

“Do you work on IT or what?” – Configurations of Heterogeneous Actors in Information Systems Design

Johanna Sefyrin

Department of Information Technology and
Media
Mid Sweden University
851 70 Sundsvall Sweden
johanna.sefyrin@miun.se

ABSTRACT

In systems design a number of different actors participate, and the boundaries between these are not always self-evident. The purpose of the paper is to explore how heterogeneous agencies were configured during a systems design project. The empirical material for the study was gathered through the use of ethnographic methods, and analyzed diffractively. The conclusions are that in the project a range of agencies were configured, and these were sometimes enabling, and sometimes restricting. Furthermore the administrative officers (mostly women) in the project were configured as business experts, and this categorization made invisible their contributions as systems designers.

Keywords

Information systems design, agencies, systems designers, feminist technoscience.

INTRODUCTION

In information systems design a range of categories are involved. Some of these are human actors and stakeholders, contributing in different ways, with specific knowledges or in specific occupational positions, while others are non-human (e.g. pens, computers, tables etc.). Examples of such actors are systems designers, users, customers, programmers, business process experts and many more. These categories are sometimes helpful, but can also be problematic, and the boundaries between them are not always as clear-cut as the concepts seem to indicate. Suchman [31] argues that the categories ‘users’ and ‘designers’, often set up as dichotomous, make invisible the intricate and multiple agencies and relations that are involved in systems design. Her argument is that these categories serve to make invisible a world which is more complex than indicated by the categories. However, concepts such as these are not set once and for all, but are processes of change and destabilization [15]. Hence it is important to open up problematic categories, concepts, and dominating stories, and to keep them fluid and multiple, in order to make room for alternative understandings. This is what I will try to do in this paper.

The stories in this paper all depart from a systems design project in a Swedish government agency. Associated with the project was a range of different actors and stakeholders, and the boundaries between these were quite blurry. The purpose of the paper is to explore how heterogeneous agencies in various ways were configured during a systems design project. In the systems design project, one crucial group of participants was the administrative officers. Their positions in the project were manifold and overlapping. They were seen as administrative officers and as experts of the administrative process. They were also regarded as formulators of business requirements, as compared to those who would formulate systems requirements (from an information technological point of view), and as future user of the system. In some of these positions they had wide possibilities to act while in others they were more restricted. These different actors came into being in different project contexts and with various consequences. Because of the administrative officers’ crucial positions in the project I will argue that they were also systems designers. This issue relates to a central debate in feminist technology studies; the question of women’s participation in (information) technology design. Feminist and STS researchers have shown how technologies are constructed in use as well as in design, and this has placed women in central positions in technology design – as users [28, 33]. However, this does not mean that women do not participate in technology design, or as technology designers. With this paper I hope to show how a diffractive reading of design stories makes it possible to see how women in this project had central positions as systems designers.

The paper is structured in the following way. The introductory section is followed by a second section concerning feminist technoscience. The third section provides a presentation of the systems design project, the project organization and the project method. The fourth section concerns the research methodologies, diffraction and ethnographic studies. After that an analysis of the empirical material is presented, in which the business analysis and the various actors that came into being during this phase are in focus. This is followed by a concluding section with a focus on the results of the analysis.

FEMINIST TECHNOSCIENCE

In the stories told here, several voices are invited to participate as contributors. Some of the most important voices are the theoretical voices coming from feminist technoscience. The concept technoscience was coined by Latour [22], to indicate how science, technology and society are intimately intertwined. Feminist technoscience is the use of feminist research as a resource in order to critically explore and reformulate problematic technoscientific practices. An important issue in feminist technoscience is to point to alternatives and to how things could be different, and in this endeavour, to pay special attention also to lower frequencies and to gender performances [17]. My strategy (as a researcher generally and in this paper) is to highlight that which is deviating from the norms, or that which is an exception to the usual, rather than pointing to general patterns. This is a strategy used in order to open up possibilities for change; to point to how norms and dominant stories in themselves build on generalized understandings (and simplifications) of a messy reality. Feminist technoscience goes beyond the relations of women and men and focus on broader epistemological and ontological issues [1, 11]. A central focus is on knowledge practices and technologies as frozen or materialized knowledge [31]. When technologies are understood as materialisations of knowledges and practices, it becomes important to explore whose knowledge it is that becomes materialised. In other words it is central to ask whose knowledge is dominating and whose knowledge is marginalised in technoscientific practices [12, 21], and what the consequences of this are.

Another central focus is on how (human and nonhuman) bodies become, or materialize. In the terms of feminist technoscience, various agencies such as users, designers, business analysts and IT experts is something that becomes, or emerges out of various enactments [32, 3, 8, 9]. Butler [8, 9] argues that gendered bodies are the result of citational practices, and that in these performances existing norms are reiterated or challenged and reconfigured [8, 9]. Suchman [32], inspired by Butler, suggests that in a similar way technologies are constructed in processes of materializations through the reiteration of norms. Processes of becoming are never mechanically reiterated, instead “[t]echnologies, like bodies, are both produced and destabilized in the course of these reiterations” [32: 272].

In feminist technoscience an important idea is that the material and the social are intertwined and inseparable, and that the boundaries between these are enacted. Several researchers in this tradition have coined their own concepts to express this idea. Thus Donna Haraway [19: 194-195] talks about material-semiotic, Lucy Suchman about sociomaterial [32], and Karen Barad about the material-discursive [3]. All these concepts are invented in order to indicate how the material and the discursive are inextricably entangled. The concept signifies how the epistemological and the ontological are intertwined.

Individuals in this view are material-semiotic assemblages [15: 328], so as individuals we can know something only because we are part of the world. This is something entirely different than “the view from nowhere” [19].

A Feminist Technoscience View on Agency

In this text I will base the analysis on Karen Barad’s view on agency. From this point of view, matter has agency, or rather is agentic [see e.g. 15, 32, 3]. In a world consisting of complex processual networks, it is impossible to separate individuals from the world of which they are part, and instead they are seen as deeply entangled with and inseparable from the world. With such a view of the world, agency is not something that separate individuals “has” or “possess”. Instead agency becomes something produced by specific sociomaterial relations. Suchman [33: 241-242] writes: “Capacities for action are recast ... from inherent capabilities [of humans] to possibilities generated and reiterated through specific sociomaterial assemblages and enactments. These approaches shift the frame of reference from the autonomous human individual to arrangements that produce effective forms of agency within ramifying networks of social and material relations”. In the paper agency is mainly about the freedom and possibilities to act, produced by socio-material relations.

THE SYSTEMS DESIGN PROJECT

The stories that will be told here are based on events which took place in a systems design project in a government agency in Sweden (here referred to as The Insurance Agency, or TIA). At the time of the observations (2005-2006) TIA had approximately 320 employees, and its main business was the administration of a part of the Swedish public social insurance system. The project started in September 2005 and was at that time named ‘Project IT support for administrative officers’. The project can be seen as part of an effort to turn TIA into a public eAdministration¹. Part of the project was about designing an improved IT support for the administrative officers who worked internally in TIA, and part of it was the design of a public eService aimed at external customers. The administrative officers represented the largest professional group in TIA; they constituted 200 out of the total of 320 employees. Of these administrative officers 80 percent were women. There were two different objectives associated with the project. One objective was to provide an IT support for the administrative officers for their case administrating tasks, and the other was to design an automated system for case administration.

The project was conducted as a business development project, so in this way the technological aspects were played down. I followed the project mainly during the business process analysis phase. Business process analysis is an early phase in systems design which consists of analyzing work practices and business processes. This

¹For more about eGovernment, eServices and eAdministration see e.g. [14].

precedes any planning of the technical aspects of an information system. The project was conducted in-house, and there was a project organization consisting of a project team, a project manager (Ingrid²), a customer (John), and a project steering committee. The customer was one of the higher directors in TIA but he was not very active in this phase of the project. Instead his tasks were delegated to a representative, a delegated client (John). In fact, John started as a (delegated) customer only about three months after the project outset, and replaced another (delegated) customer who then left the project. The customer was supposed to determine how to allocate the project resources and what the result of the project would be, and the project steering committee was acting as advisors for the customer. There were also other actors and stakeholders involved in and related to the project. For instance there were several related and parallel projects that affected the project, and there were several other departments that were involved and interested in it too. There were also the external customers (citizens and employees in state organizations), tax-payers, politicians and those who formulate the eGovernment initiative including public eAdministration and public eServices. The list of related stakeholders could be made longer than this³.

The project team consisted of a number of people with various competencies. Some of these worked part-time and some worked full-time in the project. Of these there was a project core team, at the time of my observations consisting of five to six business analysts who were working full-time with the business process analysis. Hence during the business process analysis there was a larger project team consisting of less engaged people, and a smaller project group of business analysts that worked full time. The business analysts⁴ were:

- Sonja, administrative officer.
- Maria, administrative officer.
- Tekla, administrative officer (after about three months she left the project).
- Ulf, "business client". He was supposed to act as a link between the business part of the organization and the IT part.
- Jacob, an expert in graphical user interfaces (GUIs).

Hans, an expert in the business process analysis method, who was leading the day-to-day work of the business analysts.

² All names mentioned are fictitious.

³ For a more comprehensive analysis see [30].

⁴ Note that the business analysts were men and women, and that the project manager was a woman. The rest of the project group also consisted of both men and women.

The Business Development Process

The project group had already been formed by the start of the fieldwork and the business analysts had begun with their work. The business process analysis consisted of three steps; today, tomorrow, and the future. As discussed above one of the project objectives was to improve the work situation of the administrative officers, who were thus considered future users of the system to be built. Two to three administrative officers took part in the business process analysis work as business analysts, experts of the work processes to be analysed, and as user representatives. The first task was to analyse the administrative process of today, in order to understand how it worked. From this analysis an understanding of the problems experienced by the administrative officers and from a business perspective could be reached. As part of this work paper prototypes of graphical user interfaces (GUIs) were used as a method to analyse the existing work practices and to develop requirements of a better system for tomorrow and the future. The focus in this part of the business process analysis was on work practices. This focus on work practices made the knowledge of the administrative officers central in the business process analysis. P

Positions and responsibilities in the project were assigned to the participants according to a division between 'the IT department' and 'business'⁵. The IT department of an organization can be seen as part of the business, so there are no obvious boundaries between the two. However in the TIA business and IT were referred to as different units. There was a formal IT department, but the rest of TIA was considered as 'business'. According to this division, within the project context there was a division of labour in which 'the business' was supposed to formulate the business requirements and 'the IT department' was supposed to present the technological solutions. Following this logic, individual participants in the project were seen as representatives for either business or IT. These boundaries formed the basis for an important division of labour in the organisation as a whole, and in the project. Hence, the business analysts were seen as the formulators of the business requirements and as representatives of business, although not the same part of the business. Ulf, one of the business analysts, was employed as a 'business client'; a position which was intended to act as a link between business and IT. However, this position seemed to be rather vaguely defined, and it was unclear exactly how Ulf was supposed to link business and IT as a business analyst within the project. The boundaries between IT and business appeared to be an important part of the organisational culture which had material implications in the form of organisational structures and divisions of labour in the organisation as a whole and in the project. These

⁵ The Swedish word for this was "verksamheten", which has a somewhat different meaning than the English word business.

boundaries were also very important in the business process analysis.

DIFFRACTION AS A RESEARCH METHODOLOGY

Diffraction is what happens when light passes through slits, and the light is broken up. If a screen on the other side of the slits records what happens with the light, one gets a record of the history of the light's passage through the slits. Whereas reflection shows the same in a different location, diffraction shows interference patterns. Diffraction can be used as a figuration for tracing the history of something, and to show how there simultaneously are many different contexts, meanings and references to something, none of which can (or should) be forgotten [16]. Using the diffraction figuration is a strategy to avoid oversimplification; "[i]t's simply to make visible all those things that have been lost in an object; not in order to make the other meanings disappear, but rather to make it impossible for the bottom line to be one single statement" [16: 105]. The diffraction figuration also puts focus on researchers' involvement in research processes. As a researcher I can chose to put my focus on a specific pattern or ray of light, but I can also chose to change the focus to another ray of light, or add an extra. In other words I could tell many different stories, but in this paper I can not tell them all, but have to chose a few. In this paper I have done a diffractive reading of the empirical material.

For the collection of empirical material I have worked with ethnographic methodologies, and believe that this is useful when trying to understand everyday practices and messy realities [see e.g. 24, 27, 20, 7]. Thus I observed and recorded project meetings, discussions, workshops etc. with an MP3 player/recorder. At those times I took field-notes and photos, and gathered project documentation. Additionally there was a dialogue with the project manager, the method expert, and the project customer. Furthermore, formal and informal interviews with various actors in the project were conducted. Usually I spent about two to three days or part-days per week for about half a year. It was the business analysts and the business process analysis which were the main focus of the observations. My participation was rather passive; I did not participate as a business analyst, but was mostly present and listened and took notes. Sometimes when I did not understand (although the times that I did not understand were many) I asked questions when there was a pause in the work. At times (mostly after the meetings) I also talked to the method expert Hans in order to better understand what was going on. These observations started in October 2005 and ended in March 2006.

When conducting the research analysis I went through my notes, recordings, project documentation and transcriptions with the following questions in mind: Which formal occupational positions were involved in the business process analysis? Which groups and agencies were configured and how were the boundaries between these drawn? How did these boundaries change and move? In which contexts were certain agencies and boundaries

configured, and in which contexts did they change? I looked for how these agencies and the boundaries between them were configured and reconfigured in how actors talked or did not talk about themselves, others, and in configurations of 'we', 'us', and 'you', but also in practices and doings. Thus in some contexts the administrative officers seemed to be configured as administrative officers, and as such they had a lot of influence and freedom to act, but they were also restricted in some ways.

DIFFRACTIVE DESIGN STORIES

In the following analysis I will go through some work meetings in which different actors were configured, and various boundaries between these were drawn. The walk through these meetings will result in several stories of how agencies were configured and reconfigured, and thus changed with different contexts and actors. As described above there were several important actors in the project during the business analysis. The administrative officers participated mainly as experts of the administrative process that was analyzed, but also as future users. The definition of 'users' related to the project was quite complicated. Related to the project three different kinds of user groups could be identified. These were the administrative officers which were internal users of the system-to-be, external users in the form of personnel and salary administrators in customer organizations who would contact with TIA on behalf of their employees, and individual citizens who would want to use their insurance.

051026: Project meeting with the business analysts.

Present during this meeting was Hans (the method expert), Maria, Sonja and Tekla (administrative officers), Ulf (business client), me and my MP3 recorder⁶. These were the business analysts, and they were formally considered business representatives. Obviously the business analysts were different people with various backgrounds, competencies, positions on TIA and in the project, who worked with a range of things outside the project. Thus even if they were lumped together under the label 'business analysts' in this text, they most certainly were not the same. The meeting was part of the business process analysis in which the existing system was analyzed and ideas of an improved system were discussed. The topic of this particular discussion was a discussion of how an automated system would sense the complexity of different cases, and then distribute the complex cases, which the system would not be able to take care of, to the administrative officers for manual administration. In the middle of the discussion Hans, the method expert who was leading the business analysis work, said:

⁶ My MP3 recorder is taken up as an actor here, since it was treated as one by the business analysts. They were very much aware of it, and sometimes talked to it when I was away for a cup of tea. Sometimes they also seemed to censor themselves in some ways, aware of that all they were saying was recorded.

“if we want to, we can think now that we want this, and the others can say that it is not possible to carry this through”

This ‘we’ referred to the business analysts, who were supposed to formulate business requirements without considering whether these were technologically or economically feasible. Thus ‘the others’ referred foremost to the systems designers who would start their work once the business process analysis was done. These ‘others’ were not present in this meeting. Thus Hans cited the boundaries between ‘business’ and ‘IT’, and the division of labour between the business analysts on the one hand, and the IT representatives and economically responsible on the other (see above). In this way he defined the boundaries of the business analysts’ agency (or possibilities to act) to be about formulating business requirements and not to care about whether or not these might be feasible.

051117: Project meeting with the business analysts. Present at the meeting were Jacob (the GUI expert), Hans, Sonja, Maria, Ulf, me and my MP3 recorder. This was also a project meeting with the business analysts, in which the present system was analyzed, and ideas for a future and better system were discussed. In this meeting Jacob, an expert on GUIs, was present. Paper prototypes in the form of sketches of screen images were used as a technique to formulate business requirements. The prototypes were used in order to concretize ideas of a future and better administrative system. The discussion was about how these prototypes would be shaped. The discussion developed into a dialogue between Jacob and the administrative officers Sonja and Maria, in which Jacob asked questions of how they worked presently, and suggested ideas of how the system might be changed. In this way Sonja and Maria came into being as business experts. Jacob in a rather cautious way suggested various ideas for an improved system. They talked about how in the present system Sonja and Maria while talking to a customer over the phone used to write down the details for that specific case on post-it notes. Jacob then suggested that telephone calls might be recorded in a (new) system through the placement of a button in the form of a telephone icon. It was a long discussion which can not be reproduced here, but at one point in the discussion Jacob said to Maria:

“it is you who have a need”

This ‘need’ referred to Maria’s needs as an administrative officer using the system. Jacob seemed to try to make Maria define her needs – as an administrative officer – related to the system. Since Jacob asked questions and made suggestions boundaries were drawn between Jacob on the one hand, and Sonja and Maria on the other. Additionally, at several times in the discussion boundaries between requirements and solutions were drawn. Below are some examples:

Jacob: “something like that one could do instead of just having kind of a general, in a text field”

Maria: “but that, those things you can solve”

....

Maria: “but, but what I want, it’s to be able to write, and then, if someone comes up with how it should be put in that, like, if it becomes rows or fields or telephone and some come automatically ... I mean that the more simplified it is, I just want to write exactly what we’ve said [in the phone conversation with the citizen] ... everything else around I don’t care, it, it (.) it’s just good if it gets solved in another way”

In these dialogues boundaries were drawn between Jacob and Maria, and Maria configured Jacob as someone who can ‘solve’ things, to present technical solutions. In the next statement Maria presented herself as someone who did not want to care about solutions. Thus in the discussion Sonja and Maria came into being as requirements formulators, while Jacob became someone with technological knowledge.

051122: Project meeting with the business analysts. At this meeting the present persons were Jacob, Hans, Maria, Sonja, Ulf, Tekla, Ingrid (the project manager), me and my MP3 recorder. I have chosen a short transcript in which Jacob and Sonja discussed the design of the graphical user interface of a new system. Sonja suggested that it might be possible to open a new window for a preliminary calculation, but Jacob wanted to stay in the same window. His argument was that opening a new window would be the same as opening a new process, and that it would be better to stick to only one process. This was quite a technical argument, and Sonja said that she did not understand it:

“I don’t know how it works kind of, I do not know that technology, I’m lazy, I don’t even want to learn”

With this statement Sonja cited and thus reproduced the division of labour, in other words her agency as a business analyst which was limited to concern business matters, not technological issues.

060213: Project meeting with the business analysts. At this meeting Jacob, Ulf, Maria, Sonja, I and my MP3 recorder were present. They were discussing how to design a new system, and Ulf suggested that a certain process could be designed in several steps, with different ‘sheets’. Sonja and Maria did not understand what he meant with this, but Jacob did. Sonja and Maria thus argued that it would be easier to understand if Jacob first made a paper prototype and then came and showed it to them. Jacob tried to explain, and then Sonja said she did not think that his suggestion would work:

Sonja: “I don’t think this works (.) I don’t think so, I, but it

[Ulf and Jacob laughed]

Jacob: “do you work on IT or what?” [laughing]

Here Sonja was not 'lazy' but took the right to talk about technological matters. However, Jacob in response to this indicated a boundary. In one way Jacob's reply was quite an innocent and friendly joke, but at the same time he was clearly pointing to the limit of her agency. As an administrative officer Sonja did not belong to the IT department but to the business, and as such her comments about IT did not have to be taken seriously. She was not supposed to care for technological or economical issues, was not expected to, and was not even allowed to do so.

060213: Workshop with the business analysts and representatives of the IT department. This was the second of three workshops with the IT department. The first workshop took place about a week before this one. A lot of people were present in this meeting. There was Ingrid (the project manager), Jacob, Hans, Maria, Sonja, Ulf (all business analysts). There was also Simon, the overall IT architect in TIA, Peter (a systems administrator for the existing system), Lars (IT architect for the main-frame computer environment on TIA), Anne (who formulated requirements about documentation from an administrative perspective), Karl (a systems architect), Helga (who would later be in charge of the systems requirements formulations), Sven (a system administrator), and me (and my MP3 recorder).

From this presentation it is clear that behind the category 'IT representatives' (which was configured by me) a range of individuals with various occupational positions (and hierarchical levels) were hidden⁷. The discussion in the workshop was about how a new system might be technologically feasible. Then Hans, the method expert, said:

"yes, precisely (.) yes we only got to wish here we"

⁷ In order to better understand the structure of the IT department I talked to one of the personnel managers, and was told that about sixty persons were employed at the IT department. Of these about half were women. There were also clear hierarchies between the different positions; apart from the department manager there were three hierarchical levels. The manager of the IT department was the top position, and below that position came three IT architects (all these were men). Then the configuration managers, systems architects and database administrators came (eight persons). Lowest in the hierarchy were systems designers (junior, medium and seniors) who were doing the programming, main systems administrators, construction administrators (about the same as the systems designers), and the systems administrators (totally 38 persons). Additionally there were those who were managing the production of systems, and those who coordinated systems (three persons). This structural overview of the IT department names the formal positions in the department; but what was actually included in these positions, that is, what these persons actually did, I do not know.

....

"like in BA [business analysis], in the BA work we have no such limitations ... but, and that you others can say, well, it might not be worth the conversion and the adaptation"

Here Hans specifically referred to the business analysts when saying 'we', while 'you others' referred to the present IT representatives. With Hans' statements the division of labour was cited again, in which the business analysts were supposed to care only for making business requirements and for others (e.g. the IT department representatives) to decide whether these would be feasible or not. However, compared to the transcript from 051117 the boundaries again had been reconfigured. Recall that in that transcript the boundaries were drawn in between the business analysts, or more specifically between Jacob and the administrative officers. Now, again (as in the transcript from 051026), the boundaries were drawn between the business analysts and the IT representatives. This shows how the boundaries were fluid and changed with the context.

MULTIPLE AND SHIFTING AGENCIES

As indicated above, the project included a range of actors and voices, who participated more or less directly and in more or less influential positions. The boundaries between these various actors were fluid and shifting, and thereby also their agencies; they were not clear-cut or given, but came into being and were reconfigured in the on-going activities in the project. This can be seen as a mutual constitution of positions and agencies, in which occupational positions were defined in specific ways in specific contexts, and consequently specific agencies came into being. The boundaries shifted depending on the involved socio-material relations; on the participants, the discussion topic and so forth. A key focus here was to explore which agencies that came into being, and with what consequences. Hence the business analysts materialized as specific kinds of business analysts who were not allowed to care about technical or economical matters. Jacob, the GUI expert, came into being as an IT representative as well as a business analyst. Sonja and Maria, the administrative officers, emerged as experts of business, as formulators of business requirements, and as users of the system. As administrative officers they were business experts with a lot of influence and freedom to act, and as such were considered key actors in the business process analysis. As business experts they were crucial in the design of the system, and thus I would argue that they participated as information systems designers too. However, since they were not employed as systems designers, their work as systems designers did not become visible or recognized. As administrative officers, business analysts and business experts they were also limited in some ways. They were not expected or allowed to talk about technological matters. When Sonja did talk about technological matters, it was questioned and she was not taken seriously.

Concluding Remarks

The purpose of this paper was to explore how heterogeneous agencies in various ways were configured during a systems design project. The diffractive reading of the design stories showed how the business analysts and especially the administrative officers were crucial in the project. As business analysts and business experts the administrative officers were central in the design of the system, and thus I have argued that they participated as information systems designers too. As business experts, their participation was recognized as crucial, and their agencies were extensive, but in other respects they were restricted. Furthermore, since they were not employed as systems designers, their work as such did not become visible or recognized. One of the design stories thus showed how women's participation as systems designers does not always become visible. The various positions of the administrative officers were not obvious, but rather manifold, overlapping, and blurry. Clearly the administrative officers embodied multiple positions, and instead of choosing one of these positions as more important than the others, I would like to keep these contradictions alive, and argue that they were all of these.

ACKNOWLEDGMENTS

This work would not have been possible without all the helpful persons on TIA; thank you all for accepting my participation in the project, and for being so helpful! I also want to thank my supervisors Christina Mörtberg and Katarina Lindblad-Gidlund for their support and helpful comments, and the Citizys research group for constructive criticism.

REFERENCES

1. Alander, Sara (2007), *Offentliga storkök i det gröna folkhemet: Diffrakterade berättelser om hållbar utveckling* [Publik large-scale kitchens in the green people's home: Stories about sustainable development], Ph D Thesis, Luleå University of Technology.
2. Barad, Karen (1999), "Agential Realism – Feminist Interventions in Understanding Scientific Practices", in Mario Biagioli (ed.), *The Science Studies Reader*, Routledge, New York & London.
3. Barad, Karen (2007), *Meeting the universe halfway – quantum physics and the entanglement of matter and meaning*, Duke University Press, Durham & London.
4. Bjercknes, Gro & Bratteteig, Tone (1995), 'User Participation and Democracy: A Discussion of Scandinavian Research on System Development', *Scandinavian Journal of Information Systems*, Vol. 7, No. 1, pp. 73-98.
5. Bowker, Geoffrey C. & Star, Susan Leigh (1999), *Sorting Things Out. Classification and its Consequences*, The MIT Press, Cambridge, Massachusetts, London, England.
6. Bratteteig, Tone (2004), *Making change: Dealing with relations between design and use*, Ph D Thesis, University of Oslo.
7. Bruun Jensen, Casper (2004) 'Researching Partially Existing Objects: What is an Electronic Patient Record? Where do you find it? How do you study it?', Working Papers from Centre for STS Studies, Department of Information & Media Studies, University of Aarhus.
8. Butler, Judith (1993), *Bodies that Matter: On the discursive limits of "sex"*, Routledge, New York & London.
9. Butler, Judith (2004), *Undoing Gender*, Routledge, New York.
10. Bødker, Keld, Kensing, Finn and Simonsen, Jesper (2004) *Participatory IT Design. Designing for Business and Workplace Realities*, Cambridge, Massachusetts, London, England: The MIT Press.
11. Elovaara, Pirjo (2004), *Angels in Unstable Sociomaterial Relations: Stories of Information Technology*, Ph D Thesis, Blekinge Institute of Technology.
12. Elovaara, Pirjo, Igira, Faraja T. and Mörtberg, Christina (2006), 'Whose participation? Whose knowledge? Exploring PD in Tanzania-Zanzibar and Sweden', *Proceedings of the ninth conference on Participatory design: Expanding boundaries in design - Volume 1*, Participatory Design Conference, Trento, Italy, 1-5 August, pp. 105-114.
13. Faulkner, Wendy & Lie, Merete (2008), 'Gender in the Information Society: Strategies of Inclusion', *Gender Technology and Development*, Vol. 11, No. 2, pp. 157-177.
14. Grönlund, Åke (2004), 'Introducing e-Gov: History, Definitions, and Issues', *Communications of the Association for Information Systems*, Vol. 15, pp. 713-729.
15. Haraway, Donna (2004), 'Cyborgs, Coyotes, and Dogs: A Kinship of Feminist Figurations and There Are Always More Things Going on Than You Thought! Methodologies as Thinking Technologies. An Interview with Donna Haraway Conducted in Two parts by Nina Lykke, Randi Markussen and Finn Olesen', in Donna Haraway, *The Haraway Reader*, Routledge, New York and London.
16. Haraway, Donna (2000), *How Like a Leaf – Interview with Thyrsa Nichols Goodeve*, Routledge, London.
17. Haraway, Donna (1997), *Modest_Witness@Second_Millennium. FemaleMan@_Meets_OncoMouse™. Feminism and Technoscience*, Routledge, New York, London.
18. Haraway, Donna (1992), "The Promises of Monsters: A Regenerative Politics for Inappropriate/d

19. Haraway, Donna (1991), 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective', in Donna Haraway, *Simians, Cyborgs, and Women. The Reinvention of Nature*, Routledge, New York.
20. Henriksen, Dixi Louise (2002) 'Locating virtual field sites and a dispersed object of research', *Scandinavian Journal of Information Systems*, vol. 14, no. 2, pp. 31-45.
21. Karasti, Helena (2003), 'Can Film Developers Be(come) Technology Developers? Reflections on Gendered Expertise and Participation in System Design', in Christina Mörtberg, Pirjo Elovaara & Agneta Lundgren (eds.), *How do we make a difference? Information Technology, Transnational Democracy and Gender*, Division Gender and Technology, Luleå University of Technology.
22. Latour, Bruno (1987), *Science in Action - how to follow scientists and engineers through society*, Harvard University Press, Cambridge Massachusetts.
23. Lykke, Nina (2008), *Kønnsforskning. En Guide til Feministisk Teori, Metodologi og Skrift [Gender Research, a Guide to Feminist Theory, Methodology and Writing]*, Førlaget Samfundslitteratur, Frederiksberg C.
24. Marcus, George E. (1995) 'Ethnography in/of the World System: The Emergence of Multi-Sited Ethnography', *Annual Review of Anthropology*, vol. 24, pp. 95-117.
25. Markussen, Randi (1996), 'Politics of Intervention in Design: Feminist Reflections on the Scandinavian Tradition', *AI & Society*, Vol. 10, pp. 127-141.
26. Mörtberg, Christina & Elovaara, Pirjo (2009, forthcoming), "Attaching People and Technology – Between e and Government", in Shirley Booth, Sara Goodman & Gill Kirkup (eds.), *Gender and Learning Sites*.
27. Newman, Susan E. (1998) 'Here, There, and Nowhere at all: Distribution, Negotiation, and Virtuality in Postmodern Ethnography and Engineering', *Knowledge and Society*, vol. 11, pp. 235-267.
28. Oudshoorn, Nelly & Pinch, Trevor (2003), *How Users Matter: The Co-construction of Users and Technology*, The MIT Press, Cambridge, Massachusetts & London, England.
29. Sandell, Kerstin (2005), 'Enkla tekniker och besvärliga frågor; att arbeta med Donna Haraway' ['Simple techniques and difficult questions; to work with Donna Haraway], in Åsa Lundqvist, Karen Davies & Diana Mulinari (eds.), *Att utmana vetandets gränser [To challenge the boundaries of knowing]*, Liber, Malmö.
30. Sefyrin, Johanna (2009, forthcoming), "“For me it doesn't matter where I put my information” – Enactments of agency, mutual learning, and gender in information systems development", in Shirley Booth, Sara Goodman & Gill Kirkup (eds.), *Gender and Learning Sites*.
31. Suchman, Lucy (2002), 'Located Accountabilities in Technology Production', *Scandinavian Journal of Information Systems*, Vol. 14, No. 2, pp. 91-105.
32. Suchman, Lucy (2007), *Human-Machine Reconfigurations – Plans and Situated Actions*, Cambridge, Cambridge University Press, 2nd Edition.
33. Wajcman, Judy (2007), 'From Women and Technology to Gendered Technoscience', *Information, Communication & Society*, Vol. 10, No. 3, pp. 287-298.
34. van der Tuin, Iris (2008), *Third Wave Materialism: New Feminist Epistemologies and the Generation of European Women's Studies*, Ph D Thesis, Utrecht University.

The columns on the last page should be of equal length.