Transforming the Traditional Imaging Informatics Workflow Using a Deconstructed PACS Model

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Background

The Allegheny Health Network, formerly West Penn Allegheny Health System, is an academic medical center in Pittsburgh, Pennsylvania that supports 1.1 million imaging studies across seven hospitals and many outpatient centers. In 2014, the health system functioned in silos with a combination of multiple EHRs and antiquated imaging systems. During this time a significant investment was made towards a technology refresh – internal and external to radiology. Epic was chosen as the inpatient and outpatient EHR, as well as many of the ancillary systems, including Radiant for radiology. Imaging leadership, with the direction of Dr. Marc Wallace, chose to replace our existing PACS with a deconstructed PACS model. The foundation for the deconstructed PACS, our VNA, had been in place since 2010, to support 120 terabytes of images across multiple silos of radiology archives.

Case Presentation

During October of 2014, the vendors were selected, and we had final approval to proceed with implementation and March 2015 go-live. We were keeping our existing Acuo VNA, but moving it to a virtualized platform in new primary and secondary data centers. Our newly selected software stack included: Clario’s zVision to drive workflow, DicomSys to provide modality worklist, and an enterprise viewer /diagnostic viewer for image interpretation and clinician viewing. The vendors worked closely with us to meet our deadlines, but the initial viewer was unable to support our intended workflow.

In March of 2015, we decided to delay our go-live date and subsequently start the search for a new enterprise viewer in June. During this time, our first hospital went live on Epic, and imaging continued to operate using antiquated viewing technology. We continued to pursue moving both instances of Acuo to a virtual environment in new data centers. We managed to do this with nearly zero impact on our end users because we followed a process of copying the image shares and converting the databases on the secondary side. Once the secondary instance was live in the new datacenter, we converted it to our primary instance and continued to archive to it while the vendor selection was being re-evaluated.

We proceeded to work on configuring our workflow engine and started a results conversion from our multiple legacy radiology information systems to both zVision and Acuo (structured reports). By August of 2015, we had chosen Visage as our new enterprise viewer. The viewer fit easily into our intended workflow, so an expedited implementation window was achievable. We went live with our first deconstructed pacs model at both of our Epic live sites in January of 2016. A second hospital went live with Epic at the end of January, and we followed with the suite of enterprise imaging products in February. During the beginning of June of 2016, we took our orthopedic departments live, including integration with Traumacad for templating. The third site to go live with Epic was at the end June of 2016, and we were finally ready to go live in conjunction with Epic. In July of 2016, we replaced Powerscribe 5.0, with M*Modal’s Fluency for Imaging.
Outcome

*Current state:*
Three out of seven hospitals and many outpatient centers are live on Epic and have adopted the enterprise imaging model. We were able to streamline the radiologist workflow by introducing an enterprise model, reducing the number of technologist to radiologist phone calls, and drastically improving remote reading. We are currently tracking a decrease in turnaround time and an increase in radiologist productivity.

*Future state:*
Within the next eight months, three additional hospitals will be live on the enterprise solution.

Discussion

Although the term “deconstructed PACS” has recently become a buzz work in imaging IT, the unique architecture model that Allegheny Health Network designed expands beyond the PACS and incorporates a truly holistic enterprise network that breaks the silos of the traditional imaging-EMR relationship.

Allegheny Health Network started this project knowing that certain risks existed, and even though the leadership and staff were faced with many trials, the benefits of this risk certainly outweighed the challenges.

Conclusion

Allegheny Health Network made a bold move to replace antiquated imaging and EMR systems with a completely multi-vendor architecture. After several years of researching, planning, and implementing this innovative vision, AHN has shown many accomplishments from a successful project. During a time when many imaging facilities are simply talking about this type of innovation, AHN has produced results that other health systems are now seeking.

Keywords

PACS, imaging informatics, deconstructed PACs, workflow, imaging informatics transformation