CLOUD-BASED HEALTHCARE IT

Healthy Transformation

Helping Providers Gather, Share, Mobilize, and Empower Healthcare Delivery

Cloud computing is transforming the IT landscape. And it's poised to transform the healthcare IT landscape as well, making the way we deliver healthcare services exponentially more efficient, reliable, and—most importantly—affordable. Cloud computing has the potential to fundamentally change the way we design, develop, and deploy next-generation healthcare technologies—enabling healthcare professionals to gather, share, and mobilize critical data and empowering them to deliver the best possible care to the largest possible population at the lowest possible cost.

The Healthcare Crisis

The fundamental issue in healthcare is painfully obvious: It costs too much for employers, governments, healthcare providers, and patients.

For example, in the U.S., the employer cost of providing employee healthcare benefits is expected to increase 5.4 percent in 2012, well above both salary growth and the general rate of inflation. To control these high costs, employers are raising employee deductibles, increasing paycheck contributions, and moving employees to lower-cost (and often less comprehensive) health plans.[1]

Rising costs have led to rising numbers of uninsured citizens. In the U.S., the number of people without health insurance has grown steadily since 2000. According to the National Conference of State Legislatures, about 47 million Americans are now uninsured.[2]

The U.S. is hardly alone. Worldwide, healthcare spending as a percentage of gross domestic product (GDP) is reaching double digits, putting a major strain on the already-shaky world economy. By 2013, healthcare spending in the U.S. will reach 20 percent of GDP. In Canada, it will reach 13 percent; in Australia, 12 percent; and in most of of Western Europe, 10 to 11 percent.[3]

Today's healthcare delivery system is both broken up and simply broken. A patient must deal with a disconnected array of care givers with no easy way to communicate data like test results and physicians' notes from one provider to the next. There's no coordination or continuity and no plan for efficiently moving patients through the healthcare system.

Cutting Costs and Improving Access

Healthcare providers are challenged every day to enhance quality of care, optimize workflows, and improve access to services. IT can play a significant role in reaching these goals by enabling providers to gather, share, and mobilize critical data in real time to improve clinical decision-making and workflow.

Valley Health: Faster Treatment

To overcome a 30-minute wait time for activating its catheterization labs and save the lives of more heart attack patients, Valley Health needed a fast and reliable way to send 12-lead electrocardiogram (EKG) data between ambulances and hospitals so that the cath lab could be activated before the patient's arrival.

The solution was enabling wireless, two-way transmission of EKG data, electronic health records, and other lab tests using an IT architecture based on Dell PowerEdge* servers and Dell Latitude* tablets and laptops with Intel® vPro™ technology.

"Thanks in part to the solution, our patients left the hospital with stronger hearts this year than they did last year," said Dr. Neal Gaither, interventional cardiologist at Valley Health.

Read more

Cutting Costs and Improving Access

Digital technologies are essential tools for improving access to information like current orders, medical images, patient histories, prescriptions, physicians' orders, and other vital data across the healthcare system. Healthcare providers need to access the information using a variety of devices including PCs, laptops, and smartphones.

But deploying electronic medical records and other digital health technologies requires much more than just hardware and software. Transitioning to an integrated digital hospital requires interoperable, standards-based digital technologies, comprehensive solutions, careful planning, and significant culture change.

The comprehensive IT healthcare solution will be similar to the types of solutions that have already reduced costs in other industries. And it will be built around understanding and automating (where possible) the flow of patients through the care delivery supply chain with leading-edge, cloud-based technologies.

Many industries—agriculture, financial services, transportation, and others—have already used technology to improve the efficiency and, ultimately, affordability of their products and services. Information technologies have helped companies open up the supply chain, understand their customers' supply needs, provide just-in-time inventory to meet those needs, and let distributors order directly from the factory. It's a connected and collaborative approach that's proven to help dramatically reduce costs.

Fundamentally, healthcare is no different. The healthcare supply chain is made up of care providers like doctors and hospitals and other venues including clinics, homecare, pharmacies, and emergency rooms—with patients as the end customers. We need to develop systems that let patients flow efficiently and seamlessly through this complex system.

Technology can help improve care and service while cutting costs by:

- **Enabling data to travel** with the patient so that healthcare providers can coordinate care and services before the patient has to end up in the hospital.
- **Providing anywhere, anytime data delivery** to the right care provider and place.
- **Enabling coordination** and collaboration across the healthcare continuum to decrease emergency room visits, hospital admissions, and readmissions.
- **Providing lean practices** to remove delay and waste.

In a typical hospital emergency room, for example, a patient now spends approximately 95 percent of the healthcare "production cycle" simply waiting for care. If a doctor orders a test, the patient waits until the results come back and the doctor remembers to pick them up and act on them. In a coordinated system, the results are automatically pushed to the doctor the moment they're available. If the doctor doesn't respond, the test results are pushed to a backup doctor, and then to the supervisor, to keep the process moving. Everyone in the cycle has all of the patient's information at all times, enabling them to make decisions in real time.

Today, if an emergency room nurse and a floor nurse need to exchange information about a patient, one will phone the other while the patient is left waiting. In a coordinated system, both nurses automatically and instantly have all of the patient's information, so there's no need to waste time on the phone repeating the same information over and over again—which is the current standard.

By cutting down on time wasted by providing real-time patient information, the coordinated system makes care more efficient for patients and also for care givers, who can process more patients by spending less time trying to get the information they need. The same number of care givers can handle more patients—dramatically cutting healthcare costs and enabling the system to handle more patients without jeopardizing the quality of care.

Moving to the Cloud

The cloud is ideal for maximizing strained healthcare resources—both IT and human. Scheduling, training, billing, lab results, and other patient information can all benefit by moving into the cloud. Cloud computing can improve the accessibility and resiliency of sensitive health information and reduce costs by taking advantage of economies of scale.

Key considerations for bringing healthcare into the cloud include:

- **Ensuring sensitive information** such as protected health information (PHI) is secure in transit, at rest, and in use.
- **Ensuring the cloud infrastructure** complies with regulatory standards and requirements through integration with governance, risk, and compliance (GRC)

Moving to the Cloud

capabilities. Adoption of emerging standards will make it possible for applications and data to be moved to the cloud, and between cloud solution vendors, with minimal effort.

- **Developing standard policies** that can ensure data is never processed outside geographic boundaries specified by national, provincial, or local regulations.

Intel and Cloud-Based Healthcare IT

Intel® technologies form the foundation for a secure cloud computing platform for healthcare applications. Intel is working with ecosystem members to create new solutions to seemingly intractable problems—including reference designs for common healthcare usage models, maturity models for core healthcare capabilities (along with the shared utility services required to support them), and strategies for adopting the healthcare cloud. These solutions will work for organizations that are both urban and rural, large and small, and in both mature and emerging market segments.

Intel is technical advisor to the Open Data Center Alliance*, an independent organization that gives data center managers a voice in shaping cloud computing requirements and solutions. This group of global IT leaders is developing a unified vision for long-term requirements for the cloud, particularly focused on secure cloud federation, automation of cloud infrastructure, common management, and transparency of cloud service delivery.

The Intel® Cloud Builders Forum is another key group defining the future of the cloud, providing cloud industry experts and discussions and technical exchanges around specific industry reference architectures that help those interested in building or optimizing cloud infrastructure.

For the most secure platform possible, combine the flexibility of traditional security software with the strength and performance of hardware-assisted security solutions such as Intel® Trusted Execution Technology (Intel® TXT) and Intel® AES New Instructions (Intel® AES-NI).

Intel TXT is a highly versatile set of hardware extensions to Intel® processors and chipsets that, with supporting software, enhance the platform's security capabilities.

Available in the Intel® Xeon® and 2nd-generation Intel® Core™ processor families, Intel AES-NI is a series of new CPU instructions that enable faster, more affordable data protection and greater security. It implements key components of the Advanced Encryption Standard (AES) algorithm in the CPU itself to improve the performance of cryptographic operations.

The protection these two technologies provide is especially important as the complexity and proficiency of attacks is increasing. Malicious users are motivated more by financial gain than bragging rights, which may have been the case in years past. Traditional software mitigations offer no protection against low-level components of the virtual computing platform (such as the BIOS and hypervisor).

GNAX Health: Protecting Healthcare Data in the Cloud

Global Net Access Health (GNAX Health) cloud solutions for healthcare organizations use Intel® Xeon® processors equipped with hardware-enabled security features such as Intel® Advanced Encryption Standard– New Instructions (Intel® AES-NI) to provide high availability and protect sensitive data while preserving the server power users expect.

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Fully realizing the benefits of cloud-based healthcare IT will include gathering, sharing, mobilizing, and empowering healthcare delivery. The path forward includes a highly secure solution based on open standards, best practices, worldwide models, and key learnings. The result will be the best possible care for the largest possible population at the lowest possible cost.

Explore more business success stories for IT managers

[1]Deborah Brunswick, "Health Insurance Costs to Rise Again Next Year" (September 22, 2011, CNN).
[2]"Access to Healthcare and the Uninsured" (September 2011, National Conference of State Legislatures)
[3] "Impact of Healthcare Reforms on the Medical Technology Industry" (March 2010, Frost & Sullivan).
*Other names and brands may be claimed as the property of others.

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