Gerard Foster

Dr. Hillary Kim

Biomedical Research 617

February 15, 2016

<div align="center">Quantified Self Movement Gains Momentum</div>

Many of us have used the excuse, "Sorry I'm late, I lost track of time." What if there were a device that could not only help you keep track of time, but also make you aware when you are losing time and why? As part of their senior class project at Cornell, recent graduates Brian Schiffer and Sima Mitra created a watch that measures our *perception* of time, as opposed to *actual* time.[1]

The implications of this watch device, called Tic-Toc-Trac, could potentially lead to early detection of Alzheimer's disease and other neurological disorders. When properly used, Tic-Toc-Trac not only measures how long you think a particular action will take—compared with how long it actually takes—but also helps to adjust your perception so that it is more closely in line with actual time. Tic-Toc-Trac is just one of the many recent physiologic monitoring devices that contribute to the Quantified Self Movement, which is paving the way for people, both as individuals and as patients in the health care system, to measure and take charge of their own health advances.

The Quantified Self Movement uses technology to measure and analyze data in the human body for the purpose of self-tracking. The resulting data of the movement has widespread implications for the medical industry and could eventually lead to solutions for aiding doctors in diagnosing and helping patients monitor and prevent diseases of both body and mind. These advances could eventually prolong patient's lives and help reduce the increasing costs of healthcare.

There are many other practical uses of such intensive data tracking by using these physiologic monitoring devices. What if you could predict the perfect time to start studying in order to achieve the best grade on a test?

Gary Wolf, who along with Kevin Kelley started the Quantified Self Movement, theorizes that memorization is only a small part of learning and that there is an ideal moment to practice what one

---

[1] Organizations such as airlines and the military could benefit because many employees are involved in time sensitive operations, where errors can have catastrophic consequences.

wants to memorize. They believe that if one practices too soon the time is wasted and if one practices too late the material is forgotten and then must be relearned. They conclude that the right time to practice is just at the moment one is about to forget. They point to the use of a computer to practice in which a *spaced repetition* program can predict when one is likely to forget an item and then schedule practice at the right time.

Accurate records and data have always been essential components of health care; however, the notion and widespread implications of using technology to help record and keep track of this data is still in its infancy. [2]New devices, apps, and websites to measure calorie input, body fat, heart rate, blood pressure, blood oxygen levels, water intake, sleep patterns and other diagnostics are being created every day. Dr. Eric Topol indicates that "the emergence of powerful tools to digitize human beings with full support of a digital infrastructure creates an unparalleled opportunity to inevitably and forever change the face of how health care is delivered." (Sopol, p. 5)

Doctors have long urged their patients to seek ways to better monitor and control their food intake and dietary habits. According to the Center for Disease Control and Prevention, obesity affects many adults (35.7% by some estimates) (Ogden Cynthia L., 2013) in the United States. Doctors think that many diseases and conditions are exacerbated by an inappropriate diet and inadequate exercise. Medical professionals are often at a standstill, because their patients claim they want to lose weight but cannot figure out how to control their diets, especially when they are unaware of how much they are eating or how little they are exercising.

Here is another instance where quantitative technology can make keeping track of intake and output simple and easy. Instead of having to write down every calorie, fat gram, and ounce of protein or carbohydrate consumed, there are now smartphone apps, tablet apps, and computer programs that will enable you to enter and store all that data easily and let you track how food has made you feel when you ate it. By analyzing the data at the end of a given week or month, an individual can make changes that will directly help him or her adjust food intake or exercise levels to reach a desired weight and to take the mystery out of why his or her current dietary plan may not be working.

---

[2] He US-Department of Health and Services indicates that the widespread use of Health Information Technology will improve the quality of health care and prevent medical errors.

The healthcare industry is taking notice. Many hospitals are planning for the effects of personalized medicine. There is a huge increase in the amount of data-driven information, and doctors and medical staffs are being encouraged to communicate with their patients about the data they track, some of which could permanently change the diagnoses and treatment of chronic conditions. Mining of data could even support research into the genomic basis of a disease. (Glasser, 2011, p. 28)

Works Cited

Glasser, J. P. (2011). *The Strategic Application of Information Technology in Health care Organization.* San Francisco : Jossey-Bass.

Ogden Cynthia L., M. D. (2013, January 15). *NCHS Data Brief Number 62*. Retrieved from NCHS Data: http://www.cdc.gov/nchs/

Topol, E. J. (2012). *The Creative Destruction of Meicine.* New York: Basic Books.