

# Innovations

It's all about what's next

ADVERTISEMENT

ADVERTISEMENT

AD

Technology

Space

Social Media

Column

Editor's Corner

Archives



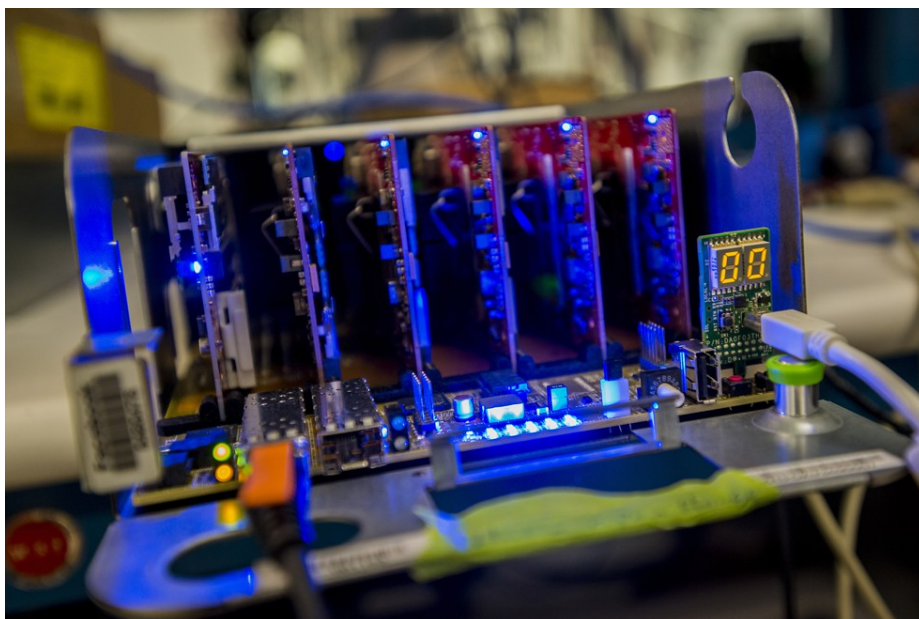
## The rise of big data brings tremendous possibilities and frightening perils

BY **VIVEK WADHWANI** April 18 at 7:17 am



More ▾

Comments



If information is power and power corrupts, we'll need to be careful about making sure the potential of big data isn't misused. (David Paul Morris/Bloomberg)

Debates are raging about whether big data still holds the promise that was expected or whether it was just a big bust. The [failure](#) of the much-hyped Google Flu Trends to accurately predict peak flu levels since August 2011 has heightened the concerns.

In my mind, there is no doubt that data analytics will one day help to improve health care and crime detection, design better products, and improve traffic patterns and agricultural yields. My concern is about how we will one day use all the data we are gathering—and the skeletons it will uncover. Think about how DNA technology is being used to free people who were wrongfully imprisoned decades ago. Imagine what supercomputers of the future will be able to do with the data that present-day data gatherers haven't yet learned to use.

they would know when to grow their crops; we had land records so that we could own property; and we developed phone books so that we could find people. About 15 years ago we started creating Web pages on the Internet. Interested parties started collecting data about what news we read, where we shopped, what sites we surfed, what music we listened to, what movies we watched, and where we traveled to. With the advent of LinkedIn, MySpace, Facebook, Twitter and many other social-media tools, we began to volunteer private information about our work history and social and business contacts and what we like—our food, entertainment, even our sexual preferences and spiritual values.

Today, data are accumulating at exponentially increasing rates. There are more than 100 hours of video uploaded to YouTube every minute, and even more video is being collected worldwide through the surveillance cameras that you see everywhere. Mobile-phone apps are keeping track of our every movement: everywhere we go; how fast we move; what time we wake. Soon, devices that we wear or that are built into our smartphones will monitor our body's functioning; our sequenced DNA will reveal the software recipe for our physical body.

The NSA has been mining our phone metadata and occasionally listening in; marketers are correlating information about our gender, age, education, location, and socioeconomic status and using this to sell more to us; and politicians are fine-tuning their campaigns.

This is baby stuff compared to what lies ahead. The available tools for analyzing data are still crude; there are very few good data scientists; and companies such as Google still haven't figured out what is the best data to analyze. This will surely change rapidly as artificial-intelligence technologies evolve and computers become more powerful and connected. We will be able to analyze all data we have collected from the beginning of time—as if we were entering a data time machine.

We will be revisiting crime cases from the past, re-auditing tax returns, tracking down corruption, and learning who were the real heroes and villains. An artificially intelligent cybercop scanning all the camera data that were gathered, as well as phone records, e-mails, bank-account and credit-card data, and medical data on everyone in a city or a country, will instantly solve a crime better than Sherlock Holmes could. Our grandchildren will know of the sins we committed; Junior may wonder why grandpa was unfaithful to grandma.



corporations reap greater profits from the information that we innocently handed over to them. More data and more computing will mean more money and power. Look at the advantage that bankers on Wall Street have already gained with high-frequency trading and how they are skimming billions of dollars from our financial system.

We surely need stronger laws and technology protections. And we need to be aware of the perils. We must also realize that with our misdeeds, there will be nowhere to hide—not even in our past.

There are many opportunities in this new age of data.

Consider what becomes possible if we correlate information about a person’s genome, lifestyle habits, and location with their medical history and the medications they take. We could understand the true effectiveness of drugs and their side effects. This would change the way drugs are tested and prescribed. And then, when genome data become available for hundreds of millions of people, we could discover the links between disease and DNA to prescribe personalized medications—tailored to an individual’s DNA. We are talking about a revolution in health and medicine.

In schools, classes are usually so large that the teacher does not get to know the student — particularly the child’s other classes, habits, and development through the years. What if a digital tutor could keep track of a child’s progress and learn his or her likes and dislikes, teaching-style preferences, and intellectual strengths and weaknesses? Using data gathered by digital learning devices, test scores, attendance, and habits, the teacher could be informed of which students to focus on, what to emphasize, and how best to teach an individual child. This could change the education system itself.

Combine the data that are available on a person’s shopping habits with knowledge of their social preferences, health, and location. We could have shopping assistants and personal designers creating new products including clothing that are 3D-printed or custom-manufactured for the individual. An artificial intelligence based digital assistant could anticipate what a person wants to wear or to eat and have it ready for them.

All of these scenarios will become possible, as will thousands of other applications of data in agriculture, manufacturing, transportation, and other fields. The only question is how fast will we get there—and what new nightmares we will create.



**Vivek Wadhwa** is a fellow at the Rock Center for Corporate Governance at Stanford University, director of research at the Center for Entrepreneurship and Research Commercialization at Duke’s engineering school and distinguished scholar at Singularity and Emory universities. His past appointments include Harvard Law School and University of California Berkeley.

## 4 Comments

Discussion Policy

You must be signed in to comment. **Sign In** (<https://account.washingtonpost.com/actmgmt/registration/login/commenting?destination=http://www.washingtonpost.com/blogs/innovations/wp/2014/04/18/the-rise-of-big-data-brings-tremendous-possibilities-and-frightening-perils/>) or **Register** (<https://account.washingtonpost.com/actmgmt/registration/group/commenting?destination=http://www.washingtonpost.com/blogs/innovations/wp/2014/04/18/the-rise-of-big-data-brings-tremendous-possibilities-and-frightening-perils/>)

Conversation Live

Newest First ▼

## All Comments

**Up by the Big Lake**

A man walks into a store and looks at bikes. Later on he is tracked inside a sporting goods store looking at running shoes. And later still he is noticed at a sports bar, watching a triathlon. What do you know about this man? Nothing. Other than he was spotted around sporting goods and watched some TV. What the data will not tell you is that he was with his nephew who set the day's agenda and the man was not at all interested in sporting goods but that he simply tagged along.

Like | Reply |

1

**eric654**

Most of the "big data" you describe I would describe as "big drivel". That includes the Ouija-bytes of big data that chokes the NSA's servers (much larger haystacks) and prevents them from finding anything of actual intelligence importance (same old needles better found by better active human intelligence).

You say: "What is scary is that we will lose our privacy, opening the door to new types of crime and fraud. Governments and employers will gain more control over us, and have corporations reap greater profits from the information that we innocently handed over to them. More data and more computing will mean more money and power. Look at the advantage that bankers on Wall Street have already gained with high-frequency trading and how they are skimming billions of dollars from our financial system."

You need to support those claims. People who publish weird stuff online can only blame themselves. I routinely publish many comments critical of government policy online which includes any kind of power grab as I see it. My identify can be rather easily looked up. But nobody has gained any more control over me. High speed trading is an interesting example, sure there are cases where the traders got an unfair advantage colluding with exchanges. But the most interesting outcome is people (I know personally) with nothing more than intellect and cheap bandwidth who are generating wealth.

You say: "We surely need stronger laws and technology protections. And we need to be aware of the perils. We must also realize that with our misdeeds, there will be nowhere to hide—not even in our past."

Do you seriously expect politicians to pass laws to "protect" us from their big contributors? The biggest threat to our well being as I see it is the Fed's ceaseless printing of dollars to give to big banks to prop them up and to give to politicians to spend. This misallocates resources and stunts economic growth by debasing the currency.

Like | Reply |

**jorge\_mt**

Wait until the machines become autonomic. Then the fun will begin.

And if they become conscious, then it will probably end.

Like | Reply |

**John Miglutsch**

After 20 years of predictive modeling - the greatest danger is that we assume that we actually know the cause behind the correlation. We spot something that looks interesting - does it really tell us what our customers are like? Should we embark on a new business division? More often than not, the machine-created connections are no more than noise. The danger is in allowing the machines to draw the conclusions without asking for greater explanation. Keep the people in the loop. @jrmigs

Like | Reply |

1

- Help & Contact Info
- Reader Representative
- Digital Advertising
- Newspaper Advertising
- News Service & Syndicate

- In the community
- Careers
- PostPoints
- Newspaper in Education
- Digital Publishing Guidelines

WP BRANDCONNECT® 




FASHION WASHINGTON 

El Tiempo Latino 

More ways to get us

- Home delivery
- Digital Subscription
- Gift Subscription
- Mobile & Apps
- Newsletter & Alerts

- Washington Post Live
- Reprints & Permissions
- Post Store
- Photo Store
- e-Replica
- Archive
-  RSS
-  Facebook
-  Twitter

washingtonpost.com

© 1996-2014 The Washington Post Terms of Service Privacy Policy Submissions and Discussion Policy RSS Terms of Service Ad Choices