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THE NUMBERS GUY

Behind the Information Overload Hype

By CARL BIALIK

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The latest information about information overload is a lot to handle.

Wielding numbers that stretched to 20 or more digits, researchers recently reported on the world's massive ability to store, communicate and compute information. All three have grown at annual rates of at least 23% since 1986, according to a study published this month in Science.

The Numbers Guy Blog
The World's Information Explosion

Translated to a human scale, the massive numbers mean that the average person in 2007 was transmitting the informational equivalent of six newspapers per day, and receiving, in turn, 174 newspapers of data.

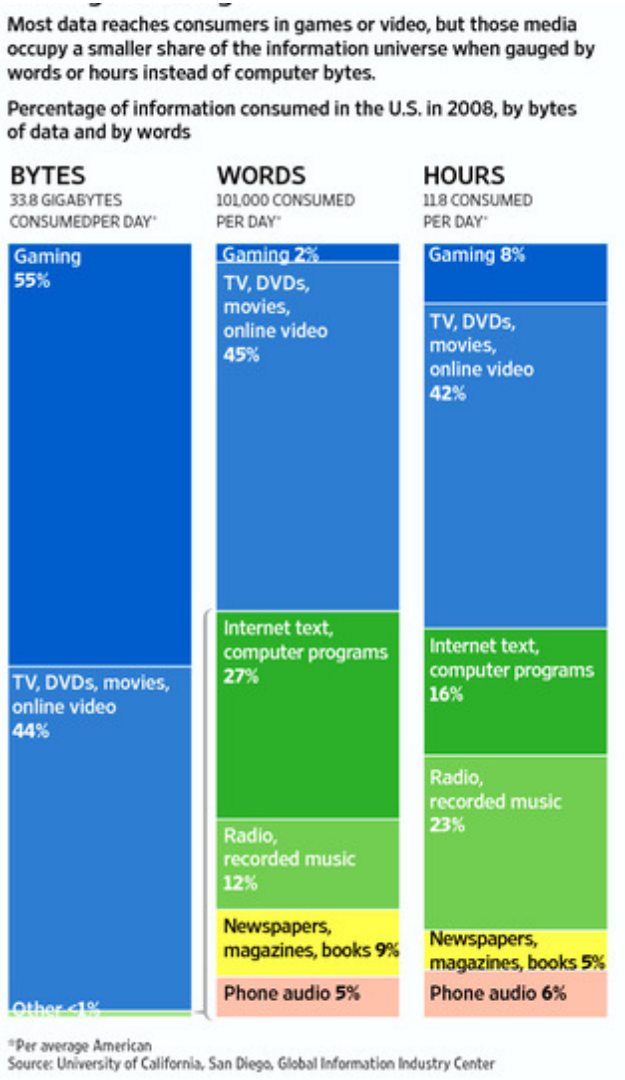
For data engineers, this might seem like cause for celebrating humanity's expanding universe of information. For the rest of us, it is another reminder that information is piling up at overwhelming rates.

But the digital avalanche isn't as massive as those numbers suggest. Much of the growth reflects the surge in high-resolution video and photos. In addition, while there is much more information available, each piece is being consumed, on average, by far fewer people than in the past.

Also, heavy Internet users—think downloaders of music and movies, or digital-photo fiends—are skewing the numbers. The average person doesn't have a high-speed line, let alone the ability to read six newspapers per day.

Parsing the Deluge

Not all forms of information grew at the same pace, the Science study reveals. The



amount of data stored in books roughly doubled between 1986 and 2007, a period during which the world population increased by about a third. The increase in newsprint was a relatively manageable 91%, while available storage—a barometer researchers used to estimate the quantity of information—in audio cassettes, vinyl records and photo negatives all declined. And nearly half the overall growth came from rapid improvements in hard-drive technology, making it possible to store high-resolution videos, photos and videogames as well as digital music.

Studies looking at the information glut do generally agree that there has been an enormous upsurge in information.

The Science study—which involved compiling disparate studies of the number of various devices and their capacity—found that in 2007, humanity was able to store 295 exabytes of information. That's 295 billion gigabytes, or about 500 million times the capacity of a typical desktop computer.

One byte is equivalent to eight bits, which are the smallest units of information. A single bit is the equivalent of answering one yes-or-no question.

Martin Hilbert, the lead author of the study, says that quantifying information is vital in order to understand it.

"If you cannot express it in numbers, you cannot do science with it," says Dr. Hilbert, an economist and researcher at the University of Southern California's Annenberg School for Communication & Journalism.

Reducing all pieces of knowledge—whether pixels, words or musical notes—to digital bits makes them easier to analyze. But bits are neutral about the value of knowledge. "You can get a lot of information out of reading a half-megabyte book, compared to watching a one-gigabyte TV show," says Roger Bohn, director of the Global Information Industry Center at University of California, San Diego. Yet in 2007, the world's capacity to store video was about 6,000 times greater, in terms of bytes, than the storage capacity of paper, according to the Science study. That, says Prof. Bohn, is a "testament to how efficient language is for communicating concisely."

More Numbers Guy

Old Data Hold Sway in Funds for Heating

What is less ambiguous is that each piece of information, on average, gets less exposure today than in the past. W. Russell Neuman, professor of media technology at the University

Sorting the Fast-Food Beef From the Chaff

Sizing Up Crowds Pushes Limits of Technology

of Michigan, is leading a study that quantifies information in terms of minutes—how much time Americans devote to consuming information, and how much time it would take to consume all the available information.

In preliminary results, published online in 2009, the researchers found that in 2005 people spent about one minute consuming media for every 1,000 minutes available—a ratio that has grown roughly tenfold since 1960.

While the amount of information is growing very fast, so might our capacity to use or filter it, says Prof. Neuman. He notes that many new tools increase ease of consumption, such as search engines and digital video recorders.

Counting the world's bytes, he says, makes the mistake of "focusing simply on capacities of machines, and not on how people are responding to the capacities of machines."

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