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GDI Study No. 45

WELLNESS 2030

The new techniques of happiness

By David Bosshart, Karin Frick, Marta Kwiatkowski and Leonie Thalmann

GLOBAL WELLNESS INSTITUTE™
EMPOWERING WELLNESS WORLDWIDE

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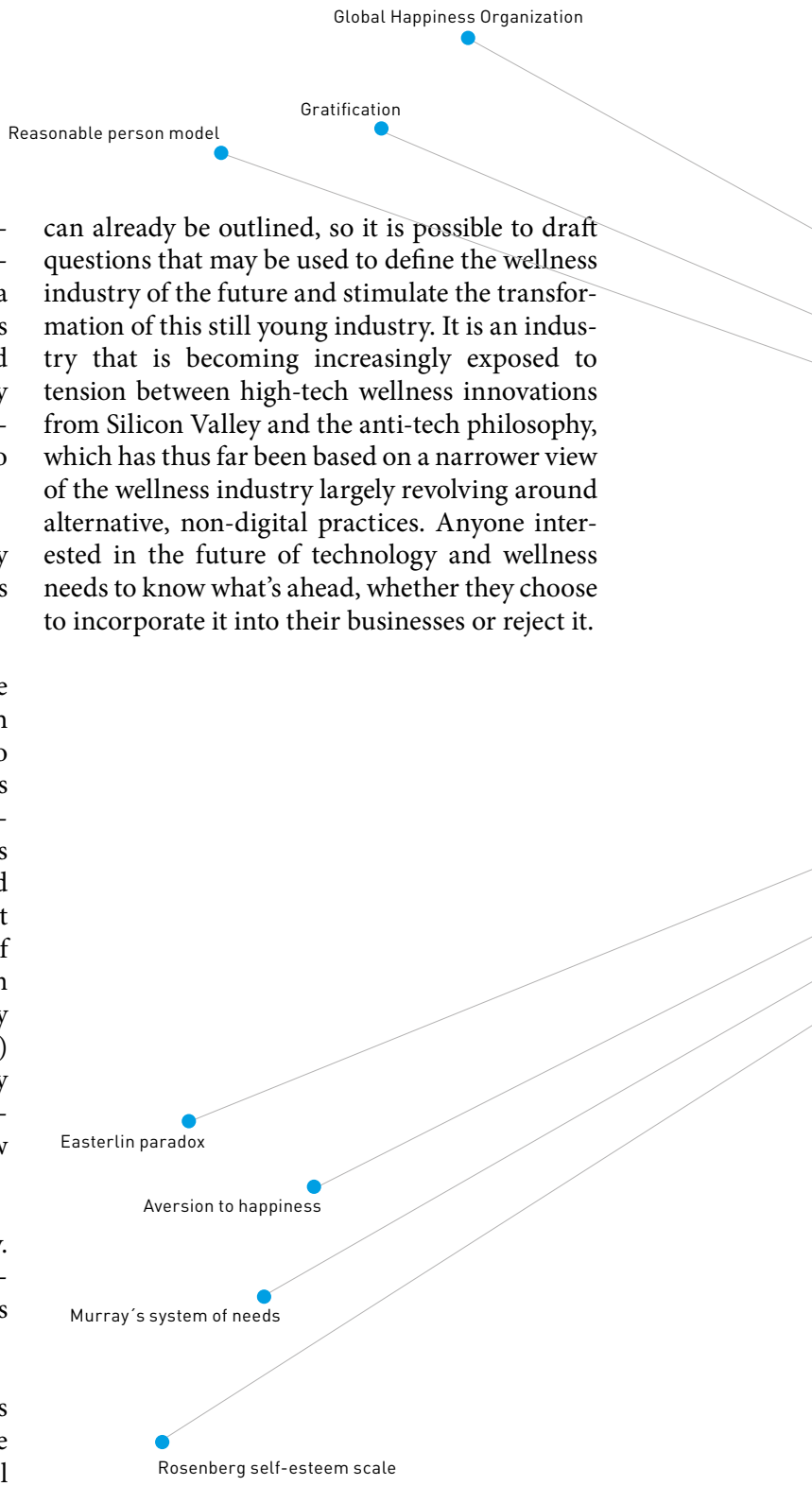


Happiness is incredibly multifaceted. If you conduct a Wikipedia analysis to visualize all the possible links to this word within the Wikipedia universe, it quickly becomes clear that happiness is a complex web. It can be viewed from myriad different perspectives and utilized in just as many ways: in philosophy, religion, economics and politics. Happiness is a longing that can be used to make money or exert pressure and power.

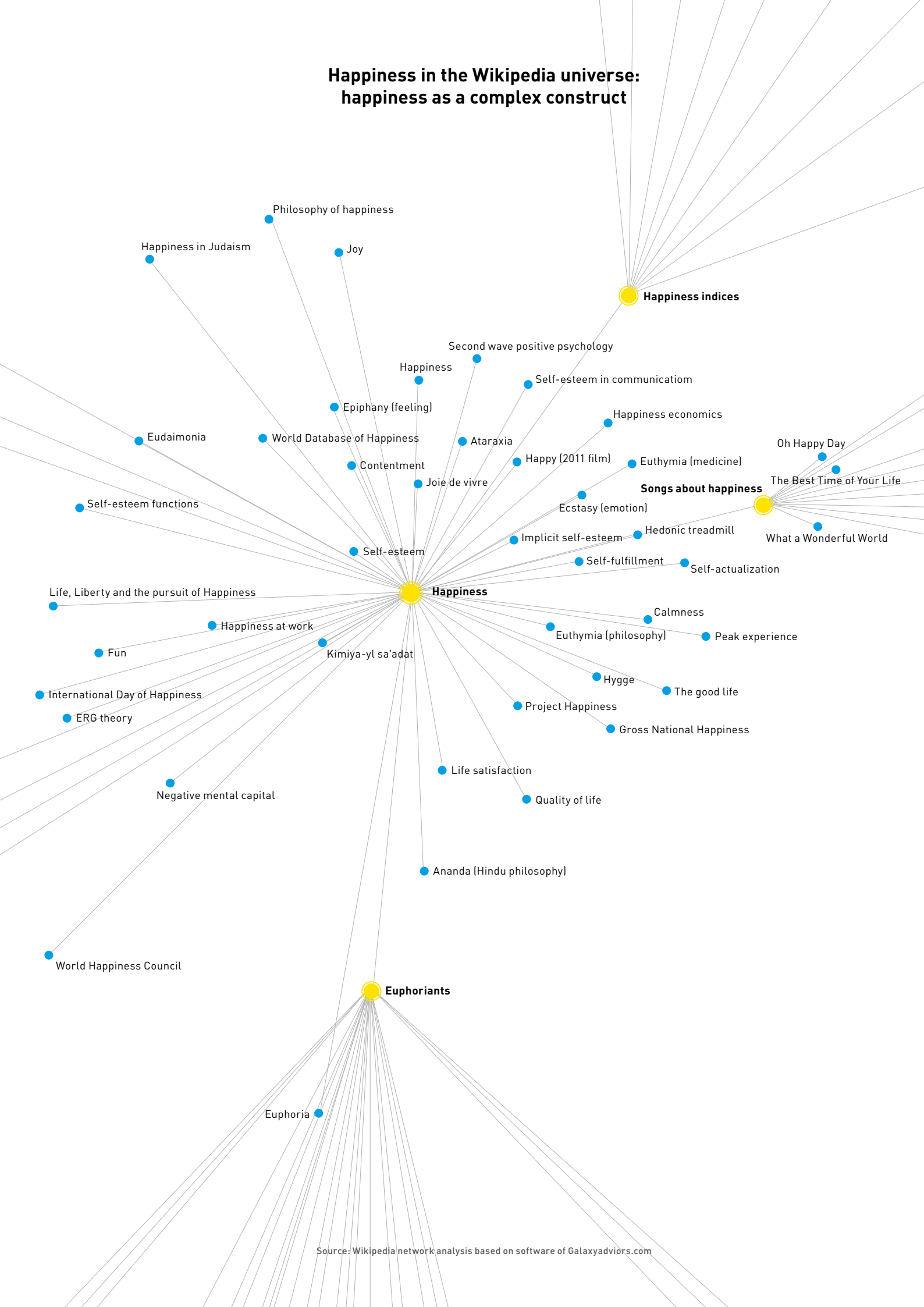
Humans have constantly tried to discover the key to happiness, using whatever tools they had access to in their cultural milieu.

In the following study, we focus primarily on the relationship and interdependency between health and well-being as an important prerequisite to happiness, and take an in-depth look at today's happiness providers, the wellness industry. However, we won't be directing our attention towards new wellness infrastructure, but shall instead attempt to describe a new era of wellness that will likely be shaped by the high-tech world of tomorrow. Today's emerging technologies could in the future coalesce with our bodies in a seemingly natural way and become part of our (enhanced) human nature. These new instruments are already being tried and tested by a small scene of biohackers, who will quite possibly become the new wellness pioneers.

Yet these developments are still in their infancy. This study aims to reveal new spaces for innovation that form a bridge between today's realities and the possibilities of tomorrow.

Our descriptions of a possible future, which is understood to be hyperindividual, hypermobile and hypernetworked, make it clear that we still haven't defined the terms and concepts of this new era. However, the motives and instruments can already be outlined, so it is possible to draft questions that may be used to define the wellness industry of the future and stimulate the transformation of this still young industry. It is an industry that is becoming increasingly exposed to tension between high-tech wellness innovations from Silicon Valley and the anti-tech philosophy, which has thus far been based on a narrower view of the wellness industry largely revolving around alternative, non-digital practices. Anyone interested in the future of technology and wellness needs to know what's ahead, whether they choose to incorporate it into their businesses or reject it.

Happiness in the Wikipedia universe: happiness as a complex construct



Source: Wikipedia network analysis based on software of Galaxyadviors.com

Summary

The industry is booming. Hardly a week goes by without a new guide, coach, course or treatment. But what is happiness, anyway? Every epoch and culture defines it differently. Today, it is mainly associated with positive emotions, health and a general state of well-being. Even if happiness does not have an end goal, it is defined as a measurable goal in our meritocratic western society.

We are on a quest to decode happiness. Will we be able to produce it soon? There are two approaches to this: firstly, the wellness movement, which no longer treats health as the absence of illness, and secondly, the tools of the mind, i.e. proper posture, awareness and other forms of self-reflection. Digitalization has expanded the technical range of these tools and offers up individual metrics for happiness.

The fledgling wellness industry has a promising future ahead. According to the Global Wellness Institute (GWI), it grew by more than 10% between 2013 and 2015 to reach a value of USD 3.7 trillion. These five major trends will shape the market in the future:

1. TECHNOLOGY IS BRINGING ABOUT A CONVERGENCE OF HUMANS AND NATURE

Digitalization is transforming our world in a major way. This will enable lifestyles with many more options and will influence our habits, needs and desires in every aspect of our lives. We are redefining ourselves: what does it mean to be human? There are three critical determining factors here: hyperconnectivity, disintermediation, entanglement – the symbiosis between humans and technology.

2. BIOHACKING – THE SHORTCUT TO WELL-BEING

Biohackers are a subculture of people with a whole range of different backgrounds. Driven by a pioneering spirit, they are connected by their openness to crossing disciplinary lines and their belief in the ability to make things possible. They want to liberate themselves from the limitations of nature, age and disease.

Biohacking is already impacting the wellness industry today. A fresh way of thinking is taking hold – a new understanding of do-it-yourself combined with the recognition of how everyone is capable of revealing and developing their own self-healing powers.

3. DATA SELFIES

We already live in a selfie culture. Smartphones have made the self-portrait a dominant form of communication. How we present ourselves is who we are. In the future, however, new data will be added to these images of our outward appearances, adding metrics for our inner lives. For a number of years now, wearable tech has been collecting data on our heart frequencies, the number of kilometers we walk and the calories we burn. This data offers insights into our well-being and is of particular interest to the wellness industry. The more data is collected from various sources, the more precise and multifaceted our digital doubles become. We will become intelligible to machines and thus able to be coded for improved well-being.

4. WELLNESS IS SOCIAL – MAKE PEOPLE HAPPIER AND HEALTHIER TOGETHER

In the pre-digital age, finding people who were good for us was often a question of luck. Today, there are new tools that optimize the search for a long- or short-term partner. Online matching platforms make it easier to find people who suit us.

In the 21st century, connecting with other people has taken on a new dimension: collaboration is

now a part of our everyday lives. Together we are smarter, learn better, reach our goals faster and make fewer mistakes. We still organize this collaboration on an ad-hoc basis for each individual task, but in the future, algorithms could take on the work of choosing the partner who suits us best. What's more, the involvement of artificial intelligence could significantly increase the quality of the results.

5. BIOFEEDBACK REPLACES SURVEYS AND LIKES

The technology for measuring emotions has made great strides and is now being tested in a number of applications. Apps are attempting to trace behavioral patterns and emotions from passively monitored smartphone data. It is possible to discern how a person is feeling simply by looking at the way they use their cell phone. Which apps do they use frequently? How often do they text? How long do they speak for and with whom? How many steps do they take and how long do they sleep? This panoply of smartphone data offers up very precise indications of a user's mental and physical health.

For the future of the industry, this trends means:

The wellness industry will become an extension of the data economy
The wellness industry must make itself fit for a data-driven future. It will become an extension of the data economy, have to decipher the wishes of its customers and create offers that match them. In this world, only those service providers who speak most directly to our own individual prospects for happiness will prevail.

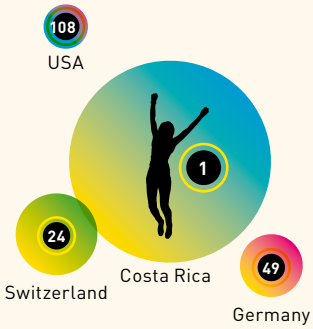
Biohackers and Silicon Valley are the new pioneers of wellness
Biohackers are set to shake up some of the rules of play. The lucrative unicorns emerging from Silicon Valley are one indication that the code to human happiness may well be cracked there. It is hard to predict which innovation bubbles will burst. What is certain is that the most innovative companies – and the ones who cope best with setbacks – are the most likely to survive and change the industry in the long term.

The wellness industry needs a hacker's mindset
In the coming years, the industry will have to focus on unorthodox partnerships and the ability to think beyond the classical understanding of wellness. The wellness industry will need the courage to experiment and, to ensure this, it must also take on the mindset of a hacker. Only in this way will it be possible to gain customers' long-term trust and pave the way for data-driven wellness.

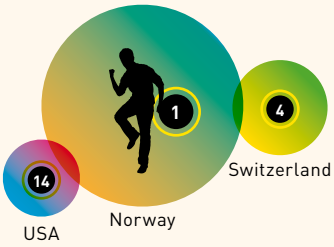
In the era of customer ratings, consumer data management will become a key area of expertise
The culture of likes and dislikes will not bypass the purveyors of wellness. The ultimate judgment of quality will come in the form of customer ratings, regardless of how many stars or seals of approval industry members distribute amongst themselves. In the long term, this could lead to a shift from expert knowledge to comprehensive consumer data management. Only those who have access to the best data will prevail.

Blurring the boundaries between wellness and health
In the future, the lines between wellness and health will become increasingly blurred. The closer the wellness industry moves towards healthcare, the closer it comes to a regulated market. This regulated market is unlikely to relax in the future. The most regulations can do is slow the pace. They will not be able to stand in its way.

Overview of the influencing factors and definitions



HAPPY PLANET INDEX 2016
This measures happiness on the basis of life expectancy, perceived well-being, income equality and ecological footprint. Costa Rica ranks number one, Switzerland comes in at 24, Germany is 49, while the USA ranks 108 out of the 140 countries.[1]

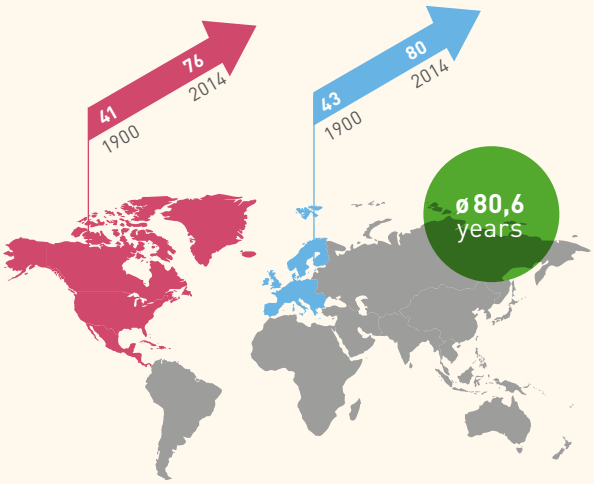


WORLD HAPPINESS REPORT 2017
The report is based on factors such as income, employment figures, social factors such as education and family situation, as well as mental and physical health.[2]

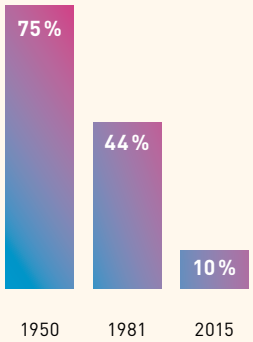
HEALTHCARE COSTS ARE INCREASING
In 2014, total expenditure on health among OECD countries was 12% of GPD on average, while in 1995 this figure was 9%.[3] The highest health expenditure was recorded in the USA in 2014: 17% of GPD.[4]

DEFINITION OF WELL-BEING
Well-being is the subjective perception of vitality (energy); it can be objectively described and measured and is a component of a person's health.[5]

DEFINTION OF WELLNESS
Wellness describes a person's state of health as a continuum and is a dynamic process that is constantly changing. The classic definition of wellness was developed by Halbert L. Dunn in the early 1960s.

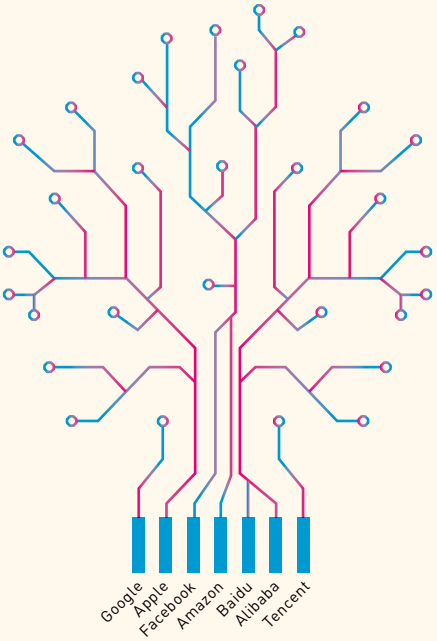


LIFE EXPECTANCY IS INCREASING
The life expectancy at birth of children born in OECD countries is on average 80.6 years. In Europe, this figure increased from 43 to 80 years between 1900 and 2014. Life expectancy in America (the entire continent) rose from 41 to 76 years between 1900 and 2014.[6]

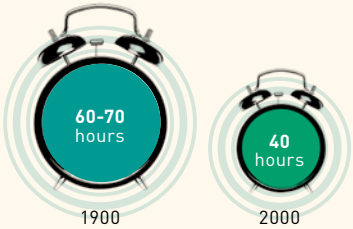


EXTREME POVERTY IS DECREASING
In 1950, three-quarters of the world's population lived in extreme poverty; in 1981, it was 44% and in the year 2015 this figure shrank to 10%.[7]

STRESS IN THE WORKPLACE
Although people are working less on average, 38% of the global working population feel stressed at work.[8]



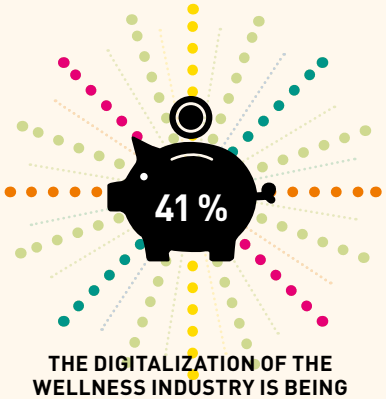
THE TECH INDUSTRY CONTINUES TO CREEP INTO EVERY ASPECT OF OUR LIVES
In 2021, 20% of all our everyday activities and interactions will take place via at least one of the tech industry's «big seven» (Google, Apple, Facebook, Amazon, Baidu, Alibaba and Tencent).[10]



MORE LEISURE TIME
In 1900, the average working week in Western societies was between 60 and 70 hours, while in the year 2000 it was around 40 hours.[9]

2022

DO-IT-YOURSELF HEALTH
By 2022, 20% of healthcare industry services will be delivered via customer-focused «quantified self» applications. Between now and then, this market will likely yield a turnover of USD 23 trillion.[12]



THE DIGITALIZATION OF THE WELLNESS INDUSTRY IS BEING DRIVEN BY SILICON VALLEY
In the first quarter of 2017, 41% of all start-up funding in the healthcare sector was invested in Silicon Valley.[11]

THE WELLNESS INDUSTRY: A MARKET WITH POTENTIAL
The Global Wellness Institute estimates that the wellness industry generated a turnover of USD 3.7 trillion in 2015. This includes sectors such as wellness tourism, the spa industry, fitness, healthy eating, and workplace wellness programs.[13]

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1 www.happyplanetindex.org
2 www.worldhappiness.report/ed/2017
3 www.data.worldbank.org/indicator/SH.XPD.TOTL.ZS
4 www.data.worldbank.org/indicator/SH.XPD.TOTL.ZS
5 www.cdc.gov/hrqol/wellbeing.htm
6 www.oecd-ilibrary.org/docserver/download/8117301e.pdf
7 www.ourworldindata.org/extreme-poverty
8 www.globalwellnessinstitute.org/press-room/statistics-and-facts/
9 www.ourworldindata.org/extreme-poverty
10 www.forbes.com/sites/gartnergroup/2016/11/15/gartners-top-10-strategic-predictions-for-2017-and-beyond/#59f6ad626976
11 PwC, Insights Healthcare MoneyTree™ Report, Q1/2017
12 Connected medical devices market and business models 2017, Market & Technology Report, Yole Development, September 2017
13 www.globalwellnessinstitute.org/press-room/statistics-and-facts/

Techniques of happiness: happiness is being decoded

Happiness is hard to express, it has different meanings in every era and culture. Today, most people use the word «happiness» in relation to positive emotions. It is also a byword for a person's satisfaction with their life, the level of joy they experience or their general well-being. Even though happiness cannot be classified as an end state that can be reached at some point and under certain circumstances, happiness has become a goal that can be measured using specific criteria in Western societies obsessed with performance and achievement. In addition to a country's gross domestic product that is used to measure economic success, international happiness rankings such as the World Happiness Report and the Happy Planet Index are becoming increasingly important.

Consequently, there has been a lot of research aimed at «decoding happiness» and significant progress has been made in recent years. We are coming ever closer to cracking the code.

According to this model, around 60% of our personal happiness depends on factors that we previously had no control over (genes) or are very difficult to change (living conditions). If a person wants to sustainably increase their happiness, they must change their behavior, way of thinking and habits.

Thanks to advances in happiness research, we are gaining a better understanding of what makes us happy or, more precisely, how we can avoid things that make us unhappy. Furthermore, new techniques and tools are being developed that can help us to become happier more quickly and easily. These techniques are firstly about self-awareness, secondly about the acceleration of (un)learning in relation to processes of change, and thirdly about reprogramming our consciousness and DNA.

New self-monitoring technologies clearly illustrate which behaviors and ways of thinking are preventing us from being happy. Once a detrimental pattern has been identified, it is possible for a person to change those habits – a step that until now many people have failed to achieve. New happiness tools (from the now ubiquitous pedometers to mood trackers such as moodpanda.com) help us to manage ourselves. They enable us to overcome our weaknesses and modify our behavior. If you can measure it, then you can control it. At least, that's what we expect.

The next generation of happiness technologies takes this approach one step further. They go to work directly on our genes or brain cells. Instead of just making the learning process more efficient, they want to reprogram consciousness and behavior directly via the stem cells or brain cells. The first generation of these techniques of happiness is already commercially available, in the form of trackers and mental coaching. The devices are located outside the body and primarily aim to change a person's behavior by highlighting the consequences of unhealthy habits and motivating or teaching us to change them using playful incentives. DIY-genomics, for example, helps people understand genomic data through its online and mobile app and crowdsourced research studies, and MyBreath offers an interactive iPhone app to help optimize breathing and detect early signs of stress. However, the next generation of these technologies will infiltrate our bodies. They aim to change human nature.

This GDI study investigates how and where new techniques of happiness could be used in future to change ourselves, our consciousness, our behavior and ultimately our nature, thereby making ourselves and others happier. How can they be used to change people's ways of thinking and behavior to improve their health and well-being?

Whether a person is happy or not can be determined using these three simplified factors

Determinants	20th century	21st century
Genes 50%	- Cannot be altered	- Biotechnology - Consciousness technology - Biohacking
Behavior, thoughts, activities 40%	- Training	- Tracking - Nudging
Living conditions, income, social status, relationshipsw, access to pristine nature 10%	- Politics	- Regulation - Taxes - Tracking - Nudging

Source: Graham, C: The Determinants of Happiness around the World, 2009.

But what is happiness? What does it mean to live a fulfilling life? For the Ancient Greeks, the founders of Western civilization, it meant living a good life, a moral achievement. However, this primarily applied to a small, privileged section of the population who were lucky enough to be able to describe themselves as free. With the rise of the major world religions, the faithful dedicated themselves to a higher good. Something greater than humanity itself. People's happiness lay in the hands of God. Their connection to God was bound to suffering and deprivation, but if they followed God's law, they would be granted happiness.

Things changed dramatically during the industrial revolution. Economization brought with it the ideal of being the architect of your own fortune. To some extent, happiness could be measured by a person's economic success and social status.

Happiness therefore also became a marketing tool that has been redefined again and again by new influencers. In her book «Thrive», the founder of the Huffington Post, Arianna Huffington, suggests that we shouldn't measure success on the basis of money, power and status. She says wisdom, well-being and giving to others are much more relevant factors. This attitude is also reflected by the mindfulness movement. Mindfulness has been in vogue in Western societies for around 20 years. Its fundamental principle: to enjoy a good life, people should be equally aware of both their own well-being and the well-being of others. Or, as the psychologist Martin Seligman puts it, a good life is only possible once a person has successful relationships with other people. Others, like scientist and Buddhist Matthieu Ricard, look for happiness through meditation or recommend manual work as the key to bliss [14], as does the American philosopher Michael Crawford. Meanwhile, Will Storr, author of the book «Selfie», turns the tables on this approach. Instead of striving towards self-optimization, he promotes acceptance of one's own imperfection as the key to happiness.

Up until now, happiness depended on our nature and our genes; these were what enabled us to maintain good health and physical appearance. And it depended on cultural techniques. Culture meant experimenting with new lifestyles. Some cultural techniques have developed into art forms, such as «L'Art de Vivre» in France: the art of seduction, the right choice of words in a relationship, an intimate look. This way of living is

[14] Crawford, M.: The World Beyond Your Head. How to Flourish in an Age of Distraction, 2016.

Notions of happiness through the ages

Source: GDI, 2017

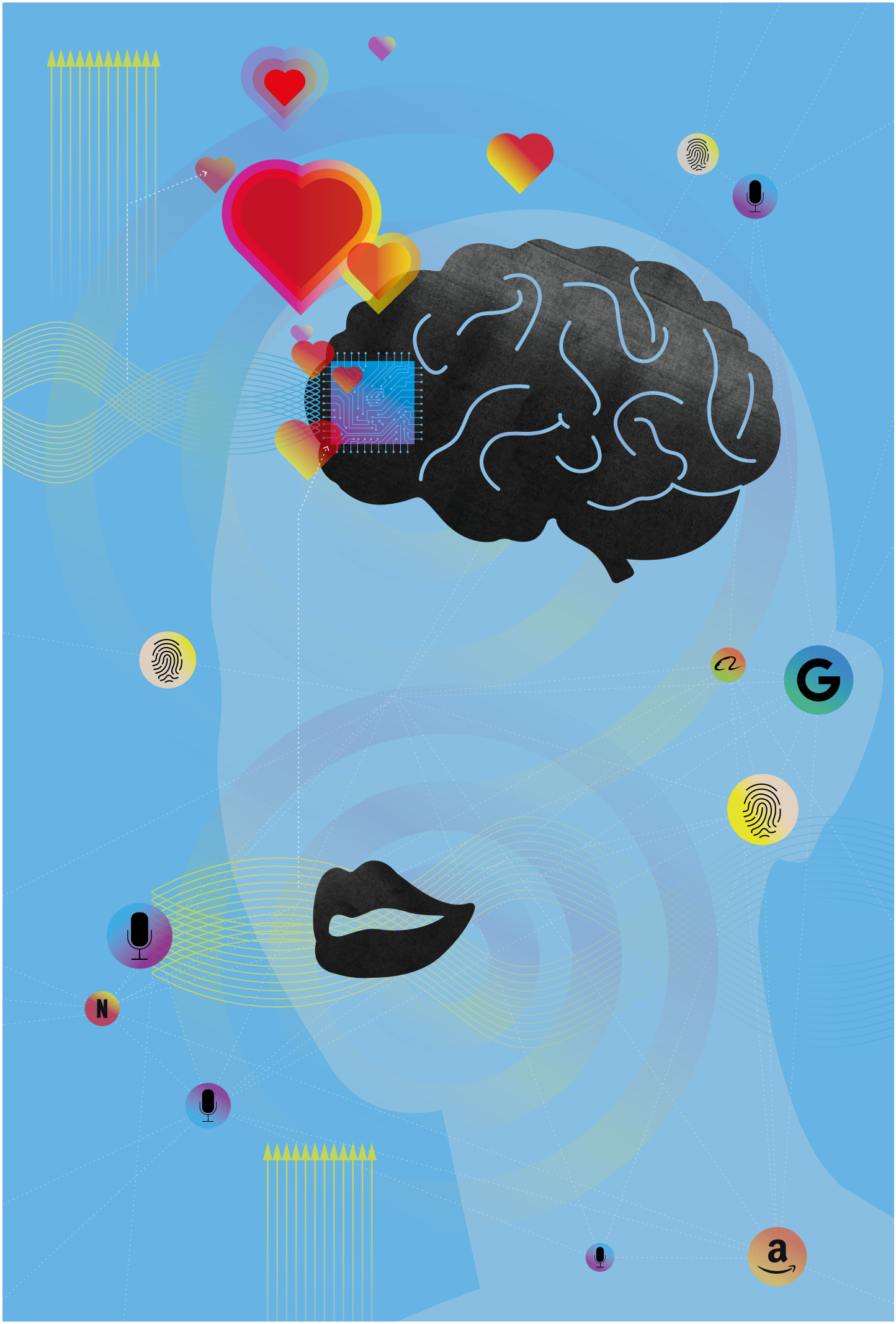
not about becoming more economically successful, its focus is on gaining cultural expertise and using it to refine one's life. Others looked to meditation and wanted to use it to gain access to something bigger than themselves. These cultural techniques have long since found their way into the wellness industry. Spa rituals often refer to this kind of lifestyle or Far Eastern practices.

The pursuit of happiness always involved significant personal effort and when it came to religion, it was tied to passion and deprivation. The process was expensive, time-consuming and usually lasted an entire lifetime – plus most people didn't actually find complete happiness.

Today, increasingly powerful technologies are opening up new possibilities. We are gradually adopting these technologies and have already significantly advanced human nature. Caitlyn Jenner is a well-known example of this. She underwent a sex change, although her new identity still conforms to traditional gender stereotypes. New lifestyles are now being developed through «mechanical» methods – by means of surgery, biohacking and pills. Now we're in the process of hacking biology, we are beginning to reprogram human nature.

There are numerous different theories on how to achieve happiness, yet they all assume that happiness can be «produced». As long as you have the right means. Until now, people have relied on spiritual tools: the right attitude, mindfulness or other forms of self-reflection. Thanks to digitalization, these spiritual tools are now complemented by technical tools and it is possible to individually measure the causes of happiness. We live in an era of the «disposable life» and believe that we can constantly redefine ourselves by describing ourselves in terms of new parameters. These biological and cultural parameters are being made digital and transparent.

Apps measure our stress levels and remind us when we don't pay enough attention to other people. In this way, digital solutions produced by IT corporations are expanding on the products and services already offered by the established wellness market.



From health to wellness through to happiness

«Wellness relates to the entire person and is more than just the absence of disease.»
World Health Organization

Health was a key issue during the industrial age. For most people, life consisted of hard physical labor. The British philosopher Thomas Hobbes described life at that time as solitary, poor, nasty, brutish and short. As such, it was vital to prevent disease and maintain good health.

Scientifically based preventative healthcare originated in the 20th century. It improved the quality of life and well-being of large swathes of the population. However, what exactly constituted health, wellness and well-being remained a matter of interpretation.

Health itself cannot be measured. There are no hard and fast criteria. Florence Nightingale defined health as a condition of well-being and the capacity for an individual to use all the powers they possess. Most people define and describe health in this way: an absence of pain and symptoms of disease, the ability to be active and do what is necessary to live a good life.

Wellness, on the other hand, describes health as a continuum. The classic definition of wellness was developed by Halbert L. Dunn in the early 1960s. Wellness means using your maximum health potential and staying in harmony with the environment.

In the 20th century, health and wellness were firmly embedded in a clinical context. The aim was to correct defects and deficits so that people could participate in the labor market. Today, the focus has shifted powerfully to preventative wellness consumption. Consumers should no longer only follow the instructions of doctors and other experts, but instead enhance their own abilities. There is now a market for self-optimization. When offered at reasonable prices, this industry makes it easier for consumers to make personal decisions, such as choosing the right food for a healthier and happier life. More of our most important health-related decisions are being made in supermarkets or while shopping, instead of in doctors' practices or pharmacies.

We are gradually becoming aware of how we can use new technologies to enhance our potential, to see and hear better, learn faster and thus grow beyond ourselves.

The health and wellness industries are interdependent. We can only improve our well-being if we are able to tackle health-related challenges more effectively. As societies become wealthier, life expectancy increases. But aging populations are expensive. If, as a society, we don't carefully balance health and well-being, we could be faced with this scenario in the future: instead of lots of happy retirees, there will be lots of heavily taxed retirees and unhealthy miserable ones [15].

Our pursuit of happiness and the new technological possibilities will – in the best case scenario – help us to lead long and happy lives.

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[15] Somerset Webb, M.: Living longer is not all good news, Financial Times, 30.9.17.

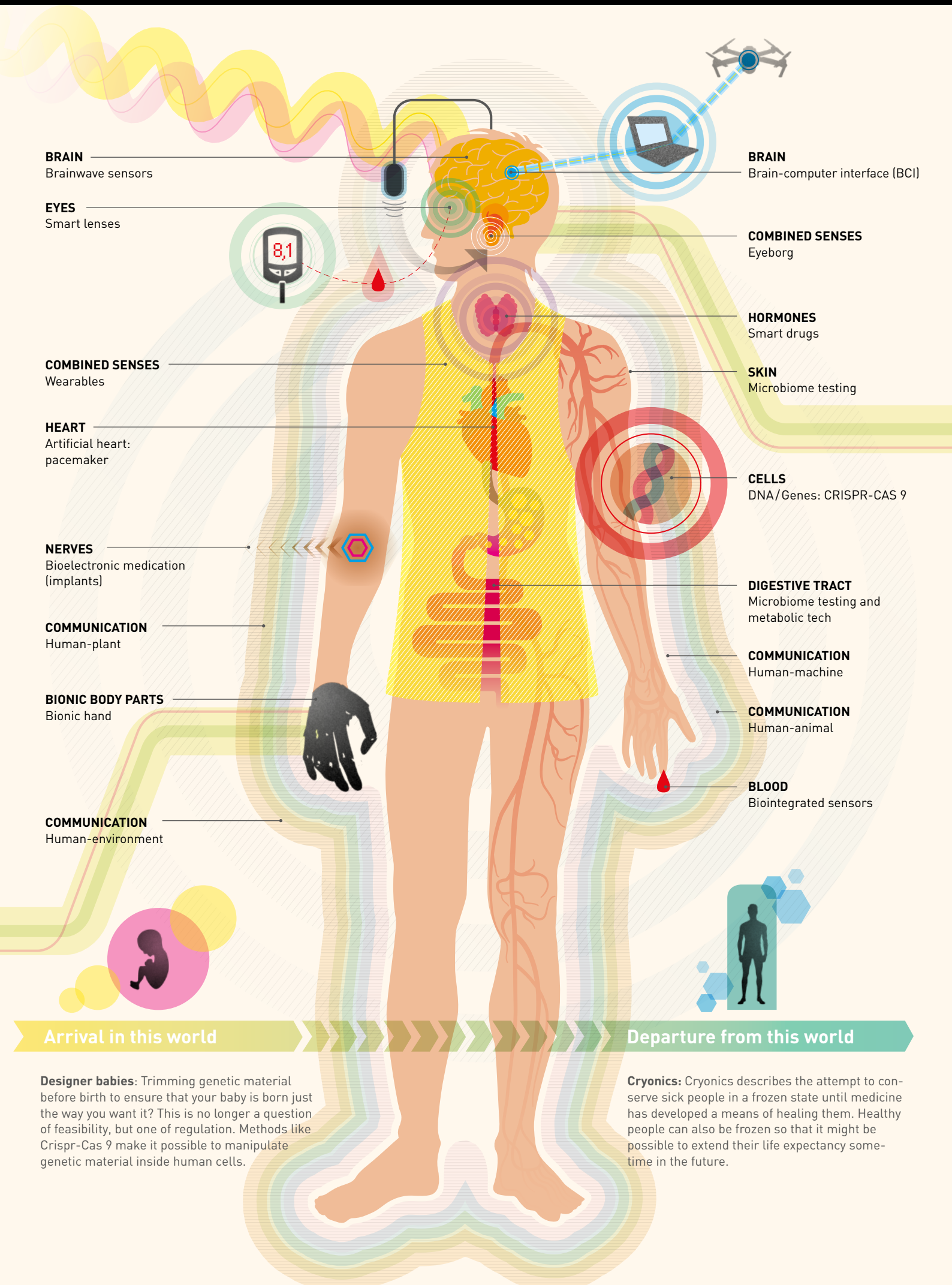
(Cultural) Techniques of happiness

Source: GDI, 2017

MAJOR GROWTH MARKET

The wellness industry is a young economic sector that is growing at a remarkable rate. According to the Global Wellness Institute (GWI), the global wellness market grew by more than 10% between 2013 and 2015 to reach a value of USD 3.7 trillion. The cult of youth is still going strong, feeding concerns about the maintenance of one's own body. Only people who appear capable, fresh and strong can stay competitive.

New markets are popping up along the border between the inner body and the hostile outside world. Health is represented as our duty and it means much more than just the absence of disease. In 1948, the WHO defined health as a «state of complete physical, mental and social well-being». Fitness programs for improving physical well-being are no longer enough. Even the trim, taut and terrific version of wellness no longer meets the expectations of our age. Today, well-being is a strategy.



Arrival in this world

Designer babies: Trimming genetic material before birth to ensure that your baby is born just the way you want it? This is no longer a question of feasibility, but one of regulation. Methods like Crispr-Cas 9 make it possible to manipulate genetic material inside human cells.

Departure from this world

Cryonics: Cryonics describes the attempt to conserve sick people in a frozen state until medicine has developed a means of healing them. Healthy people can also be frozen so that it might be possible to extend their life expectancy sometime in the future.

BODY

BRAIN

Brain-computer interface (BCI) – Neuralink
A brain-computer interface makes it possible to operate machines using our thoughts.

Brainwave sensors – Berkley Ultrasound
Brainwave sensors are used to treat depression, Alzheimer's disease and dementia.

EYES

Smart lenses – Google Verily & Alcon
Now: glucose contact lenses are used to monitor a person's glucose level. Future: adding intelligence to objects that people routinely use in their day-to-day lives.

NERVES

Bioelectronic medication (implants) – Galvani Bioelectronics (joint venture between Verily and GlaxoSmithKline).

Bioelectronic medication is an emerging scientific field. Its aim is to use minuscule implantable devices to precisely alter the electrical signals in nerves in order to treat chronic diseases that cause paralysis.

COMBINED SENSES

Wearables – such as a vest developed by David Eagleman that makes it possible to hear in an entirely new way. There are 32 motors built into the vest. Every motor responds to a different audio frequency by starting to vibrate. This enables sounds to be perceived through the skin on one's back and then translated into words.

Eyeborg This device created by Neil Harbisson converts colors into sounds. An eyetracker is positioned on the person's forehead using a pivoting arm. This arm connects the eyetracker to a chip that is surgically inserted into the skull. The Eyeborg sensor constantly detects the frequencies of the colors in front of it and transmits this information to the chip. There, they are converted into sound waves, which then travel through the skull to the person's auditory system. This makes it possible to hear the colors.

BIONIC BODY PARTS

Bionic hand (i-limb ultra – Touch Bionics); patients can control their prosthetic hands using their thoughts. Bionic prosthetic hands are connected to the brain via the remaining nerves and transplanted muscles.

CELLS

DNA/genes – CRISPR-CAS 9 (manipulation of genetic material in human cells). Longevity: cell rejuvenation (Calico Google)

BLOOD

Biointegrated sensors (Dexcom Google or Lumee by Profusa) work like glucose monitors (CGM). Biocompatible implants monitor fluorescence, oxygen, glucose, lactate and other biomarkers in the blood.

DIGESTIVE TRACT

Microbiome testing and metabolic tech (Ubiome or Aire) provides information about the digestive tract based on the microbes found in stools or the amount of gas in the blood.

HORMONES

Smart drugs like nootropics or microdosing psychedelics (Third Wave) are used regulate a person's hormones, making it possible to control their hormonal levels.

HEART

Artificial heart: pacemaker
«I always have to have batteries charging,» Andrew Jones says in the video, produced by Great Big Story. «At night, when I'm going to bed, I'll plug my phone in, and then I'll plug myself in.»

SKIN

Microbiome testing as basis for personalized skin care. Microbes provide information about the state of the skin flora.

COMMUNICATION

HUMAN – MACHINE

Brain-computer interface (BCI)
The fusion of human and artificial intelligence to create enhanced augmented intelligence: entrepreneur and Tesla CEO Elon Musk recently bought the neurotechnology company Neuralink. His goal: to develop a BCI suitable for everyday use that will enable bidirectional communication between a person's brain and a computer. If this becomes possible, machines could be operated simply through our thoughts. Information and skills could be uploaded directly from the Internet and immediately saved in our neural networks.

HUMAN – PLANT

Human-plant interface
The power of digital research meets biological material to create new opportunities for interaction with our natural environment. Project Florence led by artist Helene Steiner (Artist in Residence, Microsoft Research) demonstrates that plants have their own language. Human-plant interfaces could be used to translate the electrochemical signals emitted by plants into a language that humans can understand. That way, plants could let us know what they need.

HUMAN – ANIMAL

Human-animal interface
Scientists are currently working on the development of technologies that will enable animals to talk to humans. How? Through «animal-computer interaction». Scientists are researching how technologies such as GPS and wireless communication could be used to develop a common language for humans and animals.

HUMAN – ENVIRONMENT

Molecular scanner – connect with your environment
Today, the molecular scanner SCiO and the competing product Tellspec make it possible to analyze the chemical composition of things. The environment around us is being tracked and the information is transmitted directly to our smartphones. The spaces we inhabit cannot yet react to our biochemistry, but the molecular scanners enable us to interact with our environment.

Five trends for the future of wellness

Trend 1: technology is leading towards convergence between humans and nature

«Technology will disrupt the way we think and how we experience our body. The next wave of technology will reshape how it feels to be human. Wellness will be disrupted by new technologies and will serve as a point of convergence with many other industries.» [16]

Digital technology is here to stay. We are leaving the world of industrial, linear processes with their comparatively slow progress and change behind us. That world is being substantially altered by digitalization and the possibilities of new technologies. This will lead to an exponentially altered lifestyle and influence our habits, needs and desires, in every aspect of our lives. We are redefining ourselves: what does it mean to be human? There are three critical determining factors that are rewriting human life in the digital age: hyperconnectivity, disintermediation, entanglement.

I. Hyperconnectivity
Everything is linked to everything else. That means the end of industrial silos. Knowledge that was defined for certain types of companies, stacked in departments or on isolated company servers is now being connected. Hyperconnectivity promises enormous increases in efficiency. Those who are well connected and better informed about human behavior, bodily functions and health problems will be able to identify business opportunities more quickly and develop new services faster.

ll. Disintermediation
In the past, we talked a lot about hardware and software, about physical matter and technical engineering. Those days are over. The most valuable companies are those best equipped to deal with vast amounts of complex data. The quality of the data is crucial for the quality of the services offered. For instance, the private taxi service Uber wouldn't be nearly as successful without its excellent data management system that is constantly being improved. Such companies have direct access to customers. They can react to every customer request with speed, precision and flexibility. This presents a challenge for established companies: can they adapt quickly or will they be put out of business by new, aggressive and better positioned start-up companies?

Hyperconnectivity and disintermediation not only break open the old silos, they also lead to convergence between humans and nature. They force us to gradually develop a new image of ourselves.

III. Entanglement – symbiosis of humans and technology
We can no longer conceive of ourselves as separate from our human nature or our technologies. Instead, we see ourselves as simply part of some greater whole in which we are permanently entangled [17].

During the Enlightenment, progress was analytical, it resulted from the deconstruction of things. Today, progress is synthetic. Instead of classifying new organisms, we are designing them. Instead of discovering new worlds, we are creating them.

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[16] Marc Cohen, School of Health and Biomedical Sciences, RMIT University Australia

[17] www.longnow.org/essays/enlightenment-dead-long-live-entanglement

Humans are transforming themselves. We are becoming more and more intertwined with our creations. It's no longer really possible to distinguish between natural and artificial. We are increasingly becoming what we make. The opportunities presented by technology seem to expand with each new step and create new, previously unknown needs. This also explains the increasing importance of self-optimization. New analytical tools are opening up new dimensions of self-awareness. Body and soul are being decoded, diagnoses and prognoses are constantly improving. Our risk profile can even be determined before we are born. New therapies are not only healing sick people, but also helping healthy people to increase their potential. They are preventing illnesses and smoothing out dents in our well-being.

TECHNOLOGY IS CONTROLLING HUMANS

We are entering the age of the «technologies of the self» – techniques for controlling your own body, thoughts and behavior[18]. Individual techniques and their meanings have changed over the centuries. Historically, technology was intended to help humans survive. Later, innovations such as money and calendars increasingly changed the way society was organized. From the early 19th century onwards, industrial manufacturing brought prosperity and above-average GDP growth. Over the course of the 20th century, leisure time was commercialized with facilities like cinemas, amusement parks and television, and the 21st century marks a new era of leisure inventions. In this context, smartphones and Facebook have been less instrumental in increasing prosperity, instead serving as symbols of the changing employment landscape. As a result, value creation has become more abstract: the wellness industry still focuses on infrastructure, building spas and providing treatments, but services like Google focus on data management (software) and don't produce anything anymore – except for faster, more precise and flexible analyses of increasing amounts of networked data (produced by us). A major consequence of this development is that Google is becoming more and more aware of our behavior, our real desires, our longings and worries (more aware than we are ourselves).

WHAT ARE THE CONSEQUENCES FOR THE WELLNESS INDUSTRY?

These new possibilities are changing our expectations: people expect new technologies to significantly improve their lives. Although these expectations vary depending on the geographical, cultural and historical context, they are growing rapidly all over the world due to hyperconnectivity and disintermediation. In just a few decades, relatively narrow views regarding health have led to narrow views about wellness. Today, these views almost automatically include a desire for well-being and happiness. That has broadened the scope of the wellness industry, but it also presents new challenges. The industry must react to new requirements like data-driven self-enhancement, and become more professional.

The wellness industry is a young industry undergoing extremely rapid growth. The key players haven't yet emerged, but they will likely appear over the next few years and start shaping the industry. And that will take a lot of work: it will require the establishment of professional structures, the creation of new strong brands, and the development of clearly differentiated products and services. The industry should set the bar high

[18] GDI: Innovating Change. From Social- to Self-Optimization, The Five Stages of Innovation, 2017. http://www.gdi.ch/en/Think-Tank/GDI-Trend-News/News-Detail/

from the outset so that it will be able to secure margins and develop innovations. No easy task. For while digitalization continues at lightning speed, the sector remains dominated by the industry's established ways of thinking and analog emotionality. So it's all the more important to network the enormous opportunities provided by analog strengths with ever-improving high-tech insights.

In the 21st century, inventions will no longer only focus on improving people's living standards but optimize the people themselves: from smart assistants and illness prevention to improved human biology and the enhancement of our very beings, which will prolong our lives even further.

Trend 2: biohacking – the shortcut to well-being

«What if we disintermediate spirituality itself, and redesign it for a modern secular world? What if tech that provided the benefit of 10,000 hours of meditation was as accessible as cell phones? Can we hack consciousness itself?»
Mikey Siegel

Biohackers do not accept the biological limitations of the human body. They want to manipulate our physiology in order to increase our well-being and happiness. How? Technologies will be used to change the genetic material of organisms and equip them with new characteristics.

To date, however, the biohackers' attempts have been little more than finger exercises on the piano of progress. Their efforts have produced luminous plants and frogs.

But the results of today are not as important as the new research structures looming on the horizon. Research infrastructure is becoming more affordable. Increasing numbers of laboratories are being set up «in garages». It's like the dawn of the computer industry in the 1970s. Back then, the big breakthroughs were not made in the development labs of the major companies, but in the garage companies in Silicon Valley.

Lab equipment is cheaper than ever these days. Automated processes like gene sequencing and gene editing, CRISP technology and the exchange of research findings or DNA sequences in online databases make biohacking affordable and accessible to many people.

THE ROOTS OF DO-IT-YOURSELF BIOLOGY

The biohacking movement started as do-it-yourself biology in the late 1980s. Young researchers in the USA wanted to break free from the narrow confines of the university and take research into their own hands. With unswerving belief in the emancipatory potential of technology and a high degree of willingness to undertake risky experiments, they wanted to break new scientific and medical ground. Their bodies and they themselves were often the subjects of their research projects. Instead of progressing one step at a time like the scientists in the larger laboratories, they carried out visionary experiments.

Today, this subculture attracts people from various different disciplines: data sciences, neuroscience, biotech, art, extreme sports, futurism, citizen science, nutritional research, organic agriculture, medicine and open source software. These biohackers, laypeople and experts are united by their pioneering spirit, openness towards crossing new frontiers, dangerous ideas, a belief that their aims are achievable and a determination to free themselves from the limits of nature, age and illness. From the perspective of a biohacker, immortality is an engineering problem.

A look at the biographies of biohacking's leading protagonists reveals the breadth of this movement

GEOFF WOO, CEO of Hvmn (pronounced «human»). Hvmn is a Silicon Valley start-up that develops and sells nootropic dietary supplements designed to improve cognitive functions. Its pills are supposed to be capable of catapulting a person's intelligence to the next level: **«We believe that the human is a system that can be quantified, optimized, and upgraded,»** says Geoff Woo on[19] the company's website.

MIKEY SIEGEL, a computer engineer, founded the Consciousness Hacking movement in San Francisco in 2014. Today, it has more than 4,000 members. The organization wants to use the best technologies to transform human consciousness. **«What if we disintermediate spirituality itself, and redesign it for a modern secular world? What if tech that provided the benefit of 10,000 hours of meditation was as accessible as cell phones? Can we hack consciousness itself?»** asks Siegel[20].

NEIL HARBISSON, an artist and the first cyborg to be officially recognized by the government. Born colorblind, Harbisson looked for ways to hack his biology so that he could experience colors. By implanting an antenna in his skull, Harbisson investigated the limits of human perception and the relationship between color and sound[21]. **«If we extend our senses, then, consequently, we will extend our knowledge. It's really very basic.»**

CHRIS DANCY, the most well-connected man on the planet. With the help of around 700 sensors, devices, applications and services, Dancy analyzes every aspect of his life. His goal: optimization. Dancy's system collects all kinds of data, from the number of calories he consumes through to his spiritual well-being. This quantification sometimes reveals correlations that would otherwise have remained invisible. The advantage: he can make improvements to his health, productivity and quality of life[22]. **«In the future, we will download habits and environments. We will actually upgrade ourselves as we become apps.»**

PAUL AUSTIN, founder of The Third Wave, an online platform for self-optimization using psychedelic drugs. He follows the approach of LSD microdosing and kick-started a movement that aims to improve well-being with the help of LSD. His target audience are technologically savvy. Engineers, entrepreneurs, «digital nomads». People looking for new ways of doing things in order to learn faster, so that they can keep up with the leaders of the digital economy[23]. **«Be ready to feel like someone stepped into your head and shuffled things around.»**

JEREMY SHAW, an artist from Canada, would like to understand our pursuit of transcendental experiences through altered states of consciousness. During a project, he filmed himself and others after they had ingested DMT, a molecule that is found in the human brain and in certain plants. Shaw's trial subjects were filmed up close in states of apparent euphoria or ecstasy. Subtitles at the bottom of the screen convey the participants' subsequent attempts to put their experience into words – something which people familiar with DMT believe is virtually impossible[25]. **«Everyone always talks about how, in times of crisis, people start looking for God, and I think that's very synonymous with what's happening now.»**

CHRISTINA AGAPAKIS, a synthetic biologist, researches plant/animal hybrids. **«Can humans be hacked to do photosynthesis and live without food?»** she asks. We are still very far away from the creation of photosynthetic humans, but new research has revealed fascinating biological mechanisms that could drive this newly emerging discipline forward[24].

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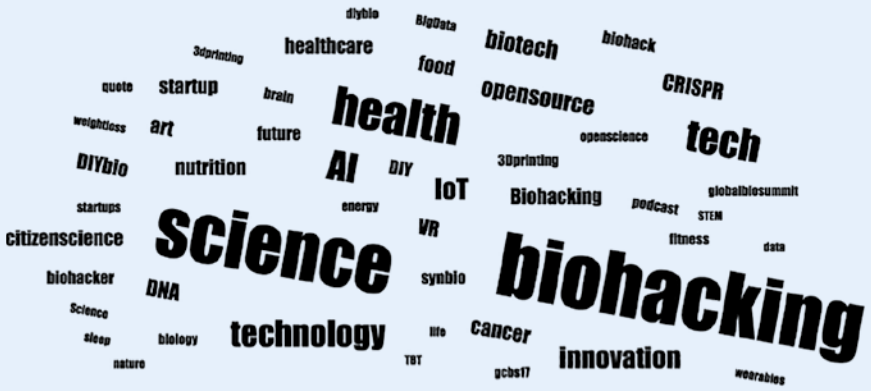
19 www.hvmn.com
20 www.mikeysiegel.com
21 www.harbisson.com/
22 www.chrisdancy.com
23 www.thethirdwave.co/microdosing-lsd-mushrooms
24 www.blog.mbl.edu/2015/02/03/sea-slug-has-taken-genes-from-the-algae-it-eats-allowing-it-to-photosyntjeremyshaw.net
25 www.blog.mbl.edu/2015/02/03/sea-slug-has-taken-genes-from-the-algae-it-eats-allowing-it-to-photosyntjeremyshaw.net

Network of the most influential people on the topic of biohacking based on an analysis of Wikipedia and Twitter.

Source: http://5.35.249.27/galaxyscope/topic/Biohacking

Hashtags used most frequently in relation to biohacking.



Source: http://5.35.249.27/galaxyscope/topic/Biohacking (with log in to twitter)

Network of the most influential people in relation to wellness and well-being.

Source: http://5.35.249.27/galaxyscope/topic/Wellness

Hashtags used most frequently in relation to wellness and well-being.

Source: http://5.35.249.27/galaxyscope/topic/Wellness

BEYOND ESTABLISHED STRUCTURES

Today, biohacking usually takes place outside the established structures of science and medical research or the wellness industry. The new biohacking movement exists on the extreme edges of these disciplines, somewhere between science and fiction. It remains difficult to predict which of their risky and highly speculative ideas will become technically feasible, realizable on a mass scale and also socially accepted. What is foreseeable is that one of the next big wellness trends will come from the biohacking subculture. This field is already attracting extraordinarily creative people. The relationships between the protagonists in the various disciplines will determine the development direction. Who is connected to whom, who decides which ideas will be exchanged and driven forward? We used a network analysis to identify the most influential protagonists in the biohacker scene and compared the resulting structure with the network in today's wellness industry.

Sophisticated software[26] was used to filter out all the English-language Wikipedia entries and tweets on Twitter that contained the term «biohacking» in order to find the people whose contributions had the most links and retweets. These people received the most attention and were consequently the best connected; their ideas and contributions resonated most widely. This doesn't automatically mean that these people were particularly active on Twitter or had the most followers. However, their ideas were spread most frequently, they were retweeted and liked. Of course, those who don't use Twitter or appear in Wikipedia were not found by our network analysis.

The network analysis revealed that discourse on wellness and biohacking is defined by different protagonists and topics on the various social media platforms. Technical and scientific topics dominate biohacking, as well as geeks, researchers and universities. With wellness and well-being, the field seems more defined by the conventional private wellness industry. The overall picture also seems «softer». Leading media platforms are also involved in the wellness discourse, although they are more heavily involved in the biohacking discourse. The hashtags are also dominated by softer topics. Health and well-being, mindfulness and yoga all feature prominently.

Strikingly, the network analysis revealed the media's high degree of interest in biohacking, even though it is currently relatively insignificant in commercial terms. The fact that leading international media such as the New York Times, The Guardian and the Wall Street Journal are discussing biohacking all serves to increase the hype. The central position of the crowdfunding platform Kickstarter indicates that there is clearly a dynamic start-up scene around biohacking. Critical or negative terms or questions about safety do not appear in the hashtag cloud, which is a clear sign that the hype surrounding biohacking is just beginning. Expectations have been exceeded and critics have not yet appeared on the scene.

Disillusionment will develop automatically. Biohacking approaches carried out on people must be subjected to the same approval procedures and testing as all other medications and implants. The journey from the laboratory to the market will take much longer and be significantly more expensive than it would be for a new software program, for instance.

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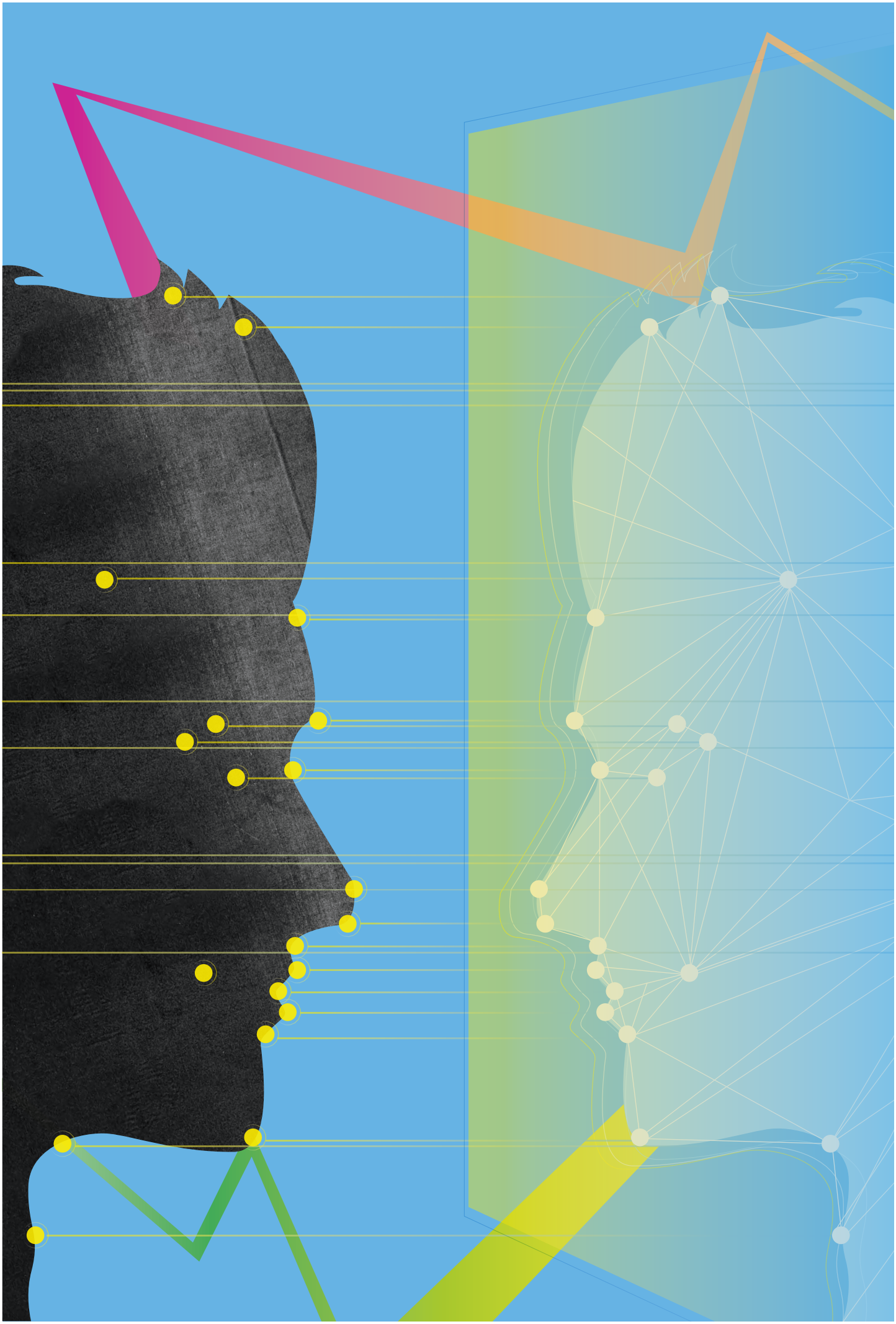
[26] www.galaxyadvisors.com/



From Buddhism to data Buddhism

	Buddhism	Data Buddhism
Path to happiness	Suffering, personal effort	One click to paradise
Scope	Becoming a part of something greater	Upgrade to your super ego
Technology	Self-control, spiritualism	Engineering, tracking
Approach	Learn and practice	Decode and recode
Result	Ego dissolution	Ego dissolution as a side effect

Source: GDI, 2017

Yet despite all these obstacles, biohacking has already started to change the wellness industry. A new way of thinking is taking hold – a new understanding of do-it-yourself combined with the recognition of how everyone is capable of tapping into and developing their own self-healing powers.

Digitalization will shape the future direction of the wellness industry. This trend is called data Buddhism. In the wellness industry, Buddhism is a kind of metaphor for any service inspired by Eastern philosophies and doctrines of salvation. Activities such as yoga, meditation and mindfulness don't aim to develop a super ego, but instead try to dissolve the «I». Mastering these techniques requires a lot of practice. Optimal well-being takes time, effort and self-discipline.

WISDOM AT THE PUSH OF A BUTTON

In contrast, the hacker wants to take the express route to nirvana. They want to rid themselves of personal weaknesses and reprogram their consciousness at high speed. Reset and reboot. Wisdom at the push of a button is data Buddhism's great promise. But it's still wishful thinking. If it does become possible to completely digitize humans in the future, the «I» could be dissolved in a never-ending network of data. The Israeli historian Yuval Harari wrote about these ideas in his book «Homo Deus»[27]. In his view, the universe is one gigantic flow of data. Organisms are reduced to mere biochemical algorithms. Humanity's cosmic calling: to create an all-encompassing data processing system into which we will all eventually merge.

An absurd idea? Maybe. Yet as the German philosopher Arthur Schopenhauer (1788-1860) – who is currently back in vogue – once wrote: «A new idea is initially ridiculed, then it is violently opposed, until after a long time it is accepted as self-evident.»

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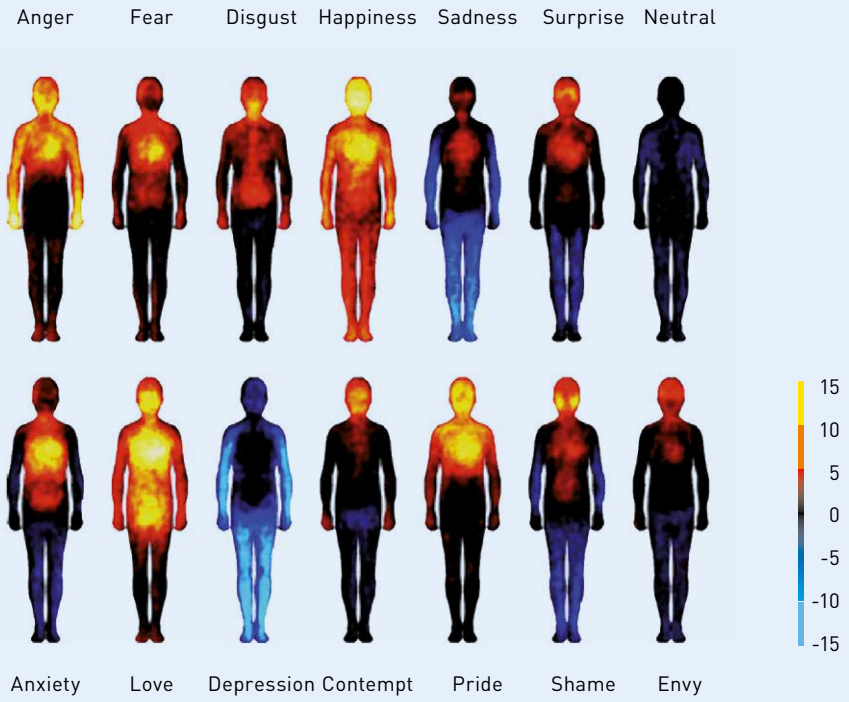
[27] Harari, Y.N.: Homo Deus. A Brief History of Tomorrow, 2016.

Bodily topography of basic (upper) and nonbasic (lower) emotions associated with words.



Source: Nummenmaa, L. et al. PNAS 2014;111:646-651.

Trend 3: data selfies

«We, the actual consumers, are the shadows of the personified simulations of ourselves.»
Benjamin Bratton

Data will give us better control over our well-being, regardless of whether it's information about our blood pressure, our adrenaline level or our skin's electrical resistance.

The fact that large IT companies use the trails of data we leave in our wake to predict our future behavior no longer surprises us. What we search for on Google, like on Facebook and purchase on Amazon is incrementally being used to generate our digital doppelgängers – which are becoming more and more perfect with every new bit of data. The doppelgänger may just be a mathematical model, but – depending on the quality of the data and algorithms involved – it more or less precisely shares our preferences, tastes, fears and worries. The data from our credit card bills, the GPS data from our smartphones and our contacts on LinkedIn complete the picture. We add to our «data selfie» with every click. Incidentally, «data selfie» is also the name for an add-on that is available for Google's Chrome browser. It visualizes the trails of data that we leave behind us on Facebook. We are our digital footprint.

We already live in a selfie culture. Since Tom Wolfe characterized the 70s as the USA's «Me Decade», there have been a host of studies describing the individualistic, egotistical and narcissistic cultural development of the Western world. But it was only with smartphones that the self-portrait became the dominant message format: today, 93% of Facebook users regularly post self-portraits for personal branding purposes. How we present ourselves online is who we are.

BECOMING MACHINE READABLE

In the future, these superficial portraits will be supplemented by new data that will document aspects of our lives rarely appearing on the radar screens of today's algorithms. For a number of years now, wearable tech has been collecting data

The technical mechanism that underpins this is quite simple: all emotional events are perceptible on a physiological level and can therefore be measured.

on our heart frequencies, the number of kilometers we walk and the calories we burn. This data offers insights into our well-being and is of particular interest to the wellness industry. The more data is collected from various sources, the more precise and multifaceted our digital doubles become. We are becoming machine readable. Our behavior can be analyzed and predicted. For algorithms, we have become an open book. No psychiatrist could sketch so precise a picture of our beings as this technology.

Even our emotions can be interpreted by algorithms in real time. This development is admittedly in its early stages in 2018, but the «roof of principle» has existed for some time. Technology is able to filter the data it has on a user to provide information about their current emotional state. The technical mechanism that underpins this is quite simple: all emotional events are perceptible on a physiological level and can therefore be measured.

Finnish scientists have been researching the extent to which these emotional events register physically amongst people from various different cultures.[28] They spoke to 700 survey participants from Finland, Sweden and Taiwan, asking them what kinds of reactions they had to emotions such as happiness, sadness, shame, disgust, envy, fear and love. Participants were asked to indicate on a computer-generated human silhouette where and how they experienced each emotional change.

The results showed that when participants were angry, they felt warmth in their faces, heads and arms. When they were depressed, they experienced a cool numbness in their heads and arms. Love triggered a positive feeling in the entire upper body; subjects experienced a particular feeling of warmth around their hearts. The study was able to prove that emotions can cause changes in physical perception, and that this happens in the same way across all cultures. Based on their survey, the scientists produced «bodily maps» that showed where and how the individual reactions were perceived in the body.[29]

CLOTHES THAT READ EMOTIONS

Clothes fitted with temperature sensors can measure changes in temperature in different parts of the body. This data makes it possible to draw conclusions about how a person is feeling and how their emotions change according to the situation. Combining this with further data (such as the kind of communication and movement

[28] www.pnas.org/content/111/2/646

[29] ibid.

patterns that smartphones usually record) even allows us to form judgments on which people are good for us and which people cause us stress.

The first models of these psychometric devices are already on the market. The «True Love Tester» bra, designed by Japanese lingerie store Ravi-jour, can only be unfastened when its clasp registers «true love». It «feels» this using a sensor that monitors the concentration of the «happy hormone» dopamine in the skin.

Unlike love, we have been measuring stress for years – primarily in the lab, but it has also recently hit the catwalk. The latest collection from Hussein Chalayan, a Cypriot-born designer based in London, projected his models' stress levels onto a screen next to the catwalk during the 2017 Paris Fashion Week. This was calculated based on heart rate and breath frequency values, which were measured in real time by sensors on the models' belts. Brain activity – another important parameter for stress – was measured by electrodes on their sunglasses.

DATA SELFIES OFFER A LOOK AT OUR INNER LIVES

We are currently experiencing a gradual shift from the conventional portrait to the data selfie that is drawing our inner lives out into the open. The emotional and biological events that take place under our skin are becoming visible. The way in which our movements and relationships affect our well-being can now be measured. The data selfie sketches out a picture of our emotions that were at best only partially comprehensible until now.

Thanks to the abundance of data that will in future be collected in real time via fitness trackers, wearables and implants, the measurement of moods and emotions will become increasingly precise. This will help give us a better understanding of the reasons behind our emotions.

Data selfies reveal the unconscious sides to our being and the signals our bodies are transmitting – and they make these things both transparent and machine readable. Whereas a photo selfie is static, a data selfie is dynamic. It shows what's giving us stress, what makes us happy, productive or creative, when we get tired, and when we need encouragement or a break. Instead of a snapshot, we get a long-term recording that shows how we are changing, whether we are becoming cooler or more sensitive, and whether we are learning to cope with situations or not. It not only shows us how we are feeling, but also indicates the condition of our relationships, who we are influenced by, and how the relationships with our partners, family, friends and colleagues are developing.

While a photo selfie is a narcissistic project, a data selfie shows us the sensitivities behind the mask and paints an unembellished picture of us as we really are. The digital data provides a true reflection of our tastes, our longings and the activities we engage in, and does so with greater fidelity than our own memories.[30]

The data selfie is a smart mirror in which we can observe ourselves from a range of different perspectives. With increasing precision and clarity, it reflects our latent strengths, weaknesses and sensitivities on the biological, emotional, mental and social levels.

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[30] Stephens-Davidowitz, S.: Everybody lies. What the internet can tell us about who we really are, 2017.

By continually showing us where we are emotionally, the technology of the future can help us to improve ourselves. The goal is to keep ourself in the best possible emotional state, and the data selfie is paving the way towards that goal.

Trend 4: wellness is social – make people happier and healthier together

«*I am feeling so lonely. Can I die from it? Yes.*» [31]

Humans are social animals. When a person is marginalized or completely excluded from human society, they suffer. Without recognition, respect or appreciation, we become ill. Social well-being is becoming an increasingly significant source of happiness in the digital age because it is placed under ever greater pressure by our interconnectedness.

In the summer of 2017, the British science magazine New Scientist [32] warned that loneliness could become one of the greatest dangers to our health in the coming years – greater even than smoking or obesity. This is because loneliness creates a burden on our psychological well-being that manifests itself in physical symptoms.

Social stress has repercussions on the immune system – this was proven some time ago by animal testing. Mice who are treated poorly by fellow members of their species have fewer T cells. These cells are an important defense against pathogens, but their production is slowed by stress hormones. Similar effects have been observed in humans. Social stress can cause lymphatic organs to shrink and lead to bleeding ulcers in the stomach or duodenum.[33]

For some years now, scientists have been investigating the effects of loneliness and social isolation on health, well-being and mortality rates. The results of their studies are alarming: lonely people have a higher mortality rate than people who feel well integrated within a social network. The greater part of this research focuses on the health and life satisfaction of people in geriatric care. Researchers at Brigham Young University conducted a meta-analytic review in which they found that social isolation increased the mortality rate at care homes by roughly 45 percent; individual evaluations estimate the figure could be as high as 60 percent.[34]

In industrialized Western countries, loneliness is on the rise as people move away from their communities in increasing numbers. One indicator of this is the continuing rise in the number of one-person households, an apparently paradoxical by-product of wealth, interconnectedness and individualism. Social dependency on others, for example family members, is decreasing. An ever-greater number of services that were once performed by relatives and acquaintances, such as caring, sharing and housekeeping, can now be

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[31] Answer by Brad Porter on Quora: https://www.quora.com/I-am-feeling-so-lonely-Can-I-die-from-it/answer/Brad-Porter-4

[32] New Scientist, Issue 3135, 22 July 2017 «Alone in a Crowd: Why so many people feel lonely but nobody is talking about it». In: www.newscientist.com/issue/3135/<http://www.newscientist.com/issue/3135/>

[33] Schulz, H. and Schulz, K.H.: Chronischer Belastungen, pp. 399-422 In: Schwedlowski, M. and Tewes, U (Pub.): Psychoneuroimmunologie, 1996.

[34] Holt-Lunstad, J. et all.: Loneliness and Social Isolation as Risk Factors for Mortality. A Meta-Analytic Review, 2015.

You can maximize your happiness by building a life that demands fewer decisions from you.

bought. The proportion of one-person households in the USA stood at under 15 percent in 1940. In 1980, it was already between 15 and 20 percent, and at the turn of the century it had reached 25 percent.[35] The share of one-person households in Europe has risen by roughly 8 percent to almost 35 percent in the last 25 years.[36] There is no indication that this trend will change in the years to come. Quite the contrary: in the future, loneliness could become a greater risk to our health and well-being than obesity, smoking, inactivity and poor nutrition are today. In the USA in 1980, 20 percent of people surveyed said they felt lonely. Thirty years later, the figure had reached 40 percent.[37]

LONELINESS IS BAD FOR YOUR HEALTH

The link between loneliness and health is complex. What is certain is that it does exist and has long been ignored.[38] Research today leaves us in no doubt that a person who is lonely is also more likely to be depressed, suffer from anxiety, dementia, schizophrenia and drug abuse, and have a higher risk of suicide.

Social isolation can also contribute to an early death for purely practical reasons. People who live alone have no one to help them when they suddenly become ill or have an accident. Symptoms of illness are also noticed later without the watchful eye of another person. Sentences like «You don't look well – you should go to the doctor» and «Have you taken your medication?» can save lives. It is even statistically proven. Lonely people are often neglectful of themselves and their personal hygiene. This sets off a chain reaction. Someone who smells and appears grubby or unkempt is likely to be avoided by other people. As a result, a vicious circle forms.

Loneliness also has repercussions on the body. When an organism produces the stress hormone cortisol, its blood pressure rises. A considerable number of studies have proven that social isolation massively increases the risk of heart attacks and strokes. According to John Cacioppo, a neuroscientist and the director of the Center for Cognitive and Social Neuroscience at the University of Chicago, the physical consequences of social isolation or rejection are as real as thirst, hunger or pain. Humans are social animals. According to Cacioppo, being socially marginal-

[35] www.youtu.be/_0hxl03JoA0

[36] Palgrave Macmillan Studies in Family and Intimate LifeSeries Standing, 2013

[37] www.youtu.be/_0hxl03JoA0

[38] Cacioppa, J. and Patrick, W.: Loneliness. Human Nature and the Need for Social Connection, 2009.

ized, or excluded altogether, is remarkably dangerous. The brain automatically switches to a self-preservation mode that places the body under extreme stress.

Scientists therefore agree that good social integration is essential for our health and well-being. This is not a matter of integrating into just any group, but rather of finding a group that suits us and does us good.

SOCIAL RELATIONSHIPS MAKE US HAPPY

«You are the average
of the five people you most associate with»
Jim Rohn

To put it plainly, the path to happiness must include the right personal relationships. The people we surround ourselves with play a decisive role in our well-being. Moran Cerf[39], a neuroscientist at the Kellogg School of Management in Evanstone, is convinced of this. The people we spend our time with are, he believes, the most important factor in our long-term happiness. According to Cerf, we find it easier to make decisions when we are in the right communities. Decision-making is a strenuous and energy-intensive process, and we can save a lot of energy, Cerf says, if we count on other people in our social group to help us make decisions.

Cerf's neuroscientific studies have shown that the brain waves of two different people begin to resemble one another when they spend time together. After a while, they become almost identical – they are literally on the same wavelength. The idea is already familiar to us from everyday life: negative people bring us down and positive people inspire us.

Cerf's conclusion: you can maximize your happiness by building a life that demands fewer decisions from you. Ideally, you should surround yourself with people whose characteristics or knowledge complement your own strengths. Cerf, for example, doesn't like choosing restaurants, so he thinks to himself: Who do I know who knows about food? This increases the chances that the person he meets will choose a place Cerf also likes, where both of them feel happy. Delegating small decisions such as these to other people can help us in many areas of life, regardless of whether we want to do more sport, watch less television or become more sociable.

SOCIAL HAPPINESS THROUGH DIGITAL SUPPORT

In the pre-digital age, finding people who were good for us was often a question of luck. Today, there are new tools that optimize the search for a long- or short-term partner. Online matching platforms make it easier to find people who suit us.

In the 21st century, connecting with other people has taken on a new dimension: collaboration is now a part of our everyday lives. Together we are smarter, learn better, reach our goals faster and make fewer mistakes. We still organize this collaboration on an ad-hoc basis for each individual task, but in the future, algorithms could take on the work of choosing the partner who suits us best. What's more, the involvement of artificial intelligence could significantly increase the quality of the results.

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[39] Hackers, Empathy And Neuroscience: A Conversation With Moran Cerf. Forbes.com, 2017/05/09. In: www.forbes.com/sites/robertwolcott/2017/05/09/hackers-empathy-and-neuroscience-a-conversation-with-moran-cerf/#4926a5d01741

American computer expert Louis Rosenberg[40] wants to increase human intelligence using an algorithm, and is turning groups into super-experts. Rosenberg calls his approach the Unanimous Swarm AI. Instead of removing humans from the decision-making loop, as expert systems have done until now, he is making them a critical part of the process. Rosenberg's algorithm brings the right people together, allowing them to boost the swarm intelligence and increase well-being through mutual support and inspiration. Collective learning, in particular, can be accelerated in this manner.

THE DARK SIDE OF DIGITAL HAPPINESS

Increased connectivity also has its dark sides, of course. In a world without distances, people can often feel that their identity is under threat and react with violence. As early as 40 years ago, media theorist Marshall McLuhan made the following statements in a television interview:

«When people get close together, they get more and more savage and impatient with each other. The global village is a place of a very arduous interfaces and very abrasive situations. Apparently, separatisms are very frequent all over the globe at the present time. (…) Every country in the world is loaded with regionalistic and nationalistic little groups. (…) It is only the threat to people's identity that makes them violent. Terrorists, hijackers – these are people minus identity. They are determined to make it somehow, to get coverage, to get noticed. In our time, when things happen very quickly, there's very little time to adjust to new situations at the speed of light. There is little time to get accustomed to anything. Even radio has sent tribal societies around the globe up the wall with intensity of feeling. One of the major violence makers of our century has been radio.»

McLuhan's statements are visionary: one only has to replace the word «radio» with «Internet» or «social media» to understand the extraordinary power these media can exert. They are capable of influencing people and placing them under enormous pressure. This has negative repercussions on health, happiness and well-being.

An example of this is the social pressure we feel to attach ourselves to the «right» group. To do this, we must maintain our visibility, as well as mingling, conversing and belonging with other people. It is a stressful process. It can lead people to take on «false» identities, to adapt, manipulate and seduce. Technology is becoming ever more powerful. Experts such as Dr. Bernadka Dubicka of the Royal College of Psychiatrists have discovered that young girls in particular are increasingly likely to experience psychological crises due to the pressure and stress of comparing themselves with their peers on social media.[41]

A person must have considerable self-awareness not to be taken in by false promises. Achieving the proper balance between social proximity and social distance will play a decisive role in our happiness in the future.

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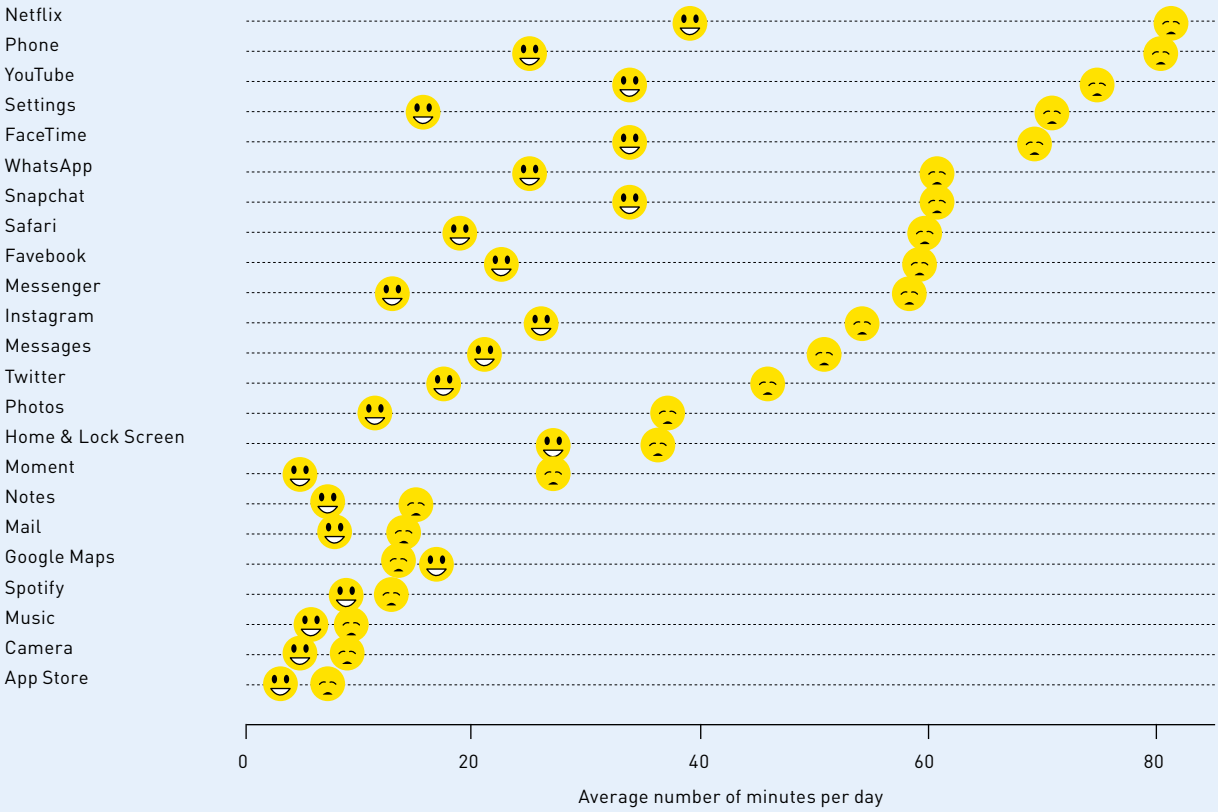
[40] www.unanimous.ai

[41] www.theguardian.com/society/2017/sep/23/stress-anxiety-fuel-mental-health-crisis-girls-young-women

Daily time in apps for happy and unhappy users[43]



Source: https://www.huffingtonpost.com/2014/01/07/boost-happiness_n_4532848.html

Trend 5: biofeedback replaces surveys and likes

When machines learn to recognize our feelings, they will be able to read almost all our desires in our eyes and no one will ever have to ask us how we are again.

In October 2001, Toyota presented a concept car called «The Pod». The car was able to recognize its driver's mood based on their reactions and driving style, and displayed this on the car's exterior using colored LEDs: red for anger, yellow for happiness, blue for sadness. There was also an antenna that moved like a dog's wagging tail. The Pod was conceived as the «car of the future», but it remained a concept car and never went into production.[42]

Since then, the technology for measuring emotions has made great strides and is now being tested in a number of fields of application. Apps are attempting to trace behavioral patterns and emotions from passively followed smartphone data. It is possible to discern how a person is feeling simply by looking at the way the use their cell phone. Which apps do they use frequently? How often do they text? How long do they speak for and with whom? How many steps do they take and how long do they sleep? This panoply of smartphone data offers up precise indications of a user's mental and physical health.

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[42] www.en.wikipedia.org/wiki/Toyota_concept_vehicles,_2000%E2%80%9309#Pod

[43] www.timewellspent.io/app-ratings

All of the big tech companies are currently investing in research on artificial intelligence or «affective computing»

Time Well Spent, for example, is an app that helps people monitor their screen time. It investigated how the screen time a person accumulates on particular apps affects their mood. The results show that more than 40 minutes of screen time per day has a negative impact on our well-being, regardless of which apps we use.[44]

HUMANS AS EMOTION TRACKERS

In the near future, an increasing number of the apps we use in our everyday lives could be fitted with biometric sensors and facial and voice recognition software that analyse our emotions. Using upgrades, companies can integrate these functions into the products we are already using today. Apple, for example, has recently bought Emotient, one of the leading companies for facial recognition technology. It is possible that you'll soon hear Siri volunteering questions like this: «Your facial expression seems sad – should I download Trainwreck from iTunes?»

All of the big tech companies are currently investing in research on artificial intelligence or «affective computing» – that is, the development of systems and devices that can read, interpret, process, simulate and predict human emotions. With software like «HowWhoFeelInVideo», for example, Amazon is analyzing the emotions on faces in sampled video clips.[45]

LA startup Polygram has developed software that studies facial reactions to shared photos. According to Polygram, the app can «read» facial expressions, assign them emotions such as boredom, happiness and interest, and automatically translate them into emojis. The social media app, which works like a cross between Snapchat and Instagram, sends out the facial expressions of individual followers in real time as they view the photos.

Few innovations have brought biometrics into our everyday lives as quickly and effectively as the 3D facial recognition (Face ID) on Apple's new iPhone X. Along with further data collected from other sources, such as sensors in clothes, furniture and toilets, innovation in the tech industry is gradually creating an ever-denser emotion recognition network and using it to provide information and feedback on our well-being.

[44] www.timewellspent.io/app-ratings

[45] www.aws.amazon.com/de/blogs/ai/analyze-emotion-in-video-frame-samples-using-amazon-rekognition-on-aws

It already seems likely that emotion tracking will gradually replace traditional customer satisfaction surveys.

BETWEEN FEAR AND OPPORTUNITY

This can also lead to fear, of course. Is the threat of total surveillance and manipulation imminent? Are we all being exploited by the tech industry?

The developers of artificial emotional intelligence (AEI) see it as primarily beneficial, claiming that AEI will help us make better decisions. But it is not only the creators of such technologies who see opportunity in them; the philosopher Alain de Botton, for example, listed the following benefits in an article for the tech magazine Wired.[46]

> **Self-awareness:** Emotions are complicated and we often fail to recognize what is really good for us. AEI could help us to understand ourselves better and make smarter decisions, in particular when it comes to important emotional questions like «what should we learn?» and «with whom should I build a relationship?»

> **Empathy boosting:** Empathy is the capacity – and the willingness – to recognize and understand another person's perceptions, thoughts, emotions, motives and personality features. The basis of empathy is self-awareness: the more open a person is to their own emotions, the better they can interpret another person's. AEI could help us to better understand and empathize with other people. This would allow us to deal more intelligently with conflicts.

> **Education:** Learning is often an inefficient process. This is because we often don't know what kind of teaching suits somebody best, when a person is most receptive, when they need a break, and what motivates them. AEI could help us to change all that.

> **Consumption:** Consumer decisions are generally a mixture of intuition, hope, habit, peer pressure and chance. The result is that many people feel unhappy with their purchases. AEI could help us get to grips with our true motivations and allow us to make consumer decisions that leave us happier in the long term.

Emotion recognition technology is not yet fully developed and the areas where it could – or should – be employed are still very much open. The fields of application for «emotion tracking» and psychometrics, however, are broadening. As the examples above show, relatively few data points are required to get an idea of a user's mood. It already seems likely that emotion tracking will gradually replace traditional customer satisfaction surveys. The more we interact with machines

[46] De Botton, A.: Six areas that artificial emotional intelligence will revolutionize. In: www.wired.co.uk, 21 Oct 2015.

in our day-to-day lives, the more important emotion recognition technology will become. If smart assistants are to converse with users and establish a relationship with them, they will have to understand how that user feels. Without the capacity to recognize emotions, smart assistants and robots will fail in everyday life.

There are also economic arguments for emotion tracking: it allows us to measure customer satisfaction in real time and the process is better, cheaper and more simple than in traditional customer survey methods.

CUSTOMER SATISFACTION AS THE MEASURE OF ALL THINGS

With the arrival of automatic emotion recognition, customer satisfaction will unquestionably become the measure of all things. Providers of consumer products and services will have to adapt according to this customer satisfaction data. As a result, even providers outside of the wellness industry will focus far more closely on the well-being of their customers. Along with subjective perceptions of happiness, the collective mood will also be measured, whether this is in a restaurant, a shop, or an airplane. In the future, local mood reports could become as much as matter of course as the weather report is today. Indeed, the first prototypes are already here. For example, a group of researchers from the universities of Harvard and Northeastern have developed a model for visualizing America's daily mood based on Twitter analysis.[47] There is also «SelfieCity», a project that analyzes the mood of cities like Moscow, Berlin or New York by looking at their selfie posts.[48]

The combined use and further development of such applications could in future become an important indicator for the wellness, services and consumer good markets, so long as we are able to measure which activities and offers make consumers happy and how long this happiness endures afterwards. An increase in well-being could become a unique selling point for an increasing number of products and services. Whether they want to relax for five minutes or change their habits in a lasting fashion, people will have access to an ever-greater stock of valid, evidence-based data on which to base their decisions. Which product will make the more lasting contribution to my well-being? Which is the best path to happiness for me? The more measurable and comparable this happiness quotient becomes, the greater its significance as a sales argument. In future, products and services may be evaluated not only on the basis of their carbon footprint, but also on the added value they represent in terms of happiness. In an age where countries have long been judged not just on the basis of their GDP but also on their happiness index, it is conceivable that we may eventually see happiness comparison portals on which users can compare products according to the value they offer an individual. The comparison would not only consider the consumer's emotions, but also those of the employees. The thinking behind this is that happier, more satisfied people are more productive and creative, have healthier lives and generate lower costs for the company and state.

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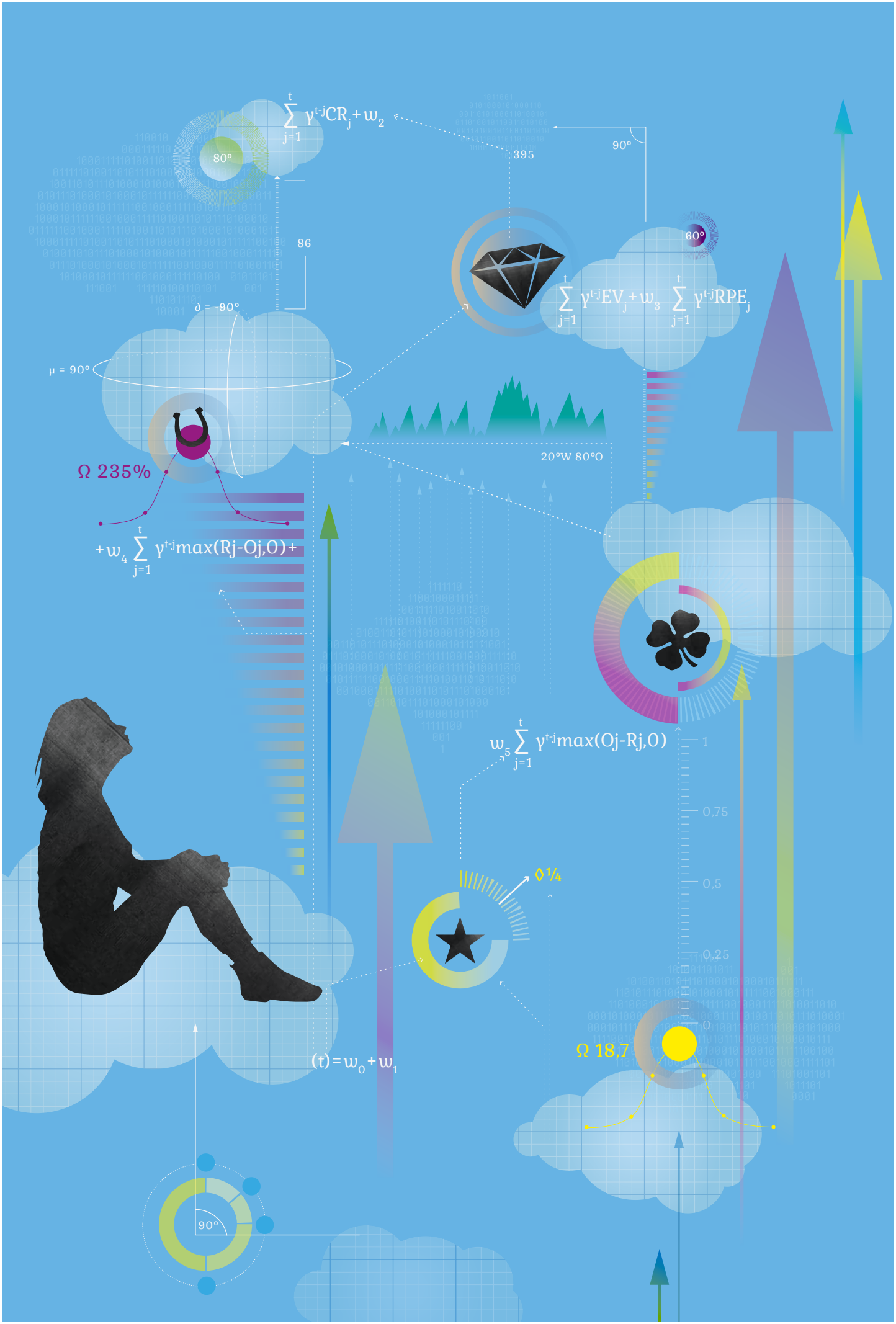
47 www.mashable.com/2010/07/21/twitter-moods-map/#jhmxjhKR6kqZ

48 www.selfiecity.net/#selfiexploratory


$\sum_{j=1}^{t} \gamma^{t-j} CR_j + w_2$
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Towards a data wellness economy

«Those who think they have no time for bodily exercise will sooner or later have to find time for illness.»
Edward Stanley, British Statesman

The business of happiness has been a huge market for some time now. It includes sectors such as wellness tourism, the spa industry and healthcare provision. Well-being depends on various individual circumstances, which is why today's offers span the entire spectrum from evidence-based treatments through to shamanism. Everyone is free to cut their own slice of the cake from what's on offer.

Even if there is no «wellness industry» as such, consumers have their own idea of what it looks like. Whether it's at a wellness retreat, in a fitness center or with a lifestyle coach, body and soul alike are tended to. Although the focus is often on «comprehensive therapies», most methods build on the positive feeling of having done something good for oneself. Once the treatment is complete, everything feels better again. Offers are put together from spa menus or fitness programs. The client pays by the hour or for a whole package of services. During the treatment, any perceived deficits are analyzed, which the client tackles in their holidays or free time. There is a clear distinction here between medical treatment and the wellness industry. Medical treatments are prescribed; wellness is chosen. This voluntary aspect to wellness is a strong indicator that customers are ready to spend money on it. Wellness is a matter of personal choice and people are happy to put money on the table for it.

Developments in the healthcare market are charting a course for the wellness industry, with a particular focus on customer-centered, data-driven applications. However emotional and varied the offerings of traditional wellness providers may be, analytical data management is not one of their core skills. In the world of the data economy, the tech industry's big seven (Google, Apple, Facebook, Amazon, Baidu, Alibaba and Tencent) are on the front line. Experts from the consulting firm Gartner believe that some 20 percent of our everyday activities and interactions will filter through at least one of the «big seven» by 2021.[49]

As a result, the wellness industry's contribution to our well-being may shift its primary focus from practical applications to continuous monitoring, made possible by the host of smart devices both on and about our persons. This monitoring will help to reveal where the focus of a therapy should lie. These strategies will require wellness providers to be conversant with very individualized data analysis and preventive prognoses – the preserve of tech companies. This transformation is comparable to the one taking place in the automotive industry, where the mechanic – or therapist – is increasingly becoming more of an analytical worker than a practical one. The values they measure are compared, analyzed and discussed with the consumer, with the advice becoming a more important part of the process than its practical application.

PAY-AS-YOU-LIVE: NEW BUSINESS MODELS

Wellness services today are mostly charged by the hour or as part of a package. The price of a massage depends on the service-provider's positioning. Depending on whether the offer comes from a simple, functional provider who doesn't see ambiance as a top priority or from a spa at a five-star resort that uses first-class care products, the difference in price can be enormous. The way

[49] www.selfiecity.net/#selfiexploratory

Moving towards data wellness – software eats wetware

Wellness Industry	2018–2024	2024–2030
Key product	Treatment, medicine	Data science, analytics, scoring, predictions
USP	Believe, cure, hope	Evidence, predictive maintenance, enhancement, hyper-well-being
Key interface	Spa, gym, shop, doctor	Smart devices, calm technologies, monitoring
Pricing	Per product or per hour	Pay-as-you-live
Key player	Specialists, individual providers	ICT, data-companies, hyper-connected, mobile
Intervention	Acute medical issues	Real time monitoring, predictive

Source: GDI, 2017

these prices are fixed is strongly dependent on subjective and individual criteria. Customers have a positive attitude to wellness and are generally prepared to pay a great deal for it as a result.

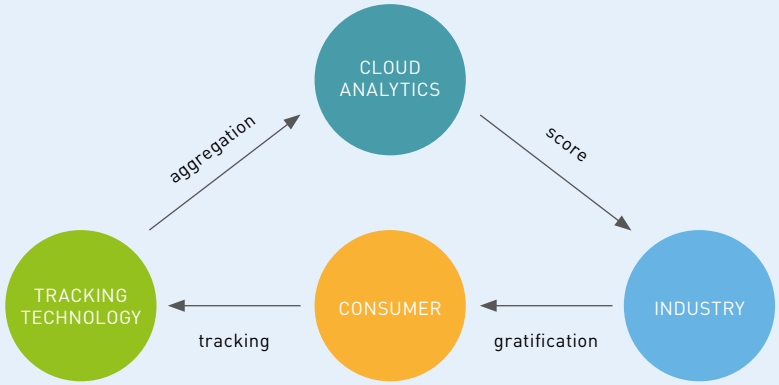
What is clear is that the more consumer and behavioral data a company has, the more personalized its price-setting can become. Wellness providers will therefore be able to create completely new business models in the future. Customers will be rewarded based on the «pay-as-you-live» principle, paying only according to what they use or contribute. Amazon, amongst others, has perfected data-based price-setting. Individual prices are generated for each customer based on a combination of user data, search criteria and product availability. Systems such as this were initially met with strong criticism, but we have now gotten used to the idea that the person in the neighboring plane seat probably paid a different price for their ticket.

Thanks to the continuously improving options for payable self-tracking, the pay-as-you-live principle has now arrived in the healthcare sector. The price of a service is determined according to a consumer's lifestyle. A number of new health insurance schemes are already applying this principle, clearing the path for pay-as-you-live in a sector that has, until now, been governed by seemingly inviolable social solidarity principles. Yield management – the art of digital price structuring according to supply and demand – is encouraging customers to spend more on their healthcare. The chances for success look good; healthcare and well-being are not, generally speaking, areas where people try to save money.

The new players in the wellness economy (e.g. Amazon 1492) have the technology and the expertise necessary to tap into this willingness to pay. They are, in any case, set to become key players in the creation of added value.

Platforms represent enormous advantages for users. They offer an inexhaustible supply of products and services and use intelligent algorithms to find relevant purchases for individual consumers. These algorithms learn tirelessly from their users and make it easier for them to cope with the complex range of goods and services on offer. If a

From platforms to the ecosystem of the wellness industry



Source: GDI, 2017

bad decision means buying the wrong pair of shoes, the risks will appear negligible, but we are less willing to experiment when it comes to health and individual well-being.

Yet this is the de facto state of things. Biohackers experiment with self-optimization on their own bodies. They act as trailblazers for the mainstream, who will likely soon follow in their wake. The abundance of disruptive «techniques of happiness» on offer today compels us to make use of inherited cultural techniques or employ the principle of trial and error to find the right path to happiness. But platforms can provide us with easy access to areas of the market that were previously opaque or even impenetrable. Whereas we used to look to renowned brand names such as the Hilton to show us the way, today that role is fulfilled by digital platforms such as booking.com. Thanks to predictive analytics, digital platforms know what a consumer wants – even before the consumer.

TRUST ME, I'M A SMART ASSISTANT

We are at the dawn of a new era. By 2020, according to Gartner's analysis, 30 percent of Internet search requests will take place without the intermediary of a screen.[50] Smart assistants are on the rise. Their creators, Google, Apple and Amazon, have all thrown their hats into the ring and the struggle for the commercialized ecosystem has begun. In the future, smart assistants will decide which relaxation exercises are best for us, as well as which nootropics should be delivered immediately to help us take the next intellectual challenge in our stride.

Smart assistants, then, are the new intermediaries. «Consciousness technologist» Mikey Siegel agrees: «What if we disintermediate spirituality itself and redesign it for a modern secular world? What if tech that provided the benefit of 10,000 hours of meditation was as accessible as cell phones?»[51] He predicts that we will soon see the emergence of a kind of Netflix for well-being – an intelligent index of wellness techniques. Spirituality and technology are fusing together. It seems we are only a voice command away from the chance to become the best possible version of ourselves. We have the opportunity to become data Buddhists. Something that required a lifetime of training for previous gener-ations might soon be available almost at the push of a button.

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[50] www.forbes.com/sites/gartnergroup/2016/11/15/gartners-top-10-strategic-predictions-for-2017-and-beyond/#1ce744a36976

[51] www.highexistence.com/consciousness-hacking-mikeysiegel-transformative-tech-future-spirituality

We will soon see the emergence of a kind of Netflix for well-being – an intelligent index of wellness techniques.

FROM SEALS OF APPROVAL TO BOT RECOMMENDATIONS

It seems highly likely that the big winners in this business will be those who are shortlisted by Alexa, Siri and co. Particularly if they can stir people's emotions. Clever marketing strategies would bet on the principle of «business to machine», where the most important recipient of a message isn't the end user but the smart assistant. The latter is only as useful as the quality and quantity of the data that it receives from its user. Ideally, this concept should focus on vendor relationship management (VRM); with the help of VRM-based applications, customers can manage and shape their data in a comprehensive and individualized fashion. In doing so, they thwart the attempts of customer relationship management (CRM) to occupy a central role in customer management. With the help of VRM, customers go from being passive to active partners in the relationship management process.[52] Data becomes the true currency, and is only given out by the consumer when there is a true benefit associated with it.

In such a system, customers are only encouraged to part with more money if service providers can offer a greater level of expertise. Star ratings and seals of approval are turning customer evaluations into the new kingmakers. The decisive questions here include: Which systems do users trust? Who controls the assistants? How can the consumer assert themselves against digital giants? Consumer emotions will play an increasingly important marketing role in this context.

The billion-dollar soccer business serves as an example of how emotional marketing functions in the age of bots. It is a sector where every fan counts and also feels the need to offer their own strategy tips at half time via Twitter. There is no service center large enough to quickly and adequately answer messages from thousands of fans. Instead, a far better idea is to focus on analyzing the «emotional customer journeys» that fans undergo.

At Arsenal, the legendary soccer club in the English Premier League, the Fan Services department calls this process «emotions management». And the similarities between fan management in sport and customer management in business are no coincidence. In the future, consumption will become a fluid process that dispenses with the conscious act of buying. The example of Alibaba in today's world provides us with an example of how this could look: with its «smile-to-pay» sys-

[52] www.cyber.harvard.edu/research/projectvrm

tem, no credit card number is entered and no cash is handed over. The facial recognition software identifies the user's smile and uses it as a pin code for their account. The user and the ecosystem are constantly connected. Rather than being a customer for the duration of their purchase alone, the user enters into a permanent relationship with the service provider. Consumers become fans. As a result, their emotions must be both guided and understood.

NEW ALLIES IN THE WELLNESS INDUSTRY: TECH STARTUPS AND UNICORNS

A unicorn is a tech startup with a billion-dollar valuation that hasn't yet made an IPO. A quick glance over the world's largest unicorns reveals names such as Uber, Xiamo, Airbnb, Palantir, Dropbox and Pinterest, and also points to another factor that distinguishes them: their disruptive potential. It also explains why they are so closely observed. Unicorns are often bought out by established players such as Apple or Google before their valuations become too high. Or, if their business model proves unsuccessful, they disappear completely – something which only serves to confirm Silicon Valley's propensity for risk-taking and experimentation. The US tech website Venture Beat counted 229 such Unicorns in 2016.

If the fusion of expertise in the healthcare and technology sectors does indeed point the way ahead for mainstream wellness treatments, it would be wise to pay special attention to unicorns in the fields of health and biotechnology.

Startups from the mental health and wellness technology sectors are in high demand with venture capital investors. Investments in online therapy platforms, biosensors, wearables and apps are booming.[53]

For two years now, business has also been booming in the wellness technology sector. The volume of transactions has seen a year-over-year percentage increase in the high double digits. New treatment methods – for example virtual reality therapy in psychiatry – are quickly finding their way onto the consumer market and could meet the wishes of self-optimizing consumers looking for more balance in the future. And that's something that could really get business moving.[54]

Wellness technology startups are developing self-tracking tools such as wearables and apps to increase user well-being. Telemedicine platforms, remote access to care services, interactive measurements of our emotional state and daily motivational text messaging services will all help to optimize our well-being. Hospital systems like Cedars-Sinai, tech giants like Google and health insurers like Aetna and Blue Cross Blue Shield are investing in and collaborating with these companies. Google, for example, is working with Quartet Health, who develops cloud-based data analysis.[55] This is an indication that platforms belonging to these tech giants will increasingly move into the wellness sector and integrate themselves into their ecosystems.

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53 www.app.cbinsights.com/research/funding-mental-health-startups

54 ibid.

55 www.medcitynews.com/2016/12/unicorn-list-theranos/

Wellness technology startups and unicorns

HUMAN LONGEVITY The gene technology company Human Longevity Inc. (HLI) combines machine learning with DNA sequencing and expert analysis. It aims to promote data-driven medicine. The ultimate goal is to create a database of human genotypes and phenotypes, and to refine this using machine learning in order to forge new paths in the fight against age-related illnesses.

23ANDME The biotech company analyses the genetic data of private individuals. It has investigated the genes of more than 750,000 customers from 50 countries since 2014. Their saliva samples were scanned for roughly 200 genetic diseases and 99 other health issues.

PROTEUS DIGITAL HEALTH The digital medicine company combines pharmaceutics with ICT and artificial intelligence. The company focuses on the development of products, services and data systems that integrate medicine with ingestibles, wearables and mobile and cloud computing.

ZENEFIT Senefits offers companies a cloud-based software solution for personnel management. Its focus is on providing support in the health insurance sector.

INTARCIA THERAPEUTICS This biopharmaceutical company develops innovative treatments using the Medici Drug Delivery SystemTM. Their medicines prevent and treat serious chronic illnesses. Intarcia Therapeutics focuses on illnesses that are widespread, poorly controlled and are growing at an epidemic rate. The company works in preventive and therapeutic medicine.

ZOCDOC A company that provides online booking services. Patients can view available appointment slots and immediately book them online. Before the appointment, patients fill in an online questionnaire on their medical history. This leaves more time during the doctor's appointment for personalized consultation. Doctors are then evaluated by patients, with this appraisal appearing on their online profile.

FLATIRON HEALTH This tech startup is supported by Google and compiles electronic patient records. The «DocSearch» function indexes all machine-written reports within an easily searchable digital patient record.

OSCAR Oscar is an insurance startup that offers technology-focused health insurance in the USA. It provides free round-the-clock telephone medical consultation to all its members. It assigns each member with a «Concierge team», consisting of three care guides and a nurse who answer questions from customers and coordinate any necessary clinical care.

Source: medcitynews.com/2016/12/unicorn-list-theranos/

Conclusion: consequences for the wellness industry

Fluid lifestyles, project-oriented working methods and frequent partner changes have become everyday. There is a constant need for us to assert ourselves in the market.

People are subject to continuously increasing pressure.

A new era of self-optimization has begun. Assistive technology gives us a sixth sense: «We shape our tools and thereafter our tools shape us», as the legendary Canadian media theorist Marshall McLuhan so insightfully put it. The more we are defined by the traces we leave on the net, the more important the origin and quality of this data becomes. In the future, it will be used to generate a 360° view of our person. Our data selfies will thus become more important than our reflections in the mirror. The opportunities offered by technology are growing exponentially. They will first lead to an explosion in intelligence, then possibly to «exponential happiness». Thanks to data, we may soon crack the code to happiness and happiness will not only be decoded, but also continually recoded. It will be both individually defined and individually attainable. We will become quasi data Buddhists at the push of a button.

The struggle towards self-optimization, however, knows no end. The technical tools that first make our «I» data possible lead us to a new level of knowledge but also of ignorance. They create a paradox of knowledge that drives us into endless, circular spirals. The more we know, the greater the next gap in our knowledge appears to be – a gap we attempt to fill using new technology.

THE WELLNESS INDUSTRY WILL BECOME AN EXTENSION OF THE DATA ECONOMY

The wellness industry must make itself fit for a data-driven future. Google, Apple, Amazon and the smartphone manufacturers are pointing the way. The journey into the data future has already begun. It is not yet clear if we will see a cross-sector platform that can access and manage all consumer data by 2030 or whether this role will be performed on an individual's behalf by data brokers or smart assistants. But one thing is sure: the various players in the wellness industry will rarely own data themselves. The wellness industry will become an extension of the data economy. It will have to decipher the wishes of its customers and create offers that match them. Software will create the «perfect match» between the consumer and what's on offer. Users will be able to choose from personalized menus, as they do with Netflix. In this world, only the service providers who speak most directly to our own individual prospects for happiness will prevail.

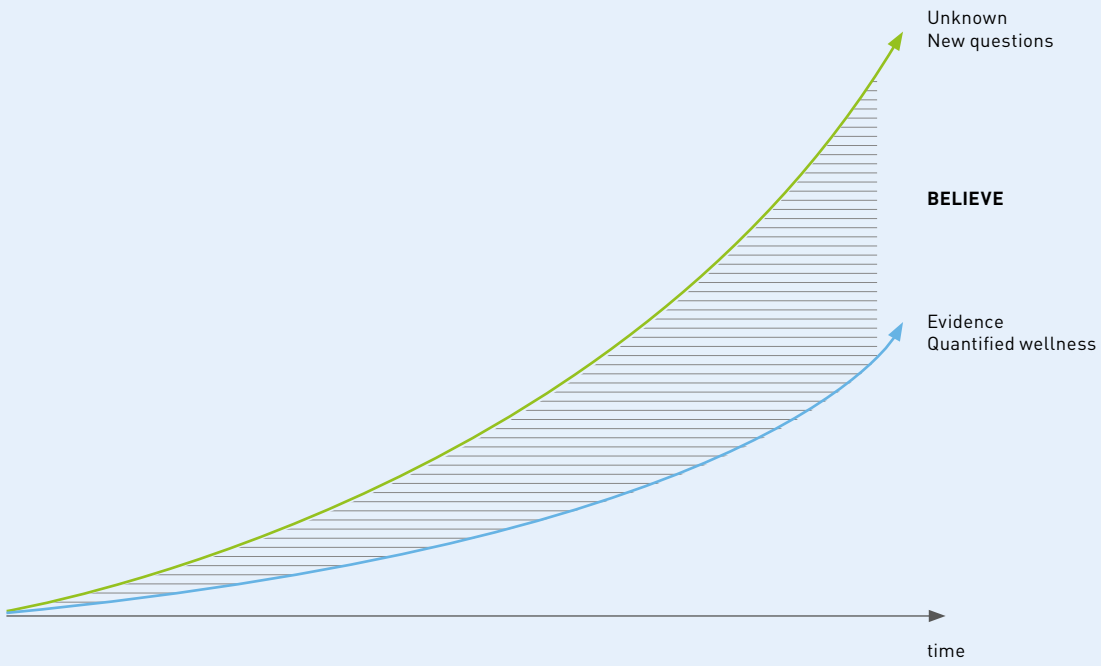
BIOHACKERS AND SILICON VALLEY ARE THE NEW PIONEERS OF WELLNESS

Biohackers are set to shake up some of the rules of play here. They are testing the possibilities of technology on their own bodies and are spearheading innovation. The lucrative unicorns emerging from Silicon Valley are one indication that the code to human happiness may well be cracked there. It is hard to predict which innovation bubbles will burst. What is certain is that the most innovative companies – and the ones who cope best with setbacks – are the most likely to survive and change the industry in the long term, defining some entirely new wellness categories in the process. They can serve as a source of inspiration for the wellness industry and even be used as active «disruptors».

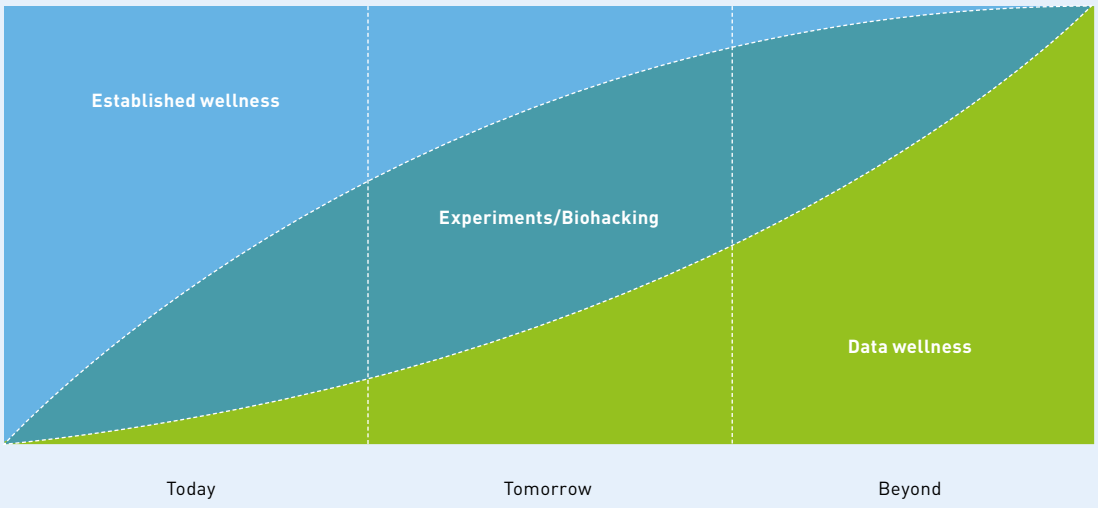
THE WELLNESS INDUSTRY NEEDS A HACKER MINDSET

In the coming years, the industry will have to focus on unorthodox cooperations and the ability

The more evidence we have, the more new questions emerge



From established wellness to data wellness



Source: GDI, 2017

to think beyond the classical understanding of wellness. The wellness industry will need the courage to experiment and, to ensure this, it must also take on the mindset of a hacker. This is the only way to build long-term trust amongst customers and pave the way to data wellness in the industry.

IN THE ERA OF CUSTOMER RATINGS, CONSUMER DATA MANAGEMENT WILL BECOME A KEY AREA OF EXPERTISE.

The culture of likes and dislikes will not bypass wellness providers. The ultimate judgment of quality will come in the form of customer ratings, regardless of how many stars or seals of approval industry members distribute amongst themselves. In the long term, this could lead to a shift from expert knowledge to comprehensive consumer data management.

This could, in turn, bring up a number of new questions: Who owns the data? Who aggregates it? Who controls it? Who programs it? Only those who have access to the best data will prevail. This is a new power structure that may ultimately lie in the hands of the customer.

BLURRING THE BOUNDARIES BETWEEN WELLNESS AND HEALTHCARE

In the future, the boundaries between wellness and healthcare/medicine will increasingly become blurred. The closer the wellness industry moves towards healthcare/medicine (e.g. biohacking approaches), the closer it comes to a regulated market. Market regulations will hardly relax in the future. The most they can do is slow the pace of innovation. They will not be able to stand in its way.

It is of crucial importance for the wellness industry to understand where new players are coming from and to identify the right collaborators. Consumer understanding in wellness is changing and the boundaries between its areas of application and the providers themselves are becoming increasingly blurred.

Appendix

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