ENGAGING *DESIGN MATERIALS*, *FORMATS* AND *FRAMINGS* IN SPECIFIC, SITUATED CO-DESIGNING - A *MICRO-MATERIAL* PERSPECTIVE

BY METTE AGGER ERIKSEN
K3 / MALMÖ UNIVERSITY / SWEDEN &
THE DANISH DESIGN SCHOOL / DANISH CENTRE OF DESIGN RESEARCH / COPENHAGEN / DENMARK
TEL: +45 2614 6452
mette.agger@mah.se

Engaging co-designers in specific situations of co-designing often also means engaging tangible working materials. However, it can be challenging, so rather than seeing it as applying design methods, the paper propose applying what I call a *micro-material* perspective. The practical concept captures both paying attention to the physical *design materials*, the *formats* of their exploration and the *framings* of focus when understanding and planning such specific co-design situations. To exemplify applying the perspective, the paper describes and discusses six specific examples of "co-design situations" clustered in three quite well-known types of co-design situations framed for; *Exploring Current Use(r) Practices, Mapping Networks* and *Co-Designing (Possible) Futures.*

INTRODUCTION

In our daily lives we are surrounded by and continuously interact with material things (e.g. Miller, D., 2005); and in his paper *Participation in Design Things*, likewise Pelle Ehn claims that *"People are fundamental to design* [..and co-design..], *but also objects and things."* (Ehn, P., 2008, p. 92).

Co-designing is a collaborative and interdisciplinary practice, and there are many ways to interact and communicate. In a co-design team, some are typically most comfortable with speaking and writing; however, apart from discussing and describing what to do and what have been done, no matter if a team is designing products, graphics, spaces, systems, services, etc., visualizing and materializing relevant issues and concrete proposals are also essential parts of (co-) designerly practice. Sketching and drawing on paper and computers are of course common design practices, but in co-design teams everyone are not trained in doing so, and it is challenging to do collaboratively. To meet this challenge, in this paper, I exemplify how engaging co-design teams can be approached through different ways of also engaging tangible working materials.

Just to mention a few, various others within fields of Design Research have explored and named tangible working materials. Generally again Pelle Ehn argue that they, can help establish shared "Language games" (Ehn, P., 1988/2008) and in a broad sense Susan Star claims that they can become so called "boundary objects" working as shared reference points among participants of various disciplinary backgrounds (Star, S., 1989) . More practically, for example as a part of engaging in "Design Games" Eva Brandt calls them "Things-to-think-with" (Brandt, E., 2001), Jan Capjon phrase them "Communication catalysts" (Capjon, J., 2005), Liz Sanders use "Generativ /Make tools" for engaging people in different topics (Sanders, L. and Stappers, P.

J., 2008) and for example to describe images and video-snippets from fieldstudies used to establish co-design dialogues during workshops Joakim Halse uses the term *design materials* (Halse, J., 2008).

Additionally, in practice, co-design teams are often distributed teams, so even in the digital age, physical meetings can be important for creating engagement in a project. For example within the field of Participatory Design (PD) we have a long and well-explored tradition of using workshops as open events (Brandt, E., 2001) or labs for bringing various stakeholders together in a design process. A variety of specific methods or techniques, often including explorations of various types of tangible working materials, have been developed to engage the participants during such meetings. Many of these methods or techniques, still practiced, were for example described in the anthology *Design at Work* edited by Joan Greenbaum &Morten Kyng back in 1991 (Greenbaum, J. & Kyng, M., 1991).

It is continuously explored how to communicate and apply design methods. Since the Design Methods movement started in the 1960's, within design fields there has been and still is an interest in understanding and sharing practical ways of working (e.g. Jones, J.C., 1992). IDEO's "method cards" is for example a widely used collection of inspiring yet very brief descriptions of How, Why and an Example (exemplified in Moggridge, B., 2007). Jones' 35 methods, described through an Aim, Outline and Example, have also been an influential collection (Jones, J.C., 1992). Even though Jones described his methods much like cooking recipes (a,b,c,… or 1,2,3,…), in the introduction to his book *Design Methods*, he encourages readers to leave room for intuition when working with design methods.

Following this encouragement, design methods or rather (co-)designerly ways of working can take a variety of forms, so to borrow Lucy Suchman's well-explored concept of "situated actions" (Suchman, L., 1987), like technologies, methods typically also have to be situated and appropriated to suit a particular co-design situation. Inspired by this, and based on my many various experiences from the different co-design (research) projects I have taught and been engaged in [see Acknowledgements], I argue that (co-)designerly ways of working have to be situated and appropriated for every co-design project and every specific co-design situation.

Very practically, as I will show and argue below, establishing engaging co-design situations - among other social, political, organisational, etc. issues (which I only briefly address in this paper) - also strongly depends on the interplay between the explicitly chosen specific *framings*, *formats* and *design materials*. Together these are captured in the concept of applying a *micro-material* perspective.

A MICRO-MATERIAL PERSPECTIVE

For example, Pelle Ehn's concept of *Design Things* could be called a macro-perspective on understanding the role of things during (co-)design (*Participation*) projects (Ehn, P., 2008). Partly opposed to this, applying a *micro-material* perspective suggests digging into and studying (under the microscope) the hands-on, material and immaterial (e.g. spoken words) details of creating and working with for example mock-ups and design games, which he mentions. The purpose of proposing this *micro-material* perspective is both to broaden the understanding of the role of things and tangible working materials in co-design, but also to provide practical concepts for engaging them in coming specific co-design situations.
When applying a *micro-material* perspective on specific co-design situations, understanding and planning what happens can become more explicit by working with the concepts of *framings* and *formats* around the exploration of *design materials* (Figure 1).

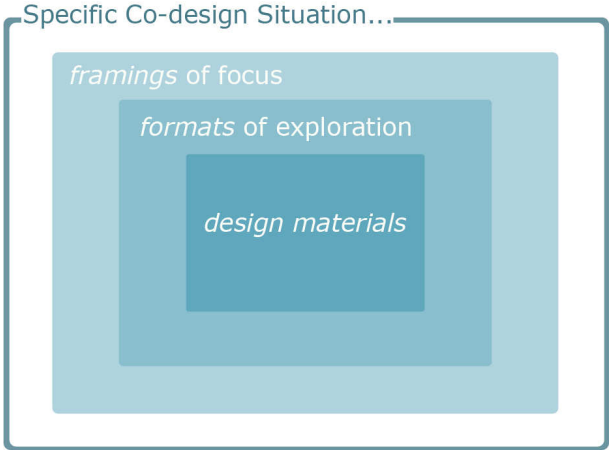

Figure 1. Applying a *micro-material* perspective on a specific, situated co-design situation e.g. during a workshop.

DESIGN MATERIALS

Design materials have different characteristics, and depending on the situation anything can potentially be *design materials*.

Figure 2. A mixed collection of tangible 2- and 3-dimensional *design materials.*

Some *design materials* can be characterized as "basic" like; pens, colored papers, foam blocks, clay, disposable cups, pipe- cleaners, game-pieces, tennis balls, hats, etc. "Basic" indicates that some(one) have brought them along to a co-design situation, but without any specific plans about their use or meaning (on meanings of artefacts e.g. see Krippendorff, K., 2006).
Others can be characterized as "pre-designed"; such as printed images, access to selected video-clips, foam & paper models or mock-ups, prototypes, etc. "Pre-designed" indicates that some(one) in the design team has selected, prepared or designed these before a meeting. Both of these can aslo be characterized as "field/project specific", if they have been personally or collaboratively choosen or created particularly in relation to an ongoing project. - Whatever the starting point, they are all viewed as *design materials* which co-designers can engage in, explore, combine, and add meaning during co-design situations. Additionally, *design materials* are both viewed as what is brought into a co-design situation to be explored collaboratively (described above) and what comes out for the continuous design process (e.g. co-designed mock-ups, "landscapes", or visual representations of these, etc.).

FRAMINGS OF FOCUS

The *framings* of focus for a particular co-design situation specifies WHY and WHAT to explore collaboratively – like in Jones' descriptions it captures the aim and focus. The term is strongly inspired by Donald Schön's concepts of how reflective practitioners interactively engage in processes of problem setting through *framing* what he calls 'the context' in relation to *naming* the things to attend (Schön, D., 1983). In his recent book *Designing Interactions,* Bill Moggridge also use the term *framing* to describe (co-design) activities of synthesising and clarifying an overall focus and framework in a otherwise chaotic project (Moggridge, B., 2007). However, here I use the term and concept of *framings* on the micro level of focusing specific co-design situations.

FORMATS OF EXPLORATIONS

The *formats* specify HOW to explore the *design materials* in relation to the *framings*. Very practically it for example captures the (pre-)defined rules of co-designing (e.g. turn taking or parallel exploration); the extra physical and/or non-physical materials or mediums used to modify, organize and explore the *design materials* (e.g. a game board, a scenary or stage, a videocamera, etc); the verbal and illustrated inspirational introduction along with the expressed specific questions and guidelines (e.g. on slides or on a printed hand-outs, etc.)

Several relevant issues are not captured in the simplified illustration in Figure 1, for example; the speed and time available for acting and the needed level of encouraging facilitation – they will be included in the discussion below. Yet other relevant issues like the attitudes and interestes of the individual co-designers, and the flow and continuity between different co-design situations and different events, are also interesting and very situated in every particular situation and project; however, they are not address in this paper.
To summarize, explicit considerations and choices, for example, to focus on project visions in stead of project planning (*framings*), the use of game boards instead of roleplaying (part of the *formats*), 2D instead of 3D objects or printed images instead of pipe-cleaners (*design materials*) are all elements of practically applying a *micro-material* perspective around engaging tangible working materials in co-designing.

THREE TYPES OF CO-DESIGN SITUATIONS

The six examples of 'specific co-design situations' included below are clustered in three types or overall *framings* of co-design situations. They have been selected from a large pool of examples from my many practical experiences of teaching e.g. interaction design and especially of being engaged in four different co-design research projects [*WorkSpace, PalCom, X:Lab* and *DAIM* - For more details see Acknowledgements]. All examples happened during workshops, in which

different tangible *design materials* were engaged in different ways (*formats*). I call the overall *framings*: *Exploring Current Use(r) Practices, Mapping Networks* and *Co-Designing (Possible) Futures.* - It is important to be aware that additional specifications of the *framings* happened in each of these specific situations. The overall types/*framings* are related to activities in various iterative process models (e.g. see Moggridge, B., 2007, p. 730), and among others, these three overall *framings* of situations have been central in most of the projects I have been engaged in, and can be viewed as central in most complex (co-)design processes today.

FRAMING : CO-DESIGN SITUATIONS OF… EXPLORING CURRENT USE(R) PRACTICES

With Participatory Design, User-centred Design, User Experience Design, User-driven innovation, etc., engaging people and exploring their current everyday practices has become common practice in much (co-)design work. For example through "Probes" (e.g. Mattelmäki, 2006) and anthropological approaches we have a large variety of design-oriented ways for gathering insights. However, as discussed in the growing community around the Ethnographic Praxis in Industry Conference (EPIC), and as for example experienced in the *WorkSpace* project, sharing rich field insights as written analytic (ethnographic) reports is not appropriate for engaging various co-designers during workshops. Therefore, in the examples below, we explored various ways of engaging co-designers through engaging hands-on, cut out "pre-designed", "field-specific" *design materials.*

EXAMPLE : "FIELDCARDS" IN A TIGHT SCHEDULE

As a smaller part of the large *PalCom* consortium, in Malmö we were 7 co-designers with various backgrounds working with the case of rehabilitation of hand surgery patients. Two of us had been doing observations and dialogue-based field work with patients and staff at the city hospital, and to share our rich insights, before a 1-day meeting with the other colleagues we had prepared a collection of what we called "Fieldcards". Our hopes were that they could help us combine the two main focuses (*framings*) of the day- analysing field data and developing initial mixed-media concepts - which we had all more or less silently accepted by accepting the email agenda sent out by the project manager beforehand. The approximately 50 cards (7x14cm) all included an image or a written title on the left side and a brief description on the right side. At the beginning of the meeting, we briefly introduced the cards, and their six different categories called: Patient portraits, Actors, Places, Situations, Central Artefacts/Media & Measurements.

Figure 3. The collection of "Fieldcards" was supposed to engage collaborative exploration, but it was difficult without any *formats*.

Our intention had been, that we through the cards collaboratively would dive into these "field-specific" *design material* to discover interesting design challenges. However, very quickly the team manager asked something like *"What are we going to do with these? – Maybe you could tell a bit to start with…"*. So after a bit of confusion, by combining different cards like the 'Group Training Session'-Situations card, the 'Coffee-table in the Hallway'-Places card and the 'Inger'-Patient Portraits card, we, who had "pre-designed" the cards, created stories about the insights we had gained from the field studies. This sparked some questions and dialogue along the way. After lunch we really had to start generating and visualizing ideas for initial concepts, as we had to present these to a larger group in the project a few days later. The "Fieldcards" stayed on the table where we had left them, while we collaboratively listed six (mainly previously identified) use-situations and ideas, which we would like to explore further through sketched scenarios…
For the point of this paper I do not dig further into this part here, but to summarize, what is exemplified, is a meeting, where we were all aware of the two *framings* of the day. With those, the time for digging into the contents on the available "Fieldcards" ("field-specific" *design materials)* was limited, but also extra challenging, as we had not prepared a *format* suitable for collaboratively doing this, so it more naturally also related to the focus of generating concrete ideas.

EXAMPLE : "FIELDPACK" & "FOCUSBOARD+"

In conjunction with the *WorkSpace* project, before a 1½-days hands-on *Grounded Imagination* conference workshop in Santorini, Greece – partly inspired by the tangible characters of Probes - we had "pre-designed" so called "Fieldpacks" (Agger Eriksen, M. & Büscher,

M., 2003). The 11 workshop participants of varied backgrounds and nationalities (who had signed up beforehand) gathered in three groups. To start this intense hands-on workshop each group got a local, Santorini cotton-bag including printed and cut out still images, snippets with quotes, maps, touristy objects and links to video-clips of being a tourist in Santorini ("field-specific" *design materials*). One bag was for example about being Fiona, a mid-20's American girl travelling on her own, and to collaboratively get into the overall topic of "tourism and disappearing computers" (specific *framings*), this group of four men set themselves in her shoes by exploring and discussing the various contents of the bag. To structure their readings, along with informally introduced verbal guidelines, all groups were provided the physical *format* of a transparent, holed, plexi-glass board called a "Focusboard" + clips etc. to place in the holes. From the pack of *design materials* this group selected some, annotated interesting issues on those, added other topics e.g. on sticker stars, speaking bubbles, etc. (additional *formats*), and used these to co-design a 3-dimensional "board of focus-points" representing their reading of her experiences of being a tourist.

Figure 4. *Design materials* of being a tourist from a pre-designed "Fieldpack" collaboratively explored around a "Focusboard+".

Before going out to do their own quick fieldwork (the next introduced *formats*), the group took close-up still images of the "Focusboard" and later in their half-way presentation combined those with images from their own field work, accompanied by Greek tunes.
After the round of presentations, we changed focus (*framings*) to develop and visualize "disappearing-computer" scenarios for tourists like Fiona (see related "doll scenario" example in the section on *Designing (Possible) Futures*).
For the condenced format of a conference workshop, the "Fieldpacks" of *design materials* worked very well as tools for quickly imersing and engaging the diverse groups of participants in the case of tourism. However, even though or maybe because the "Focusboard" was a very open *format*, allowing the co-design team to add their own interpretation - for example making the centre of the board contain the most important - in the other groups they were resistant to quite quickly change to this *format*, as it also marked changing from exploring to the more analytic mode of identifying interesting issues in the "field-specific" *design materials.*

FRAMING : CO-DESIGN SITUATIONS OF… MAPPING NETWORKS

In diverse fields like Architecture and City Planning (e.g. Chora / Bunschoten, B., 2001), Service Design (Service Design Network) and Actor-Network-Theory (ANT) (e.g. Latour, B., 2005) mapping various relations and networks are used as fruitful ways of gaining holistic views of complex structures over time. In ANT both actors (people) and non-human actors (objects, places, events, etc) are for example viewed as important parts of establishing and maintaining networks, and mapping such actor networks, and suggesting interventions in these is one the the approaches explored during Critical Design courses at Goldsmith College, University of London (Ward, M. & Wilkie, A., 2008). Mappings are often done 2-dimensionally, but for example inspired by Lego Serious Play (Lego Serious Play) in the following a couple of examples of how 3-dimensional *design materials* have also been engaged.

EXAMPLE : "PROJECT LANDSCAPE"

In the *X:Lab* meta-project exploring programmatic and experimental design research, during the "Beginnings" workshop four coming and newly started PhD scholars joined us for two days to explore different issues of practice-based design research. For example, issues of structuring a program-based research process of combining experimentation and reflection. To support our verbal discussions we created three-dimensional collages or so called "Project Landscape". Before the workshop everyone had been encouraged to bring images, keywords and objects relevant to their ongoing projects, and in about 30 minutes five separate landscapes were made on top of each their base foam board (physical *format* measuring 70x100 cm). One PhD scholar in ceramics for example created his landscape by combining his personal "project-specific" *design materials* with some of the available "basic" ones.

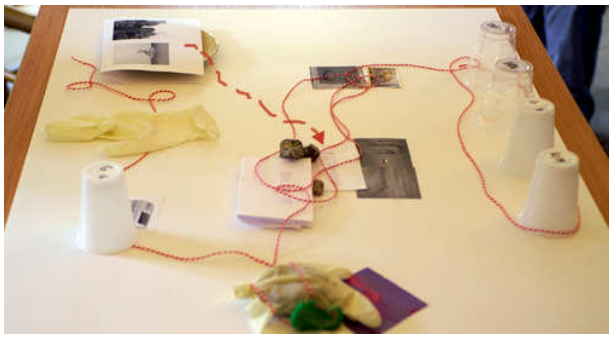

Figure 5. 3-dimensional "Project Landscape" mapping central elements of the current state of a PhD project within ceramics.

He followed the printed inspirational guidelines quite closely. The guide for example said "..for example give 3D form..to the participants/ actors/interest groups in the project…" and he mapped different central (e.g. funding and network) actors as annotated disposable cups turned upside down; the guide said "give 3D form to..the core/the topic which the project wants to explore. The projects hypothesis/program…" which he - in the centre of the board - illustrated with central "pre-designed" handwritten keywords, stones and an inspirational image in his PhD work. Lastly he used a string to connect these also with other topics like "challenges" and "expected experiments during the project", and ended the string (in the upper left corner) by "..the vision/expected goal of the project…" of exhibiting some of his works for example in a gallery. Engaging the landscape in the following collaborative discussion for example highlighed the issue of where design research projects end. It became more clear, that practice-based design research does not end with exhibitions, but rather that examples and things from practical experimentation should become parts of the overall arguments – on the landscape metaphorically the string was later extended to return to the middle of the board, where his central concepts and topics were mapped (what we in that project would call his "program" e.g. see Binder, T. & Redström, J., 2006).

EXAMPLE : "SERVICE LANDSCAPE"

In a recent interaction design master-project at K3 in Malmö/Sweden, a diverse group of students were designing place-specific Bluetooth services for and by local teenagers. Initially in the project, as part of getting familiar with different perspectives and methods from the growing field of Service Design (e.g. Moggridge, B., 2007), and after my inspirational introductury lecture, the four groups were guided by this slide:

Exercise:

1. Map/Sketch the "frontstage", "backstage" & potential "touch-points"
2. Map the relations of actors (people and objects)
3. Consider the service over time (Blueprint)
4. – identify possible "gaps" of expectations…

Work on top of a large white foam board,
and use the design materials you find appropriate.
At 11:30 we take a round of presentations…

As s a tutor I also opened a box of "basic" *design materials* for example including stickers, strings, disposable cups, etc, but mainly through a quick tour in their studio and at the school the groups collaboratively found the images and objects ("project-specific" *design materials)* they needed to illustrate their points.

Figure 6. 3-dimensional "Service Landscape" illustrating initial views of the "Backstage" and different "Frontstage Touchpoints".

After about 45 minutes one group had for example made a 'wall' to clearly mark the boarder between different frontstage interaction touchpoints and the, in their view, technical backstage - which they metaphorically related to being on the toilet. This materialized visualization clearly showed a common interaction design attitude that the technology 'just has to work'; but as I argued in the discussion of the landscape, for the user experience of the whole service to be generally positive, through this, we all got more aware of use situations where contact with the backstage and the people maintaining –in this case for example Bluetooth connections – also are important parts of experiencing a service over time. Another part of their later focus derived from the landscape – the importance of what they called the 'Ice breaker' (materialized in the

middle as a white foamblock cracked in two pieces like an ice berg). When pushing Bluetooth onto teenagers mobile phones – at this point in their project on a green bus (driving through the wall) –a very central touch-point was how to invite and inspire people to trust and accept the connection and the shared music or video-files composed by other teenagers. All in all working with the explicit 3-dimentional landscapes made the whole group more aware that creating services is a lot more than designing the "Frontstage" interfaces appearing on peoples mobile phones.

FRAMING : CO-DESIGN SITUATIONS OF… CO-DESIGNING (POSSIBLE) FUTURES

Within most co-design teams, working with mock-ups, various kinds of prototypes, scenarios, storytelling and role-playing have become common practices as ways of visualizing, materializing and experiencing (possible) futures (e.g. Moggridge, B., 2007 and Buxton, B., 2007). In the following, a couple of examples of engaging tangible working materials in different scales during co-design situations of combining ideation and exploration as a part of *designing (possible) futures*.

EXAMPLE : MOCK-UPS IN 1:1 ROLE PLAYING

In the "disappearing-computer" *WorkSpace* project working with landscape architects, for a while we had been discussing the potentials of designing a set of augmented handheld devices for them to bring out on site. At the time of the project (2002) they were still bringing large(A0), printed and folded paper-maps to navigate and annotate their observations and designs while moving around the landscape. Our ideas circled around being able to create digital overlays on top of the paper map also on site. Some of us had been sketching this on paper, we had discussed it for hours, but not until during a workshop *framed* for this, we quickly mocked up the ideas 1:1. We used the mainly paper-based *design materials* at hand in the studio, and equipped one of us with it all.

Figure 7. Engaging (paper) mock-ups in outdoor role playing to experience being an 'augmented' landscape architect out on site.

Not until then we really realized that it was not only a technical challenge to navigate all of our ideas at once. This became even more obvious when role-playing landscape architects outside by a building site, where wind, light and sound conditions also had to be taken into account. As mentioned above, the *formats* of working with for example paper mock-ups as part of full scale roleplaying or experience prototyping are well explored.
In this example, the ideas changed dramatically after this co-design situation of really engaging with the *design materials* as a part of exploring what a possible future could have been. For a while we saved the mock-ups as reminders, but it has mainly been the still images representing and capturing the collaborative experiences of engaging with and learning from interactions with the *design materials*, which continuously have been used afterwards.

EXAMPLE : SMALL-SCALE "DOLL SCENARIOS"

In the "trash-handling" *DAIM* project, during one of several workshops we were a co-design team of around 40 people being both different professionals within the area of trash handling, representatives from design consultancies and design researchers of different backgrounds. During an initial co-design situation of exploring current use(r) practices (see related examples above) in smaller groups, various ideas for possible new futures emerged. To support this *framing* shift, after a short coffee break, in plenum it was briefly explained, that by using the new available working materials, in about 45 minutes each group should have made a 2-minute video-recorded 3-scenes scenario about a possible future of handling trash. In one of the smaller groups, for a while they left the white scene of a three-phase stage (physical *format* measuring w: 3 x 33cm, d: 25cm, h: 25cm) while discussing what to do. Then while talking, one started 'walking around' with a small-scale doll (additional *format* - 11 cm tall), another started looking at the collection of printed "field-specific" images and cutting out some parts which then were set up to create atmosphere on the back stages.

Figure 8. 3-dimesional scenary for video-recording a co-designed (small-scale doll) scenario of a possible future of handling trash.

At one point they decided to focus on how different current and coming campaigns and other initiatives hopefully would change the attitude of people, so they would not continue to just dump trash next to a filled trashcanTo illustrate the little story, some continued to cut out images to illustrate the 3 step backgrounds. One now looked in the transparent plastic bag of "basic" *design materials* to find something – plastic board - to cut out and tape together to make into 2 trashcans. 2 x manipulated pipe-cleaners and long roles of colored threat were chosen from the bag to represent trash; in the first scene - layed on the floor next to a trashcan and the doll-person, and in the last scene – after having been more informed - placed in the hands of one of the doll-person bringing it along until he finds an empty can. Within the 45 minutes of intense conceptualization and materialization of the idea, with a voice-over their scenario was captured on video, and towards the end of the workshop all the produced videos were viewed in plenum on large screens.

Also in this type of co-design situation, from the bag of "basic" and "field-specific" *design materials* provided by us as organizers, some things were selected and collaboratively added meaning when engaged in materializing the scenario. However, once captured on video, the scenaries were cleaned up, the tangible *design materials* returned to the bags, and after the workshop all the 2-minute video scenarios became the new co-designed *design materials* shared in the project blog and used during the ongoing design process.

DISCUSSION

In this discussion the previous examples are related and discussed through applying a *micro-material* perspective, for example exemplifing the relations and interplays between *design materials*, *formats* of exploration and *framings* of focus in these situations.

The first example included, *"Fieldcards in a Tight Schedule"*, differs from the other examples, as this was the only situation where no explicit *formats* for exploring and engaging with the available *design materials* (the *pre-designed, field-specific* "Fieldcards") had been prepared beforehand. With the limited time available on the day, if the *formats* of exploration had been planned and prepared beforehand, instead of spending time discussing or figuring out HOW to be working during this co-design situation (approximately the coming two hours), we could have spent all the time collaboratively exploring and analysing the contents. Instead, we, who had "pre-designed" the cards, quickly invented a *format* on the spot, resulting in the situation becoming a lot more storytelling by us through mixing different cards and a lot less co-designing with the cards, which we actually had designed them for. As a consequence, after lunch when we had to move on to the next situation of sketching proposals for designing possible futures, the scenario proposals made were mainly build on previous more or less vague ideas, than on the collaborative exploration of the "Fieldcards" and the additional detailed insights they contained.
It is an example, among many others I have been involved in, where the question "How are we going to do this…?" was passed during the co-design situation – the *formats* were not clear to everyone. Of course and luckily, not everything can be planned, prepared and worked out beforehand, because then there was no need for meeting; but discussing and working out HOW to collaborate and co-design is a different situation (a different *framing*) than meeting in a proactive co-design situation for example focused on *Exploring Current Use(r) Practices*.

In the other example of that type, "*Fieldpacks" and "Focusboard"*, the first physical, and still very open *format* introduced was the "Focusboard +". The "Focusboard+" was aimed to help the groups move from diving into and discussing the contents of the "Fieldpacks", to collaboratively visualize and organize their readings and areas of interests on the board. As mentioned in the description of the example, this very open physical *format* worked best for the group described – the other two groups prefered to continue discussing and some also asked something like *"But how are we going to use this…?"* – again indicating that the verbal or in other examples written guidelines are an inseperable part of the *formats* of exploration. At least to some participants, rather than the verbal inspirational and informal style we used in this workshop, more constrained facilitation would have been needed if they should all have been comfortable with engaging in co-designing through these (to them – new) ways of *exploring current use(r) practices.*

In both of the examples under the overall *framing "Mapping Networks"*, in a *micro-material* perspective, it was mainly the additional *framings* and the written guideline *formats* that made the situations differ. The

selected and used *design materials* were a combination of "field/project-specific" ones gathered by the co-designers, and "basic" ones made available by me as a facilitator/tutor. Additionally, the physical *formats* of the foam boards as a base were the same in the two co-design situations. At a quick glance, physically both "landscapes" had similarities with different *design materials* or groups of *design materials* related by strings or stickers. However, the additional *framings* specifying the meaning of *Mapping Networks* in these special situations and the guideline *formats* specified both through my inspirational slide-introductions and the verbal and printed guidelines differed in the two examples. In the situation of the "Project Landscape" I said something like *"..make a landscape that for example materialize the core focus and actors in the project.."* vs. in the teaching situation of the "Service Landscape" it was *"..for example map/sketch the "front-" and "backstage" and potential "touchpoints" of your coming service-design.."*. Naturally, with the different additional *framings* and guiding *formats* the meanings added to the *design materials* were different (more on meanings of artefacts – see Krippendorff, C., 2006), and thus the interpretations and collaborative discussions of the "landscapes" and the insights they created for the continuous project work were also different. The "Project landscape" for example fed into the methodological planning and structuring of the ongoing PhD project; whereas the "Service Landscape" fed into discussions of their possible service-design proposal, as well as a more general discussion about the differences between interaction and service design provoked by the materialized attitude towards the so called "Backstage".

In the two examples of *"Designing (Possible) Futures"*, again in a *micro-material* perspective, it was the *formats* and *design materials* that made the situations different. The shared overall *framing* focused both situations around making possible futures concrete through materializing and visualizing tools and scenaries and then experiencing possible future through roleplaying scenarios. It was the pre-defined *formats* that specified whether to co-design in full- or small-scale. For example to support working in small-scale, the white foamboard three-step stage and the wooden dolls were provided as physical *formats* along with a bag of "basic" and "field-specific" *design materials*, whereas the existing physical space worked as scenary in the full-scale roleplaying, where white foam baord in this case was used as a *design materials* to materialize the previous ideas in 1:1 three-dimensional mock-ups.

As argued in the introduction, design methods or ways of (co-)designing are very rarely ready to take down the shelf or out of a book or a box to be applied – they need to be situated and appropriated.
We can learn from and get inspired by examples of how others have been doing, but generally the six examples above are also intended to highlight the, in many situations, fine distinctions between what are *framings*, what are *formats* and what are *design materials*. The intension has for example been to highlight the important mediator role of the *formats* of exploration. As I have shown, the physical *formats* and physical *design materials* play very different roles during co-design situations, and in some situations the verbal and/or written parts of the *formats* (e.g. instructions or guidelines) often merge or overlap with the descriptions (e.g. in the agenda) and explanations (e.g. by the facilitator) of the *framings* of focus. Thus, in all the exemplified situations, it was not the physical *design materials* themselves, that were engaging, but rather the combination and interplay between the situated and appropriated *framings, formats* and *design materials.* Of course, other political, organisational, social, etc issues (which I have not addressed in this paper) also affected the situations, but these *micro-material* issues were definitely important parts of setting the stages for the specific situations to be experienced as engaging by the participating co-designers.

CONCLUSION

Rather than focusing on using design methods, this paper presents a so called *micro-material* perspective, to help understand the roles of tangible working materials in co-designing and to help meet the practical challenges of engaging them in specific co-design situations. Through clustering, presenting and discussing six examples of co-design situations (during workshops - and in most cases as a part of longer projects), I have shared specific situated examples of the interplay between the available *design materials,* the *framing(s)* of focus and the *formats* of exploration as practical concepts for appropriating and situating ways of engaging tangible working materials and co-designers in specific co-design situations.

ACKNOWLEDGEMENTS

Thanks to K3/Malmö University and the Danish Centre of Design Research (DCDR) for funding this doctoral practice-based design research. Also thanks to e.g. interaction design master students at K3 in Sweden and all my co-designing colleagues in the different co-design research projects I report from. The projects are: Two European Participatory IT-research projects – *WorkSpace*, designing "disappearing-computer" solutions with and for landscape architects (2001-2003), and *PalCom* , developing an open software architecture for ubiquitous computing explored in 5-6 different cases like emergency situations around large accidents and rehabilitation of hands surgery patients (2004-2007). *X:Lab*, exploring how to speak about practice-based and experimental design research (2006-); and lastly *DAIM*, developing a model and a toolbox for design-anthropological, user-driven innovation mainly through a case of trash handling (2008-). – This work would not have been possible without your engagement.

REFERENCES

Agger Eriksen, M., Büscher, M. (2003) 'Grounded Imagination: Challenge, paradox and inspiration', *DC Success Stories in the Proceedings of the Tales of the Disappearing Computer*, Santorini, Greece, 1-4 June 2003.

Binder, T. & Redström, J. (2006) 'Exemplary Design Research', *In the Proceedings of the International "Wonderground" Conference (IADE)*. Design Research Society. Lisbon, Portugal.

Brandt, E. (2001) 'Event-Driven Product Development: Collaboration and Learning', *Ph.d. Dissertation. Dept. of Manufacturing Engineering and Management, DTU*, Denmark.

Buxton, B. (2007) 'Sketching User Experiences', *Morgan Kaufmann*.

Chora / Bunschoten, R. (2001) 'Urban Flotsam. Stirring the City', *010 Publishers* - Rotterdam.

DAIM project (2008-2009) – see : http://chokobar.wordpress.com/about-the-daim-blog/

Ehn, P. (2008) 'Participation in Design Things', *In Proceedings of the 10th Participatory Design Conference*, Bloomington, Indiana, USA. p. 92-101.

Ehn, P. (1988) 'Work-oriented design of computer artifacts', *Arbetslivscentrum*, Sweden.

EPIC -see: http://www.epic2008.com/home

Greenbaum, J. & Kyng, M. (Eds.) (1991) 'Design at Work: Cooperative Design of Computer Systems**',** *Lawrence Erlbaum Associates, Inc.*, Mahwah, NJ.

Halse, J. (2008) 'Design Anthropology: Borderland Experiments with Participation, Performance and Situated Intervention', *PhD dissertation. IT University of Copenhagen*, Denmark.

Jones, J. C. (1992) 'Design methods -Second Edition', *John Wiley & Sons, Inc*.

Krippendorff, K. (2006) 'The Semantic Turn. A New Foundation of Design', *Taylor & Francis Group*.

Latour, B. (2005) 'Reassembling the Social. An Introduction to Actor-Network-Theory', *Oxford University Press.*

Lego Serious Play -see: http://www.seriousplay.com/

Mattelmäki, T. (2006) *Design Probes*. PhD Dissertation. UIAH, Finland.

Moggridge, B. (2007) 'Designing Interactions', *MIT Press.*

Miller, D. (Eds.) (2005) 'Materiality', *Duke University Press.*

PalCom project (2004-2007) –see: http://www.ist-palcom.org/

Sanders, B.-N. & Stappers, P. J. (2008) 'Co-creation and the new landscapes of design', *In CoDesign, Volume X - March 2008, p. x-x. Taylor & Francis*.

Schön, D. (1983) 'The Reflective Practitioner. How Professionals Think in Action', *Ashgate Publishing Limited.*

Service design network –see: http://service-design-network.org

Star, S. (1989) 'The structure of ill-structured solutions: boundary objects and heterogeneous distributed problem solving', *Distributed Artificial Intelligence (Vol. 2), p. 37 – 54, Morgan Kaufmann Publishers Inc.*, USA.

Suchman, L. (1987) 'Plans and situated actions. The problem of human-machine interaction', *Cambridge University Press.*

Ward, M. & Wilkie, A. (2008) 'Made In Criticalland: Designing Matters of Concern', *Working paper.*

WorkSpace project (2001-2003) – see: http://www.disappearing-computer.net/projects/WORKSPACE.html

X:Lab project (2006 -) –see: http://www.designforskning.dk/visProjektliste.asp?artikelID=1574