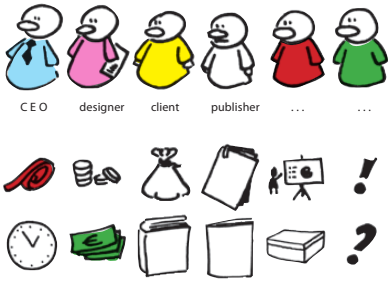
The toolkit to sensitize and prepare participants for the workshop



There are many questions as to how we can succeed in designing as a part of doing research, or conducting what we call 'design research'. In an afternoon workshop, we explored best practices and the ingredients for success in this area. The keynote speakers and 40 invited experts from a variety of fields participated in this workshop (see pages 50 and 51 for a list of the partipants). They included R&D managers from multinational corporations, designers from specialized and general design consultancies, academics from universities and polytechnics, and policy makers at national and EU level. They shared their experiences and keys to success with respect to design research in the broadest sense.

Approach

About a week before the workshop, each participant received a 'toolkit', designed to sensitize and prepare the participants for the workshop. Here we drew from recently developed design research methods by using a 'sensitizing tool' from Contextmapping (Sleeswijk Visser et al, 2005). Each toolkit contained three mini-poster exercises to stimulate the participants to reflect on, and to express, their experiences with respect to design research. There were also two 'project description forms', inviting participants to prepare an example case to bring to the table. Each of these exercises came with a mini poster background, and a set of triggering words and images designed to get the participants going (see illustration on the opposite page). The exercises addressed the three workshop topics: 'preserving insights', 'acceptance and support', and 'spreading the word'. Participants were asked to complete at least one mini poster and one project description form, preferably the ones for the topics about which they had the most interesting things to say. They brought the completed mini posters and forms to the workshop, where they were used as visual position statements and for reference later in preparing these proceedings.

The afternoon session split the 40 participants into three groups, each group focusing (initially) on one of the three topics mentioned above. The groups were free to modify and interpret the topic. Each group ended up addressing all three topics, and discussing the different views on design research in general. During the workshops, the participants tried to create and clarify a shared understanding of the topics. They shared and discussed cases that exemplified the 'growth of knowledge'. The afternoon ended with a plenary session, consisting of short summarizing presentations from each of the groups. During the group meetings and the plenary sessions, notes were recorded. These notes, and the recordings of the final presentations, served as the information pool from which we drew the themes outlined below.

6.2 Results

Participants of the Blue workshop group

Interpreting the data from these workshops resulted in six themes, stated as questions:

1. What do we mean by 'knowledge'?
2. For what and whom do we preserve this knowledge?
3. How do we keep this knowledge alive?
4. How do we preserve it?
5. Who do we need to convince, to be allowed to do designing as a form of research, and how do we convince them?
6. How can we close the gap between designing and classical forms of research?

Each theme is discussed below, using citations that express the various views of the participants to deepen the topic.

1. What do we mean by 'knowledge'? Or, what is this generalizable knowledge that goes beyond the designed product?

Three case examples explained various ways in which design research generated knowledge that went beyond the designed product, i.e., knowledge that was used by the company for other purposes. One company broadened its knowledge base, a second changed its design approach based on the research, and a third company actively used knowledge gained in an earlier project for a very different application.

In the first case, a group of students developed an innovative concept design for welding equipment. For the company involved in this project, the new concept design provided a spark for exploring new knowledge domains, such as marketing and production. The designed product functioned as a trigger for exploring new knowledge. In the second case, the knowledge obtained from the designed product led to a new approach to product development. It is widely known that the Short Message Service (SMS) application was not originally designed for consumers. Consumers themselves discovered that this application was valuable for them. Nokia used the knowledge that they obtained from the SMS case as the basis for setting up a platform for mobile phones, which is more suitable for participatory product development.

In the third case, knowledge gained in an exploratory project at Philips Research on enhancing the waking up experience, by for instance projecting images and messages onto the ceiling, are now used in products for medical examination rooms. The Philips Ambient Experience Design uses projection - as well as a number of other technologies - to customize the immediate environment in healthcare facilities for people who have to undergo examinations such as CT or MR scans. In all three examples, the participants found knowledge that goes beyond the designed product by engaging in - and reflecting on - their design activities, either on a content level, e.g., knowledge

A beautiful book can stimulate to spread the knowledge of the project

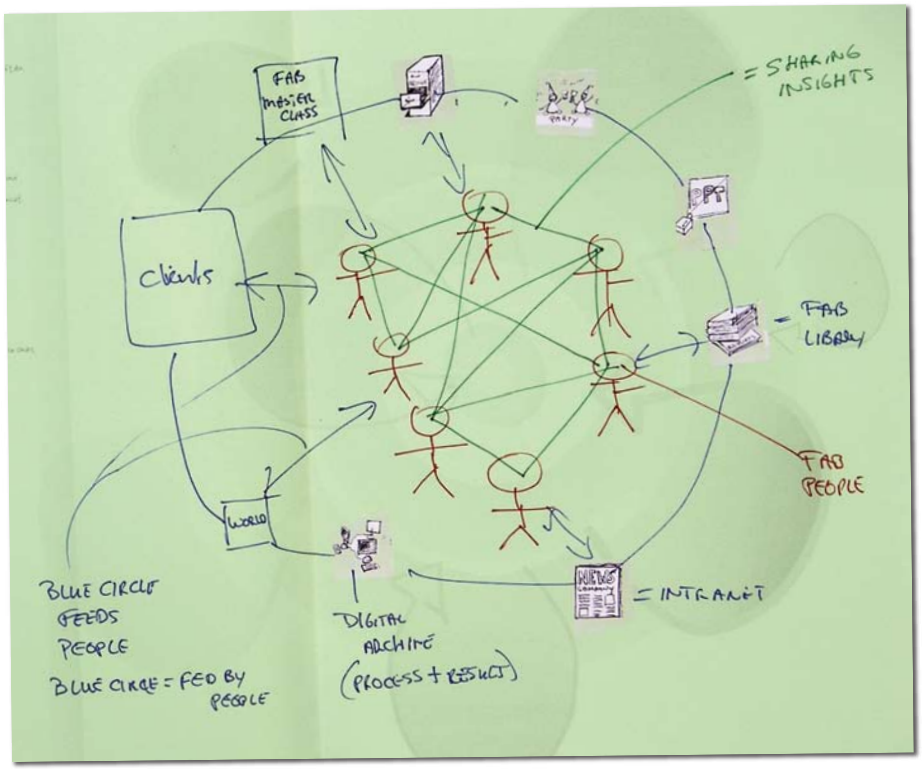
about marketing or user psychology, or on a process level e.g., knowledge about a participatory approach to product development. Most workshop participants were familiar with preserving these two types of knowledge. Preserving knowledge seems to be an obvious thing to do. But what do we preserve this knowledge for, and who will retrieve it?

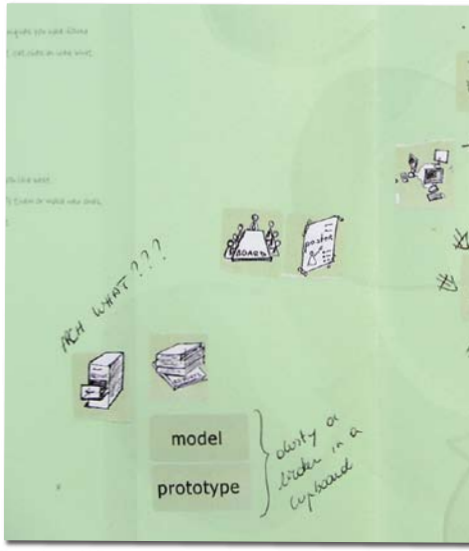
2. For what and whom do we preserve the knowledge?

Several participants mentioned that preserving knowledge is not only about keeping the knowledge, but also about the act or habit of preserving. "A lot has to do with the culture of preserving, the rigour of storage, keeping it somehow." (Henri Achten) This is particularly true for designers as they "..tend to be archive makers" (anon). But is it really necessary "to make knowledge explicit to preserve it?" (Elmo Diederiks) It appears that preserving knowledge is about preserving a broad set of memories, rather than about preserving specific facts. When the knowledge surfaces at some point in the future, its value is often in things which would not have been explicitly identified at the time of storing it. "Looking through things again, makes you remember things that you have often forgotten." (Gillian Crampton Smith)
For example: in one case that was brought forward, a designer used preserved documents to create an overview of her design work. This helped her to reflect on how the quality of her work had developed over time. In another case, a team had produced a beautiful book (see illustration above), containing results and insights of a design project. The book stimulated the designers and the clients involved in the project to 'show - and - tell' about it. Having such a document to refer to helps designers to draw new knowledge from the project time and time again.

In short, as designers, we tend to preserve knowledge both because it is in our nature to preserve things, and because we need preserved knowledge – for instance captured in artifacts – to recall the knowledge that we have obtained. The principal issue is that the preserved artifacts only stir up memories to people who were involved in the project. This means that the knowledge is in the people rather than in the artifact and the memories are typically not about detailed facts, but about the wider experience during designing.

This raises the question: how can we preserve people?, and especially, because people "float in and out of projects all the time" (Gillian Crampton Smith), how can we preserve people's knowledge?
Yet perhaps the actual question is, how can we make the preserved knowledge accessible for other people in the organization as well? Or alternatively, how do we keep the knowledge alive in our organization? To achieve this, many of the participants had explored methods of sharing, transferring and/or communicating the knowledge.





Left: The importance of a coffee machine in larger organisations
Above: A small organisation: What's the problem?

3. How do we keep knowledge alive? Or, how do we share, transfer, and communicate knowledge?

The participants discussed how knowledge can be communicated, in order to keep it alive in the organization. It was soon understood that communicating knowledge in a small company is rather different from communicating knowledge in a large company. A designer from a large company stated that, "the need and the way of preserving is complex when a company is big" (Tanya van Rompuy). In contrast, a design consultant from a small design agency expressed his surprise that this was a topic at all. This difference between communication of design knowledge in large and small companies was apparent in the mini posters that were created by the participants of the workshop, see illustrations above). Whereas smaller companies hardly encounter any problems, large companies struggle with issues such as 'knowledge management':

[S]: "We use 'shoeboxes', both digitally and physically. Prototypes and drawings, they stay alive. When somebody asks us, we just open the shoebox and everything, its entire history comes back. So what's the problem?" (Pim Jonkman)

[L1]: "Well, we have a design studio consisting of 200 people." (Paul Gardien)

[L2]: "The problem is also about storage." (Tanya van Rompuy) [..]

[L3]: "You know what your project was about. Within Philips you are the only one. It is impossible for others to know everything about all the other projects." (Elmo Diederiks)

The latter issue of 'knowledge awareness' in the company turned out to be troublesome for many large companies, as illustrated by the quote: "If only HP knew what HP knows." (anon) In large companies, often web-based databases are maintained to facilitate the storage, retrieval and exchange of information and knowledge. "Although technology can facilitate, it can't replace actual face-to-face meetings." (anon) Participants also mentioned that "there is a distinction between formal and informal knowledge"

Participants of the Blue workshop group

(Aukje Thomassen), and formal and informal communication of knowledge. Yet both, formal and informal, are needed: "You have to experience things in order to understand them… It's a sort of gut feeling. On the other hand, you need more formal knowledge, in order to transfer your ideas to the stakeholders involved." (Elmo Diederiks)

"The coffee machine is a good way of passing knowledge through to other units. In informal chats, you are really sure that they pick it up. At P&G, we try to start from the user. We often make one-pagers with visuals and we force people to make one-month learning reports, which people can react to if you have done something interesting. Furthermore, all projects can be found in the internal database, but you only retrieve information from the searchable databases." (Tanya van Rompuy)

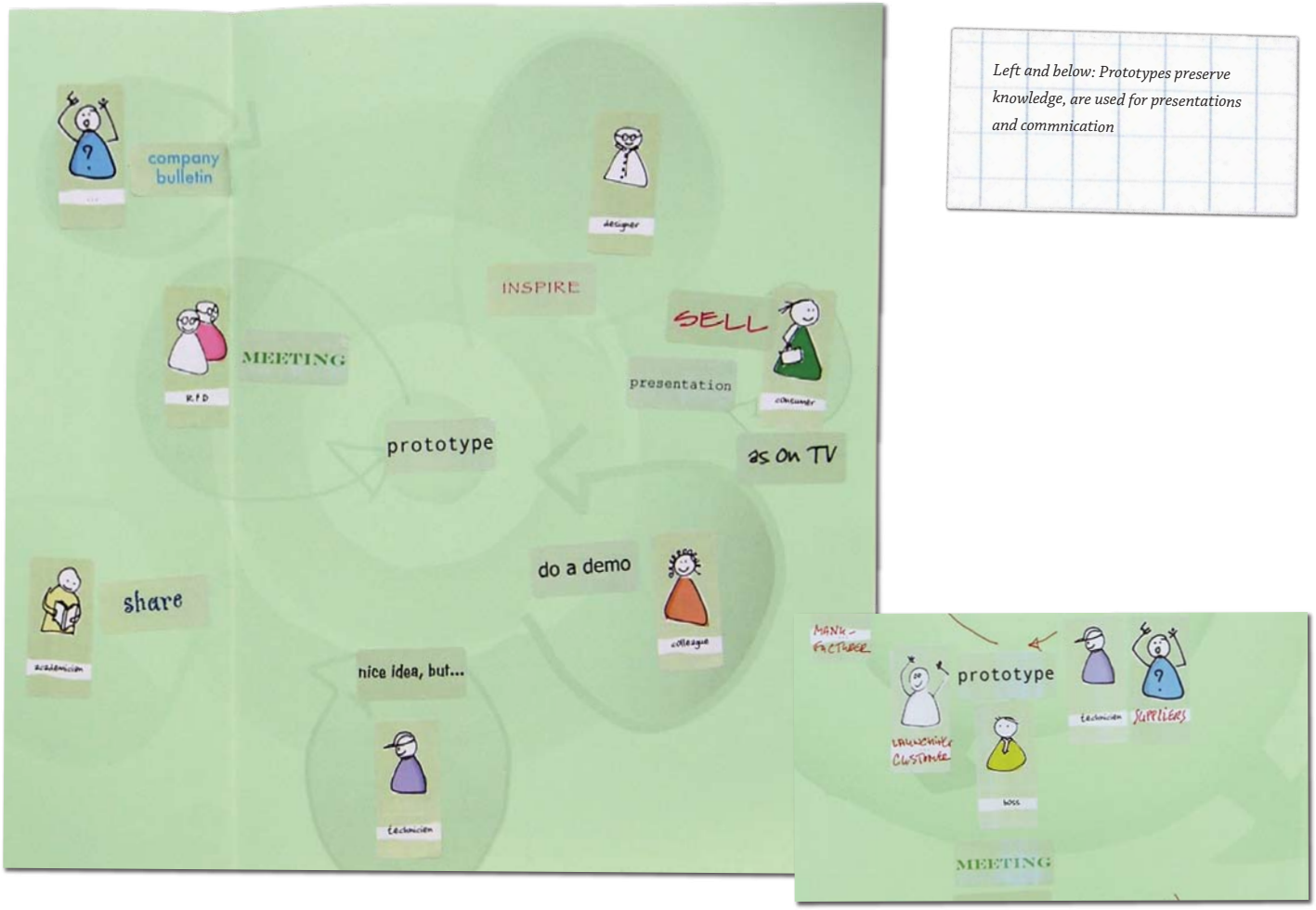
People often have a personal preference for particular forms of knowledge and particular means of communicating knowledge. In order to keep the knowledge alive in your organization, "the knowledge has to speak to you" (anon), and to your colleagues. So "how do we preserve knowledge?" (Stefan Wensveen) A second related question that came up is: "What to keep, and what to throw away?" (Marcel Vroom)

4. How to preserve knowledge?

Although everybody recognizes the problem, there is no single answer to the question of how to preserve knowledge. Still, two issues were identified in the workshop that should be considered when preserving knowledge: (1) the medium for preserving the knowledge, and (2) the desired level of ambiguity. Several interesting ideas about preserving knowledge and insights were presented: "It should be inspirational on the one hand, and re-usable on the other hand." (anon) "Keep the trash." (Pim Jonkman) "You should have something short, visual and physical. This allows you to go with big steps through the process. Just shove it into a box." (Pim Jonkman)

A common remark was that knowledge is, and should be, preserved in layers, allowing both for an initial overview and the subsequent gradual uncovering of detail. One attendee illustrated this remark with a story about an Italian designer, who archived his projects in small physical boxes. These boxes assisted in the process of gradually uncovering the different levels of detail of a past project. Similarly, short, visual and factual information sheets, such as infographics, could be used as a means to structure information and select relevant knowledge.

A few examples of preserving knowledge were shared in which different media were combined to improve the accessibility of knowledge. For instance, Ianus Keller used different media, such as packaging, stickers and a DVD, in his Ph.D. thesis to "minimize the bookness of the book" (Ianus Keller), and to seduce its recipients to start reading it. These examples led to the question of "whether the medium is the most determining



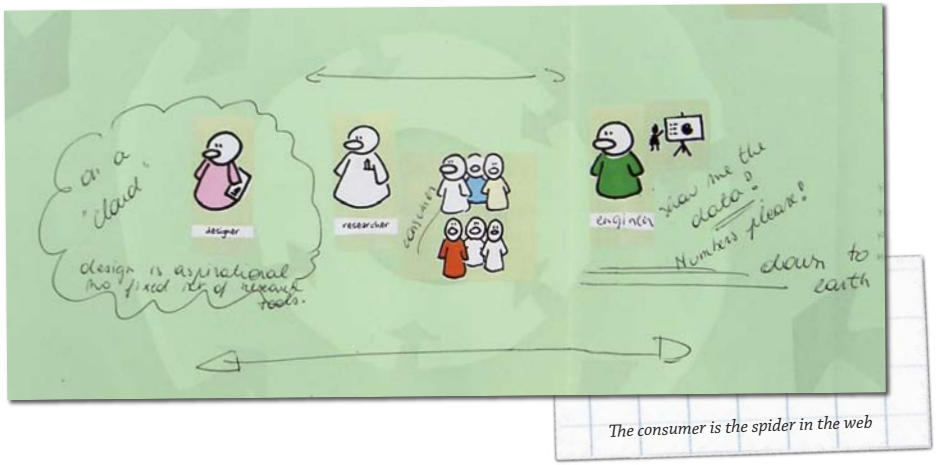
Left and below: Prototypes preserve knowledge, are used for presentations and commnication

factor" (Phil Tabor) in preserving and communicating knowledge.

A recurring medium for preserving knowledge was the prototype. This medium was often used for preserving knowledge, simply because "prototypes are the only physical items that remain after a project has ended" (anon)."Documents and PDFs dissipate, but prototypes and self-running demos remain." (Jim Hennessey) "Prototypes are very powerful." (Paul Gardien)

Next to preserving knowledge, prototypes are also used for presentation and for communication, as was visualized by two attendees in illustrations above. The following case was brought forward in which prototypes were used for preserving knowledge: "I have worked on dish washing detergent, which was difficult because of its compounds and viscosity and such. We have developed prototypes of the dispenser, but when they were finished, the development team said that they had changed the format. So the prototypes were not used, and people wanted to throw them away various times over the years. I was opposed to that, merely because they had been very expensive. Years went by, and then we moved to another building six months ago. All of a sudden I saw my prototypes displayed in our office. Somebody put them there because he thought they were rather nice. I immediately thought: who started the project again?" (Tanya van Rompuy)

Tanya Van Rompuy also mentioned how the re-installing of the prototypes in the office did not just function as decoration, they also re-activated the knowledge they carried. People started



The consumer is the spider in the web

to ask about the thoughts behind the solution embodied by the prototypes. Through their physicality, prototypes remain 'in the way', occupying a physical space, unlike formal documents, which are easily stowed away in a locked cabinet in a storage room, and unlike digital documents on a computer, which can remain totally silent, hidden somewhere on a hard disk under a cryptic name.

By their nature, prototypes do not make implicit knowledge explicit. "Prototypes go through many iterations, and it is difficult to link them to what they were intended to be." (Tanya van Rompuy) As a consequence, "resurrection leads to an interpretation of its own" (anon). Some people consider this to be a loss of knowledge (of the original decisions and considerations): "In a Philips project, there was a lot of knowledge and visions behind the project, but the prototype was the only thing that remained. And now it seems that the project is reduced to only that prototype." (Paul Gardien)

Others think the ambiguity of preserved knowledge is desirable as it allows for new connections to be made: "I interpreted my own work differently every time I had a look at it." (Pim Jonkman) Another attendee claimed that ambiguity, 'unfinishedness' is an indispensable quality of prototypes, because "you need room for interpretation if you want stakeholders on board" (Elmo Diederiks). This leads us to the topic of 'Acceptance and Support'.

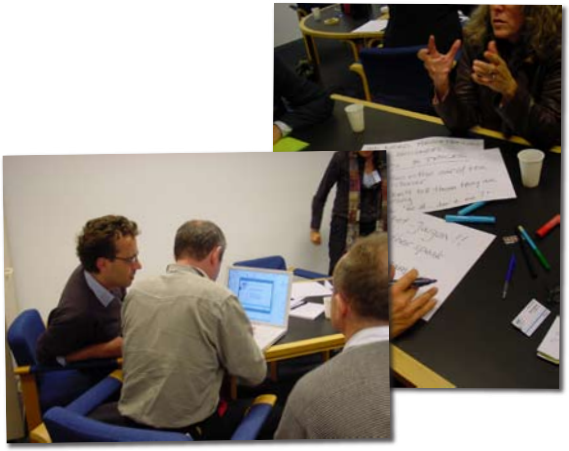
5. Who needs to be convinced that designing is a worthwhile approach to research, and how do we convince them?

Many people agreed that senior management are the first people that need to be convinced of a design research approach. "Without management support, you do not stand a chance." (anon) Then other stakeholders and/or shareholders can be convinced. "You should get the manager in your group." (Arthur Eger). But how do we convince them? And what factors will convince them, and how can these factors be conveyed?

Starting with the latter question, good communication skills were found to be essential in being convincing.
One attendee told the group about his recent experiences with media training. In this training he was taught to stay on the message, and to formulate three key points, which were then to be constantly repeated in order to get the message across. The group agreed: "Designers need media training!" (anon) In addition, several people mentioned that it is important to speak the language of the people that you have to convince.
In some cases, this means that you have to "give numbers" (anon) in order to get credibility, even if you yourself don't 'think numbers'. Another approach that was suggested was to "find a common ground" (anon). "Something in common brings everybody on board: 'end user' is often the magic word when talking to different disciplines" (Elmo Diederiks), because "everybody approaches the matter through the user's eyes to begin with" (anon). One attendee visualized the consumer as "the spider in the web", which means that the people involved in the design process are interconnected by the consumer (see illustration above).

To summarize: in order to convince people you need to have good communication skills; speak the language of the people that you have to convince; find a common ground, which may lie in

Impressions of the Yellow workshop group



the everyday experience of the consumers with products; and have good reasons for design research to begin with.

Returning to the first question of what reasons convince, the researcher's, and/or designer's track record and personal relations were considered to be most crucial in convincing stakeholders to engage in design research. A few cases were brought forward in which showing successfully completed design research projects turned out to be very helpful: "By having the chance of showing a client [through example cases] how valuable research for design could be, I was able to get the money for doing the research." (Theo Groothuizen) Attendees suggested that a reliable base of design research cases would be useful for reviewing and explaining the design research approach and its benefits.

Showing successful projects from the past is no silver bullet. In one example, a successful earlier design project was shown to convince the stakeholders of the design research approach. "In spite of the results the designers were not accepted as partners in research of new products and systems." (Theo Groothuizen) This problem was recognized by some others: "Practice does not value the (design) research we do. Academics don't consider it research at all." (Caroline Hummels)

The emerging methods of design research can fall on deaf ears in those trained in and adhering to rigorous classical discipline, for instance insisting on large numbers of participants and quantitative statistics even for exploratory studies. This statement raised the question of how we can identify and close the gap between design and research.

6. How to close the gap between design and research?

A joint answer to this question was to convince people, i.e., CEOs, stakeholders and shareholders, of the design research approach by involving them in design research themselves, and as a result "create co-ownership" (anon) and understanding. "Give them a hands-on experience of how designing works. The value of design is understood after people experience it by doing it. [..] You can engage people in design research by sharing your tools, your methods." (Caroline Hummels) A nice example was brought forward in which people experienced design research by means of a workshop: "We held a one-day workshop at a conference in which we started with twelve personas and at the end of the day twelve working prototypes were built and tested in a matching experiment. This was a 'perfect' integration of theory (design for personality, update technology tangible interaction), hands-on design (vision, ideas, concepts, prototypes), and research (through design) in one day." (Caroline Hummels)

Although the outcome of the workshop did not teach its participants to design, it allowed them to experience the value of the approach. Hands-on experience with the objects of their decisions is a necessary ingredient for decision makers.

The afternoon ended with summarizing presentations from each of the groups.

6.3 General Conclusions

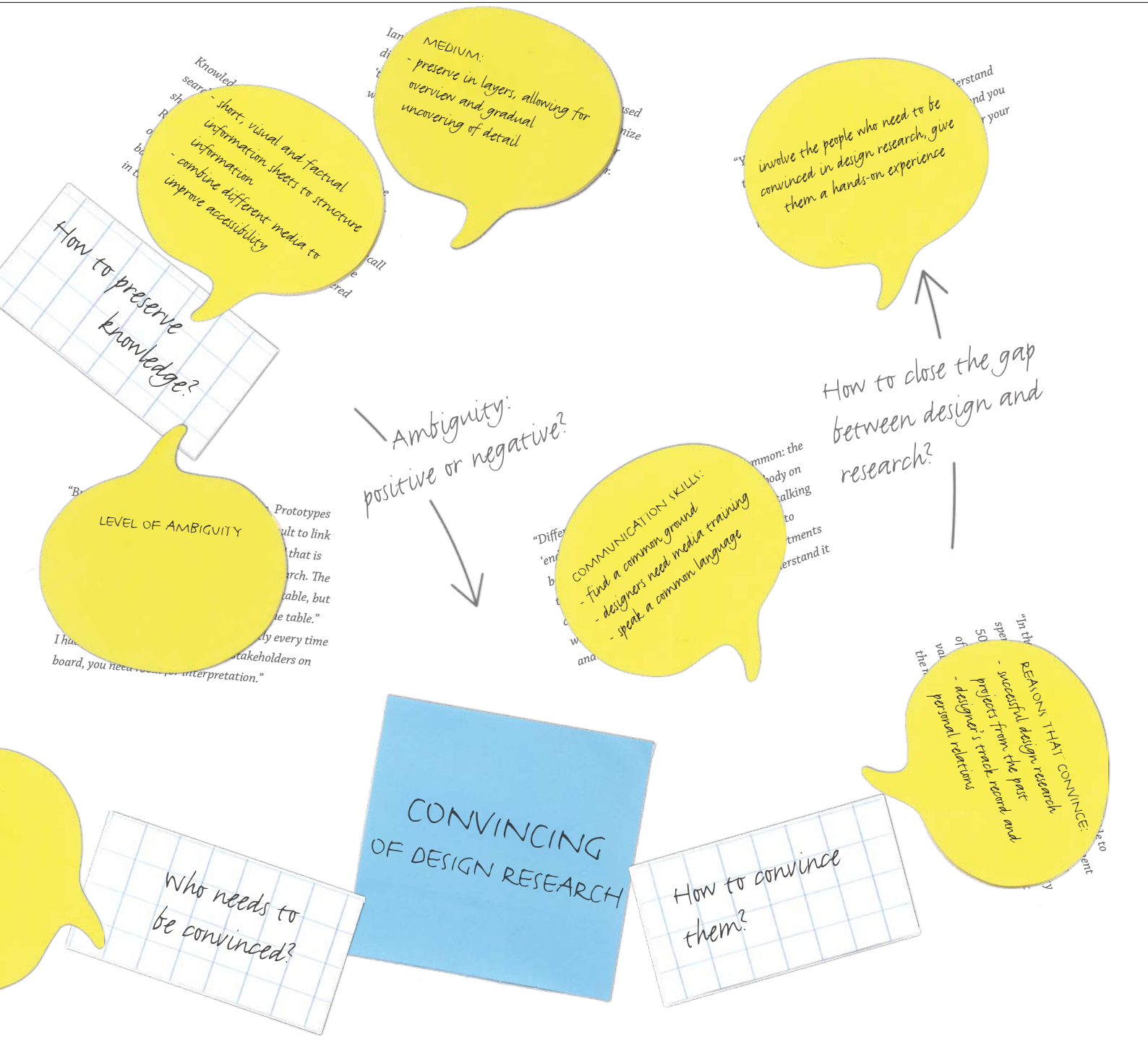
During the workshop the participants identified case studies and discussed what could be learned from these case studies concerning design research. The discussion led to many ideas and suggestions, for instance about preserving and communicating knowledge. At the same time, many new questions about design research were posed. A clear answer to these questions was not found, nor was consensus reached on what constitutes design research (or its component terms design and research). Instead, the discussion led to a better understanding of design research, and in particular to a better understanding of how designing fits in with doing research, and how designing contributes to knowledge.

For example, it appeared that social aspects play a very important role in all aspects of design research; in 'preserving insights', in 'acceptance and support', as well as in 'spreading the word'. Several participants had experienced in practice that knowledge is preserved in people rather than in artifacts, and recognized the importance of informal communication as a means to make this knowledge accessible to other people in the organization. Yet informal communication cannot replace formal communication. Finding the balance between these two forms of communication is an important topic of inquiry.

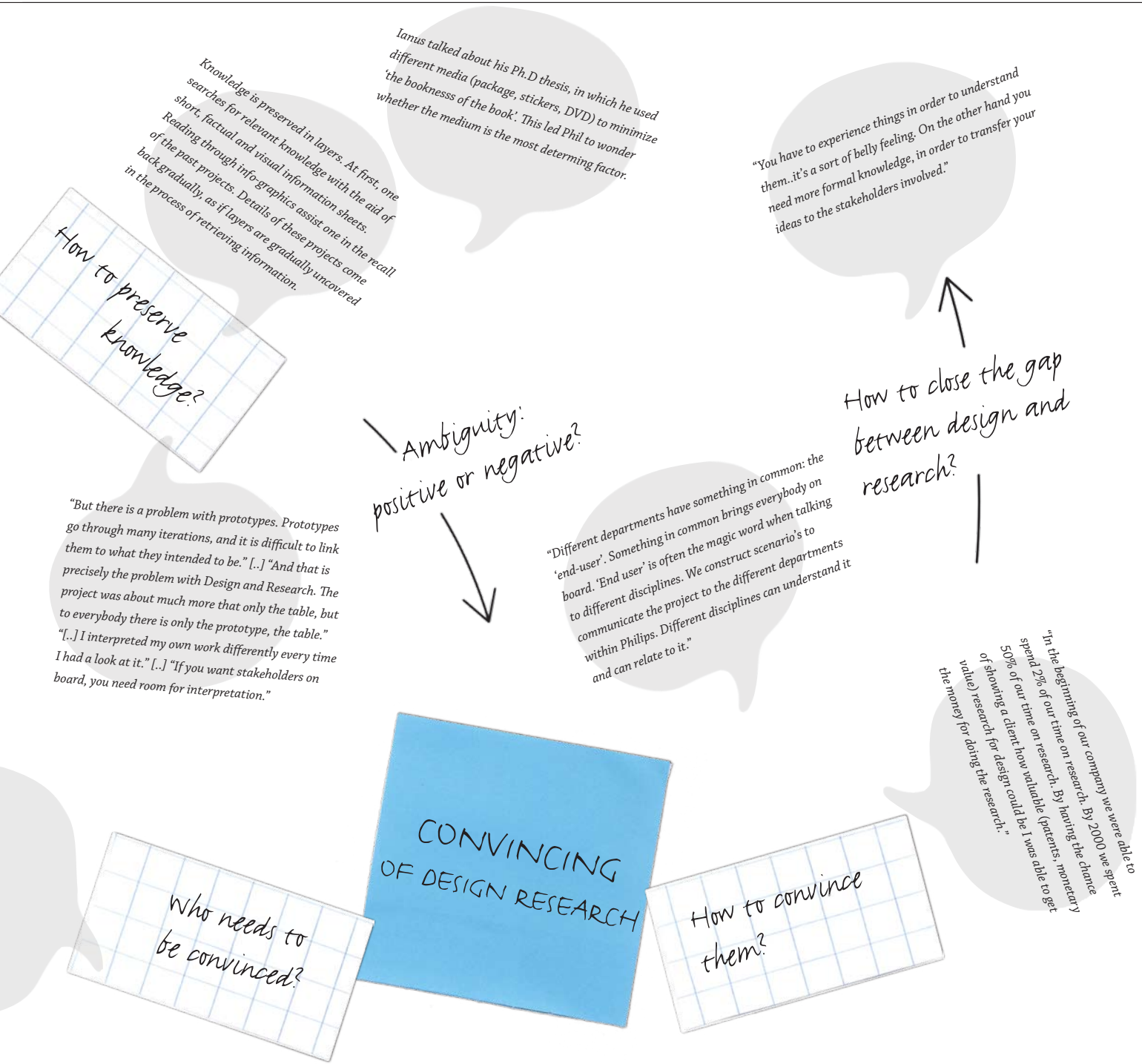
Another important thing that we learned, is that the composition of a project team is not as static as often presented. "People float in and out of projects all the time", so the composition of the project team is dynamic, changing continuously. As a consequence, there is a continuous flow of people and, if things go right, of knowledge. During the workshops this flow of knowledge was often considered to be problematic as it may cause knowledge to be lost. We think there is a positive side to knowledge flow as well: due to the exchange of knowledge between people, who have different backgrounds and work on different projects in parallel, new knowledge may be generated that is valuable for either the project running, for parallel projects or for future projects. Therefore, in our opinion, we should pay more attention to composing the project team, and empowering its members to leverage knowledge from earlier and other projects.

At the end of the day, we cannot claim that the sessions provided final answers to the questions of the day, but they gave us a good feeling for the manner in which the subject matter is experienced by those engaged in this emerging activity. There is a community of people practicing and studying design research, and a growing understanding of its importance for the development of both applied results (products) and fundamental results (knowledge). Future research will have to focus on developing policies, processes, techniques, and tools that support this community in further developing and applying its new promise into the practice and theory of product development.


How to keep the knowledge alive?
COMMUNICATING KNOWLEDGE
RECALLING:
- get an overview of design work
- creating a beautiful book
- small vs. large company
- informal vs. formal knowledge
it's in our nature to preserve things
For what or whom do we preserve knowledge?
CONTENT LEVEL:
- (case: Philips)
- change design approach based on research (case: SMS Nokia)
PRESERVING knowledge
What do we mean by 'knowledge'?
PROCESS LEVEL:
- broaden knowledge base (case: welding equipment)
CEO
WORKSHOP DESIGN RESEARCH


CONVINCING OF DESIGN RESEARCH
How to preserve knowledge?
- short, visual and factual information sheets to structure information
- combine different media to improve accessibility
MEDIUM:
- preserve in layers, allowing for overview and gradual uncovering of detail
LEVEL OF AMBIGUITY
Ambiguity: positive or negative?
How to close the gap between design and research?
involve the people who need to be convinced in design research, give them a hands-on experience
COMMUNICATION SKILLS:
- find a common ground
- designers need media training
- speak a common language
REASONS THAT CONVINCE:
- successful design research projects from the past
- designer's track record and personal relations
Who needs to be convinced?
How to convince them?


How to keep the knowledge alive?
COMMUNICATING KNOWLEDGE
"[..] We developed prototypes of the dispenser, but when they were finished, the development team said that they've changed the format. So the prototypes were not used. [..] Years went by, and then we moved to another building 6 months ago. And all of a sudden I saw my prototypes displayed in our office. Somebody put them there because he thought there were rather nice. [..] "Looking through things again, makes you remember things that you have often forgotten. "It sounds like a sort of resurrection, a spin off."
"We use trashcans, both digitally and physically. Prototypes and drawings, they stay alive. When somebody asks us, we just open the trashcan and everything, its entire history, comes back. So what's the problem?" [..] "There is also an assumption present. You know what your project was about. Within Philips you are the only, it is impossible for others to know everything about all the other projects."
"A lot has to do with the culture of preserving, the rigor of storage, keeping it somehow." "Leaving the institute, I have looked through the stuff that passed by in the last 5 years. And it really got better."
For what or whom do we preserve knowledge?
PRESERVING knowledge
What do we mean by 'knowledge'?
""SMS was not intended as a product for consu-mers, the consumers discovered this themselves. Nokia took this knowledge from the SMS case, and used it as the basis for a new approach to product development in general: a platform for mobile phones, more suitable for 'serendipity' or community-involved participatory product development."
"A group of students developed a new concept for welding equipment for a company, in which there was an LCD screen on the inside of a welding mask and a camera on the outside. This offered all kinds of new possibilities. [..] Having a design with a completely new concept forced the company to explore new knowledge domains about for example the marketing and production of such a product and this new concept was a new insight to the company."
WORKSHOP DESIGN RESEARCH


Knowledge is preserved in layers. At first, one searches for relevant knowledge with the aid of short, factual and visual information sheets. Reading through info-graphics assist one in the recall of the past projects. Details of these projects come back gradually, as if layers are gradually uncovered in the process of retrieving information.
Ianus talked about his Ph.D thesis, in which he used different media (package, stickers, DVD) to minimize 'the booknesss of the book'. This led Phil to wonder whether the medium is the most determing factor.
"You have to experience things in order to understand them..it's a sort of belly feeling. On the other hand you need more formal knowledge, in order to transfer your ideas to the stakeholders involved."
How to preserve knowledge?
Ambiguity: positive or negative?
How to close the gap between design and research?
"But there is a problem with prototypes. Prototypes go through many iterations, and it is difficult to link them to what they intended to be." [..] "And that is precisely the problem with Design and Research. The project was about much more that only the table, but to everybody there is only the prototype, the table." "[..] I interpreted my own work differently every time I had a look at it." [..] "If you want stakeholders on board, you need room for interpretation."
"Different departments have something in common: the 'end-user'. Something in common brings everybody on board. 'End user' is often the magic word when talking to different disciplines. We construct scenario's to communicate the project to the different departments within Philips. Different disciplines can understand it and can relate to it."
"In the beginning of our company we were able to spend 2% of our time on research. By 2000 we spent 50% of our time on research. By having the chance of showing a client how valuable (patents, monetary value) research for design could be I was able to get the money for doing the research."
CONVINCING OF DESIGN RESEARCH
Who needs to be convinced?
How to convince them?