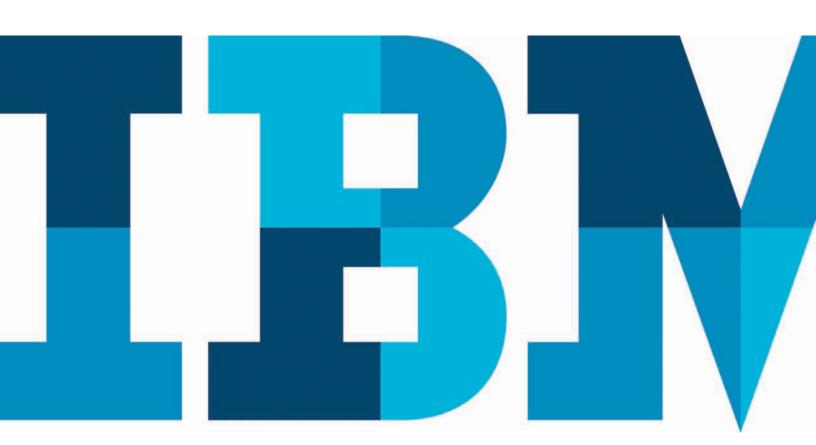# For healthcare, change is in the air—and in the cloud

Scalable and secure private cloud solutions can meet the challenges of healthcare transformation

Contents

Introduction

Attentive to government regulations that govern data security and sensitive to patient and professional concerns for medical records confidentiality, the healthcare industry has been cautious when it comes to embracing cloud computing. "Public" clouds, in which infrastructure services are supplied offsite by an independent provider, are often considered too vulnerable to operator error, data theft or other compromise to meet exacting healthcare needs. But now developments in "private" clouds, in which the healthcare organization hosts and operates its own cloud environment, are pointing the way toward a significant increase in cloud adoption. One recent study noted, in fact, that while only four percent of the healthcare industry used cloud computing in 2011, the cloud model is expected to see a 20.5 percent compound annual growth rate in healthcare from 2012 through 2017.[1]

Advances in cloud computing, however, are not solely about advancing IT capabilities—they are about providing new products and services supporting the diverse needs of the healthcare organization. And as important as data security is, it is only one element in effective private cloud services. A private cloud can give a healthcare organization the ability to meet long-term and evolving trends in the industry as well as to respond rapidly to sudden surges in IT infrastructure and application demand.

The need may be for a new delivery model to meet the increasing demands on health IT infrastructure generated by increases in chronic illnesses, or it may be the result of an epidemic that requires quick access to large volumes of patient records. It may come from the increased need for more data sharing and professional collaboration, or from the explosive growth of medical information of all types. In any and all of these cases, a private cloud can be a key engine that drives healthcare transformation to overcome IT infrastructure- and application-related obstacles and to capture opportunities for improved patient care and business operations. A cloud can help healthcare organizations enhance visibility into and control of their IT infrastructure and ultimately help in automating their operations.

Changes that require a new approach to health service delivery

The healthcare industry is awash in change. Consumers are more empowered, knowledgeable and demanding, with greater expectations for quality, outcomes and the entire healthcare experience. The changing demographics and lifestyles of aging and overweight populations shift the focus from episodic care to chronic conditions. New technologies promise to revolutionize risk assessment, diagnosis and treatments—and also to raise costs.

Telling insight into the changing face of healthcare lies in the example of patient interaction and the flow of information that drives it—for as reactive care gives way to proactive care, how information is conveyed also is undergoing significant transformation. According to a recent study by the IBM Institute for Business Value, the use of traditional media to engage healthcare customers is expected to drop by 27 percent in the next three to five years and face-to-face interaction is expected to drop by 16 percent. But the use of social media is expected to soar by 43 percent, with implementations in 68 percent of healthcare organizations.[2]

The information generated by social media, in turn, will join electronic health records (EHR), digitized x-rays, digital pathology and other data-intensive information sources to create an unprecedented explosion in healthcare information. The amount of data—much of it unstructured—managed by hospitals and ambulatory providers in North America alone is expected to quadruple its 2010 levels by 2015.[3] In response, data use, protection, availability and management become issues of key importance.
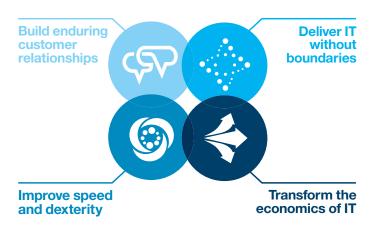
An aim of many healthcare organizations is to use information to develop a patient-centric approach that draws providers and patients closer with shared information, collaborative roles and information delivery to the patient's location rather than only at the healthcare site. In fact, healthcare organizations are more likely than others to seek ways to improve their support for both internal and external collaboration. According to the IBM study, 60 percent of healthcare CEOs versus 52 percent of global CEOs are seeking greater internal collaboration, and 67 percent of healthcare CEOs versus 53 percent of global CEOs are seeking greater external collaboration.[2]

Changes such as the creation of more collaborative, patient-centric environments—but also changes to enhance regulatory compliance, increase staff productivity and efficiency, or reduce business and clinical costs—require a steady flow of dynamically aggregated and personalized information. Healthcare organizations that continue to rely on increasingly complex IT systems may, as a result, be held back in their attempts to improve. Others are turning to private cloud computing as a more flexible and scalable approach to applications and infrastructure—one that can support new care delivery and business approaches to drive success for the entire organization.

Transformation that reaches across the healthcare environment

Cloud computing holds much promise. An Internet-based private cloud can provide broad reach for connecting with stakeholders of all kinds. It can deliver business agility to meet evolving user needs and market demands. It can enable analytics and insight from multiple information sources to support improved service delivery and management. It can support secure collaboration, team-based care delivery and the ability to use applications and data—previously siloed for specific and limited functions—for greater clinical and business impact.

In the changing healthcare environment, in other words, a cloud can be an enabler of organizational transformation. Leveraging the power of cloud computing, healthcare organizations can create dynamic infrastructures that can improve operational speed and dexterity by optimizing and accelerating IT resource and service delivery. They can erase clinical and business boundaries by simplifying access to information and connecting people and functions across formerly siloed ecosystems. They can improve the economics of IT by optimizing availability and reducing complexity. And they can build enduring patient and stakeholder relationships with insight that improves services and fosters trust.

Benefits of cloud computing in healthcare

Build enduring customer relationships

Deliver IT without boundaries

Improve speed and dexterity

Transform the economics of IT

Candidates for cloud-based operations include workloads of all kinds. Clinical functions can benefit from greater access and flexibility by shifting support to the cloud for functions such as patient communications, referral services, point-of-care decisions, treatment plans, home care monitoring and alerts—including self-service portals—and use of mobile devices. Business and IT functions can benefit from flexibility and scalability to support medical research, readmission reduction, medical image management, compliance management, and provisioning of compute and storage capacity to meet peak demands.

The transformational capabilities of cloud computing enable clinical functions to more easily aggregate, share and analyze data while maintaining security and confidentiality requirements; support business opportunities for new ways of engaging, partnering and collaborating with the full range of stakeholders; and enable the streamlining of IT processes and the freeing-up of IT resources to transform IT from a cost center to a strategic engine of innovation.

Beyond virtualization to a new information and service model

How does cloud computing do this? Initially, it builds on virtualization—the pools of computing resources that many enterprise infrastructures, including those in healthcare environments, already have in place. Cloud computing extends those capabilities to the Internet, allowing user access anywhere and anytime, and it increases resource scalability with rapid deployment of even the largest capacities to accommodate growing user needs.

Whether the cloud is considered public or private, cloud computing provides a new consumption model that standardizes offerings, speeds service delivery and simplifies access to technology resources and business capabilities.

The flexibility, scalability and access provided by cloud environments make them ideal platforms for information exchange, including the information needs emerging for greater collaboration and personalized patient care in the healthcare industry. Within a healthcare environment, a cloud can provide a cross-platform approach that spans technical or clinical information silos to enable fast sharing of images and data across heterogeneous applications, locations and medical disciplines, and to support sophisticated analytics of images and data throughout the enterprise.

An effective response to security and other healthcare challenges

With infrastructure treated as a single, large resource, cloud computing can directly address challenges healthcare providers face—supporting clinical and business functions with elastic resource scalability and streamlining IT by providing standardized and automated management. Cloud computing can meet growing needs for patient and clinical services without a substantial increase in IT investment and can deliver secure and easy access to patient data and key resources from shared workstations and mobile devices. It can dynamically scale

compute and storage environments for research in academic medical institutions and lower IT costs while increasing data management of everything from patient records to emails.

Cloud computing supports the healthcare organization's clinical and business functions with improved systems performance, uptime and reliability—reducing organizational risk to unplanned events—and with the ability to meet expected levels of availability, reliability and integrity. Cloud computing can scale resources up or down without service interruption. It facilitates simultaneous service deployment and upgrades.

Importantly, as a centrally managed enabler of clinical and business operations, cloud computing supports the healthcare organization's ability to comply with regulatory standards.

It is worth noting that the Health Insurance Portability and Accountability Act (HIPAA), with its privacy rules governing health information, was created in 1996—before clouds came into wide use. As cloud adoption was gaining momentum, HIPAA security provisions took effect in 2003, followed in 2009 by the Health Information Technology for Economic and Clinical Health (HITECH) Act, which addresses privacy and security of electronic transmission.

The perceived challenges of creating a cloud environment that supports compliance with these existing standards have slowed cloud adoption for many healthcare organizations. Yet a proper and effective cloud environment can meet these compliance standards. While many healthcare organizations initially were concerned that public clouds may not be secure enough for their highly regulated environments and their vast amounts of sensitive data, the control an organization can have over a private cloud is increasing cloud's viability and acceptance among healthcare providers. With private clouds, organizations can gain greater visibility into the technologies, processes, staffing and costs that support their security operations.

Imperatives in healthcare that drive the need for transformation

On a smarter planet, where systems and organizations are more instrumented, interconnected and intelligent than ever before, healthcare organizations have new opportunities to use technology to enhance and improve their clinical and business functions. With its ability to support breakthrough new services such as real-time analytics across data and organizational silos, and to address management and cost challenges stemming from the explosion of data and sprawling infrastructure footprints, cloud computing provides an effective approach for optimizing operations across the entire organization.
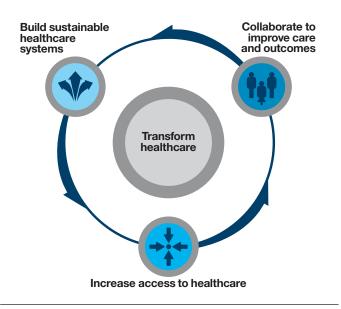
As a tool for business model innovation, cloud computing helps healthcare organizations meet three imperatives for becoming more efficient, information-driven, patient-centric operations:

- **Build sustainable healthcare systems**: In creating an efficient, flexible organization that proactively manages requirements and opportunities, healthcare providers must overcome the operational challenges of cost control and efficiency, regulatory compliance and resource utilization, and visibility across the infrastructure.
- **Collaborate to improve care and outcomes**: To improve quality and efficiency while cultivating patient centricity, healthcare organizations must overcome challenges in the implementation of electronic medical records, collaboration within and among care teams, patient engagement, information integration and analytics, evidence-based decision support, and personalized care.
- **Increase access to healthcare**: To reduce disparities in access and to transform individuals into advocates for their own health, organizations must address challenges in analyzing patient needs and behavior, adapting resources and delivery networks to meet these needs, anticipating demands, and delivering services to both consumers and providers.

A holistic IBM approach to cloud deployment and management

The technologies that are part of the IBM® SmartCloud™ Foundation enable healthcare organizations to easily build and rapidly scale private clouds with a holistic approach that includes cloud migration and seamless integration of traditional and cloud delivery models. IBM SmartCloud Foundation offerings provide the virtualization, consolidation, automation and management of service delivery to support the flexibility and agility that healthcare organizations require.

Imperatives for a new healthcare business model

Build sustainable healthcare systems

Collaborate to improve care and outcomes

Transform healthcare

Increase access to healthcare

IBM SmartCloud Foundation offerings deliver a broad array of capabilities, from service automation and assurance to secure integration, to deliver:
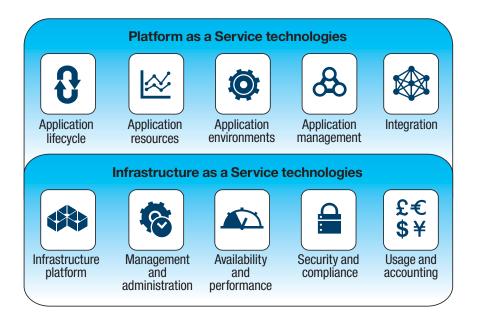
- **Visibility**: Providing insights to enhance resource performance and ensuring security with policy-based access controls, including from mobile devices
- **Control**: Simplifying cloud administration with rapid, scalable provisioning, and reducing disruptions by integrating service desk, change and maintenance management
- **Automation**: Enabling integrated lifecycle management of cloud services and collaborative service development, testing and service provisioning

Enabling immediate access to business solutions, combined with deep industry insights, business process skills and analytics, IBM SmartCloud Foundation offerings can improve clinical and business productivity, support regulatory compliance, speed innovation and delivery capabilities, and lower capital costs—reaching far beyond traditional IT virtualization to enhance the value it provides to the healthcare organization.

Cloud leadership built on global experience, expertise and partnership

IBM delivers deep and broad capabilities across cloud delivery models, providing solutions for enterprises, regardless of the stage of cloud adoption they are in, as they move beyond virtualization to the higher-value stages of cloud computing. IBM cloud solutions are resilient to the velocity of changing healthcare needs, provide choice and flexibility, enable enterprise-class infrastructures and embed built-in analytics for improved insight, planning and decision making.

IBM SmartCloud Foundation

Platform as a Service technologies

Application lifecycle	Application resources	Application environments	Application management	Integration

Infrastructure as a Service technologies

Infrastructure platform	Management and administration	Availability and performance	Security and compliance	Usage and accounting

As a leader in promoting and developing interoperable, flexible and customer-driven cloud-computing standards, IBM has helped more than 2,000 enterprise clients since 2011 transform their environments to cloud-computing. IBM combines its own hands-on cloud experience managing 4.5 million client transactions per business day on the IBM cloud with innovations from thousands of IBM researchers, 13 cloud development labs, six cloud data centers and more than 200 collaborating partners worldwide to create breakthroughs in cloud services and security that can build a smarter planet to benefit healthcare organizations of all kinds.

For more information

To learn more about IBM cloud solutions for healthcare organizations, please contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/cloud-computing/us/en/private-cloud

Additionally, IBM Global Financing can help you acquire the software capabilities that your business needs in the most cost-effective and strategic way possible. We'll partner with credit-qualified clients to customize a financing solution to suit your business and development goals, enable effective cash management, and improve your total cost of ownership. Fund your critical IT investment and propel your business forward with IBM Global Financing. For more information, visit: **ibm.com**/financing

[1] Horowitz, Brian T., "Cloud Computing in Health Care to Reach $5.4 Billion by 2017: Report," *eWeek.com*, July 6, 2012, http://www.eweek.com/c/a/Health-Care-IT/Cloud-Computing-in-Health-Care-to-Reach-54-Billion-by-2017-Report-512295/

[2] IBM Institute for Business Value, "Leading Through Connections," *IBM Global CEO Study 2012*, May 2012.

[3] ESG, "Research Report: North American Health Care Provider Information Market Size & Forecast," January 12, 2011.

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