6 Reasons
You Need a Powerful Enterprise Imaging Platform

Enterprise Imaging Solution Coupled with Unified VNA:
The Strategy to Achieve Improved Healthcare Outcomes

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Today, the overarching goal of any healthcare organization is to improve clinical outcomes without further encumbering the cost of operations.

The inevitable transition to a value-based healthcare model further emphasizes quality clinical outcomes, compelling providers to develop and implement an inclusive strategy focusing on cost containment without compromising on clinical outcomes. The only way to achieve these transformational shifts is through revitalizing the healthcare environment with technology that can help providers progress toward producing quality clinical outcomes over time.

**Providers Seek More Value from Their eHealth Investments**

After spending millions of dollars in the first and second waves of the global healthcare digitization drive, the third wave of investment is set to focus on optimizing the hospital information technology landscape to deliver seamless performance and enhance clinical quality and safety. Advanced healthcare strategies will evolve and embrace emerging technologies such as artificial intelligence, cloud computing, big data analytics, and clinical mobility solutions that have the potential to streamline complex healthcare workflows.

**Global Healthcare System Objectives**

Healthcare organizations around the world are transitioning towards a collaborative care model, the success of which requires weaving together distinct dimensions of patient health data to generate a single, consolidated view. An enterprise-level platform that can orchestrate patient data from distinct clinical repositories has the potential to help providers identify the most effective treatments, paradigms, and care plans. While electronic medical/health records (EMR/EHR) find their way up the ladder in defining the digital maturity index of a healthcare enterprise, in reality it is highly functional medical imaging software designed to streamline a complex imaging environment.
A cohesive approach for improved healthcare outcomes requires:

- Access to longitudinal health records that offers complete patient information and historical data
- A 360-degree patient view (patient records, medical images, and clinical histories)
- The ability to perform analytics and generate real-time patient insights for improved decision-making
- Empowered collaboration across provider teams (physicians, clinicians, specialists, and staff)
- The ability to share and exchange patient data across and outside of a health system

Today’s Medical Imaging Environment

Medical imaging plays a significant role in articulating the overall clinical outcomes in a healthcare enterprise. Today, the medical imaging environment is more challenging than ever before, with new imaging technologies producing large and complex data sets intensifying complexities to store and distribute imaging contents across the healthcare enterprise. The challenge with the existing medical imaging landscape is an inability to handle massive amounts of imaging data produced from the combination of advanced imaging technologies.

- Diagnostic imaging-based specialties: radiology, cardiology, neurology, orthopedics, gastroenterology, dermatology, pathology, wound care, ophthalmology, and more
- Procedural imaging-based specialties: interventional radiology, interventional cardiology, intraoperative computed tomography (CT), magnetic resonance imaging (MRI), image-guided therapies, and image-guided surgeries
- Therapeutic imaging-based specialties: radiation therapy, radiation surgery, therapeutic ultrasound, and image-guided brachytherapy

It is anticipated that these too will join the enterprise imaging bandwagon, demanding their own version of imaging workflows and archiving systems. With the ongoing shift toward value-based care, providers are now focusing on streamlining the complex medical imaging environment with innovative technologies that can boost clinicians’ ability to make treatment decisions quickly and safely.
What PACS and VNA Fail to Address

Although picture archiving and communication systems (PACS) and vendor-neutral archives (VNA) provide healthcare organizations with the means to store and manage their imaging data, enterprise-level image viewing and exchange in a fragmented environment is still a challenge.

PACS limitations: For almost two decades, PACS dominated the medical imaging industry, having been used extensively by individual imaging departments such as radiology, cardiology, pathology, dental, and several visible-light imaging specialties to digitize, manage, distribute, and share images within the departments.

PACS enabled healthcare organizations to transition from film-based imaging to digital imaging, but miserably failed to address data sharing, interoperability, and care-coordination approaches. Existence of discrete PACS in a healthcare enterprise forced clinicians to engage in time-consuming activities such as multiple system entries, searching for the same patients in multiple user interfaces, and accessing different image viewers from different vendors, resulting in workplace chaos. VNAs were built to address some of the specific shortcomings of PACS; since then, VNAs have become a valuable tool to streamline the complex medical imaging workflow.

VNA limitations: VNAs allow healthcare organizations to consolidate distinct clinical data archives on a single viewing and storage platform, enabling a unified viewing experience across the enterprise regardless of vendor constraints. Ideally, the VNA works by consolidating archival layers of several existing PACS, subsequently standardizing and archiving medical images from distinct repositories into a central repository and resulting in:

- A reduction in the number of systems clinicians need to access for viewing
- A reduction in the amount of time spent by clinicians to log in and out of different PACS
- Vendor-agnostic, open standards-based file storage preventing excessive future migration cost

Although VNA claims to offer unified viewing experiences with a single integrated viewer, many clinicians are bound to depend on PACS viewers that offer specific functionalities and attributes that are not available in VNA viewers. Image-enabling an EHR is a strategic approach leveraged by providers to promote improved care collaboration, but VNAs are not necessarily helping providers succeed in this approach because many VNAs lack universal image viewing capabilities. Although they claim to be truly universal, there are still concerns about interoperability and the lack of collaboration and team synchronization tools. In many instances, VNAs fail to scale up and provide unified access to images in various locations.

Overall, VNAs help overcome the challenges of discrete PACS by enabling greater departmental integrations within the healthcare enterprise, but they are not suited for cross-enterprise imaging strategies in an approach to improve healthcare outcomes.
These limitations have resulted in the emergence of the concept called "enterprise imaging," with the sole purpose of consolidating patient health data from multiple information systems, clinical image archives, and multiple imaging specialties for rapid retrieval and display across the enterprise powered with a universal viewing platform. As data becomes increasingly important to providers, an enterprise imaging strategy can help streamline clinical workflow by allowing a single point of access to relevant patient data from across the enterprise.

**Enterprise Imaging Solution Coupled with Unified VNA:**
The Strategic Approach to Achieve Improved Healthcare Outcomes

Enterprise imaging solutions encompass systematic tools to seamlessly obtain, organize, store, and deliver medical images and other longitudinal patient information from separate healthcare information systems for reading and reporting on a single, universal viewer. A complete enterprise imaging solution comprises four vital components: a universal image viewer, clinical workflow tools, collaboration tools, and a neutral storage layer. The critical need to integrate and consolidate patient information from distinct clinical repositories is driving the shift towards enterprise imaging solutions, as shown in Exhibit 1.

**Exhibit 1:** The Ability to Handle Patient Data from a Multitude of Health IT Systems in Convergence with Cloud, Mobile, and Web Technologies Forms the Emerging Ecosystem for an Enterprise Imaging Platform
These benefits illustrate why a robust, cloud-based enterprise imaging solution is necessary to achieve improved clinical outcomes and deliver true patient-centered care.
6 Reasons You Need a Powerful Enterprise Imaging Platform

1. Image-Enabling the Healthcare Enterprise
With a universal image viewer developed using HTML5 front-end technology, healthcare organizations can work to image-enable their existing EMR/EHR, patient portals, and tel health platforms via a Web browser, providing clinicians with the opportunity to access and display patient medical images and reports from multiple imaging archives and information systems from geographically dispersed locations. By harmonizing patient medical records, images, and reports, providers can create a single view of the patient—a longitudinal health record accessible virtually anytime, anywhere.

2. Automating Complex Imaging Workflow
Enables automated imaging study identification and distribution, automated ingestion and delivery of images from remote locations, automated access to Digital Imaging and Communications in Medicine (DICOM) structured reports, third-party advanced visualization viewers, and voice-dictation systems such as Nuance PowerScribe integrated in the healthcare enterprise. The workflow solution focuses on integrating several DICOM objects, non-DICOM objects, and health level seven (HL7) messages into the clinical workflow without requiring a manual intervention, saving time and resources. In an effort to improve organizational workflow, the enterprise imaging platform readily integrates with the electronic master patient index (eMPI), patient identifier cross-referencing (PIX), and patient demographic query (PDQ) systems to automate advanced routing, fetching, filtering, retrieval, and delivery of relevant medical images and reports.

3. Enterprise Mobile Imaging Strategies
Mobile devices in the care setting ensure timely access to critical clinical resources and patient summaries at the point of care. The latest generation of smartphones, tablets, personal computers, and other clinical-grade mobile devices are becoming ubiquitous in physicians’ offices and imaging environments as a means to standardize care protocols and improve healthcare data flow. A mobile medical imaging capability allows clinicians to quickly capture and directly integrate visible light images, videos, or notes with appropriate patient health records. Enterprise imaging solutions with powerful mobile imaging capabilities offer uncompromised access to diagnostic-grade images in any browser-enabled device, expanding the potential of cross-enterprise interoperability to achieve timely diagnosis and faster treatment decisions.
4. Empower Collaborative Care and Synchronization

Transformation to a more collaborative approach to patient care is one of the most important topics in the healthcare industry. Distributed care teams hamper clinical collaboration on patient cases for combined decision-making. An enterprise imaging solution embedded with powerful clinical collaboration and synchronization tools can have a big influence on patient centricity and personalization of care. Enterprise imaging allows clinicians to share and exchange medical images, clinical reports, and insights with providers in and outside of the care delivery network. The cloud-based, collaborative platform increases clinician and patient digital engagements, ensures secure healthcare communication, reduces referral time, and avoids unnecessary patient transfers.

5. Cognitive Intelligence and Analytics Capabilities

Big Data in medical imaging has the potential to be a valuable tool, but implementation can pose a tremendous challenge. The ability to draw health insights from massive volumes of medical imaging data can play a key role in the development of deep learning algorithms to perform data mining on patient medical images and implement predictive diagnosis tools. A cutting-edge enterprise imaging solution with a built-in analytics engine can infer vital health information from complex, heterogeneous data sources while understanding unstructured clinical notes in the right context to identify patients at high risk, providing the right intervention to the right patient at the right time. This approach could lead to new opportunities related to concepts such as integrated care pathways and population health management, deriving individual and community-level health insights.

6. Healthcare Compliance Monitoring, Data Retention, and Storage Utilization

A well-implemented enterprise imaging solution can store and distribute clinical contents in standardized healthcare data formats supporting all clinicalologies and could help reduce storage costs with information life cycle management tools and business continuity solutions coupled with disaster recovery. According to HIPAA guidelines, providers are expected to manage and retain patient medical images for up to 6 years from the date of creation. As more and more healthcare organizations transition to the cloud, regulatory mandates related to healthcare compliance monitoring and data retention are becoming more stringent. A cloud-based enterprise imaging platform equipped with data security, compliance monitoring tools, and digital dashboards for compliance visualization can help organizations comply with medical imaging data retention policies and guidelines to achieve improved healthcare outcomes.
State-of-the-Art System from a Single Vendor Consolidates All Patient Medical Images into One Clinical Repository

While the curiosity surrounding enterprise imaging is running high, healthcare organizations still face a daunting challenge: finding a single vendor offering a best-of-breed solution that addresses every facet of enterprise imaging to successfully implement a solution that brings clinical and financial benefits.

Novarad® has an excellent track record for implementing imaging solutions that afford many advantages in terms of healthcare data interoperability, content visualization, distribution, and data management. Novarad’s Ncompass Enterprise Imaging® solution advances radiology imaging workflow by bringing in multi-specialty imaging and care collaboration capabilities, empowering healthcare providers to make an immediate impact on their imaging departments. Novarad’s enterprise imaging strategy effectively bridges the gap between what providers want and the organization’s objectives. Novarad offers a team of clinical and IT experts to assist with enterprise imaging solution planning, implementation, service, and management of feature enhancements.

With its multi-modality image viewing and powerful mobile imaging capabilities, Novarad’s enterprise imaging technology platform empowers providers to access, collate, and present all relevant clinical data in appropriate context to patients, helping them better understand their medical conditions.

To achieve true enterprise imaging, Ncompass offers simplified mobile (e.g., phone and tablet) acquisition workflow empowering clinicians to capture and integrate visible light medical images, video, or notes with patient medical records. Images captured using Web-enabled smart devices can be sent directly to an enterprise image archive and be linked to the patient’s EMR/EHR for immediate clinical reference. This app, called SnapView™, safeguards patient’s protected health information (PHI) by routing images from smart devices directly to the Universal Archive, entirely bypassing the mobile device’s memory.

The company’s use of Object Store in the Universal Archive means that data is always present in the right place at the right time. Object Store creates a secure, active archive environment that efficiently consolidates data objects from various storage silos. Retrieval speeds for large data sets are up to two times faster than other architectures. It offers enhanced security—in motion and at rest—because of military-grade encryption. In the event of a data breach, the information is indecipherable. The Patient Storyboard® tool, which encompasses a unique drag-and-drop functionality, allows clinicians to place various images and multimedia side by side for comparative analysis.

Overall, Novarad’s enterprise imaging solution provides clinicians with a unique platform to collate and present all relevant clinical data in an appropriate context to have an engaging and meaningful conversation with patients.