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Vendor Neutral Archival
& How It Will Change the World (of Medical Imaging Informatics)

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Vendor Neutral Archive (VNA) is a much misunderstood term in the world of medical imaging informatics. Depending on whom you talking to, the definition of VNA differs from person to person; so what exactly is VNA?

Is VNA just another DICOM Archive? This depends on what your definition of a DICOM Archive is. To illustrate what VNA is, we need to first define the term 'Vendor Neutral' in the relevant context. Before the ACR/NEMA (or DICOM) standard was established, modalities being sold communicated only with other equipment sold from the same vendor. If your facility had purchased a CT Scanner from Vendor A, that CT Scanner will only be capable of communicating with a film printer or a Picture Archival & Communication System (PACS) from the very same vendor (in this case, Vendor A). Interoperability was a huge issue then.
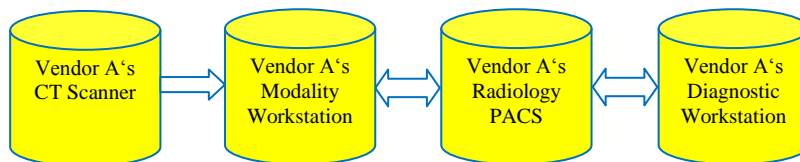

Fig. 1 - Typical Installation (Pre - DICOM Standard)

With the introduction of the ACR/NEMA standard (which subsequently became DICOM), issues with interoperability started being resolved. There is no longer a need to replace entire setup (modalities, printers, scanners) every time a modality was replaced or the need to have multiple film scanners, each serving only a specific modality. Subsequently, we entered a multi-vendor modality environment as we know today, with PACS solutions being able to communicate with ease between modalities of different make and model.
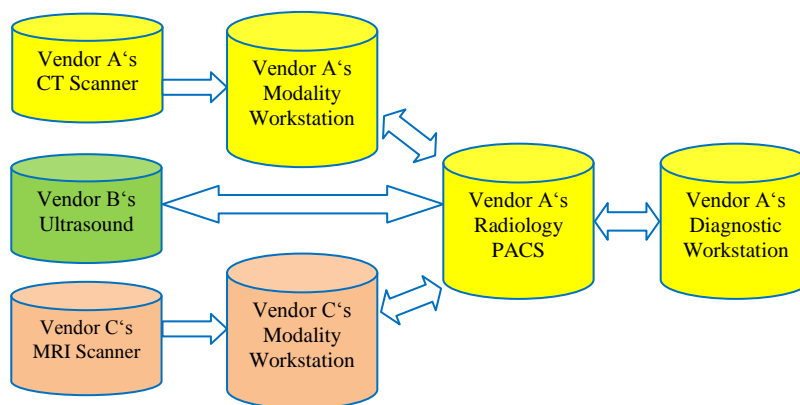

Fig. 2 - Typical multi-vendor modality installation in a radiology department

Now all seems fine with a multi-vendor modality environment, the same PACS and the same film printer can now serve the entire radiology department, consolidating images from different modalities and presenting them in the same diagnostic workstation for radiologists' interpretation. However, the hassle still kicks in when you it is time to upgrade or change your facility's radiology PACS; data migration has to be performed. In addition, your facility might find difficulties in trying to use other vendor's diagnostic workstation on your radiology PACS. Now that is strange because your radiology PACS is supposed to support the DICOM standards so it would ideally just be 'plug and play'. Right?

Still, all seems bearable until other medical disciplines started adopting PACS of their own (e.g. Cardiology, Ophthalmology, Pathology, Dental etc). Imagine that you are a cardiologist and your department needs to 'borrow' the CT Scanner from radiology for relevant image acquisition because it is too expensive for your facility to own a dedicated CT scanners (which makes sense). You will end up with a scenario like this;
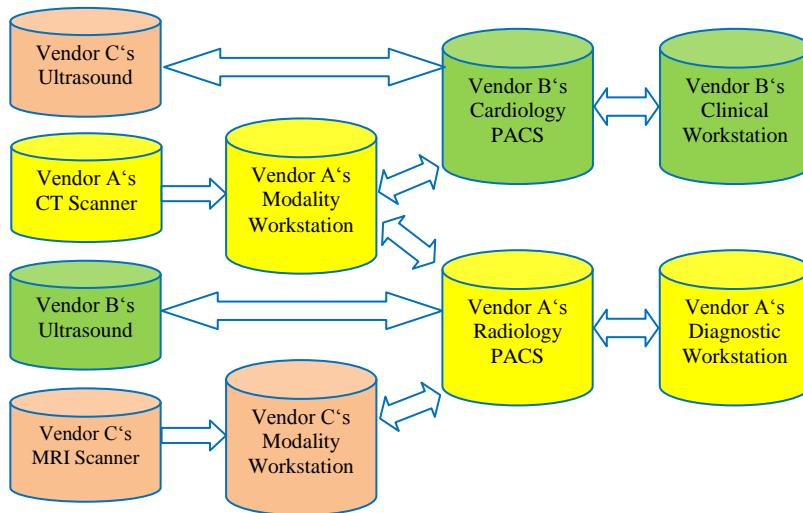
Fig.3- Typical Multi-PACS Environment

Now this scenario poses a few headaches. The technologist acquiring the medical images must remember which PACS to sent the images to (else it will entails in more rectification steps and potentially wastage of storage space), the cardiologist will have to use the two different workstations, one for cardiology, where his common modalities are connected and one for radiology, where he might need to refer to the occasional Chest X-ray. This will definitely impair his workflow and reduces the turnaround time (even worst if the radiology department is located in another building – which is normally the case).

In addition, the problems with Data Migration in events your facility decides to upgrade or change PACS solution remains except now that you have two PACS to worry about - radiology and cardiology. To reflect the real world, let's throw an Electronic Medical Record (EMR) into the mix.
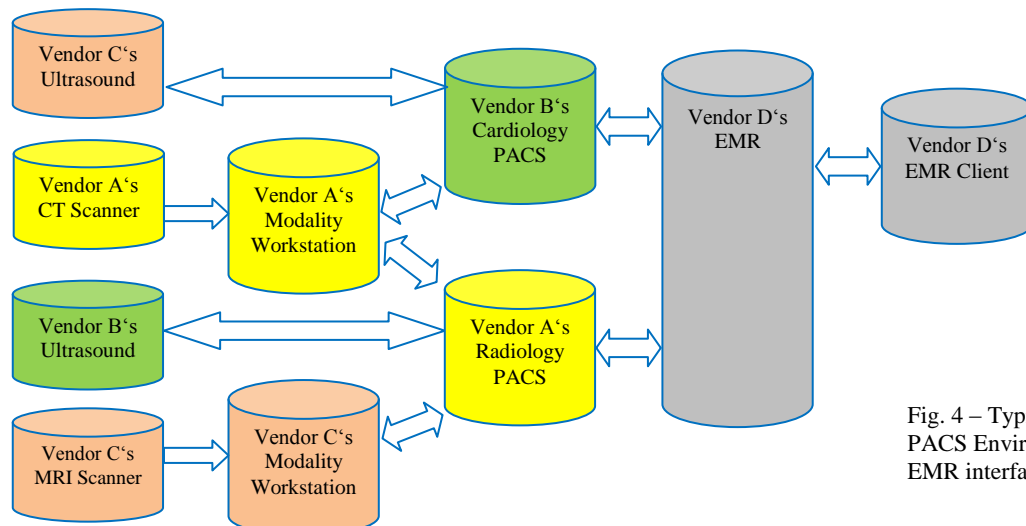

Fig. 4 – Typical Multi-PACS Environment with EMR interface

Any clinician accessing a patient's medical records via the facility's EMR has to access both the cardiology and radiology records because chances are, the relevant images are located in two different PACS, again this is a compromise on their workflow and can be quite cumbersome as both PACS will require the use of their own dedicated image viewers in order to access the relevant data, this can easily cause confusion and undermine adoption/change management efforts for your facility's EMR.

From an IT perspective, this translates to two sets of interfaces, servers, archives PACS, networks etc to be maintained; this is not only costly (manpower, training, software licenses) but also burdensome in terms of efforts and definitely not environmental friendly (energy and cooling for hardware). The data migration problem that will take place when you change either your radiology or cardiology PACS still exists; except that the problem is now 'a little' bigger since it is connected to the EMR (the rest of your facility depends on it – 24/7).

Now imagine for a moment that you have other clinical disciplines that have own PACS, your pathology department, your nuclear medicine department, your ophthalmology department etc and you have Tele-imaging services running across multiple facilities. The IT infrastructure for your medical imaging needs just got a lot more complicated in terms of operational workflow (and extremely costly to maintain).

This is where VNA comes in. taking the above scenario; this would be the architecture with VNA;
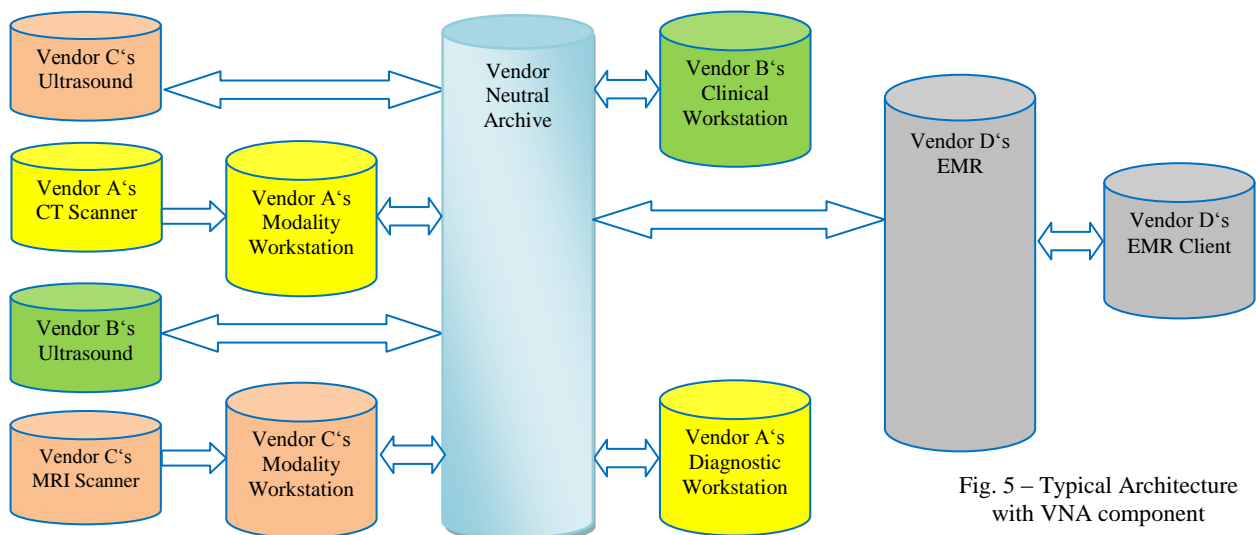

Fig. 5 – Typical Architecture with VNA component

Simply put, what VNA does is it decouples the traditional segment of PACS and workstation by providing vendor neutrality in the archival segment, allowing your facility to achieve vendor neutrality not only from modalities but also workstations and most importantly, your medical imaging data is not 'constrained' or 'restricted' – this translates to possibility of no downtime if events of data migration or upgrades. Amazing? You bet!
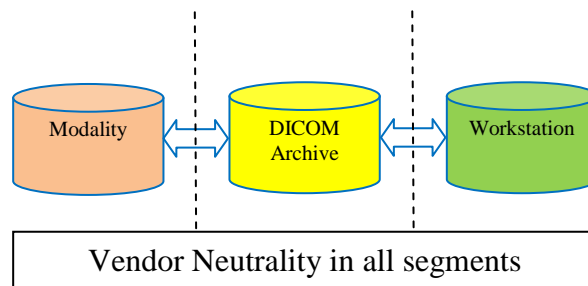

Fig. 6 - Interoperability between all segments

So is VNA just another term for Enterprise Archive? It depends if your Enterprise Archive is capable of providing your facility;

1. Data Ownership
2. Data Sharing
3. Data Access

Take a step back and ask yourself - Do you really own your facility's data? Are you able to migrate your medical imaging data to another PACS solution quickly and with ease? Without being 'held at ransom' from your existing PACS solution provider?

The ability to own your imaging data and effectively sharing them (with ability to normalize the DICOM images) across the different clinical disciplines and allowing access of these medical images to enable collaboration across the medical image lifecycle does not only help your facility save cost and streamline workflow but it also have a direct impact on patient's safety and quality of care.

The topic of VNA is huge and will take more than a whitepaper to be effective communicated. To find out more about Vendor Neutral Archive and how it will change the world of medical imaging informatics, please stay tuned for the upcoming release of the Ebook entitled the same "**Vendor Neutral Archive & How It Will Change the World** *(of Medical Imaging Informatics)*" a community project by binaryHealthCare.

This Ebook will address related topics including;

- What PACS vendors are not telling you about VNA
- Areas of assessment in selecting a VNA solution
- Best practices associated with VNA in areas of PACS Administration, Change Management, Data Migration etc
- What new exciting possibilities exists for your facility if it achieved an effective implementation of VNA
- Emerging trends in imaging informatics after the impact of VNA

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