

So whether it's for art, memory, health, or data for data's sake, people are tracking themselves and sharing their results. We do it because we love data or because we have specific things we want to optimize about ourselves. As Kevin Kelly wrote, "Unless something can be measured, it cannot be improved."

When Gordon Bell is asked what he has learned about himself through the MyLifeBits project, his reply is unexpectedly qualitative: "That's been a really hard question to answer... I guess it's the rich set of connections and people that I've been involved with."

Bell's comment reflects the challenges that come up over and over again at Quantified Self discussions — questions that tend to revolve around two topics: motivation and meaning. How do we stay motivated (and motivate others) to track ourselves, and how do we make sense and learn actionable lessons from all of this data? The search for solutions to these challenges offers ample opportunities for innovation. Imagine self-tracking games that reward people for recording their health with badges of recognition; passive monitoring devices that remove the need to actively track yourself; social pressure in the form of online group challenges; prizes awarded to algorithms that turn messy data into beautiful insight.

## CURETOGETHER

One step on this path of innovation is self-tracking applied to health. An example of this is CureTogether, a patient data-sharing site I co-founded with Daniel Reda where people come to self-report symptoms, treatments, and triggers for over 300 conditions.

People are tracking their depression, cholesterol, migraines, and countless other measures. Using migraine as an example, patients visiting CureTogether can see community statistics and learn that the top reported symptoms are "Nagging pain in one side of the head" and "nausea," the top reported treatments are "sleep" and "ibuprofen;" the top reported triggers are "stress" and "not enough sleep" and the top related conditions are anxiety and depression.

Instead of narrative websites that provide emotional support in the form of shared disease stories, the quantitative data at CureTogether enables decision support and hypothesis generation. People are getting ideas for new treatments that they ask their doctors about. They are seeing how common or rare their symptoms are, and learning what triggers might be affecting them. While each individual's data is completely private, the aggregate data is open for researchers around the world to analyze and use to make discoveries for the greater good. Some interesting correlations are already starting to emerge, like a potential link between migraine and fibromyalgia.

Alexandra Carmichael is co-founder of CureTogether, blogger at *The Quantified Self*, advisor to Singularity University, and mentor to several startups. Find her on Twitter @accarmichael.

## RESOURCES

Gordon Bell Homepage

<http://research.microsoft.com/en-us/um/people/gbell/>

MyLifeBits project

<http://research.microsoft.com/en-us/projects/mylifebits/>

Jim Gimmell

<http://research.microsoft.com/en-us/people/jgimmell/>

Franklin's 13 Virtues

<http://www.sfheart.com/FranklinsVirtues.html>

Homebrew Computer Club

[http://en.wikipedia.org/wiki/Homebrew\\_Computer\\_Club](http://en.wikipedia.org/wiki/Homebrew_Computer_Club)

The Quantified Self

<http://www.quantifiedself.com/>

Tweetwhatyoueat

<http://www.tweetwhatyoueat.com/>

Alex Rossi's Tweetwhatyoueat Video

<http://www.kk.org/quantifiedself/2008/11/alex-rossie-shows-tweet-what-you-eat.php>

Ryan Grant Talk

<http://www.kk.org/quantifiedself/2008/11/tivo-for-life.php>

Attila Csordas

<http://www.kk.org/quantifiedself/2009/09/sf-bay-qs-8.php>

CureTogether

<http://www.curetogether.com/>

PatientsLikeMe

<http://www.patientslikeme.com/>

FitBit

<http://www.fitbit.com/>

DailyBurn

<http://www.dailyburn.com/>

## SELF-TRACKING WILL CHANGE THE FUTURE OF HEALTH

The Quantified Self and CureTogether are just the beginning. Here are some scenarios that point to a fundamental shift in healthcare coming in the near future.

### Self-Organized Clinical Trials

Patients have started coming together to define their own case-control studies. At PatientsLikeMe, patients with ALS either took lithium or didn't take lithium, and they tracked their progress. They didn't find that lithium helped slow the disease progression, but they did run an ALS trial with the largest population in the fastest time and with the lowest cost ever.

### Streaming, Ubiquitous Biosensors

Think constantly uploading data about your body to an online repository is far off in the future? Not so. For a one-time fee of \$99, you can now have FitBit, the accelerometer with the beautiful clip-on form factor and wireless uploading of exercise and sleep data. It's passive motion tracking in your pocket.

### Analytics for Your Health

A number of emerging companies are trying to do for health what Google Analytics has done for website management and what Mint has done for finances. DailyBurn is one example doing this for fitness and nutrition, with a \$0.99 iPhone app that lets you take pictures of the barcodes on foods you eat to help you more smoothly track your caloric intake. A big challenge here is the lack of interoperability and standards adoption. EMRs, PHRs, and self-reported data just don't talk to each other very well yet, but medical informatics groups like the Regenstrief Institute are working on it.

### What Treatment Will Work For Me?

The true promise of all this self-tracking is, in the end, personalized medicine. With enough data about your symptoms, biomarkers, environment, genes, response to previous treatments, and aggregate population data for comparison, it should be possible for a series of algorithms to determine which treatment is statistically most likely to work for you, with the greatest efficacy and least side effects.

This is an exciting future to which I am dedicating all my waking effort. So now that you've heard Gordon Bell's story, and mine, and the voices of Quantified Selfers across the country, the choice is yours: will you document your life? ☺



WINTER 2009



# SCRAPHEAP

## transhumanism

### DIY RFID

LEPHT ANONYM

**I'm sort of inured to pain by this point. Anesthetic is illegal for people like me, so we learn to live without it; I've made scalpel incisions in my hands, pushed five-millimeter diameter needles through my skin, and once used a vegetable knife to carve a cavity into the tip of my index finger. I'm an idiot, but I'm an idiot working in the name of progress: I'm Lepht Anonym, scrapheap transhumanist. I work with what I can get.**

Sadly, they don't do it like that on TV. The art of improving the human is shiny and bright in the media. You see million-Euro cryogenics policies and hormonal life-extension regimes that only the elite can afford. You see the hypothesis of an immortal silicon body to house your artificially-enhanced mind. You could buy that too, maybe, if you sold most of your organic body and the home it lives in. But you can do something to bring it down a notch: homebrewing.

My first foray was into RFID (radio frequency identification) following Amal Graafstra. He's famous for having his doctor implant him with a passive ID ampoule. After one visit to an outraged state GP here in Scotland ("I wouldn't do it even if I could, and I have no idea why you want to do it!"), I was fairly certain I'd been born in the wrong country for that — here, doctors would be struck off the records for helping me. I was on my own.

Luckily, I'm far too stupid to be stopped by bureaucracy. I bought my first Swann-Morton scalpel online, scrubbed the cleanest bathroom we could get with household bleach, settled myself cross-legged over the bathtub with my spotter, and poised the blade over the Biro-ink line I'd drawn for guidance. For a few minutes, I doubted whether I'd even be able to do it — cutting yourself open is not something we're adapted to be good at. Contemplating St. Gibson, I took the plunge.

It took a few weeks to heal, and when it did, with some help from my local gurus I was able to program a cheap open-source Phidgets RFID reader to recognise the chip's hexadecimal ID. The piece of C code that did it resided on a Linux machine and ran in the background while the reader was connected, waiting for my chip to show up. In short, it could see me and print a little "hi" when it did. That's just garbage programming, too — you can see the potential if it was given to a real coder. The chip works with any homebrew RFID project: Graafstra's RFID keyboard, for instance, grants or revokes access to my XP box based on whether the user is Lepht or not. You want a laptop tracking system? A door that only lets you in? A safe that won't allow keypad input if you're not next to it? All you need is an ampoule (you get five for a Euro, the last time I checked), from any RFID hobby place, a cheap reader, and a touch of disregard for risks. Salvage a keyboard from your local dump and you've got a simple system for bioidentification.

RFID chips work on passive power. Readers take power from a USB to generate magnetic fields. The chips contain copper coils to convert the magnetic field back into an electric one that they can use as their power source. After the RFID op, I acquired another implant that works with EM fields, the neodymium-60 nodule pioneered by Steve Haworth.

The implants sit in various places under my skin: middle fingertips of my left hand, back of the right hand, right forearm — tiny magnets, five or six millimeters across, coated in gold and then in silicon to isolate the delicate metal from the destructive environment of your body. They're something of an investment at about thirty Euros apiece, and hard to get hold of, but worth pursuing. When implanted, they become technological sensory organs.

There's an entire world of electromagnetic radiation out there, invisible to most. Our cities are saturated with it. A radio, for instance, gives off a field that's bigger than the device itself. So do power supplies and wires in the walls. The implants pick up on the fields, and because they're magnets, they fizz with gentle electricity, telling you this hard drive is currently active, that one is turned off, there's the main line in the wall. Holding a mobile phone, you can feel the signals it sends and receives. You know it's ringing before it starts to play any sounds, and when you answer it, you stick the touchscreen stylus to the back of your hand to hold it, then to your finger to type.

After a while, you don't notice anything novel about this at all. Building computers, you pick up screws that have fallen down into the motherboard with one fingertip and stick them on the back of your wrist for safekeeping. You know not to touch the board when it's powered, because your hands can "see" whether it is or not, just like you can see whether the hard drives being tested on the machine next to it are actually being written to or not. It's just like any other sense, except that this one can be given to you for the price of a node, a needle and a bottle of antiseptic. A new way of seeing the world, all for about fifty Euros. There's nothing stopping you except your own sense of self-preservation. I say all this not to show off, but to invite more people in. I dream of seeing more body-tweakers around who are into these things. I know there are people out there who could open up home modification like we've never dreamed.

Watching commercials for vitamin pills on TV and thinking you need a mad scientist's lab to be a transhumanist? You don't. I've got no money, talent or backing. You just need curiosity and the willingness to withstand some pain. Risk, not money, is our obstacle. Is it yours? Are you reading this magazine right now? Do you think like that? What could we achieve together?

Turn off the TV, then, if you're curious. Pick up that needle. Come to the junkyard. ☺

*Lepht Anonym is the Silver City's pseudo-anonymous biohacker, famous only in Aberdonian emergency rooms. It Lives for transhumanism. you can contact it at [lepht@triotimum.com](mailto:lepht@triotimum.com).*

## RESOURCES

Sapiens Anonym  
<http://sapiensanonym.blogspot.com/>

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