THE DIGITAL HEALTH REVOLUTION

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Technology has forever revolutionised different industries. Innovation happens at such a rapid rate that we can often take its impact for granted.

Over 100 years ago, we gained the ability to see inside the human body to identify broken bones – the X-Ray changed healthcare dramatically. By the 1970s, there was the birth of the MRI scanner: bringing unprecedented access to the human brain, with the ability to identify the effects of a stroke, multiple sclerosis and even locate tumours.

Now healthcare technology is becoming personal. This revolutionary tech is bringing monitoring, testing and analysis to the individual, thanks to relatively inexpensive, small and portable gadgetry.

People can track their physical activity to see how many calories they burn during the day, using a £100 device such as the Jawbone UP. With this information, users can then plan their food consumption to either lose or gain weight – again, this can be tracked using a simple app such as MyFitnessPal. You can track your sleep, to see how this affects weight, physical activity or even productivity, using a device such as the UP or an app such as Sleep Cycle.

It isn’t just the technology in the devices alone that is creating a new era for healthcare. The insights and data provided can be even more spectacular and useful in fully understanding your personal health. With APIs available for most devices, and simple tools such as IFTTT.com, which allows people to connect devices to each other, we can start to see how one thing can affect the other and begin a personal health tech ecosystem.

It is clear that digital tools and services are bringing about a new revolution in healthcare. Now the question is - how will the healthcare industry use this? Some companies are embracing technology; such as 23andMe – a lab in Los Angeles which maps customers’ genomes, and then uses social networking and surveys to identify patterns around the world; giving family history sites a good run for their money (after all, what could be more accurate than DNA for finding long lost second-cousins?)

Digital Health is more than just the technology hardware. It is the use of the internet, APIs, and ease of access that is kickstarting a mainstream adoption of the trend. We are at a tipping point, where greater control of personal health is being taken back by the individual – all thanks to Digital Health.

Digital Health is the result of revolutionary technology that can be applied to healthcare. It enables people on an individual level to take control of their health, fitness and wellness through self-tracking, self-testing, self-diagnosing and self-analysis. Tools and services offering sensors or DIY health kits are bringing Digital Health to the mainstream enabling individuals to retain data and thus take control and change the scope of good healthcare forever.
“Wearables” is one of the fastest growing areas of health technology, with 2013 noted by many as being the year that wearable tech moves from the realm of the Quantified Self hobbyist, to the everyday guy and girl on the street.

Way ahead of their time, the Chinese Qing Dynasty first came up with the idea of putting a fully functional abacus on a ring in the mid-1600s. But it wasn’t until the 1990s that wearable computers like the Timex Data Link series, co-developed by Microsoft, really began to pave the way for smarter devices that could track our every movement and integrate seamlessly into daily life.

Today, wearables have benefited hugely from advances in semiconductors and wireless tech, not to mention integration with a myriad of web services. Low-powered, high performance sensors such as accelerometers and heart rate monitors teamed up with close proximity communications standards are now typical elements within activity tracking gadgets.

Connectivity with smartphones is also on the increase as product manufacturers seek to take advantage of the ever-present, and increasingly powerful, mobile device in our pockets. Apple’s commitment to more deeply integrate Bluetooth within future iOS and OSX releases will be a boom to wearable devices and peripheral manufacturers, but also serves as a warning shot to the industry as a whole as it crystallises its own plans for an iWatch.

Products such as the Fitbit, Nike FuelBand and Jawbone UP are the current fashionable choice amongst newly devoted self-quantifiers, contributing to the estimated $3-5 billion wearables market. But smaller startups continue to innovate and could help drive the sector to $30-50 billion by 2018*.

The B1 smart watch from Basis and the Shine from Misfit Wearables are two great examples of what the next evolution could look like, but whether they will be blown out of the water by Apple or another major manufacturer remains to be seen.

While devices remain popular in our gizmo-obsessed world, it is very likely that wearables will soon become integrated into everyday clothing in a form-factor no more obtrusive than a button or zip. We’re looking forward to seeing how a spin in the washing machine might affect our daily step count records.

*Credit Suisse June, 2013
Why visit a doctor to find out your body fat or have a blood test done when you can simply do it at home, at your convenience? In the past the answer to this question would be easy; it is either too expensive to do, or just not possible. That is no longer the case. With Digital Health technology we are able to self-test at home far more than ever before.

Using 23andMe you can map your genome, by simply spitting into a test tube which is sent to a lab in LA. Using an iHealth Wireless Blood Pressure Wrist Monitor you can track blood tests and monitor change over time – ensuring you focus on improving areas of your health that may be at risk. Furthermore, by using activity trackers and Wi-Fi scales people can monitor their weight and body fat to ensure they stay fit and healthy.

Healthcare is going DIY. DNA is mapped through mailing services; expensive software is being replaced by smartphone apps and the doctor is increasingly being seen almost as an inconvenience, when the information that advises them is right at your fingertips on the internet.

However, the question that remains is whether or not one can trust this data, the DIY technology itself or rely on their own self-assessment without years of medical training to back it up.

The thought of having a piece of technology inserted into our bodies makes most of us wince, yet it is very likely you’ll have met plenty of people with a pacemaker, artificial joint or some form of permanent implant without even knowing it. Many of these would perhaps be considered old school and functional in comparison to what is coming next. However, looking back at previous years and the growth in technology it is assumed that the near future will see us having far more sophisticated technology not just on our skin, but embedded within our organs. The challenges to making this a reality are vast, and would have been completely impossible to overcome just a few years ago.

Foreign items, particularly computer hardware, generally don’t go down that well when introduced to the sensitive environment of the human body. In fact, its first instinct is to reject them. This could take many months or just a matter of minutes, but it may prove to be critical or even fatal in acute circumstances. In short, high tech implants are not something to gamble on and this makes their careful development an even bigger, not to mention expensive challenge.

Despite this, in what is a testament to the rate at which advances are being made, innovative organisations such as MC10 are creating tiny implants, some as small as one-fifth of the width of a human hair. These will not only be flexible (thereby reducing the chance of rejection), but contain local computation capability which could then signal alerts to a medical professional or trigger the automatic release of targeted drugs.

While robot limbs and man-made organs could be seen as the nirvana of biomedical technology, it is likely that the practicalities and potential high impact of micro implants will mean they will reach a body near you more quickly than you think.
As Forbes wrote earlier this year, there are many compelling reasons as to why pharma should be a market leader in the Digital Health space. Technology is an essential part of the solution for pharmaceutical companies to cope with demand and care efficiently with increasingly tech-savvy patients.

In addition to this, the industry is seeing changes as a new generation of medical students use new practices. Smartphones and numerous apps like STD Triage are being used as diagnostic and therapeutic tools and even performance-enhancing pills, like Modafinil, known as smart drugs, are readily available.

Former methods of case studies and charts are being replaced by a large set of direct patient data putting them at the centre of the evolution. These so-called ‘citizen scientists’ practice self-advocacy empowered by information to act on personalised care – who said anything about asking your doctor?

This is being backed up by the Center for Disease Control, suggesting that the use of the internet and social media tools has grown for physicians as some healthcare professionals use it to build, engage and maintain their patient base. The tools are also used to research emerging medical trends and prepare for the inevitable switch to electronic medical records.

Consumer demand and desire to obtain direct and immediate wellness information, self-diagnose, and have various health research available at any time has, according to Pew Research Center, risen too – the two naturally go hand-in-hand.

“Technology is an essential part of the solution for pharmaceutical companies to cope with demand and care efficiently with increasingly tech-savvy patients.”
It has been long established that there is a close relationship between psychological and physical health. It’s no news that health professionals warn against stress, overworking, internal conflicts and other time-consuming demands of everyday modern life. The danger and difficulty for many is finding ways out of this so-called rut.

Smart business people know that competition is a motivator, which is why we have leader boards, objectives and awards to encourage enthusiasm in the work place. There’s no denying the achievements through what is essentially known as gamification. It takes one to be open-minded about new methods of combating psychological stresses and step out of your comfort zone in order to make work and life more fun. Following the health tracking path may just be the enlightenment you were after.

They don’t call it a mental game for nothing, so consider the following questions: do you know what you want to gain? Do you want to do this for you? When you go to bed at night are you relaxed or is your mind racing? What do you want to change?

Good psychological health implies balance, clear values, inner calm and a general sense of wellbeing. Certain tracker devices such as the Ki Fit, will give you a report outlining what can be improved to reach your goal, and can help you achieve better psychological health through physical activity. It’s proven that motivation is achieved and sustained when activity is being watched, or perhaps tracked, by another person.

This can be adapted to the Digital Health industry in many ways. It has become evident in recent years that expanding technologies are playing a big role in the area of psychological motivation. While traditional willpower is hard to achieve for many people on their own, tracking devices and apps now available mean people are self-motivated to achieve new goals.

With a simple app such as GymPact, you are at once more motivated to go to the gym, perhaps not for the ideal reason of staying fit, but because the app will know if you don’t go and will take money from your bank account for not doing so.

Tracking a variety of areas in life through new readily available technologies, you can start to create behaviour change and in time see character traits change too.
The Quantified Self movement

How many hours did you sleep last night? How much coffee did you drink during the day? Did you burn more calories than your base metabolic rate? Did these three variables have an effect on each other and change the outcome of your day? Were you as productive as you could be? Were you happy?

You may not consider such questions on a daily basis, but your body and subconscious are constantly aware of them. Whether you know it or not, your actions, and the interactions they trigger, have a profound effect on your health and wellbeing. A growing community is dedicated to tracking this personal data and changing their lives as a result.

The momentum of this new movement is down to the technology. Inexpensive devices or low cost apps on smartphones now allow us greater insight than ever before. Mix low cost, freely available technology with the life hacker mentality and you’ll get yourself a quantified-selfer.

To quantify yourself is to track elements of your own life, to learn from the facts and make positive change. The term Quantified Self was coined by Wired Editors Gary Wolf and Kevin Kelly in 2007, who set up the online community quantifiedself.com, which showcases Digital Health devices and people’s own experiences of tracking their lives.

So how is a person’s life quantifiable?

Well, for example, if you find your workload at work difficult to manage, using a programme such as Rescue Time will help identify where your time goes during the day, empowering you to make changes.

People learn the cause and effect of their actions through self-tracking. They track their activity levels, from simple apps such as Moves for iPhone, to consumer devices such as the Fitbit, to the kinds of technology only being created just now – like MC10, a computer chip that can be applied to skin or internal organs to track a person’s health.

Through tracking different areas of your life, chain effects can be revealed and, in turn, altered. Too much coffee in the evening and you don’t sleep well. Too little sleep and you have no energy to exercise. Less exercise and you lose the impetus required to stay creative and focused at work. Or perhaps it is something else entirely that isn’t being tracked yet? Get tracking and find out.
The world of sport is getting more competitive and tougher as the years go on due to advances in science, new training methods and not least, technology. Athletes are constantly looking for new ways to evolve their fitness and to perfect techniques, ensuring they are prepared for competition day.

Previously, playback of past performances was the most effective method to analyse technique. But why wait until after the game? Why not track performance during competition or training, using the live data to improve mid-session.

Using devices such as the BodyMedia (or Ki Fit in the UK) the performance coach meets the data analyst. Such devices monitor motion (and much more than just steps), sweat levels and skin temperature. This provides accurate data on performance quality.

It is not just devices too, now connected clothing is analysing activity live and during play to provide feedback loops of performance. US company Vibrado has developed a basketball sleeve that analyses the perfection of a shot or throw, and provides feedback on how to improve.

As the technology gets smaller, the more likely that athletes can expect feedback on their performance live. We’re expecting more clothing based Digital Health tech very soon.

“Previously, playback of past performances was the most effective method to analyse technique. But why wait until after the game?”
It is no surprise that Digital Health is being talked about on digital platforms. There are influencers in this area who blog, tweet, and vlog their thoughts, experiments, and learnings to the wider community so that we can all learn more about this new area.

You would expect a Digital Health influencer to be someone with a medical background, to understand the science of the body and to have a certain clout when talking about such topics. However this is not always the case, and that in itself offers an insight into what the internet has done for influence in general.

In the realm of Digital Health, the influencers are self-trackers and body hackers. It is the people who are willing to make significant changes to their lives and to run experiments on themselves who are influencing an entire community of Digital Health fanatics.

Tim Ferriss (pictured) is the most prominent example of this. Ferriss has hacked his body to manage blood sugar and insulin levels so that he can eat normally, just at different times, to lose weight. He even set up a company, BrainQUICKEN, which produced smart drugs to hack your mind and increase short term memory and reaction speed.

You needn’t be as extreme as Ferriss to become an influencer though. Simply experimenting with levels of exercise, diet and sleep can be an interesting test for people to learn from, and is something that Dave Asprey (aka The Bulletproof Executive) does on his blog – along with promoting drinking coffee with butter and coconut oil mixed in.

To see how people are using digital technology to monitor the effects of such experiments, you need only glance at quantifiedself.com. The blog is packed with case studies from people using activity trackers such as the Fitbit, sleep monitors such as the Zeo Sleep Manager, and hacking APIs from various devices to create beautiful visualisations of their health.

So as healthcare transforms to become more digital, so does the influencer. If an NHS spokesperson were to come out today to advise the practice of drinking coffee mixed with butter and oil, then people would be likely to take little or no notice, other than to ridicule. But when a Digital Health influencer, whose credentials are experiments with their own body, says the same, people listen.
INFLUENCERS
How does technology fit into your daily routine as a dietician at The National Hospital?

It simply doesn’t, unfortunately. It is a challenge because it does not support equality and diversity as current technology is not offered to the regular NHS patient who often lives on a budget, and struggles to get by. However, I do recall on one occasion that somebody had lost 10kg using a calorie counting app on their iPhone in which they had included a very rare nutritional supplement.

Would you say that medical professionals are often wary of technology due to sensitive patient information or other factors?

Most definitely. All information that could potentially help somebody identify a patient needs to be protected. It is mandatory that all information sent via technology requiring internet access is filtered via a protective measure. Confidentiality and keeping patient information safe is essential for patient care. Health care professionals (HCPs) are required to cohere with this and will be penalised (and often blacklisted) if patient information is shared or leaked to inappropriate sources. Social media plays a huge role in this, and is blocked on all hospital computers and devices. Tablets on the ward, rather than medical notes, is definitely something in the pipeline.

In your opinion, is the view of technology changing in the dietetic sector due to various new Digital Health equipment? Or is it in fact challenging medical professionals?

Pedometers, Fitbits, Nike Fuel Bands and calorie counting apps are definitely a thing of virtue and aid dietitians in getting a more accurate idea of somebody’s daily intake and activity level. However, this technology is not available on prescription, nor are they yet affordable for the general population. Also because none of these are scientifically proven to improve the health of an individual we technically cannot recommend these, and as part of our Trust policy and code of conduct we always...
have to mention at least two-three different brands so that we are not promoting one specific product. There are a whole lot of measures in the home that take away from consultation time, free up services, but do these in fact provide invaluable and incorrect information? Would you recommend any?

Technology like heart rate monitors, Fitbits, pedometers and Polar watches estimate calorie burn throughout the day, much like cardiovascular gym equipment estimates calorie burn. However, it is important to bear in mind that these often over-estimate calorie burn and hence the debate "exercise makes you fat" has come about. It’s about educating patients on health initially, and then technology may be of benefit.

In regards to getting somebody going I do find step counters and activity monitors very beneficial as it is recommended by the government to aim for 10,000 steps per day to maintain/lose weight and/or 60 minutes of physical activity (including walking) per day.

What are your views on the way in which we currently measure ourselves in the healthcare sector (BMI/scales/body fat index) – are these outdated methods and or are they in fact useful? All of the above (BMI, scales, body fat index as well as the Schofield Equation - using age, weight and gender to estimate somebody's energy requirements etc.) give us an "idea" and a "baseline" of somebody’s current health. This, however, may not be 100 percent accurate and it is gender and build dependant. It is important to note that due to valuable scientific research the practice of HCPs within the healthcare sector changes on a weekly basis and dietitians are constantly expected to keep up to date via CPD, which is assessed by a professional body every year.

What would be the most valuable digital home tool to ease the burden on the NHS, in your opinion?

24-hour camera supervision, although this is obviously not ethical. We have technology which can measure blood glucose and ketones. However, if there was one which could provide instant results for the average electrolytes that are regularly checked it would provide a quick clinical picture of a patient’s diagnosis, and the appropriate treatment can be commenced quicker than normal. This would in turn aid shorter stays in hospital, hence a quicker turnover of patients etc. Bear in mind that a patient's bed in the NHS costs £300-£500 per night. This would be ideal for chronically ill patients, who could then report their results on a regular basis, and in a timely manner to prevent unnecessary hospital admissions.

How do you see future innovations transforming simple measurements to set a new benchmark and potentially provide an individual and accurate prognosis?

If tablets and an app like SwiftKey were available on the ward that would aid in assessing more patients in a shorter period of time and enable us to put more focus on the clinical aspects of our care, as well as reducing admin time.

Ideally any technology that will allow us to input the patient’s anthropometric measures after which it will calculate BMI, BMR, daily calorie, protein, CHO and fat requirements using scientifically proven equations. This takes approximately 15 minutes to do manually per patient, and if you see 10 patients in a day for 45 minutes each, that’d save us 150 minutes per day and allow us to see an extra three-to-four patients.

In regards to second opinions and the waiting times associated with the vast demand on the NHS; Huddle could potentially transform the future as it is a safe way to store, share and work on files with anyone inside and outside the NHS“It’s about educating patients on health initially, and then technology may be of benefit.”

“Huddle could potentially transform the future as it is a safe way to store, share and work on files with anyone inside and outside the NHS”
Dave Icke

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Dave is the CEO of MC10. MC10’s mission is to extend human capabilities by making high-performance electronics virtually invisible, comfortable, and wearable. MC10 reshapes traditional electronics into new forms that can stretch, bend and flex into next-generation products that fundamentally transform how we interact with electronics. Dave has vast experience with disruptive platform technology start-ups. Dave has a B.S. degree in Chemical Engineering from Stanford University, and an M.B.A. degree from Harvard Business School.

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Hosain Rahman is the CEO and founder of Jawbone, a developer of popular products and services for the mobile lifestyle, and one of the largest venture capital-backed consumer electronics companies in the world. Hosain is passionate about bringing innovative and intuitive products to market that let consumers get the most out of their mobile experience.

Stephen Hale

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Stephen Hale is the Head of Digital for the Department of Health and ensures digital is integral to the way the department works. Stephen blogs at Health conversations (hale.dh.gov.uk/) sharing Digital Health ideas, strategies and reports. The blog is aimed mainly at the health and social care digital community, and the government web community. Previously, Stephen worked in the Foreign Office, where he wrote an official blog about digital diplomacy.
Stephen Davies

Stephen is a seasoned digital strategist and has been working specifically in digital comms since 2005. He is one of the early adopters of digital, and is a frequent speaker on the conference circuit and has spoken at events around the UK, mainland Europe, Russia and the UAE. He is a committee member of Forum Davos, an annual conference held in Davos, Switzerland which covers global developments in communications. Stephen is a proponent of the oncoming Digital Health revolution and the colliding intersection of technology and healthcare. He writes about this at Bionic.ly one of the first blogs dedicated to the topic. Forbes magazine columnist, John Nosta said Stephen is “a resonate voice for Digital Health and a must follow. Outstanding blog with informative content.” Stephen speaks at events advocating the Digital Health revolution.

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Kevin Kelly is one of the co-founders of ‘The Quantified Self’, a global collaboration of users and makers of self-tracking tools exploring “self-knowledge through numbers”. Kevin also co-founded Wired in 1993. He has also written a book for Viking/Penguin called What Technology Wants, published October 18, 2010. He is editor and publisher of the Cool Tools website, which gets half a million unique visitors per month. He co-founded the ongoing Hackers’ Conference, and was involved with the launch of the WELL, a pioneering online service started in 1985. He authored the bestselling New Rules for the New Economy and the classic book on decentralised emergent systems, Out of Control.

Dave Asprey

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Dave Asprey is the Founder of BulletProof Executive – a site dedicated to advising consumers how to supercharge your body, upgrade your brain, and be bulletproof. It is followed by half a million people. Dave began the quest to improve his health 15 years ago, and has since become a biohacker, spending more than $300,000 on personal self-experiments, and distilling the knowledge of more than 120 world-class doctors, biochemists, Olympic nutritionists, and meditation experts.
Gary Wolf

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Gary Wolf is the co-founder of The Quantified Self, a global collaboration among users and makers of self-tracking tools exploring “self-knowledge through numbers.” Wolf is also a contributing editor at Wired magazine. In 2005-2006 he was a John S. Knight Fellow at Stanford University. He is the author of two books: Dumb Money: Adventures of a Day Trader (with Joey Anuff, 2000); and, Wired – A Romance (2003).

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Halle is the founder of Rock Health, a company powering the future of the Digital Health ecosystem by bringing together the brightest minds in technology and medicine to build better solutions. Halle was named one of CNN’s “12 Entrepreneurs Reinventing Healthcare” and Forbes “30 under 30”. Halle is responsible for building partnerships and overseeing Rock Health’s strategic direction. She previously worked for Intel and Apple, and founded YogaBear.org.

Adriana Lukas

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Adriana is the Founder and organiser of the London Quantified Self meetup group and focuses on research of non-hierarchical organisations. Adriana has a passion for the use of emergent technologies that increase individual autonomy and creativity.
Maneesh Juneja

Maneesh specialises in Big Data, and has been in the healthcare industry for over 18 years. In Feb 2012, Maneesh founded Health 2.0 London, part of the international Health 2.0 movement, to put together events that will drive healthcare innovation through technology. In June 2012 Maneesh also started his own consultancy, MJ Analytics, providing expertise and analytics to the pharmaceutical industry on observational patient databases. Maneesh is part of the TED community, having attended pioneering events such as Health 2.0 India and the Wisdom 2.0 conference in Silicon Valley. Maneesh’s long term goal is to find innovative uses for data to improve the health of everyone on the planet.

John Nosta

John is chief creative officer of Maven Marketing and writes for Forbes about how science, technology and medicine impact life. John is known for his innovative spirit, forward thinking, love of technology and as an influencer in the Digital Health space. As the author of Health Critical in Forbes, he can be found testing the newest advances in the world of technology.

Paul Sonnier

Paul is the Head of Digital Health Strategy at Popper and Company, and founder of the Digital Health group on LinkedIn which now boasts 19,000 members. Popper and Company is a strategic management consulting and M&A advisory firm whose mission is to help clients across the life sciences and Digital Health spectrum. Paul is also currently a member of the Global Agenda Council on Digital Health. Prior to his current role, Paul held a range of positions within the health technology industry, including Vice President of the Wireless-Life Sciences Alliance and Co-Chair of Healthcare Communications SIG.

Paul has been quoted extensively in the media, having been featured in Forbes, the Huffington Post, Scientific American, VentureBeat, and numerous healthcare publications. He also keeps a comprehensive list of Digital Health and related health innovation events occurring around the globe at storyofdigitalhealth.com.
Maaten den Braber

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Maaten den Barber is the author of ‘Measured Me’, one of the most popular and well-known ongoing personal experiments in self-quantification and self-optimisation. Its ultimate goal is to demonstrate that any aspect of everyday life can be quantified and logged on a regular basis, and that the knowledge from these numbers can be used to help people live better. To prove that, Maarten personally selects and tests different gadgets, apps, questionnaires and other tools and services, and then shares his experiences in the blog.

Derek Newell

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Derek Newell has over 20 years of experience working with innovative healthcare technology and services companies. He is passionate about exploring the intersection of healthcare and emerging technologies, believing that health outcomes and wellness improve when mobile and Digital Health technologies connect consumers with the traditional health ecosystems. Prior to joining Jiff, Newell was president and CEO of Robert Bosch Healthcare. Previously, he was also the CEO of Health Hero Networks, a US-based remote-patient monitoring company, and the chief marketing officer of a leading disease management company. Derek is a leading voice in the areas of healthcare technology and finance.

James Park

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James Park is a serial entrepreneur with a passion for creating products and companies. Fitbit is the third start-up that he has founded. Previously, James was a Director of Product Development at CNET Networks, where he led product management, engineering, and design for Webshots. Before CNET, James was a co-founder of Windup Labs and CTO of Epesi Technologies. James also worked at Morgan Stanley, where he helped develop trading strategies and software for a quantitative trading fund.
Belinda Liu

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Belinda is the founder of an iPhone app called urWell, which aims to help users with a number of health goals. Through a simple tracking method where you rate different variables (e.g. sleep, productivity, gratefulness and so on) based on a sliding scale. You can see your overall progress over time and see which areas you need to improve on. Belinda’s goal is to develop effective practices, products, and processes that ignite positive changes in people’s lives, particularly in the areas of education and healthcare.

Vishal Gulati

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Vishal is an investor in growing businesses with experience across the healthcare value chain around the globe. Vishal’s main interest is the promotion of a global ecosystem in the world of Digital Healthcare with early stage innovators at its centre. This includes bridging the gap between healthcare professionals and technology entrepreneurs and between established enterprises and young companies using competitive challenges.

Nina Nashif

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Nina is the Founder and CEO of Healthbox, a company that uncovers and fosters innovative healthcare solutions, delivering a collaborative infrastructure to enable entrepreneurial success. The entrepreneurs selected to participate in one of the 16-week programs receive structured, customised support designed to address the challenges unique to starting a business in healthcare. Healthbox startups gain $50,000 in seed capital, industry context, user insight, market traction, mentorship, and guidance for fundraising and growth. Prior to joining Sandbox, she was on the executive leadership team of Sg2, a private healthcare analytics and consulting firm where she worked with both the public and private healthcare sectors around the world.
How does Digital Health tech fit into your daily routine and what tech do you use for self measurement?

I never leave home without my FuelBand and I rarely run without a GPS watch. However I use my watch more just to see how far I have run. I judge my speed by how I feel as opposed to checking the watch dial every five minutes. I think people can concentrate too much on stats to tell them how well they are performing, but I encourage my crew to listen to the gadget that knows you best: your own body. Run with feeling.

What makes you choose a gadget? Are there any features you find essential or completely useless?

I choose gadgets according to usability, accuracy and how clearly they show and share information. A clear display is essential and the ability to use at speed without the use of a computer to change settings is important. Something that is tough and can be used at whatever time of the day is also important. I like products that are intuitive as opposed to complex, so you don’t need a university degree in advanced mathematics just to get it to turn on. I’m also drawn to brands with a proven track record as opposed to those blatantly out to make a quick buck.

How has the advance in Digital Health technology helped you to achieve your goals? Both for Run Dem Crew, and personally?

I always tell people that the final jigsaw puzzle in my own fitness journey was the day I discovered Nike Plus. The ability to listen to the music I was making on the way home from the recording studio while exercising suddenly meant that sport became part of my daily life, rather than something I stopped my life for.

In your opinion did Digital Health tools help motivate yourself and the crew? Have you seen personal progress as well as that of others?

It’s very motivating to see other people completing and sharing challenges and I’d say a product such as the FuelBand really drives this point home particularly in the global urban running scene. Finally, we have a product that measures all of your daily activity not just your activity in the gym. Suddenly walking up the stairs at work, as opposed to taking the lift, had an attraction.

What are the biggest improvement or achievements you’ve seen taking place where tech has been involved?

The integration with social media has been a huge leap in motivation not only for myself, but also the global Run Dem audience. The ability to share achievements has been a huge motivator in getting people off the sofa and into some form of physical activity. The drop in price of tech as well as better design particularly in GPS watches, has been an awesome advancement. I may be sweating but I still need my design to be on point.

How do you see future innovations transforming lifestyles and ways of living?

The rise of apps and gadgets that share fitness goals through social networks has meant that fitness has now become part of common social interaction. You are no longer considered strange if you take care of your health, but instead are considered a social outcast if you don’t.

I for one know many people who have joined Run Dem because they felt left out of conversations and social circles. The sharing of information, be it a plate that calculates the exact amount of calories in a meal or a tap that reminds you to drink a certain amount of water a day, will encourage people to embrace a healthier lifestyle. The idea of ‘Health is Wealth’ will become a common language.
RUN WITH FEELING
The majority of the trends we see are being advanced through consumer adoption. The technology to self-track is widely available at a low cost, and is sometimes even free. But does counting the number of steps you take each day add much value? There is a good argument that it does; however when compared to what one company is currently doing with one NHS Trust, it makes it seem trivial.

Ki Performance, who use BodyMedia devices, sold as the Ki Fit in the UK, is working with Royal Liverpool and Broadgreen University Hospital Trust patients with chronic heart conditions to improve and monitor their recovery in the most detailed way the NHS has ever seen.

By kitting out people recovering from heart attacks or heart surgery with a Ki Fit device and providing an initial Ki Physical Activity Audit, the Ki Scientists are able to bring valuable insights to the doctors, nurses and exercise physiologists enabling them to tailor the intervention, and accurately monitor the activity levels and sedentary states of patients outside of the hospital. Perhaps most importantly, these insights are shared with the patients empowering them to understand and take control of their own behaviour. This is a major, but simple advancement.

Physical activity is a crucial part of any cardiac rehabilitation programme. Patients attend exercise classes every week during their programme, and in the past doctors would ask patients how much activity they have undertaken on average. Naturally, many factors come into play here, the patient can under or overestimate activity, misunderstand what moderate and vigorous activity means for them, and make uneducated assumptions of what an average day actually is.

With the Ki Fit device patients are providing accurate, current and helpful data to the Ki Scientists, doctors, and themselves. Patients can be monitored throughout their recovery, and if they aren’t meeting their activity goal, the healthcare practitioner can address this straight away to help put them back on track. Importantly, the patients can also see how active they are every minute of every day, not just during their weekly exercise sessions and they can be involved in the decision to change their own behaviour.

This application of the device in the NHS within cardiac rehabilitation is just the start. In the short term, similar applications can be rolled out within diabetes and obesity; the opportunities are endless. We see Digital Health impacting the healthcare service much more in future.
KNOW THYSELF
Experts on Digital Health

Adriana Lukas
Founder, Quantified Self London

The Quantified Self movement is a phenomenon driven by individual people keen to share their personal stories – they identified a problem, created a way to track it and then learned from the data they had generated. People can use Fitbits and devices like Jawbone UP, but it’s different to what we see within the group. These popular devices have a cool factor to begin with, but the personal issue is missing, unlike when people create a method of tracking themselves to solve a problem. It needs to be meaningful.

Kirsty Oswald
Writer, Medical Newswire

With the growing prevalence of chronic diseases there is increasing recognition that, for the best outcomes, patients must be actively involved in the long-term management of their own condition. It seems inevitable that Digital Health will take on an even larger role in this, with many possible benefits.

Digital Health provides a tool through which patients can become more engaged with their own health, helping them to participate more in decisions made with their doctor – something that is essential to tackle the widespread problem of treatment non-adherence. What’s more, by providing doctors with reliable, in depth monitoring information over time, it can help them to optimise future treatment. And, while it may require an initial financial outlay, implementing such technology could ultimately lead to greater time efficiency, better use of healthcare resources and, consequently, cost savings.

Christopher Lendrum
Personal Trainer & Founder of Strength Physio

Digital Health is a huge part of my everyday life as a personal trainer. As an example I use Coaches Eye, an app which films movement, with a lot of clients. I find it invaluable in treating injuries and as a marker of how movement dysfunctions improve after rehabilitation. I’ve seen an increase in clients bringing their own devices, such as Fitbit, which has improved people’s workout ethic as it holds clients accountable and gives them an objective measure of how many calories they are burning from day to day.

Public on Digital Health

Helen Hawes
Radiography student, University of London

I have the NHS app on my phone, and I also have an exercise app that I sometimes use to help me devise my workout regime. However, I find the costs involved a problem, and the charges I incur whilst using the apps often stops me from downloading them or using them for extended periods of time. In saying that, I do think technology is helping to make healthcare more accessible – however the flip side is that access to too much information can make patients believe they can self-diagnose, sometimes causing unwarranted panic.

Jeremy Crick
IT Consultant

I’m not one of those people who enjoys exercise for the sake of exercise, and I’ve found that most exercise gadgets I’ve tried have failed to motivate me. By far the most effective solution I’ve come across is a pedometer that connects to a video game, which rewards the user with in-game items. It quickly became a competition amongst my friends, and the health benefits are a nice bonus.
**onemorelifehack.com**  
UK industry blog on Digital Health, life hacking and quantified self.

**23andMe**  
Analyse your DNA for just £100 with this home-delivered service. Simply spit in the test tube and send it back to their lab in LA.

**BodyMedia**  
Go one step further and analyse activity levels more accurately, measuring heart rate, skin temperature and moisture. It’s a little more expensive and bulky.

**Cardiio**  
A revolutionary app that tracks light from your face to measure blood pressure.

**Fitbit**  
Wireless activity monitor which measures distance, calories burned and overall activity level.

**Forbes Health Critical**  
Leading blog for Digital Health, written by number one influencer, John Nosta.

**Jawbone UP**  
Track your basic activity, sleep and food intake with this comfortable wrist-worn and showerproof device.

**Moves**  
Track your movement with this free iPhone app.

**MyFitnessPal**  
The leading UK food tracker, helping millions reach their weight goals.

**Nike Fuelband**  
The wireless band tracks dozens of everyday activities as well as time and distance covered.

**Sleep Cycle**  
Track your sleep to find out how much deep and light sleep you get.

**quantifiedself.com**  
Conclusion

For the past two centuries, technology has revolutionised all industries. Some have generally been slow to adapt. And many, many companies – often with vast histories and decades of success – have failed to keep up and evolve as technology propels industries forward. We’ve seen it with publishing, music, and film over the past decade-and-a-half, and the older, archaic names of those industries have seen profits fall, store fronts close and companies disappear entirely.

In health, we are on the cusp of a digital revolution.

The startups that are emerging in the space at the moment are just the beginning of what will fundamentally shift our understanding of healthcare. It will be a change that personalises healthcare, makes it cheaper, and brings power into the hands of those who need it the most. The space is wide open for anyone to make a dent and a fundamental impact on people’s lives.

The technology, as we have seen with quantified self, has been falling in price as the markets have expanded, meaning that tracking devices are now affordable to a huge section of the public. The same will happen within other areas of Digital Health as well. But the technology we are looking at now is just the beginning of what’s to come. Technology which is currently only in the hands of the few and the early adopters will soon pass into the hands of the many.

This is an incredibly exciting moment in Digital Health. The space is growing at a rapid rate. Technology is evolving fast. The community of those using the products is increasing, and importantly, influencers are still emerging.

If you’re in this space, whether as an influencer, a startup founder, or simply someone with an interest in it, we want to meet you. Get in touch.
To find out more, please visit: hotwirepr.it