

OGILVY CONSULTING

Biohacking

*When biology becomes a
data source for marketers*

Ogilvy

By Dayoán Daumont

Forward

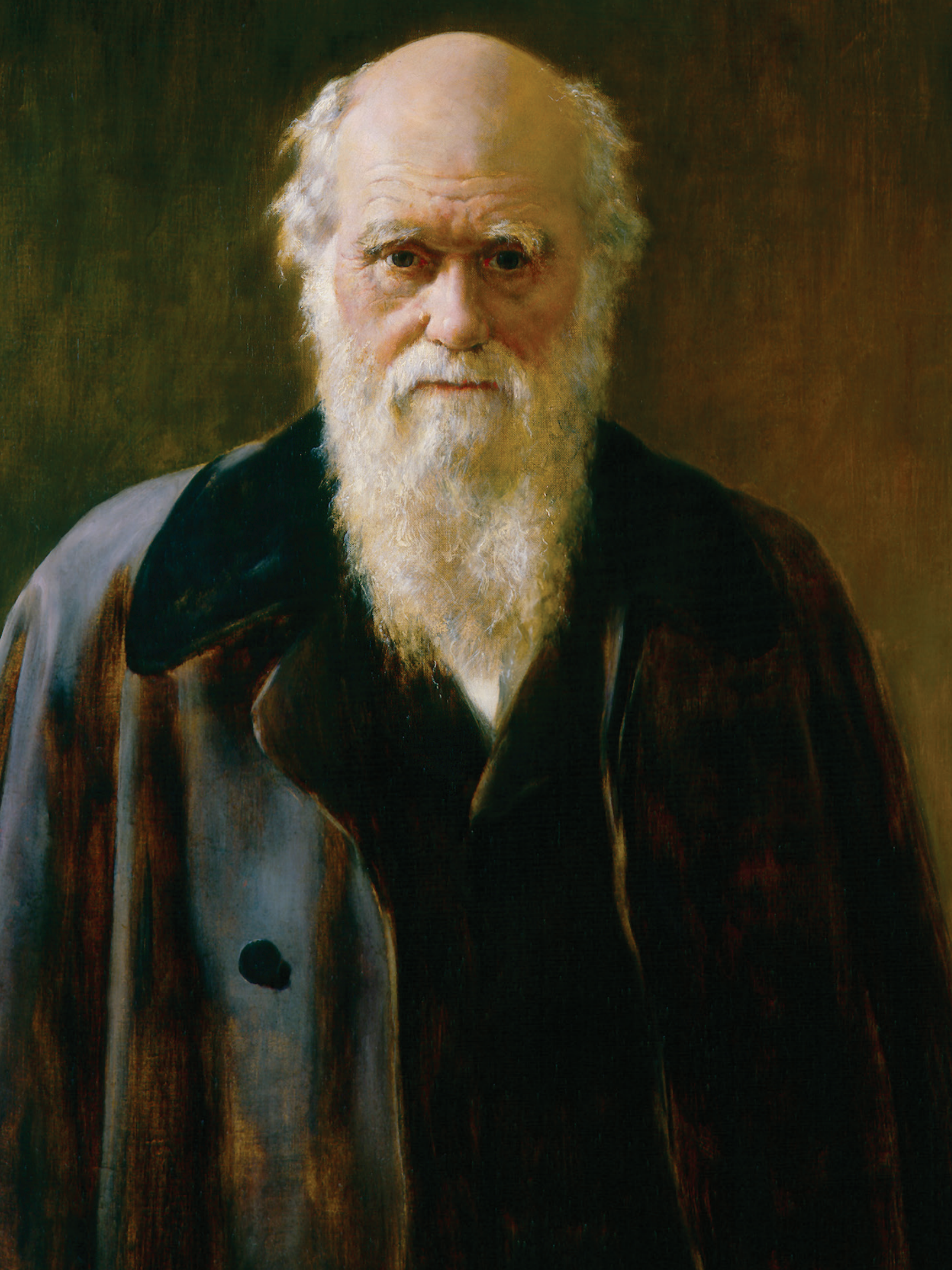
The convergence of technology and biology is beginning to erase the line that separates humans from fiction. The next platform is not technology, but the human augmented by technology. This will change how we live, move, study and work. It will also change who we are. For marketers it is a chance to build an entirely new relationship between their brands and the consumer.

The manipulation of genes and implantable technology are giving clinicians the ability to address some of the toughest diseases and degenerative conditions.

In this report we will explore how brands engage with a connected and augmented human and leave the research and medical implications to the experts in the field.

This X-ray depicts the hands of Amal Graafstra, founder of VivoKey Technologies (www.vivokey.com). The two radio frequency identifier implants in his hands are used to unlock his car, computer and door to his home.





“In the long history of humankind (and animal kind, too) those who learned to collaborate and improvise most effectively have prevailed.”

-Charles Darwin

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INTRODUCTION TO BIOHACKING

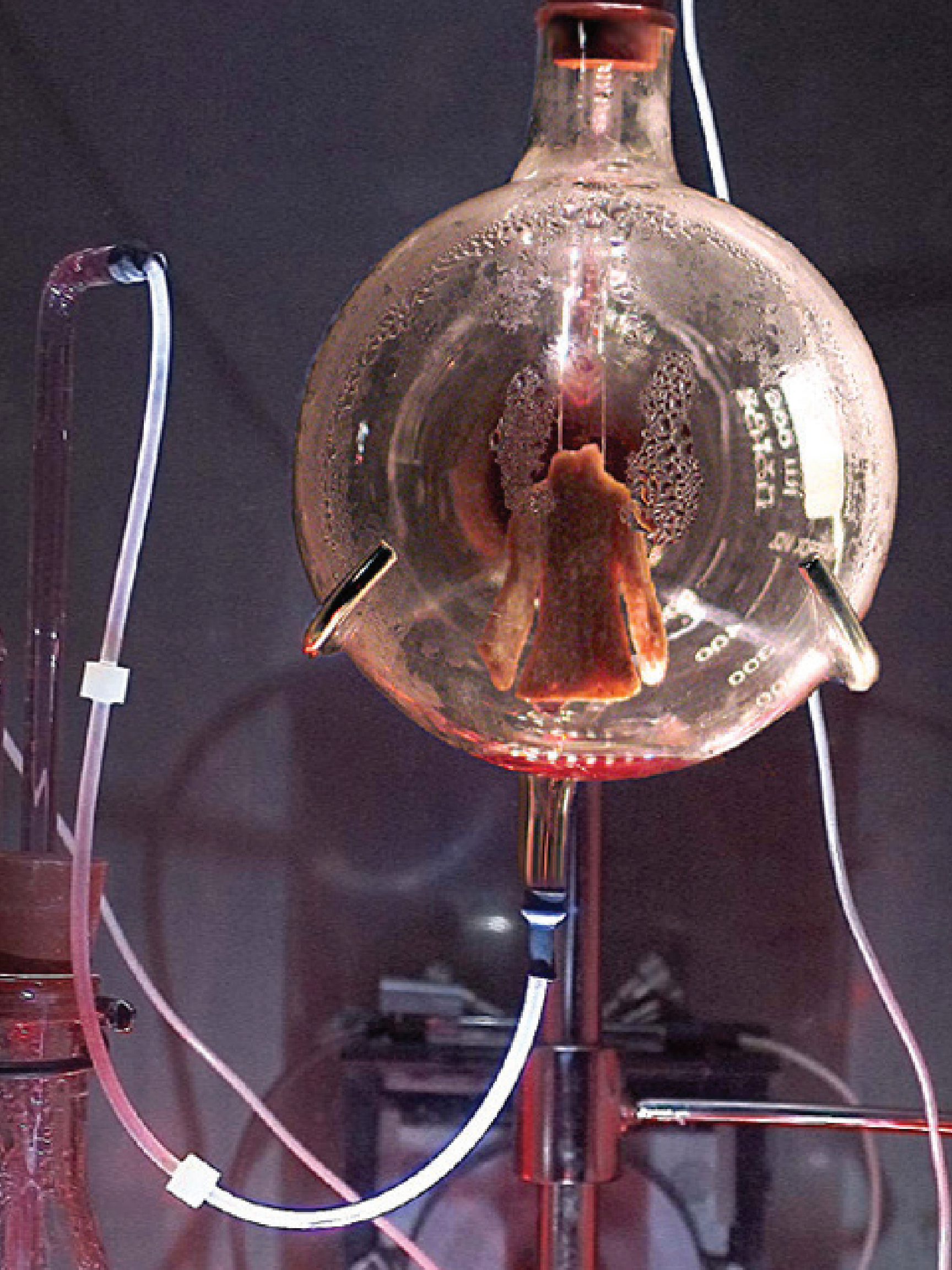


Misconceptions About Biohacking

The word biohacking conjures a world that lies exclusively in the realms of science fiction and fantasy. We know of countless examples of augmented humanoids, from the Borg in Star Trek to the concept of human bodies as ‘sleeves’ in the Netflix series *Altered Carbon*.

What was once thought to be the realm of fiction is soon becoming a reality. A world in which the entire body becomes upgradable seems not so distant or incredible. From the manipulation of DNA using technologies like CRISPR, prosthetics that are better at specific tasks than human limbs, to IoT wearables that can accurately diagnose pre-diabetes.

We’ll explore the impact and opportunities that a connected consumer and their biology will have on human expectations and the brands that serve them. A major opportunity awaits brands as the commercial potential for biohacking and biometrics becomes real.



What is Biohacking?

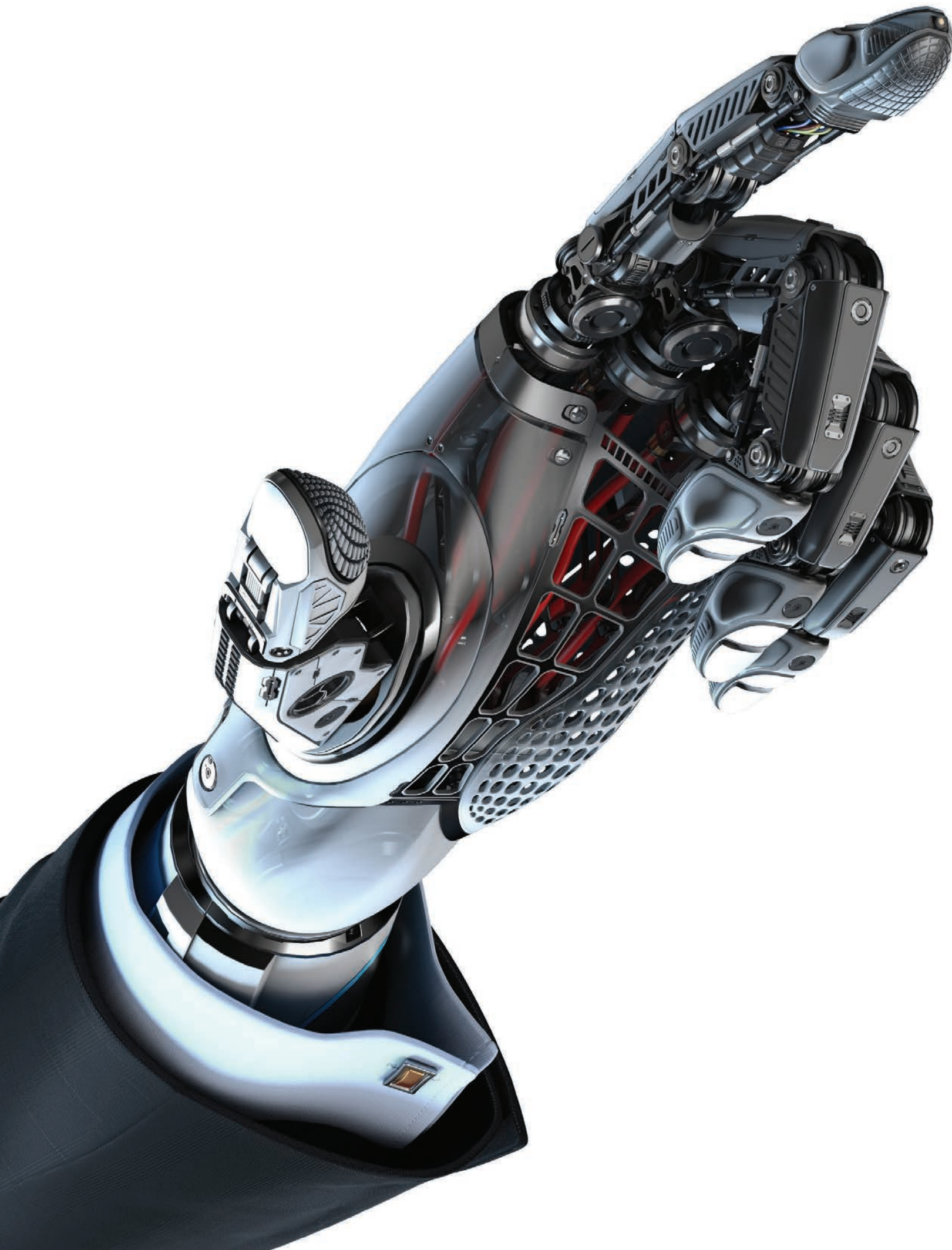
Biohacking is the activity of exploiting biology experimentally by a wide range of people, from R&D labs to people who are not official experts or scientists, either as a hobby or in pursuit of a cure.

Biohacking has the potential to optimise current human limits and change the way humans search for care and pursue biological enhancements. Some use biohacking as a way towards clinical care like heart and limb replacements, or corrective surgeries.

On the edges of this world are those pushing the boundaries as pure exploration and artistic expression—tinkerers embracing Biohacking, like Oron Catts and Ionat Zurr, the team who run SymbioticA, a lab for biological art at the University of Western Australia. Their first big project in 2004 was the ‘Victimless Leather’ jacket, created out of living cells from human and mouse DNA.

The opportunities from Biohacking, and specifically the connected human, can be as fantastical and impactful to us as marketers as these art experiments.

In this paper our focus on Biohacking will be as a tool to follow, personalise, and uncover insights based on the connected human.



The Intersection of Biology and Technology

Technology has changed every aspect of human life, from the way we work to the way we travel. The pace of change means our children are born in a world that will be markedly different by the time they reach our age. Yet our biology has remained basically unchanged.

Biohacking tends to span a range of technologies across very different disciplines; most commonly these augmentations are broken down into the following categories:

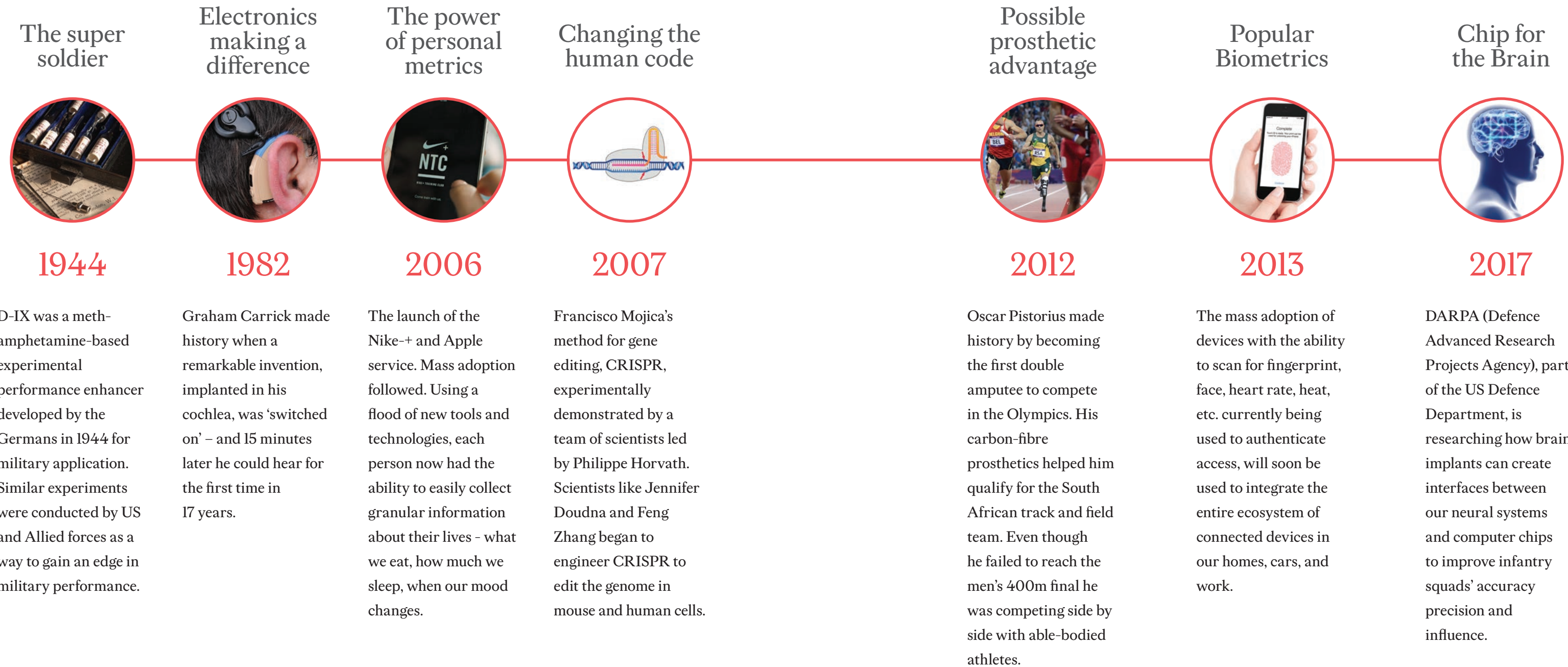
Prosthetics – typically focused on replacing missing limbs or as a way to enhance tenuous tasks, from athletes in Cyber Olympics to military research of robotic exoskeletons.

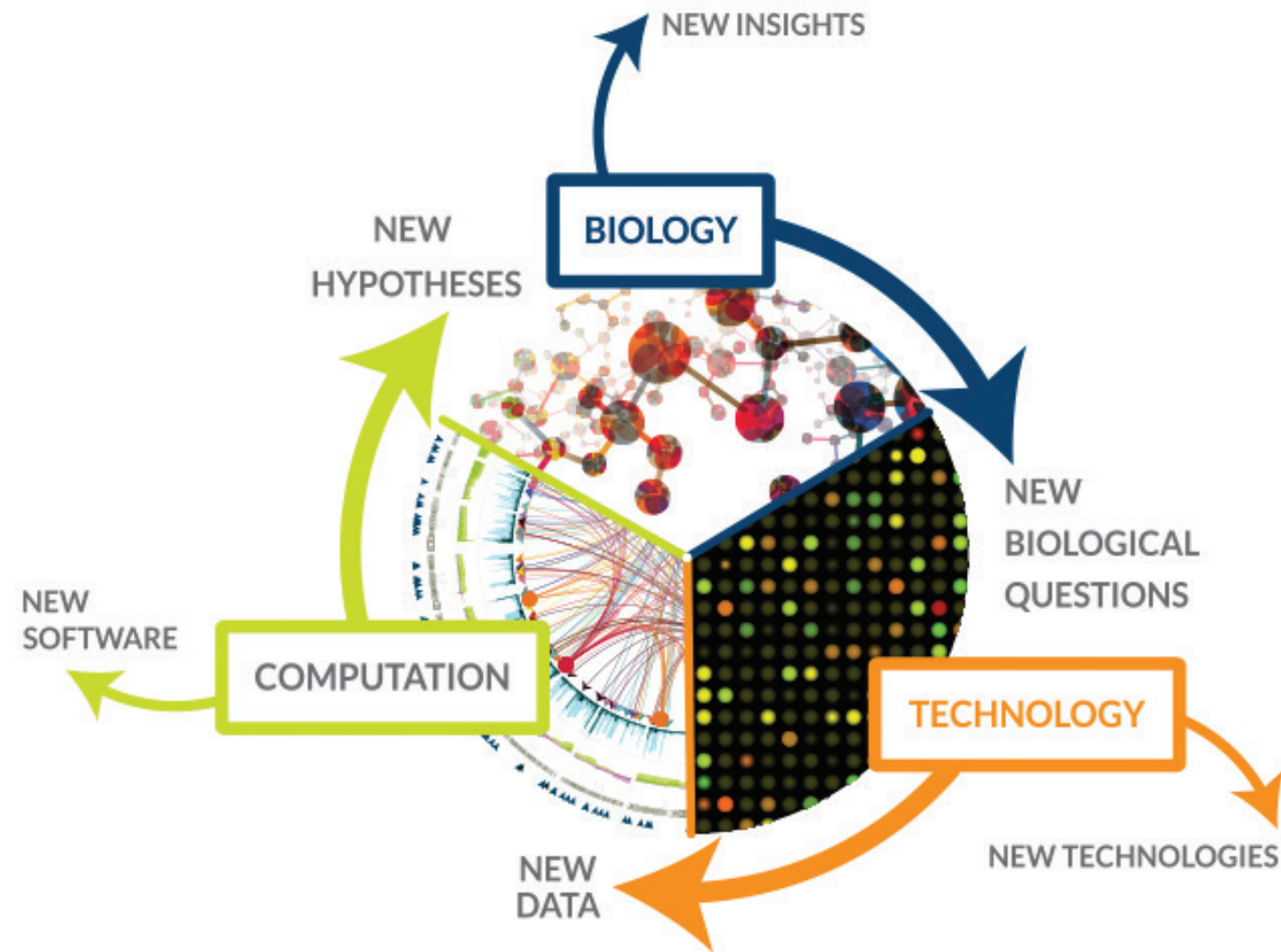
Brain Interfaces – connecting the brain with the outside world; for example, helping patients suffering from ‘locked-in syndrome’ to control objects and avatars in virtual or physical space.

Exogenous sensors – those we wear, get connected to and have all around us, from insulin trackers to health monitors.

Nootropics (smart drugs) – the use of supplements and drugs in order to enhance memory, intelligence, and endurance.

Gene Editing – modifying DNA in order to create a new augmented human.





Systems Biology Trinity:
Institute for Systems Biology's
innovation engine

Meeting the Consumer

Biohacking as a collection of technologies and applications provides untapped potential for an exciting future. But these must not come at the expense of what's most important, the individual citizen.

This System Biology model can help us understand and focus on the relationship and impact that biometrics will have on human behaviour, experiences, and expectations. It demonstrates an ever growing and evolving cycle where biology and technology co-exist to create a comprehensive view of the modern consumer.

For the model to be successful, it must be rooted in becoming consumer obsessed and have ability to explore technology in the service of the individual.

If a brand wants to consider using biometrics and biohacking, its primary concern should be the effect on the consumer, followed by the impact on the brand itself. We are not treating a disease or diagnosing a condition, and as such the consumers' needs must come first.

WHAT DOES BIOHACKING LOOK LIKE NOW?

Focus

Of the biohacking groupings discussed earlier we will focus on the ones that impact the means whereby brands explore consumer experience.

Prosthetics – typically focused on replacing missing limbs or as a way to enhance tenuous tasks, from athletes in Cyber Olympics to military research of robotic exoskeletons.



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Visionaries are Backing it

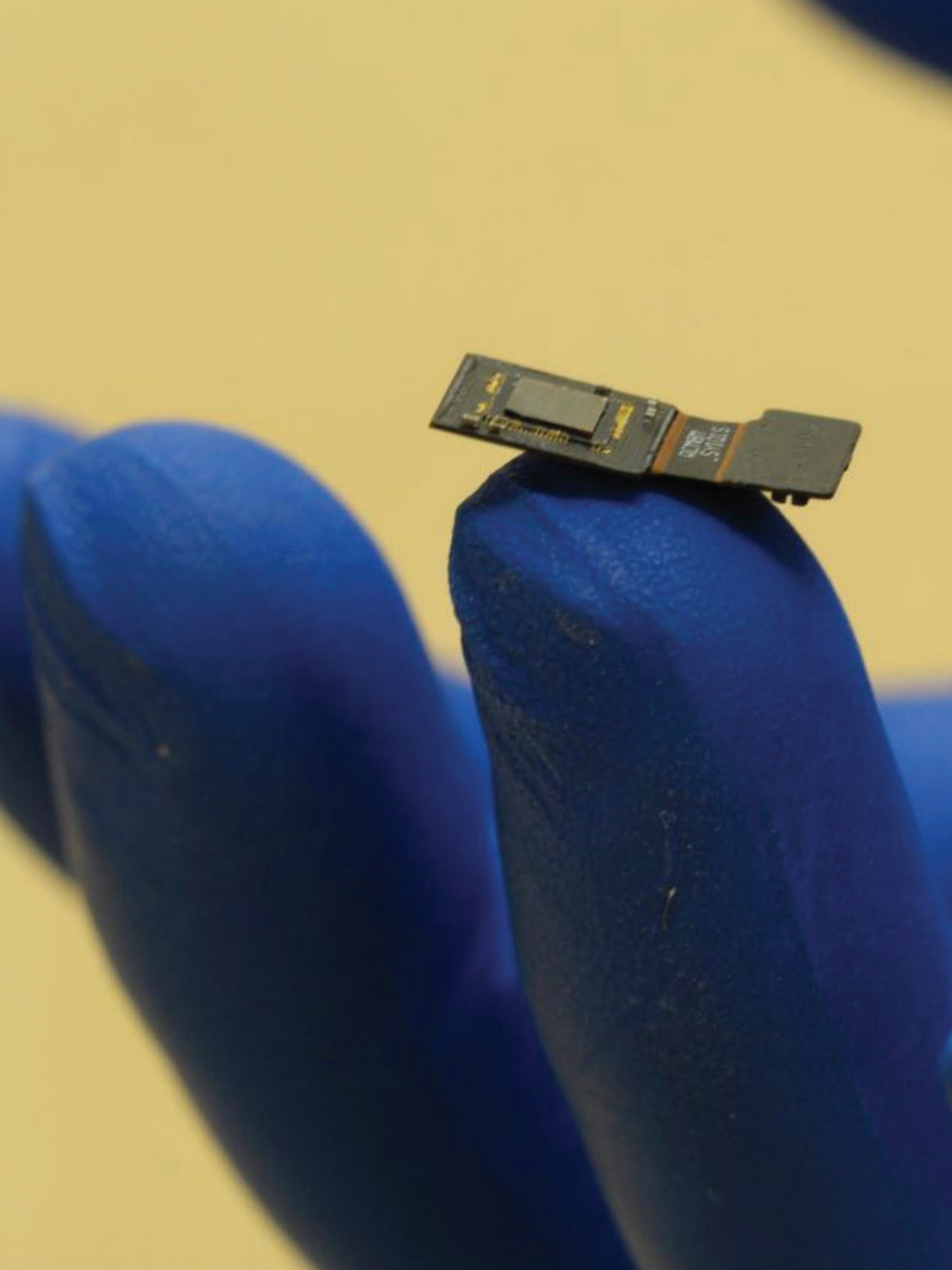
“Creating a neural lace is the thing that really matters for humanity to achieve symbiosis with machines. Humans must become cyborgs if they are to stay relevant in a future dominated by artificial intelligence.”

Elon Musk, speaking in Dubai, February 2017.

According to Musk, if we want to remain relevant then a ‘merger of biological intelligence and machine intelligence’ is the crucial next step. If we fail to do this, we’ll risk becoming ‘house cats’ to artificial intelligence.

So far, brain-computer interfaces have been used for relatively simple tasks, mainly to restore motor control of paralysed patients and enable communication for locked-in patients with brain injuries.

Musk is backing a brain-computer interface venture called Neuralink. The company is currently creating devices that can be implanted in the human brain, aiming to help human beings merge with software in order to augment and eventually merge with technology.



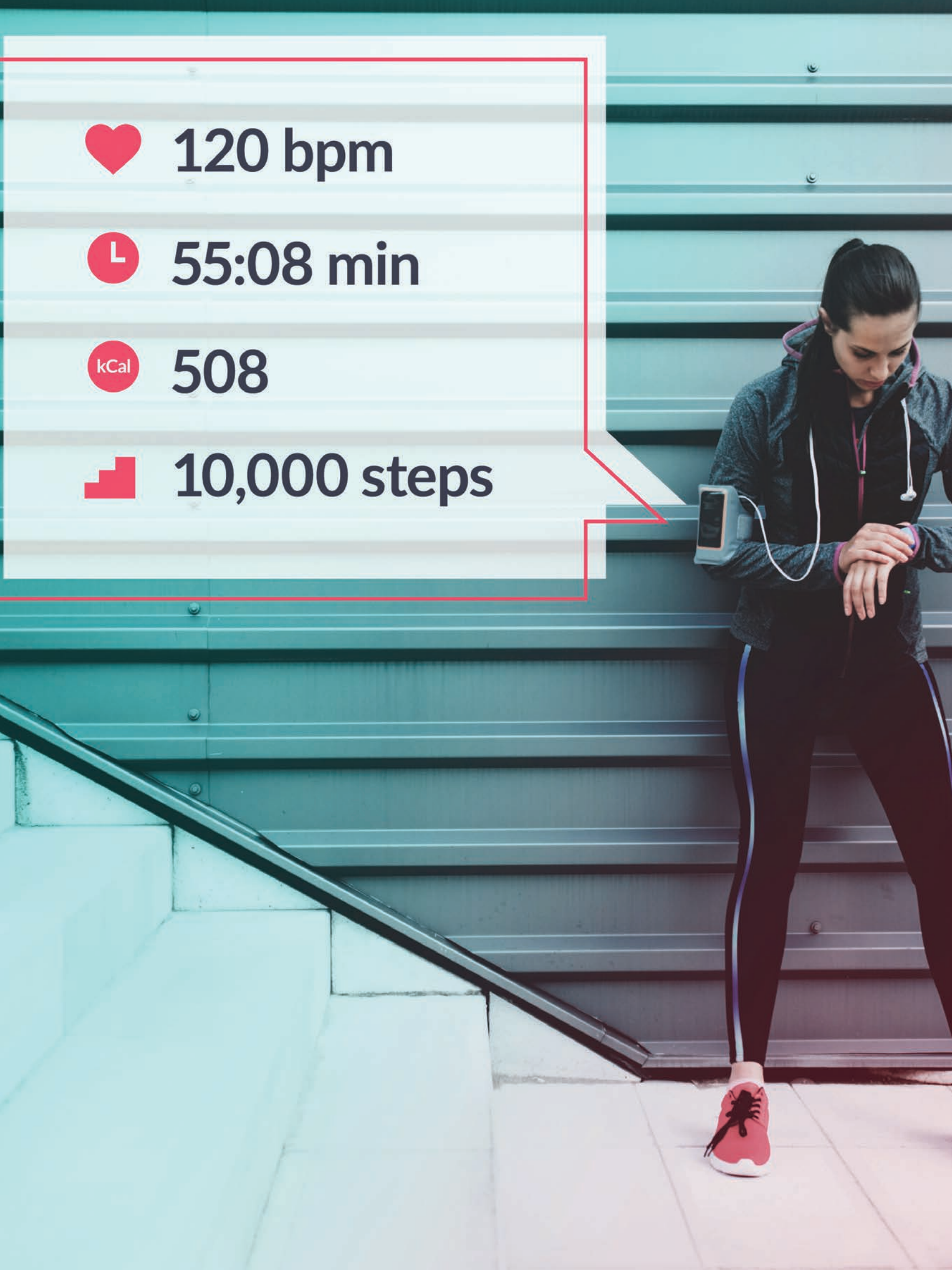
The Connected Human

DARPA (Defence Advanced Research Projects Agency) is taking inspiration from the entire animal kingdom. The agency is developing technologies for the next generation of soldiers, enabling them to be able to eat grass, communicate telepathically, resist stress, climb walls like a lizard, and much more. Dolphins don't sleep, Alaskan sled-dogs can run for days without rest or food, bats navigate with echolocation, and goats will eat pretty much anything. Crack the code of these attributes, and the next superhuman will be just around the corner.

According to DARPA, the programme, known as the Neural Engineering System Design (NESD), is developing an implantable neural interface able to provide advanced signal resolution and data-transfer bandwidth between the brain and electronics.

The implant acts as a translator of digital to analogue, converting digital communication, like binary code, into an electrochemical language used by the brain.

Once our analogue biology is converted into 1s and 0s it's a short step to augmenting intelligence, memory, and stamina.



♥ 120 bpm

L 55:08 min

kCal 508

10,000 steps

The Ones We Wear Everywhere

According to Cardiogram founder Brandon Ballinger's latest clinical study, the Apple Watch can detect diabetes in those previously diagnosed with the disease with an 85 percent accuracy.

This particular study used data from 14,000 Apple Watch users and was able to detect that 462 of them had diabetes by using the watch's built in heart rate sensor.

It is estimated that as many as 285 million fitness devices will be on human bodies by the end of 2018, with a 40% compound annual growth rate. Smartwatch sales are predicted to grow from 1 million devices in 2013 to 92 million devices in 2018. It's not a matter of if our biology will be monitored, but when and how often.

With this access, the ability to commoditize wearable data will create insights and data opportunities far beyond current usage. We should expect more from our devices than just tracking our steps and sleep. It's been a slow start, but we're now at a tipping point. A new form of marketing will emerge from this data access and it behoves us to prepare ourselves and our brands.



The Connected Home

Google has submitted a patent application, number US 2018/0000355 A1, that aims to make your bathroom into a diagnostic centre. With the use of optical sensors placed in the user's rooms and devices (e.g. Google Home or bathroom mirrors), the connected tech will capture data on an individual's cardiovascular function and, through the use of data analytics and insights, motivate appropriate and personalised behavioural changes that reduce the impact of heart disease.

Google's new invention for at-home health tracking would monitor certain aspects of a patient's physical appearance and track changes in appearance that are related to cardiovascular health problems. The data would be monitored for trends and shared with patients or their medical professionals.

These connected environments will continue to grow as more and more manufacturers connect to each other's data streams. The collection and interpretation of the data is the magic to these systems and it's here that we begin to understand how the connected home creates opportunities far beyond health monitoring.



Supplementing Biology

Think of the movie 'Limitless' and you start to get close to where these supplements are aiming.

The company HVMN (pronounced 'human') is exploring the principle of 'upgrading' the human body. The company's main product is NOOTROBOX, a line of nootropics or, 'smart drugs', meant to enhance neural performance in areas such as memory, learning and focus.

How effective are they? Are there any side effects, and, if so, how severe? Is this just another placebo teasing us towards the fantasy of a superbrain? All questions still unanswered but an exciting proposition none the less.

A new app-linked pill has been approved by the US Food and Drug administration that aims to track medication usage from the inside. Abilify MyCite is primarily used to treat schizophrenia, the ingestible trackable pill has an active sensor that communicates with a patch on the takers body that collects and communicates with an app on a smart phone.

Not only will we be taking supplements that augment our biology, we will then track their impact and effects from the inside of our own bodies.

THE IMPACT ON BRANDS

From Biohacking to Biometrics

The Connected Consumer

The sensors on smartwatches and fitness bands provide data on a user's heart rate, sympathetic nervous response, blood glucose level, EKG, temperature and more. We are in a world where consumers are comfortable wearing devices that are always monitoring the body and its responses. We find ourselves at the inflection point where biology becomes data, where human biometrics ushers in a data dimension never before seen or available.

What started as activity monitors are now shifting towards health & wellness wearables, so it's clear how their value to a consumer is compelling. We are now wearing these devices everywhere and anywhere and you can imagine a scenario where the biometric data collected is now in context to the non-exercise day, while you watch Netflix's "Stranger Things" or ask Alexa for a margarita recipe. What will Netflix and Amazon do with this new resource?

The Data Dimension

This is a data treasure trove of biometric insight that can be connected to a brand experience, entertainment, and consumption. We'll be able to modify our engagement strategies to take advantage of biometric awareness.

The obsession in marketing has been personalisation, the audience of one. Adding this new dimension of biometric data will affect how we identify and engage with our future customers, from entertainment to general consumption to dating. Its being referred to as biometric marketing or emotional targeting.

Data for Personalisation

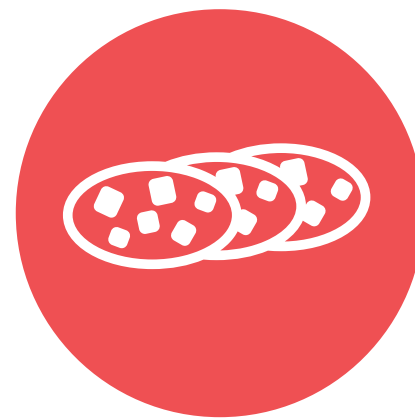
Time



When

The web always kept track of when an action was taken. The exact time of day was the first time we could track audiences behaviour at scale

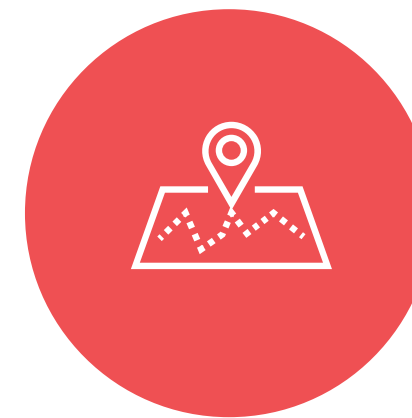
Profiles



Who

First with cookies and then with the advent of a pervasive online profile. Social media accounts keep track of everything you do beyond its own properties.

Geolocation



Where

Mobile devices know where you are at all times. Every interaction from photos to emails to tweeting, it's all geotagged when stored.

Biometrics



How

The advent of health monitors that track everything from blood pressure to insulin levels give data analytics a powerful modeling dimension never before seen.

Based on Cavan Canavan's TechCrunch article 'The Future of Biometric Marketing', but viewed from a marketer's perspective.

The Future is Biometric Marketing

Tracking the Connected Users

In 2014, Cavan Canavan, the CEO of FocusMotion, was already imagining this future: “Imagine a world where entertainment choices are built around your emotional preference, where you would know before going into a movie or watching a TV show if it fits the pattern for your emotional preference. Or, imagine going on a date where both parties agree to share their biometric data after the date. You’d be able to read their arousal profile and understand that they weren’t as into you as you were into them.”

Now consider Instagram, Bumble, and Facebook and you begin to see how this can be a powerful personalisation parameter for user journey planning and choice architecture.

All social interactions are now open to emotional targeting. Will the value exchange be high enough or the behaviour of sharing data be so common that consumers volunteer this new emotional dataset?

Bricks and mortar is becoming highly connected and soon our digital and physical self will merge. With biometric data access and the ability to understand the insights derived from this data a new world emerges. The in-store staff would be able to respond based on the individual consumer’s emotional preference, increasing the likelihood of an amazing experience.

Driving connections through the subjective world of emotions is something quite sensitive. By itself it’s probably too ephemeral and hard to use as a predictive parameter. In conjunction with the implicit nature of our digital footprint, the when, who, where of current tracking technology, this additional parameter offers marketers a brand new profiling dimension that takes us much closer to true personalisation.

Brands Create Value For Consumers

As brands begin to manage emotional data, the way in which personas for target audiences are built will need to evolve and provide different engagement strategies for new and specific emotional states.

Marketing technology (Martech) is in high demand by brands that want to get closer and more personal with their audience and customers. However, currently none of these systems account for a biometric profile. This is sure to change.



AI as its Translator

Scientists from a Google subsidiary, Verily, have recently submitted their findings to the Nature Biomedical Engineering journal. The journal describes how Google's scientists have discovered a new way to assess a person's risk of heart disease using machine learning. By analysing medical datasets of nearly 300,000 patients it was able to predict their risk of suffering a major cardiac event.

They used AI to analyse patients' eye scans, age, blood pressure, and smoking habits amongst other data points. By using neural networks they mined the data to create an association model of health risks tied to the eye scan results. The blood vessels in the back of the eye are representative of the body's health.

Big data has been touted as the ultimate path for solving the most sticky of problems. But real consumer breakthroughs are still in their nascent state and making a real difference to the everyday is only just taking shape. Add to this ocean of data the exponential growth of biological data and the distance between potential and consumer impact seems even wider. The only real solution is the full embrace of machine learning in order to derive true value and the ability to transform tracking data into consumer experiences.



Data and AI Saving Lives

In 2015, doctors from a hospital affiliated with the University of Tokyo's Institute of Medical Science in Japan admitted a patient diagnosed with acute myeloid leukaemia, a type of blood cancer.

Noticing that the recovery from the typical treatment for that type of cancer was slower than expected they began to wonder if the initial diagnosis had been incorrect.

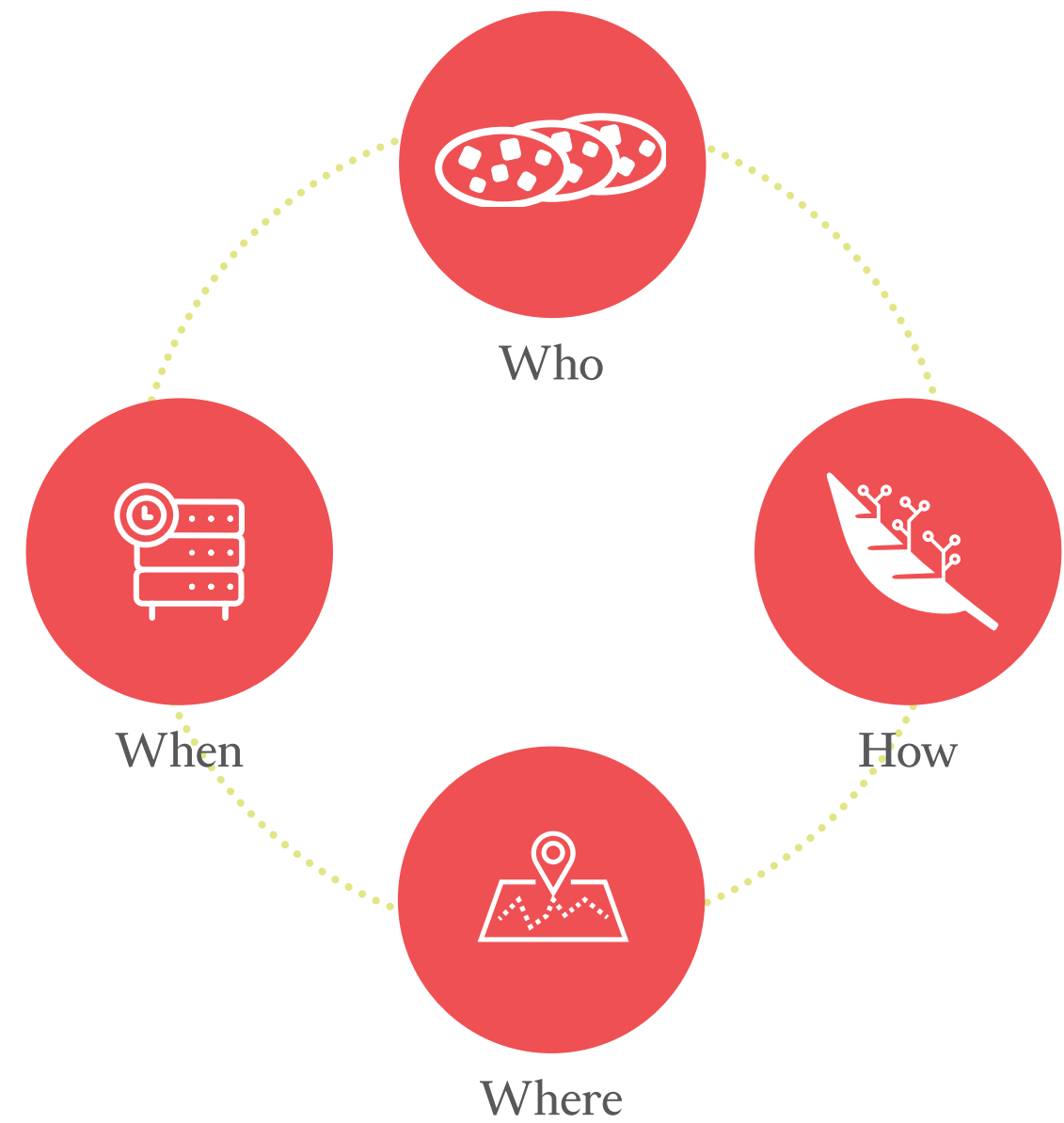
As part of a research study using IBM's Watson they included this patient's files for analysis and cross-referencing. This was part of a process that included the review of thousands of oncology research papers, patient files, treatments and patients' DNA structures.

By cross-referencing the patient's own genetic data against the analysed database, Watson detected over a thousand genetic mutations in her DNA. Once it identified the likely mutations causing her leukaemia, it was then able to match her DNA to the treatment that was most likely to have success. It was then reviewed by the clinicians in order to confirm the findings.

Remarkably, Watson accomplished this feat in just ten minutes — human scientists would have taken two weeks.

The Biohacking Data Profile

The addition of biometric data creates a powerful personalised 'Intent' parameter that is unique to each individual. This intent is simultaneously implicit and explicit and will require machine learning to understand it and derive insights.



Sentient Data Model

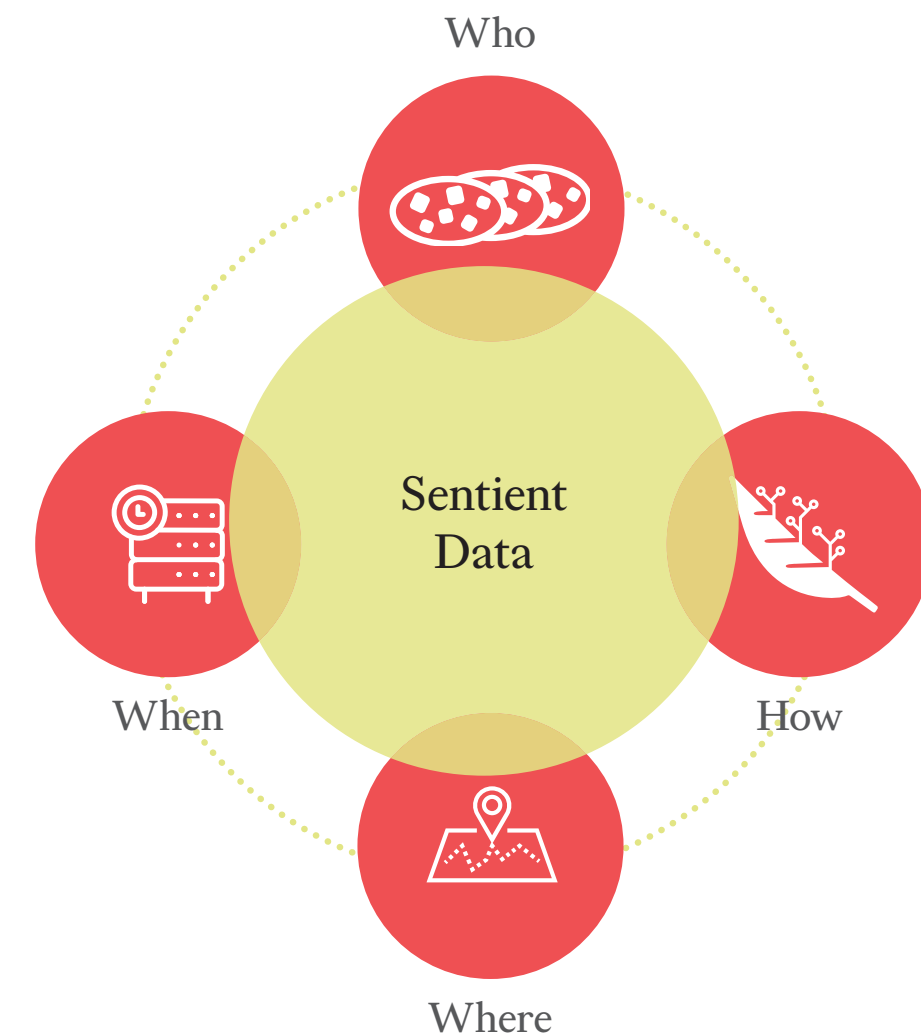
Brand consumer strategy has traditionally been focused on one thing – maximise conversion. The digital revolution has slowly shifted the strategy towards personalisation where consumers are not merely treated as income targets but towards maximising value and creating amazing personalised experiences.

Existing and future technology that will surround consumers and be worn by them, does much more than merely respond to an individual's expressed needs. It also creates an individual emotional profile, unique to the consumer's biometrics, that combines the existing parameters, when, where, and who with the biological how.

Marketers will need to respond to this new data dimension with a new or adjusted marketing framework.

This biometric dimension will extend the current Experiential Marketing model to an emotional framework. Taking into consideration an inclusive spectrum of interactions between a user and a brand. This data will span the entire journey from discovery, consumption, abandonment, and re-engagement. Every aspect of the journey can be mapped against an emotional 'How' dimension.

We call it Sentient Data. Every user engagement strategy will need to take this dimension into account when building a brand's new response and intent model framework.



Impact to Brands

Now that we are collecting data that creates an holistic Sentient Model, we can begin to map the opportunities for your consumers. Here are three ways Sentient Data can help you and your brand better engage with your consumers.

Augmenting	Addressing	Servicing
<p>You manage a user database of millions of contacts. You run a robust CRM program to manage your communications that track usage and offer upgrades and rewards.</p> <p>By augmenting your user database with third party Sentient data, you will be adding personalised behaviour profiles for each of your consumers.</p>	<p>Being able to identify consumer intent is the holy grail of the marketer. Use of look-a-like models, audience segmentation, and demographic targeting are all used to create a marketing framework that, at best, only works some of the time. But most of the time it leaves consumers confused as to why that shoe they bought online is still following them around the web.</p> <p>Consider using everything we currently know about the consumer, then leverage the emotional data. With the 'how' dimension the use of Behavioural Science becomes a wonderful strategy to define these engagements.</p>	<p>As a brand with a service model your goal is to identify and share the appropriate amount of individual attention for best ROI. Too pushy and the consumer gets annoyed, not enough and they get frustrated. Understanding the right triggers is a subjective art and one that technology alone gets wrong.</p> <p>By enabling your technology stack to read a consumer's Sentient Data you can establish 'how' the consumer feels and then respond appropriately. Say a consumer enters your store and they are feeling frustrated as they search the aisles, why not send them a notification on their smartphone and suggest a store search tool or that a customer service rep approach them?</p>

MAKE IT SAFE

So Much Data So Much Anxiety

The Danger is Real

It's understandable if our reaction to this new level of personalisation comes with a feeling of dread that your privacy may be in danger. It's easy to feel both excitement and trepidation at this type of data mining.

The fact is our data is being used constantly - it's being mined, exploited, hacked, and sold without us, the consumer, ever knowing. Company data breaches or hacks can happen when you are innocently communicating with friends and family. The Yahoo hack in 2013-14 compromised nearly 1bn accounts. In 2018, the very public Cambridge Analytica and Facebook data scandal revealed up to 87m profiles were downloaded without permission since 2014.

If every transaction or interaction in our new digitally connected world is vulnerable to attack, who is there to protect us? Your government? During Mark Zuckerberg's senate hearings Sen. Brian Schatz repeatedly asked whether Facebook could see emails he sends on WhatsApp. Given you don't send emails on WhatsApp, and WhatsApp is encrypted it's not hard to imagine that data security regulation by our governments is a distant dream.

The Network is an Accomplice

The reason this happens, beyond the obvious criminal intentions, is that we rely on a centralised network where large corporate entities manage, store, and reap the value of our data. In the 1950s famous thief Willie Sutton, when asked why he robbed banks, said: 'Because that's where the money is.' Keep your profit-making performance data in one central 'secure' place and it's easy enough to see why hackers come looking.

Enter the Blockchain

Blockchain technology can be used to secure individual profiles and place the control in the hands of the consumer. This is key to ensuring this amount of personal data can be secure from hacking and misuse.

The collecting, storing, and then discarding of all but the encryption of your personal data permits a distributed digital system to be used in a similar way to a government ID card or passport. As long as you can keep your personal devices secure nobody has your ID or personal information, but you can authenticate yourself when and where you need to do securely - just like the old days, when your ID was only found in your wallet.

There are a number of companies entering the authentication and security world, some include IAME, SelfKey, ShoCard, and Civic. These companies aim to replace traditional identification processes with a decentralised version where people can prove their identity without fear of identity theft. Digital IDs could be used by banks and online retailers to authenticate users, or by airlines instead of a passport.

Civic in Action

Civic can confirm your identity, but does not need to store your information to do this.

Civic is a digital identity platform that leverages Bitcoin's public blockchain. A user signs up to the Civic app, it collects various identifying information. All of it is passed through to either a government agency or a third party identification verification service depending on the country. Once verified, Civic takes a cryptographic hash of all the information, inserts the hash into the public blockchain, and then erases the personal data from their servers.

If Civic or any of the companies using Civic for authentication are hacked, all your personal data is safe, since it was never stored anywhere other than on your device.

Blockchain is certainly not the only way to make personal data safe but one of the most interesting solutions. The alternative are centralized entities with all of the data under one roof.

As we consider the merging of all these data parameters into a single consumer view, security must be at the top of the list when architecting the system.

WHAT'S NEXT



As Biology Becomes Data

As marketers consider this new dimension of personalisation and consumer insight, brands will need to create new frameworks for planning, deploying, and using it. The merging of the consumer with technology is well on its way and it's just a matter of what will we do with it rather than if and when it will happen.

The evolution is here and there's more to come:

The
Augmented
Human

Analogue
to Digital

Translated
by Machine
Learning

Becoming
Sentient
Data



Disney's magic band connects the entire consumer experience pre, during, and post park attendance

Is Your Brand Ready?

Interrogate your brand and ask the tough questions:

- What are the products and services I have in my portfolio that will be most impacted by the connected consumer?
- What are the strategies for making my data work with Sentient Data?
- How will my customer/consumer feel about their emotional states being tracked and analysed?
- Does the current value exchange and convenience between brands and consumers extend to biometrics?
- How will my brand be top of mind when a consumer's intent is measured by their emotional preference?
- Are there any tools or processes to help my brand address this future?

CONCLUSION

Conclusion

We are in an exciting new world, where our digital self meets our physical reality with boundless possibilities for marketers. Brands that can set the path to manage and explore this new data dimension will be rewarded by great customer loyalty, as well as the most efficient and effective marketing and sales practice.

Ogilvy Consulting, with a dedicated health & wellness practice and martech expertise, can help brands create a transformation roadmap that aligns the brand's mission with a strategy and martech solution, inclusive of a Sentient Data framework, to deliver the most effective business solutions.

Contact us to help you navigate this path and in the process build better, more fulfilling, experiences for your customers as well as market leading business solutions.



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“We and our technological creations are poised to embark on what is sure to be a strange and deeply commingled evolutionary path”

-Arati Prabhakar, DARPA's former director

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Many thought leaders from various industries are making sense of this crazy technology. I drew great inspiration and depth from them and credit is due.

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