And it is somehow related to the social dimension of whatever people do.

I try to trace the development as I see it. The first attempt was called a social technical design and it started without a computer technology already much earlier. It has several origins, but we can highlight the Tavistock Institute in London, which was not a research body, but it was doing practical consultancy work for a number of clients and doing organizational improvement very much based on the worker participation. This thread ended up in Mumford's famous book 'Effective System Design and Requirements Analysis' (2) which introduced the ETHICS method in

1979 when it came out. This found a fertile ground in Scandinavia, and two different directions emerged. The first take was a technical-business-oriented school in Denmark and in Stockholm. Another one was what did eventually become the Scandinavian School of Participatory Design which was much more militant, and it allied itself with unions and workers and recognized these kind of workplace contradictions. The problem with the technical-business approach was that it saw the technical system and social system as separate parts of a whole, that there is a possibility to take them apart and design and change them separately and then somehow fit them together and get the big change happen. And that meant in practice that the participation was for the social system and not for the technical system. There also emerged a social informatics school in the US, Rob Kling was the major character there. That development largely followed the direction of the technical-business one in Europe.

But then during the 80s there became new influences, the first was cooperating with workers and unions that fostered the participatory design; second came from anthropology and micro sociology where was a turn towards everyday life, that is using the same methods which were used in studying the primitive cultures to study the normal everyday in Western countries. And then there was the emergence of social studies of science and technology, which brought yet another set of eye-glasses. And finally, the technology development like Volker was telling us, it changed a lot. The emergency of the PCs and mobile networks changed the situation where the technology was used.

I remember when we installed our first LAN, 10 PCs, a file server and a printer. A curiosity was that the first coaxial cabling for LAN was with thick as a finger and so stiff that it was very difficult to flex it to turn from the corridor to a room and back. But remarkable was that as users we had until that been very much protected from the complexity of the networking by the very sophisticated mainframe operating systems. Those operating systems were very good and very efficient. But because the available computing power for LAN management was very limited and LAN operating systems were at their infancy, they were only capable to make technical connections between devices, and so all higher level coordination and protection was basically left to the users themselves to manage. So, we had a shared hard disk visible to everybody, but no facilities to manage or partition it, not even folders. To manage the disk somehow, we had to make external rules ourselves, for example that for recognition all one's filenames have to start with a particular letter. And managing printing was another nightmare before we worked out another set of rules. So, suddenly, these kinds of things became visible. If one wants to support cooperation through computers, there are lots of new unrecognized issues, lots of appropriation work needed in order to get anything done. This was one of the triggers for the emergence of CSCW.

The attempt to conceptualize this novelty was to move from the “socio-technical system” to the “work”. This happened in participatory design, where Pelle Ehn

(1988) prepared his PhD thesis book, “Work Oriented Design of Computer Artifacts” which is an attempt to put PD on theoretical grounding. Sounds grand, but it's not a bad idea and it also connects with CSCW. CSCW has been a project to understand what happens in technically mediated cooperative work, when the social side is taken seriously (Greif 1987). Over time it has been found, however, that the concept of work is in one way too diffuse and fluffy to serve as an anchor point for analysis, and in another way maybe was too limited to deal with all aspects of social behaviour, and despite the three and a half decades of development, no general conceptualization for CSCW unit of research has emerged. In Information Systems Steven Alter from Univ. San Francisco has suggested that unit should be work system, but his work system is more like a system-theoretical concept, and it is not really capable of dealing with all the social issues.

And then, we got more influences in the 90s and in the 2000s that brought even more richness and messiness. The topic has grown more and more rich and at the same time it has grown more and more messy. There are concepts like bricolage and drifting from Ciborra (2002), one of those people who recognized already early that the design does not go as planned, but there always come contingent issues, so that it ends up with putting together something which can be made to fit into what is already there, a bricolage. And drifting was also a concept to describe how the design started off. Designers have some kind of idea of where to go but in the end the design moves to a direction which developers themselves cannot totally control. Another important issue are infrastructure and infrastructuring, originally from Bowker & Star (1999) and Hanseth & Ciborra (1998), and that is something socio-informatics has also already taken into agenda. Through the concept of infrastructure, the concept of historicity was also brought into the area. We have had a problem with history in the whole information technology research, it has often been bracketed out but in real life you cannot escape it. Development happens but the infrastructure is there and so something which has happened before has to be taken into account. And then there is embodiment, that we have bodies and live in a material environment and that is materiality or social materiality and entanglement. And somehow discussions about issues like this have seemed to be difficult within the conceptual space of work; that when we started instead to talk about work practice, it somehow becomes easier to take this kind issues into account.

And so, the third attempt has been the practice, the social technical practice, practice as the potential intermediate level, the focus of research. That is something we have already discussed quite a bit this morning because it is sort of the central concept in socio-informatics. In social sciences it has been used over a long time in a variety of purposes by a number of different researchers with different kind of aims and backgrounds. And so, the concept of practice clearly lacks internal coherence. Kjeld Schmidt, who unfortunately is not here, has been one of the vocal critics of the concept of practice (Schmidt 2018)). I think that quite a lot of his criticism against the attempts to work out a practice theoretical view is sound and solid. But

still the concept seems to be useful because many things which seem to be important in understanding situations can be brought together with it. As a proto-concept, a container of issues needed to take into account, it might be useful, but because of the locality, uniqueness and history of each individual practice, it may be tricky indeed to generalize a “theory of practices” to cover them.

We heard in the introduction that designing for practice needs a very close collaboration between experts and users, and a long-time commitment. If there aren't infrastructures and evolution of infrastructures, there's repair, maintenance, improvement, redesign. Mutual learning happens there. And mutual influence between software and work practice and that is where appropriation comes into the force that software changes practice, but often meets resistance and has to be adapted as well and so, it goes on and on. And as many of us know and have heard, today it's very difficult to organize this type of designing in academia under the current funding systems. It is very challenging to find a way how something can continue beyond normal project confines. We should think of such research as a “clinical research”.

One researcher who has discussed this at a general level is Stephen Toulmin, a British American philosopher. His work in ethics and in argumentation are well-known around the world, but this side of his work is also very interesting. He has suggested that research on changing whatever in real life should be seen as a form of clinical research, like the clinical research in medicine for example (Toulmin & Gustavsen 1996). We have the basic research in medicine which is studying the human body and how the human bodies function and decay and how they change and what happens. And then there's clinical research which means that if the basic research is interested in humans in general, the clinical research is always interested in one particular case and what can be done in this situation. Clinical research develops its own methods and own body of knowledge. And all clinical understanding develops particular concrete instant uses and not more abstract and universal ideas. There is a nice quotation that far from sound practice being based on prior theory, practice is grounded first in experience that afterwards theory has the task of explaining why any given practice is more effective in one situation than another. The idea of clinical research might be helpful in illuminating some of the difficulties and some of the differences that socio-Informatics currently has.

The practices we work with in design projects are unique cases, they have their own history and background. The conceptualizations found in practice literature are based on different cases and need to be taken with a grain of salt and tested, and perhaps modified, if they don't work in this case. The major source of understanding is the previous experience on similar situations within the group. This looks just like clinical research discussed above, aiming for treatment of individual cases. And more reflective basic research is conceptualization based on recurring experiments, a corpus. The clinical research develops over time its own body of knowledge of what works, and it keeps asking new questions. In his book, Toulmin

(2001) sees the use of aspirin to lower the fever as an example: the phenomenon has no exact scientific explanation. We know that it works, but we don't know why it works. That is an example that clinical research can have its own knowledge. It can challenge the basic research: we know that this works, but why does it work? I suggest that there is a possibility to formulate now the next, the fourth attempt to conceptualize our field of research. If what Socio-Informatics is currently doing with practices is seen as “clinical” research, what might the corresponding “basic” research be? What is the general issue, of which our design projects, technology-driven changes of practices are instances? My candidate is “the dynamics of technologically mediated practices” as the field of research. How practices and technologies change and why? Are there any recurring patterns? Can they be explained? Basic research should be relevant for the clinical research, and that has been a challenge for ICT research in general. Originally information systems aimed for relevance in research and when I came to the field in 1970s, everybody was doing methods system design and that was the major topic. Industry was not listening of course, and that has always been a problem. But there was a plethora of different kinds of methods, how the whole organization should attack this system design problem. But anyway, the attitude was that we, the academics, try to find a way how to make a system development succeed. But in the 80s and early 1990s, the interest of design methods waned. The community turned from relevance towards rigour and academical creditability in research. Also, in HCI again, when I came into research, everybody was doing practically relevant work, such as the structures of the hierarchical menus and how many items can be put on them. The emergence and rapid evolution of graphical interface killed this kind of research. HCI very much went to the leading edge research in the 90s, what can be done with the newest technology. There is an interest in artifacts, but if something is already used in actual practices, it's not interesting enough to be studied in universities. CSCW has kept the connection with relevance over time, they keep asking what is actually happening in the real life. But there has been a lacking connection with the design world. This has been recognized, and one time there was a quest for “design implications”. Every paper had to squeeze out something which is directly related to design. But it really does not work that way, a much larger collection of experiences is needed instead of a singular study. And Socio-Informatics is one of the few groups which has really taken everyday practices as the serious target for research and development, both the richness and the messiness. That is commendable and really rare. This perhaps explains why it seems to be a bit difficult to find interested research partners. When you are first in the in the road, there is nobody to answer when you call them, they do not yet recognize the questions you want to ask.

Socio-Informatics is clearly geared towards the clinical results, but it has also contributed the basic research. Interesting is that these contributions to the basic research have not been very well recognized as such by the group itself. For example, appropriation is a very good example that is obviously not something which is

directly related to design. There has been recognition of the phenomenon, it has been found in a number of cases and it has got its own label and finally crystallized into a clearly theoretical concept. That is something you should do much more and also recognize better the existence of the different basic and clinical levels of work. Doing the cases and collecting clinical understanding on practices, but every then and then lean back a bit and reflect upon – what can be generalized from the experience, but also what kind of questions have emerged to be pondered at the basic level. More conscious approaches towards the basic research would be useful. Although there surely is a Scylla of empty theorizing, but there is also a Charybdis of the sinking into the drift sand of empirical details. One must learn to steer the course in between.

As the last point of the talk I try to give some pointers towards potentially useful background sources for grounding of the “basic” research. First there is Marx and his idea of active material practice as the foundation of human life. And Activity Theory, that can be seen as an attempt to operationalize Marx’s practice concept further. Activity Theory “activities” are a very special form of practices discussed in “practice theories”, and so they can be conceptually more coherent, and not so vulnerable to the criticism. With respect to practice-level change, there exist even an AT-based field-tested method and toolkit for grassroot development, the Change Laboratory (Virkkunen 2013).

Then we have Toulmin’s quest for practical philosophy: need to return back to the practically-oriented philosophy which can tell you something about everyday and not only about something that is totally abstract. Toulmin (2001) sees that there is a recovery going on, that there already exists movements towards the oral or narrative, the particular, the local and the timely.

Then engaging into discussions and criticism within several communities on artifacts. The CSCW community is still interested in artifacts (Orr 1996) but IS has largely lost the sight on artifacts (Orlikowski & Iacono 2001), and HCI is only interested in the leading-edge artifacts and not the ones which are actually in use. HCI has totally outsourced the practical development of interfaces to Apple, Google and Microsoft. And even the design research community has been criticized to lose the connection with artifacts (Findeli Bousbaki 2005). It would be necessary to move from the leading edge towards the blunt edge of technology research: to look closely how to muddle through the everyday swamp – maintenance, repair and improvement instead of innovation. But for that it is necessary to have a step-wise deep longtime involvement into a practice to understand how things go.

It would also be possible to do some historical research on artifact dynamics, based on analyzing a corpus of cases where artifact-practices have changed. There are two potential directions to enlarge the corpus: first interventions – using the same clinical corpus suggested by Socio-Informatics, but focusing on changes themselves instead of design processes. Another would be the analysis of the historical evolution of various IT artifacts/systems and corresponding practices. Such

analysis would resemble what STS has been doing for a long time, but concentrating less on social forces but on practices, technologies, and design decisions and looking at the changes and trying to learn. Such retrograde analysis would naturally face challenges, because the practices have mostly disappeared. On the other hand, changes in the IT artifacts are often quite well documented in the form of various versions of the software.

Each of the versions of the software indicates some kind of change and there is very little historical research done. The one I know is the “biography of system” by Pollock & Williams (2008). They have been following the development of the SAP system, how it evolved into the world. But there is an interesting parallel, a “theory of inventive problem solving “(TRIZ) developed by Genrich Altshuller in the former Soviet Union. It was quite widely used in Soviet Union and taught in a number of technical schools. Afterwards it has gained some attraction in West as well (Altshuller 1999). By analysing a large body of patent information, Altshuller tried to find out how technical systems evolve over time – what sort of solutions have had a tendency to become replaced by another specific type of solutions. He went through a large number of patents and found a number of recurring evolution paths and patterns, that could be used supporting design efforts. The problem from our point of view is, of course, this is only an interesting example because it is looking only at the technical systems and not also the practices where they are used – but it anyway shows that such evolution tracing can be done.

At last, we would need a critique of political economy of software business. Socio-Informatics would be in a very good position to recognize what kind of problems there are in the current competitive bidding based software development, that it is impossible to build long-term relationships between work and design. That is not only harmful for long-term research, but it is naturally even worse for the development of work practices and artifact together in general, and that may well be the cornerstone of the productivity of a work. We can then ask the classic question if the conditions of production are becoming obstacles of the development of production forces? The way how the software development is organized is becoming a major obstacle for the development of production forces. What should and could be done? And what is the role of Socio-Informatics in breaking that deadlock? That is an interesting question.

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Gender Relations at Work: Implications for Socio-informatics

Michael Ahmadi, Ina Wagner, and Anne Weibert

One of the great challenges of our time is how we can live within the limits of the earth and its resources and natural cycles. The papers in this section address various aspects of this challenge.

We are going to talk about gender relations today and also implications for Socio Informatics. This talk is mainly influenced by the projects and the general initiative that we have worked on and, of course, the computer clubs, the upcoming book, and also the feminist Living Lab which was my project and influenced my PhD thesis (Michael Ahmadi). So, the ideas that we present today, they mainly steam out of these academic experiences. we are going to start with more of a theoretical introduction and later we will have some more practical examples like upbringing and gender constructions, and also examples from the work environment. I think we can all agree that the IT field remains male dominated and the design team still tends to be comprised of homogeneous groups of young white and educated men. And as we will see later notions about what a real programmer, a real coder, a real techie, a real gamer is, are picked up from a very young age through so called social agents such as parents, such as social status, good interactions, media exposure, at work, etc. And this is especially problematic in terms of technology users and development as the absence of diverse perspectives can contribute to fundamental design flaws. So, examples include instances where technology does not pay attention to female interests. The Apple Health app which at the very beginning did not include the menstrual cycle, or step counters that estimate steps based upon the average body weight of males,

or motion sickness for women because they are using the art technology. The test users have solely been male and so you see these exclusionary processes. Also early voice recognition software that was not able to detect higher pitched voices, these are all examples of how design flaws could be integrated into technology if we're not paying attention to such issues. So from a research perspective, the tracker is indeed quite tricky, as social constructions are so deeply ingrained into our culture and into our society. Many of these structures and these modus operandi are taking more or less for granted, we are not that reflective about them, they're more implicit. So in response to these problems, studies examining the gendered nature of technology, and also following up on this explicit feminist agenda as in HCI design and research that have gained traction in recent years and also at our department. So maybe if you're not that familiar with feminist research, it does offer some epistemological and methodological implications on how to address the aforementioned issues. A vital contribution of feminist research is that it tries to bring marginalized experiences to the center. And in feminist HCI, especially standpoint theory is the main dominant theory that gained prominence. It argues that individual perspectives are shaped by their surroundings and experiences and that knowledge is, for this reason, situated and we have to make these experiences, we have to bring them to the fore. But it's also important that the term 'feminist research' should be understood and used inclusively. It is not solely about women but it's more of a general commitment to end sexism, to end racism and class exploitation. This is arguably the most essential prerequisite for 'feminist research'. It is also expressed in matters of, for example, intersectionality which means that different exclusionary factors can combine to create discrimination. And this is also a reason why Feminist Research leans heavily towards mainly qualitative methods in order to bring these marginalized experiences to the fore. And as we have also discussed in our chi papers, the problem is inherently methodological.

So, researchers or feminist scholars especially, they have hinted to epistemological issues and offered solutions such as a more feminist approach to actual research. Yesterday, we had the talk by Kari Kuutti who talked about the everyday practices at the target of research, the richness, the messiness, as he labelled it and feminist research. He tried to add another twist, another perspective to that by saying that the everyday world and everyday social interactions should be treated as problematic. So, it focuses, to a degree, to the messiness but also with a different twist to it. This is something that feminist scholar Dorothy Smith brought to the table. And then the broad commitment of feminist research is what underpins much of what is known about feminist HCI. So, asking yourself questions such as 'Whose perspective are represented?', 'Who is part of the research team?', 'What are our own biases?', 'Is our research sample biased?'. And eventually 'Who are our intended target groups?', 'Which are the types of groups that we have in our minds?'

If one grows into that world of technology that Michael has just sketched, then we can see that how one grows up with this topic is a matter that is fundamentally connected with questions of learning, of sense making, and of skill building. This slide provides you, in brief, with some concepts that are of relevance here, seeing learning as a process of natural selection, weighing arguments and information in discourse with others, seeing material component as supportive, connecting learning to the construction, and building off things and to the interaction with materials and with tools. And also recognizing that context matters, and that knowledge is also generated in interaction and in collaboration with others. When technology is ubiquitous, then programming and digital skills become key competences. And Jeanette Wing has famously described this as computational thinking. It's more than mere coding. It's concerned with concepts and with analytical thinking and meant as a compliment to the medical and to technical logics. And it's meant to be for everyone everywhere, not just within the informatics domain. And if this is the case, if everyone is meant, then how do we ensure that everyone can really participate and how do we adequately engage a diverse range of learners? Yesterday in the Health and Ageing workshop we have discussed how being human is very diverse and can mean very different things. This is also of relevance here. Research has discussed this, and the focus on the content to be learned has shifted to a focus on the learners themselves. The acquisition of computing and of programming skills is also seen as closely related to matters of the self, is embedded in social context and community, and has been linked to craftsmanship and to questions of aesthetics. Now I (Anne Weibert) am going to, sort of speak, open the door for you to a long standing initiative here in Siegen - the computer clubs which have come around as learning spaces where their activities seek to enable precisely this. An exploration and appropriation of technology as a means to be creative and to creatively connect with surrounding neighbourhood, with nature, and to even at times tear technology apart and rebuilt it just for the sake of finding out about it, to make beautiful connections with crafts, with personal meanings that people bring to the space, and with sewing, with origami, with light, with neighbourhood, with people.

I (Ina Wagner) will continue with two issues that I think are highly relevant for design. One of the issues is the ethics and politics of care; the second one is the genderedness of organizations. Feminist scholars have produced a substantial amount of theoretical work concerning these issues and numerous empirical studies to which I can only briefly refer. In regard to the notion of care, we can go back to the feminist critique of traditional ethical thinking. The 1993 book "Moral Boundaries" by Joan Tronto was highly influential. She argued that care is not only about the actual work of caregiving, but more generally a practice that involves attentiveness, responsibility, competence, responsiveness, and integrity. And it is also about the distribution of resources. It is important to add the critique of a potential essentializing notion of care as corresponding to women's social skills and to a female culture of caring. What I find interesting is that Tronto, but also many others after her, emphasizes the political nature of care, saying that care

is not just a private issue but a social and political one. According to her, the concept of justice, by which she meant social and distributive justice, without a notion of care is incomplete. There are lots of studies that show that the ways in which care is performed in society and institutions is deeply entangled with issues of power and inequality. The notion of intersectionality has been added later and enriches the debate on care. In one of the chapters in the book ('Gender and technology "at work"') that we are just working on, we have looked into the history of the computerization of care work, from early nursing information systems and clinical protocols to care robotics. And not surprising to this community, what comes to the fore in all these studies is that the systems designer tend to treat care aspects as invisible and residual kinds of work while making it accountable in terms of measurable activities. And this invites us to critically think about issues of standardization and what is not considered in standardization processes, but also to think about how to make space for experience and intuition, for patient- and peer-aided judgment in professional caretaking in addition to systems-aided judgment. And just to briefly refer to the debate on automation, it also invites us to think about which aspects of care can and should be automated. Just want to mention studies by Aimée van Wynsberghe and Eva Hornecker who have argued the need for designers to consider that the functional aspects of seemingly simple activities, like lifting a patient from the bed into a wheelchair, are closely interwoven with its emotional and social aspects. There are also numerous feminist studies about service work and emotional and affective labor (as for example the work of Arlie Hochschild) that describe the emotionally and socially supportive work that is part of the everyday work in many undervalued occupations.

The second issue I want to refer to is the genderedness of organizations, as well as the question, 'Is undoing gender possible?' The debate on gender in organization goes back to Dorothy Smith and John Acker. Many others have continued this debate arguing that, and I quote from a paper by Benschop and Doorewa, 'the persistence of gender inequality and the perception of equality emerge from a so-called gender subtext, the set of often concealed power based gendering processes. For instance, organizational and individual arrangements, objectives, measures, habits, systematically reproducing gender distinctions.' Dorothy Smith and John Acker have argued that there is a gap between gendered realities, how people working in organizations experience them, and seemingly gender-neutral thought in organizations. They point at the impersonal objectifying practices of organizing, managing, and controlling large organizations. And connected to this, there is a rich debate on whether it is possible to 'undo gender' in organization in the sense that gender does not matter. And I think this is an interesting question given that many consider gender attributions as omnirelevant and as, in a way, unavoidable. Strongly connected with research on the genderedness of organizations is research on masculinities 'at work'. There are lots of studies dealing with the fact that the ideal worker in many organizations, especially in the industrial context, is still a man. And there are studies looking into the

marginalization and harassment of women in many industries and also into the threats that a masculine culture at work poses to women's femininity. But some studies provide some evidence that undoing gender may be possible.

And I want to conclude with the question, why and in which ways is this relevant for design. I have been thinking about designing in an industry 4.0 context with a view onto gender equality. If we care for gender equality, can we simply ignore the genderedness of these organizations? There is very little empirical research that would help us understand this better. Lena Abrahamsson and Jan Johansson have over at least 10 years studied work in the metal industry and in the mining industry. Their research in the mining industry, for example, describes how digitalization supports a transition from heavy, dangerous work that is very much tied to an image of masculinity, physical strength, particular craft skills, exposure to mastering of dangerous working conditions, to work that is about controlling complex production lines in an office. As a result of these changes, the participation of women in mining has been increasing. And also, more of these women see the possibility to enact their femininity differently. Abrahamsson and Johansson argue that digitalization per se will not reduce or remove the link between male dominated workplaces and masculinity unless more radical moves are made to change the workplace culture and the whole organization to one that is deeply committed to distributive justice. What happens in mining companies, they found, is not an undoing of gender but processes of regendering that are slowly changing the mine workers' masculinity to suit this new situation. And they see this as the most probable scenario for the future. So, my question is, how can we as systems designers, entering these workplaces and designing systems, contribute to this necessary undoing of gender?

Future Proofing, Knowledge Transfer & Meta Research – Some Introductory Remarks towards a Book Project

Ina Wagner

Our motivation for working on our book (“Future Proofing. Making practice-based IT design sustainable”) was the observation that what designers build, together with user organizations and practitioners, does often not have a lasting effect in the organizations and communities that participate in a project. So, our key questions were ‘What happens after a practice-based project comes to an end? How can its positive outcomes survive and maintain their effects when the consortium dissolves?’ These are questions that are close to the heart of the people working in Siegen. Aiming for sustainability means designing to enable people, communities, organizations to self-develop. Much of our work was about how to build the conditions and environments for sustainable practice-based research. What makes the book rich and interesting is that we decided to carry out a series of in-depth interviews with senior researchers that have worked on projects and project lines in different areas of work, from manufacturing to health care, ICT for development, and IT service provision. Some of these projects have their base in Siegen, some in other countries and with different research groups. We invited the senior researchers to reflect on their projects regarding the idea of sustainability. We asked them to tell us about the measures they took and how successful they were, which barriers they encountered and what they think should be done differently. The main part of the book comprises case studies which

describe these cases. Based on these cases, we undertook an extensive cross-case analysis. One of the results of this analysis is a conceptual framework that we developed and refined.

The cases cover a wide range of types of innovation. We started with the idea that practice-based research aims at sustainable solutions, i.e. solutions that are sustainable in practice. Whether the solutions are sustainable depends on the quality of the technologies. It also depends on whether a research team or consortium is committed and able to prepare the phase of appropriation of the design result by an organization or community after a project ends. To achieve this the project has to pay attention to learning and capability building during and beyond a project. The cases helped us to better understand the dynamic between appropriation work and ownership which is key to sustainable design. Ownership refers to who 'owns' the project idea, the process, and the solution in the sense of who has an influence and who took responsibility. In a participatory design project, ideally, designers and users co-own the idea, the process, and the solution from the very beginning. Thinking about ownership should start from the very beginning of a, and be in focus during the appropriation phase. The cases also taught us about the visible and invisible work that is necessary to make appropriation possible.

We investigated different types of technologies and types of innovation from off-the-shelf technologies to large-scale technical inventions; at technologies that might not be technologically advanced but are primarily designed to innovate specific practices. Volker (Volker Wulf, University of Siegen) was particularly insistent on discussing what we call 'forms of sustainability', which means that not all projects reach the same stage of sustainability. This part is inspired by a set of categories that have been proposed by Iversen and Dindler: maintaining, scaling, replicating and evolving, to which we added a discontinued and (still) open form of sustainability.

We think of contextualizing a project not only in the sense of creating access to users, communities, and organizations, and getting to know how and why practitioners do their work the way they do it. Embedding an emerging design in these local practices is key to achieving a sustainable result. We also emphasize the importance of creating alliances, or the 'tying of knots' as Susanne Bødker calls it. It refers to building the relationships that may help sustain the project outcomes in the long term. This does not just include working with users but also looking at other possible alliances outside the project consortium. Moreover, understanding the politics of a place was in many cases absolutely necessary in order to succeed. This work of contextualizing and creating alliances often remains invisible and not accounted for. An example of this kind of work is Ellen Balka's project of developing a tool to support adverse drug effect (ADE) reporting in a medical context. It was started as a participatory project and the tool was successfully installed at a local hospital and is being used to this day. From

the very beginning, the team had planned to extend the system to the provincial level, which required the integration of PharmaNet, a huge system that connects hospitals and pharmacies. The project lasted for ten years.

Ellen provided a fascinating account about what kind of work they had to do in order to make this project successful. Just to give a few indications, over the course of two and a half years they interacted with 38 organizations in an effort to gain support for their project and to motivate the provincial Ministry of Health to plan for and fund it. Much work went into complying with processes of other stakeholders, like enrolling in their product management system, attending weekly meetings, getting a budget number in order to buy tablets through the health authorities, etc. In short, work that goes beyond academic work. This included having to do things ‘nobody ever actually used’: ‘Anything anybody ever asked us to do? We did it. People wanted briefing notes, presentations, and detailed specs. We did them. They wanted us to fill out a project chart and a business case development for them. We don't know if anybody ever read them but they tried to exhaust us’

Our analysis also covers the temporal dynamics of a project. Funding institutions, and this is a common experience, impose temporal structures that may be detrimental to achieving sustainability. Hence, one of the changes we envision is to have funding institutions develop funding schemes that support the work of making the solutions that have been developed in a project sustainable in practice.

Among the technology issues malleability and maintainability stand out as important conditions for achieving sustainability. Maintainability was an aspect that came strongly into focus in the case study about Nic Bidwell’s work in South Africa. Over the span of several years, she and her team built a community network in a rural part of South Africa, the Mankosi community. This is fascinating work. that points at the need to produce a fairly robust solution and to design for easy maintenance and repair. We think that these aspects should also not only be considered in technologically marginalized and resource constrained environments.

Another condition for a sustainable design result in many cases is an early focus on technology integration. The projects that reported difficulties connected with legacy systems, large scale infrastructures, used top-down approaches to design. It was instructive to see how in some of the follow-up project to initiatives that largely failed, the designer teams managed to break up this top down approach, by, for example, starting small within a limited space, working to implement and support the appropriation of a local solution to eventually scale it up to similar sites within an organization. There were also interesting insights on how to build strategic partnerships with the different stakeholders in the field, when engaging in large-scale projects, including software companies.

Appropriation of a design solution is strongly connected with learning, capability building, and ownership. Ownership is about who is in control of different processes and takes responsibility for them. We found different constellations of ownership in different types of projects: ownership in the hands of the designer, management, or software developers. Ownership is fundamental to the successful handover of a solution to a participating community and organization. This not only implies early consideration of how to prepare and manage this handover, but how we best manage that ownership is shared from the beginning of a project – the idea of participatory design. We looked at different cases where ownership is shared between users and professional designers, where we saw that on site capability building was one of the main strategies to ensure sustainability and ownership over time. The Mankosi community network in rural Africa is a wonderful example of that. In this case, the community itself allocated responsibilities for the various activities that were necessary to sustain the network, building local control and accountability mechanisms; and researchers helped build a network of local research assistance developing local technical competencies around the network. We also looked at several projects where ownership was in the hands of an organization's management. But one encouraging insight is that although management may be in control and also in a position to stop a project at any time, in some cases it was management that provided space for appropriation and learning, giving users the possibility of exploring and also redefining and extending tools. Another important and connected aspect of sustainability is attention to legal financial and policy issues.

One of our conclusions is that funding should not be just directed towards technological innovation, but towards innovative, technologically supported social practices with a view to achieving sustainability. We discussed the importance and benefits of embedding projects in regional development initiatives, a strategy on which the group in Siegen is working with some success. Operating on a regional level offers the advantage of being able not to only adapt its vision to the local conditions, but also to participate in the definition of this vision. This strategy offers the chance to utilize already existing networks and it facilitates access to political decision makers and funding agencies in the region. An example is the Kompetenzzentrum Mittelstand 4.0 that is cooperating with small and medium sized companies in the manufacturing. Miriam Lewkowitz' home care projects exemplify another successful strategy. Myriam put a lot of effort into building alliances with stakeholders in the insurance sector since they play a relevant role in the healthcare supply chain. She also describes how a change of the regional policy in the area of health care where a new gatekeeper in the form of a regional eHealth agency was introduced destroyed all her previous efforts. She and her team managed to adapt to this new constellation by building a relationship with this new regional health agency.

We also want to draw attention to the transnational cultural sharing of solutions as a sustainability strategy. An example are the community networks in the Global

South. Non-profit organizations, such as AlterMundi, provide advocacy to community networks in Latin America (and beyond) but also concrete assistance in the form of open-source and decentralized technologies. Heike Winschiers-Theophilus wrote a lot about sharing experiences and solutions across continents, for instance, Namibia and Borneo. And she emphasizes the benefits of an incremental approach where we start from small local interventions that work and can be maintained and also moved to other sites, amplifying the learning opportunities on each side. In sum, were able to identify quite a lot of possibilities and strategies of achieving sustainability in practice-based projects.

Torn between Academia and Activism - Comments from a Critical Friend

Dave Randall

If I had prepared one slide for this symposium, it would have consisted of two quotes, and my response to the two quotes. The first quote would have come from Karl Marx - Karl Marx's early work in the Communist Manifesto, where he very famously said that philosophers have hitherto described the world. The task, however, is to change it. My response to Karl would have been: "So how's that worked out for you? "

The second quote comes from Bertrand Russell. And this is a more serious quote. Bertrand Russell was an activist as well as a philosopher, a very famous philosopher. Russell was also a member of CND, which stood for the Campaign for Nuclear Disarmament. And he said, famously, the problem is to persuade the world to acquiesce in its own survival, to which my response would be: "If you, Bertrand, with a brain with the size of the planet, can't successfully do that, how to expect me to do it?". This speaks to me at least to some very serious problems.

My relationship with Volker (Wulf) has been a good one. If it had not been a good one, I wouldn't have been here for the last 10 years - we get on extremely well. Nevertheless, we don't agree about everything. There are reasons for this. First, the reasons lie in personality. Volker is an energetic, idealistic, event driven man. I am a lazy, rather indifferent, and more to the point, deeply, deeply cynical man. There are some consequences to this. And I like to think of these consequences in terms of what I would think of as an inflationary as opposed to a deflationary tendency. I think of that kind of energy, that kind of creativity, that kind of belief that you really can change things as inflationary. I think of my own attitude,

which lies something along the lines of nothing ever changes, the world is going down the drain and there's nothing I can do about it as deflationary. There is a pathway between the two.

But my work here has changed my views - enough that I find myself more engaged than I used to be, I find myself taking issues more seriously than I used to. Just let me mention a few other people, like Débora (Leal), Max (Krüger), Michael (Ahmadi), Sebastian (Taugerbeck), and Phillip (Engelbutzeder). People who are very committed as activists, who nevertheless, are sometimes troubled. I know they are, because they refer to me as the department's therapist. So, they come and talk to me about the troubles, which I think sometimes remain a little bit invisible to more senior people and turn out to be quite important. This contrast between deflation and inflation pans out in a variety of ways.

I have never been a subscriber to what I would call the Spider Man theory of design. The Spider Man theory of design, basically, is that with great power comes with great responsibility. Have You ever seen Spider Man movies? Then you know: "With great power comes great responsibility". My response to that is: "Guys, have you never noticed we don't have any power? No one's listening!" And I want to caution against this. I know, again part of Volker's very energetic belief, that we're going to change the world. The first draft of this Social Informatics thing actually had the sense that we are really going to change the world. First, I said to him: "No, Volker we're not. If you believe that the main way in which the world is going to change comes from academic papers, you have got it badly wrong!"

Academics have a lot less power than they think they have. The degree to which the rest of the world is listening to us approaches zero. Again, a reflection of my own cynicism. Again, I have changed my views. I no longer fully believe the deflationary approach that I associate with my training in ethnomethodology. I believe that there are other things we can do. And I am more engaged than I used to be. That is certainly true. The special people I mentioned before taught me things and I am grateful for it. I am grateful to Volker for the creative tension that has been between us when we have been writing papers about political involvement in various places. But I still believe that we must not exaggerate our own influence. Not just on a political level, but also on a design level. Because for all our protestations about the need to move away from mechanistic approaches to design, this is what still dominates. That is what is happening in most places in the world. It is still large corporations and the traditional methods of design that still dominate, and we remain a small voice. And we need to recognize that. This is not a critique of ambition. It is basically a critique of realpolitic. We do not always achieve as much as we think we are going to achieve. There is another layer to this, and this is more of an academic concern. And it has to do with the relationship between description and prescription. Now, I have no objection to the idea that this is a design community. I know that and I subscribe to that set of values. Nevertheless, we must think very carefully about by what the role of

academic input is here. In particular, and this is where the deflationary tendency reasserts itself, I am really troubled by the fact that some of my colleagues do not recognize that this rigorous commitment to praxeology that they assert, nevertheless does not stop them theorizing. I do not understand how on the one side, you can say that the only thing that you are interested in is the user's view of the world, and then impose a theoretical commitment on those users. That seems to me to be troubling. As we have talked about this at length, I am deeply resistant to notions of practice theory, they seem to me to be the typical sorts of sociological invention. Those of you who know me know that I would like to think of myself as the anti-sociological sociologist. I think of sociology as a largely irrelevant discipline, where it basically involves a bunch of academic sociologists talking to each other and agreeing that they really are great.

To be fair to Volker, he does speak about illuminating concepts. Herbert Blumer's famous critique of very variable analysis, a paper I hugely admire, basically argues that there are no precise concepts in the social sciences, and there cannot be. But what there can be is illuminating concepts, concepts that help us thinking about the world in particular ways. And I am very sympathetic to that view. I am not sympathetic to theoretical constructs, which impose a vision on the world. What probably is the most controversial thing here: What does the word appropriation mean? In papers that the senior staff here have written, there are some very clear definitions of appropriation. Nothing that I want to disagree with - I think they are good papers. But when I see my younger colleagues talking about appropriation, I say to them: 'So, appropriation is quite a long word, isn't it?' The word 'use' is a lot shorter. Why don't you use the word 'use'? And I do not get a satisfactory answer. What I mean by this is that because Volker was implying the shoulders of giants in his lecture, one of the dangers of riding on the backs of giants, is precisely that you do not get the self-reflexivity that you want to see. I want to see junior colleagues asking the question, why are we talking about appropriation when we can talk about use. But they do not, because they are encouraged to shoehorn their work into an existing methodological framework of Grounded Design. They should be much more critical of that. And I do not think they are.

Yesterday I was talking with Peter (Tolmie) and with Mark (Rouncefield) about my own academic experiences. And we were talking about our emotional reactions over a long period of time to academic experience. And I say quite genuinely to them, that the last 10 years of my life, in academic terms, have been my happiest times. I have enjoyed working here [at the University of Siegen] more than at any other point in my academic life. I have found my relationship with many, if not all, of my colleagues to be productive and interesting. But in order that you are productive and interesting, you must have some conflict- back to Karl Marx. There has to be a dialectic! I continue to believe that without some kind of creative friction, you go nowhere!