WHAT DO WE KNOW ABOUT PRODUCT USE?
A TECHNIQUE TO SHARE USE-RELATED KNOWLEDGE IN DESIGN TEAMS

Mieke van der Bijl-Brouwer/ Stella Boess/ Christelle Harkema,
University of Twente/ Delft University of Technology/ Eindhoven University of Technology
m.vanderbijl-brouwer@utwente.nl

ABSTRACT
We propose the Envisioning Use workshop technique that enables members of a product development team to share and become aware of knowledge they have and do not have about product use. The technique was developed in an iterative process in which the workshop was executed and evaluated with practicing designers. The technique combines steps in which knowledge is accessed in different ways such as remembering, imagining, experiencing and envisioning product use. The evaluations showed that with this approach a broad spectrum of product use knowledge can be collected in a half-day workshop. The interactive character of the workshop supports sharing knowledge on product use. The workshop should be executed at or before the start of a design project, possibly involving the client. It is applicable to both projects aimed at redesigning an existing product and projects that have a more explorative character.

Keywords: usability, design technique, design teams

INTRODUCTION
To be able to design products that elicit a positive user experience it is often valuable to get information about what users currently experience with related products and can be expected to experience with new ones. Human factors research has advocated for years now to apply user testing (e.g. (Kanis, 1998; Kuniavsky, 2003)) and to prototype experiences (e.g. (Buchenau and Suri, 2000)) to achieve these goals. What is practically undisputed by now is that information about usability and user experience is relevant input for design decision-making. However, there are still many problems in making user and use related information fit well with development processes (e.g. (Cooper, 1999; Cockton and Woolrych, 2002; Norman, 2010)) and even in coming to agreement on what are suitable user information related techniques (e.g. (Gray and Salzman, 1998; Bargas-Avila and Hornbaek, 2011)). Moreover, our recent studies of how designers deal with usability in practice show that this information does not always come directly from end-users (Boess, 2009; van der Bijl - Brouwer and van der Voort, 2009). Practicing designers use knowledge about product use from previous projects or their own personal experiences. They apply this knowledge as a frame of reference in informal techniques such as testing with colleagues, family or themselves. With this informal testing the designer is closer to the testing process. However, their knowledge often remains implicit and is not shared with team members. Sharing knowledge explicitly would help product development teams in setting requirements and creating usable designs (Kuijk, 2010). Therefore we developed the ‘Envisioning Use’ technique that supports creating a shared vision on product use by means of a half-day workshop in which members of a product development team gather information and potential gaps about use in an early design phase. They do this by making their personal knowledge and assumptions about product use explicit in a shared frame of reference. The technique is not intended to replace user testing, but serves as an addition to currently applied usability techniques.

The Envisioning Use technique was developed by three members of the Design for Usability project. In this four year-project, three universities and five companies collaborate in research about design for usability. One of the aims of the project is to develop methods and tools to support designers in
DIVERSITY AND UNITY

dealing with usability in practice. Our Envisioning Use technique was developed iteratively by evaluating each version of the workshop with practicing designers and adjusting the technique accordingly. In this paper we present the final result of these iterations.
The workshop was first proposed in (Van der Bijl-Brouwer and Boess, 2010). In this paper we present two evaluations of the workshop in design practice with a fictive case and two evaluations of the workshop with a real case. Furthermore we present the inclusion of a new step in which team members reflect on the gathered information.

THE ENVISIONING USE WORKSHOP

As mentioned above the Envisioning Use workshop is a technique in which members of a product development team come together and share their knowledge about product use to be able to create a shared vision on this topic. This is done by combining several ‘small’ usability techniques which each access the knowledge in a different way. The basic principles of the workshop are:
• making use of stories and scenarios
• making both facts and assumptions explicit
• structuring the information in a ‘product use mind map’

These principles are discussed in the following section.

The role of stories and scenarios

The workshop uses stories and scenarios. The motivation for this is that the workshop looks at user-product interaction on the level of use situations rather than product details. The rise of digital technology has revealed the need for attention to use situations because of the wealth of new possibilities, but also because of the less direct connection between perceivable qualities of objects and interaction possibilities. For example Erickson (2006) explained that it is important to not “get too fixated on a single aspect of the situation” as a designer orienting to a new challenge. A distinction between story and scenario is adopted, following Erickson (2006) stories are something that actually happened (or could have happened) to a real person or fleshed-out protagonist. Scenarios are something that could happen to an assumed person, and that is being projected on a more or less well-known future situation. In the workshop, the participants are first invited to share stories of actual experiences with the product or service to be (re-) designed, or related products/services of their own or other users (e.g. as seen in user tests). This situates their thinking in actual situations. Later, they devise scenarios and act them out. This orient their thinking towards all the aspects that are part of situations and how they are influencing them.

Making product use knowledge explicit

The use-related information which is made explicit in this workshop provides a possibility for designers to communicate about the aspects of product use. Discussing the information provides a better and shared understanding of product use. This knowledge is essential input for creating a product design that suits the needs of the user.
The product development process is directed by decisions about the design problem and design solution. These decisions are preferably based on information but in some occasions not all information is available while the decision needs to be made to make progress. Making decisions based on assumptions is then the strategy to cope with the lacking information. This is a commonly accepted strategy as long as the assumptions are verified later on in the process. For this reason a distinction is made in the workshop between facts and assumptions about product use. We also included a ‘questioning’ step which makes explicit which assumptions need to be verified.

The product use mind map

Informal usability techniques such as testing yourself or testing with colleagues incur the risk that the testing is not sufficiently contextualized. The importance of this contextualizing is discussed by for example Green and Jordan (Green and Jordan, 2002) who state that designers should have insight in use situations to be able to design products that are pleasurable to use whatever the circumstances. For valid testing of use the test conditions should reflect the expected use situations the product will meet as much as possible. This applies to formal user testing as well. To achieve this goal, a designer needs
Figure 1: an example of how the product use mind map distinguishes information on use situation aspects and use issues.

insight in both the use situations a product will meet and corresponding use issues (van der Bijl - Brouwer and van der Voort, 2009). For example, when designing a compact photo camera, designers need on the one hand to know the circumstances of use, for instance about locations of use, weather conditions, who the user is, what they are trying to do (= use situation aspects). On the other hand they need to know what these circumstances mean for the use of the product, for example whether the screen is readable in bright sunlight, whether the buttons are controllable with gloves on when it is freezing and whether it does not feel slippery when you have sweaty hands from the heat (= use issues). In the product use mind map we therefore distinguish information about use situation aspects and information about use issues by means of using color codes (see figure 1). This division is comparable to claims analysis such as applied in scenario based design (Carroll, 1995) in which ‘situation features’ are connected to possible pros and cons (claims) of that feature. Use situation aspects include user characteristics, goals and context. Use issues are events that happened or could happen in an interaction between a product and a user. They can be identified from own experience of how use situations actually unfolded, or projected by reasoning how given use situation aspects could affect what happens. Use issues can be positive or negative and can concern performance, usability or user experience.

THE ENVISIONING USE TECHNIQUE

In the Envisioning Use workshop, knowledge about product use is gathered in the product use mind map by combining different techniques to access the knowledge (see figure 2). This section describes the different steps of the workshop.

Members of a product development team are invited to participate in the half-day workshop. The participants should have knowledge about product use of previous or related products and/ or have influence on design decisions which influence product use. For example it is good to involve a usability engineer or marketing manager because of their broad knowledge of the user. It is also essential to involve a designer, project leader and/or engineer because they directly influence design decisions. Our experience is that around five is a workable number of participants.

Figure 2: the different steps of the Envisioning Use workshop make knowledge about product use explicit in the product use mind map.

Preparation

The workshop is started off by explaining the goals and the steps of the workshop. Furthermore the division in knowledge on use situations and use issues is explained. Use situations are to be written on pink post-it notes, use issues on yellow post-it notes. Then the basic structure for the product use mind map is set. This is done by hanging up to six flip-chart sheets on a wall. An initial impromptu categorization is created by inviting the participants to define use phases of the product. On each sheet (or most) a use phase is noted as a heading. This initial categorization is of no relevance later in the
workshop, but it is an easy and factual start to filling the sheets. Use phases being noted down might be, for example, installing, preparation, cleaning etc.

**Remembering**
In this step participants are asked to recall stories of product use that they have experienced themselves or have observed with other people, for example in a user test or with friends. The story is first shared verbally with the other participants. Then the main use issue of the story is written on a yellow post-it. If the issue is directly related to a particular aspect of the use situation, this situation aspect is written on a pink post-it. Both notes are then stuck to the related use phase on the flip-chart sheet wall.

**Imagining**
While ‘remembering’ still continues, participants are asked to also imagine other possible use situations of the product and to imagine what issues these situations could cause. When these issues are based on assumptions, they should be written with red marker. Situations and issues based on facts are written with a black marker. The imagination is stimulated by providing the participants with associative materials. These are a broad selection of images of users, use environments or objects that are more or less related to the case at hand. Figure 3 shows a collection of images that was used for the (fictive) case of the presentation microphone. In one workshop we stimulated participants’ imagination by asking them to play possible scenarios with figurines on a ‘map’ of the use environment.

**Structuring**
At this stage of the workshop, the product use mind map tends to get a little chaotic and overwhelming because of the many post-it notes attached to it. Participants are therefore asked to make clusters of notes and to assign names to each cluster (figure 4 and 5). They are free to choose how they want to cluster the notes. Their categorizations can be related to a certain type of issue, for example issues related to the acceptance, or to a certain type of use situation, for example physical user aspects. At this point participants can let go of the division into use phases if they want to. Often notes can be assigned to different clusters. However, the aim of structuring is not to create a perfect categorization, but to facilitate overview and reflection.

**Experiencing**
In the experiencing step, participants define one or two scenarios and role-play the scenario with a mock-up or an existing product (figure 6). The scenarios are written on a large pink card, corresponding in colour with the pink use situation notes. On the cards participants should describe the
characteristics of the user(s), the setting of the scenario and the goal of the user. Then participants should create a simple simulated environment and assign roles. The participants that do not play observe what happens. The issues that occur are written on the yellow use issue-notes by the observers during the role-play and by the actors after the role-play. All notes are organized in the product use mind map.

**Targeting**
The product use mind map now contains a large overview of all use issues and use situations - known to the participants - that influence decision-making on design. However, some prioritization is now needed to be able to select issues that guide solution generation. To achieve this, participants are firstly asked to individually label the three to five most important issues by means of stickers. Secondly, these issues are discussed in the team and translated into a list of starting points for solution generation, which is written on a flip-chart sheet.

**Envisioning**
In the envisioning step, participants are asked to quickly create solutions for the target defined in the previous step. This can be done by means of sketching product ideas or creating mock-ups of product ideas. Another way is to firstly draw the ideal future scenario and then think up product ideas that fit this scenario. Idea generation takes place individually or in pairs. The creators write positive issues of the ideas on blue post-its. Then they present the idea and accompanying issues to the other participants who shortly give their comment on the ideas (figure 7). These comments can lead to more blue post-it notes which describe both positive and negative use issues relating to the ideas. When the use issues relate to specific use situations they are placed near the corresponding pink post-it note on the product use mind map.

**Questioning**
The last activity in the workshop is to indicate the ‘knowledge gaps’ in the product use mind map that is now created. This is done by means of writing questions about the lacking information on green post-it notes and adding them to the product use mind map (figure 8). Questions can concern the confirmation of assumptions, general questions about users or context, questions about technological opportunities and other questions about possible solutions. The questions are then prioritized and grouped with regard to the means to answer the questions, for example which sources should be consulted or which kind of user analysis is needed.

**Wrap up**
In the wrap up, next steps need to be planned to be able to answer the questions defined in questioning.
Furthermore a record should be made of the product use mind map to be able to take it into the design process.

Some steps can be skipped or exchanged, depending on the goal of the case, for example ‘envisioning’ new product ideas might not always be necessary.

**WORKSHOP EVALUATION**
Since one of the aims of our research project is to develop tools and techniques that are valuable for design practice, the Envisioning Use technique was developed in a way similar to user-centered product design. This means that we followed an iterative development process with multiple evaluations in which we involved the end-users of our technique: the design practitioners. This approach was advocated by for example Wixon (2003) who stated that the success of design support depends on the extent by which it fulfills the needs of practitioners.

**OBJECTIVE AND RESEARCH QUESTIONS**
The main objective of the evaluations was to evaluate the usefulness and set up of the technique. Our main research questions were:

- What are the benefits and limitations of the workshop?
- What is the application domain of the workshop?
- How does the workshop fit in the current design process?

**METHOD**
As mentioned above, we followed an iterative development process. The first versions of the workshop were piloted in an academic setting with different groups of experienced designers. These iterations were presented in (Van der Bijl-Brouwer and Boess, 2010). After each pilot the workshop was evaluated and adjusted accordingly. The workshop as presented in this paper was further detailed by means of four evaluations in design practice. The workshop was executed twice with a fictive and twice with a real case. Directly after the workshop, participants were asked to reflect on the technique in a group interview. Participants of the real cases were asked to fill in a questionnaire a month after the workshop to track the results of the workshop in the subsequent design process.

**CASES**
We firstly executed the workshop with a fictive case - the design of a presentation microphone - in two Dutch design studios. The first session was done with nine designers (design studio 1), the second session with six designers (design studio 2). In both cases the aim was to have designers experience the workshop without trying to get a complete product use mind map. The workshop could therefore be executed in one and a half hours. The ‘envisioning’ step was skipped.

The first real case was executed with a company that wanted to explore the adaptation of an existing software product for filing and workflow support to a for them unfamiliar professional market. Since no project team was yet formed, five employees with different backgrounds were involved in the workshop, some of whom had specific knowledge about the new professional market. The initiator of the workshop was the employee who was assigned with the task to explore market opportunities.

In the second real case workshop we applied the technique at a consumer electronics company to the case of a kitchen appliance for a new cultural market. This project was already in the development stage. The workshop participants were the project manager, usability engineer, product designer, product development engineer and marketing manager. The usability engineer had already gathered user insights in the new market and thus had an expert role in the workshop.

**DATA ANALYSIS**
The workshops were recorded on video and the evaluation interviews were recorded on a digital voice recorder. The workshop videos were observed and a description of the steps and most striking events were summarized in a report for each workshop. The audio recordings of the evaluation interviews were transcribed fully. Subsequently relevant sections of the transcripts and workshop reports were identified and assigned to the research questions.
RESULTS

This section answers the research questions through which we evaluated the Envisioning Use technique.

BENEFITS AND LIMITATIONS OF THE WORKSHOP

The main benefits and limitations of the workshop that were discussed in the evaluations concern the wide variety of use issues that is captured in a relatively short time, the benefits of doing the workshop together and the difficulties of working with the proposed structure in the product use mind map.

Broadness of use issues

The main benefit of the workshop according to the participants of the design studios is that the structure and interactive character of the workshop provide an efficient means to get insight into the breadth of use situations and issues that play a role in the design of a certain product. Participant (design studio 1): “Just within an hour, you get an amazing amount of output, which is really helpful”. This is particularly valuable in a predevelopment stage of a design process. In the last workshop, which considered a project that was further in the development process, participants indicated that the use issues themselves were not new to them, but it was valuable to make them explicit in the product use mind map. However, a surprising result of this last workshop was that the project leader indicated that this overview made him feel uncomfortable: “I don’t feel happy with it but I don’t know why. That is what I think good, that it is put on the table [...], but we still have to conclude on the questions [...]. There are only more questions, that is good, but what is next. That is what I miss in the process.” The workshop made explicit that there were still many issues that were uncertain, but the project was already in a stage that it would be impossible to take away this uncertainty.

Sharing knowledge about product use

All participants mentioned that it was very good to do such a workshop together and share knowledge in a group. Participant (design studio 1): “As a group you a get a lot more [...], like everybody has this knowledge and it’s just a good way to step back and see opportunities and create new ideas with actually a lot of things you already know” The interactive character of the workshop supports creating a shared vision on issues that are important in the design process. As one participant of the software case indicated: “We’ve been working for a while on doing researches and you build information on that and we talk for a couple of hours every week, but here, you do it as a group. Imagine, you would do it with ten people, then, in the end you would probably have the idea of this is what we are going to make, this is what we are going to solve, these are the problems that we are dealing with.” Doing the workshop together also keeps project team members more dedicated to usability in the design process. One participant of design studio 2 mentioned: “by experiencing this workshop, you can achieve that everyone who is working on the project stays dedicated and motivated.”

Structure of the product use mind map

Although all participants appreciated the general structure of the workshop, a limitation of the set up of the product use mind map is that the division in use issues and use situations was not always clear to participants. In the first sessions the division itself was found difficult to deal with in the workshop, but this improved after a clearer explanation of the terms in the later workshops. However, the actual goal of distinguishing these types of information remained unclear to some of the participants. The idea of the division is that use issues always relate to a certain design solution while use situations do not change with a design. Therefore an overview of potential use situation aspects can serve as a frame of reference of use for the design process, for example by setting the test conditions for future user tests. Moreover, thinking in use situations could make participants reason ‘away from the product’ and more towards use. These goals should be more clearly explained.

APPLICATION DOMAIN

The main issues that were discussed with regard to the application domain of the Envisioning Use technique concerned the design phase, the
involvement of a client and the familiarity of participants with the design problem.

**Design phase**

All participants indicated that the workshop is particularly valuable at the start of the project. Participant (design studio 1): “usually you get a project brief from a client when you start a project and i think this could be really something to really at the first stage to familiarize yourself with the project and [...] asking questions like, does it have to be like this, or, is this the actual problem [...]”

Researcher: “would that be also about defining the brief? “ Designer: “yeah”

The project of the last case was already a couple of months in development and participants indicated that it would have been much more valuable to do the workshop at the start of the project.

**Involving the client**

Participants of the design studios were interested in executing the workshop together with the client of a project. On the one hand the client can bring in his or her knowledge on product use. On the other hand the workshop can make the client more aware of the importance of usability. One participants of design studio 2 indicated: “you could do it with the client, because now sometimes we fail in creating a shared vision with the client. “

**Familiarity with the design problem**

Participants of the design studios who worked on the fictive case indicated that it might be difficult to apply the workshop to a case that you are not familiar with: (Participant, design studio 1) “well, there was one thing that I was thinking about, in terms of experience with the product, because, we just had this workshop with a product that at least a number of us might have used before, but I can imagine it’s very different for products that you actually use all of us and products we never use. For example if we’re doing rescue tools for fire men. None of us has ever been near such a product in our lives.”

However, in both real cases that we worked with, at least some of the participants were not familiar with the target market (both cases) or the design concept (software case). The participants of those workshops did not indicate that the workshop was not appropriate for these cases. We observed in those workshops that a lot of information about those unfamiliar topics was shared between the ‘experts’ and the other participants. This was also confirmed by one of the participants of the software case: “...and i am not part of the project, so i don’t know anything about [certain issue of the target market], but by brainstorming I get the feeling that within four hours I do have an image of what plays a role there. So, according to me, it includes a very good knowledge transfer.”

This shows that the workshop is very well applicable to unfamiliar cases as long as there is at least one ‘expert’ on the topic involved in the workshop.

**RELATION TO THEIR CURRENT DESIGN PROCESS**

One of the aims of the Envisioning Use technique is that it results in a shared frame of reference on product use that can be applied in later stages of the design process. The only tangible result of the workshop is a wall with flip-chart sheets with many post-it notes on it. Since we did not evaluate the workshop yet on a complete design process in practice, we asked participants how they would take the results into their design process.

At both design studios, participants suggested to prioritize and summarize the data into key points for communication. We explicitly included this step in the workshops for the real cases (see ‘targeting’ in the technique description). For communication of the results participants suggested to visualize those key issues in for example a PowerPoint, illustrated by pictures of the role-play and quotes.

According to a participant of design studio 1, the data could furthermore be used to set the question list for use evaluations in later stages of the project. “well, i can imagine that when you’re further developing the design that you test it, [...] and that with this kind of feedback and going back and looking at it in a different way you can yeah, improve. Researcher: so, would you use this then as a frame of reference in your, in this testing [...]. Designer: it helps making a question list for it”
The project leader of real case 2 indicated that the results could be used as input for the FMEA analysis they routinely conduct.

Although the participants of the last workshop clearly indicated that the workshop was executed too late in the design process, participants of the first workshop indicated that it might be useful to repeat the workshop in a later design stage: “...and I would say it would be perfect to use it, not only at an early stage, but every time that you start, that you have something. Now, this is our starting point,[...] let’s do the full cycle again. With this early version of our design.”

DISCUSSION

COMPARISON TO OTHER USABILITY TECHNIQUES

We have seen that the Envisioning Use technique has benefits, according to the participants. As we have iteratively simplified the technique so that it is possible for participants to grasp it within the timeframe of one afternoon, we have also come to reflections on the broader benefit of the technique in relation to the various or sets of techniques that have been proposed (e.g. in the Ideo Methods cards (IDEO, 2003)). We have explicitly situated the workshop in the development process and have tested it there, and we collected data on its fit in the development process. The findings, such as that it connects well with the beginning of development, can be used to provide structured guidance and examples for development teams on when and how to use the techniques and how this connects in with their process. With this we hope to be able to take the valuable practical contributions such as experience prototyping as described by Buchenau and Fulton-Suri (2000), and provide practical connections for them with the development process.

By taking the situation of decision-making in the development process as a starting-point for our efforts, we have come to a different set of insights, it seems, than most usability-oriented work. Hornbæk (2010) pointed to a number of dogmas that have been holding those concerned with usability back from connecting better with the development process. They are, for example, that there is too little emphasis on the next step from the identification of usability problems, that the counting of usability problems is the best measure of a method, and that usability assessment and development are separate activities. The Envisioning Use technique is a new departure from those dogmas. Its assumed place is within the development process. It does not, however, try to solve the problem of how to integrate use related information in development. Rather, the technique facilitates that the teams themselves present this information within the team in a palatable format and through their own activities. This enables them to realise which challenges they have to address. We have now completed an initial assessment that lets us conclude that the format is practically workable for development teams. From their feedback, we have initial indications that the workshop supports them in deciding on steps to take to address the identified use-related information. We have yet to evaluate whether the technique is effective in actually influencing participants’ decisions and activities in the following.

One of the means through which the workshop can influence the continuation of the design process is developing the created product use mind map into a frame of reference of use that can be applied throughout the design process. Several structured frames of references have been developed. For example Lim and Sato (2006) propose a Design Information Framework which structures multiple aspects of use situations and Beyer and Holzblatt (1998) developed five types of consolidated work models which show the common structure in the work different people do. While these formal frames of reference of use situations are aimed at giving a complete and structured overview of use, our product use mind map concerns a more informal frame of reference which supports informal reflection. Scenarios might be a valuable format to communicate this frame of reference. We did not include scenario writing in the workshop, because its creation process is relatively slow compared to the post-it approach and is difficult to do in teams. However, scenarios have proved to be very successful for communication purposes (Carroll, 2000) and the results of the workshop could quite conceivably be translated into scenarios for
DIVERSITY AND UNITY

communication. Participants of the first case for example proposed to generate a scenario storyboard with explicitly added use issues, based on the created product use mind map.

Further research will explore if it is possible to apply our informal frame of reference to formal user testing which includes more test persons and better representations of the user and context. For example in user testing the use situation aspects can help to define the test conditions. Furthermore insights that are gathered during the design process from user analysis or field observations should be used to further complete the product use mind map. The usability engineer of the last case planned to add the mind map data to a use scenario description of gathered user data (so the other way around).

**Figure 9. In stories participants reason from use issues to use situation aspects, in scenarios they reason the other way around.**

**COMBINING STORIES AND SCENARIOS**

Although the goal of the division in use situations and use issues was not clear to all participants, going back and forth between use situation aspects and use issues worked remarkably well. These relations between use issues and situation aspects and the different steps are shown in figure 9. In the remembering phase the stories of the participants usually start with a certain experience, a certain issue of use. From these use issues they reason back to the use situation aspects that played a role in this experience. Subsequently in the imagining phase, both the assembled use situation aspects and the inspiration cards support participants in associating to scenario’s (possible use situations) that would result in corresponding use issues. Likewise, experiencing results in stories that lead to use situation aspects, and envisioning is based on use situation aspects (combined in scenario’s) that lead to use issues. In this way associating between the different sources supports revealing the issues. Moreover retrieving the stories was not restricted to the remembering phase. Both the inspiration cards and the role-play triggered new memories. While each perspective on use stimulated participants to come up with stories and scenarios, the combination of perspectives was a particularly strong stimulant to really question and investigate use.

**SHARING KNOWLEDGE ON PRODUCT USE**

All participants acknowledged that the workshop made it possible to create an overview of the knowledge and knowledge gaps about product use within just a few hours. The workshop stimulates the sharing of knowledge and assumptions about product use and facilitates discussion of these aspects. These activities contribute to a shared understanding of the relevant use related information. This sequence of building understanding can be seen as the main benefit of this workshop compared to other communication and sharing techniques. For example, brainstorming is a technique that can create large amounts of data and information about use situations and issues in a short time but does not do this in a structured way, nor does it provide a shared understanding of product use. Other available techniques to communicate and share knowledge are for example knowledge management systems. These systems provide the possibility to collect, share and search the company information and knowledge. However, these systems have often been found to be unwieldy to build and maintain, and have problems with member motivation. Not many usability techniques provide the step to creating shared knowledge and understanding from research insights. This workshop gives an opportunity to usability experts who have perhaps already identified usability issues through in-depth analysis, to then facilitate co-ownership of the already identified issues in the development team.

The workshop aims to create a shared vision about product use by means of an overview of all the knowledge and knowledge gaps. Participants commented that such an overview can never be
complete, because there are always things that you
don’t know. In the last workshop it was also
mentioned that “the unknown unknowns are always
a risk”. These unknown unknowns are unforeseen
issues (Wideman, 1992). It is not the focus of this
workshop to reveal the unknown unknowns, but the
fact that it was mentioned by one of the participants
suggests that they became more aware of them.

What to make of the team leader’s discomfort in real
case 2? A first general explanation could be that
many questions were generated that showed how
much information was lacking. But as this case was
performed later in the process most of the questions
were already identified by the team members.
Discussing the questions during the workshop made
evident that the most important question was not
about detail design solutions (e.g. dimensions of
certain product parts), but it was whether the
general concept was the right one for the intended
text. Questioning the basic design problem when
the product is already at the development stage
would have large consequences. While this was
primarily an indication for us that techniques like
this should be positioned early in a process, “in pre-
development” as the team leader said, it is also an
indication that the workshop can touch the core of
the design concept at hand. The technique invites
reflection: what is the real problem we want to
solve, and are we doing so?

APPLICATION OF THE WORKSHOP
Having applied the Envisioning Use technique in two
very different real development situations, we can
draw initial conclusions on its applicability in them.
Real case 1 was an early stage (pre-development)
software/service design process for a professional
use context. Real case 2 was already in the
development stage, with substantial user insights
already collected, and concerned a consumer
domestic appliance for an unfamiliar cultural
context. So the cases were very different.
In case 1, the use situations and issues the
participants identified were on a higher level of
abstraction than in case 2. For example, in case 1
the participants’ scenarios contained the persons
involved and the various locations they move
through, as well as the future software/service as an
orange box that was not specified any further than
this. By contrast, in case 2 the participants discussed
at length the implications of the identified use issues
for design decisions they had already taken, such as
a particular way that the physical product could be
activated and monitored at different moments of
one specific use situation. It is difficult at present to
separate whether the differences should be
attributed to the development stage or the type of
product being designed. We can conclude from their
feedback that the technique provided connections
for both development teams into their further
process. The team leader’s discomfort in case 2 is an
indication that teams would benefit from working
with the technique from the start. Early insights
from applying the technique in a complete design
process in design education (Van der Bijl - Brouwer,
2011) indicate that the technique could be useful at
several moments in the development process, after
it has been introduced at the beginning. There, the
design students actually used it on their own
initiative to adjust their process several times.

CONCLUSIONS
In this paper we presented the Envisioning Use
technique, a half-day workshop in which members of
a design team gather knowledge on product use by
combining different techniques. The gathered
information on use situations and use issues is
brought together in a ‘product use mind map’. Our
evaluations in design practice with both fictive and
real cases have shown that the technique is
successful in creating a shared vision on product use.
It is applicable to both projects aimed at redesigning
an existing product and projects that have a more
explorative character.
The aimed connection of the workshop to the design
process is best met when the workshop is first
executed at the start of the design process. The
applicability of the workshop results in later stages
needs to be evaluated in future research. We made a
first step in this direction by applying the workshop
in a student project.
To promote the application of our workshop in
practice we furthermore plan to create a workshop
manual that allows companies to organize their own
Envisioning Use workshops.
ACKNOWLEDGEMENTS
The authors gratefully acknowledge the support of the Innovation-Oriented Research Programme ‘Integral Product Creation and Realization (IOP IPCR)’ of the Netherlands Ministry of Economic Affairs, Agriculture and Innovation. Furthermore we would like to thank all participants of the workshops for their enthusiasm and valuable feedback.

REFERENCES


Cooper, A. (1999). The inmates are running the asylum: why high-tech products drive us crazy and how to restore the sanity: Indianapolis: Sams.


