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HEALTHCARE INNOVATIONS WITH  
THE CREATIVE INDUSTRIES



**CROSSOVER  
WORKS #4  
HEALTHCARE  
INNOVATIONS  
WITH THE  
CREATIVE  
INDUSTRIES**

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## Smart healthcare

The Netherlands has a dynamic range of companies that are increasingly starting to work outside their own specific sectors. This creates new combinations between businesses from a variety of fields, also known as ‘crossovers’. These crossovers have the potential to develop extremely innovative products and services, and that offers many social benefits: it paves the way for finding solutions to the problems that our society struggles with.¶

Among the top sectors, the creative sector is in the best position to successfully bring about fruitful crossovers. Designers appear to have the unique ability to develop new initiatives with other disciplines and generate support for them. We have already published three books with great examples of what that can lead to.¶

This fourth book is something new: a special edition about the extraordinary collaboration between the creative industries and the healthcare sector. Currently, promoting healthy and active aging is indeed a major challenge for our society. Our population is getting older and the traditional welfare state is a thing of the past. That requires solutions which make people less dependent on professional healthcare and allow them to live independently for longer, as well as smart tools that assist in maintaining a healthy lifestyle.¶

How can the design sector contribute to these goals? This book reveals a range of successful, innovative case studies where the creative sector plays a major role. They include collaborative solutions for self care and prevention, for those that need assistance, for home care and informal carers, for residents and caregivers in nursing homes, and for patients and medical staff at hospitals. Like games that can help children with anxiety disorders, online platforms and smart patches to monitor patients at home, interactive tables and benches for people with dementia and apps that improve the performance of surgeons.¶

Each and every one is the result of designers, engineers, scientists and healthcare professionals who think outside the box and have come together at just the right moment to create new business opportunities. With this book, CLICKNL, the Creative Industries Fund NL, the Federatie Dutch Creative Industries, the Dutch Chamber of Commerce and the Dutch Creative Council want to ensure that it’s even easier for these parties to find each other.¶

Linde Gonggrijp  
Director CLICKNL



SELF CARE AND PREVENTION

Taming voices and a pan on the table

How do you ensure that people take good care of themselves? The healthcare sector is increasingly discovering the value of creativity to prevent people from becoming ill or needing to rely on healthcare providers. Collaboration based on market demand keeps leading to better solutions. Bas van Lier

Mileha Soneji from India, a recent graduate of the faculty of Industrial Design at TU Delft, likes to keep things simple. A couple of years ago, a fellow Indian developed a spoon that compensates for the tremors of Parkinson’s patients. A technical feat, but with the disadvantage that it looks like a device for someone with a disability. For her uncle, who also suffers from the disease, Soneji developed a solution without the stigma: an elegant mug with a slightly tapered opening to prevent the contents from spilling over the edge, even with severe trembling. And when Soneji saw her uncle, who had difficulty walking, stroll briskly down the stairs, she came up with the idea that projecting stairs on the floor could help him more easily walk around his house.

Fragrance dispenser

There are numerous examples of designers who have come up with these kinds of smart solutions to allow people with a variety of disabilities to help themselves, and therefore live longer and more enjoyably in their own surroundings. A few years ago in the UK, the Design Council initiated a project which challenged designers to seek solutions for the growing group of elderly people with dementia. One team devoted themselves to the problem that many older people with Alzheimer’s forget to eat, causing them to lose dangerous amounts of weight. Their solution consists of a fragrance dispenser which emits the scent of food three times a day. A trial showed that 52 percent of the users of the *Ode*, as the device is called, gained an average of two kilos after 11 weeks.

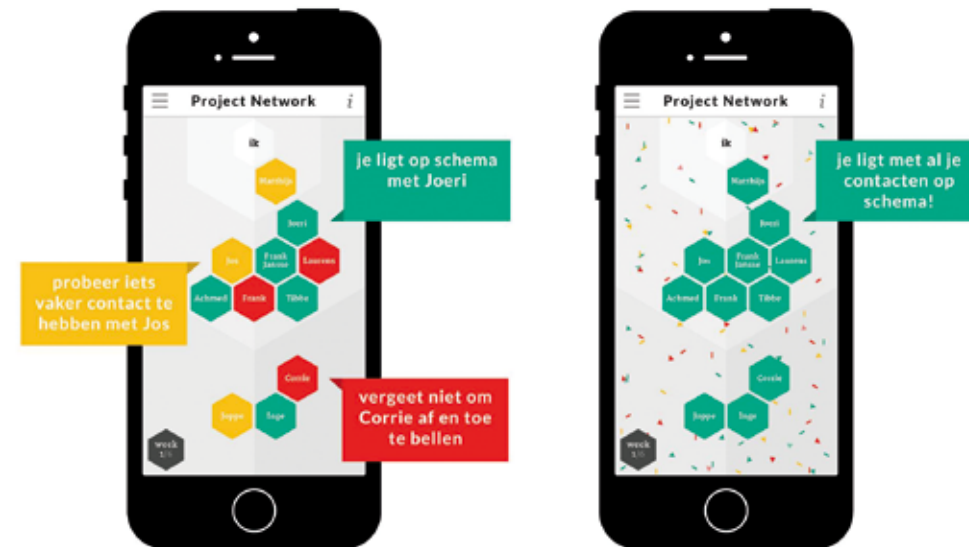
In general, malnutrition is growing problem among the elderly, especially because they more frequently continue

to live independently, and for a longer period of time. To provide a solution, Rotterdam-based Spark design & innovation, commissioned by Iseco in Breda, developed the *Casserole* meal warmer. Iseco supplies food-warming systems to healthcare institutions. The Casserole employs the same technology for at home. With the press of a button, the device heats up frozen or refrigerated meals which are delivered by food service suppliers that that Iseco partners with. Because of the gradual heating process, the quality of the meal is better than reheating it in a microwave. And the Casserole, which in terms of design wouldn’t be out of place at the best French kitchenware shop, can go right on the table. And that’s much more appealing than eating from a plastic container.

Taming Voices

The value of creativity is also increasingly being recognised by the healthcare sector. More and more healthcare institutions are looking to collaborate with the creative industries to develop new, smart, and surprising self care and prevention tools. A shining example is the partnership between the Parnassia Group and Reframing Studio that led to the award-winning *Temstem* (Taming Voices) app for people who hear voices in their head: a simple, distracting smartphone game for moments of stress, which appears to greatly reduce suffering. The very same collaboration resulted in the Project Network app, which helps people maintain their social network in times of mental

© Project Network by Reframing Studio and Parnassia Group, April 2015



instability – precisely because social contact is important for recovery during such periods. Project Network has been nominated for the Dutch Design Awards 2015.👉

To encourage these kinds of partnerships, the creative industries expertise centre U CREATE from the University of Applied Sciences Utrecht (HU) the University of the Arts Utrecht (HKU) has been entirely focused on health and wellbeing since January 2015. “We are trying to make connections between researchers and entrepreneurs in the creative disciplines and the world of healthcare,” says Walter America, director of U CREATE since early this year. “So far, the approach from the creative sector in this field has been primarily supply-driven. Designers identify a problem and enthusiastically devise a solution, but the question is whether there’s really a need for it. And then it turns out that healthcare providers have other priorities at the moment, so there isn’t an opportunity to properly validate and improve the design. We want to change that by working more from the demand-side.”👉

### The journey of 5

At paediatric oncology centres, the need arose for products that encourage children with cancer to eat better and exercise more. Both increase the chances of recovery, but are often a problem for chronically ill children. For the research project *‘Participatief Ontwerpen voor KinderOncologie’* (Participatory Design for Paediatric Oncology; POKO), five design agencies and 27 students and researchers from the University of Applied Sciences Utrecht (HU) and the University Medical Center Groningen (UMCG) collaborated on physical and digital products that aim to stimulate adequate nutrition and exercise for children with cancer. One of the results was the game *‘De reis van 5’* (The journey of 5), designed by students under the supervision of Rhinofly (now Kaliber). This game, partly digital and partly physical, helps children in the recovery phase to start tasting and develop a regular metabolism again.👉 Responding to the needs of the healthcare market has major advantages, says Amerika. “There’s a lot of energy and a desire to change from the healthcare side. As a field of expertise, creative entrepreneurs and healthcare providers can collaborate from the very start and there’s much more talk of equality, which greatly increases the odds of success. It’s a triad: the technology is developing rapidly, it requires creativity to apply the technology, and it takes social entrepreneurship to get the application off the ground. These aren’t successive stages, it’s a simultaneous process. That’s what we’re trying to encourage here.”👉

### Interesting market

On way of doing that is the open call *‘Langer zelfstandig functioneren met dementie’* (Functioning independently for longer with dementia) from



Reis van 5 (Journey of 5) encourages proper eating and exercise habits for children with cancer.  
Photography: Khalid El Khouani, Kaliber

ZonMw and Create Health, the partnership of the Dutch top sectors life sciences and health, the creative industries and U CREATE. The call for proposals is open to public-private partnerships which must include representatives from a research organisation, a healthcare or wellbeing organisation, a patient organisation and businesses from the creative industries and healthcare sector.👉

“A programme like this helps creative companies to become active in this market,” says Amerika. “Healthcare is an interesting, but also complicated market for creative businesses. The question is: Who dares to get involved? In other countries, you see that collaboration between doctors and designers is becoming more prominent. In the Netherlands, there are good opportunities in this area. Both the Dutch healthcare system and Dutch creative industries have a strong reputation abroad. The combination of the two has major potential.”👉

All creative disciplines, from interactive and spatial design to product and fashion design, can play a role in this. Digital technology still shows a lot of promise, including wearable devices which measure a variety of vital signs and physical activities, but are still mostly used recreationally. However, it’s also possible without using technology: For his graduation project at the Design Academy Eindhoven, Jeffrey Heiligers developed *‘Posture’* together with physiotherapists – clothing with extra seams that force the wearer to adopt good posture when sitting in an office chair. According to the product description, it’s a *‘tailor-made remedy to correct the poor postures of the digital generation’*.👉



## MINDLIGHT

### Gaming to control fear

Breathe deeply, don't get distracted by the scary things around you and focus on the goal: Mindlight playfully teaches you to deal with irrational fears.¶

Arty's parents drop him off at his grandma's house. But once he's inside, everything seems suspicious. It's pitch dark and there are monsters lurking everywhere. Fortunately, Teru the magic hat brings light into the darkness. Mindlight is an applied game that helps children with anxiety disorders to overcome them. The game works on the basis of biofeedback: the magic hat is a headset which uses an electrode on the forehead to measure how anxious a child is. By relaxing, the hat emits light, the darkness is dispelled and grandma is saved.¶

Mindlight teaches children to stay calm in situations that they perceive as threatening. In that respect, games might be just as effective as costly behavioural therapy, says Teun Aalbers of GainPlay Studio. This gaming company was approached by professors Isabela Granic and Rutger Engels from Radboud University and the PlayNice Institute to ask if they could develop a game to support behavioural therapy. Mindlight is now ready to go to market. The next challenge is to convince practitioners of its usefulness – the positive expectations will need to be supported by research. A PhD student at Radboud University is currently working to analyse the results.¶

Researcher Teun Aalbers is already convinced of the benefits: "Games can be great tools for reinforcing therapy. After all, they disguise the learning process in a very appealing way, and can be played at home. The healthcare sector and the gaming industry tend to think within their own dogmas. Together, we've managed to break through that. In the healthcare sector, I expect that there are still plenty of gains to be made with this kind of cross-sectoral collaboration."¶

[www.gainplaystudio.com](http://www.gainplaystudio.com) | [www.theplayniceinstitute.com](http://www.theplayniceinstitute.com)



PROTECTIVE UNDERWEAR & CARIN

Just another routine

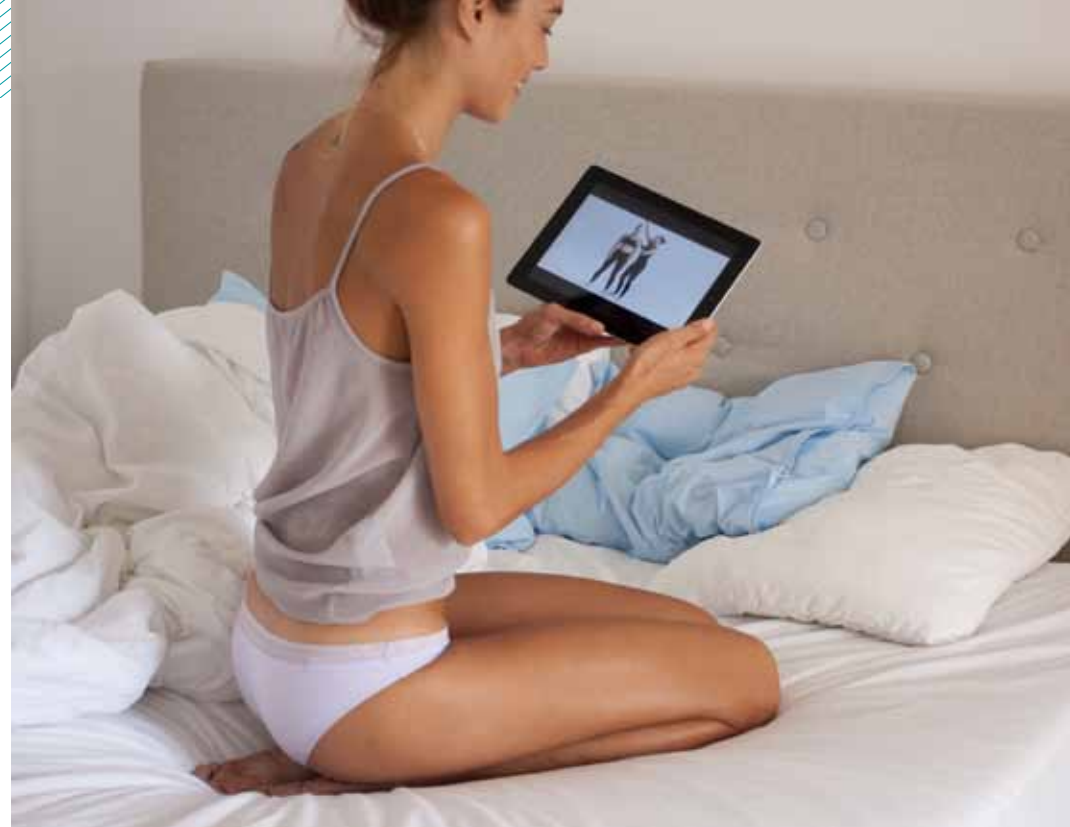
Designer Julia van Zanten developed undergarments that remove the stigma of incontinence. But collaborating with a physiotherapist and a business specialist delivered an even better remedy.👉

When she discovered that her grandpa was increasingly skipping his beloved daily walk because he didn't want to wear an incontinence pad, Designer Julia van Zanten started to think about alternatives. "With an aging population, incontinence is a common problem that has a major impact on quality of life. There are plenty of products on the market that functionally solve the problem, but they carry a stigma. People get embarrassed. I wanted to find a solution to the emotional component."👉

Van Zanten talked extensively to people who suffer from incontinence, their family members, pharmacies and nursing homes. Her analysis of the problem resulted in Protective Underwear: undergarments that aim to normalise their daily use. They aren't paper nappies or pads that you keep in your bathroom cabinet, but normal underwear made from fabric that you'd find in your wardrobe. The super-absorbent thread has an open-knit structure which expands when it absorbs moisture. And because of the fast-drying material, you can easily wash and wear the underwear again.👉

An important component of this project, which was Van Zanten's graduation project at the Design Academy Eindhoven, was a taboo-breaking campaign with the slogan 'just another routine'. It instigated something even bigger: She's now started collaborating with a physiotherapist and business manager under the name LifeSense. This new company has not only put the underwear on the market, it has also integrated them into an online pelvic floor training programme called Carin. "Using an integrated sensor and a customised exercise programme of five minutes a day, we're working on new ways to overcome this daily inconvenience."👉

[www.juliavanzanten.com](http://www.juliavanzanten.com) | [www.lifesense-group.com](http://www.lifesense-group.com)



Photography: Julia van Zanten



## CARE AT HOME

## On the lookout for helping hands

We're living at home for longer – sometimes because there's no other option, but also because that's what we want. Unfortunately, old age still makes things more difficult and that increases the pressure on homecare services and informal carers. How can we make things a bit easier for informal carers and organise supplementary care remotely? *Willemijn de Jonge*

In ten years' time, the number of octogenarians will have increased fourfold. The number of people with heart failure will have risen from 500,000 to 1.1 million, and the number of diabetics is expected to double from 600,000 to 1.2 million. Joep de Groot, board member at CbusineZ, the branch of insurance company cz focusing on healthcare innovation and participation, effortlessly reels off the figures, adding: "If we carry on like this, we won't be able to pay for healthcare." Change, or rather innovation, is inevitable. Healthcare needs to improve, and it needs to be more affordable – that much is now clear. Insurance companies, healthcare providers and the government are all diligently seeking solutions to make healthcare more efficient and make those requiring assistance more independent. It's not only out of necessity; people are also keen to remain independent in familiar surroundings and take an active part in society. "We're moving away from a healthcare system that concentrates on healing towards one which provides the best possible service to the chronically ill. The focus is shifting from extending life to enhancing the quality of life," says De Groot. Hence, the aim is to allow people to stay at home more comfortably, for longer, and remain as healthy as possible. But the fact remains that old age still makes things more difficult. This creates a situation whereby people with worsening symptoms keep living at home, increasingly limiting their ability to access their doctors and specialists. In turn, that puts a heavier burden on homecare services and informal carers.

**Big Brother**

How can we respond to the growing need for helping hands? It's a question that resonates throughout iZovator, a founda-

tion that also focuses on healthcare innovation. "We make connections between a range of parties that can work together to make a difference," says director Sjoerd Vegter. "We scan the healthcare sector looking for interesting new initiatives that can help both patients and healthcare providers."

The current trend is that homes are becoming increasingly advanced. Technology is gradually moving from nursing homes into patient's homes, explains project manager Doret Brandjes. The automated medicine box, complete with an alarm and call system that's activated if a patient makes a mistake, is already well established. In-home sensors that record your movements take things one step further. Brandjes: "One of the first symptoms of dementia is that you start to move about differently. Your day and night rhythms are disrupted, for example. A sensor on the wall can record these changes without needing to actually film you, which would probably be an unacceptable invasion of your privacy." And what should we make of a GPS device on your belt that allows informal carers to pinpoint your location with a simple phone call to the healthcare switchboard? It may initially bring Big Brother to mind, but it does help to prevent immense frustration for dementia sufferers and their loved ones. It eliminates the need to constantly keep tabs on each other for fear of losing one another.

**Walking frame with arms**

A development that some people feel is going too far – but which is being worked on intensively – is care robots. CbusineZ supported the design of a care robot dubbed *Rose*, which could be operated remotely

Socio-bot Zora helps to alleviate loneliness.



from the command centre. Rose could help people get dressed, fetch the post and put food in the microwave. “Rose was actually able to open the microwave without assistance, which was extremely impressive,” says Joep de Groot. But unfortunately Rose didn’t make the grade. “The technology wasn’t advanced enough, and we wanted to introduce the robot on a very large scale. On top of that, each Rose cost a couple million euros. But we’ll definitely keep investing in care robots. The lessons learned from Rose will be applied to the next robot, because cz believes that technology can be part of the solution.” There’s now talk of a somewhat simpler walking frame robot with arms. An elderly person walks using the frame, but can rely on the robot arms to perform a range of tasks. “We already have working prototypes that are showing enormous potential,” adds De Groot.¶

### **I am Alice**

In addition to service robots, major investment is also being pumped into so-called socio-bots, which primarily serve as a remedy for loneliness. The Belgian invention *Zora* has already made her debut in the Netherlands: she chats, sings, dances and moves around with her housemates. Meanwhile, researchers and designers from the SELEMCA project at the vU University Amsterdam are putting the finishing touches on Alice, a programmable ‘child’ from an even newer generation of robots. The acclaimed documentary *Ik ben Alice* (I am Alice) shows how this little robot earns a place in the hearts of three lonely elderly ladies during an intensive trial period, despite their initial scepticism.¶

“Many of our colleagues in the healthcare sector aren’t impressed by a cold, talking doll that’s supposed to take care of people,” says Brandjes. “But if that doll can turn on the evening news for you, alert someone if you fall and have a chat with you now and again if no-one else is around, I think it’s great. Loneliness is truly a huge problem that’s lying in wait. We can’t get around the fact that informal carers themselves are also growing older. And we’re a long way from making the switch from institutionalising everything to a community model. Technology can help us as we try to find the balance between caring for others and caring for ourselves.”¶

### **The power of persuasion**

It’s clear what the creative sector can contribute when it comes to home automation, wearables, games and robots – after all, function and form have to be designed. But it’s certainly not as straightforward as it seems, explains Brandjes: “A person suffering from dementia would immediately remove a strange bracelet from their wrist that they didn’t recognise. Creative input is required to design something that naturally



The concept “Alice in a wheelchair” was designed by Johan F. Hoorn. Photography: © CRISP – Wetzler & Berends.

feels like it’s right for you.” Insurance companies and healthcare consultants also think that designers can play a role with regard to the power of persuasion. A creative may be able to inspire people to become an informal carer or to change their mindset when it comes to neighbourly assistance. And this awareness aspect is also important in many other fields. “A dietician can explain exactly what you should eat to stay healthy and a doctor can tell you that you should exercise more, with the same goal in mind,” says De Groot. “This is perfectly wise advice, but how successful are these healthcare professionals in actually motivating people to change their behaviour? It could all do with some more enthusiasm. So also in this sense, I’m convinced that the creative sector can play an important role in overcoming obstacles in healthcare.”¶



HEREISMYDATA & ECARE APP

Undergoing treatment but still at home

The Radboud University Medical Center has joined forces with Philips to design an app that monitors COPD patients 24/7. It gives patients, their doctors and informal carers greater control over their health.

For some time now, the Radboud University Medical Center has been working on a data platform that allows patients to share their information online with doctors, healthcare practitioners, family and friends: Hereismydata. Recently, Philips took it one step further with an eCare app, initially specifically for patients with the chronic lung disease COPD. “What’s revolutionary about this app coupled with an online platform is that we can now take healthcare out of the hospital and into people’s homes,” says Lucien Engelen, director of the Radboud University Medical Center’s reshape Center which was created especially to focus on these kinds of innovations.

The hospital gives patients a ‘smart patch’ and a tablet with the eCare app installed. Once applied to the body, the smart patch collects important data on respiration, heart rate, exercise, sleep patterns and more. This information is automatically recorded by the app; patients supplement the data by answering questionnaires at home on the tablet. In addition to the patients themselves, all of the relevant care providers can get real-time access to exactly the same data. A major change compared to the snapshot of information people normally get to see at the hospital. Doctors can now base their treatment on the complete picture and better notice if something isn’t right; patients are more aware of their own condition and also have more control over it.

“For the first time ever, this app allows patients to become real partners in their own healthcare process,” says Engelen. “That’s unprecedented.” Moreover, this is just the start of the collaboration between Philips and the Radboud University Medical Center on Hereismydata. The pilot focused on COPD, but they are also working on eCare apps for other chronic diseases.

[www.hereismydata.com](http://www.hereismydata.com)





## BUBBLE WIZARD

### Blowing bubbles to stay fit

The Bubble Wizard app playfully teaches toddlers and preschoolers how to blow well as young as possible. It assists in the treatment of cystic fibrosis and can reduce the use of medicine as well.¶

If you have cystic fibrosis, blowing is very important: to be able to measure your lung capacity and start the right treatment, but also to make your lungs stronger and be able to clear them out. “The problem is that most children can only really blow properly when they are around six years old,” says designer Martijn Straatman. For his son and other children who suffer from this disease, he developed the Bubble Wizard, a special app that parents can use to teach their children how to blow starting from the age of three.¶

Supported by health insurance company VGZ, and in consultation with specialists, he developed a mobile game for three to five year olds. There are wizards and dragons to make it exciting, heroes to identify with and bacteria that you can blow away with a strong puff of breath. The better you blow, the higher your score. You can do with just a phone, or you can attach the ‘Wiz’ and use the corresponding mouthpiece. It’s an exact replica of the mouthpiece that is used in the hospital. With this app, you can practice at home with your child from a very young age, and successful pulmonary function tests can be completed much earlier.¶

With this solution, the treatment can become more targeted, says Straatman. “In a baby’s first year, we administer so many antibiotics ‘just to be sure’; with valid test results, the use of medicine can be reduced. In addition, you can build up your immunity by regularly exercising your lungs.” The app has now been accredited by the *Nederlandse Cystic Fibrosis Stichting* (Dutch Foundation for Cystic Fibrosis). Straatman is already thinking about other applications: “Blowing well could also be helpful for speech therapy, for example.”¶

[www.facebook.com/bubblewizardfoundation](http://www.facebook.com/bubblewizardfoundation)



## DESIGN FOR NURSING HOMES

## Applications that engage the senses

What can designers do for people in the later stages of dementia? Nursing home residents often sit apathetically in their chairs without talking, moving or eating. Increasingly, multidisciplinary initiatives are focusing on improving the quality of life at nursing homes. ¶ Willemijn de Jonge

Henri Snel focuses on quality of life on a daily basis as an architect, researcher and informal carer. When his mother was diagnosed with Alzheimer's disease 15 years ago and was eventually admitted to a nursing home, it planted the seed for his specialisation. As a caregiver and designer, he constantly noticed things at the nursing home that made him think: Can't this be done differently? He observed the daily occurrences there, talked to the nurses and cautiously began trying things out. This led him to create the agency Alzheimer's and Architecture, with the mission to improve living conditions for people with this serious disease. ¶

**Haptic perception**

Snel completed several research projects with scientists, healthcare institutions and design students – he is head of the Inter-Architecture department at the Gerrit Rietveld Academie. “Forging coalitions is absolutely necessary, because the only way we can make progress solving the current problems is by doing it together. The scientists I work with are accustomed to staying in their own little worlds, and the same applies to architects. But what movement scientist Wouter Bergmann Tiest says about haptic perception for example, is knowledge that every architect should have. It's about how we experience our environment using the sense of touch. Promoting spatial perception is certainly important for this target audience.” In addition, it's difficult to make a good design if you don't have firsthand experience how things work in a nursing home, Snel believes. Therefore, he always takes his research groups into the field, which means getting practical experience at a nursing home and empathising with the residents as best they can. For example, he has his students shuffle through the corridor wearing frosted glasses,

soundproof headphones and nose plugs to understand what it's like to have your eyes, ears and nose let you down. ¶

**Biodynamic light**

His observations and research confirmed the importance of multi-sensory activation, also known as ‘*snoezelen*’. “Due to budget cuts, most people who end up in a nursing home are already so far gone that they sit apathetically dozing in their chairs, making their circadian rhythms even more disrupted than they already were. The nursing staff doesn't have the time to constantly wake people up and encourage them to move.” So the search began for other solutions to stimulate people – but in moderation, because overstimulation also leads to stress. Snel mentions a project where a relatively simple adjustment appears to solve a number of problems: he's working with a healthcare institution on the implementation of biodynamic light, which allows the brightness of the light to be adjusted to the activity at hand. “For a 20 year old, 200 lux is perfectly fine, but for someone who's 80, it's absolutely insufficient to be able to see properly. What you see on your plate looks like a grey blob, and that's not appealing to eat. If you provide a minimum of 1000 lux with the correct Colour Rendering Index (CRI) during mealtimes, people will eat more and enjoy their food more. In addition, chewing appears to be an important form of movement, so with something as simple as light, you can kill two birds with one stone.” ¶

**Cherry pips**

The applications that Henri Snel and his students are thinking about are aimed at making everyday things as pleasant as possible and slowing deterioration as much as possible. For example, occasionally listening to headphones playing the songs from past, hanging up wash together to encourage interpersonal contact, a smart handrail that guides the way in the corridor, or a zone that lets you experience the transition from outdoors to indoors. Or a blanket with cherry pips in

Cherry pip blanket, by spatial designer Yu Song.







Sensory handrail, by spatial designer Julia da Conceição Estevão.

the hem that you can warm up in the microwave. “I placed one on the lap of a gentleman who was constantly swearing. He fiddled with it for three hours without saying a thing.”<sup>¶</sup>

It’s really always a matter of making things and then trying them out. That characterises the designer in him. “Ever since my design and architecture studies, I’ve been accustomed to making something and then trying to take it further.” In his mother’s nursing home, they’re letting him do his thing. Because it just might help. Perhaps that’s the added value of designers in healthcare, he confirms. Taking something that already exists and looking at it and using it in a different way. It can lead to new experiences with a positive impact.<sup>¶</sup>

### **Tactile Dialogues**

At the Eindhoven University of Technology’s faculty of Industrial Design, interaction designer Martijn ten Bhömer is also focusing on collaboration between designers, scientists, engineers and healthcare providers. He’s doing PhD research on how they can best approach multi-disciplinary collaboration to create ‘smart textiles’ for healthcare. One important interim conclusion from his research is that using experiments and prototypes is much easier than sitting down together and trying to think it all through in advance. Here too, a designer’s natural inclination to create and test things plays a crucial role. For example, for a project from CRISP, in collaboration with healthcare facility De Wever, Metatronics, textile designer Borre Akkersdijk and the Textiel-



Tactile Dialogues: a communicating pillow created by designers Martijn ten Bhömer and Borre Akkersdijk. Photography: Bart van Overbeeke Fotografie.

Museum, he developed a pillow that uses communication without words: Tactile Dialogues. Inside this multi-sensory pillow, integrated sensors respond to touch by vibrating. It’s so large that both the carer or nurse and the patient can place it on their laps at the same time, creating a bridge between the two. By touching it, pressing it or stroking the fabric, the pillow makes a vibration that the other person can feel. So each person can trigger the other to move.<sup>¶</sup>

### **Uncomfortable**

According to Ten Bhömer: “A visit from a family member to someone with advanced dementia is often very uncomfortable. Tactile Dialogues allows you to still have contact with each other by allowing the body to play a role.” The material, the colour and the knitted pattern were chosen so that it wasn’t childish or stigmatising; it has to appeal to both carers and patients.<sup>¶</sup>

At the end of 2014, the final tests were completed at De Wever. “We intensively studied the impact on visits from family members over a period of three weeks. Statistically, it’s still too early to draw firm conclusions. But the response from several family members has been extremely positive. The pillow also appears to a good tool for talking about the entire dementia process with the healthcare provider.” And they are positive as well: De Wever wants to keep the final prototype.<sup>¶</sup>



## MUZIEKBANK

## The bench that invites you to strum

Designer Sandy Bruns immersed herself in sensory activation – for an assignment from the Gerrit Rietveld Academie, and also for her grandma who suffers from dementia. Her *Muziekbank* (Music Bench) is not only a delight for the senses of touch and hearing, but also arouses so much curiosity that it gets people moving.👉

Her design is a long red bench covered with guitar strings, which is large enough to seat five people. Whether you sit on it or stand next to it, the strings have an irresistible appeal. Your hand wants to reach out so you can hear what a touch will do. The strings are tuned in chords and octaves, so it will always sound good. And it feels special: the bench's thin birch construction acts like a soundbox, transmitting vibrations to anyone sitting on it.👉

The Muziekbank was Sandy Bruns' graduation project at the Gerrit Rietveld Academie where she studied Inter-Architecture. What started as an assignment – design a sensory stimulation room – resulted in a unique product that will soon have a permanent home in the *Snoezelcentrum* (multi-sensory therapy centre) in Buitenveldert. “I've spent a lot of time in nursing homes and looked carefully at how residents relate to their environment. What's especially striking is that once people sit down, they don't get out of their chairs. They are completely lacking energy and therefore very dependent on the caregivers. I don't think these people are very likely to move to a multi-sensory room.”👉

That's why she chose to design a piece of furniture that could simply be placed in the day room, where patients can sit alone and with each other, their family members and their caregivers. The bench has been tested extensively at a nursing home from healthcare group Brentano in Amstelveen, where the response exceeded expectations: “The intention was to engage the senses, but what happened went far beyond that. For example, one woman who was strumming the strings suddenly remarked that she used to play the banjo. And one man started singing the Ave Maria.”👉

[www.sandybruns.nl](http://www.sandybruns.nl)



Photography: Sandy Bruns



## ACTIVE CUES

### Magic table slows decline

Lure little fish with a hand movement, pass the ball to others at the table, make words appear or wipe the autumn leaves from the table. The *Active Cues Tovertafel* (Active Cues Magic Table) helps to counter the degenerative process of dementia.¶

People with advanced dementia often sit in their chairs looking straight ahead, despite the fact that a lack of movement and social interaction accelerates the process of deterioration. CRISP challenged designers and scientists to develop a game that keeps these elderly people moving. It led to a collaboration between industrial designer Hester Anderiesen, game design agency Monobanda and healthcare provider Careyn. The intensive research process, which is part of Anderiesen's PhD programme at TU Delft in close collaboration with the department of Clinical Neuropsychology at the VU University Amsterdam, resulted in a concrete product: the Active Cues Magic Table.¶

Actually, the product is not the table itself – it can be played on any tabletop – but a projector that beams interactive figures made of light onto the table. With a simple gesture of your hand, the animations change shape or direction. “We came up with and tested a lot of different things,” says Simon van der Linden of Monobanda. According to him, the freedom of movement that the team achieved during the development phase was crucial for the end result. “One of the biggest challenges was to make it fun for people with various stages of dementia at the same table. For us as game designers, an especially interesting detail was that it shouldn't be a learning game, but a game that makes you do something. And even though it requires minimal supervision, the staff had to be on board as well.”¶


The beauty of this collective trial-and-error approach is that it works: most people sitting at the table became more active from playing the game. The projector has already been installed in more than 40 nursing homes. Currently, they are investigating whether the system can also be adapted for people with mental disabilities or autism.¶


[www.activecues.com](http://www.activecues.com) | [www.monobanda.eu](http://www.monobanda.eu)





## DESIGN FOR HOSPITALS

### Enhancing comfort and safety


With increasing regularity, designers from various disciplines are being brought in to improve working processes in hospitals, enhance the patient experience and increase their safety. Both the medical staff and the patients are seeing the benefits.  Bas van Lier

“Seeing through the eyes of an industrial designer enables you to improve processes in the healthcare sector,” says Julia Garde, who obtained her PhD from the University of Twente late in 2013 with a board game she designed. The game, called Healthcare Environment & Activity Design (HEAD), helps to streamline working processes in complex environments such as hospitals. For Garde’s research, the game was put to the test as part of the new construction project for the Medisch Spectrum Twente (MST) in Enschede. 



At the start of 2016, the city-centre hospital is set to relocate to a new building where patients will receive treatment in private rooms and can use a tablet to order food from room service at their convenience. It’s a completely new approach that calls for enormous changes to the working processes.  The HEAD game, a type of participatory design, was brought in at an early stage to help staff contribute their own ideas about the new way of working. During the game, staff from a variety of disciplines (e.g. nursing, departmental and dietary assistance, ICT) were required to act out work situations on a floor plan of the new building. This helped them to identify issues and devise solutions. The various staff members gained a better understanding of each other’s work and as such, are now properly prepared for the new situation. 

#### Holistic approach

Jos Stuyfzand, head of Philips Healthcare Design, also argues that designing for hospitals demands a holistic approach. Everything needs to be geared towards making patients, visitors and staff feel as comfortable as possible. That’s why – quite some time ago – Philips stopped focusing solely on medical equipment (accounting for 40% of its turnover) and started turning its attention to the design of its immediate environ-

ment and the corresponding processes. Stuyfzand: “To do this, we set up Philips Healthcare Transformation Services, an extremely multidisciplinary consulting service that brings together specialists such as psychologists, management consultants and designers to collaborate and advise clients. The key question that they are concerned with is: How can we change the current healthcare system to make it more efficient and affordable without affecting the high level of our culture of care?” 

#### Skilled in visualisation

The role of designers within the Philips team involves much more than Ambient Experience Design, a renowned system that allows patients to use visuals, audio and lighting to personalise the space during an MRI scan. In a general, it’s about optimising the entire healthcare process, also known as the ‘care continuum’. Currently, Philips Healthcare Design is involved in designing and equipping individual departments and even entire hospitals from every corner of the globe.  “Our work is increasingly about analysing and visualising data,” says Stuyfzand. “Designers are good at visualising complex, abstract processes that provide a better understanding to specialists in other fields. In this way, designers play an interesting role in finding solutions to the issues that the healthcare sector is facing as a whole.” 

HEAD helps streamline complex working processes. Developed by Julia Garde.







Philips develops medical treatment rooms that help patients to relax

### Patient safety

Patient safety is naturally an important topic in healthcare, and also one where design can make a contribution. A few years ago, Iris Hobo from industrial design agency Panton in Deventer conducted research at Nijmegen's Radboud University Medical Center into the role of design management in patient safety. Partly based on British research, she investigated whether certain design interventions improved safety in the operating theatre at the hospital's oral and maxillofacial surgery department. For example, a light and a bell marking the start and end of the operation improved compliance with hygiene regulations and reduced the total number of door movements.¶

Panton was later brought in to consult on the construction of a new operating theatre complex featuring twenty individual theatres. In collaboration with hospital staff, a system of colours, labels and pictograms was developed with accompanying instructional posters, floor plans, holders for disposable items and training booklets. Everything was designed in the same style to increase unity, clarity and ultimately safety in the operating theatres.¶

### Serious gaming

Hospitals are also becoming increasingly interested in using serious gaming as a tool to train staff and improve safety. Ian Leistikow, coordinator of patient safety at the University Medical Center Utrecht, thought that a nice video game could be a great way to train young doctors in patient safety. Working together with a psychologist and game design studio Visionshift Studios, he developed Air Medic Sky 1



Design interventions for improved patient safety, designed by Iris Hobo and Panton.

(AMS1). The game is based on the fact that doctors' errors aren't usually the result of medical inexperience, but are more often a consequence of organisational mistakes, lack of communication, stress and fatigue. AMS1 teaches doctors how to effectively deal with factors like these that could potentially affect their work.¶

Earlier this year, the University of Amsterdam even created a new position to focus on developments in this area. In March 2015, Marlies Schijven was appointed professor of Surgery, specialising in serious gaming, simulation and applied mobile healthcare. Schijven certainly has all the required skills: she attended the Design Academy Eindhoven, studied to become a health scientist and physician at Maastricht University and earned her doctorate in Leiden with a thesis on Virtual Reality Simulation techniques for surgery. Schijven has already collaborated with game companies WeirdBeard and Little Chicken to develop two apps for the Academic Medical Center, designed to help doctors hone their quick decision-making skills and deal with equipment failure. Both games provide a just a glimpse of what we can expect from someone who embodies the crossover between design and the medical world.¶

## MEDIALIS & DR GAME

### AMC doctors perform better with apps

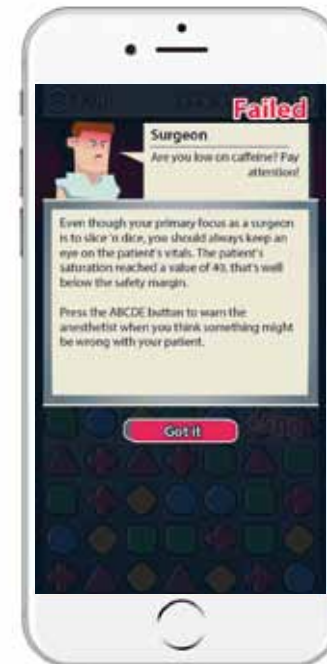
Together with game companies Little Chicken and Weird-Beard, the Academic Medical Center (AMC) developed two apps to help doctors sharpen their skills using a game. “We have shown that surgeons perform better thanks to gaming,” says Dr. Marlies Schijven.📱

Marlies Schijven is a professor of Surgery who specialises in serious gaming, simulation and applied mobile healthcare. In close collaboration with Dutch game companies, she developed two apps that surgeons in training can use to practice their skills with a mobile game. According to Schijven, “Lots of people like playing a quick game on their phone. You can take advantage of that.”📱

The apps are designed for professionals; you need to have medical expertise to be able to answer the questions correctly. The first, Medialis from game company Little Chicken, helps you learn how to quickly make decisions. You race against the clock to answer multiple choice questions about medical issues, such as removing a gallbladder using keyhole surgery or respiratory problems. At the end of the game, you can share your score with colleagues or with your instructor, says Schijven. You can challenge other players, and keep track of your score or share it by SMS, WhatsApp, Twitter, LinkedIn or Facebook. The second app is called Dr Game: Surgeon Trouble and was developed by WeirdBeard. During the game, something goes wrong with the equipment that’s essential for a laparoscopic surgeon. The player needs to go into trouble-shooter mode to solve the problem.📱

According to Schijven, it’s the first time that apps like this are available which have been thoroughly medically evaluated in advance – both games have been validated by the AMC. “We have shown that surgeons perform better thanks to gaming. That’s why it’s logical to develop mobile games. For example, in a test situation, surgeons in training who play Dr Game recognise problems more quickly, and are better at solving them than surgeons who were trained the ‘old-fashioned’ way.”📱

[www.littlechicken.nl](http://www.littlechicken.nl) | [www.weirdbeard.nl](http://www.weirdbeard.nl)



- Medialis by Little Chicken
- Dr Game: Surgeon Trouble by Weirdbeard



## XILLOC MEDICAL

### A printed piece of skull

Medical technologist Maikel Beerens designed the perfect solution for skull defects: his 3D-printed implants not only fit much better than the standard substitutes, they also require significantly less operating time.¶

Maikel Beerens often explains the process using the example of Mark, one of the people who have been helped by his revolutionary invention. When Mark fell from his bike, the surgeon removed two pieces of skull to give his swollen brain more space. When the pieces were eventually put back in place, they were rejected by his body. After four operations spanning six years, a ‘cobbled-together’ construction and a completely disrupted life, a 3D-printed implant finally gave Mark his head back. “If he had received these implants right away, he only would have needed two operations over the course of three months,” says Beerens.¶

He made his discovery during an internship at the Maastricht University: using electron beam melting, he managed to print a patient-specific piece of skull out of titanium, which was then successfully implanted in the patient. It was completely custom-made, constructed before surgery based on a scan. There are now hundreds of people walking around with implants from Xilloc Medical, the company that Beerens started four years ago. “We’re kind of a bol.com for patient-specific implants,” says Beerens to sum up the concept.¶

What’s brilliant is that surgeons from anywhere in the world can order an implant online, simply by uploading the patient’s scan. The online request and check only take about 10 minutes, and the operating time is reduced by more than half. So it’s no surprise that demand is increasing: 25 hospitals worldwide are already on board. Beerens’ goal is for Xilloc Medical to become market leader within 10 years. “I’m a designer at heart, but I’ve already reinvented myself a number of times. Lately, I’ve mostly been a passionate entrepreneur.”¶

[www.xilloc.com](http://www.xilloc.com)



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## When doctors and designers collaborate

We're aging, the welfare state is eroding and the money is running out. High time for smart solutions that ensure we can keep providing good healthcare and make those who need help less dependent on costly consultations and treatment. These solutions often come from unexpected sources. From the creative industries, for example: designers are increasingly collaborating with healthcare providers, scientists and engineers. In this book you'll discover the kind of valuable and heart-warming products and services that can lead to. ¶