

# Health Tech

Business Opportunities  
in Stockholm-Uppsala

November 2017



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Health Tech is an emerging field that provides new types of services and products for lifestyle changes and health care.

Positioned at the interface between traditional life science and ICT the Health Tech industry has a broad audience of costumers, ranging from individuals to health care providers and insurance companies.

Health Tech includes concepts like Digital health, e-health, Life Log, m-health, Quantified Self, Tele-health, Wearables and Well Tech.

Today, technological innovations are transforming health care on a global scale and creates irresistible business opportunities along the way.

Prolonged life expectancies and growing numbers of patients with chronic diseases, along with the fact that people are becoming more and more interested in assuming more personal control of their health and wellness, have led to a situation where countries all over the world are facing ever-increasing demands for healthcare services. Unfortunately, the other side of the equation, the healthcare funding, isn't keeping up. Something has to happen, and that something is Health Tech.

Before we show you a selection of promising companies that we think will be part of the Health Tech revolution, let's have a look at some of the reasons why so much of this interesting development is taking place in the Stockholm-Uppsala region. And why we think you should get in early.

# 1. Why Stockholm-Uppsala?

Stockholm-Uppsala is by no means the only place where the Health Tech revolution is brewing. It is however, one of the few places where you find both a world leading ICT cluster and a very strong Life Science cluster in virtually the same spot. Everything needed for interdisciplinary cooperation to succeed is within easy reach and key personnel can't help but bump into each other on a regular basis.

## The Unicorn Factory

Stockholm-Uppsala is home to one of Europe's most important tech communities and some of its fastest growing startups. Dubbed the "Unicorn factory" by the Financial Times, the region has the most unicorns per capita in the world after Silicon Valley. But it didn't happen overnight. Stockholm's tech scene has developed over decades into what today is a world-class, mature startup hub. Good technical and business schools, a critical mass of people eager to start their own businesses, events and meet-ups, co-working spaces, a supportive government, angel investors and VCs, the talent needed to turn ideas into viable businesses – it's all in place and working in favor of the region's entrepreneurs.

The Life Science cluster in Stockholm-Uppsala on the other hand is one of the leading ones in Scandinavia and one of the world's most productive. The close ties between industry, academia, society and healthcare ease the development of ideas into commercially viable products. Five of Europe's finest academic institutions, among them Karolinska Institutet, with world renowned research and education in medicine, engineering and biology play their part too. Add the large medical databases and the basic principle in Sweden that the individual researcher owns the result of his or her research and you get the perfect conditions for new and profitable ventures.

## The Health Tech trinity

It doesn't stop there. What really provides the perfect conditions for Health Tech is the unique mix of healthcare institutions, medical industry and digital know-how found in Stockholm-Uppsala.

It's in the intersection of these three crucial sectors where many of the new ideas come to life. Add a population of tech-savvy early adopters along with authorities willing to try new technology to alleviate rampant health care costs and you get a perfect test market for new Health Tech products and services.

## Global outlook

The Swedish market is small in comparison to other European markets. This may at first glance seem like a disadvantage, but the upside is that it forces the region's startups to adopt a global outlook from day one, since the home market will never suffice. To help even more innovative startups to grow in global markets, The Structural Fund Partnership Stockholm County has granted Stockholm Innovation & Growth and collaboration partner Stockholm Science City Foundation, SEK 40 million over three years for the development project "Growth & Internationalisation".

The project aims to develop:

- Cooperation between small and large companies in the region.
- New financing platforms for growth that will increase the availability of venture capital.
- Matchmaking activities between emerging growth companies and people who want to start working in such companies.
- Industry-specific efforts to develop interaction between emerging growth companies, academia and new communities in areas such as health care, games and the music industry.
- Soft landing opportunities in other countries that can facilitate for Swedish companies to establish operations in new markets.
- Cooperation between relevant actors in the region working with growth and internationalization consulting.

**"Sweden is a small country and anyone with an idea knows that they have to go global. That's why so many global companies are born in Stockholm."**

Bonnie Roupé  
CEO & Founder, Bonzun

## State support for Health Tech

In order to implement new technologies and processes, economic investment isn't enough. There's also a need for removing legal stumbling blocks and changing heavily regulated environments with risk-averse, process driven cultures that has been in place since hundreds of years. In order to speed up the transformation, the Swedish government has set a goal to become the world's best country in the area of e-health by 2025. As a result, several prerequisites for implementing a digital transformation of health care are currently being changed or are already in place in the Stockholm-Uppsala region.

## Insurance companies are getting in on the action

The really big savings from Health Tech will come from treating people with chronic diseases, which account for a significant part of Sweden's health care costs. Factor in the fact that private health insurance has tripled over the last ten years in Sweden, and it's easy to see why the insurance industry is one of the major drivers behind the Health Tech transformation. Medical insurers have realized what the traditional health care systems haven't; that the most substantial savings from the new health technology will come from prevention rather than treatment. Expect further involvement and investments from insurance and Life science companies shortly.

**“Today AI technology has many applications. It is behind the recommendations that streamed media services make based on consumption habits, in the assistants in our phones and as advisors in areas such as healthcare and legislation. And consumers believe it is here to stay.”**

Ericsson ConsumerLab  
10 Hot Consumer Trends 2017

## H2 Health Hub (H2)

It's an old saying that the best way to fast-track your business is to surround yourself with other highly motivated business builders. In 2016, Paul Beatus, CEO & Co-founder of H2 realized that it was high time for a permanent meeting place for the many Health Tech startups in the Stockholm-Uppsala region. And it wasn't only to help entrepreneurs focus on their businesses rather than juggling infrastructure issues. “Health Tech startups are often venturing into uncharted territories as they try to integrate their health solutions into preexisting healthcare systems and face a number of specific challenges like regulatory issues, data storage concerns and the choice of business models. We wanted to create a co-working space where people could work, collaborate, create, and share their experiences and build new ecosystems together”, says Paul. Perhaps the biggest benefit enjoyed by the startups are the synergies created by the close interaction between startups and partners which are large companies like Samsung, Pfizer and Bonnier, representing a selection of business sectors which will play a role in the future health ecosystem. Tomorrow's health solutions have to be co-created with all stakeholders in close proximity. Therefore, H2 is located at the very heart of Hagastaden, in a unique environment that gives them access to not only the Karolinska University Hospital and Karolinska Institutet, but also many county council functions as well as many biotech companies. “All of our startups are aiming at a global market and our industry partners, who all are large

global companies, can be of great help to fast track growth through access to expertise, distribution networks and sales channels.” The very first member was Werlabs (see Hotlist-section), a company that started out with four people and which has since moved on to their own premises after experiencing tremendous growth. “The next step for us is to form even more partnerships with partners and continue building the value chains that are needed for the success of the Health Tech sector”, Paul concludes.

## **“We are a watering hole for investors who are interested in what the Stockholm Health Tech scene has to offer.”**

Paul Beatus  
CEO & Co-founder, H2 Health Hub

### Lead Patients

We’ve all heard healthcare providers complain about the fact that their patients use Google to read up on their illnesses and have the audacity to want a say in the way their illnesses are treated. But what if we could harness this ambition among patients to assume a greater responsibility for their own health, rather than viewing it as a threat? That’s the thinking behind a state funded project at Karolinska Institutet called “Lead Patients”, headed by PhD student Sara Riggare. A Lead Patient is defined as a patient (or informal care giver) who develops strategies and methods to maximize his or her ‘feel-well-time’, while living with a life-altering illness. The project’s name is derived from the well-known concept of “lead users”, or in other words people who are ahead of the majority of the market on a major market trend, and who also have a high incentive to innovate. The concept of collaborating with lead users to identify new market opportunities and solutions is widely used in most industries, but has until now not been employed by the health care and life science sectors. “Today, the people who experience the problems are not viewed as a viable part of the solution. We want to change that”, says Sara Riggare. She and her colleagues are creating a center for lead patients, where training and education, regardless of diagnosis, will be delivered. The center will contribute to radically improving the way healthcare meets the competences and expectations of patients in self-care and improvement work – all to the benefit of the Stockholm-Uppsala Health Tech scene. The potential is vast: A recent report shows that if 20 percent of Swedes who face chronic illnesses, can be encouraged to assume greater responsibility for their own care, healthcare costs can be lowered by some SEK 2.8 billion

“In order to have a vibrant life science industry in the future, we need to involve patients and relatives.”

Sara Riggare

Founder of the Lead Patient project

## AI - it's everywhere

Artificial Intelligence (AI) is quickly becoming one of the hottest topics in Health Tech. This is due to a rapidly increasing availability of information in digital format, technical progress in so-called deep learning and machine learning as well as platforms that make the technology available. In turn, this creates new and exciting opportunities in everything from drug development and cancer research to decision support and clinical trials. The region's biggest player in ICT – Ericsson – named AI as the number one trend in their “10 hot consumer trends 2017”-report. They are not alone in their faith in AI. Harpreet Singh Buttar, an analyst at Frost & Sullivan predicts that “By 2025, AI systems could be involved in everything from population health management, to digital avatars capable of answering specific patient queries.”

## A numbers game

Though perhaps not the most glamorous part of the new gold rush, the unsung hero of the AI revolution is data. Lots and lots of data where AI can derive, structure and analyze information from different types of sources, both structured and unstructured. And nowhere are large, longitudinal medical datasets more readily available than in Sweden. The Swedish national personal identity number (“personnummer” in Swedish) was introduced as early as 1947 and is probably the first of its kind covering the total resident population of a country. It's widely used for everyday purposes in Swedish society, not least in the healthcare system, and makes it possible for researchers to follow patients literally from cradle to grave, something that is more or less impossible elsewhere. Add the strong Swedish tradition in computing and automatic data processing along with the early adopter mindset prevalent among Swedes and it should come as no surprise that giants like IBM, Microsoft and Amazon are already ramping up their AI-efforts here.

## Some interesting AI-related companies from Stockholm\*

- *Coala Life* adds machine learning to its portable product and cloud service for self-measurement of the heart.
- *Aifloo*, a Kista start-up, develops an AI-based security system run in a pilot in care homes.
- *Shim* has attracted venture capital for the development of an intelligent consumer product, the chat bot Shim, which “Helps you get to know yourself and strengthen relationships with people you care about.”
- *Furhat Robotics* builds a social robotic head that uses a proprietary operating system for “social intelligence”.
- *Gavagai* is developing a tool optimized for analyzing text data from open answers in questionnaires, a process that is usually done manually and is very time consuming.



- *SAS Institute* is a major Swedish international analytics company, which has launched a commitment to AI for the Swedish healthcare industry.
- *HealthiHabits* uses a combination of AI and machine learning to discover healthy habits and helps users achieve sustainable behavioral changes.
- *Brighter* focuses on diabetes systems for the international market. AI is in their pipeline and they have active collaborations with AI companies.
- *Lifesymb* develops real-time motion analysis using machine learning and 3D cameras.

\*Source: Artificiell Intelligens och machine learning för sjukvård och life science, Henrik Ahlén, Alfa Bravo, Stockholm Science City Foundation, Feb 2017

## 2. Recent Investments in Stockholm-Uppsala

The Nordic Web, a digital publication keeping track of investments and startups from the Nordic region, published a new report in January 2017. According to the report, interest and investment in Stockholm continues to rise, with a total of 247 investments made in 2016 compared to 90 investments during 2015 – an increase of 175%. In relation to the other Nordic countries, Stockholm strengthens its position as the capital of Scandinavia, representing 54% of the total amount invested in the Nordics.

**“In 2016, 1 in 3 investments that were made in the Nordics were made in Stockholm, up from the 1 in 4 in 2015. This is despite investment increasing across the Nordics, meaning that Stockholm continues to outpace them all.”**

Neil Murray  
CEO, The Nordic Web

### Health and Wellness investments in Stockholm-Uppsala Jan-Feb 2017

Company	Investment (USD)
MedUniverse*	1-3M
Magnea	<0.5M
Winningtemp	<0.5M
Fitness Collection	<0.5M
Coala Life	3-5M
Belly Balance	<0.5M
Noseoption	<0.5M
Irris	10-20M
Competencer	<0.5M
Natural Cycles	5-10M
Coala Life	1-3M
Airunum	<0.5M
WeMeMove	0.5-1M
Lifesum	10-20M
Werlabs*	3-5M
KRY	5-10M
Fitness Collection	0.5-1M
Aifloo	1-3M
Bluecall	Undisclosed
Shim	<0.5M

Source: The Nordic Web

\*For more information on these companies, see following pages.

## 3. Why you should invest

Fifteen years ago everyone wanted to work for the big telecoms in Stockholm's "Wireless valley". Today, many of the most creative minds from that era are working together in other areas like the mobile and gaming industry, transaction technologies, streaming music and of course, Health Tech. Quite a few are going it for themselves. Many for the second or third time after having started companies that by now have become global businesses. This of course means that they have found out what works and what doesn't. If that isn't a good reason to get in early, we don't know what is.

In summation, this is why we think you should look closer at the Health Tech sector in Stockholm-Uppsala:

### 1. Unique business opportunities

The challenges within health care are real and need to be addressed. This is a huge industry ripe for disruption.

### 2. The trend is clear

The number of Health Tech investments in the Stockholm-Uppsala region rose from 11 in 2015 to 20 in 2016.

### 3. Portfolio weighting

The fact that investors are allocating a greater percentage of their assets into Health Tech shows confidence.

**"It's a very vibrant scene with many interesting start-ups and innovative technologies. As a pan European VC it's a must to look at the Stockholm region for exciting opportunities."**

Karlheinz Schmelig  
Managing Partner, Creathor Venture

## 4. The Hot List

The Stockholm-Uppsala Life Science Investment Hotlist is a project supported by the European Union and features a carefully selected list of investment cases. The list is curated by Invest Stockholm and is intended as a tool for investors focused on disruptive commercial innovation in life science. It's updated continuously and to qualify for the list, the companies must offer a product or service, based on unique research that will lead to a commercial solution with global potential. They must also have established themselves in the market with a finished product or service, alternatively, be close to the commercialization phase.

On the following pages you find a selection of startups from the Hotlist that are poised to change the health care industry as we know it.

### **“We’ve seen a dramatic increase in the number of investment enquiries in this sector over the last few years”**

Ylva Hultman  
Head of Life Science, Invest Stockholm Business Region

#### **Axess Lab**

*Challenge:* Patients often miss their appointments. It's so common that it's even got its own term: "no-shows". These no-shows account for between 5-15% of all health care appointments. On top of that, 30% of all phone calls to health care providers concern appointment times. Each no-show costs the health care system at least SEK1 000. On top of that, no-shows lead to increased administration, treatment queues and patient frustration.

*Solution:* Dit-i-tid (Swedish for "there in time") is a reminder service that reduces the number of no-shows. The Stockholm based company Axess Lab has developed the reminders with government funding, together with patients that have aphasia, mental illnesses and cognitive impairments. The service takes sms(text message)-reminders to the next level. Patients can receive more than one sms and at times they pick themselves. The reminders include maps, directions, add-to-my-calendar-buttons and contact information. In other words: everything the patient needs to remember the appointment and get there in time.

#### **Begripsam**

*Challenge:* Most companies and organizations want more customers. But many of them

miss out on potential users by not considering people who deviate from what is considered normal or average. They simply don't have the know-how needed to implement the design and development processes that take into account the high requirements of accessibility, usability and user experience that are needed when users have different mental and cognitive disabilities.

*Solution:* The Stockholm based consultancy Begripsam AB wants to contribute to more universally designed products and services to meet all users, regardless of ability. The company develops and applies methods so that everyone can participate and influence how products and services should be designed. Begripsam AB conducts research and development independently or in collaboration with others who share its vision. Its methods and practices are rooted in research and lived experiences. Together with the members of the non-profit association Begripsam, the company participates in the standardization work both in Sweden and on an international level. The ultimate aim of the business is to contribute to a society where everyone can fulfill his or her potential.

### **Biosync Technology**

*Challenge:* Stress is an epidemic of the 21st century, causing financial loss and decreasing the quality of life of millions. The WHO estimates that stress costs the US economy \$300 billion dollars a year. The picture is similar in Europe, where stress is the second most frequently reported work-related health problem. As many as 50-60% of all lost working days are attributed to work-related stress and the number of people suffering from stress-related conditions caused or made worse by work is likely to increase. Stress also has a direct impact on prevention and the treatment of major chronic diseases such as Diabetes, Cardiovascular Diseases, Chronic Pain, Multiple Sclerosis, and Asthma. Yet, stress is not addressed in our daily lives.

*Solution:* Biosync Technology has developed a portable biofeedback system comprising a stress sensor that measures skin conductivity connected to a mobile app, a web app and a cloud-based IT system. The system uses a graphical interface through which users can learn about which social and practical situations increase their stress levels, turning Biosync's solution into a tool for daily life stress management and self-learning. In combination with the company's unique algorithm for data analysis, the system offers great potential in various applications, e.g. cost savings by primary and secondary prevention of stress related diseases, improved chronic disease management, sports.

### **Blodkollen**

*Challenge:* People are becoming more and more health conscious. But wellbeing has until today been focused on how we look or what we eat, with too little emphasis put on how our bodies respond to our lifestyles. In today's society, individuals who aren't already showing symptoms of disease have limited access to thorough health checks and detailed feedback from physicians, nutritionists and fitness experts. This state of affairs limits people's ability to act proactively in order take responsibility for, and enhance their wellbeing – something that could potentially save society vast sums in health care costs. It also poses problems for those who want to optimize the results of their exercise and dietary efforts.

*Solution:* Blodkollen (Swedish for “the Blood Check”) makes blood analysis available to anyone who wants to take charge of his or her own health and wellbeing. Different types of checks are offered online and the blood analyses are performed by more than 100 third party clinics throughout Sweden. By having their blood analyzed, people get insights about key health parameters and objective feedback on what’s good about their health and life style, what needs attention and what can be improved. This gives Blodkollen the potential to save money for both public health institutions as well as customers by bringing knowledge about their health status before they go to the doctor. It also gives the doctors more time to focus on the specific help they can provide as professional physicians.

### **Bonzun Health Information**

*Challenge:* Every day, approximately 800 women die from preventable causes related to pregnancy and childbirth. Yet, many health care facilities lack obstetric doctors and are insufficient for patients. Another issue facing pregnant women is that they often have no-one to turn to with sensitive questions and crowded waiting rooms make them hesitant to go to the hospital with minor queries. Unfortunately, this lack of information all too often leads to preventable pregnancy and infant deaths. Mothers themselves are affected too: China has the highest amount of suicide among women in the world, a fact the WHO links to the country’s lack of support during pregnancy.

*Solution:* Bonzun’s app is the first complete e-health app for pregnant women. It offers pregnant women (and expecting fathers) access to pregnancy specific research, information, symptoms checkers and test trackers that help them establish whether the changes to their bodies are normal or not. This helps them understand their symptoms; establish whether they should be concerned and aims to put their minds at rest. For women with limited access to health care, Bonzun’s app can be a life-changer. The app has been downloaded 1.3 million times since Jan 2015 and was nominated as China’s Top Mobile and Internet Startup 2015.

### **Byon 8**

*Challenge:* In the primary healthcare sector, a lot of time is wasted determining a patient’s clinical picture, anamnesis, and of course, in obtaining the correct diagnosis. This places patients at risk of malpractice and leads to cost increases for the health care units. In many cases, clinics are forced to hire expensive contract doctors to make up for lost time.

*Solution:* In 2012, Stockholm based BYON8 set out to change this unsustainable situation when it started the development of a new A.I.-based diagnostics platform. The solution supports patients in providing their doctor with a correct account of their medical history and current symptoms. It also makes it easier for the doctor to make the right decision on diagnosis and appropriate prescribing. The company’s diagnostics solution AITOPYA can minimize time spent by providing more efficient and accurate access to patient information, maintain good continuity with the patient, and rationalize documentation and administration with up to two hours per day and physician. The result for correct diagnosis and treatment is improved from today’s level of 60% to over 90%! AITOPYA will provide better conditions for successful prevention and care of patients, both in Sweden and

globally.

### **Challengize**

*Challenge:* Investing in employee health is one of the best ways any company can spend its money. Business health initiatives increase wellbeing, motivation, and productivity while cutting down costs of health care and the risk of chronic diseases. Studies have shown that workers who take part in health initiatives drop their absenteeism and medical expenditures by around 25%. The challenge is how to motivate employees to get more active and create a healthier company culture where everybody works together towards the same goals.

*Solution:* Challengize is a social, modern and 100% digital team health challenge. It puts the focus on healthy everyday exercise, team-building and in creating a winning corporate culture across a company's entire organization, no matter where in the world the employees are or what kind of exercise they favor. Cycling or yoga. Walking or aerobics. They all count. Challengize creates a unique key around each user and by adding activity, time, distance etc, the algorithm creates individually based Challenge Points. Using Challengize's social networking platform, it's easier to create commitment and engagement between all employees, as well as creating positive PR. Challengize offers measurability that shows how much well-being has increased on a team, unit and company level for each challenge. In the end, the company will have more active, motivated and united teams, making everyone a winner.

### **Coala Life**

*Challenge:* Cardiovascular disease is the leading cause of death in the world. More people die from cardiovascular diseases than from AIDS and all forms of cancer combined. In Sweden, four out of ten Swedes die of heart diseases. A key contributor is late diagnosis and many are affected without knowing it. Early detection has the ability to save lives.

*Solution:* Coala Life, a Swedish medical technology and life science company focusing on heart diagnostics and mobile health, has developed the Coala Heart Monitor, a patented and commercial solution for remote monitoring and self-screening of heart sounds and ECG. The hardware and cloud based solution with smart algorithms makes it possible for everyone to monitor his or her heart anywhere, anytime. The service is enabled in close contact with physicians and cardiologists. Many heart diseases can be detected and appropriately treated through preventive screening and diagnostics, including auscultation (listening to the heart) and ECG. The problem is that many people aren't aware that they have a heart condition. Coala Life was founded in 2004 to change just that. The company's solution replaces an analogue device from the 18th century, the stethoscope, with a digital solution that records heart sounds, ECG, and heart rate. This allows many heart diseases to be detected and treated early, including atrial fibrillation, which significantly increases the risk of stroke. A series of patents and unique technology form the basis for the system.

## Gleechi

*Challenge:* Every year over 1.5 million people suffer from strokes, with more than 50% suffering from long-term disability. Rehabilitation often requires the patient to meet with a physiotherapist several days per week, which is a major problem for many patients. The most common reason for patients not recovering is due to lack of motivation since rehabilitation requires the patient to perform monotonous repetitive exercises several times a day. Attempts have been made to enable patients to perform exercises in front of their computer using sensor systems to track the patient's movement. However, these solutions are still limited to simplified body exercises and are not able to let the patient practice more complex exercises, such as hand and finger movement.

*Solution:* Gleechi develops the software VirtualGrasp that enables hand interaction in virtual environments. The technology is coming from several years of research at KTH and enables stroke patients to do rehabilitation tasks for their hands in front of a computer. VirtualGrasp is the only solution on the market for visualizing fine finger movement and accurate grasping, thus enabling patients to perform relevant and motivating exercises in front of their computers in their homes. The predictive software enables patients to perform tasks in the virtual world that they are not able to do in real life, thus accelerating the rehabilitation process through the concepts of visual amplification.

## Gnosco

*Challenge:* As many as 500 people in Sweden die every year due to malignant melanoma and the cost of skin cancer care in Sweden exceeds SEK1.6 billion annually. According to the WHO, the incidence of both non-melanoma and melanoma skin cancers has been increasing over the past decades. Currently, 132,000 melanoma skin cancers occur globally each year. Early detection of melanoma is crucial for disease prognosis. Melanoma specialist skills should therefore be within easy reach for the general practitioner during the patient's first consultation.

*Solution:* Stockholm based Gnosco's product Dermicus is a CE-certified telemedicine platform specifically aimed at more efficient communication between specialists and general practitioners. Besides handling patient cases faster and more efficiently, Dermicus is also an E-learning platform. The system includes a mobile phone, an application, a customized dermatoscopy and a server platform. The General Practitioner (GP) uses mobile teledermatoscopy to send clinical data and pictures through a mobile application to the platform. Gnosco has developed two products: Dermicus Mole and Dermicus Wound. The former puts Melanoma specialist skills within easy reach for GP's. The second does the same for patients with Slow-healing wounds – another big drain on healthcare resources that accounts for 2-4 % of the Swedish health care budget.

## HealthiHabits

*Challenge:* For many chronic diseases, like diabetes, behavior is perhaps the most important aspect of health. But patients and close relatives are often confused about living with the disease, and find it difficult to make good decisions about daily activities related to diet, exercise, stress and medical guidelines. Not sustaining healthy behaviors



leads to significant health risks such as blindness, amputations, stroke & premature death. Regrettably, health care professionals do not have the time to guide patients continuously, which leaves people with a chronic condition in need of good support tools in their daily life.

*Solution:* HealthiHabits enables people with diabetes to maintain a healthy life style by easily connecting with people that have similar medical backgrounds and health goals. The technology is designed by HealthiHabits together with researchers in collaboration with Karolinska Institutet Innovations AB and STING. HealthiHabits provides a diabetic user with personalized information, motivation and interaction with similar people that have been successful in controlling their condition. Healthihabits is the only solution on the market that uses artificial intelligence in the context of a people-to-people platform with the goal to personalize solutions to the user. Thus making it easier for a person to maintain or change their daily habits to obtain long term health outcomes that can prevent disease progression and the health risks connected with diabetes.

### **ImagineCare**

*Challenge:* While health care systems all over the world provide care, the care isn't based on people's schedules, needs and almost never takes advantage of existing technology. In fact the opposite is true. Patients simply don't get access to the best available clinical expertise or world-class medical research, based on their own terms and preferences. The lack of access, coordination, cost of care, prevention and easy to use software has led to an all-time high pressure on global healthcare systems.

*Solution:* ImagineCare with HQ in Stockholm offers a holistic health experience system that focuses on the customer experience, integrating behavior change design into mobile apps and new clinical web applications. The latest evidence in health and chronic disease management is paired with patent-pending cloud-based technology solutions to offer a highly secure and engaging end-to-end digital health service. ImagineCare's support team of Health Navigators and Registered nurses use a custom designed clinical web application to provide more personalized and contextual service. This provides unified communication support, EHR integration capabilities, and more modern customer relationship management tools. ImagineCare leverages automation and machine learning to enhance the overall care experience without letting them get in the way of excellent human support and coaching capabilities. Better data will yield better outcomes (and higher ROI) along with more personalized services.

### **Lyfepond**

*Challenge:* We are in the middle of a healthcare and life science revolution. Never before have so many new health related products and services been launched. And never before have so many people felt empowered to take charge of their own health and wellbeing. But there's a fundamental problem. And it's about integration. We simply don't have the processes needed to leverage all these new innovations and make them work for the individual. And there's a lack of established marketplaces where patients and third party vendors can meet.

*Solution:* Stockholm based Lyfepond is a combination of a health care and an e-commerce company. The company calls itself a one-stop-shop for patients and dependents and acts as a hub that integrates traditional as well as digital healthcare products and services and makes them available to everyone.

Through Lyfepond, patients can connect with other people in the same situation, get professional advice and read the latest news about their diagnoses from the most innovative and supportive people and companies in the world. Based on their profile data, users also get unique offers on products and services that can help them lead better, healthier lives. In order to enable patients to play a more active role in their healthcare, Lyfepond gathers and stores patient health data from everything from apps to patient journals and makes it available to the patients themselves as well as the relevant health care providers. This way, Lyfepond is quickly becoming a much-needed integrator in the fast-growing medtech market.

### **Mando Group**

*Challenge:* When people try to lose weight, they are told to eat less food and exercise more. But most weight-control programs address the wrong aspect of food intake: When people eat their meals quickly, they don't feel full; quite the opposite, they feel hungry all the time and overeat – with the added drawback of a slowing metabolism. And exercising makes you hungrier yet, again causing overeating. By slowing the rate of food intake, using feedback from our Mandometer®, we can normalize the food intake eliminating chronic hunger.

*Solution:* The Swedish Mando Group, a healthcare provider for eating disorders and obesity is currently developing a consumer version of its successful clinical treatment for obesity and is launching the service in Q3 this year. The product includes Mandometer®, the medical device teaching people how to eat, a portable scale for relearning how to eat and an app with a smartphone as the user interface. The app displays the user's eating pattern, plotted against the ideal. It is an easy-to-use, clinically proven method to achieve a sustained weight loss using behavioral modification as the key ingredient. The fact that the eating pattern is reestablished into the natural eating mode, means the user will have practiced and learned what is natural for the body and it is easier to stay with this pattern than to deviate and thereby relapse and gain weight again.

### **MedUniverse**

*Challenge:* Faced with an evolving digital and regulatory landscape, the life science industry is struggling to find effective solutions to access health care professionals with educational information and marketing messages. The life science industry is obliged to inform and educate their target groups about new treatments and devices. The US pharmaceutical industry alone spends more than \$24 billion each year on marketing to healthcare professionals. However, the current methods neither involve HCPs nor collect data from interactions in a systematic way.

*Solution:* MedUniverse is a tailor-made patient case tool for the life science industry. Clients from the pharmaceutical industry can easily create interactive and visually compelling patient cases to engage, inform and gain insights from their key target groups, typically

specialist doctors and other HCPs. In participating, HCPs can update their knowledge and at the same time take part of aggregated results from peers, which in the long run supports improved patient outcomes. MedUniverse is currently working with many of the leading global pharmaceutical companies on a worldwide basis.

### **Mimerse**

*Challenge:* The World Health Organization estimates that, globally, 450 million people are experiencing a mental or behavioral problem at any given time, making psychiatric illness one of the leading causes of ill health and disability. Psychological conditions and mental health disorders cost an estimated \$2.5 trillion globally in lost productivity and medical expenses. Many mental disorders can be treated without the use of drugs, but techniques like cognitive behavioral therapy, exposure therapy and general psychotherapy do not scale, are too expensive or have too few providers for them to be viable alternatives for millions of sufferers.

*Solution:* Mimerse aims to automate, democratize and disrupt mental health by leveraging the power of Virtual Reality. The company builds augmented and VR-experiences in the form of self-help apps that measure, manage and treat mental health disorders. The treatments are self administered, automatic and scalable and sold directly to customers in order to circumvent the clinical establishment. Costs are very low – order of magnitude cheaper. The only requirement is access to VR, a technology that is becoming more and more commonplace. Mimerse’s treatments are evidence based (the company tests its apps in randomized controlled trials) and the effects are easy to monitor as Mimerse can gather data on the real world performance of its apps. In June 2016, Mimerse conducted the “Face your fear” VR experiment, in cooperation Samsung Nordics.

### **MindApps**

*Challenge:* Despite ever-higher global living standards, mental health problems are one of the main causes of disease worldwide. It’s estimated that one in six people experienced a common mental health problem in the past week. One of the main problems is stress. About three out of four Americans regularly experience physical or psychological symptoms caused by stress. Almost half feel that their stress has increased over the past five years and that they are lying awake at night due to stress. Yet, societies’ resources for treating these problems are quite inadequate.

*Solution:* There is ample evidence that mindfulness and meditation are effective tools for preventing and reducing mental illnesses and stress as well as improving mental health and sleep. Stockholm-based MindApps offers its users the benefits of mindfulness through The Mindfulness App, which now counts more than two million users. As opposed to competing apps and programs, MindApps connects different experts in e.g. meditation to the platform in order to offer a wide variety of high quality courses, apps and programs. The app is sold using the freemium business model and customers are gradually being converted into subscribers. MindApps are also developing “MindGym” a comprehensive digital platform accessible from smart phones, tablets and computers that offer courses, programs and modules within the area of mindfulness and health in its wider sense.

## **Invicta Medical**

*Challenge:* It's estimated that there are about 100 million sleep apnea sufferers worldwide. And as many as 80% go undiagnosed and untreated. The economic impact of undiagnosed sleep apnea amounts to a staggering \$150bn annually, in the US alone. Left untreated, sleep apnea can have serious and life-shortening consequences: high blood pressure, heart disease, stroke, diabetes, depression, obesity and car accidents caused by fatigue.

*Solution:* Invicta Medical is developing a medical device to treat sleep apnea by opening the upper airway with non-invasive electrical stimulation.

## **Pilloxa**

*Challenge:* Each day, more than eight individuals in Sweden die from not taking their medication as prescribed, costing society SEK 20 billion a year. It's estimated that as many as 10 % of all hospitalizations at Karolinska University Hospital are due to patients not taking their medication as they should.

*Solution:* Pilloxa is developing a patient-centric adherence platform and is currently commercializing their first product; a smart pillbox that helps patients keep track of their medication. When a dose is not taken on time this is detected by sensors in the pillbox and the user is automatically reminded by an app on his or her mobile phone. Loved ones and caregivers can also get notifications. The app contains an updated list of the patient's current medications and also lets patients and health care professionals track the medicine intake in real time and gain insights of their adherence. The solution will roll out to hundreds of medicating patients in several pilots and clinical trials during the fall of 2017. The pilots and studies are being performed at six of the biggest hospitals in Sweden (including Karolinska University and Danderyd Hospital). Pilloxa's commercial partners include pharmaceutical companies, clinical research organizations, healthcare providers and insurance companies.

## **Qinematic**

*Challenge:* Healthcare and fitness professionals the world over lack a fast and efficient way to objectively measure posture, balance, range of motion and movement control. All too often, they resort to simply eyeballing performance and then spend valuable time on note taking. In the absence of a functional and affordable dynamic posture screening platform, still photos and text are used when trying to describe 3D movement. This in turn, leads to inaccurate diagnoses and treatments.

*Solution:* Stockholm based Qinematic offers a suite of software to automatically capture, analyze and report 3D video of posture, balance and movement for optimal health. In a matter of minutes the company's software can scan human movement, give instant animated feedback, immediate electronic reporting and the possibility to export metrics and 3D data for research. Qinematic's software runs on an off-the-shelf touch screen computer and off-the-shelf sensors and turns it into a movement lab that everyone can afford. Qinematic Posture Scan stores 3D footage securely and enables it to be used locally or remotely as soon as the scan is complete, as well as in the future to monitor

progress over time. With the help of QInematic's products, practice-based evidence from thousands of health service providers such as gyms, clinics, workplaces and pharmacies can be used to individualize advice about the body (and our mood) for optimal health and wellness.

### **ScioReality**

*Challenge:* In Sweden, every 10th patient suffers from healthcare-related injuries to a cost of SEK 6 billion every year. This equals 10% of the healthcare budget. With better access to training, many of these injuries can be avoided; practice makes perfect. However, the training platforms today are costly, inefficient and sometimes even non-existing. Just like a pilot needs flight hours before flying a plane, a doctor needs their training hours before being able to perform a procedure safely on the patient. Today, training is carried out using animal models or donated bodies, both of which are scarce and costly. Therefore, the training opportunities are limited. In addition, today's training only provides isolated single procedures and does not incorporate the holistic operation with the rest of the team. Team training is non-existing today and usually done during the operation with the actual patient.

*Solution:* In order to meet the current and future healthcare challenges, we need smarter solutions; solutions based on virtual reality and augmented reality. ScioReality's virtual operating room (VOP) has been developed together with Södersjukhuset (Stockholm South General Hospital) since 2015. In VOP, orthopedic surgeons can practice a procedure on a virtual patient, as many times as needed, without affecting the cost. In the individual setting, orthopedic surgeons can practice performing orthopedic procedures such as fixating an intramedullary nail fixation. In the team setting, other medical professionals, such as nurses, will be present to practice communication, collaboration, and plan the operation. With more training, an operation could be made more efficiently and thereby increase the patient flow and quality of care, decrease the cost of healthcare-related injuries, and ultimately, save patient lives.

### **Shim**

*Challenge:* Research shows that spending one hour a day on social networks reduces the probability of a person being completely happy with his or her life overall by around 14%. Sadly, the average person will spend nearly two hours on social media every day. And although our smartphones give us tremendous capabilities, this shows that we as a society perhaps haven't matured in our ways of using them. We need to push our technology use towards a pattern we are happy about, where we feel technology really helps us achieve meaningful goals as opposed to just capturing our attention and making time pass.

*Solution:* Shim is an evidence-based chatbot that helps people allocate time for their emotional wellbeing and become more reflective. The app is based on principles from two decades of research on cognitive and behavioral strategies and is designed to increase the users mental wellbeing. The people behind Shim have done their first scientific study on Shim, and the study showed that users, who talked to Shim on a regular basis, decreased their stress levels and increased their emotional wellbeing significantly compared to a control group. Shim's mission is to utilize psychology and technology to help people act

and think in ways that are good for themselves and society as a whole.

### **Vitamin Manager**

*Challenge:* No two people are alike. And everyone has unique nutritional needs. Yet vitamin supplements are traditionally sold in “standard” batches that don’t take into account people’s differences in goals and lifestyles.

*Solution:* Vitamin Manager is a fully customized supplements program that takes the guesswork out of deciding what supplements to take and when. Based on the results from the company’s online supplement configuration engine, or an optional blood test, Vitamin Manager offers personalized daily doses of vitamins, minerals, oils, boosters and herb extracts. Using modern pharmacy technology the company is able to produce over 1 million combinations to get the right tailor made supplement for each customer in order to optimize effectiveness and avoid overdosage. Vitamin Manager’s customers receive practical daypacks as well as the monthly delivery direct to their mailboxes. All Vitamin Manager’s supplements are produced in Sweden and follow the EU Register on nutrition and health claims set by the European Commission of Food Safety. The company is founded in Sweden

### **Werlabs**

*Challenge:* In the Western world, as much as 70% of health care budgets are spent on treating chronic disease; type-2 diabetes, stroke, cardiovascular disease etc. Many of these diseases could have been prevented through lifestyle changes, better diets and more efficient exercise. Unfortunately, the health care systems of today are geared more towards reactive treatment than proactive prevention. People who don’t already show symptoms have limited access to the data they need in order to measure, track and analyze their health status, which prevents them from making changes with positive effects on their health.

*Solution:* Werlabs offers health analyses via blood testing. The company’s offer consists of a comprehensive blood analysis and an interactive digital journal of collected health data analyzed using both human and machine intelligence. Compared to traditional health analyses, Werlabs can reduce the time for the patient to get results from 1 month down to 1 day. The company has built an infrastructure for blood sampling and blood analysis using existing health care facilities and labs, which negates the need to develop its own tests. Werlabs is quicker, cheaper and more comprehensive than traditional health check-ups.

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