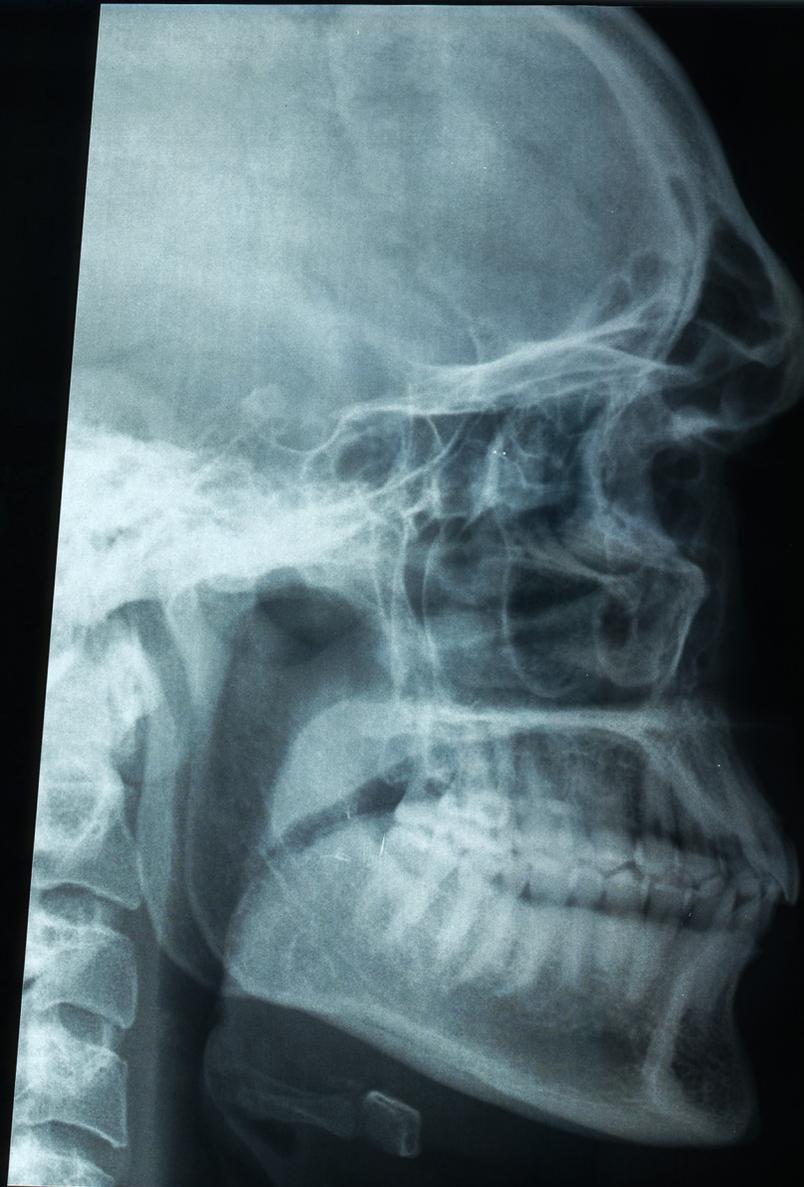


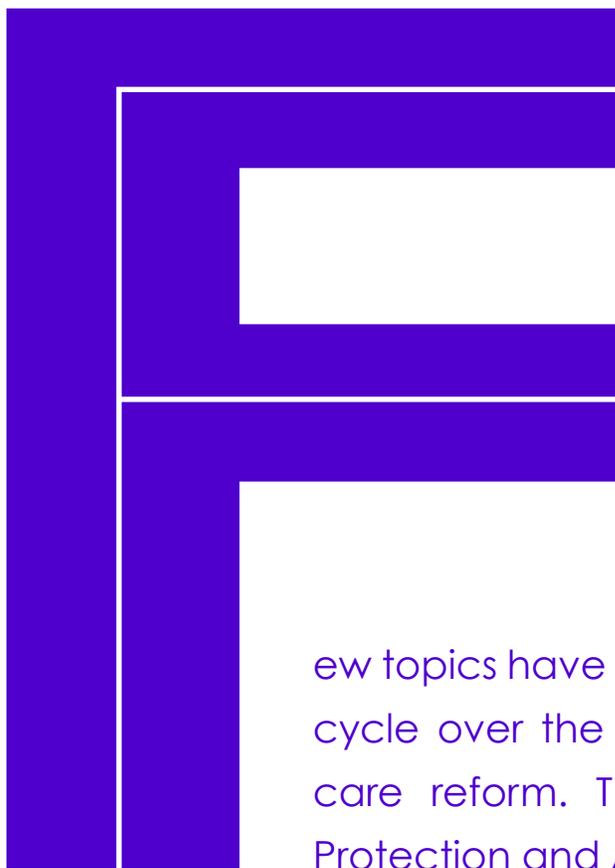
**CAN CLOUD COMPUTING**

**HELP FIX HEALTH CARE?**



By Scott Donahue

Vice President TripleTree, LLC



ew topics have dominated the political news cycle over the past year more than health care reform. The recently passed Patient Protection and Affordable Care Act is aimed at improving the quality, cost, and accessibility of health care in the United States – an indisputably massive but much-needed undertaking.

Aside from political debates in Washington, the technology industry continues to buzz about cloud computing. It may seem, at first glance, that health care reform and cloud computing are unrelated, but TripleTree's research and investment banking advisory work across the health care landscape are proving otherwise; the linkage with cloud is actually quite significant.

Our viewpoint is that cloud computing may end up mending a health care system that has largely let a decade of IT innovation pass by and now finds itself trapped in inefficiency and stifled by legacy IT systems.

## HEALTH CARE IT AT 30,000 FEET

It is not controversial to state that health care IT lags most other verticals by at least 10 years. Most health care systems are built on workflows that consist of paper medical records, duplicated test results, non-digitized images, handwritten notes, fragmented IT systems, and siloed information. Information sharing across providers is inefficient and data portability is rare. Consumers and patients have very little transparency on health plan costs and covered services, and health insurance Web sites provide very little clarity. Physicians still rely on pagers as a primary communications tool, and coordinating care schedules and other administrative processes are cumbersome.

A 2009 PricewaterhouseCoopers Health Research Institute study found that nearly half of the \$2.2 trillion the U.S. spends each year on health care is wasted. While it is impossible to point to any single breakdown contributing to the waste, it is clear from the study's findings that this is an industry that has significantly underutilized technology to improve efficiencies.

Health care reform has mandated that it is time for health care information technology (HIT) to be modernized. The Health Information Technology for Economic and Clinical Health (HITECH) Act includes \$18 billion for hospitals and doctors to digitize medical records in a format known as an Electronic Medical Record (EMR). The thinking behind the push to medical record digitization is that once

medical records are digitized and information can be more easily shared, duplicative tests will be eliminated and patients will have greater control and access to their medical information. With billions of dollars up for grabs, hospitals and doctors are quickly prioritizing their IT activities around EMR implementation.

## EMRS – A GOOD START

Digitized health records are just a component of the more efficient IT infrastructure vision trumpeted by the HITECH Act. Most health care IT infrastructures need a massive upgrade to more easily capture and share information, and to make their organizations more intelligent, and the data manage more actionable.

Several EMR vendors are offering their solutions as a cloud-based offering, providing an alternative approach to help hospitals better manage the otherwise massive capital IT investments that would need to be made to support EMR implementations.

However, just as across other industries, there is an ongoing debate within health care as to the viability of cloud-based

solutions given the care needed for patient privacy and sensitive personal information. In considering cloud computing for health care organizations, the following must be considered:

- Systems must be adaptable to various departmental needs and organizational sizes.
- Architectures must encourage a more open sharing of information and data sources.
- Capital budgets are tight and any technology refresh cannot overburden the already brittle budgetary environments.
- Scalability is a must as more patients enter the system and more data becomes digitized.
- Portability is needed as doctors and patients would benefit from the ability to remotely access systems and data.
- Security and data protection are paramount.

Much has already been written about cloud computing's potential and demonstrated successes at helping enterprise IT infrastructures adapt and transform into more efficient and flexible environments. But where does cloud computing fit within health care?

Perhaps the largest resistance point across all HIT for adoption of cloud computing is patient information security and privacy. Health care contains specific data privacy requirements legislated through HIPAA (Health Insurance Portability and Accountability Act) privacy rules, which provide federal protections for personal health information.

Similarly, many HIT systems deal with life-and-death processes and procedures (e.g., ER triage decision support systems or drug interaction databases). Cloud computing for health care will need to have the highest level of availability and offer bulletproof security in order to gain acceptance in the marketplace.

As a result, general IT cloud computing environments may not be suitable for many health care applications. As the notion of private cloud computing is catching on, health care must go one step further – the formation of hCloud environments that specifically address the security and availability requirements for health care.

Just as cloud computing offers multiple benefits for enterprise computing environments, hCloud provides an infrastructure that allows hospitals, medical practices, insurance companies, and research facilities to tap improved computing resources at lower initial capital outlays, thanks to the on-demand nature of cloud computing. Additionally, hCloud environments will lower the barriers for innovation and modernization of HIT systems and applications.

Information contained within an hCloud can also be better analyzed and tracked (with the proper information governance) so that data on treatments, costs, performance, and effectiveness stud-

ies can be analyzed and acted upon. Facilitated by hClouds, patient information can be shared among authorized physicians and hospitals, providing more timely access to life-saving information and reducing the need for duplicate testing.

## A HEALTH CARE CLOUD REVOLUTION IS OCCURRING

hClouds are providing one of the most promising opportunities to reduce technology and treatment costs within health care. Consider the following examples:

- athenahealth has become a fast-growing HIT vendor by offering SaaS-based practice management and EMR software. Acceptance of this cloud-based solution brings about at least two distinct advantages over existing systems: 1) low upfront fees since little to no technology is installed onsite (i.e., "affordable"), and 2) a living database of insurance payment rules that is continually updated based on the denials of its clients. If a requirement changes for submitting a claim, athena can apply that knowledge across its entire client base (i.e., "adaptable").

- All states and many municipalities are establishing health information exchanges (HIEs), which are cloud-based information clearinghouses where information can be more easily shared between hospitals, health systems, physicians, and clinics (i.e., "open"). There are dozens of vendors and service providers building cloud HIE solutions, and multiple HIEs are now live. Though it is early

to assess the true value of an HIE, the concept should improve patient care by making information sharing more timely and efficient.

- Many pharmacology vendors including Eli Lilly, Johnson & Johnson, and Pfizer are starting to tap the cloud to improve research and drug development (i.e., "scalable" and "affordable"). Commercial cloud vendors including Amazon, IBM, and Oracle have developed pharma-spe-

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cific clinical research cloud offerings with the goal of lowering the cost and development of new drugs.

- Hospitals and physicians are starting to see cloud-based medical records and medical image archiving services (i.e., "open" and "portable") coming on line from the likes of HP, GE, and Iron Mountain. The objective is to offload a burdensome task from hospital IT departments and allow them to focus on supporting other imperatives such as EMR adoption and improved clinical support systems.
- Early successes of cloud-based physician collaboration solutions such as remote video conference physician visits are being trialed. Extending such offerings to a mobile environment for rural telehealth or disaster response is becoming more real with broader wireless broadband and smartphone adoption. There will be many intersections by the adoption of mHealth (mobile health care) and hCloud (i.e. "portable").

These are a few early examples of where cloud computing is successfully benefiting an industry that is hypersensitive to information security, wary

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of disruptive IT retrofits, and highly risk-adverse. Successful adoption and implementation of hCloud technologies will help win over health care CIOs who, as a whole, have taken a more skeptical view of cloud computing than colleagues from other industry verticals.

Partial solutions will not win over industry resistance. hCloud solutions from vendors that understand health care nuances can build winning solutions. TripleTree is watching closely to see if hCloud activity takes root in private or hybrid clouds (because of security and other industry nuances) rather than public cloud infrastructures. Regardless, the enormity of challenges facing health care requires innovative solutions.

We have long espoused that innovation in health care needs to come from outside of the industry. Today, the likes of Amazon, Dell, Google, IBM, Intuit, and Microsoft have built early visions for cloud computing and see a role for themselves as health care solution providers. We are convinced that traditional HIT vendors will benefit from aligning with these groups such that their domain-specific knowledge can attach itself to approaches for cloud (public, private and hybrid), creating a transformational shift in the health care industry. ■