Het Dorp: innovation in long term health care
Het Dorp: the Healthy Environment of the Future

Het Dorp (the village), the most famous and innovative living community for people with disabilities since 1962, in Arnhem, the Netherlands, is being radically modernized. With more than 50 years of innovative experience, Het Dorp is transformed into a super smart and healthy living environment. While the built environment was focused on in the 1960s, the modern zeitgeist asks for a different approach. Het Dorp seeks to once again be the icon of the future, where people (with or without disabilities) live in a healthy living environment, accomplished through smart technology. The ambition is huge:

a transformation into the smartest, healthiest environment imaginable, into an international flagship.

Three worlds are brought together: (1) Health; (2) Technology; and (3) Regional Development.

Real innovations derive from the overlap and connection between these worlds. Today, Het Dorp already contributes to the future. In the Academy Het Dorp, innovative parties work together to fulfil the ambitions.
The World Changes
People live longer (on average 35 years longer than at the end of the 19th century) and develop a chronic condition on average 15 years earlier. According to the United Nations, about 10 per cent of the world population has a severe disability, that is, more than 700 million people. In the Netherlands, 5.3 million people suffer from a chronic disease, which is approximately a third of the population. For people of 65 years and older, this is even 70 per cent. Additionally, 1.9 million Dutch people have more than one chronic disease, or severe disabilities that require constant attention. Consider for instance non-congenital brain injuries. The population that is permanently and severely incapacitated thereby grows with about 30,000 people yearly. Or consider the people with neuromuscular conditions, such as ALS or Duchenne. For them, ventilation is often a sheer necessity in the long term. The long-term disability also has an enormous societal impact. Through prevention and better treatment of degenerative diseases, enormous gains can be achieved for people themselves AND for society as a whole.

Het Dorp sets the Trend
“Het Dorp leads the changes in health care.” These words were spoken by Daniel Kraft, co-founder and director of Exponential Medicine at the Singularity University, one of the world’s most prominent organizations in the field of health care innovation, at its 50th anniversary.

Het Dorp will be a varied, green and sustainable district. A district that has invited the outside inside and where it is all about the connection: with city, landscape, nature and of course between people. A district revolving around quality of life, wellbeing and happiness. And a district which is on the verge of another major breakthrough.

On account of the low threshold of the technology of today, less people have to live in a specialized facility such as Het Dorp. And should they live there, it is no longer a matter of course for the duration of their whole lives, because they can be assisted – faster and better – in achieving their desired independent living.

The changes are implemented by residents, professionals, academics and businesses. The development is both smart and slow. It is about a big spatial and technological change that will be implemented step by step – smart and slow. Manageable for residents, professionals and nearby residents.
Two years ago, Lies Hebels was diagnosed with ALS. Her decreasing muscle strength has also led to a decrease in the respiration of the longs. Therefore, in consultation with Lies, her family and the physician, the decision has been made to proceed to non-invasive ventilation. This turned her life, and that of her children, upside down.

“I could only go home once the situation at home was safe and sensible. This means: adaptation in the house so that I can appeal for help in a timely manner when suffering breathing difficulty. And, in addition, sufficiently trained people to assist me in these situations.” An alternative is a specialist residential facility where people on respiratory support can live. These places have limited availability in the Netherlands. People live separate from their families and far away from their residence. “I did not want that. I wanted to be able to live with my family in my own environment, as much as possible independently of third parties.

Therefore, Lies has chosen for temporary living in Het Dorp in a ‘normal’ house where she and her family received network training in ventilation. “It was nice to have a personal residence there. I could practice the situations that were important to me together with my children and carers.” Thereby, she gained the confidence that together, they could organise this even at home. Safety was, and is, important to Lies. “The conversations with my councillor on the topic were very supportive.” In this way, she could practice how she could organise her tube feeding at home. She dared to travel further from her home which made her experience a renewed sense of freedom. This gave her the feeling that she could resume her place in the family in full.

In the meantime, Lies has returned home. She feels that she was well able to organise the support she needs with her children, carers and the Home Health Care Services. However, she misses a good paging system at home. “Fortunately, my sons are practical and have rigged a system that suffices for me, but it gives less security. I have a call button, but what if it fails or no one hears it? If the system from Het Dorp would have worked in my home as well, it really would have been ideal. Then, I would have gotten even more of my independence back.

“The training in ventilation in Het Dorp gave my family and me the confidence that we would also manage at home”
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Lies Hebels
Development 1: Health, dealing with your own challenges
At the end of 2014, Machteld Huber presented a new concept for health: health stands for the capacity with which people adapt and have autonomy, in the light of physical, emotional and social challenges in life. This new concept is in line with the current zeitgeist, where health care is going through a transition, amongst others towards a more user directed context. Huber thereby enforces the work that Siza has already been doing for years: assisting people in learning to deal with their limitations in their own life, so that they themselves can determine what they want and what they do, without forced dependence on anyone else.

People want to arrange their own lives. That is also laid down in new legislation by the government. Economic motives also play a role: health care costs too much. Within five years, the costs for health care would, without intervention, lead to spending half of our salary on health care. The citizen can depend less on assistance sponsored by the government. Efficiency measures of health care providers alone cannot be enough. Quality, personal choices and autonomy in a personally chosen (living) environment will not be achieved in that manner. Using new technology can make health care cheaper, and also satisfies the need for autonomy of the Dutch citizen in particular.

Development 2: Technology at the heart of life
Siza has been an incubator of innovation in health care. The use of technological aids is highly valued and the client AND provider are stimulated to use these possibilities. The utilization of technology, however limited, often makes a world of difference. All of a sudden, someone is enabled to organize what is necessary oneself. An app makes independent travel by public transport possible in spite of the physical disability. By means of eye control of home automation, someone without hand function can still open and close the curtains. And robots take over the tasks that you cannot perform yourself.

In 2012, two special residences (Paswoningen) have been completed in Het Dorp, specifically developed for people with disabilities, with the newest technologies and smartest solutions. They have been developed from the viewpoint, and with the collaboration of the users. This, and the collaboration with health care professionals, businesses, artists and designers, has led to a beautiful and thought out interior and lay-out of the residences, wherein almost everything is controllable via a tablet or eye control: from coffee machine to doors and windows, the rotating kitchen or the sofa bed. Use is also made of wearables, sensors, smart cameras and Internet of Things. They make people and the health care smarter and can contribute to a
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Adjusted kitchen in Paswoning
much smarter utilization of professionals. This technology can particularly be combined with the data and knowledge that the technology provides, whereby new insights are uncovered for client, carer and assistant.

Thus, a shift is made from ‘technology associated with health care’ to ‘technology at the heart of health care’. This is put in the foreground in the support system CareWithMe, developed by Siza. Instead of ‘we do everything for you’, we move to ‘we help you to organise it yourself’. The challenge behind CareWithMe is to develop a learning system of people, sensors, software and hardware in the buildings and surroundings. The result is that the surroundings are even more supportive for the client and his or her wish to live independently as long as possible. And the learning environment that has been created in Het Dorp, ensures that also the next (comparable) client will be better supported.

In order to stimulate the progress of use and development of innovation in health care, Siza has founded the ‘Field Lab Disabled Care’, supported by the Province Gelderland, Oost Ltd, and Health Valley: an incubator in which is intensively collaborated with the users, from the successful developing, the expedient researching and accelerated introducing onto the market of tested technology and solutions in health care. Users, health care organizations, and businesses research and develop together in this incubator. Additionally, Siza is co-developer of various product innovations, such as the application GoOV, whereby someone can travel with public transport by oneself, and is not always dependent on taxi transport anymore.

**Development 3: Environment and Building as a Condition for Health and Happiness**

There is increasing understanding of the fact that the quality of a building and living environment are enormously important to health and a pleasant life. That is also the starting point for the new construction of Het Dorp. (Urban) transformation, healthy districts and climate adaptation are big challenges (inter)nationally. Districts become smart and sustainable ecosystems, in which people can live a pleasant life. Het Dorp will be the flagship for the building and setting up of new districts in which the quality of life and independency are the focus.

‘Building A’ is, in 2016, the first building with thirty six new care apartments. The building breaks with the existing living and health care visions. It is built on the basis of the principles of Active House and Healing Environment: inside climate, comfort and energy are balanced, the living comfort and the health of residents are the focus, and the built environment contributes to the physical, mental and social wellbeing of users. In the design and use of the innovations, the user is centred on (User-Centred Design).
Gijs van der Brink is 37 years old and the proud father of a daughter of 4. Gijs worked as a lean consultant at Essent when he suffered a cerebral haemorrhage 2.5 years ago. “From that moment on, a lot has changed in my life. My work has ended and I have been living in Het Dorp for nine months now. After my rehabilitation, I first lived somewhere else, but that did not go well. In Het Dorp, I can do things that suit me and I come into contact with others easier. Yet, I do not perceive myself as a changed man. Before my stroke, I was mostly focused on the future, now I live from day to day. I do the same things, but in a different manner. I made my job out of my hobby filming, for which I could never find time. At Essent, I had a lot of contact with people. Even now I want to be meaningful for others, I want to formalize this in future. How?

I do not know yet, that will come my way. It is important to me that I develop myself further each day.”

At a first glance, the small things are what bother Gijs, but he experiences them as very annoying. “For instance, a sheet that I cannot pull over myself in the night. I hate that I then have to ask an assistant for something so small. If a solution could be found, that would be nice. Also, my short term memory is not what it used to be. If I have to do multiple things at once, I forget what I have agreed to. Sometimes, I forget things completely, while I always used to know exactly when I had to be where. I now enter all my appointments into my I-pad; that is already a big improvement.”
Paswoning
Building A does not only function as a showcase of health care innovation but also as an innovation centre, in which the interaction between residents, professionals and smart developers will again lead to better and newer solutions. Additionally, it is a building forgoing the use fossil fuels – it even produces energy – and waste flows are reused. Building A does not stand alone but is part of a smart ecosystem that has been designed for Het Dorp. The building will be part of a smart grid with among others a heat and cold storage which generates heat in summer and stores it in the ground for use in winter.

The Paswoningen and Building A together constitute the stepping stone for a sustainable regional development of the entirety of Het Dorp. The different development lines that are given form in Building A constitute the building blocks for all following buildings. Through the use of monitoring and user experiences, the building blocks will be increasingly smart: from learning building to learning environment.

**Design Building A**

Building A has been designed from the inside outwards. People discharged from the rehabilitation centre can come here to get their life back in order. They still have to learn to deal with their disabilities. This is an emotional process that is paired with much frustration about the loss of control over their own life. This subject was leading in the design of the residences, the spatial lay-out and the transition from public to private. By means of routing or smart interfaces, residents can exert control over the interaction with their environment at every level.

Each level has an average of seven residences with a shared south-facing terrace. The residence is the private domain where one can be undisturbed, but also come into contact with the neighbours. Everything is controllable by tablet or phone, for instance the front door and big glass panes that slide down to let in sun and fresh air. Thanks to the large panes, the residents have a fantastic view of the green surroundings (het Veld – the field) and a lot of sunlight enters the residences. The hallways are extra wide and are pleasant to stay in.

The tiered terraces on the north side form the roof and ceiling of the innovation centre. By folding the glass panes inside, a controllable interface between residence and innovation centre is created. From the galleries at the different levels, residents have a view of the high lobby of the innovation centre, and can easier orient themselves by means of this anchoring point.
The sloping landscape provides the building with two ground levels. The head entrance is accessible from the Amsterdamseweg and is located at level 01. There is also an entrance with a direct connection to the Dorpsplein (village square). Residents can choose between a route with more or less stimulus and encounters.
New Financing and Earning Models for Health Care

The innovative strength of the Netherlands is great. The Netherlands – as is well known – are a leader in the field of water and energy. This also applies to health care. The Netherlands have been in the top 3 health care systems of Europe since 2008.

In Het Dorp, innovations are accelerated and new products developed. The products are tested and further developed together with users, residents and employees of Het Dorp. These innovations and products change the world of health, technology and regional development. New possibilities and business models are created by means of the cross-overs, experiments and user experiences. These innovations are scalable and (inter)nationally marketable, creating new investment capital for further development. Additionally, the innovations are suitable for implementation in other fields of health care and society. Collaboration within Het Dorp also stands for collaboration with the world. We want to increasingly use the resources of the world as a subcontractor of knowledge and we want to test and implement innovations worldwide.

Therefore, the collaboration is interesting for businesses, governments, knowledge institutions and of course Siza itself. Parties invest in, and recoup from health care products, products in the field of health care technology and building technology. Additionally, they market innovations, for instance in a package deal. They also strengthen their own marketing, knowledge and network.

Businesses work on concept and product development in Het Dorp. They invest in their own products and strengthen these through the network; the open collaboration and cross-overs that are created with the other parties (businesses, governments, knowledge institutions and Siza). Additionally, the users are nearby. The concepts and products are immediately tested by users in Het Dorp. This user experience assists in the re-strengthening of the concepts and products and in making them scalable and marketable. Het Dorp becomes the flagship, a showcase for a healthy living environment of the future. Partner businesses can make use of this trade mark in their own marketing. Furthermore, they can use the collaboration for talent development and intake for their own personnel.

Knowledge institutions bring together knowledge from different disciplines and find a common field and cross-overs. A holistic approach and research in the field of, for instance, Active House is made possible. All parts, all pieces to the puzzle, come together in Het Dorp after all. Additionally, they are able to put feelers out on the market via direct contact with businesses, and user experience via direct contact with residents.
Also for governments, the development in Het Dorp is interesting. The knowledge and innovations are applicable nationwide and worldwide: Het Dorp is a flagship district. It is a smart society centred on health and happiness. Thanks to the innovations, the costs can decrease, and the Netherlands stays a leader with its innovation power and health care system. Issues such as prevention, eHealth and a district-oriented approach come together in Het Dorp. These ambitions align completely with the ambitions of the national, provincial and local government: governments, businesses, social and health care organizations, and citizens, work together better to strengthen the autonomy of people. Everyone should be able to participate in society and live as independently as possible.

With the developments in Het Dorp, Siza invests in her own core business and quality. Clients get even more autonomy over their own life.
Academy Het Dorp
The renovation of Het Dorp has no format, and requires an unusual organization in which people who live and work in Het Dorp, knowledge institutions, businesses and governments challenge each other to the full. Therefore, we have set up ‘Academy Het Dorp’, a collaboration with innovative leaders who want to fulfil the ambition with us. In this context, we are looking for international partners (businesses and knowledge institutions) that encompass the best of three worlds:

prominent organizations in the field of:
(1) health,
(2) technology and
(3) regional development.

Innovation that is valuable to all parties involved will be derived from open collaboration at precisely the overlap and connection between these worlds. Together with the partners, we want to set up a disruptive innovation program and work on solutions and innovations which can be used for the residents, and thereby are scalable and marketable.
Invitation

Would you like to contribute to THE innovation in long term health care? Contact us!

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Rob Hoogma
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With the robot arm on his wheelchair, Robert van Ginkel can eat, drink and brush his teeth without assistance. It is nice to be able to eat on your own time – and at your own pace. If you require assistance, sometimes it has to go quicker than you want because also others are waiting, or you do not actually have much of an appetite yet.

Robert controls the robot arm with a series of buttons on the table top of his wheelchair. Each button has a command: to the left, to the right, up, etcetera. It took a while to master. “But now I do it without thinking,” says Robert.

His smartphone also has a holder on the table of his wheelchair. He can control it with one button. The cursor moves over different menus, where he can click on different options.

In this manner, Robert can also email and use WhatsApp. Robert found the phone on the Support Convention in Utrecht, a yearly event for people with a disability and people who work in disabled care. “My phone is very important. I can contact friends or call a taxi.”

Robert agrees wholeheartedly that technological advancement is one of the pillars of the renovation of Het Dorp. He himself would like to contribute to the thought process, with a designer of a technological business, on the development of a robot which can get a drink from the fridge and pour it in a glass. “That is not yet possible with this robot arm. Therefore, I have to call an employee if I want something to drink, and sometimes that takes a while. I would like to have the freedom to do that myself.”
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