

Mawell

more time to care

Delivery of an XDS installation for Region Zealand, Denmark

Agenda

- Presentation
- Region Zealand example
- Process for making an XDS installation
- Affinity domain and profiles/standards/implementation guides
- Informatics key topics
- Transactions
- Solution for region Zealand
- Data migration
- Region Zealand demo
- Questions and Discussion

Quick facts Mawell and presentation

Presentation

- Kristian Skotte – Solution Architect, VP Consulting.
- Malin Lundgren – Healthcare informatics

Quick facts Mawell

- Mawell is an IT Company in e-Health.
 - ✓ Scandinavia
 - ✓ UK
- Our experts and development teams aim to provide services and products that increase efficiency and release time for healthcare professionals – more time to care.
- Mawells largest strength is in our ability to connect IT with real healthcare. Backed by support and maintenance management commitments, our consulting teams and software solutions make us a comprehensive supplier within eHealth.
- Employees: 130
- Offices: Stockholm (HQ), Gothenburg, Oulo, Helsinki, London.



Region Zealand example

Demand

Increase efficiency of workflows regionally and inter-regionally. Political decision to facilitate and standardize access to journal and image data within and across regions. In addition a local need in Region Zealand to increase efficiency for non-radiology imaging workflows.

Purpose

Increase efficiency of healthcare resources by giving access to all radiology/non-radiology patient data and enabling tele-radiology work flows.

Solution

- National patient overview to images and reports.
- Regional patient overview to images and reports.
- Common referral handling including workflow support.
- Support for tele-radiology work flows

Integration to XDS-archive:

- 2 GE RIS/PACS,
- Carestream RIS/PACS,
- EPR system OPUS
- Several non radiology modalities and imaging systems. For example Endobase.

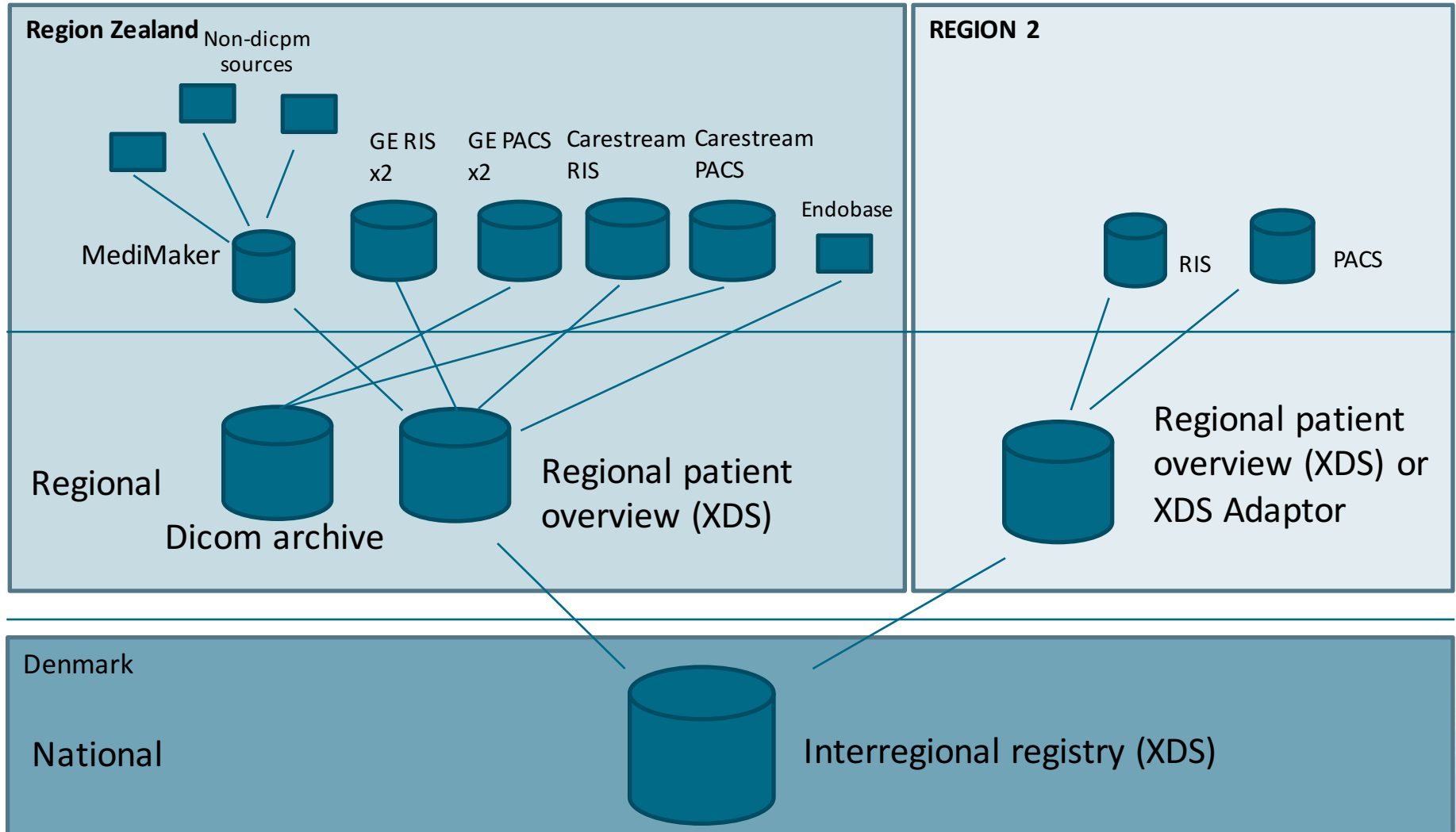


- Reduced waiting time for images (hours → minutes) ✓
- Reduced double examinations ✓
- No CDs, no papers ✓
- Simplified workflow for external consultations ✓
- Simplified and faster access to information from different departments ✓
- Improved "2nd opinion" workflow ✓
- Comply with rules & regulations, security ✓





Sjukhus	RIS/PACS
Roskilde	GE (ROS)
Fakse	GE (ROS)
Køge	GE (ROS)
Naestved	GE (Syd)
Nykøbing F.	GE (Syd)
Nakskov	GE (Syd)
Ringsted	CSH
Slagelse	CSH
Holbaek	CSH
Kalundborg	CSH



Process for making an XDS installation

Process

- Requirement analysis
- Gap analysis to standards
- Define affinity domain
- Installation/configuration
- Integration and mapping
- Validation
- Migration

Affinity domain and profiles/standards/implementation-guides

Document Specifications



Implementation Guide for CDA Release 2:
Imaging Integration

IHE Technical Frameworks

- Anatomic Pathology
- Cardiology
- Dental
- Endoscopy
- Eye Care
- IT Infrastructure
- Laboratory
- Patient Care Coordination
- Patient Care Device
- Pharmacy
- Quality, Research and Public Health
- Radiation Oncology
- Radiology

CDA for Imaging
Implementation Guide

XDS Source implementation Guide

+ Master Value Catalogue

CDA referral
Specification

XDS-SD
Specification

IHE Profiles used

- **XDS** - Cross-Enterprise Document Sharing
- **XDS-I.b** - Cross-Enterprise Document Sharing for Imaging
- **ATNA** - Audit Trail and Node Authentication
- **CT** - Consistent Time
- **PIX** - Patient Identifier Cross-referencing
Only patient merge

CDA-I

- CDA implementation guide for imaging
- We use a Level 3 CDA
 - the highest level of semantic interoperability (for CDA)
- Example of body content:
 - DICOM Object Catalog
 - Report findings
 - Patient history
 - Question

Master Value Catalogue

- List of all OIDs
- List of all valid codes
- IHE classifications

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	OID-root:								Name								
2	1.2.826.0.1.3680043.2.1537.7	0	1	1	1	1	1	1.2.826.0.1.3680043.2.1537.7.0.1.1.1.1	examinationCode -Naestved		All OID's which are colour-coded purple are regionally defined OID's for Region Zealand to use only. These have to be replaced with regionally defined OID's within every region. NB1: it is not necessary to use a separate OID for typeCode. The one used for examinationCode can be used too. NB2: It is necessary for the OID used for referral ID to end with .4 and the OID used for examination ID to end with .5						
3	1.2.826.0.1.3680043.2.1537.7	0	1	2	1	1	1	1.2.826.0.1.3680043.2.1537.7.0.1.2.1.1	examinationCode -Ringsted								
4	1.2.826.0.1.3680043.2.1537.7	0	1	3	1	1	1	1.2.826.0.1.3680043.2.1537.7.0.1.3.1.1	examinationCode -Roskilde								
5	1.2.826.0.1.3680043.2.1537.7	0	1	4	1	1	1	1.2.826.0.1.3680043.2.1537.7.0.1.4.1.1	examinationCode -Medimaker								
6	1.2.826.0.1.3680043.2.1537.7	0	1	0	1	2	3	1.2.826.0.1.3680043.2.1537.7.0.1.0.1.2	SKS codes								
7	1.2.826.0.1.3680043.2.1537.7	0	1	0	1	3	3	1.2.826.0.1.3680043.2.1537.7.0.1.0.1.3	practiceSettingCode								
8	1.2.826.0.1.3680043.2.1537.7	0	1	0	1	4	3	1.2.826.0.1.3680043.2.1537.7.0.1.0.1.4	priorityCode								
9	1.2.826.0.1.3680043.2.1537.7	0	1	0	1	5	3	1.2.826.0.1.3680043.2.1537.7.0.1.0.1.5	statusCode								
10	1.2.826.0.1.3680043.2.1537.7	0	1	0	1	6	3	1.2.826.0.1.3680043.2.1537.7.0.1.0.1.6	healthCareFacilityTypeCode		All non-purple OID's are to be used by all regions and can also be found on sheet <i>Codes and Ids</i> .						
11	1.2.826.0.1.3680043.2.1537.7	0	1	0	1	7	3	1.2.826.0.1.3680043.2.1537.7.0.1.0.1.7	contentTypeCode								
12	1.2.826.0.1.3680043.2.1537.7	0	1	0	1	8	3	1.2.826.0.1.3680043.2.1537.7.0.1.0.1.8	typeCode								
13	1.2.826.0.1.3680043.2.1537.7	0	1	0	1	9	3	1.2.826.0.1.3680043.2.1537.7.0.1.0.1.9	classCode								
14	1.2.826.0.1.3680043.2.1537.7	0	1	0	1	12	3	1.2.826.0.1.3680043.2.1537.7.0.1.0.1.12	IdentifierTypeCode- studyInstanceUID referenceIdList -NOT USED								
15	1.2.826.0.1.3680043.2.1537.7	0	1	0	1	13	3	1.2.826.0.1.3680043.2.1537.7.0.1.0.1.13	IdentifierTypeCode- link exams to images referenceIdList								
16	1.2.826.0.1.3680043.2.1537.7	0	1	0	1	14	3	1.2.826.0.1.3680043.2.1537.7.0.1.0.1.14	IdentifierTypeCode- link exams to referrals referenceIdList								
17																	
18	1.2.826.0.1.3680043.2.1537.7	0	1	0	2	1	1	1.2.826.0.1.3680043.2.1537.7.0.1.0.2.1	patientID								
19	1.2.826.0.1.3680043.2.1537.7	0	1	0	2	2	1	1.2.826.0.1.3680043.2.1537.7.0.1.0.2.2	employeeID - Zealand regional scope								
20	1.2.826.0.1.3680043.2.1537.7	0	1	1	2	2	1	1.2.826.0.1.3680043.2.1537.7.0.1.1.2.2	employeeID -Naestved								
21	1.2.826.0.1.3680043.2.1537.7	0	1	2	2	2	1	1.2.826.0.1.3680043.2.1537.7.0.1.2.2.2	employeeID -Ringsted								
22	1.2.826.0.1.3680043.2.1537.7	0	1	3	2	2	1	1.2.826.0.1.3680043.2.1537.7.0.1.3.2.2	employeeID -Roskilde								
23	1.2.826.0.1.3680043.2.1537.7	0	1	4	2	2	1	1.2.826.0.1.3680043.2.1537.7.0.1.4.2.2	employeeID -Medimaker								
24	1.2.826.0.1.3680043.2.1537.7	0	1	0	2	3	1	1.2.826.0.1.3680043.2.1537.7.0.1.0.2.3	organisationID - Zealand regional scope								
25	1.2.826.0.1.3680043.2.1537.7	0	1	1	2	3	1	1.2.826.0.1.3680043.2.1537.7.0.1.1.2.3	organisationID -Naestved								
26	1.2.826.0.1.3680043.2.1537.7	0	1	2	2	3	1	1.2.826.0.1.3680043.2.1537.7.0.1.2.2.3	organisationID -Ringsted								
27	1.2.826.0.1.3680043.2.1537.7	0	1	3	2	3	1	1.2.826.0.1.3680043.2.1537.7.0.1.3.2.3	organisationID -Roskilde								
28	1.2.826.0.1.3680043.2.1537.7	0	1	4	2	3	1	1.2.826.0.1.3680043.2.1537.7.0.1.4.2.3	organisationID -Medimaker								
29	1.2.826.0.1.3680043.2.1537.7	0	1	1	2	4	1	1.2.826.0.1.3680043.2.1537.7.0.1.1.2.4	referralID -Naestved								
30	1.2.826.0.1.3680043.2.1537.7	0	1	2	2	4	1	1.2.826.0.1.3680043.2.1537.7.0.1.2.2.4	referralID -Ringsted								
31	1.2.826.0.1.3680043.2.1537.7	0	1	3	2	4	1	1.2.826.0.1.3680043.2.1537.7.0.1.3.2.4	referralID -Roskilde								
32	1.2.826.0.1.3680043.2.1537.7	0	1	4	2	4	1	1.2.826.0.1.3680043.2.1537.7.0.1.4.2.4	referralID -Medimaker								
33	1.2.826.0.1.3680043.2.1537.7	0	1	0	2	5	1	1.2.826.0.1.3680043.2.1537.7.0.1.0.2.5	patientID -Roskilde								

OID for code system: 1.2.826.0.1.3680043.2.1537.7.0.1.0.1.5		
Status		
Contains status' codes valid in document source		
Total terms	10	

Code	Display Name	Description
Ukendt	Ukendt	
Ændret	Ændret	
Aflyst	Aflyst	
Afvist	Afvist	
Godkendt	Godkendt	
Dikteret	Dikteret	
Henvist	Henvist	
Slut	Slut	
Start	Start	
Booket	Booket	

CID 29 Acquisition Modality		
From Digital Imaging and Communications in Medicine (DICOM)		
Part 16: Content Mapping Resource		
Total terms	46	
Coding Scheme Designator (0008,0102)	Code Value	Code Meaning
DCM	AR	Autorefraction
DCM	BMD	Bone Mineral Denistometry
DCM	BDUS	Ultrasound Bone Densitometry
DCM	EPS	Cardiac Electrophysiology
DCM	CR	Computed Radiography
DCM	CT	Computed Tomography
DCM	DX	Digital Radiography
DCM	ECG	Electrocardiography
DCM	ES	Endoscopy
DCM	XC	External-camera Photography
DCM	GM	General Microscopy
DCM	HD	Hemodynamic Waveform
DCM	IO	Intra-oral Radiography
DCM	IVOCT	Intravascular Optical Coherence Tomography
DCM	IVUS	Intravascular Ultrasound
DCM	KER	Keratometry
DCM	LEN	Lensometry
DCM	MR	Magnetic Resonance
DCM	MG	Mammography
DCM	NM	Nuclear Medicine
DCM	OPM	Ophthalmic Axial Measurement

Informatics key topics

Patient identifiers

- There is no Patient Identity Feed in the solution.
 - All source systems validate the patient data. The submitted patient data is therefore assumed to be clean.
- National patient identifiers and emergency numbers handled in the regional solution.
 - Only national patient identifiers interrregionally.
- Patient merge is supported

Challenges

- IHE releases a new version of the XDS-profiles each year. Compatibility issues with software.
- IHE documentation is extensive with lots of cross-references. Some contain broken links.
- Sometimes difficult to meet requirements
 - For instance required elements that are not applicable in the solution

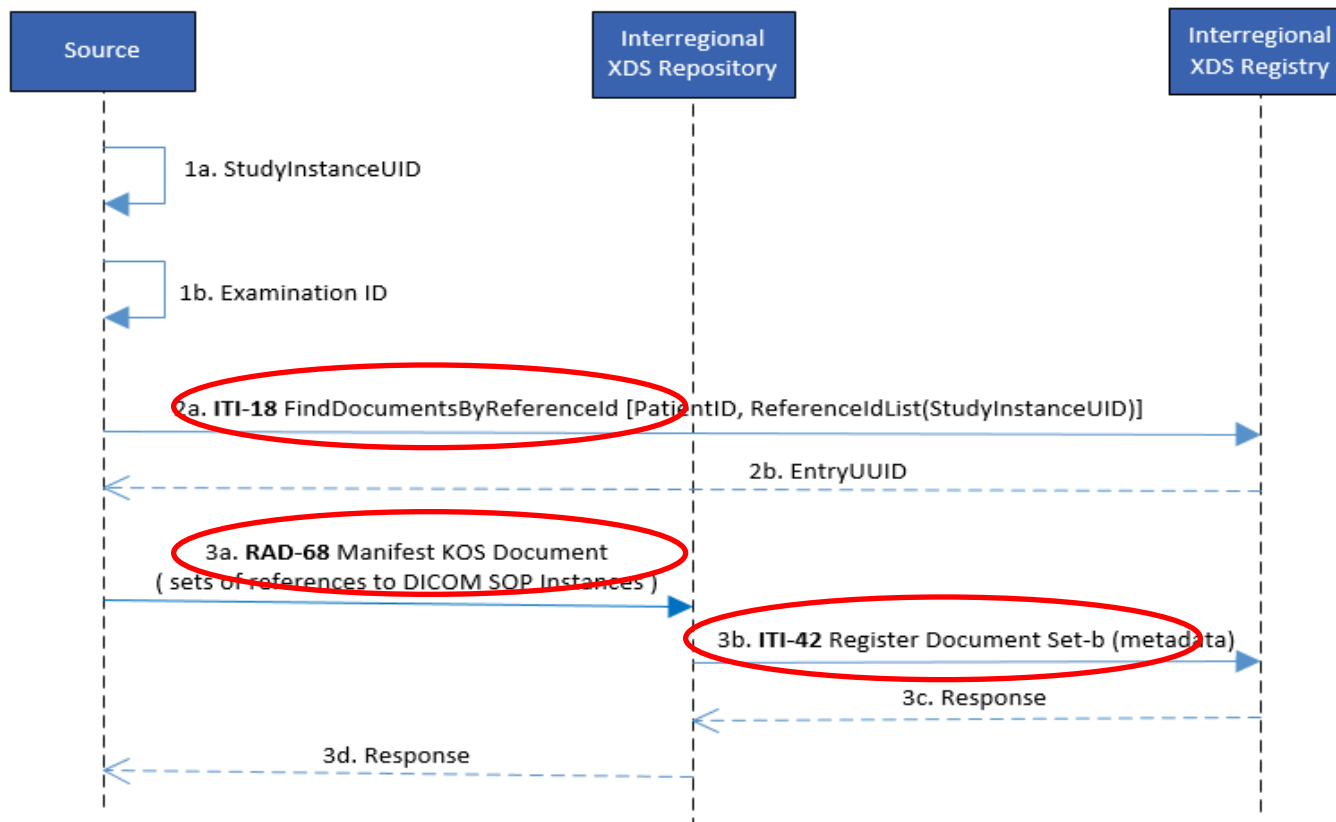
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Transactions

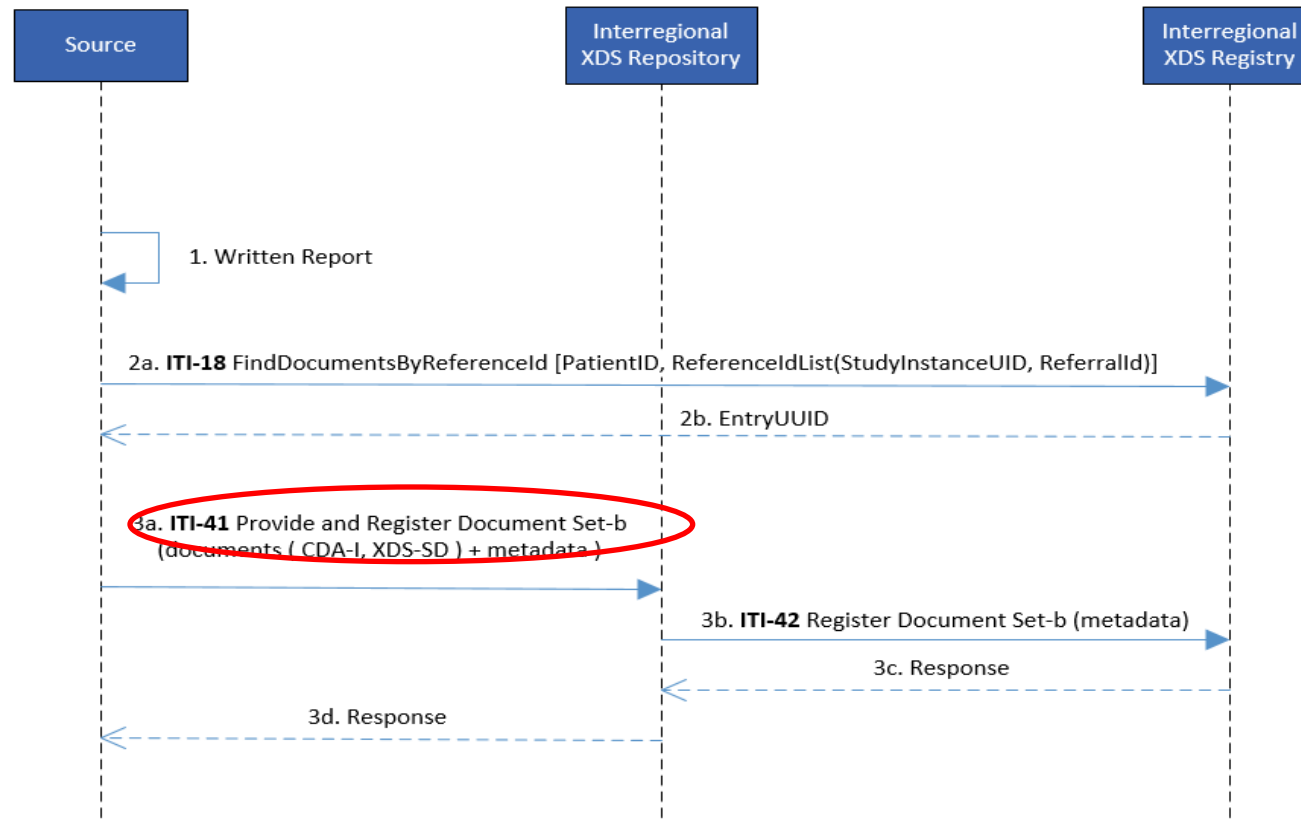
Transactions

- Central transactions
- "Remove" document

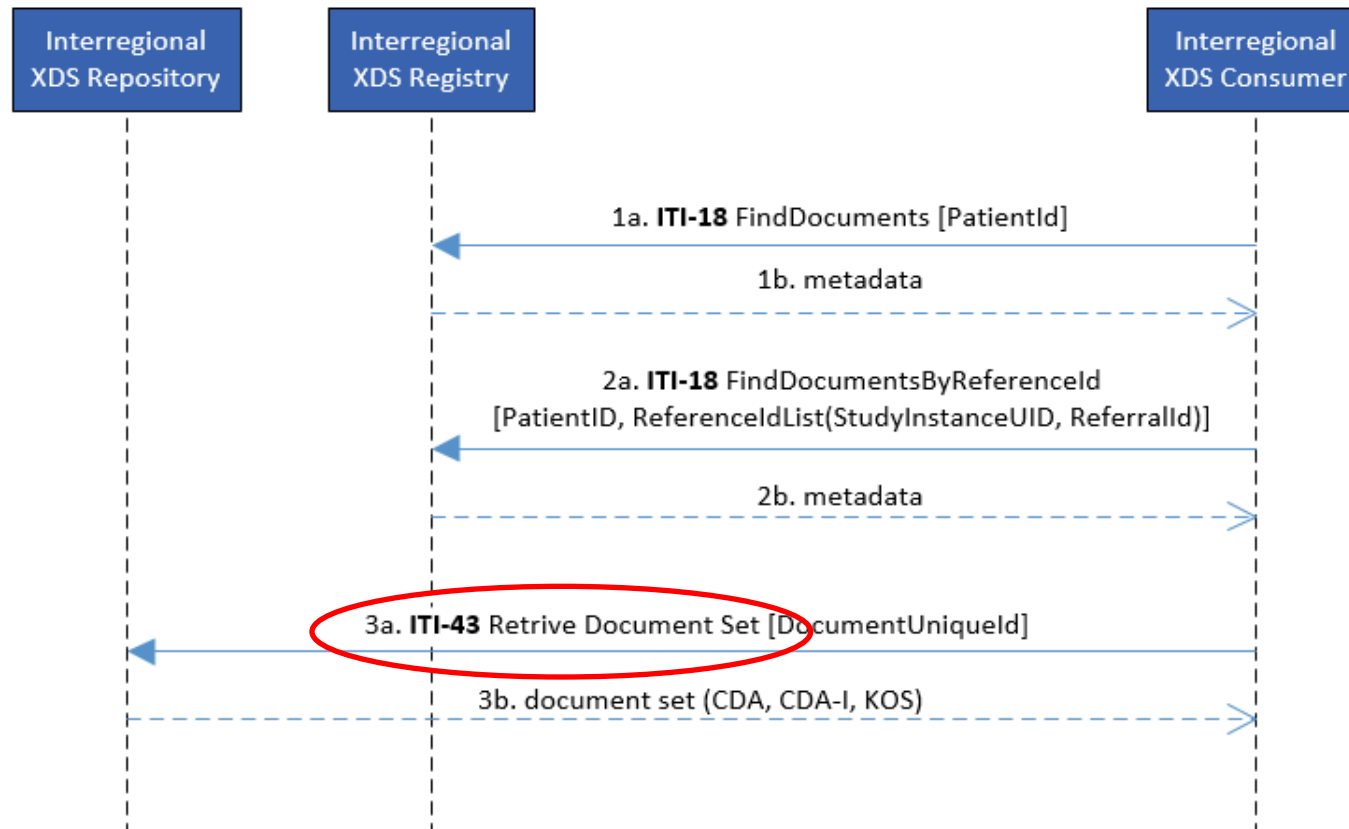
Central Transactions



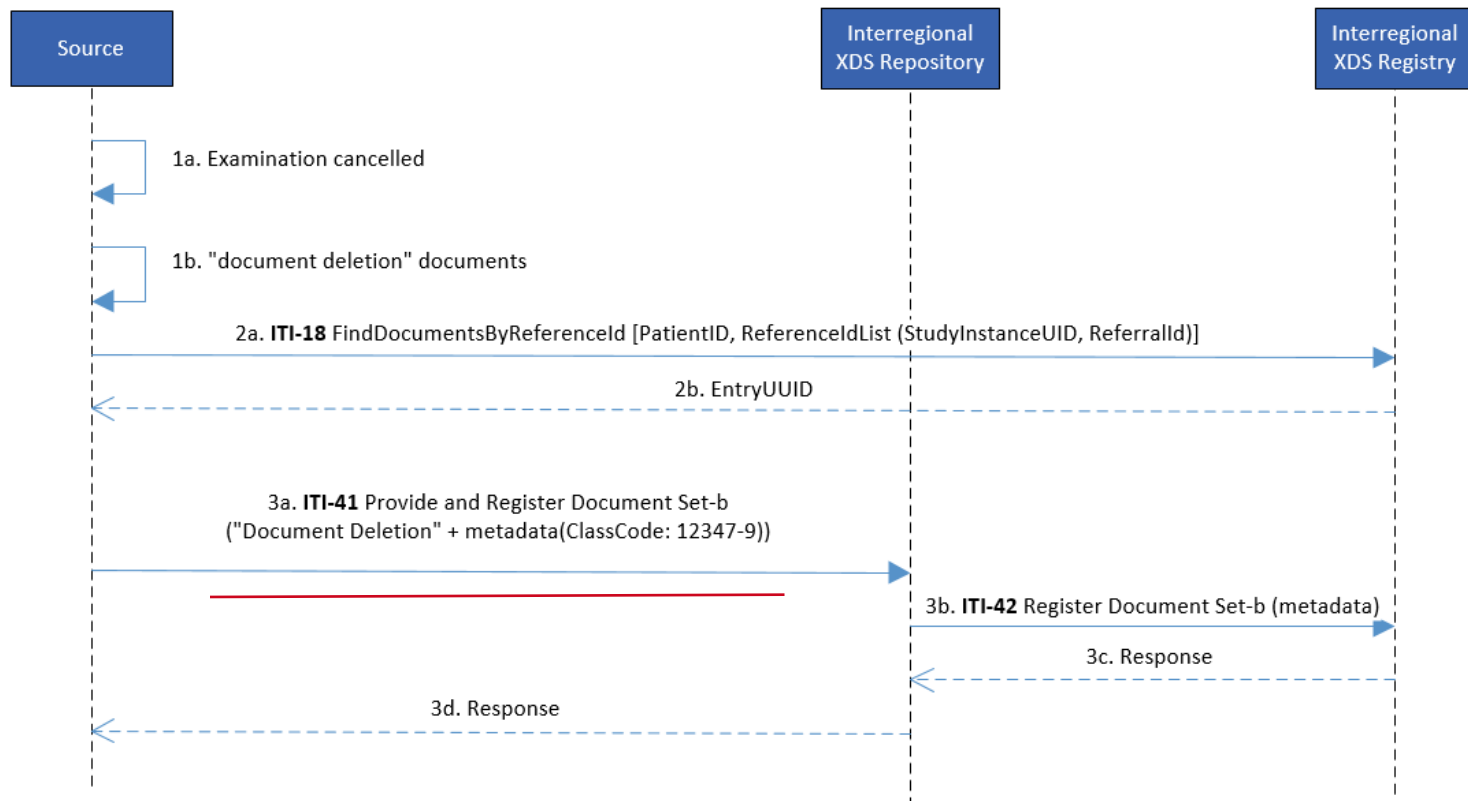
Central Transactions



Central Transactions

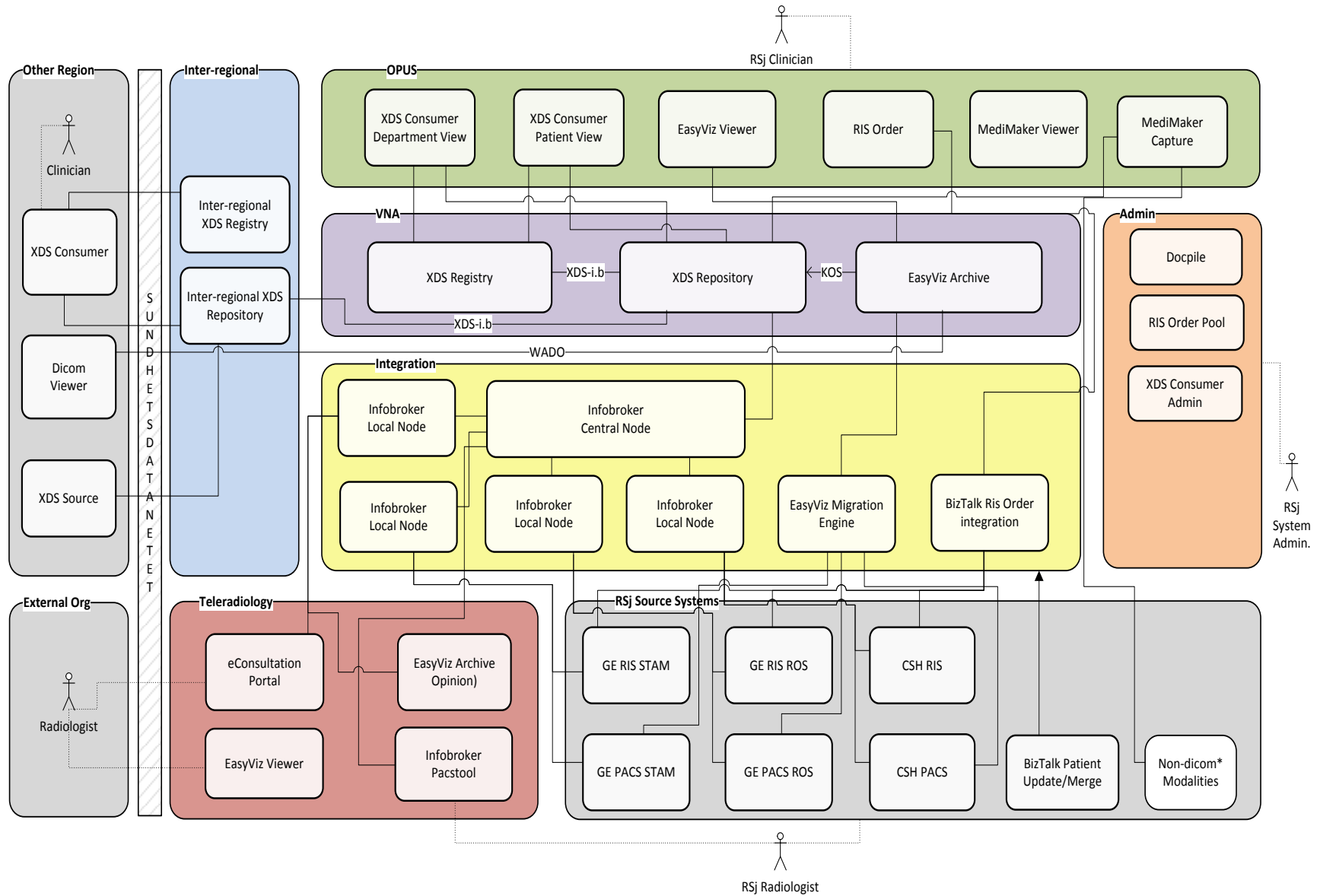


"Remove" document



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Solution for Region Zealand



Usage

- In use since autumn 2012
- 6692 unique logins per month (oct – 2015)
- 95 802 logins per month or about 6,7 per minute during the time the system is in active use (oct – 2015)

Data migration

PACS data

- Large amount of data
- Data quality varies over time
- Duplicate entries in PACS due to manual copies
- Proprietary solutions

RIS data

- Exported from RIS-interface
- Quality varies over time

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Demo Region Zealand

Filter



▼ Sparade frågor

Skapa ny...

Editera...

Ta bort

▼ Datum

Alla undersökningar

Från:

Till:



► Status

► Remitterande avdelning

► Remitterande läkare

► Utförande sjukhus

► Utförande avdelning

► Modalitet

► Kroppsdelen

Rensa filter



Personnummer: 2911824828

☐ Visa interregional data

Datum	Undersökning	Utförande a...	Modalitet	Bilder	Undersöknin...	Status	Utförande sj...
2014-01-08 0...	Klinisk foto	NAE ORTOPÆ...	OT	0	MM3867	Godkendt	Næstved Syge...
2013-12-30 1...	Oesophagus	Ringsted, Rad....		0	DK38U933356...	Booket	Ringsted Syge...
2013-12-18 1...	Costae	Ringsted, Rad....		0	DK38U933356...	Godkendt	Ringsted Syge...
2013-12-17 1...	Ansig	Ringsted, Rad....		0	DK38U933356...	Slut	Ringsted Syge...
2013-12-17 1...	Clavicula H	Ringsted, Rad....		0	DK38U933356...	Godkendt	Ringsted Syge...
2013-12-17 1...	Mammografi bg.	Ringsted, Rad....		0	DK38U933356...	Godkendt	Ringsted Syge...
2013-12-17 1...	Thorax	Ringsted, Rad....		0	DK38U933356...	Slut	Ringsted Syge...
2013-12-17 1...	UL mamma	Ringsted, Rad....		0	DK38U933356...	Godkendt	Ringsted Syge...
2013-12-16 1...	UL -undersøgel...	NAE PÆDIATRI	OT	0	MM3840	Godkendt	Næstved Syge...
2013-12-12 1...	UL -undersøgel...	NAE PÆDIATRI	OT	1	MM3835	Godkendt	Næstved Syge...
2013-12-12 1...	UL -undersøgel...	NAE PÆDIATRI	OT	1	MM3832	Godkendt	Næstved Syge...
2013-12-12 1...	aaa	NAE PÆDIATRI	OT	1	MM3830	Godkendt	Næstved Syge...
2013-12-11 0...	Mammografi bg.	Ringsted, Rad....		0	DK38U933356...	Booket	Ringsted Syge...
2013-12-11 0...	UL mamma	Ringsted, Rad....		0	DK38U933356...	Aflyst	Ringsted Syge...
2013-11-05 0...	UL -undersøgel...	HOL MEDICINS...	OT	4	MM3544	Godkendt	Holbæk Sygehus
2013-11-01 1...	aaa	HOL MEDICINS...	OT	1	MM3520	Godkendt	Holbæk Sygehus
2013-09-12 1...	Ansig	Ringsted, Rad....		0	DK38U933355...	Aflyst	Ringsted Syge...
2013-09-12 1...	Ansig	Ringsted, Rad....		0	33355787	Afvist	Ringsted Syge...
2013-08-29 1...	Albue begge	NFS Diagnosti...		0	DKST1097492	Booket	Nykøbing F Sy...
2013-08-17 1...	Henvi	Ringsted, Rad....		0	33355347	Afvist	Ringsted Syge...
2013-08-17 1...	Henvi	Ringsted, Rad....		0	33355367	Afvist	Ringsted Syge...
2013-08-15 1...	Trachea	Ringsted, Rad....		0	DK38U933355...	Booket	Ringsted Syge...
2013-08-15 1...	Trachea	Ringsted, Rad....		0	33355667	Afvist	Ringsted Syge...

1 - 100 av 311 objekt

Opdatera

Mottagningsbekräfta

Detaljtskrift

Visa media

Visa detaljer

Svar 1

- UL mamma
- Mammografi bg.

Undersökning utan svar

- Thorax

Remissinformation

Remittent

Lk, Lungemedicinsk Amb., HOL

Utförande avdelning

Ringsted, Rad.afd. Ringsted Sygehus

Anamnes

Ønsket undersøgelse: 3 undersøgelser

Indikation: Til Kristian og Jacob

Transport: Følges

Svar 1

Nästa



Senast ändrat: 2013-12-17 13:03

Objektivt er der intet abnormt at palpere i mammae eller axiller.

Bilateral mammografi viser normal symmetrisk kirtelfordeling uden områder med mikroforkalkninger eller stillet t egning.

Ultralyd viser symmetriske forhold med normale lobuli. Der er ingen fokale forandringer og ingen patologiske ly mfeknuder i axillerne.

Konklusion: intet abnormt.

Dikterende læge: Test læge

Sekretær: Anette Knudsen

Kopi: Skrevet d. 17-12-2013

Tekst godkendt af: Test læge

Undersökningar

UL mamma

Undersökningsidentifikare: DK38U933356328

Undersökningsdatum: 2013-12-17 12:57

Kroppsdelen: MAMMA

Status: Godkendt

Koder: Q25: UL mamma

UXUC40: UL-undersøgelse af mamma

Mammografi bg.

Undersökningsidentifikare: DK38U933356327

Undersökningsdatum: 2013-12-17 13:15

Kroppsdelen: MAMMA

Status: Godkendt

Koder: B47: Mammografi bg.

UXRC40: Klinisk mammografi



Questions / Discussion