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Enterprise Imaging
The Future of Radiology

E-supplement Supported by an Educational Grant from Agfa HealthCare

Contents

Enterprise Imaging and Personalised Care at Istituti Fisioterapici Ospitalieri

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An overview of how Enterprise Imaging supported the multidisciplinary needs of Istituti Fisioterapici Ospitalieri (IFO), an oncology hospital and research centre in Rome, Italy, and how it enhanced the productivity and efficiency of its radiology services.

Key Points

- Istituti Fisioterapici Ospitalieri (IFO) is a renowned scientific institute in Rome, Italy. IFO is a public hospital that specialises in oncology and dermatology.
- In June 2020, IFO went live with Agfa HealthCare's Enterprise Imaging solution, which includes the Enterprise Imaging for Radiology platform, the Elefante RIS and the XERO Universal Viewer.
- The platform has upgraded the radiologists' PACS function and has improved efficiency and productivity.
- Enterprise Imaging has automated the workflow and has resulted in the elimination of repetitive tasks.
- Since the implementation of the Enterprise Imaging solution, the number of CTs increased from 16,422 in 2019 to 18493 in 2020, and the number of MRIs increased from 5099 in 2019 to 5706 in 2020.

Introduction

Istituti Fisioterapici Ospitalieri (IFO) is a renowned scientific institute in Rome, Italy. IFO is a public hospital that specialises in oncology and dermatology. It comprises two scientific institutes: the Reginal Elena National Cancer Institute (IRE) and the Dermatological Institute S. Gallicano (ISG), both of which are scientific institutes for research, hospitalisation and care (IRCCS).

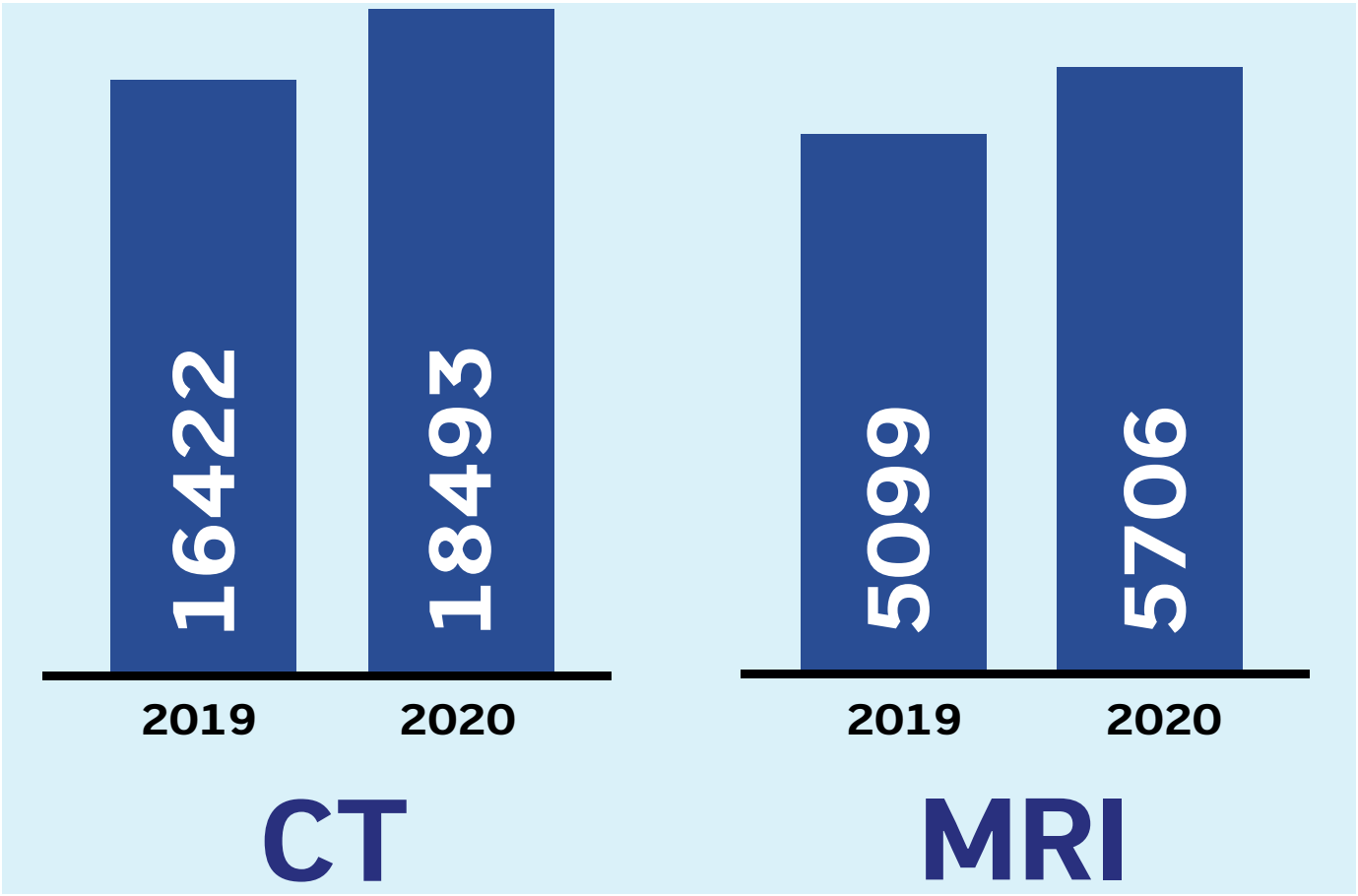
IFO handles about 10,000 inpatient admissions and 1,275,000 outpatient appointments each year. It also carries out 100,000 imaging exams each year. The hospital is well-known for its focus on research and high-quality patient care, and, in particular, its commitment to supporting patients and staff by using the most advanced technology. IFO follows rigorous protocols and is known for its collaboration with international institutions to ensure patients are supported throughout their care journey - from diagnosis to therapy - with a personalised, end-to-end care plan.

In June 2020, IFO went live with Agfa HealthCare's Enterprise Imaging solution. The goal was to implement an image management solution that could integrate advanced research technology and increase efficiency and productivity. So far, the research hospital has shown a successful increase in its productivity in radiology and fast, secure and easy imaging access for specialists and researchers.

Supporting a Smarter Hospital

At IFO, the goal is to bring the highest degree of digitisation and to ensure clinicians have access to the information they need and when they need it for accurate diagnosis, care and research, in a smart way. According to Guiseppe Navenateir, IT and Clinical Engineering Manager for IFO, the research hospital looks for new and improved image management technologies and applications every three years.

Advanced image management solutions are critical for IFO. That is why it was natural to transition to Agfa HealthCare's Enterprise Imaging solution, which includes the Enterprise Imaging for Radiology platform, the Elefante RIS and the XERO Universal Viewer. This comprehensive solution offers radiologists access to advanced functionalities and specialised applications that can be embedded in one platform.



The Enterprise Imaging platform enables radiologists and specialists to access diagnostic information whether they are in or outside the hospital. Also, the flexible RIS interfaces with the appointment system of the regional government, which is important for IFO.

Successful Implementation and Results with Enterprise Imaging

With the successful implementation of the Enterprise Imaging solution, IFO has seen the following positive results:

- The platform provides easy access to images, anywhere, anytime, for every specialist. Clinicians can access imaging studies immediately and can view images from the EMR or any other computer or mobile device through the XERO Universal Viewer. In addition, the XERO Xtend offers advanced clinical applications and 3D processing.
- The platform has upgraded the radiologists' PACS function and has improved efficiency and productivity.
- Elefante RIS1 is integrated within the Enterprise Imaging platform and offers IFO the ability to customise it as per the specific needs of the hospital.
- Enterprise Imaging has automated the workflow and has resulted in the elimination of repetitive tasks.
- Since the implementation of the Enterprise Imaging solution, the number of CTs has increased from 16,422 in 2019 to 18493 in 2020, and the number of MRIs has increased from 5099 in 2019 to 5706 in 2020.
- The Business Intelligence feature with Enterprise Imaging helps the hospital monitor its radiology Key Performance Indicators so that the team can analyse areas for improvement and determine how to increase the quality and quantity of activities.
- The platform has increased the reach beyond the radiology department. Every case can be discussed between a number of specialists, and information can be exchanged easily and efficiently.
- The XERO Viewer allows patients to view their own images via the Patient Portal, also provided by Agfa HealthCare, and access their results from the comfort of their home. This feature also provides cost-savings to IFO as they no longer have to make CDs or DVDs. ■

At Agfa HealthCare, we support healthcare professionals across the globe to transform the delivery of care. Our focus is 100% on providing best-of-suite Imaging IT software solutions that enable secure, effective and sustainable imaging data management. From product development to implementation, our unified Enterprise Imaging Platform is purpose-built to reduce complexity, improve productivity and deliver clinical value. We use our proven track record as an innovator, our in-depth medical knowledge and our strategic guidance to help healthcare providers achieve their clinical, operational and business strategies.

Successful Implementation of Enterprise Imaging Solution at Canisius Wilhelmina Ziekenhuis

An overview of the implementation and integration of an Enterprise Imaging Solution at Canisius Wilhelmina Ziekenhuis (CWZ), Nijmegen, the Netherlands.

Image Credit: Javi Gomes

Canisius Wilhelmina Ziekenhuis (CWZ) in Nijmegen is one of the 27 top clinical teaching hospitals in the Netherlands. The hospital's main branch is located in Nijmegan. This branch has 28 medical specialisms, eight paramedical departments and five urgent-care departments and IC units.

Background

The hospital had two PACS systems in 2017 - one for radiology, nuclear medicine and cardiology and a second one for images from other departments. Only three departments were connected to the second PACS system. The team at CWZ wanted to establish a system that would enable all specialists to request examination and testing from within the EHR, and these requests/orders would be communicated to the department that would generate the images. The images would then come back to the specialist, who could then make the report in the EHR. In other words, CWZ was looking for an image-management system that would be automated, EHR-driven and standardised. The goal was to create a system where all images would be centralised in one consolidated environment.

Integration of Enterprise Imaging Platform

Agfa HealthCare's Enterprise Imaging solution fit the hospital's needs and includes:

• Enterprise Imaging Platform that offers the ability to bring images from all departments together in one consolidated environment.
• XERO Universal Viewer application that is integrated into the medical record and which allows doctors to view medical images.
• XERO Capture that allows users to quickly and easily transfer images made with mobile devices to the Enterprise Imaging platform.

The project leader from CWZ worked in consultation with Agfa HealthCare and developed a team comprising three functional application coordinators, one technical application coordinator, a radiographer and two people for the EHR. The team was responsible for implementing the Enterprise Imaging platform at CSW. The project was divided into eight phases, and each phase lasted three months:

• Phase I - The project team was trained, and the infrastructure and applications needed for the roll-out were set up.
• Phase II - The first three departments were connected. This was done in close collaboration with the project team and Agfa HealthCare.

In each of the following phases, the system was rolled out in two or three departments.

Improvements with Enterprise Imaging

With Agfa HealthCare's Enterprise Imaging solution, CZW was able to bring together all their medical images into one system. In addition, the integration of this system with the EHR has made it faster, efficient and more secure. CZW was able to generate significant returns on quality, the satisfaction of staff, and regulatory compliance. In addition, the hospital was able to generate significant time savings. For example:

• Ultrasounds in the gynaecology department used to be printed out, labelled and scanned. The process was time-consuming, and image quality was poor. With the Enterprise Imaging platform, the hospital was able to generate time-savings of 2-3 minutes per examination. At 20,000 examinations per year, this is a cumulative saving of 700 work hours.
• The Doppler examinations in cardiology were also printed out and scanned. With the new system, the department generated time-savings of 4 minutes per examination. At 800 examinations per year, this is a cumulative saving of 53 work hours.
• Hearing tests in the ENT department were printed out and scanned. With Enterprise Imaging, the department could save 1-2 minutes per examination. At 5300 examinations per year, this resulted in a cumulative saving of 130 work hours per year.
• A total of 225 work hours per year were also saved for the ultrasound, endoscopy and urodynamic examinations in the urology department.

Another example of the use of Agfa's Enterprise Imaging platform is in the dermatology department. Under the old system, photos were taken with a camera and saved on a network disc. But with the new system, an order is generated in the EHR. With the Capture tool from Agfa's XERO Universal Viewer, the photos are added to the order in a simple and secure manner. The report and the images can easily be linked, and all related patient data is collected in a secure place. Similar efficiencies were observed in other departments as well. The entire process has become faster, ensuring that the patient's course of treatment is not delayed.

With the old system, images could only be viewed by the specialist who performed the examination and not by those who submitted the request. Often, the images were stored in locations that could not be located easily later on. With the new system, images are always accessible for specialists, along with the results. Specialists can inspect images using the XERO Viewer that is integrated into the EHR. Images are easy to locate, and the entire process is much faster. A doctor from a different department can see the examinations a patient has undergone. This can help avoid double examinations.

The centralisation of all images in one system has also made it easier to manage and control everything. Everything is logged and recorded. The platform is completely secure, and the exchange of images within a network is safe. Images are even accessible to patients, hence ensuring that all parties involved in the process have easy access to all the information in one central location.

By consolidating the two PACS systems, CZW was able to facilitate greater coordination between different departments, improved decision-making and more efficient functioning of all key processes.

Conclusion

Overall, by implementing Agfa HealthCare's Enterprise Imaging platform, CZW was able to derive the following benefits:

• Fewer operations which in turn results in substantial time savings.
• Reduced double examinations.
• Faster accessibility of images across disciplines which in turn leads to the more efficient delivery of care.
• Creation of a system that is easier to manage and control and which is more cost-effective. ■

Enterprise Imaging VNA – Enriching Patient Imaging Records

Author: **Christien Lefebvre | Global Program Manager – Enterprise Imaging VNA |** Agfa HealthCare

Agfa HealthCare's Enterprise Imaging VNA solution is a modern, standards-based platform purpose-built on the latest technology. Health Management.org spoke to Christien Lefebvre, Global Program Manager, Enterprise Imaging VNA for Agfa HealthCare to discuss the VNA solution, what benefits it offers and why healthcare organisations and clinicians should transition to it.

Key Points

- Agfa HealthCare Enterprise Imaging VNA is the next generation cloud-enabled enterprise workflow and data management solution that can store native and non-native medical images and documents, allowing geographic boundaries to be removed.
- The focus is on extensive data management, collaboration, indexing to make data available when needed.
- The data consumption and distribution model helps with patient diagnostic times and reduces patient reimaging requirements when a patient moves from facility to facility.
- Agfa HealthCare VNA's data protection focus is to have all its data stored on the VNA system both encrypted at rest and in transit.

Can you tell us something about the Enterprise Imaging VNA solution from Agfa HealthCare?

The Agfa VNA is the next generation cloud-enabled enterprise workflow and data management solution that can store native and non-native medical images and documents, allowing geographic boundaries to be removed. The VNA solution has been innovated over the last 12 years to bring a collaborative model for data management that increases the availability of patient data while helping improve the timeliness of care by reducing the requirement to reimage patients. The focus of the Agfa VNA solution is based on extensive data management, collaboration, and indexing to make data available when needed.

When you say vendor neutral, what do you mean exactly?

The Agfa VNA offers true neutrality built on a state-of-the-art cloud-enabled solution, allowing clinical users to query for a complete patient timeline. The Agfa VNA has been deployed globally in over twenty countries now for over a decade. Agfa's focus on neutrality is towards connected image sources, format independence and consumer independence. With the help of the Agfa VNA Dicom tag morphing ability, applying Image Object Change Management "IOCM" and preservation mapper, allows its users to define a common taxonomy for data growth, significantly when expanding in non-Dicom imaging and document areas.

Is VNA limited to unifying imaging data in one central location, or is there more that can be done?

I immediately think of federation, compatibility, interoperability, and potentially endless integration options; for example, with the proper Agfa VNA workflow, the Agfa VNA can acquire any patient data, regardless of the Original Equipment Manufacturer (OEM) or datatype (image or document). The Agfa VNA can then categorise and store this newly acquired data based on the available dataset from the HIS or a clinical console. There are additional data nominalisation offerings that clinical users can use to enrich this newly acquired dataset.

How does Agfa's Enterprise Imaging VNA solution ensure patient data is protected?

The Agfa VNA works with best-of-breed standards to ensure patient data is protected, starting with an aggressive patch management process following National Institute of Technology (NIST) guidelines. The patching process ensures our deployed "golden images" pass Nessus vulnerable scans before being installed. We also use a combination of DIMSE-C, IPV6 and HTTPS services depending on the dataflow requirements. We integrate user access via industry standardised login modules to ensure integration with our customer policies around accessibility and encrypted SSL user authentication. Understanding the concern around patient data from an unwanted security access point, we also use data segregation rules based on external system Application Entity Titles (AETs) defined within the Agfa VNA Access Control List (ACLs) Application Programing Interface "API." On top of these layers of patient data protection, we have detailed ATNA logging exported to an external repository. Agfa VNA's data protection focus is to have all its data stored on the VNA system both encrypted at rest and in transit.

How does the VNA solution benefit radiologists and clinicians with their everyday tasks?

The Agfa VNA solution allows all clinical users to access all the relevant patient data regardless of the treatment area or diagnostic areas. This data availability and collaboration-centric enable model provides clinician users with all the available patient data to help determine the best possible treatment plan. The ability to share information, study comments and the extensive patient data historical timelines allows for cross treatment plans. The Agfa VNA can even unlock medical advances by enabling clinicians to link illness across service areas. The Agfa VNA enriches patient imaging records with data previously inaccessible to a diagnostician from enterprise modalities and service areas.

Agfa VNA solution is based on extensive data management, collaboration, and indexing to make data available when needed

What makes your VNA solution different from that of your competitors?

The Agfa VNA solution differentiates itself by enabling an organisation to go beyond a consolidated archive. Most VNA systems connect a few PACS systems to a centralised archive and offer the ability to ingest from modalities. With the Agfa VNA solution, service areas that create imaging content can go onboard to the solution quickly with little effort through clinical acquisition and normalisation tools. Agfa HeatlhCare has worldwide experience, and we have expertise in integration with over fifty clinical service areas, hundreds of PACS and thousands of imaging devices and systems. Our extensive integration experience drives the VNA solution for hospitals,

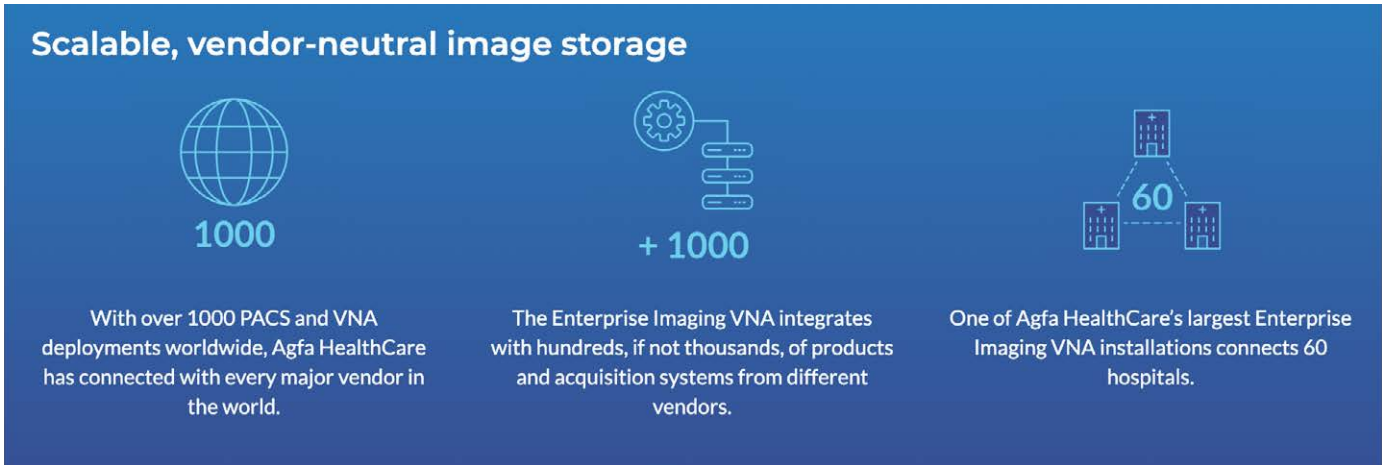


Image Credit: Agfa HealthCare

health networks, and regional or national imaging collaboratives, knowing that they will not have their data left on an island when planning their long-term digital care strategy.

Is this a costly solution for healthcare organisations? Or is it likely to result in long-term savings if implemented properly?

VNA investments vary widely based on desired VNA workflows, XDS, FHIR enablement, and BCDR strategy within the Agfa VNA solution. The Agfa VNA offers an immediate soft Return on Investment (ROI) concerning infrastructure and resource power and better long-term Total Cost of Ownership (TCO). The Agfa VNA solution can reduce resources and hardware by consolidating PACS and archives, enhancing data management efficiency by reducing redundant configuration, and allowing care facilities to capture revenue with crucial evidence from hospital service areas that have previously lost or missed billing opportunities. This broad approach to consolidation of imaging systems and increasing collaboration across service areas allows for improved data sharing, modelling, and capacity planning, resulting in a long-term cost-benefit model that healthcare leadership should not ignore.

How do you ensure healthcare organisations that adopt this platform use it effectively? Is there training for the people involved, or is this easy to use?

Within the Agfa VNA platform, there are advanced services that monitor and report on the overall system. We classify these services into two categories: "System reporting" and "Process reporting." The Agfa VNA services allow for clinical and operational insight into VNA system health, overall performance and reports on the institution's mission-critical KPI are being archived. Our VNA dashboards that handle our System and Process reporting are customisable, allowing the administrative user to alter the views based on any user's particular role and job function. Along with these VNA dashboards and monitoring services that help ensure the system operates effectively, we offer advanced training paths to ensure all administration can manage their Agfa VNA environment. The focus of the Agfa VNA is to have all system tools configurable via our API so that it allows for ease of use and customisation. A simple search Agfa VNA Knowledge Base (KB) offers administrative and clinical users a step-by-step guide to make their desired changes.

The VNA & PACS market is projected to have healthy growth by 2023. Do you have any plans to improve/add on to this feature?

We are focused on three main areas that are already in development and prototyping;

1. We are expanding our non-Dicom native workflows leveraging lossless compression and reviewing the ontology of these studies; our API can leverage a proper taxonomy to ensure the clinical user experience is appropriate. There is very little value in acquiring non-Dicom data if there are limited tools to index this information for clinical end-user search and find properly.
2. We are expanding our VNA federation model to support multi-health systems and international level federation in the cloud. The focus around federation growth is our data accessibility to our streaming zero-footprint viewer (XERO) to offer more shared workflows. Shared workflows and collaboration are the future for sizeable multi-enterprise health networks and academic collaboration.
3. The final main focus is on AI and machine learning within the VNA environment. I feel that the poor uptake of AI within some aspects of healthcare is based on the dataset. There is a need to apply AI and machine learning to a small dataset while ideal in certain areas of medicine. I believe there are extensive options when applying machine learning to enormous datasets in trillions of objects. With proper anonymisation and correct AI-defined paraments, it is hard to imagine what we can learn around medical imaging. ■

For more information about Agfa Healthcare's VNA solution, please visit https://global.agfahealthcare.com/vna/

The Cost of Keeping the Imaging Status Quo

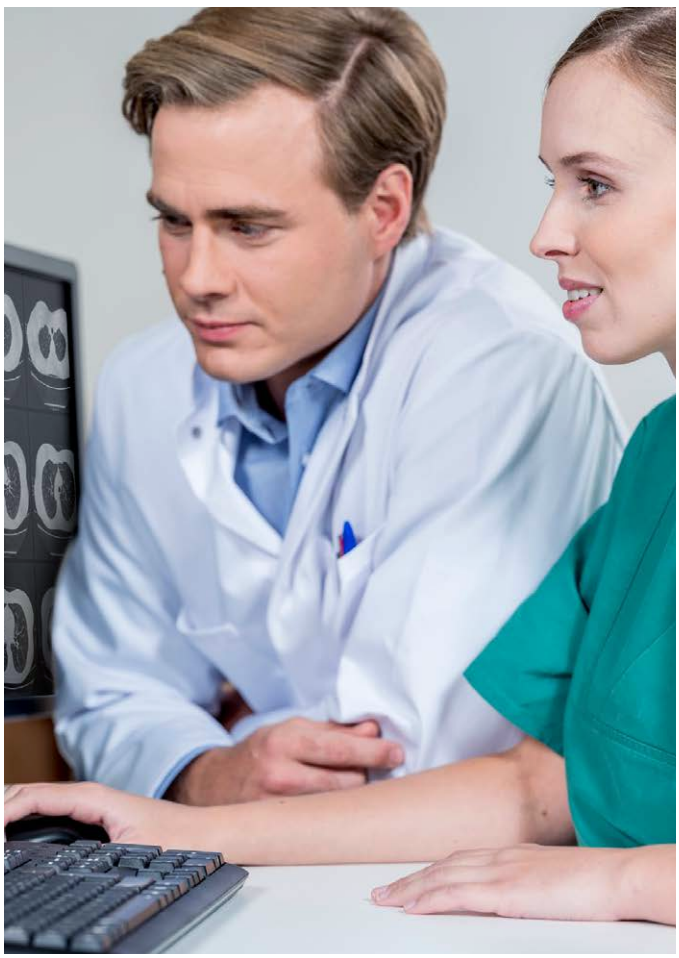
As demand for diagnostic imaging continues to increase, it is important for hospitals and radiology departments to trade in the imaging status quo of the isolated silo for a consolidated approach such as Enterprise Imaging.

Key Points

- Hospitals today have to deal with an assortment of disparate, standalone systems that have different capabilities and functions and are often inefficient, fragmented and costly.
- Diagnostic and clinical users could benefit from a complete patient imaging system such as Enterprise Imaging.
- Economic, operational and clinical forces are pushing healthcare systems to switch from traditional imaging systems to a unified Enterprise Imaging ecosystem.
- A converged Enterprise imaging approach offers several benefits, including reduced complexity, lower cost, increased efficiency, and enhanced care and satisfaction.

Imaging and Imaging IT are fundamental components of modern healthcare. Their increasing application and use for clinical diagnosis and treatment decisions have resulted in the use of a variety of systems and technologies across departments, specialties and healthcare facilities. That is why many hospitals today have to deal with an assortment of disparate, standalone systems that have different capabilities and functions and are often inefficient, fragmented and costly.

Diagnostic and clinical users could benefit from a complete patient imaging record. However, in such a fragmented environment, this could be quite a challenge. But this challenge must be overcome if healthcare organisations want to trade in the imaging status quo of the individual, isolated silo for a consolidated approach. One such solution is Enterprise Imaging.



Why Do Imaging Systems Need to Change?

Three primary forces are pushing healthcare providers to switch from traditional imaging systems to a unified Enterprise Imaging ecosystem. These include:

Economic Drivers

Buying, implementing, deploying, integrating and supporting multiple imaging systems across multiple departments is an inefficient and costly solution. The time and money spent on managing and updating these siloed systems and on duplicate storage could easily be put to better use by investing in more efficient and value-driven solutions.

Operational Drivers

When healthcare organisations use siloed systems, each system requires separate staff trained in its maintenance and interface. Again, the time and money spent on training staff on multiple user interfaces can be more efficiently utilised

to develop skills that enhance patient care. Also, synchronising different systems with varied capabilities can be very difficult, and auditing can also be quite complex.

Clinical Drivers

Physicians and clinicians are ultimately the ones who need patient imaging records. Switching from system to system to find, compare and diagnose images and then make treatment decisions based on those images can be time-consuming, cumbersome and extremely inefficient. The goal of an imaging record system should be to provide easier access to all images so that clinicians can focus on adding value rather than spending their time browsing through different systems.

Advantages of Converged Image Management

Image management systems have one basic purpose: to acquire, store and display images. A consolidated system such as Enterprise Imaging converges image collection, storage, management and sharing. This is delivered through a scalable and centralised platform, reducing the technical complexity, IT footprint and cost of the imaging ecosystem while increasing efficiency. At the end of the day, the ultimate goal is to enhance physician satisfaction and patient care.

Here are a few advantages of a converged Enterprise Imaging approach:

Reduced complexity and total cost of ownership

Enterprise Imaging allows the use of lower-cost storage alternatives such as tiered or cloud models. It also optimises storage utilisation and eliminates duplicate storage. In addition, a centralised system is less costly and takes less time to manage and run. Security and data privacy is also much easier on a centralised platform, and data recovery is simpler and faster. Finally, Enterprise Imaging supports non-orders based workflows. Therefore, integrating these into the billing system and workflow improves the payment and reimbursement process.

Increased operational efficiency

Using a standardised approach for image capture, storage and quality across an enterprise increases the long-term value of these images and reduces the risk of duplicate exams. Also, Enterprise Imaging supports the latest industry standards, thus simplifying the integration of current and future applications. This not only makes the system more efficient, but it also reduces staff and training costs while optimising resources.

Enhanced clinical care and satisfaction

The Enterprise Imaging platform harmonises workflows and helps build a patient-centric approach to care delivery. It facilitates information sharing, multi-disciplinary cooperation and patient engagement and improves the overall experience of both staff and patients. Longitudinal patient imaging records also eliminate redundancies and enrich the strength and impact of multi-disciplinary teams. Enterprise Imaging also offers an intuitive and powerful viewer for image-enabling the EHR.

Building a Tailored and Robust Strategy with Enterprise Imaging

While each hospital has its unique needs, Enterprise Imaging allows healthcare organisations to build a robust imaging strategy, step-by-step:

Step 1: Converging radiology imaging ecosystem through PACs, advanced image processing, reporting, clinical applications, collaboration tools, analytics and more.

Step 2: Converging cardiology imaging into a single system through the use of third-party solutions, thus optimising the use of services such as Cath lab, CT, MRI, ultrasound, nuclear medicine and ECG.

Step 3: Offering a consolidated platform with an enterprise-level VNA combined with a universal viewer providing care providers access to multimedia patient information they need, anywhere, anytime – including at the point of care.

Step 4: Driving imaging workflows of other departments and service lines, making them standardised and stored centrally in the VNA.

Step 5: Allowing cross-enterprise imaging sharing within a hospital network and routing and sharing workflow support to better manage data.

Overall, Enterprise Imaging offers a new strategic pathway to hospitals. It can be applied based on the hospital's immediate economic, technical, operational and clinical priorities and their objectives and current situation. Whether it's overstressed IT resources, low clinical productivity, missed financial reimbursements, declining referrer loyalty or staff or patient dissatisfaction, Enterprise Imaging offers the path to achieve organisational goals smoothly and efficiently. ■

A consolidated system such as Enterprise Imaging converges image collection, storage, management and sharing

With the Unified Radiological Information System (URIS), the Moscow Health Care Department Has Laid the Foundations for Connected Care

Interviewee: Sergey Morozov I Chief Regional Radiology Officer I Moscow Health Care Department I CEO at Diagnostics and Telemedicine Center I Moscow, Russia

300 modalities, 1500 radiologists, 1500+ technicians, 10,000 referring physicians, 500,000 patients... Moscow's Unified Radiological Information System (URIS) and its unified digital infrastructure have become a 'one stop shop' to access patient imaging data across the megalopolis and beyond. And a core component of URIS is the unified Enterprise Imaging platform, offering the scalability and functionality for the present and the future of this ambitious project. Connecting all medical imaging devices into a single service, with Enterprise Imaging, supports "anywhere/anytime" access to the patients' imaging data, enabling 'true' teleradiology and enhanced patient care.

Making Medical Imaging More Accessible to Patients

The foundations for URIS were laid in 2012, during a large-scale modernization of Moscow's healthcare services. "Hundreds of CT and MRI scanners were purchased for and installed in the primary care and out-hospital facilities. Previously these modalities were mostly available only in hospitals," describes Professor Sergey Morozov. "The mission was to make these types of imaging more accessible to patients, in a cost- efficient way, through the outpatient primary care and out-hospital facilities. The success of this approach has enabled us to launch other key initiatives since then, such as a lung cancer screening program and an MRI prostate screening, to name only two."

Very soon after the installation of the new modalities, discussions began on how to connect them within a unified information system. "This would offer clear and necessary benefits, including overall standardization, increased efficiency, efficiency metrics, and harmonized workspaces and workflows for radiologists and technicians," Professor Morozov continues.

To enable this connection, Agfa HealthCare's Enterprise Imaging platform was selected. Professor Morozov: "We needed a solution that could work as a radiology archive, and provide advanced tools and workflow automation for radiologists and referring physicians. It was very important to select a vendor that delivers the highest international standard for enterprise imaging. But we also needed the possibility to scale in the future, especially in terms of adding many more modalities. So when I became chief radiologist of Moscow in 2015, I was very pleased that Agfa HealthCare's Enterprise Imaging had become part of the URIS project in 2014."

A Unified Service Offering Access to All of the Patient's Images

The overall goal was to integrate all local radiology services into the URIS service; the first challenge was connecting multiple modalities from different sites by February 2015- only one month after the signing of the contract. By mid-2015, all the CT and MRI modalities from the primary care and out-hospital facilities were not only connected but integrated in the advanced diagnostic workflow automated by Enterprise Imaging.

Professor Morozov: "Different workflow approaches were implemented, such as cross-reporting, where radiologists at one primary care and out-hospital facility would report studies carried out at another primary care and out-hospital facility. True teleradiology and remote reporting, dashboards for productivity analysis and peer review, were also tested, with more modules added to make this possible. We continue to tune these approaches, with the support of the Agfa HealthCare application specialists"

Enterprise Imaging Platform

1300	modalities
1500	radiologists
1500+	technicians
10,000	referring physicians
500,000	patients

Big Jump: From 700,000 to 5 Million Studies Annually

In 2018, the project took a huge leap forward, when the city's new vice-mayor in charge of healthcare decided to leverage all of the informatics, by having all CT, MRI, mammography, digital X-ray and X-ray angiography devices in hospitals and primary care and out-hospital facilities connected to URIS by the end of 2019.

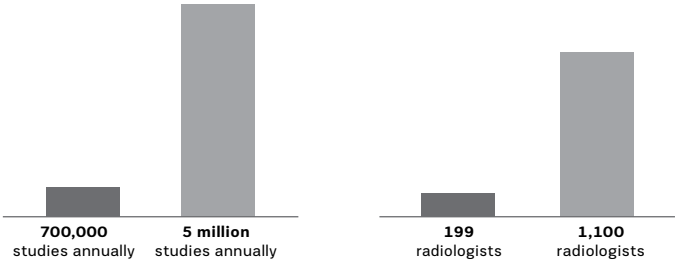
"This meant connecting 1200 more modalities. It was very important that Enterprise Imaging was able to scale to meet the massive growth in demand. It enabled us to increase from 100 to 1300 modalities very quickly and seamlessly," says Professor Morozov.

With the decision, the estimated yearly volume of images handled by the Enterprise Imaging platform exploded from 700,000 up to 5 million. So in 2019 Agfa HealthCare split the platform into two clusters: one for the primary care and out-hospital facilities, one for the hospitals. To handle the migration and upscaling, Agfa HealthCare, local partner ITco and the Moscow Department of Information Technologies (DIT) collaborated closely, 24/7, to support optimal performance while keeping resource allocation requirements in mind.

Following this evolution, the number of radiologists using the platform for viewing and reporting increased from 199 in 2015 to 1,100 by the end of 2020.

Worklist Management Supports 'Expert' Radiology

The task-based workflow management is a key functionality in Enterprise Imaging for each radiologist on the platform. It adds value not only for the radiologists, but also for technologists, referring physicians, patients and the healthcare system overall. "Worklist management based on automated task assignment enables us to distribute studies among our radiologists, based on subspeciality rather than location. Every study is thus reported by an expert in that subspeciality, not, for example, the radiologist who happens to be in the hospital or primary care and out-hospital facility on that day."



This distributed way of working has had several very important benefits for radiologists across all locations, he continues. "Firstly, we can reduce second readings, because every report is already an 'expert' report. Secondly, radiologist satisfaction has increased, because these professionals are working with their familiar studies and pathologies.

Furthermore, as the radiologists have the specific knowledge needed for the studies they are working on, report turnaround time has drastically improved. Five years ago, it was five days. Now it is on average less than one hour! This is a very important metric for patient care quality, as it means the referring physician and the patient have access to the diagnostic information much more quickly."

Other functionalities enabling a more comfortable and efficient workflow for radiologists include the ease of switching from one working place to another, and helpful tools such as hanging protocols.

Report turnaround time
5 days >1 hour

"Report turnaround time has drastically improved. Five years ago, report turnaround time was five days. Now it is on average less than one hour!"

Prof. Sergey Morozov

Centralized Remote Reporting Enhances Productivity

The centralized, standardized platform was also key to enable the launch of the Moscow Reference Center for Radiology (MRC): the first teleradiology center created as part of the public healthcare system. Opened in 2020, it now has 96 radiologists remotely reporting some 25,000 imaging studies each week and plans are to grow the number of radiologists even further.

Radiologist productivity has doubled with the MRC, Professor Morozov explains. "Around the clock IT support, dedicated workstations with diagnostic monitors and automated worklist

management provide the radiologists with an environment that is very conducive to efficiency. In fact, because radiologist productivity has doubled, we can make the same number of reports with half the radiologists.

Not only is this more cost-effective, but it allows us to provide additional specialized training to upgrade the radiologists' skills. We can also deliver more and better services to remote locations. Russia is a huge country, and it is not possible to provide an expert radiologist for every CT machine. But by connecting those devices to the digital infrastructure, we can increase the reach of this critical imaging insight to more patients, and remotely report the studies. 'Expert As A Service', in a way."

Standardized Workplaces and Anywhere/Anytime Image Access

Beyond the centralized reading and reporting services at the MRC, the digital infrastructure and unified platform have enabled a standardization and harmonization of radiologist workplaces in every hospital in the city. "This allows us to smoothly transfer images from the primary care and out-hospital facilities to the hospitals, which reduces repeated studies," describes Professor Morozov.

The XERO universal viewer plays a key role, providing "anywhere, anytime" access to the patient's imaging record – not only for the radiologist, but for all stakeholders. "Radiologists might use XERO to quickly and remotely check a patient study that requires specific attention, for instance. And in the future, I am convinced the XERO functionality will be an important step in truly freeing radiologists from their physical locations," he explains.

As new service lines have been connected to the digital infrastructure, other specialists have been increasingly making use of the functionalities, as well. "When we connected the angiography devices, vascular surgeons began using the platform to inform about their decisions regarding operations on stroke and myocardial infarction patients, for example. Traumatologists and ENT surgeons also use it, to check CT, MRI and X-ray results."

Private PET-CT centers such as those specializing in oncology imaging are also connected, giving referring oncologists at the hospitals access to the PET-CT scans taken at those private centers. And with XERO embedded in their electronic health records, referring physicians can directly check patients' images: in the last year, nearly 10,000 did so.

Empowered Patients and Continuous Quality Improvements

Patients also have easier access to their own information: 500,000 patients have downloaded their imaging studies and reports from their electronic health records. "This access empowers the patient, making it easier for them to get a second opinion, for example. Looking back 20 years ago, patients were 'bound' to their healthcare provider literally because of the notoriously bad handwriting of the doctor: it wasn't legible, so only the doctor had full access to these notes. Now, patients can take their data anywhere.

It also raises the possibility that several years in the future, a patient may come back and say 'you missed a tumor in this lung image, and now it has grown from 1 mm to 10 cm'. But it is always better for the healthcare system to have information, rather than not have it. This kind of pressure on hospitals and physicians, which drives quality improvement, is good for everyone in the end."

Creating a Collaborative Learning Environment

"The Enterprise Imaging platform includes an online collaboration functionality, that enables a radiologist to contact a more experienced radiologist for support with a diagnosis. Peer review for us is definitely not only about quality review, but about creating a learning environment. The radiologist requesting the second opinion is learning from their more experienced peer. Normally, these consultation requests decrease over time. When they don't, we can monitor the situation and determine if the radiologist could benefit from some additional training. This provides more objective feedback and encourages more learning," Professor Morozov describes.

Peer review can also help to highlight possible discrepancies in reporting, for example a missed diagnosis or missed incidental finding. "It's important that the reading specialist pay attention to everything in the image, not just the 'target' area. For example, if the expert is looking at an aortic CT, and misses an ovarian tumor that is visible in the image, this is not acceptable. Peer review has enabled us to have very constructive discussions to make it clear what we expect, and that someone is watching and checking, to promote continuous quality improvement."

"The Enterprise Imaging platform includes an online consultation functionality, that enables a radiologist to contact a more experienced radiologist for support with a diagnosis. Peer review for us is definitely not only about quality review, but also creating a learning environment."

Prof. Sergey Morozov

Rapid COVID-19 Response

When COVID-19 unexpectedly hit in early 2020, the URIS digital infrastructure was ready to meet the needs and demands of the healthcare crisis. "We were able to leverage our set-up to support the response. For the first months, PCR testing was not widely available, and the doctors didn't yet have a clear vision on how to differentiate COVID-19 from acute viral disease. CT lung scans were the primary method for diagnosis."

Agfa HealthCare and its local partners worked closely with the Department of Information Technologies of Moscow (DIT) to connect the primary care and out-hospital facility cluster and the hospital cluster, to enable even faster sharing of studies

from one to the other. Federal and private centers were also connected.

"This allowed us to perform COVID-19 triage at the outpatient clinics, and quickly transfer patients to the hospital when needed. As hospital resources became overstressed, we were able to add the federal and private hospitals to the network," he explains.

"Using the digital infrastructure, we quickly standardized CT reporting for COVID-19 diagnosis, remotely taught our radiologists how to read them, developed a standardized CT scale grading for COVID-19 severity and pulmonary impact, and then spread that knowledge around the world."

Prof. Sergey Morozov

Artificial Intelligence

The standardization of the datasets in the archives is also supporting the development of Artificial Intelligence tools to further support the radiology services. "We have over 1,500,000 studies that are being analyzed by AI algorithms from different vendors: not only from Russia, but from around the world. The anonymized data goes directly from URIS to the AI tool and back again. The studies are then received by our radiologists pre-analyzed by the AI. This can help reduce the risk of human error, decrease the burden on the radiologist for routine tasks, and let the radiologist focus on the pathology and studies that require his expertise for prompt analysis and reporting," he describes.

"We also have a huge database of COVID-19 lung CTs, which we have used as the primary diagnosis tool during the pandemic. Our peers test their AI algorithms on our datasets, and they refer to our datasets, which include the classification of disease severity."

The Human Side of Technological Advances

While digital technologies in healthcare are fundamental to achieving the productivity, cost and care benefits Professor Morozov has outlined, it is important, he says, to remember that technology is an instrument, and the heart of both healthcare and technology is people.

The flexibility and dedication of the Agfa HealthCare team have played a critical role in the stages of the project over the years. Most recently, for example, Agfa HealthCare team resources have been instrumental in integrating a local, third-party voice recognition system, as well as for testing the integration with a number of AI algorithms.

"Furthermore, from the beginning, you have to keep in mind the people who will use the technology, how they accept it, whether they are ready for it, etc. And this digital infrastructure we have built with Agfa HealthCare is ultimately about people: including the local, technical and project expertise Agfa HealthCare has brought. I am very pleased that Agfa HealthCare is part of this project."

URIS

- 162 medical facilities belonging to the Moscow Health Care Department
- 1,102 radiologists
- More than 30,000 studies a day
- More than 10,500,000 studies uploaded - 5,284,556 of which in 2020
- 1,371 diagnostic devices connected:
  - 192 CT scanners
  - 97 MRI scanners
  - 53 angiography machines
  - 21 PET/CT scanners
  - 630 X-ray units
  - 30 densitometers
  - 119 mammography scanners
  - 3 SPECT-CT machines
  - 12 gamma cameras
  - 214 photofluorography scanners
- 10,000 referring physicians check images and reports online
- More than 500,000 patients have downloaded their images and reports
- Report turnaround time reduced from 5 days to 1 hour
- Half the number of radiologists needed for the same number of reports

Agfa HealthCare Solution

- Enterprise Imaging is a secure, scalable platform that converges images and imaging data so that it can be viewed and shared, in real time. The Enterprise Imaging platform transforms the medical imaging ecosystem; enables multi-specialty, multi-site collaboration; empowers extended and connected care, and provides physicians with the insight they need to make informed decisions.

Enterprise Imaging Platform

- The XERO universal viewer enables radiologists and referring physicians "anywhere, anytime" access to the patient's holistic imaging history.

Regional Radiology Collaboratives - Benefits of Intelligent Networking?

Author: **Daniel Fascia I Director of Radiology I NHS Nightingale Yorkshire I Consultant Musculoskeletal Radiologist I Harrogate & District NHS Foundation Trust I Clinical Lead I Yorkshire Imaging Collaborative Project**

The Yorkshire Imaging Collaborative (YIC) is a combined technology and business transformation project which unified radiology imaging and report-sharing between 8 NHS trusts across Yorkshire, including the recently established NHS Nightingale Hospital Yorkshire and the Humber. Dr Daniel Fascia has extensive experience in radiology practices and technologies and has been in post as the Clinical Lead for Transformation at the Yorkshire Imaging Collaborative since 2017.

Key Points

- The Yorkshire Imaging Collaborative (YIC) transformation programme was designed to create a single unified radiology image and report sharing network across central Yorkshire.
- Agfa HealthCare's Enterprise Imaging (EI) is an imaging platform which provides Trusts with a unified PACS, complete with clinical tools, reporting functionality and a powerful workflow engine to maximise productivity.
- Agfa HealthCare's XERO Exchange Network (XEN), a web-based platform, is a sophisticated piece of viewing software that offers clinicians the ability to share images with other XERO users as part of a new XERO exchange network (XEN). This is particularly beneficial in support regional networks and ICSs.

Background to the Project

Dr Daniel Fascia is the Clinical Lead for the Yorkshire Imaging Collaborative (YIC) project, an eight-site group of NHS Hospitals whose ambition was to ensure that every patient in Yorkshire could attend an appointment and have full availability of their medical images and associated reports at the point of care.

The YIC went out to tender in 2017, and after a competitive process, the final contracts were signed with Agfa HealthCare to implement its Enterprise Imaging (EI) solution and XERO Universal Viewer, collectively known as XERO Exchange Network (XEN). In 2020, the YIC began to connect the XERO Image Viewer at each site to form the XEN across the Trusts.

The network was live within 4 weeks, and enabled the connected hospitals, which collectively cover a patient population of over 3 million, to diagnose patients who are transferred between sites at a much quicker rate than was previously possible.

What was the biggest hurdle in implementing a multi-site project of this size?

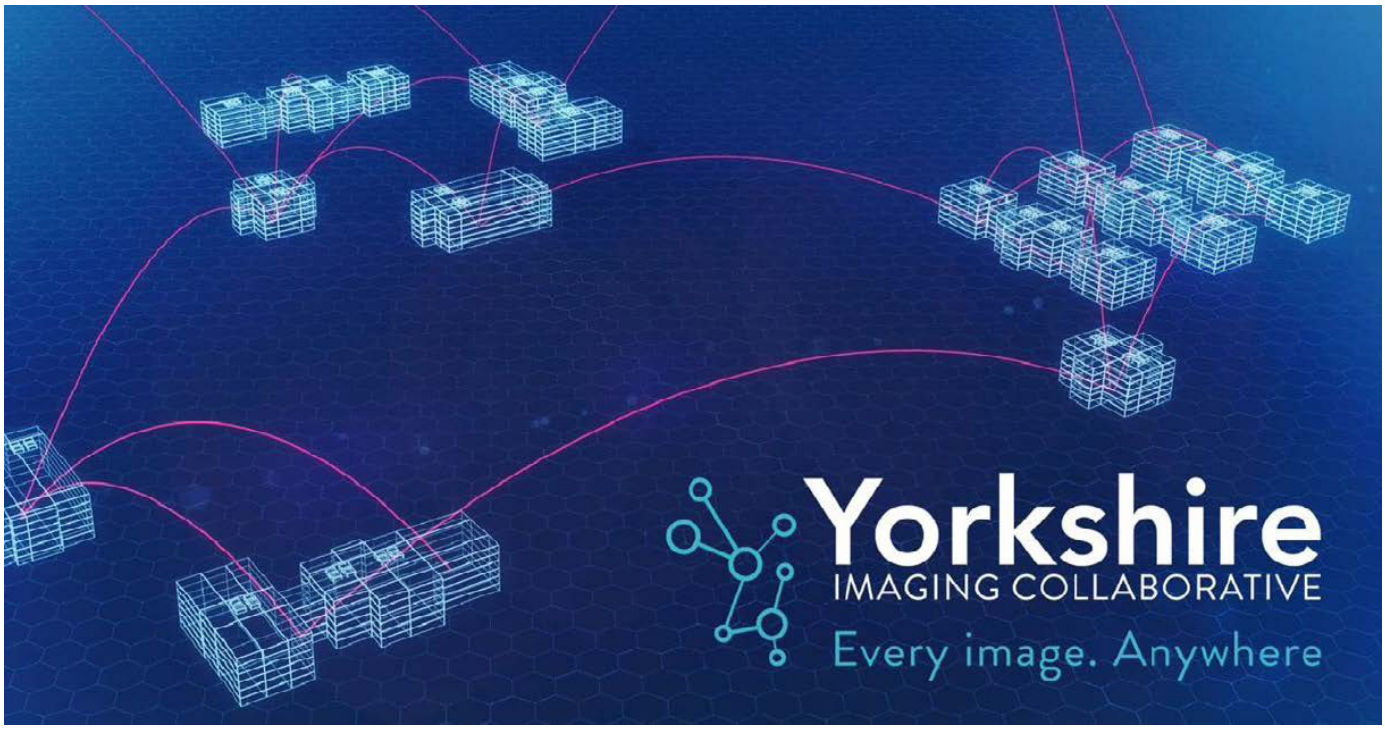
The biggest hurdle is less to do with technology, and more to do with the difficulties of the transformation - getting Trust teams philosophically on board.

During the earlier stages, many of the team agreed that the collaborative approach is a great idea, however when it comes to deploying the very concept we've discussed, there is resistance from the same group.

This emphasises that any source of change - positive or negative - is disruptive for human beings. Change needs nurturing carefully, and as a Collaborative, we needed to be sure to manage this diligently.

How did you mitigate these challenges?

The Collaborative adopted a specific approach to support a gentle transformation - a franchise model. This entailed lots of meetings, brainstorming, inviting opinions and reviewing how a change could be implemented. The project board would converge, discuss, and finish the meeting by concluding what we have decided. This way, any decisions and associated actions will not be a surprise, as each franchise holder had a contribution to the conclusion.



Generally, when you explain the concept to the project stakeholders, provide them a background of why a change is needed, and help them to understand how it will improve patient care, improve data accuracy, speed up working and running of meetings, they seem to be on board. This is because they gain an understanding of how it matters, and why it is important to them, the Trust, and our patients.

The Collaborative had the XERO Exchange Network (XEN) deployed within the Enterprise Imaging platform. Can you give an overview of the clinical benefits of a united radiology imaging and report-sharing solution?

The Project Board wanted one key outcome for the Collaborative - that every patient's full set of images, and the associated reports, would be available at point of care. XEN allowed us to do that.

The solution provided us with an index of all medical imaging for the region, along with the relevant reports, so that healthcare professionals could search by the patient's NHS number, find their record and view current and prior images across other sites; essentially having the full imaging record available. Reviewing this wider scope of information is an essential part of writing a good radiological report – it reduces administrative questions, enables concise comparisons and allows more certainty. This helps us achieve a gold standard of care.

In addition, as clinicians started to work more remotely due to the pandemic, this exchange of information was a huge benefit. The interruptions of COVID-19 also meant that we were having to ask patients to be scanned in other hospitals - other than what was routine, and yet we still had to review the results. XEN supported this change in working. We experienced an adoption curve, which was combined with the general disturbance of clinical tasks during COVID-19, but the group soon realised the key feature of seeing images from everywhere and understood that it was a big game changer.

How did these clinical realisations equate to benefit to the patient?

The ability to receive remote care. As an example, a patient can receive a scan in one of the peripheral hospitals, and yet his/her clinician at Leeds Teaching Hospital can still review it as simply as if the study was performed in Leeds.

This flexibility for the patient was paramount, especially during the pandemic when travelling was compromised and larger hospitals were already under significant strain with managing the surges in admissions and wanting to reduce the number of visitors to site.

What is your overall experience of the Enterprise Imaging concept within a Collaborative project?

Enterprise Imaging has been a very successful PACs replacement across our Imaging departments. It's a very modern piece of software which has a higher emphasis on workflow and built-in image viewing capabilities. The YIC found it to be an incredible productivity upgrade.

As a Collaborative, XERO Exchange Network allows Yorkshire NHS Trusts to collectively access radiology reports and view all images - across our entire region, completing the clinical history and helping us to write a more accurate report. As a radiologist, EI helps achieve that gold standard and is what makes a difference, to us and patients, on a daily basis. ■

Dare to Change!

Author: **Roland Kuffer I CIO I Chem Hospitalier Emile Mayrisch I** Grand Duchy of Luxembourg
Author: **Mike Moes I PACS Manager | Chem Hospitalier Emile Mayrisch I** Grand Duchy of Luxembourg
Author: **Mohamed Requieg I PACS Manager I Chem Hospitalier Emile Mayrisch I** Grand Duchy of Luxembourg

An overview of the successful collaboration between Centre Hospitalier Emile Mayrisch (CHEM) and Agfa HealthCare and the implementation of the Enterprise Imaging platform.

The Centre Hospitalier Emile Mayrisch (CHEM) is the biggest hospital in the southern region of the Grand Duchy of Luxembourg. 1861 staff and 258 doctors work across three sites to care for 100,000 patients per year. But from an information technology perspective, it is a single hospital.

CHEM has been using Agfa HealthCare's RIS/PACS solution for 25 years. As Roland Kuffer, CIO, describes, "we were one of the first! And we have collaborated with Agfa HealthCare all these years, working together to always push the envelope further. As part of this, over time, we became increasingly convinced of the advantages of transitioning from the dual RIS/PACS solution to a unified Enterprise Imaging platform. Any functionalities we implement at one site, should be available at all three sites, directly and seamlessly."

The final decision to transform to Enterprise Imaging came after a very thorough workflow analysis from order placement, scheduling, RIS functionality to embedded result distribution in the EHR.

"We had to be sure that all of the workflow elements, functionalities and interfaces between the different systems could be replaced by the Enterprise Imaging platform. Once we knew we would not lose any of this, we very quickly made the final determination to make the change," describes Mike Moes, PACS Manager at CHEM.

The contract was signed at the very end of December 2019, and installation of Enterprise Imaging began in March 2020. "Of course, this timing created some unexpected challenges, but no project goes entirely as expected, so flexibility between stakeholders is critical," describes Mr. Kuffer.

A Single Workstation For Each Persona

The benefits of the unified solution were quickly felt at every level: from doctors and technicians, to administrative staff, to IT and PACS administrators, explains Mr. Kuffer. "Each different type of user, or 'persona', has their own, dedicated desktop. To give an example of how this makes a difference, with a RIS/PACS, the technicians get the worklist from the RIS, but they cannot see the patient's previous exams there: that requires the PACS. With our Enterprise Imaging, both the worklist and access to previous images are provided from the same platform, on one workstation."

Secretaries also have a dedicated desktop with their worklist, which was previously in the RIS, but is now on the consolidated enterprise solution.

For the doctors, Enterprise Imaging has also resolved the inefficiencies and difficulties of the RIS/PACS dichotomy. Mr. Kuffer points out that, increasingly, the clinicians' requests for imaging must be validated by a radiologist. "This is quite difficult to streamline in a traditional RIS/PACS set-up: the doctor must do one action in the RIS, and another in the PACS.

But with Enterprise Imaging it is very easy: the radiologist can validate the request and transform it into an order on a single workstation, even for more complex exams such as those using ionising radiation. You can define a different workflow for every type of exam, if you want. One radiologist can validate the exam request, another can interpret it. Enterprise Imaging is very flexible with workflows: any set-up you want is possible."

Another important advantage is that administration is simplified for the PACS administrator, thanks to the single console for handling interfaces, troubleshooting, managing the system setup, and more.

One-Click Images: XERO Seamlessly Integrated in the EHR

To further enhance the efficiency of the workflows and extend this advantage to the clinicians, CHEM decided to integrate the Agfa HealthCare XERO universal viewer deeply into the EHR, giving greater relevance to imaging information by placing it in the context of the patient's record.

"Often, the XERO viewer is integrated in the EHR at the patient level, but we wanted to push things further. By integrating it at the exam level, our clinicians can now open the relevant exam in the viewer, with just one click access directly from the EHR. This decision required a bit more work during

Centre Hospitalier Emile Mayrisch

the implementation of Enterprise Imaging, but will offer long-term benefits," describes Mr. Kuffer.

A Consolidated Platform That Reduces Total Cost of Operation (TCO)

In parallel to the benefits felt by the users, other advantages are more strongly experienced 'behind the scenes'. "Having a single platform that consolidates servers, interfaces and systems simplifies installation and maintenance, saving the IT team a tremendous amount of time and effort," explains Mr. Kuffer. "With the RIS/PACS, just installing one workstation required configuration with the RIS, the PACS, the Speech functionality – that last one could take hours! And whenever there was a problem, we had to determine if it came from the RIS, PACS, etc. So there were a lot of analyses to do.

With Enterprise Imaging, installing software or setting up a new workstation is much easier. And with a single overview, we can quickly determine the cause of the problem and fix the configuration. So even though there are more servers now, we can see everything on a single desktop; it's much more manageable."

As Mr. Kuffer describes, with Enterprise Imaging, no broker is needed between the RIS and PACS, so from three systems, they have moved to one. "That means one installation, one client, one configuration – the advantages are undeniable!"

Reaching Beyond Radiology: Clinical Pathways

The advantages of Enterprise Imaging reach far beyond the radiology department. "With Enterprise Imaging, the PACS is no longer an isolated island; instead, it is in the centre of the village, supporting our clinical pathways. For a wide range of the specific patient cases a set of different actions for lab, medication, care and radiology are predefined. Radiology plays an important part in the smooth workflow of the care path. "

He describes, "In our emergency department, we have created a dashboard showing the status of radiology and laboratory exams. Staff can see, on one screen, the status of all exams ordered for the patient: when they begin, when they are finished and when the report is available. In most hospitals, emergency department staff have to call around to see where anything is. But with Enterprise Imaging, we have all of the information needed, in one place. Enterprise Imaging communicates all the exam statuses via HL7, for the integration of a consolidated view of our emergency department."

He continues, "Furthermore, like many hospitals, we use a third-party endoscopy modality, and the relevant data is kept in an endoscopy documentation system. With Enterprise Imaging, all of the data and reports are available in one platform, which means that the clinicians can view both conventional radiography and gastrocolic images using XERO. In the same way, they can access ECGs, for instance. This fits with our vision of integrating the imaging data from all image-creating departments across the hospital into Enterprise Imaging, and making it available to our care professionals through the patient record."

Informed Decisions

Using the unified platform has also enabled the hospital to standardise its use of the Business Intelligence tools. "We were already using Business Intelligence in our previous system to

monitor the performance of the departments. However, there were a variety of individual analyses being made ad hoc.

With Enterprise Imaging, everyone can go through the same interface, which enhances control and cohesion, making it easier to optimise our processes and take informed decisions on, for example, investments," he describes.

implementation planning, especially as the Agfa HealthCare team could not come to the hospital. However, they remained directly accessible to us; whenever we had a question or problem, we could contact our technical support team. That was critical to the success of the project," describes Mohamed Reguieg, PACS Manager for CHEM.

With Enterprise Imaging, we finally have a truly single, unified system. This is the logical step hospitals have been waiting for

Close Collaboration Between Imaging, IT and Agfa HealthCare

"There are two particularities about our project that I believe played a big role in enabling it to move as smoothly as it did, despite the global COVID-19 pandemic. Firstly, is our very strong implementation team within CHEM. The other is the close partnership we have with Agfa HealthCare.

At the hospital, the PACS team is fully integrated in both the imaging and the IT worlds, forming a bridge between the two. "Mike and Mohamed's knowledge of both sides of the equation enabled us to jump over several hurdles, and to make certain decisions during implementation more quickly," says Mr. Kuffer.

"I'm very proud of my entire team, including those responsible for interoperability, and those who installed and configured the PCs. The migration was a joint effort that required careful and correct planning. There were a lot of interfaces with the PACS that disappeared from one moment to the next, so close coordination between imaging and IT was critical to maintain normal hospital functioning without disruption."

"The COVID crisis impacted – at the last minute! – our

Daring to Change

While Mr. Kuffer considers Enterprise Imaging the 'logical' step for hospitals, he sees it as even more: an opportunity to disrupt processes and evolve into a next-generation healthcare provider.

"When you have been working with one system for 20 years, and you have the chance to use something new, it's a big step. You have to take the time to question and re-evaluate your processes. Don't just try to adapt the new solution into what you have been doing: explore what you can do more with the new system, evaluate the possibilities, and adapt your workflow to that. The world has changed, and your processes shouldn't be the same as 20 years ago."

"Of course, change management in the organisation is important: it isn't easy to turn your back on those 20 years of familiar processes! To facilitate the change, we set up a steering committee that met every week, and as I said before, having PACS managers with one foot in radiology and one in IT was a big help. But in general, I find that once people have time to get used to the new system and way of working, they never want to go back to the old way. So dare to change!" ■

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