



POINT OF VIEW

# Changing the Digital Image Management Paradigm

Shifting focus from TCO to ROI

# New considerations for the value of the image archive



...the insights that can be uncovered through cutting leading-edge analytics tools can fill critical care gaps and drive quality and consistency.

Buyers of imaging infrastructure and technology have been chasing acronyms for the past three decades. It started with RIS (radiology information system), grew into PACS (picture archiving and communication system) and then moved to VNA (vendor-neutral archive) — and the justification for each centered on total cost of ownership (TCO). Arguments for adoption repeatedly speak about decreasing TCO by improving workflow, adding more dense storage, decoupling archives from viewing and so on. In all, the digital transformation continues to turn out more data while the needs for data management, and associated hardware and labor to manage that data, continue to create new costs.

This way of thinking about TCO, however, drastically undervalues the image data itself. It's time to change the paradigm for image data management and the systems that use this data.

At the core is VNA, which holds a wealth of insight on a variety of health conditions and has the potential to introduce innumerable operational efficiencies and quality improvements. This centralized data aggregator should be seen less as storage and more as a foundational element to building and supporting a data-driven healthcare enterprise.

It's time to focus on a new acronym: ROI (return on investment). With the right analytics tools, your healthcare enterprise can add tremendous value by tapping into VNA image data in a more meaningful way.

# Current market forces provide an ideal backdrop for smarter use of image data

The market forces we describe below are on a collision course. They're consuming sparse resources in your institution to explore new programs at minimum cost and with a focus on increasing revenues. While many of these drivers are already in some Brownian motion, there is still time for imaging overall to integrate, analyze and adopt a proactive strategy.

**The collision of technology and market forces propel organizations to take a fresh look at their enterprise imaging strategy and their VNA.**

## Value-based care

Changing reimbursement models that put an emphasis on outcomes and overall quality of care have cast a shadow on high-tech imaging. With expectations and efforts to lower utilization, radiology can no longer measure its value in throughput. As more providers take on risk, each imaging service line is looking for ways to impact outcomes.

## Commoditization of imaging

Amid this push to “do more with less,” radiology practices may also be facing the risk of imaging services being outsourced to lower cost teleradiology providers. Departments are struggling to make the radiologist and the radiology work product more visible components of the care process, as well as provide differentiated value.

## Increasing complexity of image data

Advances in imaging modalities are producing more prolific data sets. From breast tomosynthesis to a 320-slice CT to breakthroughs in 4D imaging, this data adds complexity to the practice of medicine as doctors throughout the healthcare enterprise try to keep pace. The sheer number of images in some studies can overwhelm a radiologist's ability to consume this data.

## Projected physician shortage

Estimates suggest that demand for all physicians will exceed supply by 2025. In addition, despite new entrants to the field, close to 50% of radiologists are 55 and older and attrition is beginning to reduce the candidate pool. Projected physician shortages will require organizations to focus on increasing and enhancing clinical support.

## Growing image stores

The volume of medical image studies produced globally may have slowed slightly, but the overall size of medical imaging procedures continues to trend upward; current estimates are 450 petabytes per year. The average retention rate for this data is 10 years, so the value of the imaging archive will continue to be a conversation for the foreseeable future.



# Embrace imaging analytics to elevate the enterprise value placed on image data and radiology services

Adopting a unified analytics platform is the best way to transform your VNA into insights and outcomes that can be monetized. The platform must be geared to deliver data that providers can leverage throughout the enterprise to make consequential improvements to the delivery of care. Applying an analytics layer to the enterprise imaging strategy that takes a systems-level approach, rather than focusing on operational improvements for the radiology department, reinforces to the institution that the imaging service line can provide new, unique and differentiated value to patient care.

## Analytics and the enterprise imaging strategy

The HIMSS-SIIM member workgroup defines enterprise imaging as a “set of strategies, initiatives and workflows implemented across a healthcare enterprise to consistently and optimally capture, index, manage, store, distribute, view, exchange and analyze all clinical imaging and multimedia content to enhance the electronic health record.

VNA, universal viewer and enterprise worklist are typically considered the cornerstone components of such a strategy, with each institution implementing these technologies in accordance with its own goals and objectives. No matter how you define your institution’s enterprise imaging strategy, you must also consider how analytics fits into the plan. Other components focus on workflow and management of new and larger data sets, but without analytics, the strategy falls short of helping caregivers synthesize increasingly complex data and applying the exam results to patient care.

## Opportunities in an Enterprise Imaging Strategy

These general capabilities lay the groundwork for the discovery of new insights across patient care, patient billing, and the risk management of the patient population



### Create discrete data

Today the work product of the radiology service line has very little actionable data. Transform it into discrete data that can be worked to drive care plans and programs.



### Mine image data

Generate insights in support of your population health and evidence-based medicine initiatives.



### Provide decision support

Create tools that provide probability-driven, differential diagnoses to give physicians additional support at the point of care.



### Make incidental findings actionable

Incidental findings can be more easily linked to comorbidities or other key indications and can be placed on worklists for caregivers to help identify and proactively address.



### Apply quantitative imaging biomarkers

Leverage analytics and prior exams to create more accurate, detailed assessments.



### Perform retrospective analysis

Look at historical cases to reduce error rates, or for research programs.



### Enable use of machine learning

Turn the archive into a high quality annotated data set to which algorithms can be applied.



### Create worklists to track recommendations

Appropriately manage the follow up recommended by radiologists, so that patients are certain to receive the required care.



## Leverage analytics across the enterprise

### Focus on analytics with transformative implications

Ensure your analytics layer is designed to be adopted by all participants along the chain of care — including the hospitals, clinics and physicians' offices. Your strategy for imaging analytics should not simply be a multitude of vendors. Remember that the focus isn't on finding incremental value for a specific set of image data but on making a transformative leap forward in the way care is delivered.

### Multidisciplinary engagement

Care teams are looking for data to help them solve clinical problems. Radiology leadership should seek input from multidisciplinary collaborators while weighing the priorities of the analytics platform. Rather than bringing data to care teams, engage clinical teams in a conversation about what data they need and how care would be delivered differently if you could provide it.

## Monetize imaging data by leveraging insights to drive measurable transformation

Radiology has been at the forefront of technology adoption. From investing in the newest imaging modalities that have advanced the early detection and treatment of cancer to embracing voice recognition as a part of your workflow, diagnostic imaging has continually led the way for the health enterprise. Now, the insights that can be uncovered through its cutting leading-edge analytics tools can fill critical care gaps and drive quality and consistency. Adopting analytics can keep radiology on the cutting edge, further monetize its work product, and help the service line impact diagnoses and outcomes on an unprecedented level.

Radiology's potential contributions to the transformation of care delivery fall in several broad categories that range from making radiology's output stronger to becoming more directly involved in preventative services.

### Optimize radiology workflow

Analytics presents exciting opportunities for reading radiologists to improve the accuracy and consistency of reports. Applying analytics capabilities to improve efficiency and thoroughness has powerful downstream implications for ordering providers. For example:

- Potential critical findings, such as hemorrhagic brain bleeds, could be triaged and moved up in the worklist.
- Study abnormalities could be automatically highlighted to reduce the possibility of them being overlooked.
- Repetitive tasks could be automated so radiologists can focus on image interpretation.

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# Are you ready to unlock the value in your VNA and find the ROI?

## Expand screening services

Utilize VNA to support population health and value-based care initiatives that seek to identify patients with early or low risk of diseases before they move into a higher risk category where treatment is more difficult and more expensive. Exams that have already been performed can also be used to detect the earliest signs of osteoporosis, diabetic retinopathy, coronary artery disease and emphysema. Radiology provides unique insights that can become actionable across the continuum of care and help reduce risk across the patient population. This positions the department as a source of value, not just an expense, for at-risk arrangements and value-based care models.

## Collaborate on early intervention programs

Partner with colleagues in other services to turn incidental findings into actionable events with potential treatment and even life-altering implications. Patients with early-stage comorbidities such as cardiac artery calcification can be enrolled in comprehensive programs that manage their condition to avoid escalating health events. Previously, these findings were locked in a static radiology report and difficult to link to follow-up, programs and other future patient encounters to be appropriately managed by a care team.

## Create workflows for emergent incidental findings

Findings, such as pulmonary nodules, thyroid masses and ovarian cysts, that need immediate intervention should be followed up on with less risk of patients falling through the cracks. Discrete data elements that identify these findings can then be tracked and placed on a worklist to ensure caregivers take appropriate and timely action to treat the patient.

## Help physicians be more effective

The human brain can't do it all. When integrated into provider workflows, analytics can act as an assistant to physicians by serving up relevant historical data, providing information on differential diagnoses or even acting as a second set of eyes. This enhances the work of the physician and reduces variance across care teams, which directly impacts the safety and quality of outcomes.

## Support the management and optimization of risk

Depending on the reimbursement model, the identification of a validated comorbidity can be cause for changing a patient's risk profile and the reimbursement structure for preventative and interventional services. In a fee-for-service setting, patients can be directed to appropriate follow-up procedures. In at-risk models that emphasize preventative care programs to avoid medical events, early identification of conditions can be a direct financial benefit to the health system.

## Establish the foundation for tomorrow

For healthcare institutions that want to participate in the advancement of machine intelligence for imaging, maintaining high-quality, discrete and annotated data is paramount. Starting this now can enable you to quickly act on future opportunities or initiatives that are as yet undefined. It also provides the flexibility to readily adapt as the market and technology change.

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# Conclusion

The collision of technology and market forces propels organizations to take a fresh look at their enterprise imaging strategy and their VNA. Recognizing the opportunity is not always obvious for health system leadership, but each institution has as an asset for growing institutional top-line revenue, improving quality and productivity, and ensuring better patient care and health. The opportunity to realize the value of all the data from clinical imaging transactions is the missing x-factor in the value delivery equation.

Not all institutions are ready to take this important step, but the adoption of an imaging analytics layer can put you on the leading edge of the volume-to-value transformation. It also positions not just the radiology department of the future but the enterprise imaging and analytics strategy for the future.

Are you ready to unlock the value in your VNA and find the ROI? Engage NTT DATA Services to create a customized assessment of your organization's imaging analytics readiness.

Contact our Unified Clinical Analytics and Management team at [UCA@nttdata.com](mailto:UCA@nttdata.com) with questions and to engage in a discussion about your organization's needs.



# Sources

1. Kaplan, Deborah Abrams. "Is Radiology Part of the Physician Shortage?" DiagnosticImaging, August 11, 2016. Retrieved from <http://www.diagnosticimaging.com/practice-management/radiology-part-physician-shortage>
2. Moore, Gregory Ph.D., speaking at the Society for Imaging Informatics in Medicine's Conference on Machine Intelligence in Medical Imaging (C-MIMI), September 2017.
3. Roth, C.J., Lannum, L.M. and Persons, K.R. "A Foundation for Enterprise Imaging." HIMSS-SIIM Collaborative White Paper published in the 2016 Journal of Digital Imaging, 2016. 29(5), 530-538.

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