Imaging Integration in Austria's National Electronic Health Record ELGA

Sponsored by

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Disclosures

Nature of Relationship	Company / Organisation
Consulting	City of Vienna
	ELGA GmbH
Research	Austrian Institute of Technology (AIT)
Without salary	DICOM Usergroup Austria
	DICOM Standards Comittee
	DICOM Working Group 32

CONTENT

* ELGA: Facts and Figures

* Why and how we did Imaging Integration

* Lessons learned so far

* Outlook – what's coming next

ELGA – Basic Facts

- Austria's national electronic health record

- Based on national law

- Opt-out (totally or for a given situation)

- Patient has full access to his/her data and audit repos

- Healthcare professional may access the data only if there is a treatment relationship (access is granted for a defined time – currently 90 days)

ELGA – Technical Facts

- Architecture based on IHE XCA

- 13 affinity domains („ELGA Bereich")

- 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

ELGA in Numbers

- **e-Reports** (since 2015)
  - Total: >80 million documents
    54,4% Laboratory Reports, 26% Imaging Reports,
    16% Discharge Letters, 1% Out-Patient Report,
    0,6% others
  - ~1.5 M new per month

- **e-Medication** (since 2018)
  - ~9 million new prescriptions per month

- **e-Vaccination** (since 2020)
  - Total: >28 million vaccinations
    (especially COVID)

e-Reports, Sept 2023

- Out-Patient Report; 1%
- others; 0,60%
- Discharge Letter; 16%
- Imaging Report; 28%
- Laboratory Report; 54%
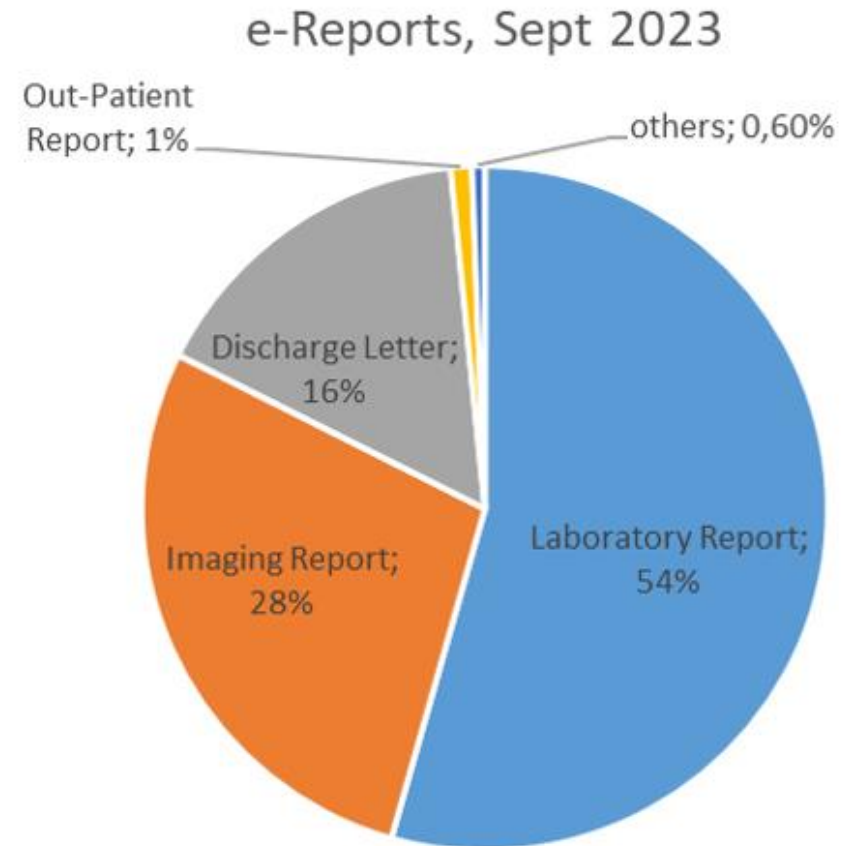
Why Images in ELGA?

Use Cases

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

Picture credits: Unsplash and Pexels

- 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 orthopedists
  - other doctors, general practitioners

- Rehab and care facilities
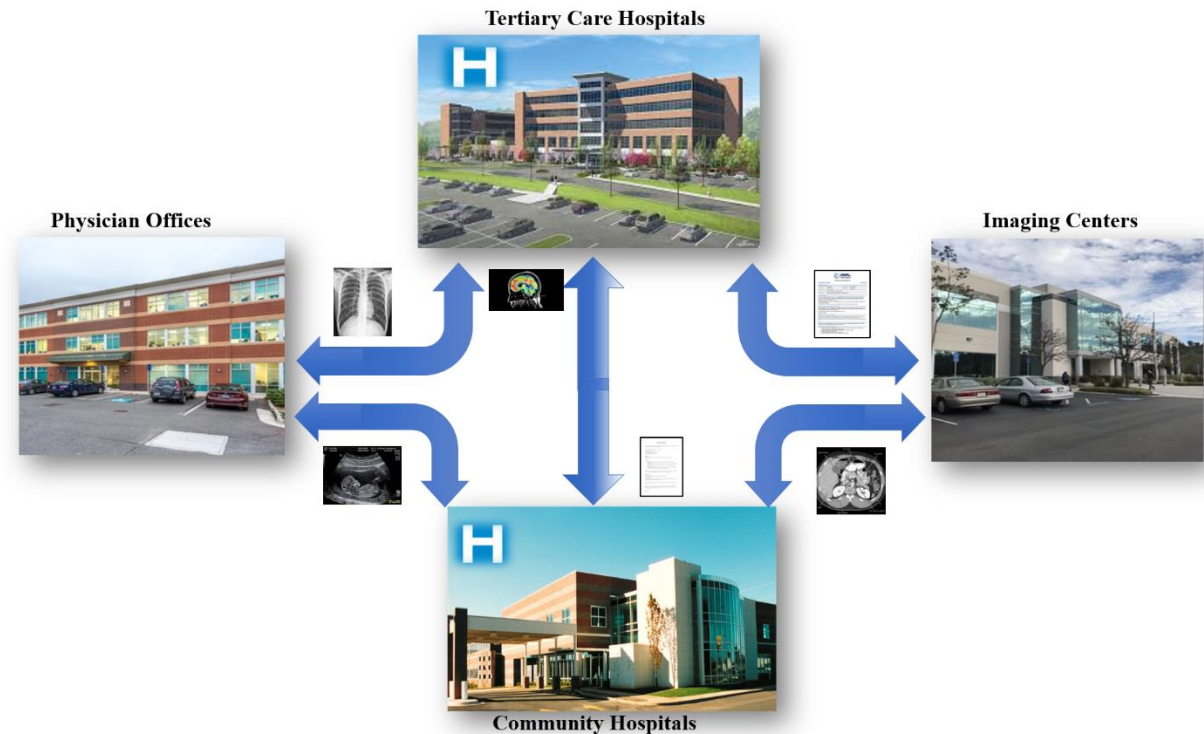
Picture: https://wiki.ihe.net/index.php/Import_and_Display_of_External_Priors

Imaging in ELGA – Current Status

Based on <u>IHE XCA-I</u> – started in 2022, broad roll-out in 2024

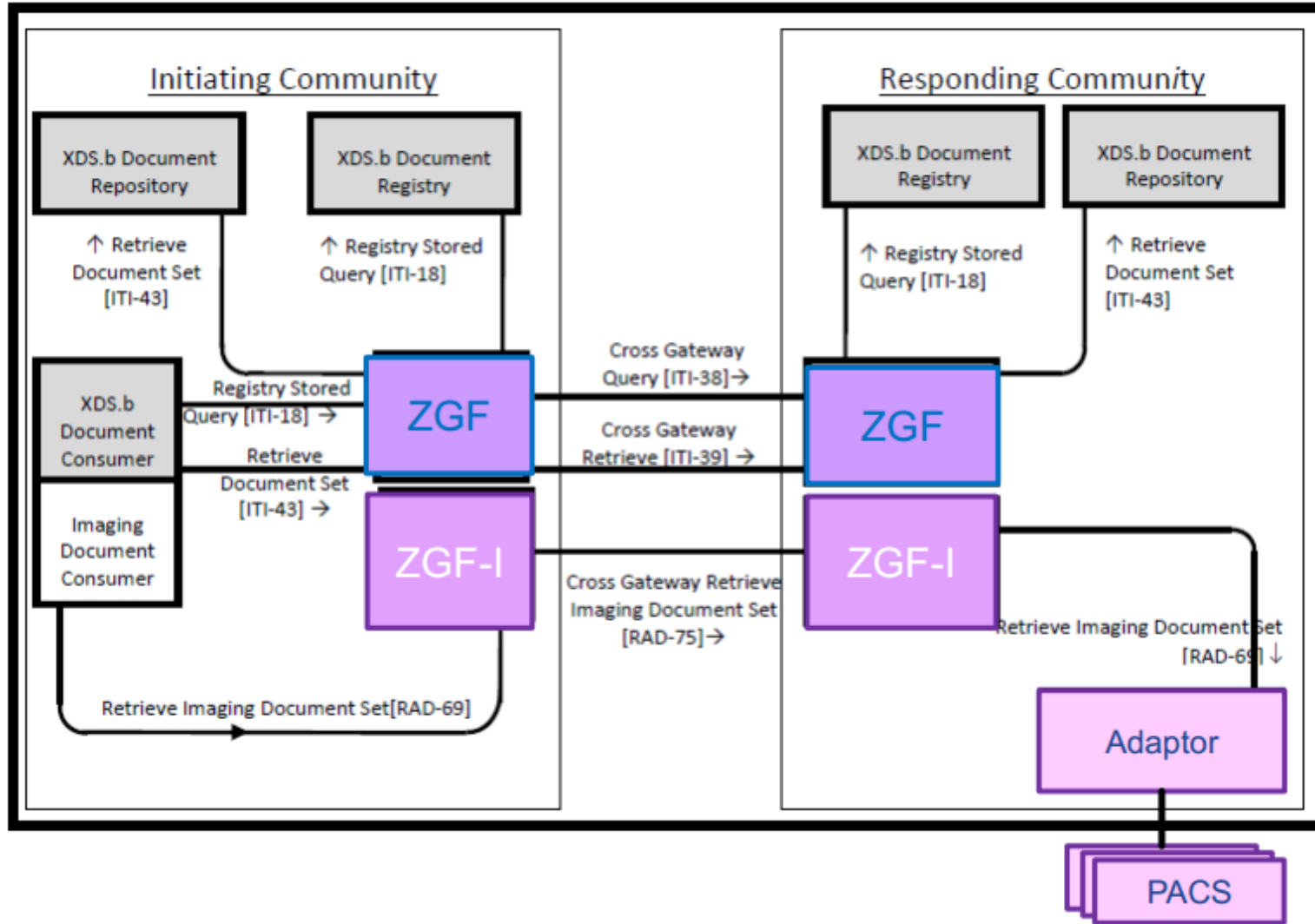Currently 44 healthcare providers in 5 communities online in 7 of 9 regions

Source:

1. Provide Images
2. Generate Image Manifest (DICOM KOS Object)
3. Register the Manifest in ELGA [RAD-68]

Consumer:

1. Search for Image Manifests [ITI-18]
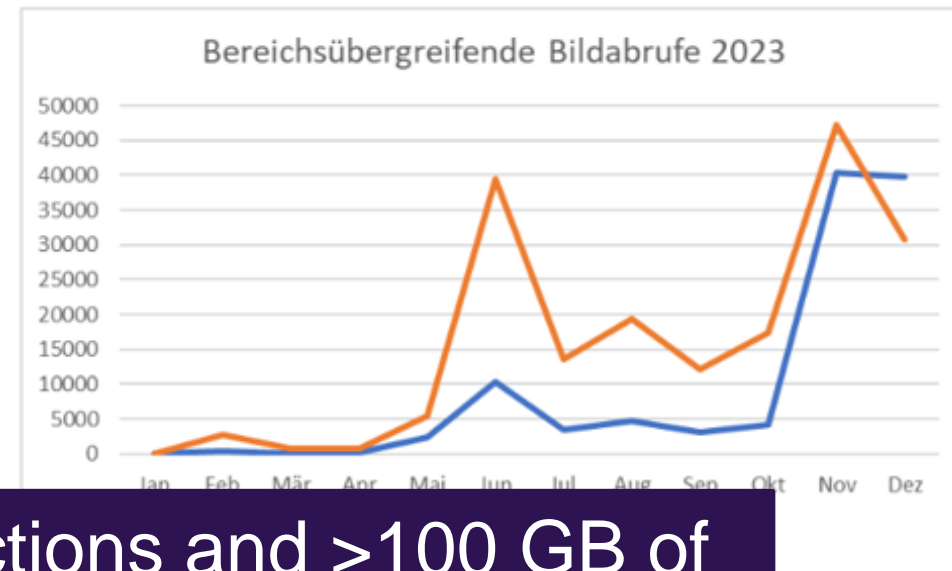2. Decide based on Metadata (incl. APPC)
3. Retrieve Images [RAD-69]

XCA and XCA-I Architecture in ELGA
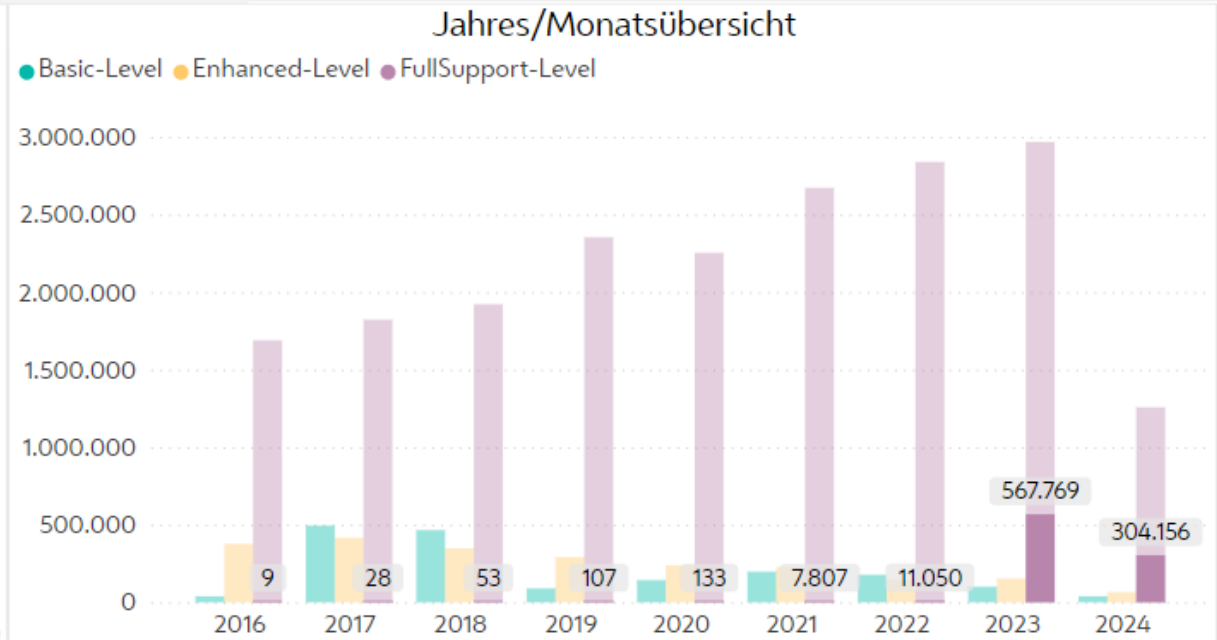
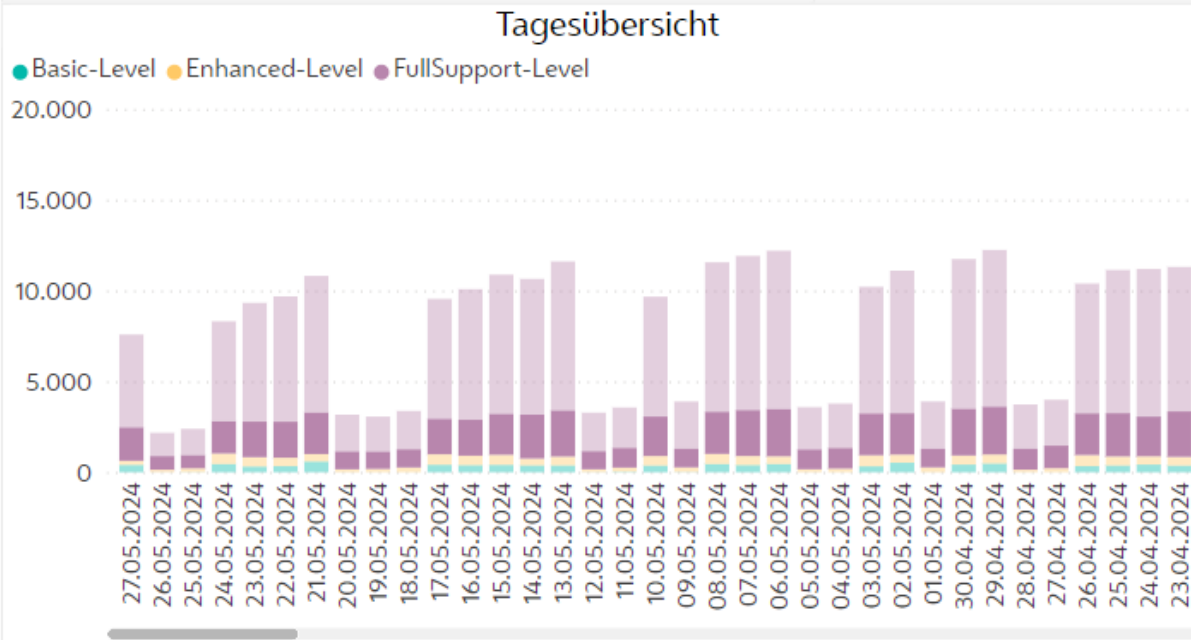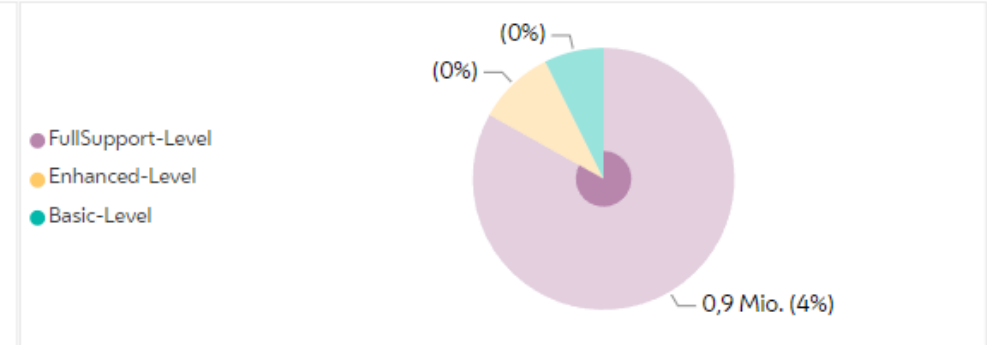# Imaging in ELGA – Current Status

In 2023:

- 42 Healthcare Providers
- 4 Affinity Domains
- 108.801 transactions
- About 190 GB

Bereichsübergreifende Bildabrufe 2023

Already 65.000 transactions and >100 GB of data transferred since 1.1.2024!

Stadt Wien

28.05.2024
zuletzt aktualisiert

30.263.178
Alle Dokumente in der Domäne

23.419.519
Alle freigegebenen ELGA Dokumente

44.047
Alle erfassten situativen Opt-Outs

Jahr
- ☐ 2024
- ☐ 2023
- ☐ 2022
- ☐ 2021
- ☐ 2020

Monat
- ☐ Alle auswählen
- ☐ Dezember
- ☐ November
- ☐ Oktober
- ☐ September

Datum (von / bis)
| 01.01.2015 | 28.05.2024 |

Dokument Name	Gesamt
Alle freigegebenen ärztlichen ELGA Entlassungsbriefe	1.829.315
Alle freigegebenen DICOM KOS SOP Class UID	891.112
Alle freigegebenen ELGA Laborbefunde	15.190.045
Alle freigegebenen ELGA Radiologiebefunde	4.799.407
Alle freigegebenen pflegerischen ELGA Entlassungsbriefe	1.095.647
Gesamt	23.805.526

Support Level	Gesamt	%
FullSupport-Level	891.112	100,00%
Gesamt	891.112	100,00%

- ● FullSupport-Level
- ● Enhanced-Level
- ● Basic-Level

(0%)
(0%)
0,9 Mio. (4%)

Tagesübersicht

- ● Basic-Level ● Enhanced-Level ● FullSupport-Level

Jahres/Monatsübersicht

- ● Basic-Level ● Enhanced-Level ● FullSupport-Level

Filtering via XDS Metadata

Amongst other criteria like Date, Document Type, …

- **Austrian PACS Procedure Code (APPC)**
  - Defined 2010 – already used then to register Imaging Reports (CDA)
  - Stored in XDS Metadata: **eventCodeList**
  - 4 axis: Modality – Laterality – Anatomy – Procedure
  - Mapping to SNOMED CT in work (already done for Anatomy)
- **Linking Imaging Reports and Manifests**
  - Only via XDS Metadata – **No references in the content of both objects**!
  - Uses the Accession Number as part of the **referenceIdList** in the XDS metadata of Report and Manifest

Imaging in ELGA – National Specifications

- Refinement of IHE Integration Profiles XCA/XCA-I etc.
  - ELGA Imaging Architecture 2.00

- CDA Implementation Guideline for the Imaging Report
  - First version released 2015, currently V3.0 in Ballot Recons.
  - Amendment of XDS Metadata Specification for Manifest registration

- Guidelines addressing DICOM topics
  - KOS Guideline
  - Guideline for creation and transmission of APPC

Lessons learned

- **Do not underestimate organisational efforts and obstacles**
  - Benefits – also financial ones – are important
  - The smooth integration into radiologist's software / practitioner's software is a key factor

- **Outpatients are important**
  - Not only focus on large organisations – drive may come from small ones!

- **Technical issues**
  - Many vendors seem to have problems to create the manifest
  - Main concerns were about performance – esp. due to network infrastructure
  - Discussions about restricting transfer syntaxes and/or SOP Classes
  - Main obstacle for addressing further use cases: XCA-I only allows retrieval of native DICOM

Imaging in ELGA – Outlook

IHE WIA, Use Case #4

Extend the XCA-I infrastructure to enable DICOMweb (QIDO-RS/WADO-RS)

First implementations are planned to go online in 2024!

Source:

1. Provide Images
2. Generate Image Manifest (DICOM KOS Object)
3. Register the Manifest in ELGA [RAD-68]

> Same as with XCA-I

Consumer:

1. Search for Image Manifests [RAD-129]
2. Decide based on Response
3. Retrieve Images [RAD-107]

> e.g., Rendered Images, Interactive Viewing

Imaging in ELGA – Outlook

New requirements for the provision of images in IHE WIA:

- Imaging Document Responder
  - Translate DICOMweb requests [RAD-129] to XCA-I [ITI-18] and [ITI-43]
- Imaging Document Source
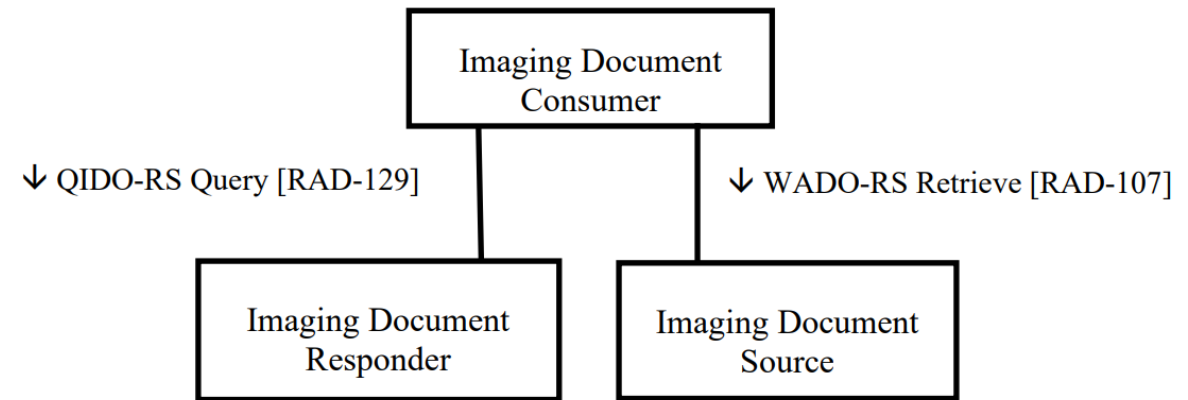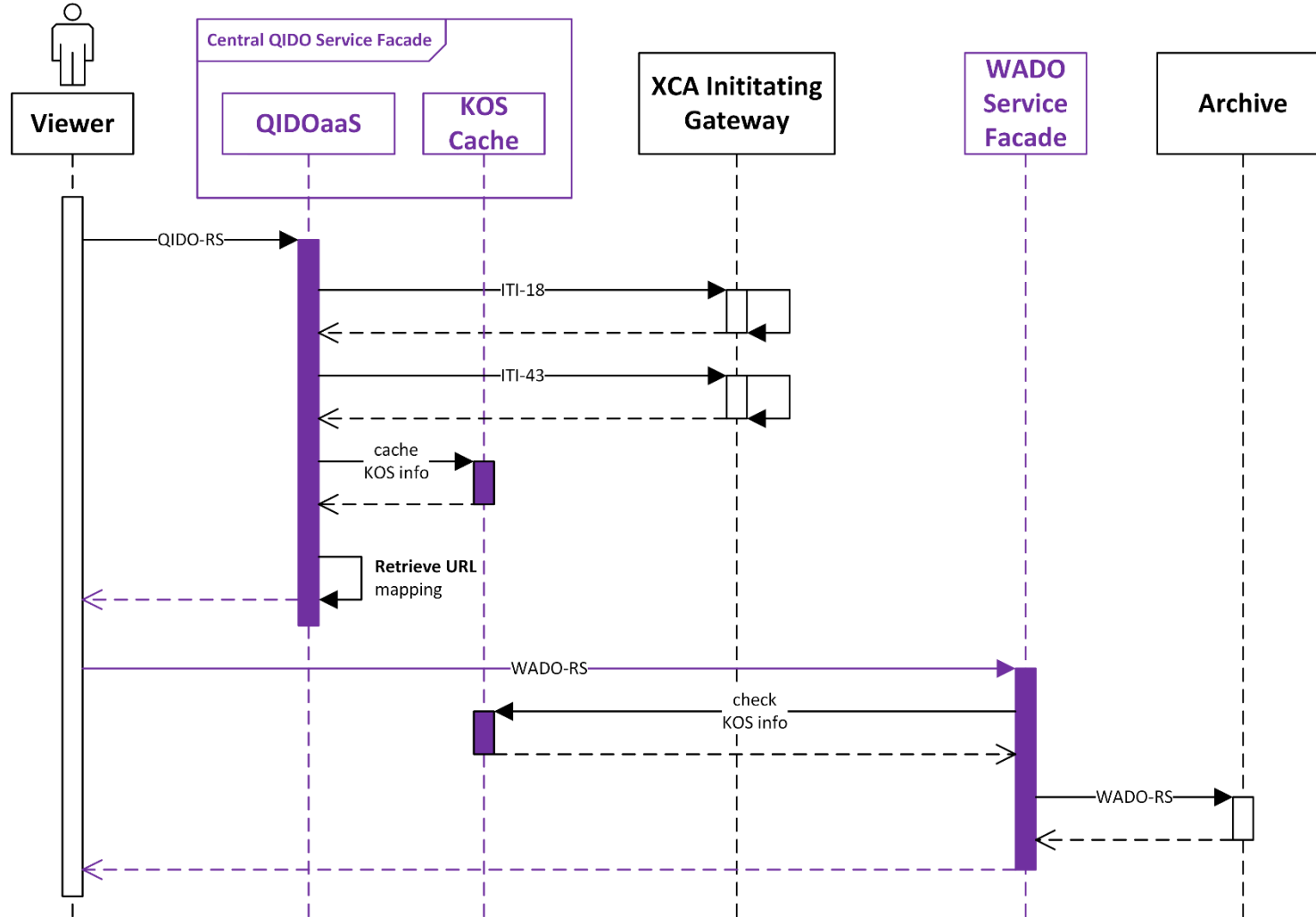 - Must support DICOMweb [RAD-107] and provide rendering

Figure 42.1-1: WIA Actor Diagram

03/06/2024

Thank you for your Attention!

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