The Fly in the Soup: A Critical Realism Perspective on the Role of the Engaged Researcher

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Abstract

Information Systems (IS) research and practice are constantly facing increasingly complex challenges through the design and development of new technology. The new technology is being researched through continuous engagement. This accentuates the importance of sociotechnical, engaged research through a critical view. However, the role of the researcher, and the engagement in research projects, is less researched. Taking a 'critical' view means to study the underlying mechanisms behind the observable, to understand change, and in this paper, we apply such a view to studying the changes in the researchers' role. This paper is based on the experience from four qualitative research projects, where we have studied four different public organizations and the technology-induced change of the professionals in these organizations. The four cases are conducted in Sweden and based on engaged research methods; an approach that draws on the perspectives of key stakeholders in a real-world problem situation to develop knowledge that might help address it. The underlying knowledge interest in this paper is understanding the driving forces behind engaged research, such as action research, how such research really is conducted and what the action entails and to shed light on some of the difficulties of engaged research while also discussing the complexity of the role. The research question is: what does the role of researchers in engaged research include over time? The main contribution is outlined in an in-depth understanding of the role of an engaged researcher which is illustrated through four main 'tradeoffs' within the role.

Keywords

Action Research, Engaged Scholarship, Critical realism, Socio-technical role.

1. Introduction

Engaged scholarship is a participatory form of research where the researcher takes an active part and engages with people in practice. It is an approach to research that takes contemporary challenges of the IS field seriously [1] based on the standpoint that scientific knowledge can be produced with practitioners rather than for them. In this approach, conducting research is thus not something done merely by the researcher or research team, but rather an achievement done collectively by researchers and practitioners in collaboration throughout the research process. The level of engagement can take different forms, depending on the research perspective (research questions) and the role of the researcher. The different forms of engaged scholarship can be outlined on two dimensions, according to i) the purpose of the research, which can be defined as either to *describe and explain* (informed or collaborative research) or to *design and control* (evaluation or action research) and ii) the researcher's role which can be considered as either *detached and external* or as *attached and internal* [1, 2].

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However, well-engaged scholarship and action research are explained in theory; doing it in practice is not without challenges. The underlying knowledge interest in this paper is understanding the driving forces behind engaged research, such as action research, where the purpose is, on the one hand, to contribute to theory and on the other hand, to contribute to practice and how such research really is done and what the action entails and shed light on some of the difficulties of engaged research while also dis- cussing the complexity of the role. Finally, the contribution is also targeted towards shedding light on how both rigor and relevance can be achieved in engaged and action-oriented research through critical realism thinking as well as role transparency.

Novel ideas about this type of research have been put forward for instance, by Mathiassen [3], highlighting its core commitment to bridging theory and practice. This allows researchers to embrace a variety of relevant research methodologies— including quantitative and qualitative methods—thus offering opportunities to overcome traditional dichotomies such as core vs diversity, rigor vs relevance, and positivist vs interpretive [1, 3]. Even so, there is still a gap concerning what happens when researchers are heavily engaged in their research over several years. Given the socio-technical nature of information systems, mixed methods have been suggested by various IS researchers, as essential for their holistic view in studying information systems [see e.g. 4] but mixing them, and pendulating between being detached with an outside-in view and attached with an inside-out view is a tricky business. Being engaged as a researcher means being part of (initiate, lead) change processes in organizations, often with the official or informal role as project leader, consultant, or expert. Furthermore, within IS research, socio-technical research also considers the technical part of the research, meaning that the role of the researcher often includes being a researcher, being a designer, and also being a developer who follows the software through from idea to actual product.

The socio-technical perspective is relevant herein as a rationale for involving multiple stakeholders and including diverse perspectives in the design of information systems in the public sector. The focus of sociotechnical thinking is to achieve "equilibrium of the entire organization, people, machines, and contexts" through active participation of stakeholders, co-creation, and co-development, which is considered a necessity to meet current challenges in contemporary digital work [5, 6]. This means balancing Scrum and limiting waste (which often requires hard labor and insights into the state of the art) while juggling interviews (which requires a soft touch) and being the project manager of the project. The research is based on the experience from four qualitative research projects, where we have studied four different public organizations and the digital work of the professionals in these organizations: physicians in hospitals and primary healthcare from an engaged research approach; home care and healthcare organization from an action research approach; communication specialists in municipalities from an engaged scholarship approach; and schoolteachers from an action research approach. The four cases are conducted in Sweden and span five years of heavily engaged and action-oriented research.

As the title of this paper suggests, this paper will not be about being a researcher that is a fly on the wall. It is, however, about being what we call a fly in the soup, being heavily engaged in the research, and making all kinds of decisions along the way. The: i) push and pull of the roles of the researcher, ii) the pendulation between the inside-out and outside-in view, iii) the struggle of knowing when enough data has been gathered and deciding when to leave the soup, is what this paper is about. The research question is: *what does the role of researchers in engaged research include over time*?

2. Historical Overview Behind the Rise in Critical Realism within modern IS

Modern IS research is paved with research on diverse digitalization efforts where the technology is either the driving force or the impact on the social constellations is the main target point. The combination, in a socio-technical spirit, is based on the relation between the social and the technical system. The social system consists of professionals and their practices, cultures, and professional roles, whereas the technical system consists of the technologies that support the work processes of the social system [7]. The socio-technical approach is well known within the Scandinavian school, has a long history, and is still thriving within modern IS research. The socio-technical approach was a response which aimed to overcome the opposition between technological and social determinism but has received criticism for being an instrumental, normative tradition, and the practical impact for the practices involved in socio-technical research has also been questioned throughout the years [8, 9]. However, in the later years, the focus of the research done from a socio-technical perspective has shifted. In the early years the research focused on altering the practices to fit the technical system, whereas today, the focus is more on the socio-technical design where both the design of the practices involved, and the digital artifacts, is viewed in an interplay where both need to be adapted [cf. 10]. In recent years, there has also been a shift towards increasing interest in sociomateriality as a more modern socio-technical approach.

Sociomateriality opens for research and understanding of technology in detail without resorting to either a strict socio-constructivist view or a technological determinist perspective, where a sociomaterial research perspective rather proposes a view of human and technology as an entangled relation and a process of mutual dependence [11, 12]. Sociomateriality has a strong emphasis on the relation and sets the interaction in focus, which implies that it is the interaction that forms the practice, and not the structures alone (hence norms and rules) [11]. Sociomateriality is thereby a perception that socially and technologically related aspects of interaction are equally important for the outcome of interaction and that the technology emerges, rather than is being a static artifact, in the activity or work [11]. Sociomateriality refers to a more mature concept than the socio-technical concept. The essence of sociomateriality is that it is not possible to separate social and technical; these are "intertwined". What we would like to illustrate with this historical overview is that sociomateriality and the intertwinedness there could also be applied to the role of the researcher. Let us continue to elaborate. Sociomateriality is a relational ontology, which is different from a substantial ontology that dominates the Information Systems (IS) field [13, 14]. A substantial ontology implies a view of humans and technology as separate entities that affect each other, while a relational ontology assumes that "the social and the material are inherently inseparable" [12 p. 456].

As noted by Leonardi [15] the study of sociomateriality can be built on alternative theoretical foundations: agential realism and critical realism. He describes sociomateriality as a post humanistic reaction to the socio-constructivist view of the relation between technology and humans. In a socioconstructivist view, humans have a dominant role and technology is more or less black-boxed or its potential agency is ignored [9]. The field of IS has, as we point out herein, been evolving in recent years, both with sociomateriality but also with critical realism. According to Bansler [16], those doing research within the critical tradition from the early IS were initially interested in the use of IT and interested in workplace democracy. Their goal was to reinforce the employee's position. This developed over time, whereas the users were not a significant part in the early years of IS research but grew into being a part of the research interest within the socio-technical tradition in the Scandinavian school where the organization is treated as two systems; a social system and a technical system and these systems function together [16]. Critical realism has come a long way as a science philosophy but is less developed on a methodological level [17]. Here is where we come to our point, with what is missing from modern research approaches. To continue towards the point, critical realism has been gaining traction within modern IS. MISQ had a special issue on critical realism as a way of opening up a structured discussion on the topic within the field of IS [18]. However, critical realism has been used more as a behavioral science paradigm [17] and there have been few attempts to unpack how the role of the engaged researcher can be enhanced from critical realism thinking.

3. Critical Realism

The goal of critical realists' evaluation is to see for what kind of people, in what kind of situations, and why an IS initiative works. Critical realism is therefore about changing the focus from the data and analytical method towards the real problem as well as the underlying causes of that problem [18]. This allows for the use of various methods to gain deeper insights into the "meaning and significance of information systems in the contemporary world" [18, p. 795]. Critical realism research can thereby both be in the form of qualitative as well as quantitative research, although Carlsson [17] states that critical realism has more domination in qualitative theory generation and qualitative evaluation studies, suggesting critical realism as beneficial in cases where controlled experiments are not an option [17]. This is especially helpful in settings where people and technology interact and can, for instance, be appropriate in multiple case settings. How is it really done then, is what we have asked ourselves. Critical realism came initially as an answer to positivism and constructivism and was first launched by Bhaskar in 1975 [cf. 17, 18]. Whereas Carlsson [17] focuses on critical empirical research cases, Nygren

and Gidlund [19] conduct a rather abstract political discussion on power relations and cultural aspects. They highlight that digital practices enable individualization but point out that they seduce the person "with the thought that with digital technology it is possible to construct and display individuality" [19, p. 515]. It is seen as a detailed form of realism and a way to recognize the reality of the natural order, and the events and discourses of the social world [20]. Critical realism is a philosophy, in contrast to critical design which is more about critical thinking concerning art [see e.g., 21, 22, 23].

Within modern IS, critical realism is increasingly used as a theory and consequently as analytic tool [cf. 18, 24, 25, 26]. Taking a 'critical' view means to study the underlying mechanisms behind the observable, to understand how to succeed or obtain desired change. It is important to note the distinction posited between critical realism and other forms of critical theory, with the claim that critical theory overall is interpretivism whereas critical realism per Bhaskar acknowledges a measurable firm reality, but that the measurable elements are less interesting than the hidden generative mechanisms that bring about those phenomena. Critical realism is presented as an alternative "philosophical underpinning for IS research" [20, p. 269], developed as an alternative to positivism as well as constructivism, and defined as a specific form of realism that "recognize the reality of natural order and the events and discourses of the social world" (ibid s. 270). Our question remains, how does one apply critical realism in engaged research. Let us continue. Critical realism has been suggested as an alternative theoretical foundation for the study of socio- materiality that allows an analytical dualism between structure and action [15], which is why we started with the historical overview in this chapter. We believe that a critical realism is a valuable addition to being the fly in the soup because critical realism asks questions of "how, why, in what circumstances and for whom [an IS initiative] has the potential to cause (desired) changes" [20, p. 275]. Thus, acknowledging the importance of understanding contexts, settings, and mechanisms and unpacking the mechanisms of the complexity of IS research.

4. Research Approach

This paper is based on the experience from four PhD projects in public organizations in Sweden, each spanning five years. The cases have in common that we have studied the technology-induced change of the professionals in these organizations. All four projects are based on approaches that draw on the perspectives of key stakeholders in a real-world problem situation to develop knowledge that might help address it: i) physicians in hospitals and primary healthcare from an engaged research approach, ii) home care and healthcare organization from an action research approach, iii) communication specialists in municipalities from an engaged scholarship approach and iv) schoolteachers from an action research approach. An overview of the cases is presented in Table 1.

Table 1

Overview of cases with reference to corresponding publication (dissertation)

Case	Case description	Reference
Case 1	Public sector healthcare, where physicians leverage work between hospitals and out-patient clinics which calls for various types of systems.	Vallo Hult [27]
Case 2	A cancer rehabilitation clinic where the nurses use various types of systems during the course of their workday.	Islind [28]
Case 3	Municipality where the communicators have a similar situation, where they shift between various systems.	Norström [29]
Case 4	Primary school where the teachers shift between different systems.	Willermark [30]

For this paper we revisited the projects, using the PhD theses as empirical data, retrospectively reflecting on the role of the engaged researcher from a critical realism perspective. The analysis was done in collaboration and abductively, to find patterns and themes in the material that reflected the process and common challenges from each project respectively. The method aligns with a contrasting multiple case study approach, with focus on contextual details and rich descriptions within and across the empirical settings [31].

5. Findings and Analysis

The following chapter includes findings from the four PhD theses that this paper draws data from, presented into three themes that were found in the analysis, which are illustrated through excerpts below. The first theme is called *juggling several roles at the same time* and describes the push and pull of the roles of the researcher. This is followed by the second theme, *the pendulation between the inside-out and outside-in view* and balancing detachment and attachment while doing research. Then the third and final theme of *deciding when to leave the soup: the struggle of knowing when enough data has been gathered in engaged research and action research* is presented.

5.1. Juggling several roles at the same time

Action research has been criticized for the notion that it can be challenging for researchers to be objective about the research context while being heavily involved as a researcher within the context [28, 29]. The following excerpt is taken from case 2:

In both studies, I have had the dual role of designer and researcher. However, in [empirical case 1], my role was more interventional and complex. The role included being the project manager for the home care project, software architect, designer, and researcher. I had a lead in designing the research interventions (in collaboration with my main supervisor), was a lead designer when it came to the digital artifact, and collected all the empirical data. I was involved in the interaction design as well as in the software development. I did the initial prototyping, was active during the interaction design along with another interaction designer, was one of the developers of the Android application, and the software architect developing and structuring the databases for all versions as well. The last version of the mobile app was developed by a consultancy, but with day-to-day contact with me during the development sprints (Scrum, type of Agile software development method). This rich engagement eliminated many research methods.

In [empirical case 2], I have had the dual role of researcher and designer. It was a less complex role than in the previous study because I have not been the project manager in this project or involved in the programming or software architecture. Even though this role was simpler, it has not been without complexity. It is a complex thing being a designer and a researcher simultaneously. I have been present and active during design interventions within the project (such as the development of personas, UX, and other interaction design methods). These design interventions were done to support the design process but had the dual function of both doing that and being data collection activities. The interviews have been conducted by me. [...] My own involvement, the interventions in the empirical settings, the research questions, the problems, and the complexity of the practices as a social situation all point towards AR as a suitable method for my research. When reflecting upon my role in the two empirical cases, my goal has not been to be "a fly on the wall", but rather to be "a fly in the soup". By that, I mean that both as a designer and as a researcher, my aim has been to be a part of the change process, and to intervene, which eliminates the role of a neutral observer.

The following excerpt is taken from case 1, where a part of the project is about building a bridge between academia and industry (in this case, healthcare):

The study design is thus framed within the context of doing research as a third-party doctoral student, as the PhD project specifically aims to promote collaboration between practice and academia. The point of departure was to identify a research need that addresses a practical project within the scope of information systems (IS) and workplace learning in healthcare. While this approach has benefits in terms of access to empirical data and a research site, as well as anchoring the research in practice, there are challenges that arise from doing research while working. The influence from practice and stakeholders on the research, while not without problems, was acknowledged and addressed in all studies, being a common way to do research in IS and related fields. However, the engaged and interdisciplinary approach can make it hard to put boundaries on the topic, given the many possibilities of this situated research. An approach wherein the researcher plays an active role engaged with people in practice is consistent with an applied research PhD project, as it bridges the challenges of being in practice while conducting research. A defining characteristic of this approach is that it draws on the perspectives of key stakeholders in a real-world situation and develops knowledge specifically to address it.

The selected excerpts provided above are representative for the tradeoffs identified in the first theme between the pitfalls and benefits that come with being knowledgeable and part of a project. It illustrates the researcher's role as an ongoing balancing act of push and pull of various roles and demands, with corresponding level of engagement and involvement, that takes place during an engaged PhD project.

5.2. Pendulating between an outside-in view and an inside-out view

The complexity of projects in which PhD students often find themselves is often high. Reflecting on the role and separating the entangled roles within PhD work takes effort which is illustrated in the following excerpt from case 2:

My main supervisor was the project manager for the overall project EU-initiative which my empirical study nr.1 was drawn from. Included in that overall EUinitiative, was the home care project [empirical case nr.1 in the other excerpt] (for which I was project manager) and the home care project was one of several subprojects which gave my main supervisor insight into my work in [empirical case nr.1]. My co-supervisors have thereby acted as outsiders when discussing the findings from empirical case nr.1. One of my co-supervisors was a part of the other project [empirical case nr.2 in the other excerpt] in the beginning, which gave my co-supervisor insights into my work in empirical case nr.2. In relation to the results of that study, my other two supervisors (my main supervisor and my other cosupervisor) acted as outsiders when discussing the results from empirical case nr.2.

Shifting between discussing the findings inside and outside of the projects and between discussing it with researchers and practitioners has contributed to me being able to distance myself from the results and has, over time, helped me separate my roles. These structures and different contexts helped me distance myself from the empirical settings and the role of a designer increasingly over time, and helped me sharpen my role as a researcher. Over time, I have realized that the roles are separate but entangled. Wanting to forward the design process and limit waste during development, but simultaneously wanting to preserve rigour and give maximum room for reflection in the data collection, is a challenge I am aware of in my findings. In addition to that (a notion that does not relate directly to my own role, but more to the validity of the findings), specific findings have been discussed with the practice, and some of the practitioners have read the papers, meaning that they have not only been a part of the co-design process and been aware that their involvement is a part of the findings, but also confirmed that the analysis of the results is plausible.

This goes to the balance and pendulating between being detached, and having an outsider perspective and being attached, and having insider perspective which is also illustrated in the following excerpt from case 1:

As a third-party doctoral student, I have been working 50 percent on IT and information-related development projects [at the hospital] combined with part-time doctoral studies at the university. Experiences from engaging in practice have thus provided a real-world context to the thesis. I have engaged in a competency-based continuing professional development program for specialist pediatricians, and in projects concerning patient safety and quality improvement. Altogether it has been an iterative process of anchoring the relevance of the research questions for realworld problems in healthcare practice. While engaged in practice, I am not, however, a health professional and therefore also have a detached, outsider perspective with respect to the physicians in terms of the data collection methods for Papers 1-3. My participant role has been as an actor in changing the practice through the combined research and development projects. [...] During the final years of the PhD project, I had the opportunity to research in the US where the support and guidance from external supervision provided new insights and perspectives and resulted in one of the included papers. While I was still in regular contact with the hospital work, and participated in course work and scientific writing, this allowed me to take a step back and approach my data from new perspectives, as reflected in the structure of the thesis.

The excerpts show that the pendulation between an outside-in view and an inside-out view as a researcher can be both beneficial and challenging. It highlights the importance of being aware and reflect on the different roles and how the engagement may influence the outcomes of the project.

5.3. When to leave the soup: The struggle of knowing when enough data has been gathered in action-oriented and engaged research

Action-oriented or engaged projects are often multi-disciplinary. In multi-disciplinary projects there are on the one hand project goals and on the other hand there are research goals which creates tensions both for the individual researcher and potentially within the group of researchers. The following example is from Case 2 and highlights this dilemma. It is the researchers own reflections from a notebook combined with explanations:

The scribble is done in a research notebook which included all kinds of research notes. This particular picture was drawn at a meeting between the researchers within the project. We had Friday meetings (stand-up meetings known from agile software development) every week and during the meeting we would discuss the data collection, the papers in the pipeline and the progress of the project. I was struggling, at the time, with the fact that I was gathering empirical data that would not go towards my PhD thesis, I did however write a paper on that data after I defended my PhD thesis. The data collection activity was in line with the project goals, but not in line with my PhD thesis. I felt guilt towards my supervisors for prioritizing the project and at other times, when I prioritized the other way, I felt guilt towards the project. At that point I knew I had enough data for my PhD thesis but I did, however, not want to back down from my project responsibilities. Likewise, in case 1, the challenges of combining work activities and projects with research activities to get synergies for example for data collection is described.

The combination of doing research while engaged in practice has been important to the thesis and outcomes of the PhD project. Working in close collaboration and participation with relevant stakeholders at the hospital has guided and validated my research in terms of regular collegial feedback, avoiding misconceptions that might arise from a less engaged effort. I have been able to present and discuss preliminary research findings in a professional setting outside of academia. The broader perspective provided valuable knowledge and insights for the synthesis in the cover chapter. At the same time, I am aware of difficulties with engaged research and the complexity of the role, where the purpose is to contribute to both theory and practice. I have been transparent about my role in all work activities and projects related to my research at the hospital. The papers included in the thesis did not involve interventions directly aimed at changing the practices of participants but may have been affected by my role and connection to the hospital.

As described above, one of the strengths of being engaged in practice and working on real-word projects is having easy and constant access to data. However, on the other hand is that the access to data makes it problematic to put up boundaries and limits between project (goals) and research (goals). This struggle between the project goals and research goals is illustrated in Figure 1 below:

aich

Figure 1: Taken from research notes of the author behind case 2

In this theme, the main challenge concern prioritizing, and the tradeoff is between project goals and research goals. The theoretical and practical do not always align, and it often up to the PhD student to make a decision as to when enough data or development is made in terms of the research goals, even though the project may not be finalized.

6. Discussion and Conclusion

In this paper, we argue for a socio-technical, engaged research approach through a critical view, as a way to face the increasingly complex challenges that IS research and practice are currently facing. We have described and discussed a critical perspective on the role of the researcher in three themes, which also provides an illustration of what the role include over time: i) the push and pull of the roles of the researcher, which means juggling several roles at the same time; ii) the pendulation between the inside-out and outside-in view and balancing detachment and attachment while doing research; and iii) the struggle of knowing when enough data has been gathered in engaged research and action research and making the decision about when to leave the soup. Critical realism is proposed as a valuable addition to being the fly in the soup, as it provides an alternative "philosophical underpinning for IS research" [20 p. 269], to positivism as well as constructivism, that also allows an analytical dualism between structure and action which is useful for the study of socio-technical practices [15].

Due to the known critique towards maintaining objectivity as an AR researcher [32, 33], it has been of importance to be a part of larger research groups involving researchers, practitioners and consultants. These constellations have called for project meetings on a regular basis where preliminary results and plausibility of the analysis have been discussed repeatedly between the involved researchers and the practitioners. The push and pull between roles, and the repeated discussions which iteratively move the analysis forward, have been important. The empirical results have also been frequently presented to, and discussed with, the practitioners. What has been guiding in all four PhD theses is the shift be- tween being empirically grounded and analytically focused in the research. We have focused on doing periods of empirical work, periods focused on design work, periods focused on theoretical framing, periods focused on analytical work and writing as well as periods focused on scientific reflections. As reflected in all themes above, the setup, and constellation around the PhD project is also central, not merely for the progress in terms of course work and publications, but also with regard to the specific challenges of doing engaged research. Especially, as described in case 1 and 2, the supervisor team is of importance. They can act as a sounding board when it comes to the results of the studies, and help with distancing the different roles, such as for in-stance from the role as a designer as well as provide support to sharpen the research focus. To sum up, in this paper have examined what the role of researchers in engaged research include over time. The paper provides insights into understanding the driving forces behind engaged research, such as action research, how such research really is conducted and what the action entails and to shed light on some of the difficulties of engaged research while also discussing the complexity of the role. The main contribution is outlined in an in-depth understanding of the role of an engaged researcher which is illustrated through four main 'tradeoffs' within the role.

7. References

- [1] L. Mathiassen, and P. A. Nielsen, "Engaged scholarship in IS research," Scandinavian Journal of Information Systems, vol. 20, no. 2, pp. 1, 2008.
- [2] A. H. Van de Ven, Engaged scholarship: A guide for organizational and social research: Oxford University Press on Demand, 2007.
- [3] L. Mathiassen, "Designing Engaged Scholarship: From Real-World Problems to Research Publications," Engaged Management Review, vol. 1, no. 1, pp. 2, 2017.
- [4] P. J. Ågerfalk, "Embracing diversity through mixed methods research," European Journal of Information Systems, vol. 22, no. 3, pp. 251-256, 2013/05/01, 2013.
- [5] P. Bednar, and M. Sadok, "Bridging the Gap Between Theory and Practice: Socio-Technical Toolbox," Lecture Notes in Information Systems and Organisation, Empowering Organizations, pp. 51-62, Cham: Springer International Publishing, 2016.
- [6] P. M. Bednar, and C. Welch, "Socio-Technical Perspectives on Smart Working: Creating Meaningful and Sustainable Systems," Information Systems Frontiers, vol. 22, no. 2, pp. 281-298, 2020/04/01, 2020.
- [7] C. Clegg, B. Ellis, J. Wyatt, B. Elliott, M. Sinclair, and D. Wastell, "A manifesto for a sociotechnical approach to NHS and social care IT-enabled business change-to deliver effective high quality health and social care for all," 2011.

- [8] G. Bjerknes, and T. Bratteteig, "User participation and democracy: A discussion of Scandinavian research on system development," Scandinavian Journal of Information Systems, vol. 7, no. 1, pp. 1, 1995.
- [9] P. M. Leonardi, B. A. Nardi, and J. Kallinikos, Materiality and organizing : social interaction in a technological world, Oxford: Oxford University Press, 2012.
- [10] P. M. Leonardi, and S. R. Barley, "What's under construction here? Social action, materiality, and power in constructivist studies of technology and organizing," The Academy of Management Annals, vol. 4, no. 1, pp. 1-51, 2010.
- [11] S. V. Scott, and W. J. Orlikowski, "Great Expectations: The Materiality of Commensurability in Social Media," Materiality and Organizing: Social Interaction in a Technological World, 2012.
- [12] W. J. Orlikowski, and S. V. Scott, "10 sociomateriality: challenging the separation of technology, work and organization," The academy of management annals, vol. 2, no. 1, pp. 433-474, 2008.
- [13] D. Cecez-Kecmanovic, R. D. Galliers, O. Henfridsson, S. Newell, and R. Vidgen, "The Sociomateriality of Information Systems: Current Status, Future Directions," MIS Quarterly, vol. 38, no. 3, pp. 809-830, 2014.
- [14] A. M. Kempton, "The digital Is different: A realist reinterpretation of sociomateriality," in In Proceedings of the 27th European Conference on Information Systems (ECIS), Stockholm & Uppsala, Sweden, June 8-14, 2019, 2019.
- [15] P. M. Leonardi, "Theoretical foundations for the study of sociomateriality," Information and Organization, vol. 23, no. 2, pp. 59-76, 2013/04/01/, 2013.
- [16] J. Bansler, "Systems development research in Scandinavia: three theoretical schools," Scandinavian Journal of Information Systems, vol. 1, no. 1, pp. 3-20, 1989.
- [17] S. Carlsson, "Critical realism," Handbook of Research on Contemporary Theoretical Models in Information Systems, Y. K. Dwivedi, B. Lal, M. D. Williams, S. L. Schneberger and M. Wade, eds., pp. 57-76, Hershey, PA: IGI Global, 2009.
- [18] J. Mingers, A. Mutch, and L. Willcocks, "Critical realism in information systems research," Management Information Systems Quarterly, vol. 37, no. 3, pp. 795–802, 2013.
- [19] K. Nygren, and K. Gidlund, "The pastoral power of technology. Rethinking alienation in digital culture," tripleC (cognition, communication, co-operation): Journal for a Global Sustainable Information Society, vol. 10, no. 2, pp. 396-413, 2012.
- [20] S. A. Carlsson, "Critical Realist Information Systems Research in Action," Researching the Future in Information Systems, IFIP Advances in Information and Communication Technology M. Chiasson, O. Henfridsson, H. Karsten and J. I. DeGross, eds., pp. 269-284, Berlin, Heidelberg: Springer, 2011.
- [21] N. Iivari, and K. Kuutti, "Critical Design Research and Information Technology: Searching for Empowering Design," in Proceedings of the 2017 Conference on Designing Interactive Systems, Edinburgh, United Kingdom, 2017, pp. 983-993.
- [22] H. Sun, Global Social Media Design: Bridging Differences Across Cultures, New York: Oxford University Press, 2020.
- [23] J. Bardzell, S. Bardzell, and M. Blythe, Critical Theory and Interaction Design, Cambridge, MA; London, England The MIT Press, 2018.
- [24] R. Bhaskar, Reclaiming reality : a critical introduction to contemporary philosophy, London: Verso, 1989.
- [25] E. Wynn, and H. Vallo Hult, "Qualitative and Critical Research in Information Systems and Human-Computer Interaction: Divergent and Convergent Paths," Foundations and Trends[®] in Information Systems:, vol. 3, no. 1–2, pp. 1–227, 2019.
- [26] L. H. Fischer, and R. Baskerville, "Socio-Technical Change: The Equilibrium Paradox," in Proceedings of the Twenty-Sixth European Conference on Information Systems (ECIS), June 23– 28, 2018., Portsmouth, UK, 2018.
- [27] H. Vallo Hult, Digital Work : Coping with Contradictions in Changing Healthcare, Trollhättan: University West, 2021.
- [28] A. S. Islind, "Platformization: Co-Designing Digital Platforms in Practice," Doctoral Dissertation, University West, Trollhattan), 2018.
- [29] L. Norström, "Social Media as Sociomaterial Service : On Practicing Public Service Innovation in Municipalities," Doctoral Dissertation, University West, Trollhattan), 2019.

- [30] S. Willermark, "Digital Didaktisk Design: Att utveckla undervisning i och för en digitaliserad skola.[Digital Didactical Design: To develop teaching in and for a digitalised school]," Dissertation. Trollhättan: University West, 2018.
- [31] M. B. Miles, and A. M. Huberman, Qualitative data analysis : an expanded sourcebook, Thousand Oaks, CA: Sage, 1994.
- [32] R. L. Baskerville, and A. T. Wood-Harper, "A critical perspective on action research as a method for information systems research," Journal of information Technology, vol. 11, no. 3, pp. 235-246, 1996.
- [33] A. Bryman, Social research methods: Oxford university press, 2015.