

DAY 1

National imaging infrastructures cases in the light of EHDS

Frank
& Nikolaus





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BRUSSELS 2026
25-26 MARCH 



Moderators



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Today's Agenda

- Introduction to Xt-EHR
- How do countries prepare for EHDS, given the current situation?

Insights from:

- *Austria*
- *Norway*
- *Netherlands*
- *France*
- Q&A

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An introduction to Xt-EHR – Imaging
EEHRxF specifications

Esther Peelen Nictiz 



Define the EEHRxF – EHDS Articles 14 & 15

European Commission to lay down specifications for **European Electronic Health Record Exchange Format (EEHRxF)**

When: 26/03/2027

Background: Commission Recommendation (EU) 2019/243 of 6 February 2019 on a European Electronic Health Record exchange format

To establish a common, machine-readable format for priority health data, including patient summaries, ePrescriptions/eDispensations, medical images and imaging reports, medical test results, and discharge reports for structured and unstructured data. The EEHRxF shall include the following elements:

- *Harmonised data sets to represent clinical content*
- *Code systems and value sets*
- *Standards and profiles for exchange*



Extended EHR@EU Data Space for primary use



EHR
@ dataspace



Funded by
the European Union



Xt-EHR Sharing Medical Imaging Studies and Reports across Europe



Purpose, context and Scope

- **Purpose:**

- To enable health professionals finding the **right diagnosis** in planned and unplanned care situations by making studies and reports available in a uniform way
- To enable health professionals to **compare** previous imaging studies and reports with current studies and reports to support optimal clinical decision making
- To **empower patients** by granting access to their imaging studies and reports

- **Context:**

- Applicable to **cross-border** sharing of medical imaging studies and imaging reports as well as to **national** level interoperability to ensure consistency and avoid fragmentation and duplication of efforts.

- **Scope:**

All Imaging studies including annotations, measurements a.o. recorded in DICOM format and related Imaging Reports produced by specialties such as radiology, surgery, nuclear medicine, cardiology, internal medicine, gynaecology, obstetrics, dental medicine, urology.

EHDS Compliant Use Cases - descriptions



- Making a Medical Imaging Study Available in EEHRxF
- Making a Medical Imaging Report Available in EEHRxF
- Sharing a Medical Imaging Study and/or Related Imaging Report between Health Professionals, **national** and **cross-border**
- Patient Access - Viewing/Downloading a Medical Imaging Study and/or Imaging Report by **Patient**
- Patient Access - Sharing/Uploading a Medical Imaging Study and/or Imaging Report by **Patient to EHR-system**

Making use of widely adopted international standards



IHE International
Integration Profiles

HL7 FHIR
Implementation
Guides (R4&5)

LOINC

DICOM



MADO

Imaging Report

IDMP

SNOMED CT
clinical terminology



Overview content D7.2 Imaging Guide – Draft version

- I Aim of this document
- II Scope and Interdependencies
- III Intended Use
- 1. Introduction
- 2. Methodology
- 3. Analysis of the existing guidelines
- **4. Implementation Guides**
 - **Business and functional specifications:**
 - **Semantic specifications**
 - **Functional Specifications**
 - **Preferred code systems and value sets**
 - **Data Model (data sets)**
 - **Guidelines for implementers (FHIR IG & IHE)**
 - **Conformity Requirements**
- 5. List of references
- Annex I Logical Models and Obligations
- Annex II Sequence Diagrams
- Annex III Query parameters/Model

To be published May 2026



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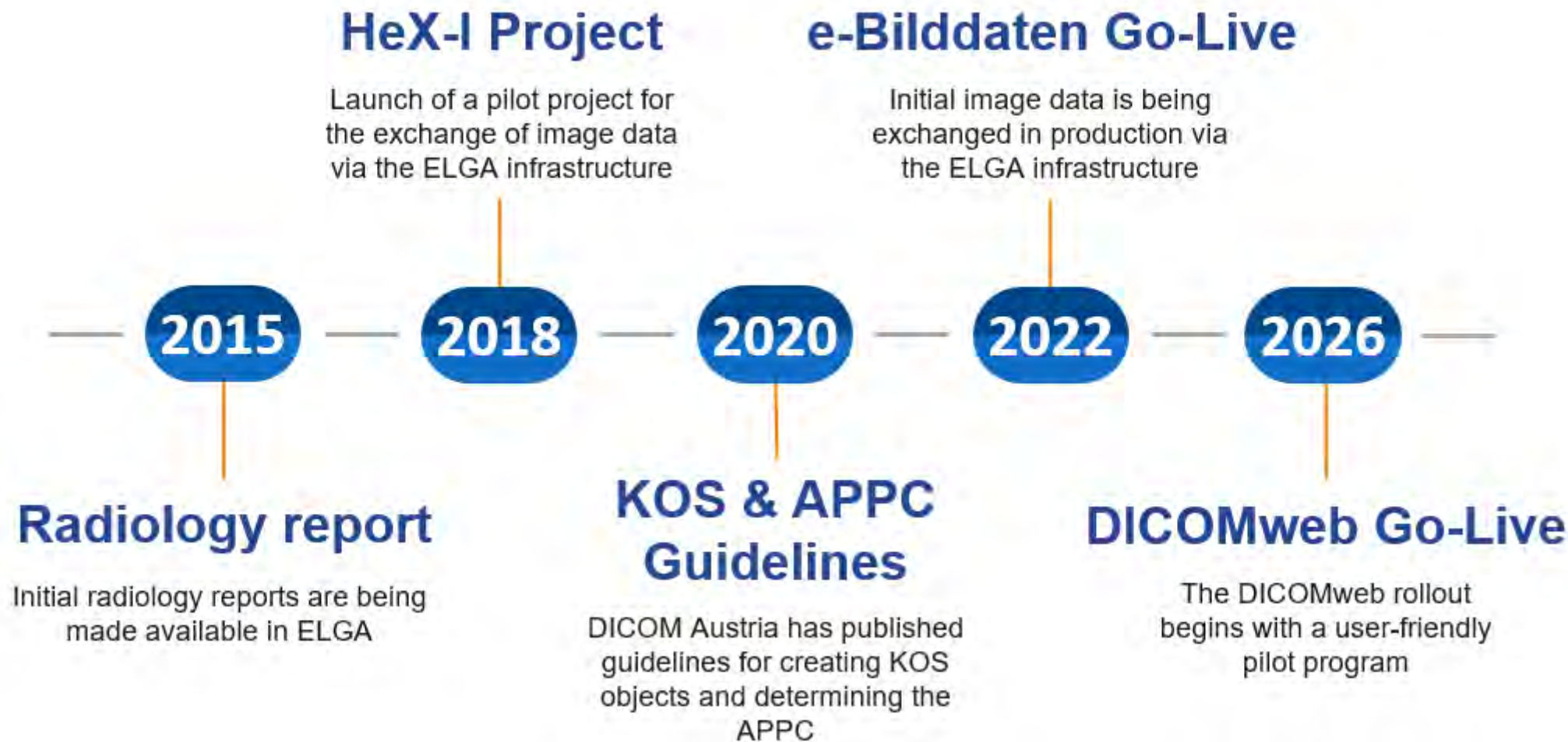


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Austria - ELGA



Nikolaus Krongraf



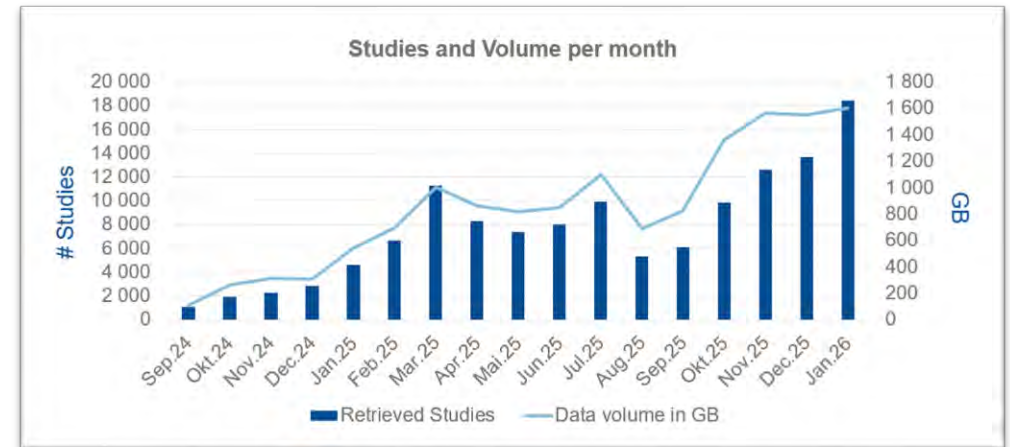
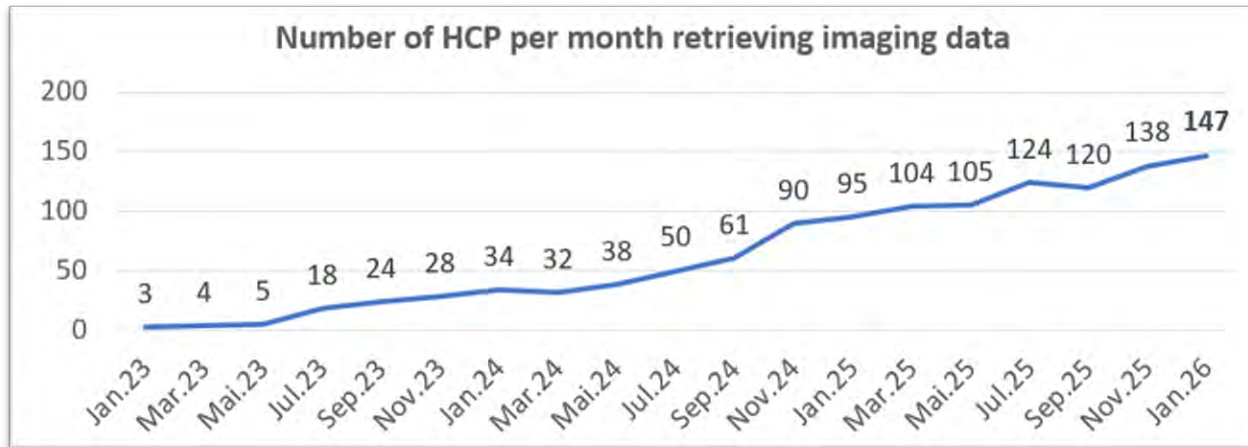
Why Images in ELGA?

- Use Cases
 - Assignment
 - Referral
 - Follow-up
 - Mammography screening
 - Tele-radiology
 - Second opinion

Users

- **Hospitals**
 - ~270 Hospitals
 - Public ones and private ones
 - often organized in associations sharing common infrastructure
- **Imaging centers outside hospitals**
 - often performing studies after referral from hospital
- **Registered doctors, private practices**
 - Radiologists
 - „Image-consuming“ doctors like orthopaedists
 - other doctors, general practitioners
- **Rehab and care facilities**

Imaging in numbers



New imaging data:

2024: ~ 1.6 Million

2025: ~ 1.4 Million

HCPs record historical image data at go-live, which explains the higher volume of new data in 2024



ELGA – Technical Facts

- Architecture based on IHE XCA
- 13 affinity domains („ELGA Bereich“)
 - federated regional registries
- Runs in dedicated, secured network infrastructure
- Central components: Master Patient Index, Access Control, ...
- National Specifications:
 - ELGA Architecture
 - HL7 Implementations Guidelines for CDA Documents and XDS Metadata
- Centrally managed terminologies: <https://termgit.elga.gv.at/artifacts.html>

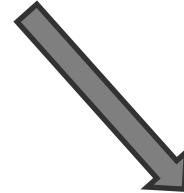
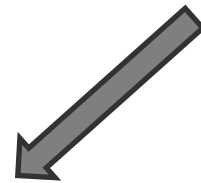


Austria also supported the work on the IHE Profiles

- MADO
- XC-WADO
- IDR

Challenges during implementation

 **EHDS Compliance**



 **Semantic Interoperability**

Harmonizing & mapping of code systems across the EU

 **Technical Readiness**

Preparing infrastructure & APIs for cross-border imaging exchange

- Austria has many tourists, especially interested in winter sports...
- Working towards EHDS, we learned that
 - our infrastructure is already well advanced
 - we *think* we are on the right track



Picture credits: Unsplash and Pexels

 **Common standards & secure communication**


Information always available at point-of-care
Seamless access to patient data anywhere in Europe


No more redundant examinations
Eliminating repeated tests across care settings


More cost-effective healthcare
Optimized resource utilization across Europe

We are happy to provide more details and answer questions, reach out to us at standards@elga.gv.at



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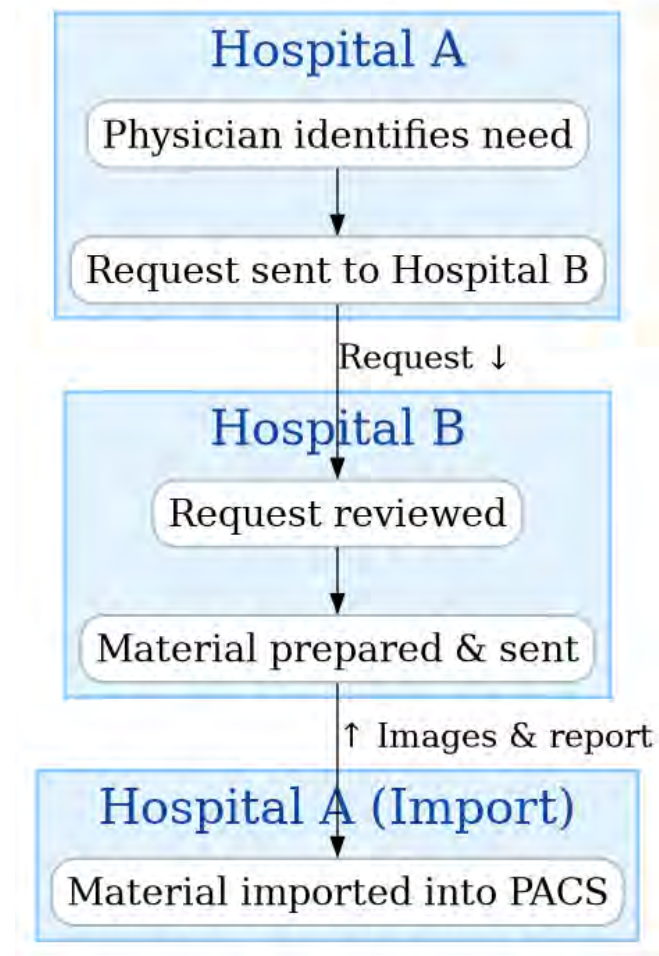



Norwegian imaging implementation


Brussels, 25.03.26

Frank Samdahl, Morten Bakken -
Helsedirektoratet


National Imaging Implementation



Ministry of Health and Care Services 

Directorate of Health 

Xt-EHR
Stakeholder consultations
Impact analysis work

National Service provider 

Impact analysis for national services

National e-Health Board

National Standardization Committee

Image sharing:
22 Organizations in Stakeholder group
2 main vendors key parts



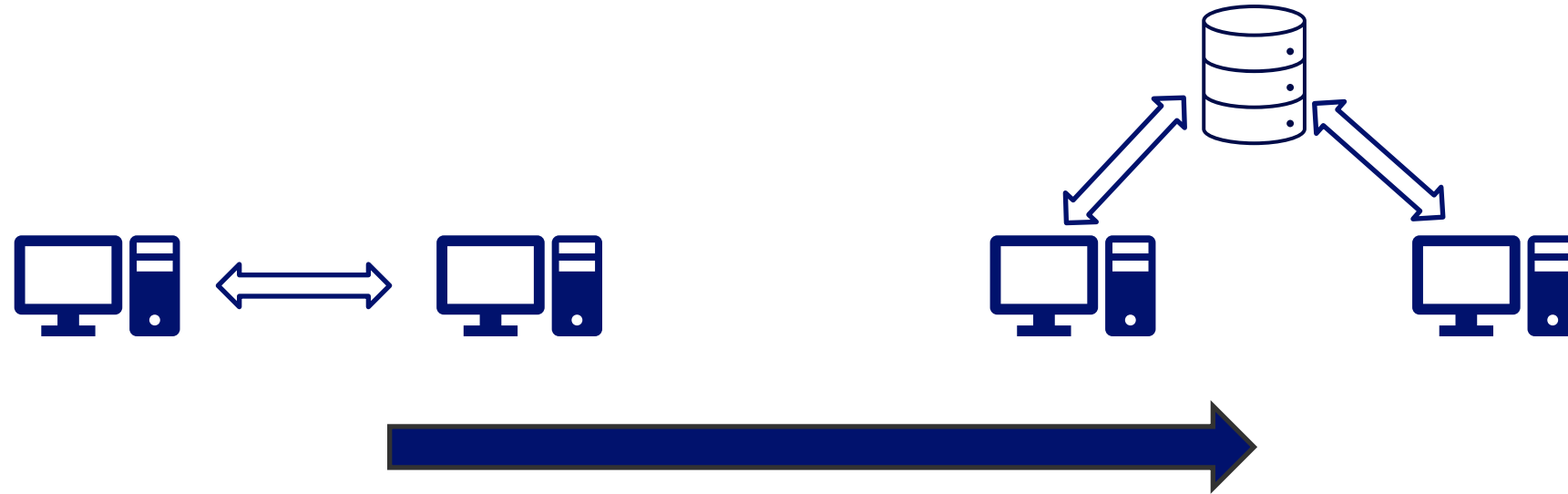
Challenges in Norway

The boring bit:

- Financing
- Resources
- Timeline
- Technical knowledge

The interesting bit:

- Image sharing already works quite well. Why change?
 - Risk of losing functionality
 - Low motivation in vendor market



Currently no central registry or repository for imaging studies in Norway

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Netherlands



Ioannis Manousioudakis

Andries Hamster

Nictiz 

 Founda
Health





National legislation on digital information exchange in Healthcare “Wegiz”

1 July 2023 into force

Step-based approach on implementation, spread out over multiple years (2023-2028)

Prioritised domains for **primary use**:

- Patient Summary data
- Nursing Discharge Report
- **Medical Imaging (Radiology)**
- Medication (prescription and dispensation, medication overview, lab results for medication, adverse event monitoring)
- Emergency Care



Medical Imaging (Radiology)

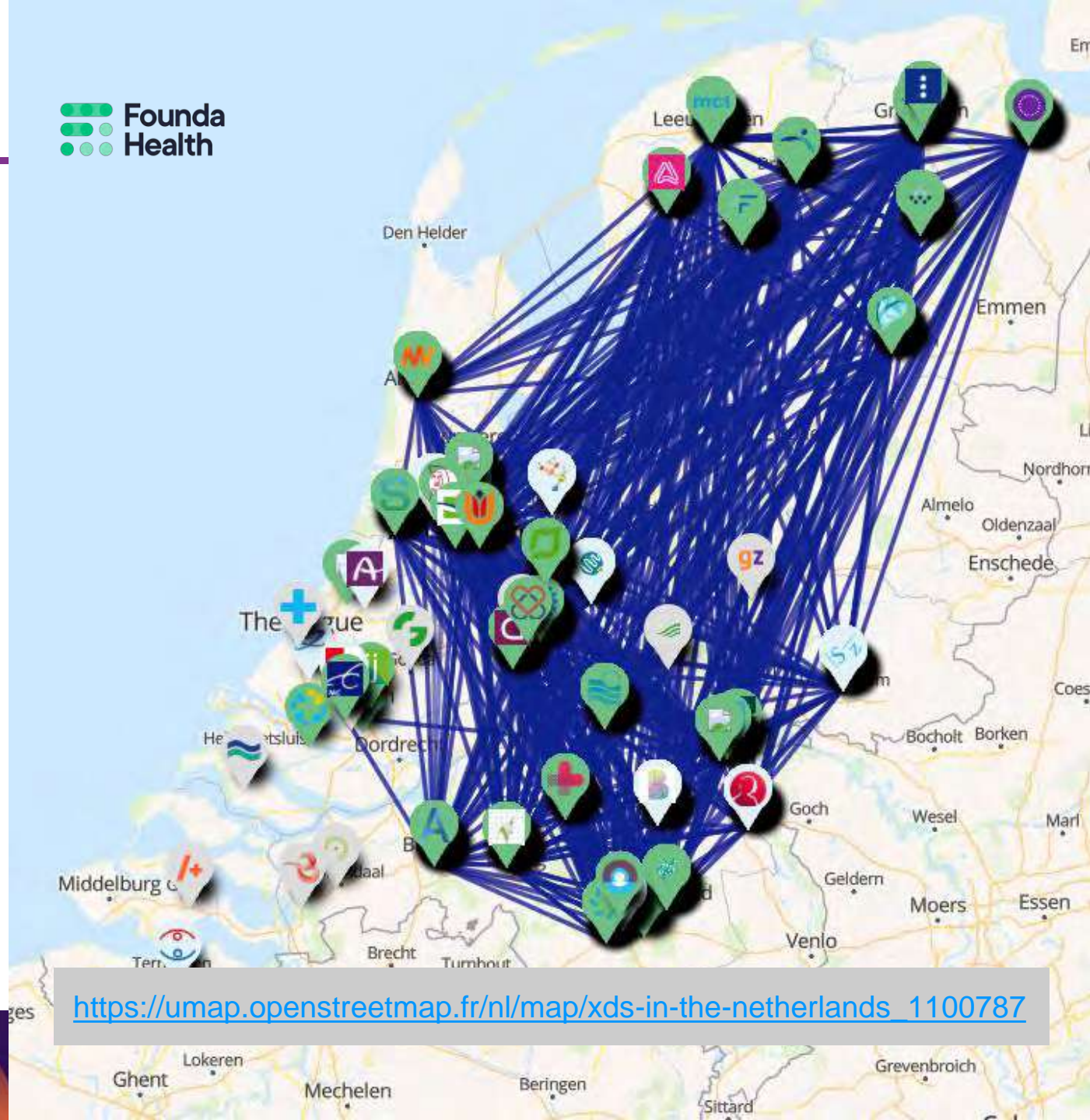
- [Quality standard](#) for health professionals
- National standard: [NEN 7541:2026 nl](#) 'Health care data exchange - Availability of radiology investigations - Image and report'
- Nictiz information standard V1.0.0: [Functional documentation](#) / [Implementation guide](#) (XCA-I)
- Current deployment architecture:
Federated regional document registries with distributed PACS/VNA's
- To close the gaps between regions:
Commercial solutions are being utilized

IHE based Image Exchange in the Netherlands

- 70% of Dutch hospitals connect via federated XDS/XCA network
- Key elements
 - National Sharing Agreement
 - Consent mediated exchange
 - Multi-vendor
- Works In Progress
 - Connect remaining 30%
 - National Image Availability
 - National level Prefetching
 - National Consent Registry
 - Modernizing technology (MADO, XC-WADO)
 - Patient Access to DICOM Object



Andries Hamster (Founda Health B.V.)

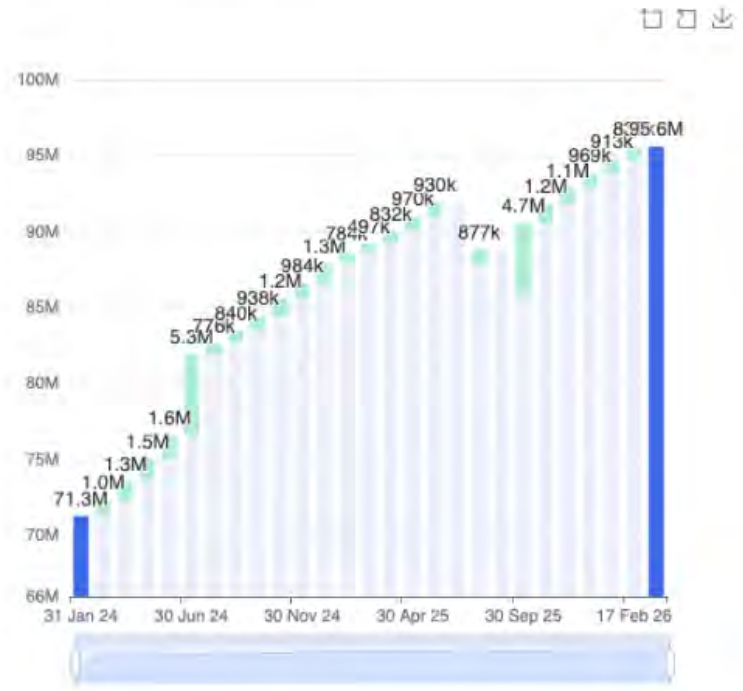


https://umap.openstreetmap.fr/nl/map/xds-in-the-netherlands_1100787

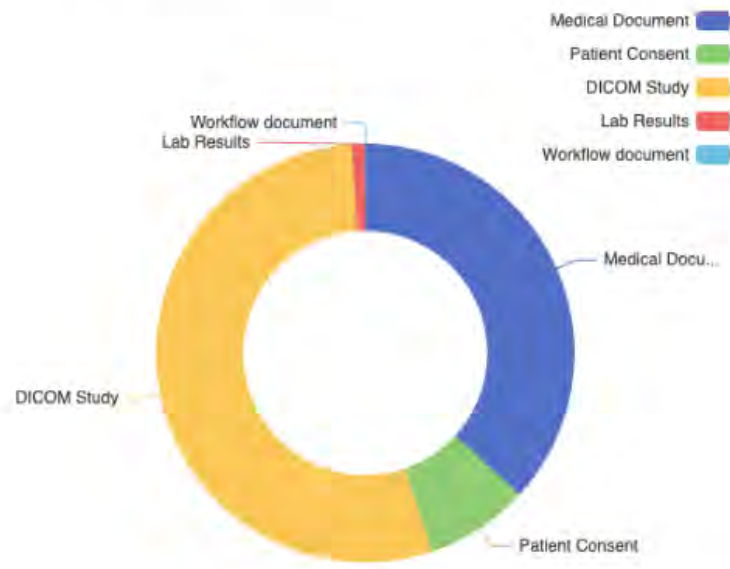


| | | | |
|---|---|--|--|
| <p>Total Document Volume</p> <p>95,597,554</p> | <p>Total Registered Patients</p> <p>23,447,084</p> | <p>Total Exchanged DICOM</p> <p>498,442</p> | <p>Total Exchanged Documents</p> <p>3,945,073</p> |
|---|---|--|--|

Document Volume Growth



Document Type Distribution



Total Document Volume: 12,361,218

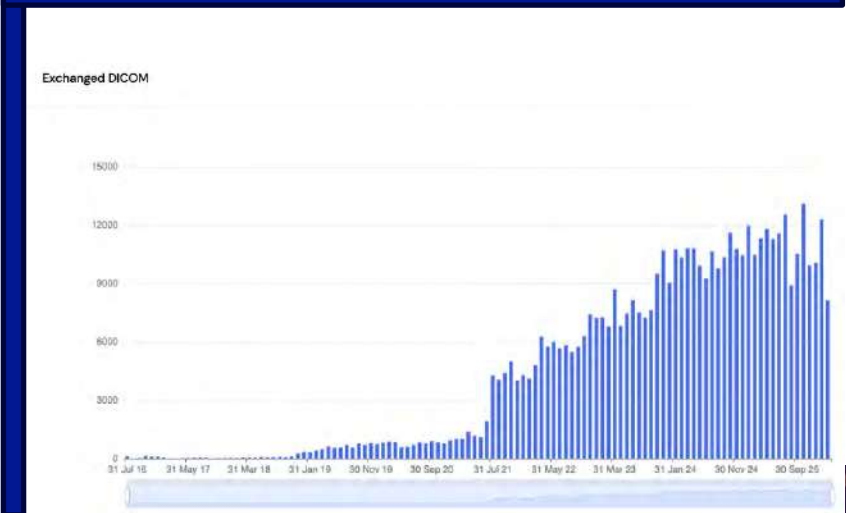
Total Registered Patients: 3,945,594

| Total Exchanged DICOM | | Total Exchanged Documents | |
|-----------------------|--------|---------------------------|---------|
| Inbound | 39,045 | Inbound | 393,014 |
| Outbound | 8,972 | Outbound | 349,680 |

Total DICOM studies retrieved by Amsterdam UMC from Peer Organizations : 39,045

Exchanged DICOM: Bar chart showing volume from Sep 20 to Sep 25, peaking at ~1400.

Peer Network: Sankey diagram showing connections to various organizations like Ziekenhuis Amsterdam, In VO, etc.





Wegiz

NL Patient Summary

Medication Process

Medical Imaging

Nursing Discharge Report

Emergency Care

EHDS / EEHRxF

EU Patient summary

ePrescription/eDispensation

Medical Imaging & Reports

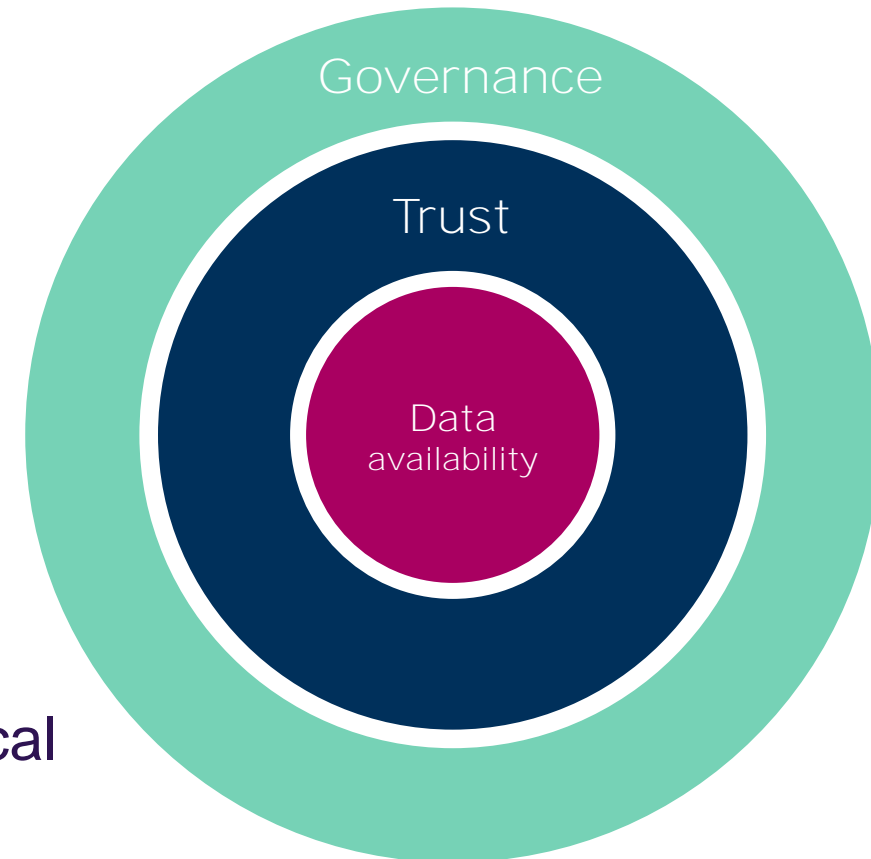
Discharge Reports

- **Fit-Gap** analysis NL vs EHDS
 - Harmonizing code systems/value sets
 - Expanding from 'Rad only' to 'Imaging'
 - Opt-in vs opt-out
 - Degree of control by patient
 - Unstructured (PDF) vs structured report
- Development of **V2.0.0** Nictiz info standard
 - Inclusion of EHDS-specs



Medical Imaging (all imaging departments)

- Achieve **data availability** in the Netherlands
 - Primary use
 - Secondary use
 - Prevention
- Data driven healthcare based on data we **trust**
- EHDS specs are the minimal specs as the basis: logical information models





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Égalité
Fraternité*



LA E-SANTÉ
FRANÇAISE



DRIM-M & MES IMAGES MEDICALES

Enabling Nationwide Interoperability for Medical Imaging in France

Vincent Perrault



Financé par
l'Union européenne

NextGenerationEU

The Ségur Ambition: Enabling Seamless and Secure Health Data Sharing

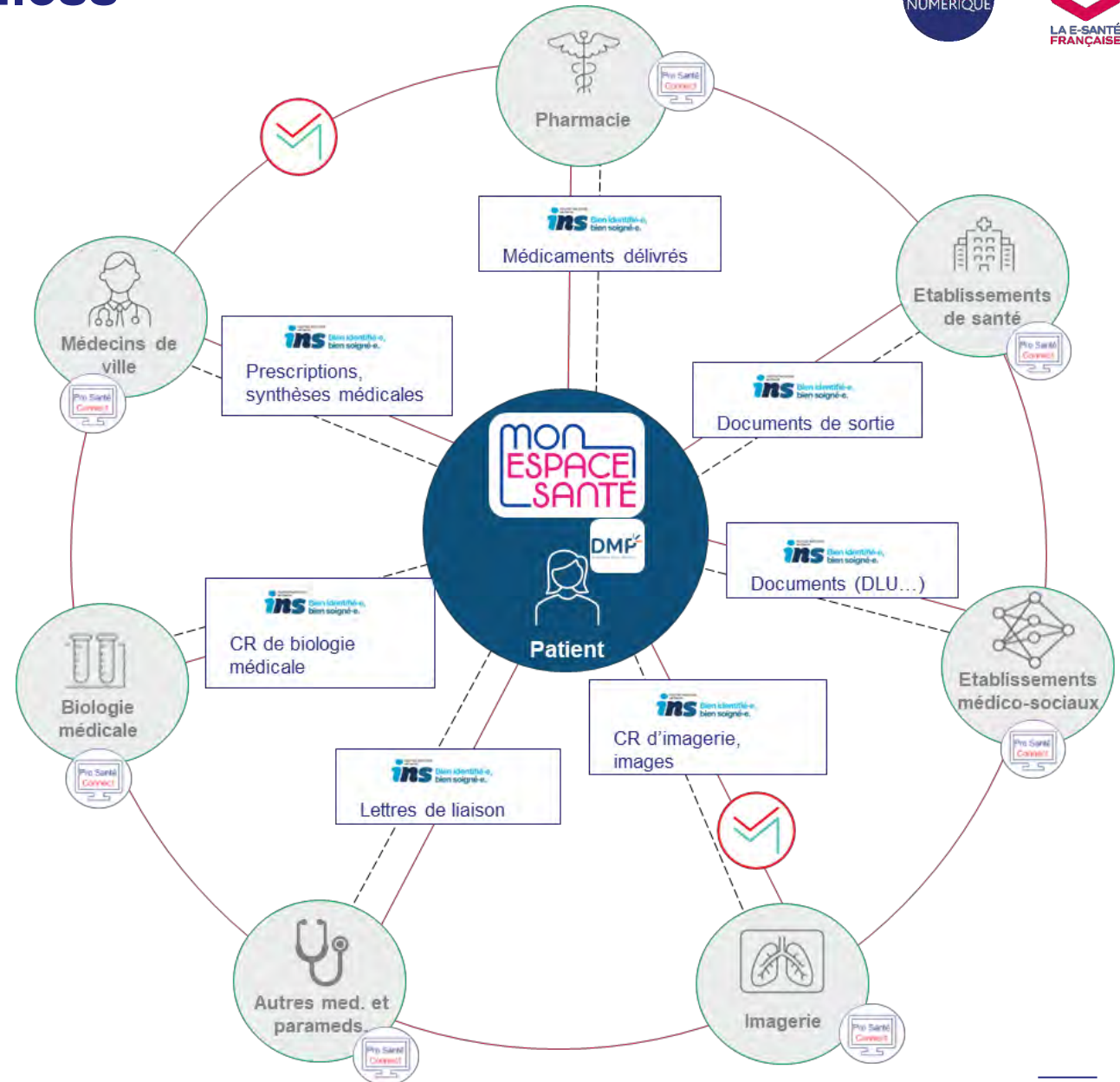
A centralized architecture was selected for most health data (HDAS, HPAS → MES), **except for medical imaging**.

Unlike other types of medical data, imaging studies are not effectively shared today, leading to multiple systemic challenges nationwide.

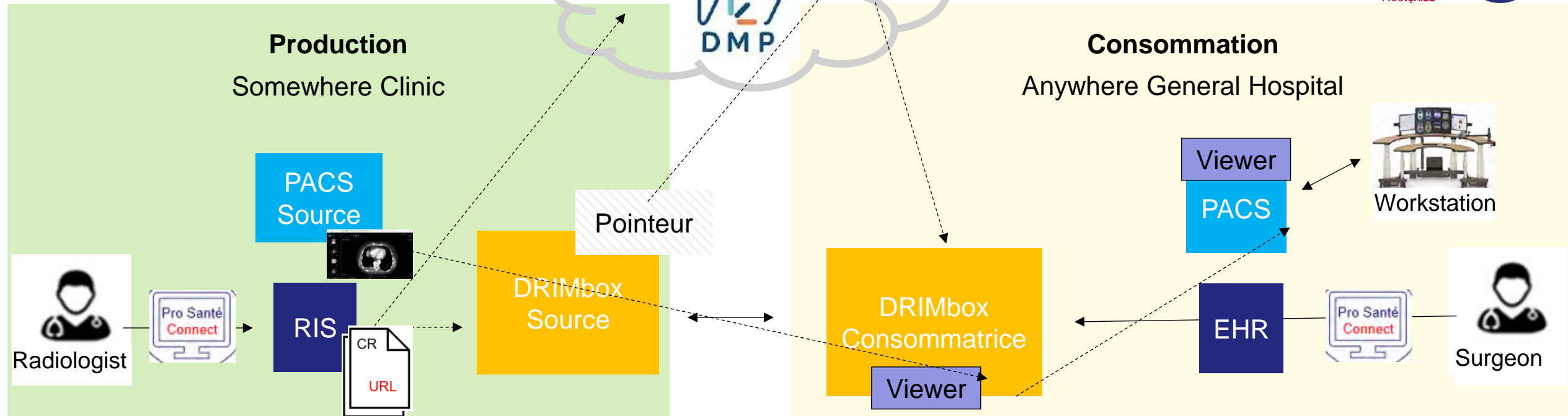
- Imaging data remain siloed within each healthcare facility (as required by regulation), while interoperability and cross-site access are still limited.
- Distribution of imaging between healthcare professionals remains complex and inefficient.

Policy response

To address these challenges, the Ségur Digital Program includes the extension of our centralized Patient repository to incorporate medical imaging data within its national roadmap.



Workflow



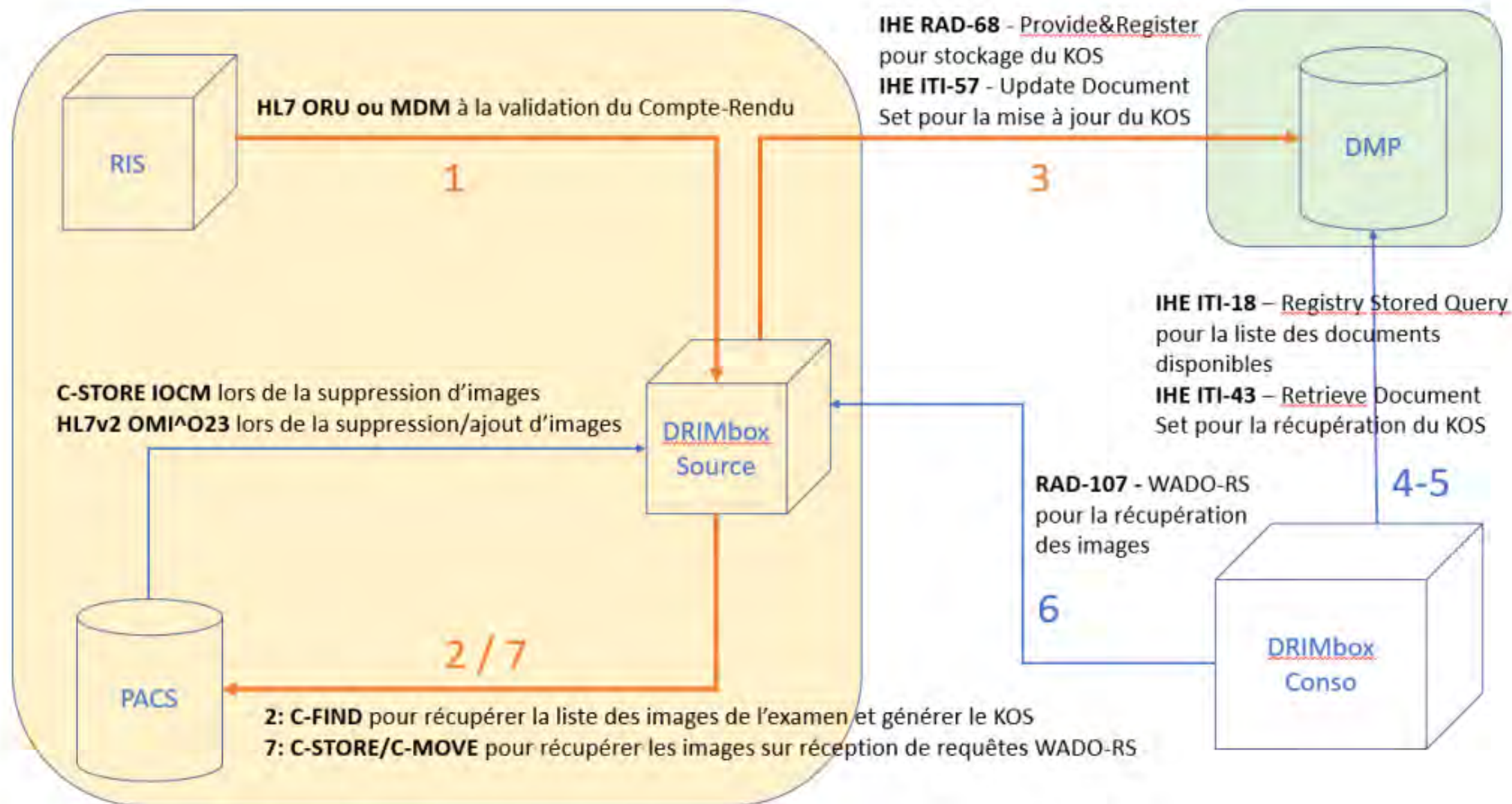
Production

- **Step 1:** The MRI scan is performed. Images are stored in the PACS. The report is validated in the RIS and uploaded to Mr. Bernard's DMP.
- **Step 2:** Report data are used by DRIMbox Source to generate a KOS (Key Object Selection). This KOS is uploaded to Mr. Bernard's DMP.

Consumption

- **Step 3:** The surgeon wants to review all pelvic imaging studies performed for Mr. Bernard. He logs into his EHR and accesses DRIMbox Conso using secure authentication (PSC).
- **Step 4:** Through DRIMbox Conso, the surgeon retrieves the pointer stored in the DMP.
- **Step 5:** Using the exam references contained in the pointer, DRIMbox Conso retrieves the images from the source PACS for viewing via the integrated DICOM viewer. The images can also be imported into the local PACS or workstation.

Profiles for imaging exchanges



Expected benefits



- **Patient and Clinical Benefits of DRIMbox :**
 - DRIMbox significantly improves continuity and quality of care by enabling seamless access to imaging data across healthcare settings.
- **Improved clinical decision-making :**
 - Immediate access to prior imaging studies enhances diagnostic accuracy and clinical relevance
 - Better assessment of disease progression over time
 - More efficient and informed surgical planning
- **Reduced unnecessary procedures**
 - Avoids duplication of imaging studies when patients move between facilities
 - Limits exposure to unnecessary radiation and reduces healthcare costs
- **Enhanced multidisciplinary collaboration**
 - Facilitates access to imaging from multiple sites during multidisciplinary team meetings (MDTs)
 - Streamlines second opinions, replacing fragmented exchanges (CDs, paper, written reports) with direct image access
- **Unified and simplified access to imaging**
 - Centralized and standardized access to imaging data, regardless of where exams were performed
 - Eliminates reliance on physical media (CDs, paper), reducing delays and resource consumption

Architecture and environmental impacts

- Imaging studies remain stored at the production site; only relevant exams are transferred on demand rather than systematically
 - No redundant centralized storage in addition to local storage
-
- **Avoidable travel and associated carbon savings**
 - Avoiding precautionary patient transfers due to lack of remote access to imaging
 - Reducing the need for radiologists to travel to screening centers (e.g., organized breast cancer screening programs) as digital workflows expand
 - Eliminating physical transport of films and paper records via courier with the dematerialization of screening programs

Perspectives



Professional adoption and collaborations with vendors

Challenges with implementing EEHRxF

Advantages of EHDS Compliancy :

- Access to images while traveling
- Cross-border expertise
- Cost reduction
- Facilitate research

Financial model : initial public funding for deployment and maintenance

Deployment roadmap

Taking into account clinical, technical, and financial factors—while acknowledging the effort required—deployment is expected to be rapid and structured in three phases:

- End of H2 2025: initial deployments and first use cases
- 2026: nationwide rollout
- 2027: full operational maturity (“steady-state”)



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How do **you** prepare for EHDS compliant Imaging sharing?



Thank you!



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Panel Moderators



Esther Peelen and
Ioannis Beerendonk-
Manousioudakis, Nictiz



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Austria



Morten Bakken and Frank Samdahl
Norway



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France

Panelists