

# Tensions in Design

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## ABSTRACT

Script is a productive figure to inscribe and analyse gender and diversity in design. This paper addresses one risk of the use of script in our desire to design for gender and diversity. We locate our discussion of this risk in two design perspectives, ‘design from nowhere’ and ‘design from somewhere’. With the help of two vignettes we discuss how ‘design from nowhere’ was perceived as a perspective to de-gender-ise and de-culture-ise design. ‘Design from somewhere’, we argue, may result in a freezing of gender and identity in time and place. We propose a more open perspective, not yet ‘nowhere’ or ‘somewhere’, and we show how the notion of intra-action may be more productive in understanding how we keep the multiplicity of gender and diversity visible in the design process. We show this with an example of the object-oriented analysis and design practice. Lastly, we focus on the accountability of the designer, who, as a modest witness, has particular responsibilities in bridging partial knowledges and keeping those knowledges visible in the design process.

## Keywords

design, intra-action, modest witness, object-oriented analysis and design, script

## INTRODUCTION

Our paper addresses the tension between the desire to design for gender and diversity and the risk of scripting gender and diversity in design. Madeleine Akrich explains the notion of script in the following way:

*Designers [thus] define actors within specific tastes, competences, motives, aspirations, political prejudices, and the rest, and they assume that morality, technology, science, and economy will evolve in particular ways. A large part of the work of innovators is that of “inscribing” the vision of (or prediction about) the world in the technical content of new object. [1, p. 208].*

The term script refers to a scenario, a sequence of expected behaviour. The term script can also be used as an analytical tool to investigate hidden or assumed scripts. For example Calude Draude [8] argues that gender scripting is a useful analytical tool during the design process as it helps to examine assumptions, design choices made, and alternatives possible.

In *Materialized gender: how shavers configure users’ femininity and masculinity*, Ellen van Oost [19] discusses the concept of gender scripting as a tool to investigate the inscription of gender in technology:

*Gender script refers to the representations an artifact’s designers have or construct of gender relations and gender identities — ‘representations that they then inscribe into the materiality of that artifact. Like gender itself, which is defined as a multi-level process, gender scripts function on an individual and a symbolic level, reflecting and constructing gender differences in the division of labor. [19, p. 195].*

Her examples of shavers especially designed for men or for women can be read of simultaneously as the inscription of gender in design as well as a scripting of gender by design.

Similarly, Leslie Regan Shade [19] uses the concept of gender script to describe how women have been inscribed as particular users and consumers:

*‘Ladyphone’—the design mimicked a make-up compact, featuring ‘a biorhythm calculator, a fatness function that calculates a user’s height-to-weight ratio, a calendar for keeping track of your menstrual cycle and a calorie-counting function. Enter an activity (cleaning, dishwashing, cooking, shopping) and the time spent, and the phone works out how many calories have been consumed [20, p. 185].*

Nelly Oudshoorns et al’ research on gender scripts showed another aspect of the inscription of the user and use in a design. They found that designers projected their interests and needs on the future users and then scripted those users and their use into the design. As most designers were male, Oudshoorns et al argue, the design style and technology can be described as masculine [18]. The concept of script is generally based on a particular understanding of designer and user. The user is representative of the people who will use the design, while the designer is the creator of technology. When the user doesn’t follow the script of technology or when the user is different from the one inscribed in the design, the technology might fail.

In this paper we will address the risk of scripting gender and diversity in design in a discussion of 'design from nowhere' and 'design from somewhere'. In the next section we will present two vignettes, taken from our respective research projects in Kenya and Sweden. These vignettes help us to present different ways of understanding 'design from nowhere' and help us ask: Can we de-genderise and de-culturise software with a "design from nowhere", a technology detached from its site of production so it can be moved to multiple sites of use [21]?

In our discussion we introduce an understanding of a 'design from somewhere' based on Lucy Suchman's located accountabilities and Donna J. Haraway's situated knowledge. We use the concept of intra-action, based on Karen Barad's agential realism, to question the notion of script. Lastly, we will turn to the located accountabilities of the designer in a conceptualisation of the designer as a modest witness.

## SCRIPTS

### Vignette 1

The first vignette is taken from a research project called *Local knowledges in global communication*. In this project we investigated, among other things, a software that formed the basis for a global knowledge-sharing network, the Open Knowledge Network (OKN). The software enabled participating organisations in thirteen countries to share files in a peer-to-peer network. Each organisation or hub in the network functioned as an independent media centre with access points in local organizations and communities. The software programme was designed in such a way to be able to address the wide diversity (gender, language, culture, knowledge, connectivity) found among the potential users. The design was flexible and open; the default settings of the software could be adapted to the particular needs of the users. Fieldtrips showed the same software package in use in, for example, a fishing village near Pondicherry and a community centre in Delhi (India), and in nongovernmental organization in Nairobi and a Maasai community (Kenya). One of the characteristics of the software was that it enabled the decentralisation of editorial services. One of those services was classification. The default settings of the software included a set of categories for classifying the stories that were shared in the network. Local categories, reflecting local ways of knowing and local needs, could be added to the default classification system, both at the level of the personal computer of the volunteer reporter who wrote the message and at the hub level. It became clear, however, that this option to localise the classification system was never used by any of the participating organisations or local volunteers:

#### *Classifying local knowledge*

I sat next to Jonathan in his office at the Maasai Rural Training Centre (MRTC) while he used his Worldspace satellite radio to establish an automated internet connection through which he downloaded new OKN articles and uploaded the articles he had written himself. Afterwards we looked at the articles he had written the past year. He showed me how he used the Open-eNRICH software to

write an article. He then chose the categories that indicated the article's type (news, knowledge, event, etc.), subject (agriculture, health, etc.), and intended audience (housewives, farmers, fishermen, etc.). We looked at all the possible categories. Jonathan showed me that there were no categories for the audience for which he wrote his stories, other Maasai communities and pastoralist communities in general. I showed Jonathan the option to create local categories. This option was however located outside the screen he normally uses to write, classify, and upload his stories. Jonathan responded that he did not see it as his task or responsibility to use the option to localise the classification system.

### Vignette 2

The second vignette is taken from the research project *From government to e-government: gender, skills, learning and technology*. The project took place in the South-eastern part of Sweden from 2005 to 2007. The aim was to study how e-government comes into being in the day-to-day activities as an alternative to the dominant discourse created in the Swedish national e-government policies. Another purpose in the project was to create an arena to renegotiate the gender and technology relation. In addition, we wanted to develop methods for collaboration and co-operation for design of IT [9, 16]. Civil servants from four municipalities participated in the project. Working groups with 2-3 civil servants per municipality were established in autumn 2005. The methods we used were cartographic mapping, in-situ interviews, walk-throughs with disposable cameras, scenarios, informal interviews, and digital storytelling. In this paper we use a narrative told in an informal interview with Anna. At the time of the interview she was responsible for tasks related to the municipal invoice processing. Anna had worked in a municipality accounts department since 1987.

#### *Day care invoices*

An upset citizen calls Anna to ask why s/he has to pay an extra fee of 160 Swedish crowns (SEK) for the day care. Anna is not responsible for the day care fees, so she was not aware, at the time of the phone call, why the citizen calls her. Anna realised that something was wrong with the invoices. The phone call was a start of a story about 1500 invoices sent to the parents with children at the municipalities' day care centres. The invoice printing procedure is outsourced to an external company and not operated by the municipality. Hence this process is out of Anna's control. Anna and her colleagues are not able to check the print-out before they are posted. The invoices were normally printed on one page but this time they were printed on two pages. The information on the additional page consisted of a service offered to the citizens to use an automatic payment service for monthly invoices. This service is part of Anna's responsibilities and therefore Anna's telephone number was on the invoice. To give the direct dial number is an exception, the number of the main switchboard is usually given, but Anna wanted to offer good service to the citizens. The notice about the extra fee of 160 SEK was incorrect and should not have been there.

The result was that anxious citizens started to call Anna. For Anna this meant a huge number of phone calls, in which she had to calm down the upset and worried citizens. Not all phone calls were related to the extra fee but they called Anna because her phone number was on the invoice. Anna was eager to identify why the original one page invoice had turned out to be a two-page invoice. After discussions with her colleagues she found out that one had inserted some changes to the text, which made the text too long, the invoice was thus divided into two pages. But the story does not explain the demand for an extra fee.

### **Nowhere and somewhere**

The vignettes point to the need of a more complex understanding of location in terms of inscriptions of gender and diversity. In Vignette I, the software was designed to address the diversity found in the existing and future user communities. One of the metaphors used during the design process was that of a *global container* (the ones moved around the world by ship, train, and truck) with *local content*. The *design from nowhere* had default settings, which enabled users to localise the software in order to create *designs from somewhere*, such as a local classification system. The designers of the software envisioned the user as a designer of a classification system.

The container figuration is also usable in the description of the design of the system used in the second vignette. However, here the software was designed to move around in different settings probably with some adaptations to each local setting but still a standard system. Vignette II shows the design was not conducted from the perspective of Anna and her colleagues. The *design from nowhere*, a standard software to be used among a variety of public services, was, seen from Anna's perspective a design from somewhere that did not reflect her practice and location.

### **Located accountabilities**

Lucy Suchman [21] discusses the location of design and differentiates between three positions: i) design from nowhere, ii) detached intimacy, and iii) design from somewhere. Suchman's understanding of *design from nowhere* is slightly different from the one presented in Vignette I. She describes designers in this perspective as "anonymous and unlocatable" who deliver "technological solutions to equally decontextualised and consequently unlocatable users" [ibid., p.95]. This was however not the case in the project in which Jonathan participated. Secondly, the software was perceived as a global software, de-genderised and de-culturised in order to allow local inscriptions of gender and diversity. The two understandings of *design from nowhere* do show, however, that *nowhere* is sometimes a desired, but always non-existing location – both in the objectivist stance (unlocatable designers and users) as in the political stance (locatable designers and users).

On the other hand, if we read the vignettes as *design from somewhere*, we easily fall back on the notion of script to describe how location, in terms of gender, diversity, designer, and user, are inscribed in the software. Script, as an analytical tool, can help us to see how a particular notion

of user was inscribed in the Open-eNRICH software. The risk of using the notion of script here is that we remain within the boundaries of a scenario in which work, roles and responsibilities are clearly defined. Vignette I shows however that this was not the case. It was not clear for Jonathan whose role and responsibility it was to develop local categories as part of designing a localized classification.

Haraway describes the risk of the *view from somewhere* in terms of spatialisation, which she discusses in the context of cartography:

*"Spatialization as a never-ending, power-laced process engaged by a motley array of beings can be fetishized as a series of maps whose grids notropically locate naturally bounded bodies (land, people, resources - and genes) inside "absolute" dimensions such as space and time. The maps are fetishes in so far as they enable a specific kind of mistake that turns process into nontropic, real, literal things inside containers" [11, p. 136].*

Such spatialisation, Haraway argues, 'freezes' materialized social practices such as gender and diversity in terms of place and fixed identity. In Haraway's perspective on the *view from somewhere*, a design is an object in which multiple locations (place and identity) and responsibilities have come together and the outcome of layers of translations.

How to design for multiplicity when both the *design from nowhere* and the *design from somewhere* carry the risk of working with inscribed or 'frozen' notions of place and identity? In the next section we propose Karen Barad's notion of *intra-action* as an alternative to the notion of script. Intra-action, as we will discuss, iteratively reconfigure what is possible and impossible in – and with – a design [4].

### **THE DESIGN PROCESS**

Design of information technology consists of various activities in order to translate an idea or vision to a final system or service. Jonas Löwgren & Erik Stolterman [14] describe the design process as a dynamic dialectical process, in which one moves between the visions, the operative images and the specifications. A range of methods, to be used in the process, have been developed in participatory design, cooperative design and interaction design, such as scenarios, storyboards, future workshops, games [7, 13, 14]. More experimental methods such as such as cartographies, digital engagement, probes, performance performances can also be used in this process [17].

Participatory design (PD) was a frame of reference in Vignette II. In PD projects the design process is located in the practices, to involve other practitioners than designers, to understand the practice, aiming at cooperation on equal terms. Hence PD approaches are located in the design from somewhere. The location in practices also enables a moving between the visions, the operative images, and the specifications. A range of visualisation techniques are used in design of (information) technologies. They are used in

discussion with other practitioners, customers, colleagues, managers, and future users of the technologies. In our design practice we use a broad understanding of specification, which we use to visualise with creative methods, such as storyboards, cartographic maps, scenarios etc. The practitioners, designers, and others are situated and located in the practice in which the system is built, as well as in the design process. The dialectic process, collaborative methods combined with PD, makes the practices, people, and their skills and knowledge visible. Such a design process also enables different interpretations of the practices by the different participants. Localisation should not be understood as only spatial. In the translation processes it becomes clear how knowledge is embodied and gained in doings and actions. The PD approach and the methods we described above help to locate this layer of translation into practices. Those involved in this iteration, a particular translation, as well as the other participants in the design process, are making choices and judgements about what to include and exclude. It is in these translations that the performance of gender intersects with design. Values and norms in the society and in the practice are expressed and they are reproduced or they are questioned. Hence the design process is a reiteration of norms and forms [6, 22]. For example in the second vignette the gendered division of labour in the municipality as well as in Swedish society were included in Anna's everyday activities, her ongoing performances. The Swedish public sector is the dominant labour market for women, civil servants are predominantly women, and their jobs are generally low-paid.



**Figure 1. A rich description of a practice created through a cartographic mapping.**

The creative methods we mentioned above are used in order to create design ideas or to understand a practice. They are illustrated with sketches, drawings, prototypes, rich pictures, storyboards and so on, aiming to keep the process open and not to move to specifications too early. At a certain point in the design process it is necessary to move to other layers of translation, from rich descriptions to specifications and to modeling. This is necessary in order to proceed in the process towards the final product. We can understand the design process as a material-discursive practice, in which materiality and meaning are entangled

[3, 4]. The move to the specifications, in the ongoing design process, is a *cut*, which breaks up ongoing activities such as the mapping conducted in the project described in Vignette II (see Figure 1). The map with all its objects, subjects, and relations is part of what emerges out of the material-discursive practice when the specification is enacted.

### **Feminist technoscience**

What happens with location, *situatedness*, when the process goes from tangible activities to more intangible activities? Do the designers and others who are involved in the next iteration take the rich descriptions into account and keep the options for different translations open? Does the iteration always necessitate a move from a *design from somewhere* towards a *design from nowhere*? What can feminist technoscience contribute to the understanding how we can keep the various perspectives (e.g. gender) 'alive' in the different layers of translations and not just the one in which the rich descriptions are created?

Lucy Suchman [22, p. 267] follows Karen Barad's [4] agential realism, when she writes: "[...] *intra-action* underscores the sense in which subjects and objects emerge through their encounters with each other". Matter and meaning are thus entangled in *intra-action* until an *agential cut* breaks the ongoing entanglement, as in the translation from the mapping of the rich descriptions (as in Figure 1) to the formulation of specifications. The subjects and objects thus come into being through the cut. This *becoming* is dependent of what is included in the *intra-action* and what is excluded, Barad [4, p 234-235] explains in a discussion about causality:

*Intra-actions always entail particular exclusions, and exclusions foreclose the possibility of determinism, providing the condition of an open future. But neither are anything and everything possible any given moment. Indeed, intra-actions iteratively reconfigure what is possible at a given moment and what is impossible – possibilities do not sit still. One way to mark this might be to say that intra-actions are constraining but not determining. But this way of putting it doesn't do justice to the nature of "constraints" or the dynamics of possibility. Possibilities aren't narrowed in their realization; new possibilities open up as others that might have been possible are now excluded: possibilities are reconfigured and reconfiguring. There is vitality to intra-activity, a liveliness, not in the sense of a new form vitalism, but rather in terms of a new sense of aliveness.*

We would like to focus on Barad's understanding of *intra-actions* as dynamically reconfiguring *possibilities* and *constraints* in each iteration. In the context of design, Barad shows us that there is a particular kind of vitality to *intra-activity*, which brings up a new liveliness in the next layer of translation conducted in the design process.

### **Intra-actions in object-oriented analysis and design**

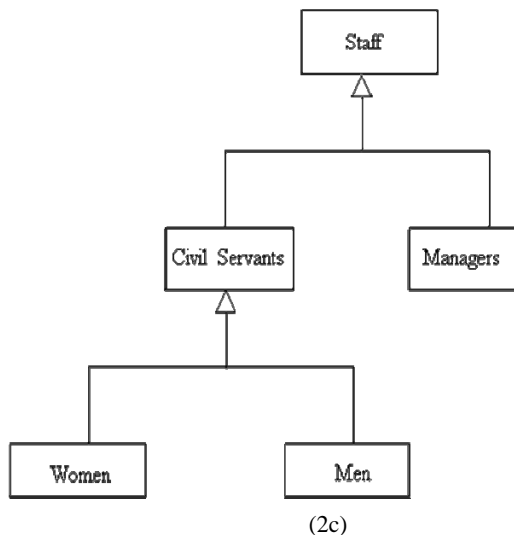
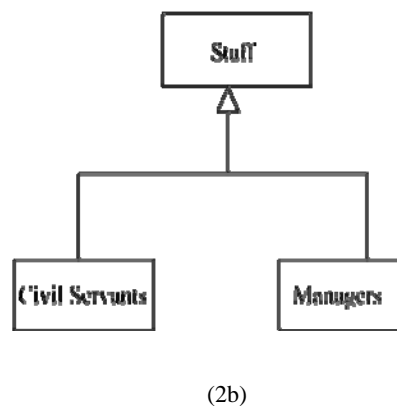
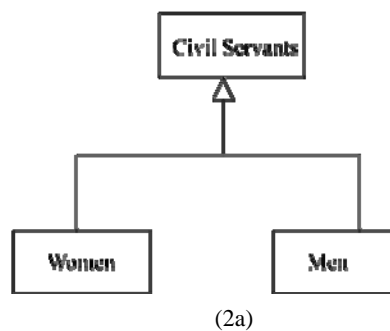
In general, a design process follows some kind of strategy or method. For example the object-oriented analysis and design (OOA&D) method uses the following activities:

*problem-domain analysis, application-domain analysis, architectural design, and component design* [15]. The activities can be conducted simultaneously or in a traditional top-down approach. The choice depends on the design project's strategy e.g. incremental, iterative, spiral model, waterfall). Our understanding of the object-oriented analysis and design is based on Lars Mathiassen et al [15] and focuses on key concepts in the analysis of the *problem-domain* and in the *application-domain*, as part of our discussion on how to keep the rich descriptions visible in the modelling stage of the design process.

In the *problem-domain* the purpose is to identify and model the domain with classes, objects, and events. In OOA&D an object is "an entity with identity, state, and behaviour" [ibid, p. 51] and a class is "a description of a collection of objects sharing structure, behavioural pattern, and attributes" [ibid, p.53]. An event is "an instantaneous incident involving one or more object." [ibid., p. 51]. In the identification of class candidates, the focus is on nouns, for example physical things, humans, rules, organisations, policies, resources, and devices. Event identifiers are verbs, for example 'account opened', 'amount deposited', and 'account closed'. Another activity is to find out the conceptual relation between classes and objects through the identification of structures. The third activity is to describe the object's dynamic properties. The results of the identification of events are illustrated in an event table, the structures in a class diagram, and the behaviour in a state chart diagram [ibid.]. The structure is the relationship between the classes and objects. We will, however, not describe or explain the whole process but only point to some activities that take place in the practice in order to identify the object, classes, and events and how they are tied together. These activities help us to discuss how to keep the rich descriptions, created in activities before the modelling layer, visible in this and other layers of translations.

Let's move back to the layer where the specification constituted the rich descriptions and the cartographic map, which was constituted with a range of actors (human and nonhumans) and relationships. In the cartographic exercise, which was conducted in the project presented in the second vignette (see Figure 1), gender and gendered values and norms were reproduced. Due to what the intra-action will encounter, specific objects, classes, events, event tables, class diagrams, state chart diagram, behaviours, attributes emerge out of the practice.

Different iterations are conducted in the analysis in the problem-domain, as illustrated in three different class diagrams (see Figure 2). In the first and third class diagram, gender is visible but not in the second. The class diagrams in which the relations between the classes and objects are tied together are not determining but the outcome of three different iterations or ongoing doings.



**Figure 2. Part of a class diagram in which the relationship between classes and objects are identified**

We conducted different iterations, all within the same layer of translation - the analysis of the problem-domain, in order to show the different possibilities. These possibilities are not determining but they "are reconfigured and reconfiguring" [4, p. 235]. The classes and objects are tied together in different ways (2a, 2b, or 2c), whereby the rich description or the map is reconfigured. Gender is included in all iterations because it became visible in the layer where

the rich description came into being. In the first (2a) and third (2c) iteration, gender is reproduced due to what the subjects, objects, and relationships encountered in this iteration, but in the second (2b) it is not visible. Furthermore, the third iteration (2c) shows an additional possibility because at this moment two other “iteratively intra-actions” [4, p. 235] open up new possibilities. Various reconfigurations of the reality of the rich description are materialised. The iterations or performances (2a, 2b, and 2c) are examples of how the notion of *intra-action* helps us to explore the possibilities of keeping *situatedness* also in this layer of translation. “Possibilities do not sit still” [4, p. 235] but are enacted in ongoing doings and actions.

The analysis of the *application-domain* is another activity in OOA&D. In this translation the use cases, actors, functions, interfaces (user and system), are identified and modelled. In OOA&D an actor is defined as: “An abstraction of users or other systems that interact with the target system”. [15, p. 119] and a use case is defined as: “A pattern for interaction between the system and the actors in the application domain” [ibid., p. 119]. The identification is presented in actor tables, use-case diagrams, actor specifications and statechart diagrams. In a similar way as in the analysis of the problem-domain, the outcome in the analysis of application-domain is dependent on who or what “encounters with each other” in the practice. As gender was included as one possible encounter, it was also possible that it emerges out of the performances (see Figure 3). The actor that came into being in the first iteration (3a) has a sign on its body most interpret it as a sign of a woman. In the second (3b), the actor is constituted with stick figure, and in the third the actor come into being with a box (3c), see Figure 3.

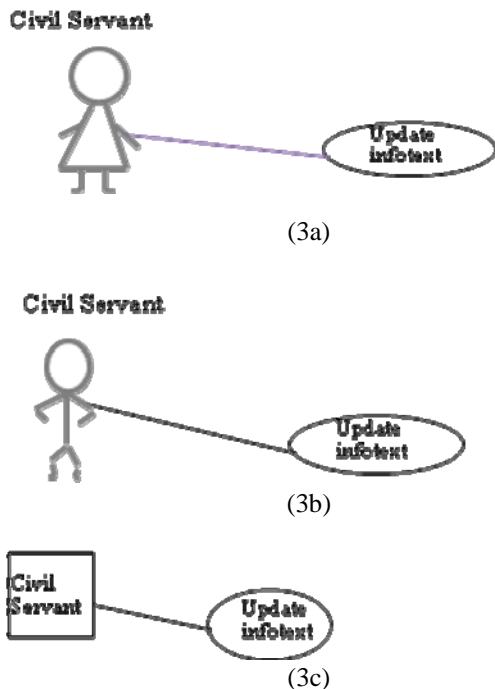


Figure 3. Three use-case diagrams

Again we see that all three iterations are intra-actions in different encounters. The rich description, here the subject, objects, and relationships in the map, is reconfigured in different ways, and different possibilities opened up. These are not static but are dependent on where the boundaries are drawn or on the encounters in the practice.

Similarly as in the analysis of the problem-domain, a range of iterations or reconfigurations within the specific layer are possible, “possibilities do not stand still”. Even if gender is visible, it depends on what gender ‘encounters’ in the interaction. Haraway [10] underscores subject and object inseparability. Not only bodies (materiality) and meaning are constituted in knowledge production, also the knowers are actively integrated in material-semiotic practices such as in the modeling we illustrated in Figure 2 and 3. Haraway continues: “In this way we might become answerable for what we learn how to see” [10, p. 190f], to what Suchman [21, p. 96] adds “what we learn how to build”.

The possibilities discussed in the various iterations with the use of OOA&D show how (re)configurations in one *intra-action* open up for different realities. The situatedness, e.g of gender, might disappear in translation, such as in the modelling stage in which abstractions are created. For example, the actors in the analysis of the application-domain are “abstractions of users or systems”. We have, on the other hand, also discussed that the outcome is not fixed. Dependent on the encounter in the intra-actions, also other realities become possible where gender is visible in the class diagrams. The realities come into being in the ongoing doings and actions of the design process: the range of translations needed to design an artifact or usable IT system from idea to implementation and use. The translations are always partial but depending on how the boundaries drawn in the performances, various subjects, objects, and relationships come into existence.

What does this perspective contribute to understanding the risk of scripting in our desire to design for gender and diversity? Our argument, based on Barad’s notion of intra-action, is that if we understand gender and diversity as ‘inscribed’ into a design, see for example Vignette I or Figure 3a, we risk assuming a certain sequence of expected behaviour. The notion of intra-action helps to understand that we need to read such ‘inscriptions’ not as a matter of determinism or as frozen in terms of place or identity. For example in Vignette I, Jonathan had the possibilities to reconfigure the default classification system, but he didn’t do that. Through his practices he created a new meaning with the possibilities given in the software and chose not to reconfigure the *design from nowhere* into a *design from somewhere*. Similarly, in Vignette II we showed that the lack of certain ‘inscriptions’ did not result in a reality in which there was space for Anna’s practice. What comes into existence depends on where the boundaries are drawn in terms of who and what is included or not. In the last section we would like to contemplate briefly the particular accountability of the designer in making these boundaries.



## ACCOUNTABLE PRACTICES

Whether designing is an open-source hackable kind of design, or a design of a more closed form, the designer is still aiming for people to use, appropriate or experience it in a satisfying way. Regardless of the openness of the design, designers still maintain responsibility for their design vision and for the resulting design. And they have an accompanying responsibility to understand the design as it is used as well as it is envisioned [5, p. 116].

When Suchman wrote about located accountabilities, she envisioned transformations of technology design based on a deeper understanding of “the work required to achieve technology stabilization” and of “one’s location within the extended network of working relations that make technical systems possible” [21, p. 101].

In way of concluding remarks, we would like to focus however on a particular accountability that results from such location. Designers and design researchers are present in the design process due to the fact that they *know* certain things. Their *witnessing* [11, 12] also means they have a specific responsibility. This responsibility can be translated, for example, in involving a diverse representation of people in the practices of the design process. As we saw in the example of the rich picture method, in stead of working with abstractions of each previous layer of translation, we can keep multiplicity visible as long as possible, in order to see the effects of the choices we make, both on humans and nonhumans, in our translations. Margot Brereton [5] describes such a located, relational, and transformative design approach in a project supporting community communications. The ultimate design, a community digital notice board, was the outcome of an understanding of design as derived from multiple, located, partial perspectives and relationships. Even in such an open design, she argues, we remain responsible for both the design as well as its use. Participating in design, as an accountable modest *witness*, depends on modesty as well as on nurturing and acknowledging these multiple relationships with others, including bridging multiple partial knowledges.

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