

Scenarios in User-Centred Design - setting the stage for reflection and action

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Abstract

This paper will discuss three examples of use of scenarios in user-centred design. The examples are from projects that the author has been involved with. Common to them are the use of scenarios to support the tensions between reflection and action, between typical and critical situations, and between plus and minus situations. The paper will illustrate how a variety of more specific scenarios emphasising e.g. critical situations, or even caricatures of situations are very useful for helping groups of users and designers being creative in design. Emphasising creativity in design is a very different view on the design process than normally represented in usability work or software/requirement engineering, where generalising users' actions are much more important than the, in this paper, suggested richness of and contradiction between actual use situations. In general the paper proposes to attune scenarios to the particular purposes of the situations that they are to be used in, and to be very selective based on these purposes.

1. Introduction

For the last year I have been working in a project called BIDI (Usability work in Danish industry). In BIDI we are collaborating with Bang & Olufsen A/S, Danfoss A/S, and Kommunedata, the first three Danish companies to have usability lab facilities. BIDI is an action oriented research project that aims to develop the work practices of usability, based on our own theoretical and empirical work in the area [6, 8, 24], the mutual sharing of experiences among the three involved companies, and practice and theory from other sources. The three involved companies do their work rather differently, but common to them all is an interest in moving out of the lab and into the field, of increased user involvement, and increased involvement with design, i.e. of moving *from evaluation to co-design* (see [5, 27]). The products

designed and sold by the companies range from computer software to hi-fi equipment and thermostats.

This paper focuses on the use of scenarios in settings such as the ones that the three companies are involved with, where interaction with users as well as designers and engineers is of increasing importance and where there is an increasing concern not only for evaluation of user interfaces but also for the creation of ideas, and for the involvement of usability work in all phases of design.

This paper considers design, be this of computer systems or other sorts of appliances, as an iterative process, involving the active participation of users and of professional designers, engineers and usability people. It is of vital importance for designers to understand use so as to build artefacts to support and develop use.

As developed in [6] it is necessary to consider means for creating trial use situations as part of the design process, so as to stage users' hands-on experience with the future. It is equally necessary to investigate ways in which users can feed back reflections over work and trial use to designers and usability people in ways that are directly anchored in the specifics of particular use situations. Based in the BIDI work, it is a particular concern to look to ways of providing hands-on experience for users, in iterative design processes. It is furthermore important to understand and develop ways in which designers may utilise scenarios and their anchoring in specific work/use situations in their *reflection* and *action* in such iterative user-centred design processes. This paper investigates the use of scenarios for providing context for trial use as well as for feed-back to designers. Further details of the overall perspective as regards what constitute scenarios can be found e.g. in [3].

2. Scenarios

Scenarios have found their role in HCI, primarily in situating or staging test examples, often in a very detached fashion where the test examples focus on somewhat abstract tasks, not on particular use situations.

In contrast to this detached post-design testing, [13] sees usability studies as an integral part of the design process and explores the application of scenarios more generally in design. Seeing usability as an integral part of design, which is well in line with the above outlined integral understanding of design and use, means that the role of usability changes from being an activity that "approves" of a computer application, to an activity that takes responsibility for the product and its future use, by being part of the design process. Furthermore, this means perceiving the user as a designer in contrast to usability studies which are carried out to endorse or underwrite a system, where the users' only role would be to accept or reject the parts being tested.

In computer systems development and software engineering use cases [22] have been promoted heavily as appropriate abstractions of users' tasks to be designed from. Use cases as well as the scenario use of e.g. [29] share with scenario use in HCI that the scenarios are abstract and predirecting users actions. At the same time, there has been a move, similar to that in HCI, from abstract descriptions or specifications of computer applications, towards prototyping and other sorts of representations that allow users to play an active role in an iterative design process (See e.g. [1, 16, 17]). In recent literature, such as [2, 3, 11, 13, 23] a wider role is discussed for scenarios in relation to this kind of design: scenarios as basis for overall design, technical implementation, co-operation within design teams, and across professional boundaries e.g. between users and designers or between usability people and technical designers and implementors.

This paper will discuss, based on three particular examples, what it means to make descriptions that are sufficiently specific, detailed and focused to support keeping future use in view, and reason about design in various types of design situations. The paper focuses on the descriptions of everyday situations that are the starting point for creating scenarios, and the relations between these situations and series of scenarios used in iterative, user-centred design. It focuses on various possible, and interconnected, uses of scenarios in design and evaluation of computer applications or similar sorts of artefacts.

2.1. Purpose and timing of scenarios

In [10] we summarise how the term 'scenario' is used with various meanings in literature from strategic planning, software engineering to HCI, and how, after all, these meanings have a certain core that justifies characterising scenarios as hypothetical, selective, bound, connected, and assessable, so that they may be judged with respect to their probability and/or desirability.

Scenarios, thus, are constructions made with a *purpose*. This purpose helps scenario constructors be selective. The purpose may relate both to the type of situation the scenario is dealing with and to the type of design situation that the constructors want to support. Coming from the perspective of an iterative process of using various types of scenarios in design, [7] introduces a distinction between types of scenarios. The paper proposes three main reasons for making and using scenarios in design:

- to present and situate solutions
- to illustrate alternative solutions
- to identify potential problems.

Of these reasons, the first two match the rationales behind [23] use and exploration scenarios, whereas scenarios that are produced by end users (together with designers and e.g. usability people) to be fed back to designers to identify problems is not considered by [23]. However, his explanation scenarios could, as I discuss later, be attuned to this purpose.

If we take a look at basic interviewing techniques (e.g. [28]), we can chose to ask open-ended or closed questions and get very different answers. The same is true for scenarios. *Open-ended* scenarios give broad and conceptual answers, whereas *closed* scenarios tend to give more detailed, specific answers.

There are many ways in which a scenario can be attuned to a particular design situation and many concerns to be considered. For instance: if we have a very crude prototype or paper mock-up, a very detailed scenario of a future use situation may be of little value, and it may even lead the evaluation astray, compared to a scenario that fits the level of detail of the prototype better. Throughout design, the needs vary, depending on type of project, organisation of activities, deadlines, etc. Therefore it is difficult to predict or propose any general sequence of activities and scenarios. It is possible, however, to understand more about how scenarios may be shaped to suit these different purposes.

[14] introduces the notion of *critical* and *typical* situations: Scenarios should be designed based on knowledge about typical ways of doing things, but addressing specific, critical instances of the typical. In [10] we discuss how critical scenarios may include situations that are contradictory to the mainstream, and how such scenarios in some cases are in very good support of creativity in design, because they allow perspectives to be confronted with one another. As [10] conclude: *scenarios are meant to provoke new ideas*. In [4, 12] small scenarios were used for structured evaluation of prototypes. Scenarios for evaluating prototypes normally move from typical ones to critical ones as the prototypes develop vertically and horizontally (and issues of what is typical and critical

may change). This is both because it is hard to evaluate critical situations if the typical situations are not yet functioning, and because learning-wise the breakdowns in use spread more and more into extreme, critical situations, as the process proceeds [6].

Scenarios are rooted in specific situations from the domain under scrutiny. [23] describes how in EuroCoOp/EuroCODE a certain sequence of descriptions and overviews of the then current work was used as part of the iterative design process as starting points for creating scenarios. [23] and many others, including the entire field of ethnographic studies of work, known from CSCW (e.g. [20, 21, 30]) have provided a useful basis for extracting such situations. [15] discusses the use of such situations extracted from ethnographic field studies, called instances, in design.

In the EuroCODE framework we worked from there also to understand the roles of scenarios in creating something new, and in [10] it is suggested to use e.g. literature examples to make projections about the future. We propose to make use of two supplementary future scenarios – *plus* and *minus* scenarios: both carrying the changes of the work practice to the extremes in order to help users think for themselves, what they want and what not.

Scenarios, as any other design representation [9] serve the double purpose of engendering the decisions made in the design situation, and of being a vehicle of communication between the participants, and even out of the group. It is the mutual experience of constructing and exploring scenarios that, fundamentally, make them shareable. Scenarios are mediating the thinking and communication that takes place in design. Thus they are grounded in this co-operative effort and in the practice of the participants. At the same time, the scenarios will be given different meaning from the different involved activities and practices, e.g. a scenario will play a different role in the construction of an early prototype, than it will in concerns for the training of future users.

3. Three ways of using scenarios in usability work and design

In the following we look at three examples as starting point for discussions of how scenarios may be used at different times and with different purposes *in* design, not after. One of these examples comes out of a typical usability setting, one out of early idea generation for a new user interface concept, and the last one out of a CSCW design process where scenarios are used to support the build-up and use of a shared understanding among the design group.

3.1. Example 1. Usability testing of prototypes

The usability centre at Kommunedata, one of our collaborators in BIDI in most cases works with county or municipal authorities who are directly or indirectly the customers of the product. For each test, the test leader develops a set of scenarios that users are asked to work with during the test. The scenarios are developed on the basis of data gathered on field trips. They are primarily designed to motivate the user to carry out a certain activity. The same scenarios are used throughout the test cycle independent of what has happened to the prototype in question. An example from a test of an application for use by nurses in public dental clinics for children was:

"Peter's mother calls you on the phone. She would like to reschedule the appointment Peter has on Tuesday and asks if he can come Thursday instead".

From this type of scenario, the user has to work out what to do and how to accomplish it. This leaves the user to consider how she is currently carrying out a task like this, how her normal ways of carrying out the task fit into her understanding of the new application she is facing, and, finally, to test her assumptions by using the new application through a modified version of her normal ways of doing things. When reflecting on this usability practice in the BIDI project we found that it is difficult (initially for the user, and a consequence for the test leader and designers) to explore in detail the difference between the current work practice and possible future ones. Furthermore, the purpose of the situation is unclear in terms of whether the scenario is meant for presenting solutions or identifying problems, because it is used both for situating the trial use, and as the main pointer for the designers to where problems may be. Our discussions lead to a proposal of using several scenarios, with different purpose and emphasis, depending on where one may be in the evaluation process. We suggest that the work with scenarios starts already in gathering data from the field trips where e.g. work situation overviews [23], and descriptions could be used. This would help to hold on to and present the selected work situations of interest for the design, both to test persons, the people that has been studied and interviewed in the field visits (this as a matter of validating ones findings and assumptions), and to designers, i.e. a kind of requirement capture.

A multitude of specific test scenarios would help focus the tests in accordance with the state of the tested application, the kind of feedback that designers are looking for, and findings and observations from earlier in the evaluation process.

In a usability test one may wish to look for as much information as possible. At the same time it is important to focus the output on issues that are important for the development of the product. For example, if the usability centre only gets the opportunity to test the application

once, focusing the test too much could cause limitations to user feedback. Testing only once often leads to a situation where as much and as all-inclusive information as possible is requested. An extensive capture of information may seem as the ideal from a usability perspective, whereas this is not necessarily true from a design perspective. In order to inform design, the output from usability tests has to be focused around issues that are of relevance to the designers at the particular point in the process. In a typical test, late in the design process, it wouldn't make much sense to focus on problems of general conceptions of the users' work practice, as these should have already been included in the design.

Based on our analysis and discussions we propose that two supplementary strategies are useful in specialising and making better use of scenarios in design in this case. These strategies are both pending on a more specific understanding of usability people of the design proposal that they are currently testing in relation to the design process (what do the designers need to know here and now), and thus on the co-operation between designers and usability people: One strategy is to aim to do early testing of overall design ideas, e.g. based on prototypes, and the other to do more focused testing later, based on what design needs to deal with at the particular point in the process. The first type of scenarios will be illustrated in the next example, whereas the second kind is most likely what will be looking for, before moving to more dramatic changes.

We propose to use scenarios for setting the stage for tests at the various points in the design process. Each of these scenarios need to be attuned to the state of the design process, and thus, to the particular purpose of the test. In order to present and situate solutions for test users, an increased co-operation between designers and usability people is necessary. A further use of scenarios is for sorting feedback to designers, and for situating this feedback in their proposed design, i.e. for presenting problems with the particular solution back to designers in very specific terms of what the users need to do, but can't, etc. Examples of such scenarios could be what [23] calls explanation scenarios, though these would need to be less abstract, and created not by designers, but in a co-operation between usability people and users, or by usability people based on their involvement with users. A specific way of involving designers with the scenarios used in the test situation is to link feedback to the scenarios. By linking these two together, we achieve a means of communicating to the designers not only the findings of the test but also in which context (namely the scenario) the user's observation was made. This means that it is possible to communicate both what the problems are, when they occur, and to provide the designers with contextual information that help them

understand why. The entire purpose of the scenarios is in a sense turned up-side down, because the scenarios are first used from designers/usability people to users, and then, following, from users and usability people back to designers, providing for them context of observations as well as specific examples to think from (see also [5]). The scenarios become an important mediation between design and use, with a modest modification of the role of the usability group.

What we have discussed in the BIDI project is indeed a moderate modification of the usability process where we propose to make use of a variety of scenarios depending on the stability and finish of the prototype. This is a way of improving the possibilities of an ongoing dialogue with users as well as designers [25], integrating usability more profoundly into design, without totally abandoning usability work as a separate activity in such an organisation as Kommunedata. Our proposals have been well received, and we are at the point of implementing some of them in the organisation.

3.2. Example 2. Scenarios as a starting point for acting in design workshops

In a conceptual design activity performed by the Danfoss User Centred Design Group, a group of researchers from the BIDI project and Danfoss had been undertaking a study of the work at a combined district heating and power plant. This field study was done over several rounds with 3-8 people spending several days in the plant recording most of what they saw and heard on video. This video was analysed and a small number of situations were transcribed as the starting point for further design considerations. These transcripts of dialogue between workers in the plant, pictures of the setting, and the actual snippets of video constituted the work situation descriptions in this example.

These descriptions had several uses including one where a workshop was carried out in order to generate ideas for overall designs in relation to possible uses of portable technology in the plant:

A group of project participants from Aarhus University and the three companies was gathered for what we call an inspiration workshop, focusing on the heating and power plant investigation. The participants were handed a small number of work situation descriptions, they watched video from the plant, and were asked to explore design possibilities for a portable piece of equipment from the point of view of four design perspectives (tool, media, system and dialogue partner, see [6, 8]), one perspective in each of four groups. An example was a piece of conversation over walkie-talkies between the control room, a controller in the plant and a maintenance person, over a full sludge tank (figure 1).

Tank Overflow .. What to do?

Transcript of conversation on the 17-6-97 from 11.17-11.22, between controlroom(CR) and processoperator. On tape Controlroom #3 and processoperator out.

Kim, who is cleaning the smokecleaningtanks, has reported that the sludgetank is full to the controlroom.

At the Controlroom :

Peter: ...men den (tanken) løber over, siger Kim.
(...but Kim says it runs over)

Jan: Jeg går ned og kigger.
Er det Buffer- eller Slamtanken ? (I'll go and have a look.
is it the buffer- or the sludgetank?)

Peter: Slamtanken ? Nu kigger jeg på buffertanken.
(Sludgetank? I'm looking at the buffertank.)

Jan: Ja, det er slamtanken, ikke? (Yes it is the sludgetank, right?)

Peter: Ja, den kan jeg kun se maks på, der er ingen visning på.

(Yes, I can only see the max value on that, there is no reading.)

Jan: Ja. (går ned til tank) Yeah. (leaves for the tank))

Jan:At tank Peter?

Peter: Ja. (Yes.)

Jan: Har du ikke en maks-maks-alarm på slamtanken?

(Haven't you got a max-max-alarm on the sludgetank?)

Peter: Så er den kommet for længe siden da.
(It would have come in some time ago then.)

Jan: Den er jo,.. det er lige før den løberud på dækket henede jo.

(It is...It's just about to run onto the (To Kim: Can we put it in the buffertank?)

Peter: Jeg kan jo starte filterpressen og køre det den vej igen nem.

(I could start the filterpress and run it through that way.)

Jan: Vent lige lidt, jeg snakker lige med Kim.
(Wait a minute- I'm talking to Kim.)

Jan: Til Kim Hvad vil du? Er du færdig?

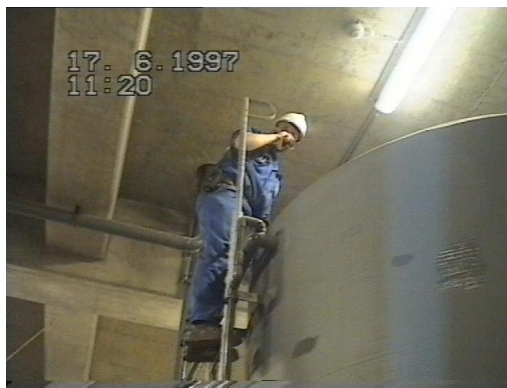
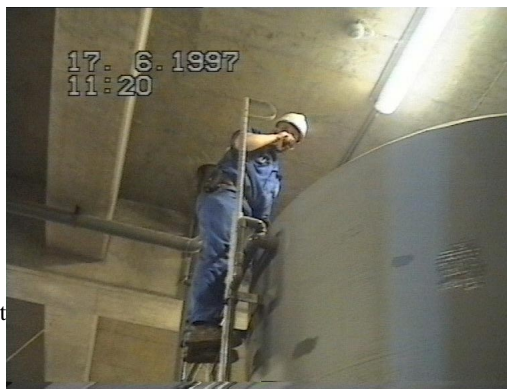
(To Kim: What do you want to do- are you finished?)

Kim: Jah, jeg mangler lige det sidste. Jeg skal bare have tømt det der.

(Yeah, I'm short of the last. I just need to empty it/that.)

Jan:Til Kim Vi starter filterpresseren? (To Kim: We start the filter press?)

Kim: Ja, det kan vi godt- og så det op i bufferen.





The groups created scenarios based on the work situation description to situate their thinking about possible solutions - where would the media perspective, emphasising communication between people in the plant head? Or, with the tool perspective, which tools would be needed, and for what purposes? The groups were further asked to present their design solution by acting out the new scenarios, and obviously this was easier for some groups than others. In particular, one group came up with a futuristic design scenario with negotiating sludge-tanks, and for them the specific dialogue of the original use setting was of little use. However, all groups found scenarios to be a useful way of relating possible design solutions to what actually happens in the plant, despite the very selective work situations.

To crystallise the design into something that is almost a caricature of the future (in that obviously, a real design solution would not pursue any one perspective to the ultimate extreme) was very useful for the discussions on where to take the design from there. In this, the specific scenarios provided means for comparing the designs since the four use situations were similar, and not chosen for what was most promoting for the actual design.

This use of scenarios is indeed a very open-ended one, where it was entirely up to the participants how much they would use the scenarios and how. The process did not proceed to change scenarios based on the design proposals. However, an obvious next step would be to consider how the scenarios could be changed or extended to support up-coming next steps in the design process, e.g. the design proposals could be presented to users based on the scenarios in what [23] calls use scenarios, and a series of critical scenarios could be used to hold on to the pros and cons of the particular design situations produced. This would be a way of feeding back design problems to the designers that could lead to what [23] calls requirement scenarios.

3.3. Example 3. The provocation of thoughts and ideas through plus and minus scenarios

In order to explore the notion of plus and minus scenarios, I will present a short example from EuroCODE. The general use of scenarios in EuroCoOp/CODE is described and analysed by [23] and will not be discussed here. However, what is not discussed in [23] is the work done to systematically explore the use of scenarios in CSCW design. The EuroCODE analysis and design work included field studies of the work of supervisors, analysis of artefacts in use (filing facilities, construction drawings etc.), future workshops with supervisors, etc. [18, 19]. As part of a concrete example to explore the use of hypermedia technology and portable devices at the Great Belt Link

(our use domain in EuroCODE) the following scenarios (figure 2) were constructed (the example is described in greater detail in [10]).

These scenarios are part of a series of scenarios produced in support of an iterative design process making use of checklists of items to focus on as regards work and technical solutions, and exemplary conceptual and technical solutions to think from as support for creativity in CSCW design. In the proposed example design process they are used as illustrated in figure 3.

3 and 4 are examples of plus and minus scenarios that illustrate how potentials and problems of future solutions are better dealt through caricatures. How such scenarios may help stage possible futures for users, and how the scenarios allow the users to relate the future technology back to their present experiences: instead of finding the middle-ground of what might or might not happen with the new application, the plus scenario picks up on the positives sides to such an extreme that even the most optimistic reader will stop and think, and the minus scenario does similarly to the negative sides. This way it is easier to think through all sorts of demands for a future application.

Though it may well be problematic for an organisation like our collaborator, Kommunedata to be too profoundly critical of their own products in front of their future users, I find the idea thought provoking: First of all, it ought to be possible to create plus and minus scenarios that are more nuanced than the above without losing the power of the caricature. In front of the users, these are not traditional test scenarios, rather they should be used earlier in the design process to discuss overall general conceptual problems of design. Or when facing specific design choices, very specific plus and minus scenarios can be used as critical scenarios dealing with particular problems also at later stages in the process. Secondly, these scenarios may just as well be used when feeding problems back to designers, as an outcome of discussions with users, thus anchoring the problems in projected future use, instead of detached problems with the current design. From previous experience, the designers would get more of a feel for the potentials and problems of their future artefact in context.

The examples illustrate how it is possible to work with a variety of different kinds of focused scenarios to bridge between use, design and usability work. The scenarios are very different from the usual Kommunedata scenarios and from e.g. use cases, in that they focus on specific situations, and diversity between these, and in that they are constructions, not use situations pulled directly out of the existing practice of use. In the upcoming discussion, I will go deeper into how to focus these scenarios for different purposes in

design. I will not go further into general aspects of a scenario-centred design process, only I will suggest that

the specific discussions here over usability, participation and design fit nicely into this general frame.

Scenario 3: Hyper-wonderland

This scenario addresses the positive aspects of how a hypermedia solution will work.

The setting is the Lindholm construction site sometime in the future.

Kurt has access to a portable PC. The portables are hooked up to the computer at the site office via a wireless modem connection, through which the supervisors run the hypermedia application.

Action: During inspection of one of the caissons Kurt takes his portable PC, switches it on and places the cursor on the required information. He clicks the mouse button and gets the master file index together with an overview of links. He chooses the links of relevance for the caisson he is inspecting.

Kurt is pleased that he no longer needs to plan his inspections in advance. This is a great help because due to the 'event-driven' nature of inspection, constructors never know where and when an inspection is taking place. Moreover, it has become much easier to keep track of personal notes, reports etc. because they can be entered directly on the spot.

The access via the construction site interface does not force him to deal with complicated keywords either. Instead, he can access the relevant information right away, literally from where he is standing.

A positive side effect concerns his reachability. As long as he has logged in on the computer, he is within reach of the secretaries and can be contacted when guests arrive or when he is needed somewhere else on the site. Moreover, he can see at a glance where his colleagues are working and get in touch with them when he needs their help or advice.

All in all, Kurt feels that the new computer application has put him more in control of things.

Scenario 4: Panopticon

This scenario addresses the negative aspects of how a hypermedia solution will work.

The setting is the Lindholm construction site sometime in the future.

Kurt has access to a portable PC. The portables are hooked up to the computer at the site office via a wireless modem connection, through which the supervisors run the hypermedia application.

Action: During inspecting one of the caissons Kurt starts talking to one of the builders about some reinforcement problem. They argue about the recent lab tests, and he takes out his portable PC in order to provide some data which justify his arguments. It takes quite a while before he finds a spot where he can place the PC: either there is too much light, or there is no level surface at a suitable height. Finally, he puts the laptop on a big box and switches it on. He positions the cursor on the caisson he is currently inspecting and clicks the mouse to get into the master file. The table of contents pops up and from the overview of links he chooses those of relevance - but no lab test appears on the screen. Obviously, the file has not been updated as planned.

Kurt is rather upset. This loss of prestige in front of a contractor engineer would not have happened if he had planned his inspection as he had in the old days.

Sometimes, he feels like a hunted fox especially in situations where he is drifting around thinking about what kind of action to take in a particular case. If he has forgotten to log out, he suddenly has a secretary on the phone: "I see you are right at caisson 39, so could you not just drop by and take a message?"

All in all Kurt feels that the new computer application has put him under control.

Figure 2: The plus and minus scenarios

4. Setting the stage for the future

Scenarios are very little in themselves. Good scenarios are not a detached description of user tasks and actions, but selective scripts or stories that stage user actions with a future artefact. They are means of holding on to situations, and how they may be changed because of a design. They represent the reflection over situations, problems or solutions and facilitate action, such as hands-on prototypes or simulations. In such hands-on activities scenarios can be used in order to focus the users' actions with a not yet existing artefact as in EuroCODE, for focused testing of design ideas or interface aspects as in the Kommunedata case, or, as in

the Danfoss case for providing input for brainstorming about design ideas where the designers get a feeling for use (present and future) by acting out scenarios.

4.1. Action based on reflection

The Danfoss design workshops use situations right out of existing work situations to stage the future action. What we must remind ourselves, however, is that this does not mean that any situation would do. We have to work with work situations and scenarios as constructions meant to stage acting in the future or to reflect on and illustrate problems with this action. As a matter of fact, a lot of work has been put into selecting and "cutting" the right situations out of many hours of video and observation material. What is gained from the real

situations is mainly the richness of detail which make them useful triggers of thoughts.

4.2. Not about the present but about the future

The Kommunedata case shows that there is much more to a good scenario than choosing a characteristic work situation. Depending on the state of the prototype that one is dealing with and of the objective in terms of purpose of the design situation and scope of the prototype as regards to what aspects of work it may support, it pays off to be very selective. And this in turn demands that work is put into determining the objective of the scenario in terms of what solutions are to be presented, and at what level of detail and robustness, or what kind of problems to focus on. This deserves to be done in co-operation between designers, and in this case, usability people. I propose that being selective pays off in a number of ways, and that it is much better to work with a number of scenarios which are all very particular, than with a few general: Open-ended scenarios as they were used in the Danfoss case serve well in the early phases of design, whereas closed scenarios may serve particular purposes, such as testing of a particular solution, later. Typical situations are equally useful for starters, but deserve to be supplemented with critical ones as the process moves on.

4.3 Caricatures make the point

On top of being selective, I find evidence in both the Danfoss and the EuroCODE examples that overemphasising distinguishing features makes the point more easily understandable for participants. In my experience it is much more effectful to create scenarios that are caricatures instead of such that are nuanced. It is much easier for users and whoever else is going to relate to the scenarios to assess things when they see full-blown consequences than when the implications go a bit in all sorts of directions. Not that they “believe” in the caricatures, indeed they don’t, but it is just much easier to use ones common sense judgement when confronted with a number of extremes, than when judging based on some kind of “middle ground”. This is indeed why the use of plus and minus scenarios is very useful.

4.4 Reflection based on action

I have illustrated how scenarios may be used when feeding problems back to designers, anchoring the problems in projected future use, instead of detached

problems with the current design. I suggest that this helps designers get more of a feel for the potentials and problems of their future artefact in context, and thus really to understand the problems as well as their current solution better. In the Danfoss case, such thinking could be utilised systematically for all four design proposals by using critical scenarios to hold on to the pros and cons.

5. Conclusion

Developing the use of scenarios in the proposed ways and settings is tied in with the development of design as an iterative process, where users as well as designers and usability people are active participants. At the same time, this paper has illustrated how scenarios provide important means for making such a process possible because they offer specific settings and situations as a basis for communication between users, designers and usability people.

We have to work with scenarios as constructions meant to stage acting in the future, or to reflect on and illustrate problems with this action. The same scenarios, or versions of the same scenarios, thus, are constructed and used in a field of tensions between reflection and action.

The paper has illustrated that purposeful clear-cutting of scenarios to encompass very particular situations or to focus on very particular problems, or parts of solutions, is very useful. Caricatures are suggested as a very efficient means for this. Scenarios must be anchored to the present work of the users and be specific, yet they must be shaped through concerns for the typical and the critical, for how open-ended or closed the situations need to be, and what needs to be brought out about the future situation.

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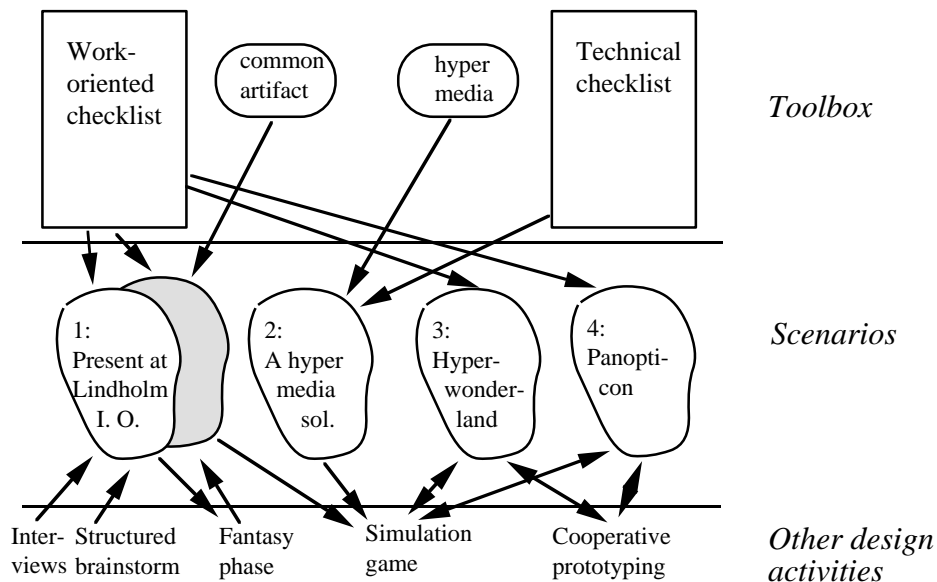


Figure 3. The proposed CSCW design process with scenarios constituting the backbone of design. The toolbox consists of checklists and examples to think from, conceptually (as regards work as well as technology). The scenarios are created and used in such participatory design activities as open-ended interviews, future workshops and cooperative prototyping. Figure 2 outlines scenarios 3 and 4 of the example.

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