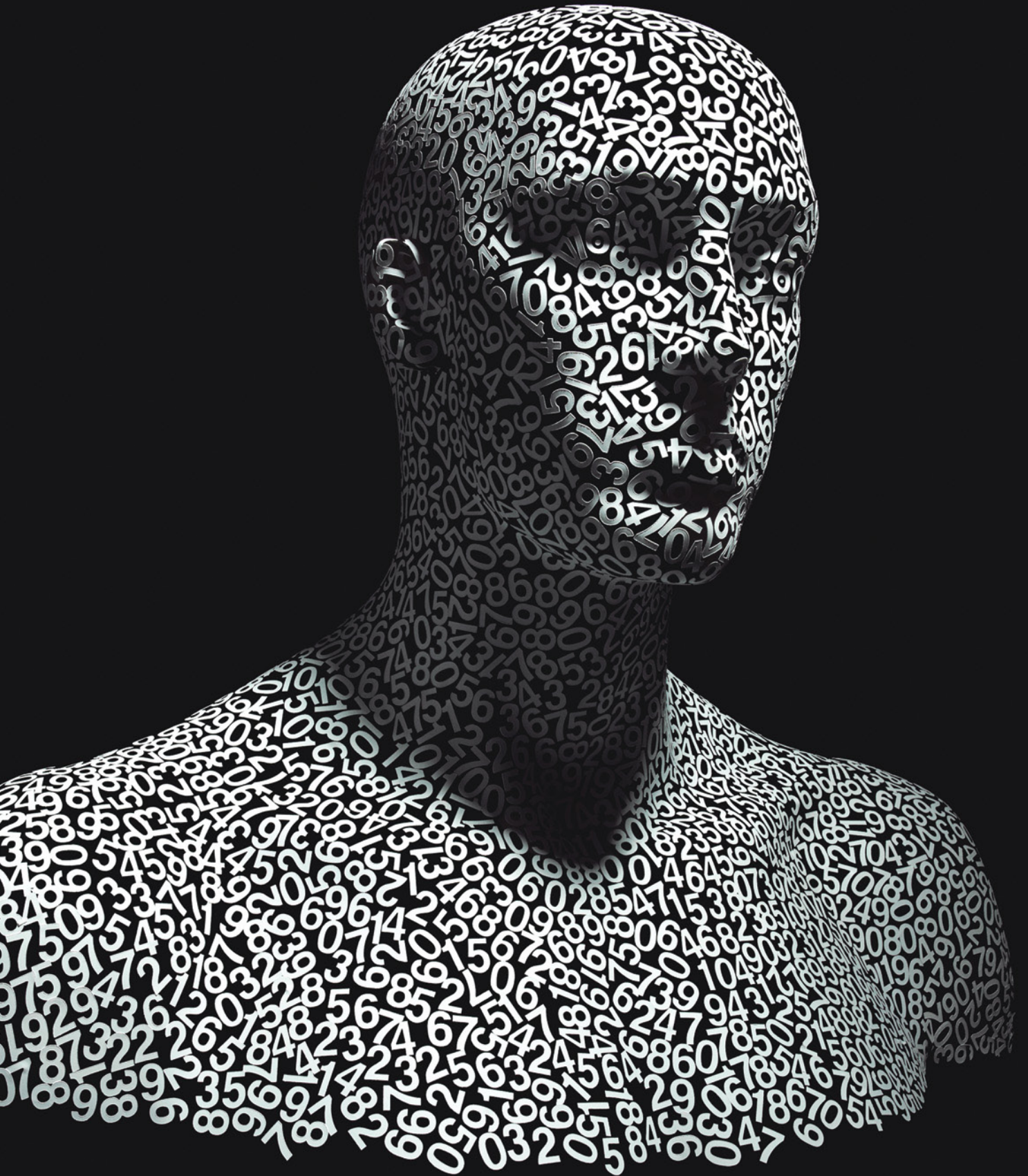




THANKS TO AN EXPLODING NUMBER OF WELLNESS APPS AND WEARABLE DEVICES, YOU MAY BE BEAMING BIODATA INTO THE CLOUD RIGHT NOW. AS THE QUANTIFIED SELF MOVEMENT PICKS UP STEAM, WHO STANDS TO PROFIT? (HINT: NOT YOU.) AND CAN THOSE CASHING IN ON BIG DATA USE YOUR HEART RATE AGAINST YOU? (TAKE A GUESS.) BY HOWIE KAHN | PHOTOGRAPH BY CHRISTOPHER GRIFFITH





BY THE TIME ANDREW PAULUS, A 23-YEAR-OLD

product manager for a Manhattan-based start-up, has brushed his teeth and slipped into his standard uniform of a T-shirt and dark pants each morning, he has already charted and evaluated his sleep, recorded the nutritional content of his breakfast (usually a Larabar), and likely quantified and cataloged his mood. Throughout the day, Paulus, a regular runner with tousled blond hair, tracks more personal data, including his location (both above- and belowground), time spent meditating, and daily wardrobe choices relative to the weather. “It becomes an obsession,” he says, “but it’s an amazing way of knowing myself better all the time.” Using tracking and recording apps and wearable fitness devices like the Jawbone UP, Paulus continuously uploads his life into the digital ether. That means the cloud always knows how deeply he’s sleeping, what he’s eating and when, how many steps he’s taking, and when and where he’s taking them. It even knows when he’s happy and when he’s sad.

An estimated 5 million Americans are already using wearable devices to sync their lives to the cloud, and their ranks are growing rapidly. Like Paulus, they are sending vast amounts of information—collectively referred to as Big Data—to the servers of salivating Silicon Valley executives. In just the first half of last year, venture-capital firms invested \$700 million in businesses developing new wearable and embedded devices. According to a study by the consulting giant McKinsey, Big Data could be worth \$300 billion annually to the health-care industry alone. But its value to sports-apparel companies, health-food purveyors, and even mattress-makers is also apparent. At this year’s Consumer Electronics Show in Las Vegas, 283 vendors showed up to promote digital health products—over 100 more than the number of companies hawking games. One British mobile-research firm estimates that by 2017, 70 million people will be buying wearable devices annu-

ally and slapping them on their wrists (and chests, ankles, and necks). And while there is no valuation yet for, say, what Paulus’ heart rate is worth per beat, there’s reason to think that users of tracking apps and sensor-laden devices are giving the milk away free.

“People are saying Big Data is the new oil,” says Gary Wolf, “and that these treasure troves of data are the big story in the future of business.” He should know. He and Kevin Kelly are the former *Wired* magazine editors who cofounded the pioneering digital-tracking group Quantified Self in 2008. Its credo: “Self knowledge through numbers.” About 30 early adopters showed up at Kelly’s Pacifica, California, home for the group’s first meeting. Five years later, there are more than 70 regular Quantified Self (QS) meet-ups in 32 countries (Paulus attends the one in New York), and the term is now used to describe almost any form of self-tracking. Nearly 600 people in search of tech-aided self-improvement registered for the third annual two-day QS conference at Stanford University last fall. “If you’re getting into this,” says attendee Dave Asprey, a 40-year-old bio-hacker and vice president of Internet security in Silicon Valley who calls himself the Bulletproof Executive, “the goal is usually one of four things: I want more energy. I want to sleep better. I want to lose weight. I want better sex.”

It was easy to spot the quantpreneurs among the ordinary self-trackers gathered within the corporate confines of Stanford’s Frances C. Arrillaga Alumni Center, a place of marble floors, reflecting pools, light fixtures beveled like precious stones, and premium coffee for all. Many had already designed self-tracking apps and launched quant-centric companies. They exuded confidence that they would soon find ways to leverage this new fascination with everyday personal-data collection into full-fledged Big Data conglomerates. One in his early twenties was headed to Stanford Graduate School of Business with

plans to make a Zuckerbergian fortune from QS data. He wasn’t a self-tracker—unless you consider seed funding a personal metric. “I live in a house with a zip line going into the pool,” he said. “Like in the Facebook movie.”

And the business of tracking how far people run or how deeply they sleep is already attracting major investment dollars. Tim Chang, a 40-year-old managing director of the \$2.8 billion venture-capital firm the Mayfield Fund, has arranged millions in financing for several QS start-ups, including Basis, which makes a watchlike device that measures your heart rate with a laser. As QS tools advance beyond simple pedometers and accelerometers toward these more sophisticated devices, Chang sees enormous business opportunities. “It’s not even about the devices,” he explains. “You get the data from the consumers and then you offer them insights, personal coaching, training, analysis. You can upsell users on a variety of things. Without the data, it’s just a bracelet business, and that’s not interesting at all. In the long run, whoever owns the biggest corpus of data is probably the most strategically valuable company.”

Jef Holove, the CEO of Basis, believes that all that information he gathers can make the world a better place—while boosting his bottom line, of course. For starters, the more data he collects, the better the product he can offer (it’s a form of collective user testing). But he also thinks that the health stats he harvests can be shared benevolently with insurance companies and corporate wellness initiatives to improve their programs as well. “We’re getting heart rate in a context that hasn’t previously been available,” he says. “It isn’t from a lab or a doctor’s office. It’s in real time, from real life.”

But not everyone is as optimistic about the promise of Big Data. Jaron Lanier, a renowned computer scientist and the author of the new book *Who Owns the Future?*, worries about the information we’re handing over being used

against us later on. “It might mean that if your health is looking shaky, all of a sudden you won’t be able to get a loan, even though there isn’t supposed to be a connection,” he says. “There could be some general cloud score—like how much of a risk is this person in some really general sense—that might be factored into decisions like a loan or a job you get or don’t get.” For Lanier, it has *Gattaca*-like potential. It’s not hard to imagine a very near future with new categories of haves and have-nots that are defined by what can be learned from the cloud—a sort of credit rating on steroids. “You could be saying, ‘Oh, crap—first I got some kind of health condition, and now I didn’t get the loan or the job that I want.’” What’s more, he predicts darkly, data stored in the cloud could wind up negatively affecting your life without your even being aware of it.

Other potential usages of your information could be more annoying than nefarious—like when your cloud-processed data rains back down on you in the form of endless targeted commercial offers. Say the cloud knows that

Andrew Paulus couldn’t sleep last night: It could lend the data to Bed Bath & Beyond, which might then try to sell him a new pillow. The auto-insurance broker Progressive already offers an electronic device that can lower your insurance rates based on how you perform behind the wheel. It’s not much of a stretch to imagine a wearable health monitor that affects your insurance premiums—and maybe even delivers reports on your sexual performance to a Big Pharma company, which then e-mails offers for discount erectile-dysfunction meds. And it’s unnerving to imagine scenarios in which other people in your life get hold of your info: What if your employer accesses data showing increased perspiration and heart rate and figures out you were out late drinking? Or if your spouse finds your location data and realizes what you were *really* doing last night?

Revenue streams have yet to catch up to the data sets that are growing by the second, but the potential is obviously there: Zeo, the maker of a popular sleep-tracking device, was sitting on statistics for more than a million nights of

slumber (the company recently shuttered, and who will ultimately snatch up this gold mine of data is anybody’s guess). Nike, the granddaddy of biodata-mining thanks to its popular FuelBand device, has 11 million members in its Nike+ community—a number that figures to grow because of the company’s new Accelerator program, which aims to replicate the success of Apple’s app store by allowing developers to find more uses for the Nike+ platform and, ultimately, more users. Google, perhaps the most established Big Data company on the planet (your e-mails and Web searches bounce back at you in the form of personalized ads), is looking to dig even deeper with Google Glass, synced eyewear that will have the ability to store images and sounds you encounter in the physical world in the cloud for future use. (A Google spokesperson says the company is not yet ready to share all the specific details about the device’s functionality, but cofounder Sergey Brin has promised that it will be commercially available before the end of the year.) And Apple is rumored to be readying its own watchlike device that will contain sensors for biodata collection and sync with your iPhone. The possibility of your feeding the Big Data beast—whether actively or passively—becomes greater every day.

Near the end of the QS conference at Stanford, Kevin Kelly compared the potential impact of all this data collecting to the explosion of an atomic bomb. The 600 enthusiastic self-trackers sat listening even as they tapped on tablets, tweeted koans, and transmitted data to the cloud for future mining, harvesting, and monetizing. “But unlike a nuclear explosion, which only lasts a few seconds,” Kelly went on, “this is an explosion that’s been going on for years and is still going. That’s how much data we’re making. It’s a nuclear explosion that’s going on forever.” And there’s a good chance it’ll wind up consuming all of us. “I don’t know if we’ll be calling any of this the quantified self in 50 years,” Dave Asprey says. “We might just call it being human.” ■

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