

# Cabinet of curiosities fuels creativity



BY JOOST VAN KASTEREN

## *Useful tool to stimulate designers' inspiration*

During the initial stages of the design process, industrial designers often use their private collection of images, magazines, and objects to gather ideas and to discuss matters with their colleagues. These collections are rather like the cabinet of curiosities or *wunderkammer* that the well-to-do of the sixteenth and seventeenth centuries liked to create. Ir. Ianus Keller, a doctorate student at the ID-Studiolab of the Industrial Design Engineering faculty of TU Delft, has developed an electronic cabinet of curiosities that enables the designer to concentrate on playing and associating with images to produce new ideas.

One of the major research themes at the Studiolab is the development of so-called tools for inspiration, tools and techniques that support industrial designers during the initial, concept phase of the design process. The focus is on enhancing the interaction between designer and environment. Ianus Keller distinguishes three levels of interaction (see TRI text box). To begin with designers at their workplace like to surround themselves with images and compilations of, for example, the target group and comparable products, simply to get the feel of what they are working on. The images outline the limits, the prerequisites, within which the design is to be given shape, as it were. The second level of interaction involves moving objects and images around, arranging them on a table top or on a wall in sweeping movements to be compared, grouped, and discussed. Finally, the third level is to prepare sketches, drawings, and (foam) models.

These are precision actions that require quite a bit of eye to hand coordination. The ideas often come during the first two levels of interaction. Once the third level is reached designers usually know what they want to make. Whatever the level conceptual design is a manual process as well as a cerebral one.

**Spatial memory** The 'Cabinet' developed by Keller picks up on the habit of many designers to collect images and objects to be used during the initial stages of the design process. During workplace interviews and observations Keller noticed that some designers took great care in cutting out the images and pasting them on cards.

Keller: "They spend quite a bit of energy on individual photographs, sketches, and objects, only to put them back on a pile. They do not catalogue them in any particular way, but there appears to be little need for that, since most of these people seem to know exactly where to find the image they want among thousands of others. Designers, by their very nature, have a well-developed spatial memory. A lack of structure when storing the images also has the advantage that you may find yourself getting new ideas just from rifling through them."

A computer could be used to provide easier access to a collection of images. Various software titles are available for this purpose. However, according to Keller such library systems are unsuitable for the informal collection of a designer.



The collections created by designers comprise stock photo books, images, catalogues, etc. The computer has been unable to replace physical collections because it does not offer the same level of overview and control.

In addition to images designers also collect physical objects.



In order to be able to retrieve images most designers mark the pages of magazines and books with yellow Post-it tags, sometimes adding keywords and project names.



Once an image is selected for adding to the collection designers spend a lot of effort on getting the cropping and storing the result. According to Keller, they spend less effort on arranging the collection beforehand, but even so they can always find the images they want.



Designers like the ones here at the SMOOL design studio in Haarlem like to be inspired by the collections with which they surround themselves on the walls and on their desk. The images influence the designer from the periphery of his vision, something that would be impossible with current computer set-ups which claim too much of the stage.



During the design process images from the collection are placed on the table to discuss and arrange them. According to Keller, the added value of arranging the pictures lies not just in the separate images, but also in their relationship and composition.



Ideas are converted into sketches, which are not simply separate images, as each sketch affects the next. It is a process of growth with a feedback element, resulting in complex compositions.

“To make the system work you have to store a whole range of information about the image, including name, date, subject, etc. To retrieve the image, the user again has to type in a set of keywords. It is all very verbal, which is of little use to designers, who like to do things visually. What’s more, the purpose of their collections is not so much to retrieve the images or to show them to others, but to use them to gain inspiration. The importance is not just what the picture represents, but also its physical appearance, i.e. its size, wear and tear, colours, and other physical aspects.”

Keller’s Cabinet, by forming a source of inspiration, offers the designer a starting point when making the first tentative steps on the way to a new design. At the same time, however, cabinet of curiosities these days tend to come in digital form. Surfing the Internet is one way of bumping into images and objects that stick in your mind. Of course you could print them, but the results are often less than ideal. One of the purposes of the Cabinet developed by Keller is to combine computer images with a collection of physical artefacts a designer collects over the years.

**Fingers** To emphasise the link with the physical collection the system does not resemble a computer. Instead it appears to the user as a worktop that doubles as a projection screen. The images are produced by a beamer fitted below the worktop that projects the images onto the worktop via an overhead mirror. The images can be moved around using an electronic pointing device. The screen displays a number of virtual stacks of photographs and sketches, just like they might appear on a designer’s normal worktop. The pen-like pointer lets you go through the stacks and spread the images all over the worktop, just like you would do with your fingers to move paper pictures around a table. You can also add new images to the collection. These can be computer images transferred from a USB memory device or pictures straight from a magazine. Keller looks up a cigarette ad in a magazine showing a designer putting up his feet in a studio filled with drawing boards, puts the ad on the worktop, and presses a button. When the magazine is removed, a virtual copy of the original stays behind on the worktop in exactly the same place and of exactly the same size. There is a touch of magic about the process of something remaining where it is even when you remove it.

Once Keller finishes cropping the picture it is added to the collection, revolving to indicate to the user that it still has to be assigned its proper place in the collection or in one of the many stacks. No words are used in the process, so the designer can remain in visual mode all the time. In addition to storing existing electronic images, the Cabinet can also be used to scan photographs, magazines, or even tangible objects to add them to the collection. In fact, it can do even more as it enables the user to add different textures and materials to wooden or foam plastic models using light projection. Keller: “This works particularly well for adding buttons and even an interactive display to a model of a mobile phone. Many students have already used these projection techniques to tweak and present their design.”

**Physical images & Searching by image** Keller designed the Cabinet to closely follow the way designers use their collection. For example, instead of displaying the images on an electronic screen, it shows them on the worktop of a separate table.

Keller: “When I talk with designers about their methods they are always getting up to get something from a shelf that they want to show me. This is something quite different from displaying an image on a computer screen, in which case the person’s, i.e. the designer’s, attention shifts from the person to whom he’s talking to the computer screen. As the focus turns to the computer, the interaction is lost. This effect occurs much less with physical images.

In addition, the interactive Cabinet stimulates interaction by enabling more than two persons to gather round it, and anyone can point to the images or move them around.”

Another feature is the search function which unlike most other search engines uses images and distances instead of words and is based on the patented MDS-I (Multi Dimensional Scaling Interactive) system developed at TU Delft (see also Delft Outlook 2000.4). In practical terms, it goes like this. A user places the tip of the pointer between two images, and the computer then searches its library for other images that resemble those two. What is new about the Delft method is that it is interactive and enables you to search by clicking between two images.



Keller: “If you want to generate ideas for the design of a new product, it helps to use existing designs as a starting point. So you use a bit from one image and combine it with a bit from another, and a bit from yet another. The creative process often consists of developing new combinations.”

**Electronic shuffleboard** The Cabinet spent four weeks on trial at WAAC’s designers in Rotterdam (known from the Senseo Crema coffee-maker system marketed by Philips and Douwe Egberts). It was then moved to spend another month with Fabrique designers in Delft, whose designs include the Albert Heijn on-line supermarket. Finally, the Cabinet was used by SMOOL designers in Haarlem.

“The object of the exercise was not so much to test the system,” says Keller, “as to observe the behaviour of designers as they used the product. Research with prototypes is an important part of Research through Design.” (See text box below) Renate Frotscher of the Fabrique design studio used the Cabinet to analyse the look and feel of a magazine that was to be “translated” from paper to a web-based magazine. Elements that determine the character of a magazine include pictures it contains, titles and headers, but also the layout and typesetting. The system proved to be very useful for this kind of analysis. Frotscher: “Normally you would start taking cuttings which you then move around to classify the various elements that make up the magazine’s qualities. With this interactive system you can simply take a picture, crop it, and then move it around electronically to see if you can evoke the same atmosphere. Of course, you could do the same thing on a computer display, but it would require much more effort. You would have to scan the images, process them, and then store them in a folder where they would be out of view. One major difference is that thumbnail images on the computer screen tend to be arranged in neat rows and columns, whereas the new system lets you move them around and put them where you want. And, they are much easier to find when you have temporarily moved them aside.” Roy Gilsing of WAAC’s considers himself a critical user in the sense that some

## Research through design

The Cabinet was developed at the ID-Studiolab, a group of researchers and designers advocating what they call ‘Research through Design’. The principle is that a design researcher should not act purely in his capacity as a psychologist or ergonomics engineer, but also as a designer himself in researching design processes.

The emphasis is on making empirical, well-designed and finished prototypes that work well enough to be used as tools by researchers and users. The experiential working prototypes serve as research media, and their role in the research is as important as that of the results of user interviews. The purpose of the Cabinet is to test hypotheses regarding the use of images in the design process by looking at the log files to see how designers used the interactive system.

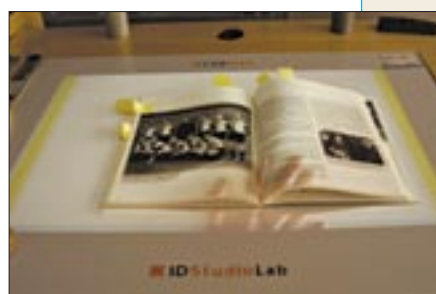
The purpose of the working prototypes is not so much to develop or demonstrate new technology as to help apply existing technology with fresh insights about the way people can use technology.

The electronics for the Cabinet were constructed by Ing. Rob Luxen. Ing. Aadjan van der Helm, who has experience in the field of designing for artists, developed the software using the fluid interaction styles created by Ir. Aldo Hoebe. Impromptu remarks and interesting applications by other researchers and designers at the ID-Studiolab also proved crucial to the development of the prototype of the Cabinet.



With his Cabinet, shown here at WAAC’s in Rotterdam, Keller wishes to close the gap between physical collections and the digital world. Collecting is much nicer to do in the real world but a computer offers much better opportunities for processing the information and making collages.

The Cabinet comprises a touch-sensitive A2-size tablet manufactured by WACOM, an Apple PowerBook computer sans display, a projector, and a digital camera. The image is projected onto the touch-sensitive surface via a mirror. The user can move images around and collect them in groups using a special pointing device. New material can be added in the form of pre-processed digital images from a memory device through the USB connection (front right) or images from physical objects through the digital camera using the button on the front left.



Adding a picture from a book. The camera records the image and projects it onto the original object. When the book is removed, an identical image remains behind, a truly fascinating experience.



The Cabinet works without words. Users can work with images intuitively the way they like to do on a table, i.e. by arranging, moving, grouping, and stacking them. A computer requires some measure of order beforehand, but the Cabinet enables the user to handle freely and creatively producing images, arrangements, stacks and compositions.



During the field tests Keller ran into some unexpected phenomena, such as the way in which one of the participating designers frantically tries to stop her colleagues messing up her collection. Again, the boundaries between real Post-It notes and their digital counterparts have become blurred.

A working prototype of the Cabinet spent several months at a number of design studios for field tests as part of the normal design process. At the Fabrique studio in Delft, the Cabinet was used to improve the website of the supermarket chain Albert Heijn.

aspects of the way the Cabinet is used are not as logical as he would like. "The emphasis is on storing images. I would much prefer a system that would help me retrieve images, such as a search engine that would search the Internet for images to match a theme, and help me to process and scale them. Nonetheless, the interactive system is very useful for discussions with other people such as other designers and clients. You can gather round it with a couple of people and move images and sketches around, which is very useful," Gilsing says.

All in all, the interactive Cabinet appears to be a useful tool for inspiration. Keller: "Using a theoretical design approach allows us to think in a radically different way about interfaces. This system succeeds in blurring the difference between physical and digital pictures, bridging the physical digital divide."

For more information, please contact Ir. Ianus Keller, phone +31 15 278 1714, e-mail [a.i.keller@io.tudelft.nl](mailto:a.i.keller@io.tudelft.nl), or Prof. Dr. Pieter Jan Stappers, phone +31 15 278 5202, e-mail [p.j.stappers@io.tudelft.nl](mailto:p.j.stappers@io.tudelft.nl). <http://studiolab.io.tudelft.nl/cabinet/>



The TRI set-up.

## TRI

You will find them on the wall in any designer's studio: collections of (sections of) pictures, sketches and in some case, bits of material and cardboard. Ianus Keller, himself an industrial designer with five years experience in industry, knows what he is talking about when he says that designers don't just go off on a limb when they start a design. On the contrary, they try to figure out in the best possible way how their product will be used and in which conditions. The designer's collection on the wall serves as a showroom of ideas and indicate the framework within which individual and collective creativity can be expressed. In recent years, electronic aids have become available to help shape the

designer's showroom. People go out with video cameras, or even better, a computer is used to create a synthetic environment, a virtual reality.

"It's fantastic to see," Keller says, "but before you get to that point, you need to program every detail, which is very time-consuming. Anyway, there is no need for so much realism to experience the environment in which the product is to be used. On the contrary, with everything looking that slick it tends to become a movie where you sit back and relax to watch. It no longer stimulates creativity."

As an alternative the ID-Studiolab has developed the TRI system. TRI is a pun on 'try' to express the explorative, tentative and playful use for which it is intended. It also stands for Three Ranges of Interaction, which refers to the three levels of interaction discussed in

the main text of this article. Its purpose is to serve as an aid. when making video collages for instance. A picture of a kitchen is projected onto a cardboard screen. A woman is cutting up vegetables, which she then puts into a pan. The image animation is jerky.

Keller: "We intentionally opted for an image-by-image presentation, again to prevent it becoming too much like the movies. The images were not recorded with a video camera but with a still camera. The interruptions between the images make you look more closely. You might compare it to making music. Miles Davis once said that music is not just about the notes you play, but more about the ones you don't play. The designer must decide for himself which images to include in the video collage, and the spectator must enter into the projected image."

TRI also uses a horizontal worktop on which both physical objects and images can be moved around. According to Keller this helps the users to group, present, and discuss ideas. Another possibility is to project different colours, patterns, and textures onto a foam or wood model of the product. It also enables the user to get some idea about the way the product should be shaped in order to make it easy to handle. The worktop also contains an LCD touch screen that can be used in combination with a digital pen to make sketches which are then stored in the computer and which can be used as a basis for more detailed sketches and images of the product.

TRI also served as the basis for further prototype development. The technology and scale of interaction of the Cabinet can be regarded as a spin-off driven by the experience gained from TRI.



Projected images can be used to flexibly try out textures, buttons, displays, etc. on foam models.