

# User Centred Design through the Keyhole: Video Design Cases

Ole Sejer Iversen<sup>1</sup> & Jacob Buur<sup>2</sup>

<sup>1</sup>Department of Computer Science, University of Aarhus,  
DK-8200 Aarhus N, Denmark

<sup>2</sup>Mads Clausen Institute for Product Innovation,  
University of Southern Denmark, DK-6400 Sønderborg, Denmark

sejer@daimi.au.dk, buur@mci.sdu.dk

**Abstract:** This paper develops a design case format capable of engaging design practitioners and design students in reflective dialog about their user centred design practice. The core idea is to present project team experience as an open resource for reflection and learning. By exploring short snippets of video that document design team activities, designers are able to mirror and expand their own design practice. In a sense they learn from viewing a user centred design practice through a keyhole and discussing what they see.

**Keywords:** User centred design, design education, video documentary, design case.

## Introduction

Within the field of HCI and particularly in the tradition of user centred design, shortcomings of conventional design processes are a strong driver for formulating alternative design approaches. In fact, the very notion of user centred design can be seen as a reaction to variants of 'technology push' and 'waterfall development' models. It has now become widely accepted to involve users in the interaction design process and to explore user work practices and future use scenarios, because conventional product development often generates products that match customer needs poorly.

As user centred design becomes an increasingly widespread and recognisable part of industrial product development, it becomes relevant for the design community to reflect upon and develop its own practice. We know from studies of other types of design practice, that the way designers work might very well differ significantly from methods and approaches propagated in the design literature (Bucciarelli 1995). We also know that the ability to

inquire into ones own practice is an essential part of the design competency (Schön 1988).

A professional user centred design practice – as opposed to trial and error application of user centred design methods - requires structured and continuous reflection on the design practice itself (Bødker & Iversen 2002). This particular notion of 'reflection' goes beyond Schön's understanding of reflection-on-action (Schön 1987). It describes the process in which design team members reflect on their own experiences and form their own motivation for *why* user participation is important. We use the term 'off-loop reflection' to address the ability to continuously reflect on where one's design practice is heading. According to Schön, reflection-on-action is triggered by conversation with the design situation (Schön 1987). It is rather more subtle to identify what may motivate off-loop reflection.

Most companies see short courses off the premises and conference participation as a way of developing employee competencies. Indeed such methods are fruitful for practitioners to get inspiration on new ways of working. But these activities do not in themselves secure development of design practice, because they are weakly

anchored in the practitioners' situations and work practices (Bossen 2002). We see off-loop reflection as an opportunity to reify and discuss past experiences, and to establish a firm link to possible future practices. Through experiments with video design cases we want to develop a format that triggers and nurtures off-loop reflection.

The *Video Design Case* seeks to capture design team experience in short documentary video movies. The videos allow other practitioners to watch a user centred design practice 'through the keyhole', and use what they see to trigger reflection on their own design practice and how it might be improved.

The video design case attempts to overcome two major challenges in design training. First, conventional design literature such as conference papers and design books encourage practitioners to understand design methods and theories on a high level of abstraction. Our intention is to use video to bring practitioners as close as possible to the actual design action, and thus to minimize the gap between our material and the practitioners' own practice. We want to stage a front row experience of current design practice as a springboard for off-loop reflection. Second, oral or written accounts of design experience are told in retrospect. In such experience stories told by for instance project managers, coincidences, mistakes and sheer luck are molded to fit a master plan of cause and effect. The unexplainable is explained. The invisible is made visible. Video helps re-establish some of the richness of the actual design activity. As we do not offer any explanations, the participants in the video design case sessions need to make their own observations and interpretations. The video documentary contains the ambiguity and uncertainty that matches practitioners' own practices.

## Video as case material

The quality that has made video popular for ethnographic fieldwork in use-contexts also makes it a good starting point for design inquiry. Not only does video allow us to examine practice 'off-loop', it is also a 'soft' media in which we can manage ambiguity (Minneman 1991) and tentatively grasp points of interest (Buur, Binder & Brandt 2000). Previously we have used video as a reflective medium within the design team with good results in our organisations, and we have developed a card game method for video analysis, which enables a group to work collaboratively with large amounts of video material (Buur & Søndergaard 2000).

At one time the Danfoss User Centred Design group completed a rather successful vision project

that demonstrated a range of innovative techniques for participatory design. The project was extensively registered on video, partly to document user reactions in design workshops, partly to serve as empirical base for the research of two PhD students, who joined the project team. Later, when the immediate research objectives had been met, it appeared to us that it might be possible to edit material from those 100 hours plus of video to involve design colleagues in discussing design practices.

So the question we set out to explore was:

"Can video be applied to transfer design experience from one project team to another in such a way that it supports off-loop reflection and design practice development?"

Our research approach is action research. As stated by Van Beinum (1998) the object of action research is not just to describe or understand social reality. Action research is a process in which the researcher is not solving a problem *for* 'the studied' but with 'the studied' (ibid p.4). Starting from an initial proposition we created material and organized sessions with professional designers in companies. Based on the reactions and experiences from those sessions, we reiterated both material, case introduction, and session programme until we were confident with the success of the intervention. This paper is based on 6 sessions with design practitioners and researchers in Denmark, Sweden, Germany, and the US.

## Case: The Smart Window Project

The project used for the video design case experiments was the Smart Window project: An effort to explore the use of Personal Digital Assistants for operators of large plants like district heating and power plants. The basic idea was to provide the operator on the move with a portable 'window', which would enable him to look into the electronics of the components and interact with them on the spot. The goal of the project was to create a vision for the company to work towards. It was organised by the corporate User Centred Design Group (Buur & Bagger 1999) in collaboration with invited experts and researchers from universities. The team was 8 in total with additional members moving in and out of the project during the 6-month period.

The video material edited for the video design case consists of 15 short sequences of 2 – 3 min duration. They each show highlights from a

particular design team activity, coarsely edited to show both the design artefact(s) in focus and the unfolding process, and with Danish dialogs subtitled in English.

### **Video documentation highlights:**

*Ethnographic field studies:* The project team spent five days observing work practices at a plant. On each day three video teams followed the daily tasks of each their operator. Video was analysed using Interaction Analysis Lab sessions (Jordan & Henderson 1994), (Jordan & Henderson 1995)..

*Scenario design:* The team made extensive use of video recorded work sequences and generated scenarios in close collaboration with users.

*User participation:* Five user workshops served to involve users and a circle of internal stakeholders in the design process. The team also brought video from the field studies back to the users for discussions.

*Designing-in-context:* Play-acting future work scenarios and co-designing with users in their own environment became an important project activity (Binder 1999).

*Interaction style design:* Taking a starting point in the corporate museum and inspiration from fashion design, the team developed three contemporary interaction style directions and explored their design potential (Øritsland & Buur 2000). Mock-ups were presented to users in catwalk fashion.

*Design prototyping:* The team used a range of prototyping materials to express design ideas and to involve users in the design process.

To provide an overview of the video material, a “video roadmap” poster shows how the clips fit on a project timeline (Fig.1). It roughly presents the clips in three groups:

1. User involvement: How the team collaborated with process operators (6 clips),
2. Product functionality: What the product should do for the operators (5 clips), and
3. Interaction style: How the team would like the operators to experience the interaction design (4 clips).

Also, we produced a little leaflet with short factual descriptions of each documented team activity: Who, what, where etc.

The video design case material presented here was assembled to support off-loop reflection on central user centred design issues such as:

- How well do we actually integrate a use perspective in the process of product development?
- How do we balance insights gained from the use context with aesthetics and innovative design thinking?
- How do we handle the inter-disciplinary team collaboration required for user centred design?

The way we ask participants to work with the video is inspired by the Interaction Analysis Lab method, which gathers interdisciplinary groups of people to analyse ethnographic field data (Jordan & Henderson 1994). We briefly demonstrate to the participants that there is a difference between observing and interpreting, and then we ask them to make personal notes and share their observations around the table after each video sequence.

### **Video Design Case Session**

*Introduction:* The organisers briefly present the ‘Smart Window’ design case (the background, design challenge, use context, results) and the design process (the design team, organisational setting, activity plan).

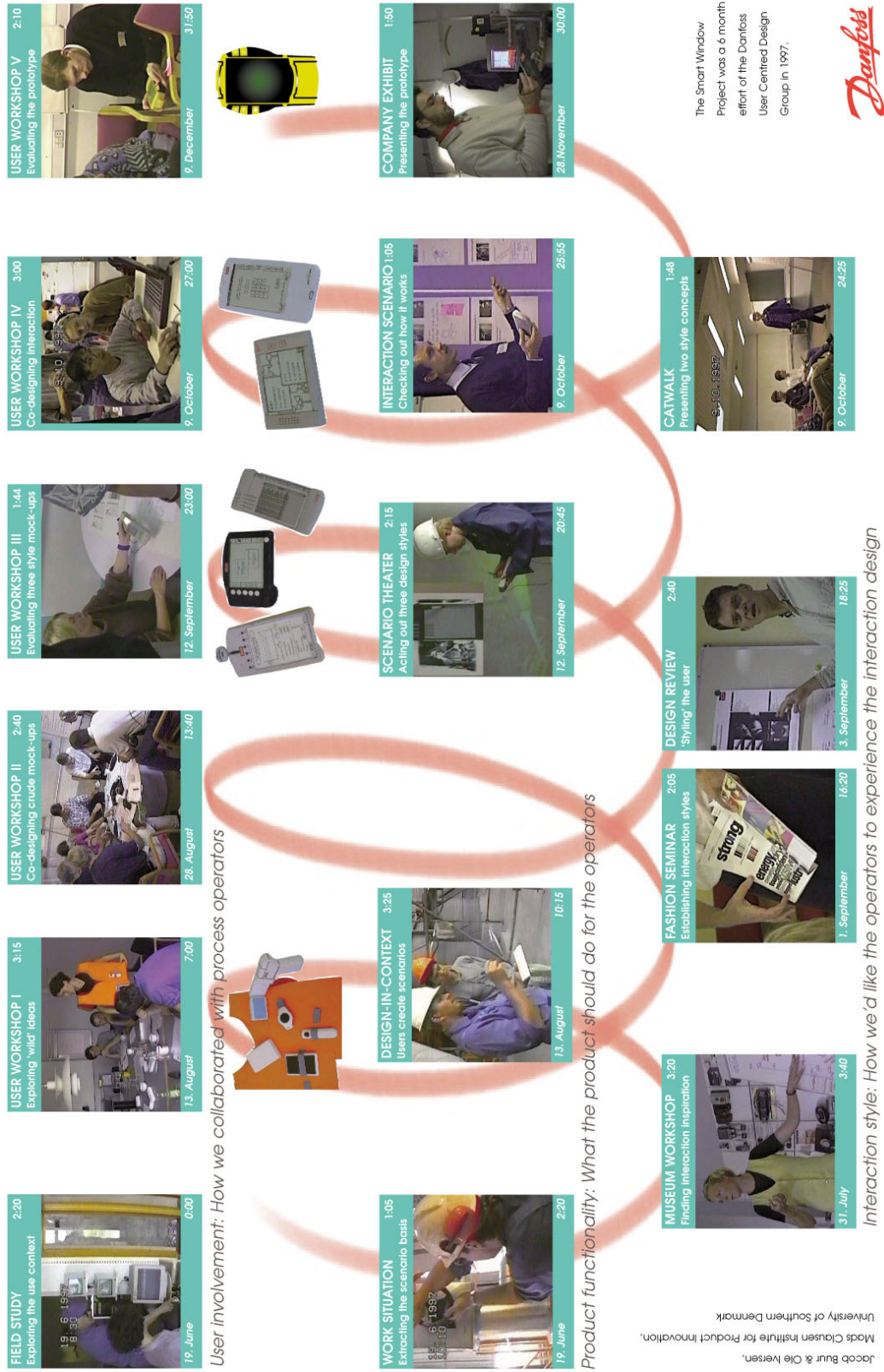
*Group focus:* Participants each state a focus point for inquiry: What would I like to explore? Each group then negotiates a shared focus point by selecting 3-4 video sequences they want to see and by choosing where to start on the video roadmap.

*Group discussions:* The participants watch the video sequences one by one and voice their observations: What is going on? What does this team do, and why? The participants bring in their personal experiences to discuss design understanding, philosophy, and methods: How would we approach a similar design challenge? How will we act in future projects? As a ground rule, the organisers encourage the use of the video material rather than lengthy speculation.

*Plenum presentation:* At the end, each group presents the one video sequence it found most inspiring and briefly reports on its discussion.

# The Smart Window Video Roadmap

15 Video highlights of a user centred design process



**Fig 1.** The video roadmap provides an overview of 15 video documentaries of 2-3 min duration. The three rows describe activities relating to user involvement (upper row), product functionality (middle row), and interaction experience (lower row).

## Outcome of the session experiments

Upon seeing the first short video sequence, participants in the video design case session typically feel frustrated: Is this all? What can we possibly learn? The videos don't have an introduction, plot, and ending like the movies we know from television. They are shot with a documentary camera, they are taken out of a larger context unknown to the participants, and they offer no explanation or clues as to what to look for.

But once participants learn to combine their individual observations before trying to interpret, they are able to construct a rich picture of the event, and they learn to use this to trigger their own experiences and understandings of design practice.

Below we have selected dialogs from two sessions to illustrate a pattern of how we found that the participants relate to the material.

### What the video tells: Observing and identifying

The first dialog stems from a video design case session at a Danish university. The participants are five researchers, who all teach human computer interaction and design.

The researchers have just watched a video sequence titled 'Design-in-Context'. It shows how a plant operator acts out a scenario in his familiar environment. With a simple foam block he imagines how he could carry out a maintenance job with a handheld computer with access to the central control system (Binder 1999). Following the facilitator's instructions, the participants all take personal notes, and then explain one by one what they have seen.

*Researcher 1: This was the user telling about what he does. Wasn't it? I didn't understand whether the block that we kept seeing was an artefact designed for the occasion, or if it was a part of his daily maintenance tools.*

*Researcher 2: As I see it, this was clearly a mock-up.*

*Researcher 3: I thought this was really fun to watch. I couldn't hear what he said, though. But I think imagining something new needs you to take a starting point in concrete artifacts. Some thing to point at. I really think you can learn a lot by visiting the work place, even though you don't understand much of the process.*

*Researcher 2: I really noticed how the mock-up - which in itself really was nothing - very much helped to support creativity in this design process. And clearly there was an element of play there. (...)*

*and the entire atmosphere was very promising for the process.*

*Researcher 4: What I wrote was: Tells about a world I don't understand. What I mean is, if I were the designer, this world would be very strange to me. I would have to make a much greater effort than watching video to acquire the necessary knowledge (...).*

*Researcher 5: I too think that the wooden thing or what it is seems to be a very fruitful design artifact, because it somehow intervenes in his process, so it makes him talk about what he does.*

*Researcher 1: Why is it that the block attracts so much attention? I mean we have all seen it, right?*

Clearly the participants around the table notice different things in the video. By hearing all observations, they piece together a rich picture of what could have happened. As there is nobody to ask for 'facts' they have to make assumptions about what they see to create meaning - "As I see it, this was clearly a mock-up".

They start identifying with the designers on screen - "If I were the designer..." - and they come up with questions that may lead them to an interpretation of the process from which they have seen only a few minutes.

### Could we work like that? Matching and imagining

The second dialog is recorded in a session with a usability group from the research and development department of a mobile phone corporation. Designer 1 is a human computer scientist with a few years of experience, Designer 2 is a newly employed group manager with a PhD in organisational development, and Designer 3 is a young apprentice doing an intern from his HCI course at university.

They have just watched the video sequence 'User Workshop 2', which shows how a design team collaborates with users in a user workshop situated in a meeting facility. In the clip, the design team presents four 'wild' design concepts to trigger user reactions.

Having seen the clip, the designers explain their individual observations around the table much like the researchers did in the previous example, and they try to come to a common understanding of what they have seen. The clip fosters a discussion about how much you can achieve with this form of user collaboration:

*Designer 1: The problem with this kind of workshop with funny mock-ups is that it is hard to move beyond the giggling stage, where everybody thinks: Oh how fun.*



*Designer 3: Right, you get fascinated by all that the technology can do.*

*Designer 2: Yes, generally speaking – how do you motivate people to do what you'd like them to?*

...

*Designer 1: Was this what you expected to see in the 'User Workshop 2: Exploring Four Design Directions'?*

*Designer 2: If it should be organized like this, I don't know. I thought it could happen in many different ways. Like playing with input and output technologies. It is probably difficult to get beyond discussion. Maybe you could get some concrete feedback. But I envisioned playing or playacting scenarios. If you had different ways of using the product, different use situations, then maybe you could ask people to act out the situations.*

*Designer 1: But maybe we're over here, then – Design-in-Context (points to another video clip on the roadmap). They walk around with different mock-ups right there in the environment.*

*Designer 2: Yes, I guess we are. Let's see that one then.:*

In their discussion, the participants make hypothesis about what else the design team on video should do in their design process, and they use the video material to check if they are 'right'. In this case the participants move on to watch the 'Design-in-Context' video with the operator acting out a future maintenance situation in a power plant.

*Designer 2: One could think of other scenarios in our market segment. For instance business people. Then we could say, okay, what kind of situations are they in? It could be the reception in a hotel, in a taxi, or in the airport, and then try to establish this kind of scenarios. Maybe use real business people, people who are used to travelling.*

Later, when the participants have seen a number of sequences, they get into a general discussion about design process.

*Designer 1: The way I understand this process, the Design-in-Context session that we saw is probably one out of many. It is a result of the first what-did-we-find-out talk following the field studies. Isn't that how it goes? Isn't that what we saw the designers' first shot at what the users need?*

*Designer 2: I am not sure. When we talked about it before, we agreed that the user workshop had several ideas about what kind of product it should be. And one of the users fell in love with the notebook-like thing.*

*Designer 1: I guess it doesn't really matter which.*

*Designer 2: Right, it doesn't. The interesting thing is could we do something like that?*

First, the participants start criticising the practice of the design team on screen. Apparently with one particular way of organising a user workshop "... it is hard to move beyond the giggling stage..." and motivate users to engage seriously with the design proposals. And the participants don't stop at criticising, they try to imagine what could be done



**Fig. 2:** Three design practitioners in a company engaged in a Video Design Case session.

differently to overcome the problems they detect: "If you had different ways of using the product, different use situations, then maybe you could ask people to act out ...".

Second, they try to match the products and design situations they see, to the ones they encounter in their own work: "It could be the reception of a hotel...".

Third, they ask themselves if methods like the one they see on video could work for them. They discuss in which ways they should try to expand their work practice, and how they should modify the methods they have seen in use to make them work with their products and organisation.

## Conclusion

Our experiments lead us to conclude that video documentary of designers in action has indeed a huge potential for supporting off-loop reflection on user centred design practice. Even though the camera position sometimes is wrong, the voices unclear, or the action out of focus, the video documentary proved to be a good place to start in our effort to offer front row access to real life design

action. The ambiguity and real life dialogue in the documentary does in itself ensure that practitioners can relate to the video segments. As if seen through a keyhole, participants only watch a very limited portion of the full user centred design process. But this forces them to make assumptions and hypothesis, and to engage their own experiences and understandings of design.

In the video design case sessions, the designers move from discussing observations and interpretations of what they see in the video clips towards discussing general issues of how to organise user collaboration and design processes. And they ask themselves if they could work in ways similar to those shown in the case, what they would change, and how they would go about it.

We believe that video design cases can become a successful supplement to the traditional sources of inspiration for design practitioners. But there are some challenges to overcome:

It requires an effort to create case material as that described here, even if the project video documentation is available. We have produced a second video design case on a different project to verify that it is possible to finish within a week – provided one has a reasonable overview of which video sections would be of interest. In itself this work is rewarding as an introduction (e.g. for newcomers or students) to the existing work practice of an organisation, or as reflection by the ones involved on their own practices.

Unlike written business case stories, this kind of material cannot easily be turned anonymous. Who appears in the videos cannot be disguised, so the issue of getting permissions from designers and users to show their activities to a wider audience needs to be resolved.

The video design case cannot provide a polished image of the design organisation in the way an advertisement video would do. That is the whole point of the exercise. This may be a barrier against video design cases in some types of organisation, e.g. consulting companies that live of their image with customers.

Along with the experiments with design practitioners, we have started work with design students with promising results – although the session format needs to be modified to take into account that students hardly have any design practice to start with.

## Acknowledgements

The video design case described here was based on a project from the authors' work with the

Danfoss User Centred Design Group. We are indebted to colleagues in the group for support and to Danfoss A/S for encouragement to experiment with work practices in actual development projects. In particular we would like to thank Thomas Binder and Trond Are Øritsland for co-organising the first video design case sessions with us.

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