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HEALTH IT & QUALITY

Shift Happens: The Need for Just-in-Time Information

It's estimated that 40 exabytes (4.0 x 1019) of unique new information will be generated worldwide this year. That's estimated to be more than in the previous 5,000 years.

That quote is just one of the many challenging facts presented in Scott McLeod's 2006 presentation *Shift Happens.* McLeod, a teacher at Arapahoe High School in Centennial, Colorado, outside of Denver, prepared a PowerPoint presentation for a regular faculty meeting. Instead of offering a rundown of what was new and different on the technology front in the school, McLeod decided to present a news story on emerging technology trends. He hoped the presentation would stimulate a discussion on what changes in the school curriculum were needed to better prepare students.

To McLeod's surprise, his presentation "went viral" on the web in February 2007 and was seen by more than 5,000,000 viewers by the end of June. Since then multiple versions of the presentation in a number of languages have been produced and made available on YouTube and other video sites (http://uk.youtube.com/watch?v=pMcfrLYDm2U).

In addition, a dedicated wiki site maintains details on the presentation and its various iterations (www.shifthappens.wikispaces.com).

Many of the key trends offered by McLeod in his presentation exacerbate the information challenges facing clinicians in the 21st century. McLeod's indentified trends include:

- A single fiber optic strand transfers 150,000,000 simultaneous phone calls or 1,900 CDs every second with this capacity tripling every 6 months for at least the next 20 years.
- More than 2.7 billion searches occur each month on Google. How were those questions answered before Google?
- More than 3,000 books are published daily.
- The information contained in just one week of the *New York Times* exceeds the amount of information an average person in the 18th century came across in a lifetime.
- New technical information doubles every 2 years and is expected to double every 72 hours by 2010.
- In 2013 a supercomputer will have the computational abilities of the human brain, while in 2023 a $1,000 computer will have those same abilities. In 2049, a $1,000 computer will have the computational abilities of the entire human race.
- The top 10 jobs predicted for 2010 did not exist in 2004. Therefore, students are being trained for jobs that do not exist, using technologies that have not been invented in order to solve problems we do not even know are problems yet.

Call to Action for HIT Specialists

With much of McLeod's details taken from reliable sources, such as the U.S. Department of Labor, the information challenges presented by McLeod are a "call to action" for clinicians and health information technology specialists. Clinicians cannot keep up with the

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onslaught of new medical information unless bold steps are taken to integrate healthcare information technology into the workflow and day-to-day processes of patient care.

In 1967, John Wennberg, MD, documented substantial variability in treatment in his pioneering analysis of care delivery in New England. Currently the Center for Evaluative Clinical Studies at Dartmouth Medical School, founded by Dr. Wennberg, continues to document variability in care in its *Dartmouth Atlas of Health Care.* The Atlas series reports on how healthcare is used and distributed in the U.S.

Considering the rapid expansion of new medical knowledge occurring today, it might be reasonable to expect and accept this continuing variability in care. In actuality, much of this variability originates from treatments long-ago rejected rather than newly discovered approaches. The accelerating growth in new medical knowledge, coupled with the birth of new sciences, such as genomics, suggests that physicians, nurses, and other healthcare professionals will invariably continue to fall

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further and further behind in their ability to keep up with the latest discoveries and approved treatments.

In addition, the use of health analytics (e.g., business intelligence) and balanced scorecards places physicians under added scrutiny as they are evaluated against evidence-based guidelines and performance metrics.

Knowledge Boom Managed by IT

As information technology has sparked this explosive growth in knowledge, only information technology can provide an adequate response. By using evidence-based knowledge embedded in clinical decision support deployed within a well-designed workflow, physicians can manage the ever changing and growing knowledge base critical to the delivery of effective and efficient healthcare.

In the future, physicians will be judged by their ability to integrate information rather than by their capacity to memorize and recall medical facts. Physicians who excel will effectively utilize information presented by computer-based clinical decision support tools and aptly apply that information to the clinical nuances of their patients. Even as new information accumulates at its exponentially growing rate, physicians will no longer be burdened with the need to assimilate all that new information. Instead, this knowledge can be reviewed, vetted, and then integrated into the clinical decision support tool. Only at the point-of-care is this new information provided to the physician, just in time to treat the patient.

This method of distributing knowledge represents a shift from slow one-to-few knowledge transfer (e.g., lectures, journal articles, textbooks) to fast one-to-many knowledge transfer (e.g., organization-based). This approach makes the process of distributing new medical knowledge efficient, timely, and accurate.

McLeod prepared his presentation to inspire his fellow teachers to develop a new curriculum that better prepares high school students for the challenges of the 21st century. Similarly, our medical, nursing, and other healthcare professional schools, as well as their professional associations, must be so inspired to adjust their clinical curriculums to address the central nature that information technology will hold in future care delivery. Clinician education requires the teaching of informatics, use of computers, and process redesign, the critical skills required of healthcare professionals in the 21st century. ❙PSQH

Barry Chaiken *has more than 20 years of experience in medical research, epidemiology, clinical information technology, and patient safety. As founder of his own company, he has worked on quality improvement studies and clinical investigations for the National Institutes of Health, Framingham Heart Study, and Boston University Medical School. Chaiken is board certified in general preventive medicine and public health and is a Fellow and Board Member of HIMSS. He is the chief medical officer at DocsNetwork, Ltd., adjunct assistant professor in the Department of Public Health and Family Medicine at Tufts University School of Medicine, and serves on the Editorial Advisory Board for* Patient Safety and Quality Healthcare. *His healthcare IT blog is at www.healthcarefusion.com, and he may be contacted at bchaiken@docsnetwork.com.*

FURTHER READING

Chaiken, B. P. (2007). Revolutionary HIT: Cure for insanity. *Patient Safety and Quality Healthcare, 4*(6), 10-11.

Chaiken, B. P. (2007). Applying path innovation to secure revolutionary HIT. *Asian Hospital and Healthcare Management,* 14, 62-64.

2008
Conference Calendar

May 29–31
2008 AMIA Spring Congress
American Medical Informatics Association
Arizona Grand Resort
Phoenix, Arizona
www.amia.org/meetings/s08/

May 31–June 1, 2008
Diagnostic Error in Medicine
American Medical Informatics Association (AMIA)
Arizona Grand Resort
Phoenix, Arizona
www.amia.org/meetings/s08/

June 2–3
Second Annual Summit on Behavioral Telehealth: Technology for Behavior Change & Disease Management
The Center for Business Innovation
The Conference Center at Harvard Medical
Boston, Massachusetts
www.tcbi.org

June 8–11
Summer Meeting
American Society of Health-System Pharmacists
Seattle, Washington
www.ashp.org

June 9–10
Summit08: Advancing Healthcare Leadership through IT
HIMSS
Renaissance Hotel
Washington, DC
http://www.himsssummit.org

June 10–11
7th Annual Advocacy Day
HIMSS
Renaissance Hotel & Capitol Hill
Washington, DC
http://www.himss.org/advocacy

June 17
3rd Annual Medical Management System Innovations Conference
American Board of Quality Assurance and Utilization Review Physicians
Orlando, Florida
www.abqaurp.org

June 25–28
Healthcare Systems, Ergonomics and Patient Safety
International Ergonomics Association
The Convention and Conference Centre
Strasbourg, France
www.heps2008.org

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