Next-Generation Enterprise Imaging: Cloud Solutions for Peak Efficiency

A blueprint for cloud imaging strategies: Scaling up Imaging Health Networks (IHN™), enhancing EHR value, boosting clinician satisfaction and fortifying IT infrastructure

Amid some initial hesitancy, U.S. healthcare organizations (HCOs) are now making a definitive pivot towards embracing cloud technology, indicating a major leap in their digital transformation journey and aligning closer with other data-intensive industries. This shift is illuminated by recent research from HIMSS Market Insights, showing that an impressive 97% of HCOs have now incorporated cloud technologies into their administrative frameworks. However, 67% acknowledge they are not maximizing these technologies for clinical, operational and business goals. Despite this, 52% plan to adopt cloud technologies for new applications, and 48% believe this will enhance patient care and quality outcomes.[1]

According to HIMSS Market Insights research, 67% of HCOs are not maximizing their cloud technologies to meet clinical, operational and business goals.

This move signals not just a strengthening trust in cloud-based solutions but also suggests HCOs are reaching a critical juncture. The healthcare industry is gearing up to enhance its core business, clinical and imaging solutions significantly. Furthermore, market projections indicate that 40% to 50% of new Enterprise Imaging (EI) projects will opt for cloud-based solutions in the next five years, underscoring the sector's commitment to evolving and improving its technological landscape.[2]

"The first real movement to the cloud [in the healthcare industry] was for back office and administrative applications," said Kim Garriott, General Manager, NetApp Global Healthcare and Life Sciences. For example, many HCOs use cloud-hosted non-clinical software such as back-office tools. "Slowly but surely, the healthcare industry has begun shifting toward a cloud-based environment for business-critical and clinical applications, such as EHRs and Enterprise Imaging," she noted.

Why Enterprise Imaging matters in healthcare

Electronic health records (EHRs) advance patient care by digitizing *text-based* patient data and making it available to clinicians in a centralized patient record. EI adds value to the EHR by making all of the patient's *imaging* data — whether it's from radiology, cardiology, wound care, dermatology, point-of-care ultrasound, digital pathology or other service lines — available in a single, converged application, similar to the EHR.

"With true Enterprise Imaging, clinicians don't have to remember which application to go to or which workflow they need to use to find images associated with a patient's clinical encounters, regardless of the service area that acquired the images. They simply open the patient's health record and all patient imaging data is there," explained Garriott. "Enterprise Imaging improves clinician efficiency by providing a single unified point of access to a patient's imaging data, which is accessible across health networks."

Cloud-Enabled Enterprise Imaging

What does 'cloud-enabled' mean?

A cloud-enabled EI application encompasses a comprehensive suite including viewers, desktop clients, web servers, core servers and a database. This setup is optimized to deliver an exceptional experience in the cloud, mirroring the performance and reliability users expect from on-premises deployments in their own data centers.

Understanding the cloud

The cloud refers to computing resources and services available over the internet, housed in public or private data centers not managed by the customer and located off-premises.

Hosting in the cloud environment

Cloud hosting is the practice of leasing hardware and infrastructure services, eliminating the need for in-house physical servers and hardware management. This approach includes:

- **Public cloud:** Services provided over the internet by third-party providers like Amazon Web Services, Microsoft Azure, Google Cloud, etc.
- **Private cloud:** Dedicated data center services managed by external providers, often through telecommunications companies.

Cloud Native

Defining cloud native

"Cloud native" refers to applications designed from the ground up to capitalize on the distributed computing model of the cloud. This architecture excels in scalability, cost-efficiency, reliability and resiliency, enabling faster market entry and simplified customer service. Notably, cloud-native architectures are not only optimal for cloud environments but also offer benefits for on-premises deployments.

Software-as-a-Service (SaaS)

The SaaS model

SaaS represents a shift in how software is delivered and managed, offering it as a service rather than a product. This model transfers responsibilities such as data center operations, hardware maintenance, cooling, electricity, networking and security from the customer to the software vendor. It simplifies the customer's IT workload and reduces their operational costs, focusing on providing the software directly over the internet.

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ROB MAYER | Chief Product Officer | AGFA HealthCare

Five reasons to consider cloud-based Enterprise Imaging deployment

EI solutions can be deployed on-premises or in the cloud. Scott Boutilier, Cloud Solution Architect, AGFA HealthCare, highlighted five reasons HCOs might want to embrace cloud technology:

1. **Availability and resiliency.** Cloud hyperscalers distribute their IT infrastructures across multiple regions and availability zones. This means that cloud-deployed solutions inherently provide more availability, resiliency and redundancy across the Imaging Health Network™ (IHN) than on-premises deployments. A natural disaster can take down an on-premises system, but typically would not take down a large cloud host because of the infrastructure's distributed nature. In addition, as merger and acquisition activity continues to grow in healthcare, the cloud maintains the availability of data and applications regardless of how large an HCO's geographic footprint and IHN become.
2. **System elasticity.** It can be hard for HCOs to forecast their storage and compute needs five years out, Boutilier pointed out. This is especially true for imaging: newer imaging technologies, such as digital pathology, can average 3GB per image, easily producing petabytes of data each year. Cloud deployment offers HCOs the ability to quickly scale up their IT infrastructure as the organization's needs change.
3. **Staffing.** "A lot of healthcare providers became enterprise IT shops out of necessity," he said. "It's not what they *wanted* to do. It's something they *had* to do. The cloud offers the opportunity to offload the management of IT infrastructure and reallocate the organization's IT staff to higher value projects."
4. **Increased security.** "Large cloud service providers invest more in security than most healthcare providers combined," he said. Deploying an EI solution in the cloud means that HCOs benefit from the robust cybersecurity posture and expertise that Amazon Web Services (AWS) and other large cloud providers (aka "hyperscalers") offer.
5. **Cost management.** On-premises deployment is tied to a capital expenditure financial model for IT. In other words, every few years the HCO needs to predict and invest in refreshing, updating and expanding its IT infrastructure. However, with cloud deployment, HCOs are able to move to an operating expenditure (OpEx) model, which can provide more cost predictability over time.

Assessing the organization's challenges, needs and requirements

There are many compelling reasons for deploying EI in the cloud. Even so, "it's important for organizations to thoroughly assess their imaging needs and requirements before making the leap into the cloud," said Rob Mayer, Chief Product Officer, AGFA HealthCare.

In guiding HCOs, Mayer emphasized the significance of the EI partner fully grasping the HCOs' responses to key questions. This understanding is crucial for aligning the cloud deployment of EI with the organization's objectives. Mayer added, "There is no singular approach. Organizations should have the flexibility to selectively adopt cloud, hybrid or on-premises solutions that best align with their goals and state of readiness." He also noted, "In this regard, choosing the right EI partner is paramount. The partner must offer guidance in an impartial and objective manner."

Mayer recommends that HCOs be prepared to answer these questions:

1. **What is the organization's vision, mission and strategy?** What does it hope to accomplish by deploying EI? Does the HCO want to focus resources on managing a locally deployed version? Or would it be better to offload IT infrastructure management by using a cloud-based, software-as-a-service (SaaS) model?
2. **What are the organization's challenges?** What are its baseline processes with respect to acquiring, accessing, using, labeling and retaining medical images? Where are the gaps or pain points in the existing workflows? How can the organization overcome these challenges?
3. **What are the organization's plans with respect to clinical reach?** For example, the HCO may be planning to set up a wound-care program. Or it may need a better way

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of capturing point-of-care ultrasounds for use in clinical documentation. "If an organization wants to expand its clinical reach into other areas or domains, can it do that itself?" Mayer posed. "Or would it be better to engage with a partner who can quickly and easily spin up more hard drive space or CPUs to support those initiatives?"

4. **What are the organization's security needs?** Does the HCO as a whole have the security depth and breadth to manage the increased cybersecurity challenges that come with deploying an EI program?
5. **What is the organization's current IT infrastructure capability?** Does it have the internal capability to replicate the EI solution to provide high availability in a cost-effective manner?

Finding the right partner

The right partner can help an HCO determine if cloud EI deployment is the best approach to achieving its imaging goals. But Mayer emphasized the importance of distinguishing between selecting a vendor and finding a true partner. "With a vendor, it's a transactional event: they give you a quote, they turn things on and then the organization is on its own," he pointed out.

In contrast, a genuine partner deeply understands the HCO's goals and challenges. A partner collaborates closely with everyone involved from clinical to IT staff to verify that the solution is seamlessly integrated into the organization's daily operations, said Mayer. This approach enables the HCO to fully leverage the solution's benefits.

Finding the right partner often comes down to asking the right questions. These six questions can help HCOs evaluate potential cloud EI partners:

1. **What is the company's approach to the cloud?** "Some companies are simply standing up an instance in a cloud so they can say they have a cloud-based solution," said Garriott. That won't provide the level of support HCOs need. "Look for a company that has integrated a cloud-based solution as part of its overall strategy," she advised.
2. **What is the company's experience in deploying fully managed EI solutions?** The company should be able to provide contacts for customers that are currently using its managed EI solution. Reach out to these customers and ask them about their experiences.**Does the company offer a cloud-based EI solution as a managed service?** There is a big difference between providing access to an EI in the HCO's own cloud instance versus offering managed services. In the first case, the HCO will still be responsible for managing the cloud; but with a managed service offering, HCOs can shift the cloud management burden away from their IT staff.
3. **Does the company offer EI under a SaaS model?** HCOs face significant pressures and are seeking more sustainable and adaptable solutions for governance, operational management and budgeting. Adopting public cloud services provides a chance to engage with a preferred partner under a single, comprehensive, usage-based OpEx model contract.
4. Is **EI a core competency of the company?** There are many different EI solutions available in the market. "HCOs should look for a converged EI platform that has been developed over time so that all the component modules truly work together," Garriott advised. Beware of so-called "EI solutions" made up of bolted-on applications that aren't well integrated.
5. **What's the company's history?** Deploying a cloud-based EI is typically a long-term, multi-year project. Partner with an established company that has longevity to support the execution of the organization's strategy through the years.

"One thing healthcare does really well is buying technology," said Garriott, "but the thing that healthcare does really poorly is leveraging those technology investments to the highest degree. That is why working with the right partner is of the utmost importance."

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SCOTT BOUTILIER | Cloud Solution Architect | AGFA HealthCare

Set your organization up for long-term success

Boutilier offered additional tips to help ensure a smooth deployment and widespread adoption:

1. **Define your destination.** "Make sure you know what your end state is, and be committed to it," Boutilier emphasized. "Cloud is new for a lot of people, especially at the scope and scale that an EI project requires, so organizations have to be ready to sell it to their user base, including those who may be skeptical."
2. **Identify your champions.** "EI is one of those areas that truly straddles the IT and clinical worlds," he said. "You need champions who can walk in both of those worlds comfortably and who can align the leadership in those two areas as well."
3. **Establish robust governance.** "Setting your organization up for long-term success necessitates strong governance structures," he said. "Governance ensures that the project stays aligned with the organizational vision, manages risks effectively and addresses compliance and security requirements comprehensively. It's about putting in place a framework that not only supports the initial deployment but also underpins ongoing operations, scalability and continuous improvement."

Boutilier described the ultimate goal of integrating EI with cloud technology as having all of an organization's "aces in their places." He explained that this strategy leverages both the unmatched IT infrastructure of the cloud and the superior imaging capabilities of the EI partner. This collaboration enables healthcare providers to concentrate fully on delivering patient care. "Deploying Enterprise Imaging in the cloud allows each party to focus on what they do best," he concluded.

Visit the AGFA HealthCare website to learn how Enterprise Imaging Cloud can support your health system's growth: www.agfahealthcare.com/cloudEI/.

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About AGFA HealthCare

AGFA HealthCare is transforming the delivery of care – supporting healthcare professionals across the globe with secure, effective, and sustainable imaging data management. AGFA HealthCare Enterprise Imaging Cloud delivers Enterprise Imaging as a fully cloud-enabled, managed and SaaS-based service to your organization providing better cost control, faster scalability, higher reliability and uptime, on-going infrastructure security, and a carefree operating lifecycle.

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