DICOM Composite Objects References in HL7 V3 in the Context of the Clinical Statement Pattern, the Clinical Document Architecture and DICOM Web Access to Persistent Objects (WADO)

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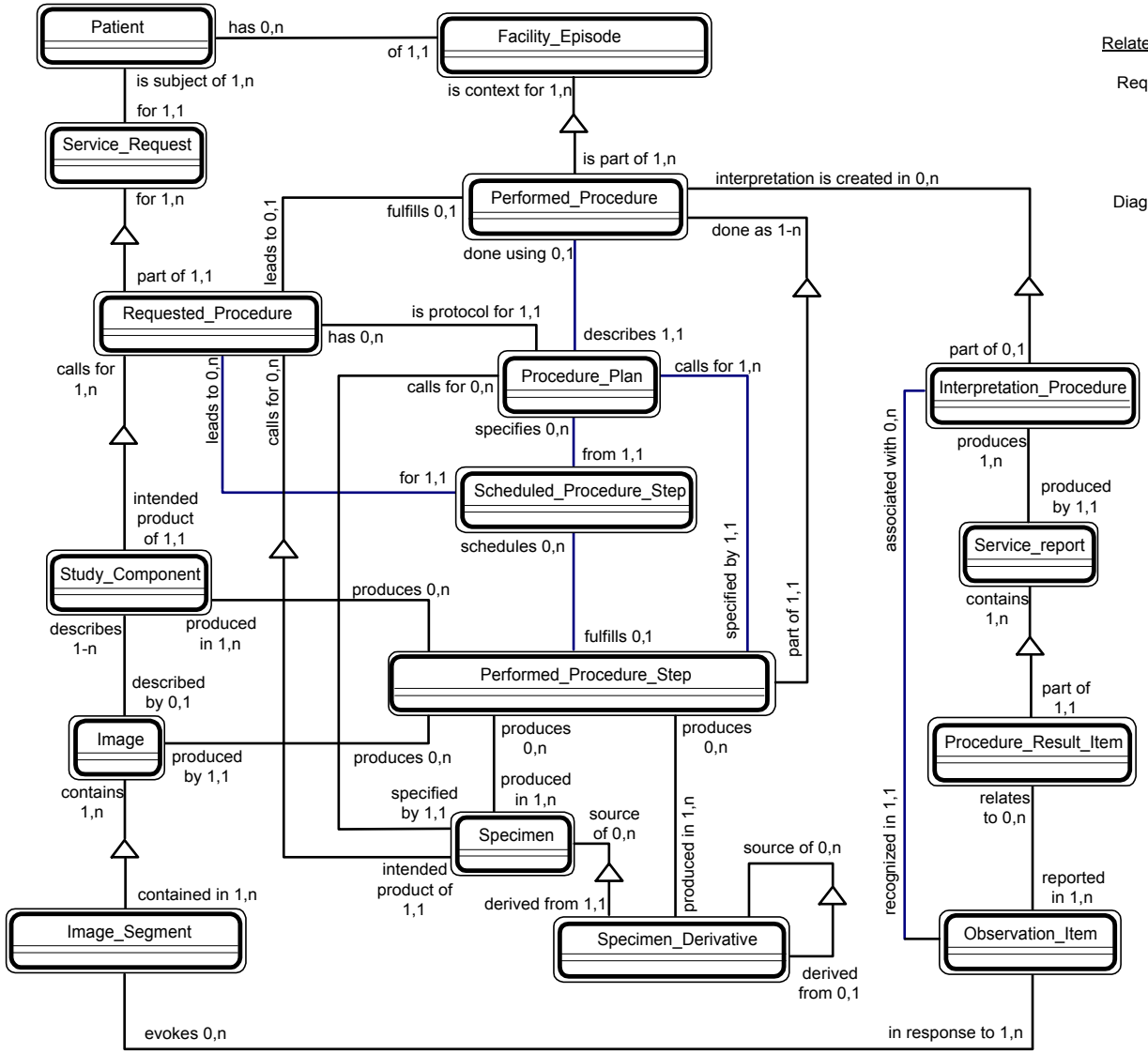
ISIS Context Model

Reference Data Model for the Information System - Imaging System Interface ISIS-950613



Related CEN/TC 251 PT3-22 Objects
- Diagnostic_service_order
- Requested_diagnostic_investigation
- Diagnostic_investigation
- Diagnostic_investigation_plan
- Patient
- Analysed_object
- Sample
- Diagnostic_investigation_result_item
- Diagnostic_service_report

Related DICOM Objects
- Patient
- Study
- Study_Component
- Results
- Visit
- Interpretation
- Image

Related HL7 Objects
- Observation_order (OBR)
- Order (ORC,OBR,BLG)
- Order Fullfillment (OBR,ORC)
- Observation (OBR)
- Observation_fragments (OBX)
- Visit (PV1-2)
- Location_visit (PV1-2)
- Inpatient_visit (PV1-2)
- Location_role (PV1-2)
- Location (NPU,PV1)
- Patient (PID,AL1,MRG)
- Person (PID,NK1)
- Analyzed-object (OBR)
- Diagnostic_schedule

New ISIS objects
- Image_segment
- Facility_Episode
- Interpretation_Procedure
- Observation_item

ISIS: Reference Data Model

Information System - Imaging System Interface

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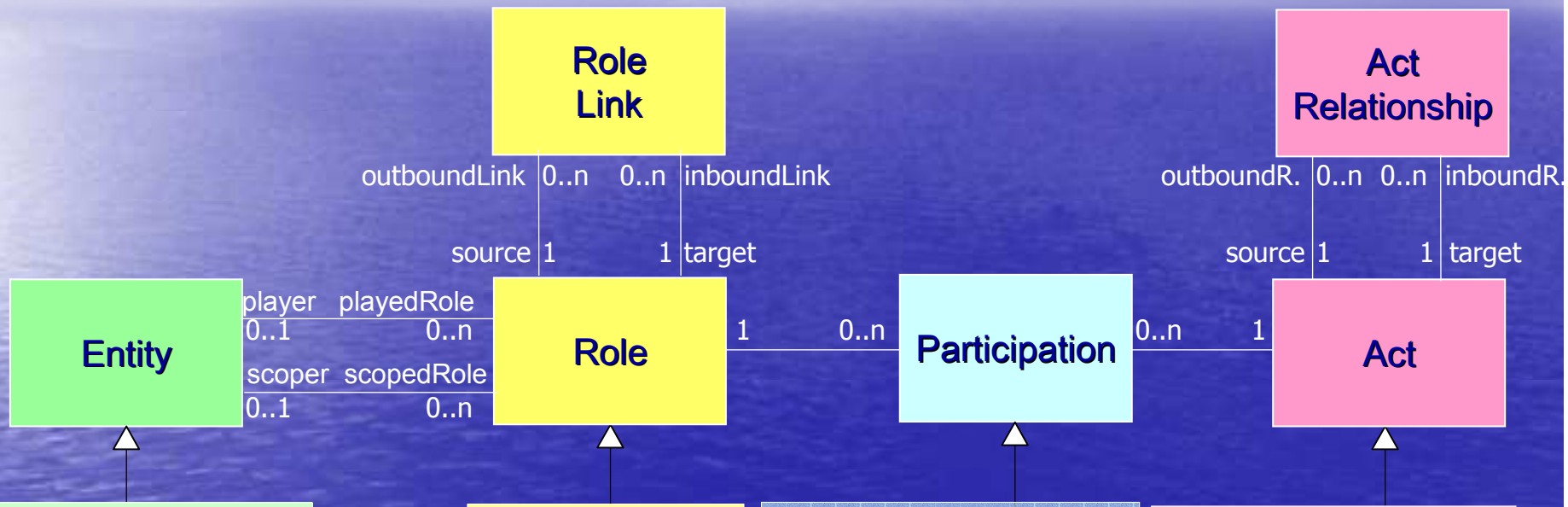
ANSI HISPP Joint Working Group
for Diagnostic Image Communication

Integration of Imaging and Information Systems: Current Status

- HL7
  - The HL7 V3 Reference Information Model (RIM)
  - HL7 Development Framework (HDF)
  - The HL7 Clinical Document Architecture (CDA) Release2
- DICOM
  - DICOM SR
  - Web Access to DICOM Persistent Objects (WADO)
  - DICOM Supplement 101 "HL7 Structured Document Object References"
- IHE
  - Retrieve Information for Display (RID)
  - Displayable Reports (DRPT)
  - Cross-Enterprise Document Sharing (XDS) and XDS for Imaging (XDS-I)

HL7 Version 3 Reference Information Model Core Classes



RIM Core Classes Explained

- Act: Represents the actions that are executed and must be documented as health care is managed and provided.
- Entity: Represents the physical things and beings that are of interest to, and take part in health care.
- Role: Establishes the roles that entities play as they participate in health care acts.
- Participation: Expresses the context for an act in terms such as who performed it, for whom it was done, where it was done, etc.
- Act Relationship: Represents the binding of one act to another, such as the relationship between an order for an observation and the observation event as it occurs.
- Role Link: Represents relationships between individual roles.

HL7 V3 Clinical Statement Model

Act and References

Reference Range & (Pre-)Conditions

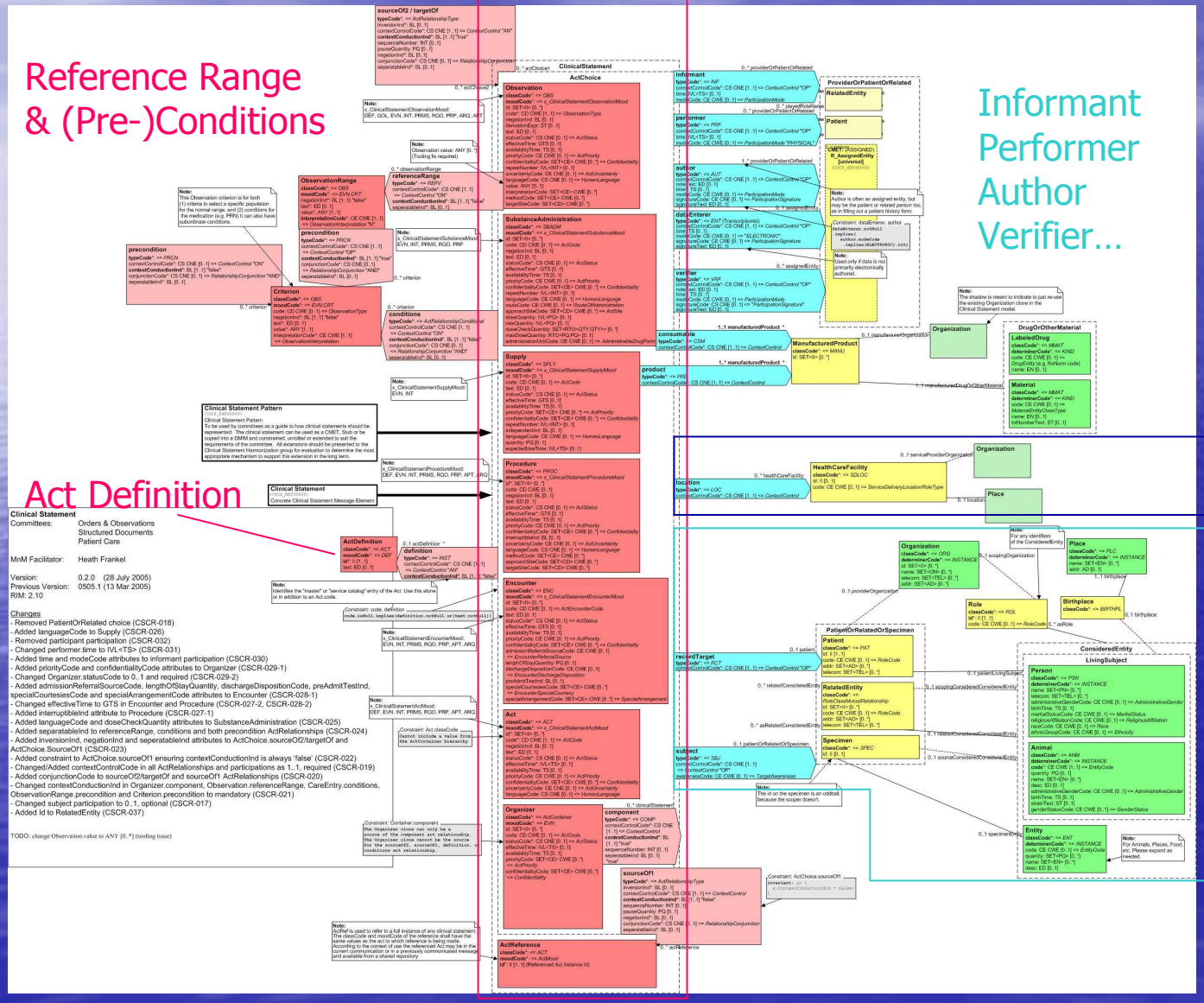
Informant Performer Author Verifier…

Pattern for use in V3 Messages and CDA Documents by any domain that needs to document clinical information

Act Definition

Location

RecordTarget & Subject



HL7 V3 Clinical Document Architecture (CDA) Release 2

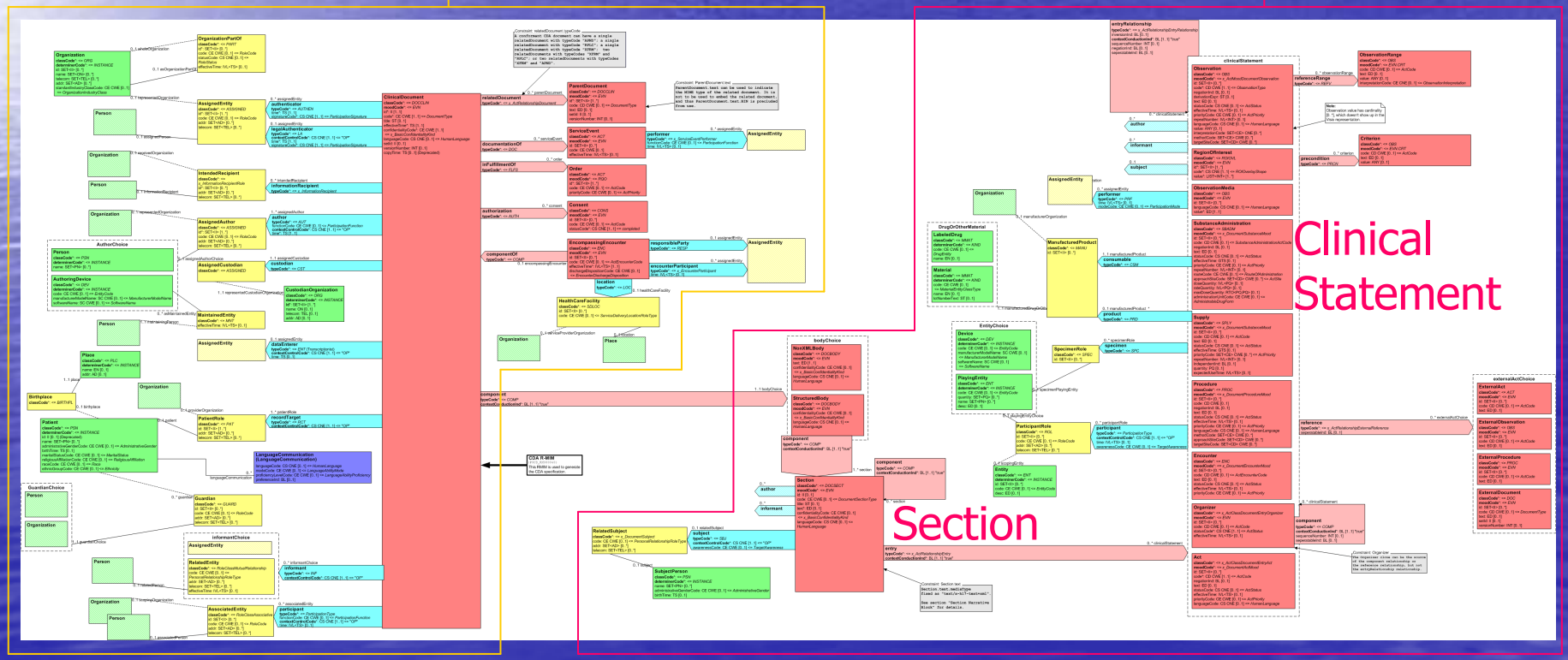
HL7 Structured Documents

Document Header

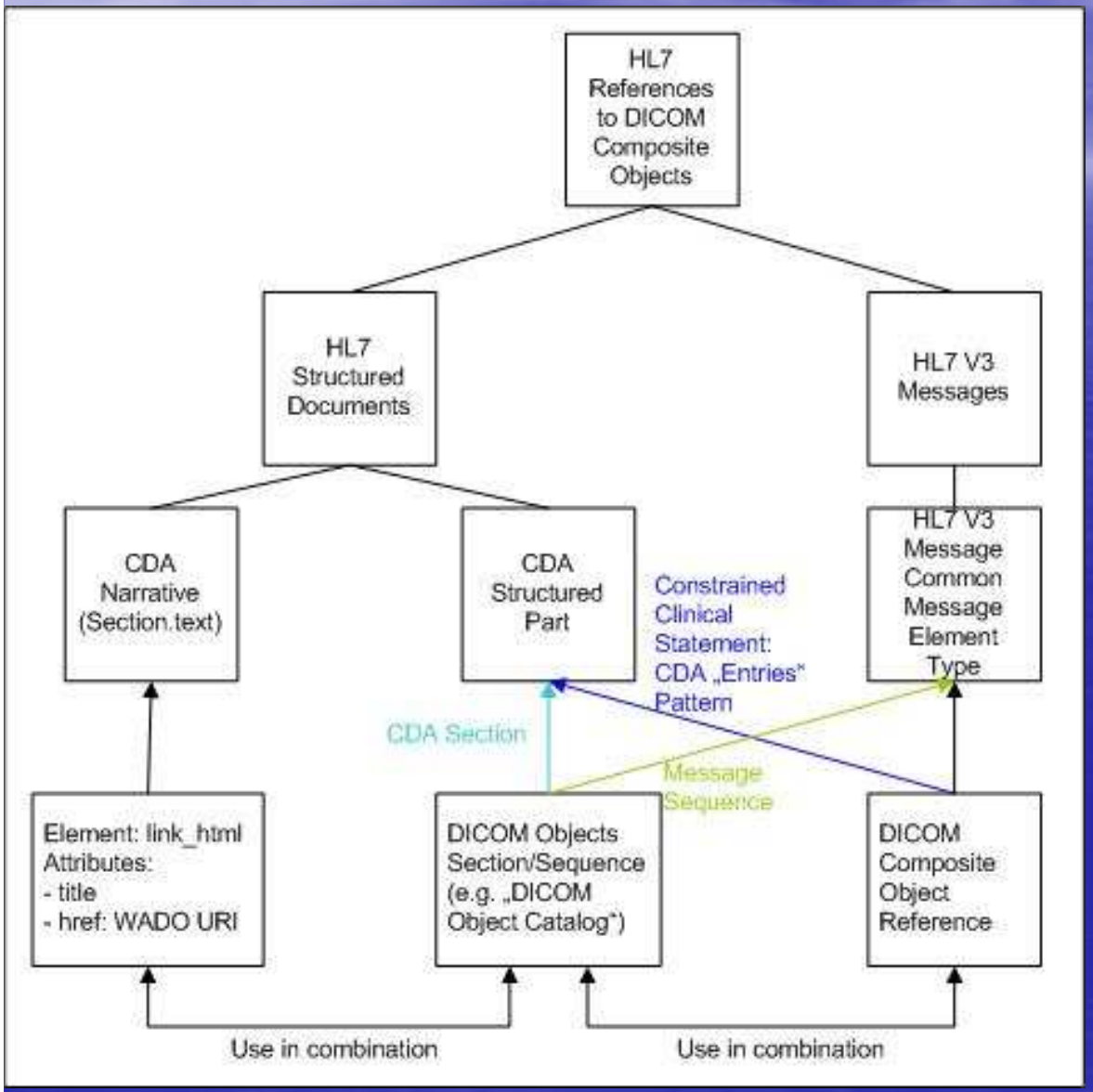
- Related Acts: Encounter, Order, Parent Document…
- Participations: PatientRole, Author…

Document Body

- Section with Narrative Text
- Clinical Statement "Structured Entries"



HL7 V3 References to DICOM Composite Objects



Reference Use cases:
-Plain DICOM Composite Object References (including non-image objects)
· References to DICOM Images plus associated Presentation State
·References to DICOM Multi-frame images

- The coded purpose of reference indicates the reason for inclusion of the significant DICOM objects

For:
-CDA Release2 Documents
- V3 Messages

HL7 V3 Clinical Statement Model: Act Choice Contents Relevant for DICOM Composite Object Reference

Clinical Statement (CS)	CDA R2 Constrained CS	DICOM Mapping
Organizer: Compound St.	Document Section	Sequence
Act		Study, Series
Observation		SOP Instance
ActReference	External Acts	Under Discussion

Clinical Statement Definitions

- Organizer: A derivative of the RIM Act class, which can be used to create arbitrary groupings of other clinical statments that share a common context.
- Act: Represents the actions that are executed and must be documented as health care is managed and provided.
- Observation: An Act of recognizing and noting information about the subject, and whose immediate and primary outcome (post-condition) is new data about a subject. Observations often involve measurement or other elaborate methods of investigation, but may also be simply assertive statements.
- ActReference: Missing Semantics, does only allow for references to single act classes

WADO – Web Access to DICOM Persistent Objects (DICOM Part 18, ISO DIS 17432): References in the Context of HL7 V3 (1)

- Access to relevant DICOM persistent objects referenced in CDA Release2 Documents and HL7 V3 Messages
  - Reference to images, documents
  - Rendered into a generic format or in native DICOM format
- Documentation and Notification of Imaging Clinical Statements Use Cases
  - CDA: Documentation of Imaging Observations
  - V3 Messages: Notification of relevant imaging observations in the context of clinical order and results messages

WADO – Web Access to DICOM Persistent Objects (DICOM Part 18, ISO DIS 17432): References in the Context of HL7 V3 (2)

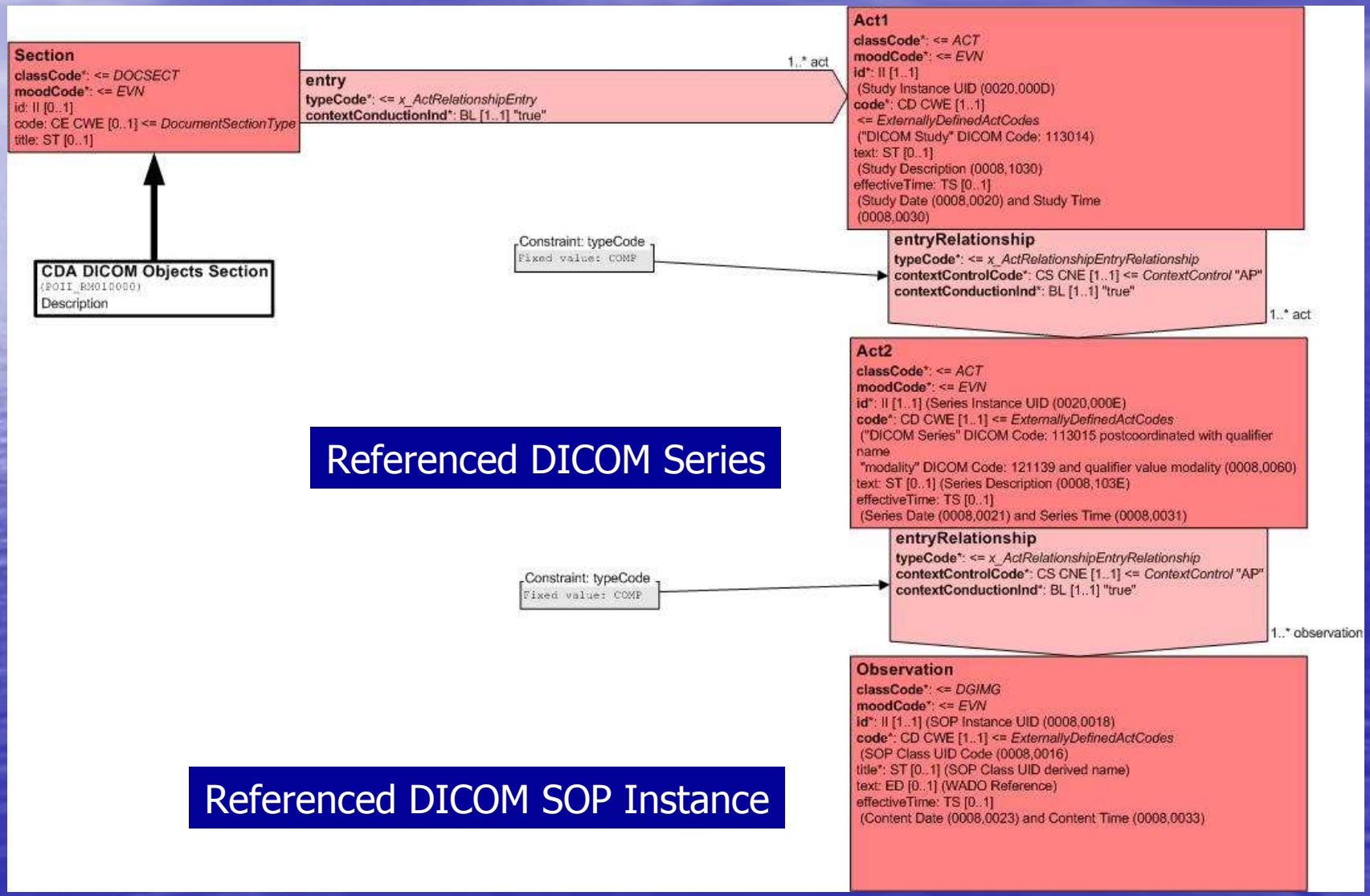
- DICOM Supplement 101 (Final Text)
  - <linkHtml> markup href attribute contains WADO URI (Narrative Text Section of CDA)
  - Combined with DICOM Object Catalog Section (Lookup of Study and Series Information)

WADO Component	Source
<scheme>://*<authority>*/*<path>*	Configuration setting, used by the conversion process, identifying the WADO server
?requestType=WADO	Fixed
&studyUID=*<uid>*	Study Instance UID for referenced image obtained from the Current Requested Procedure Evidence Sequence or the Pertinent Other Evidence Sequence in the KO Instance
&seriesUID=*<uid>*	Series Instance UID for referenced image obtained from the Current Requested Procedure Evidence Sequence or the Pertinent Other Evidence Sequence in the KO Instance
&objectUID=*<uid>*	Referenced SOP Instance UID from IMAGE content item
&frameNumber=*<list>*	Referenced Frame Number from IMAGE content item (if present)
&presentationUID=*<uid>*	Referenced SOP Instance UID from Referenced SOP Sequence within IMAGE content item
&presentationSeriesUID=*<uid>*	Series Instance UID for referenced presentation state obtained from the Current Requested Procedure Evidence Sequence or the Pertinent Other Evidence Sequence in the KO Instance
&contentType=video/mpeg	Present if Referenced SOP Class UID from IMAGE content item is for a multi-frame image IOD

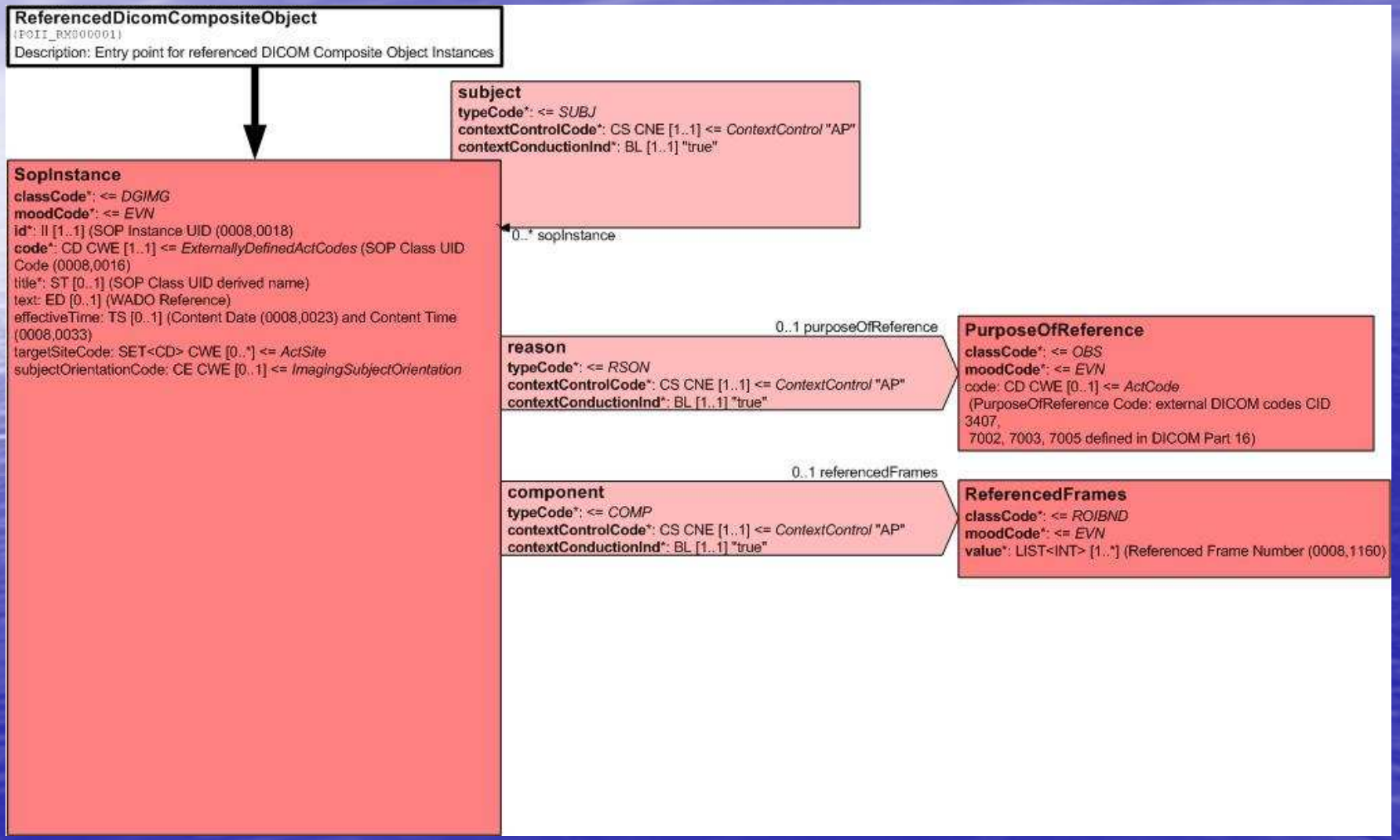
CDA: DICOM Object Catalog Section

CDA Section (Sequence Organizer for Messages)

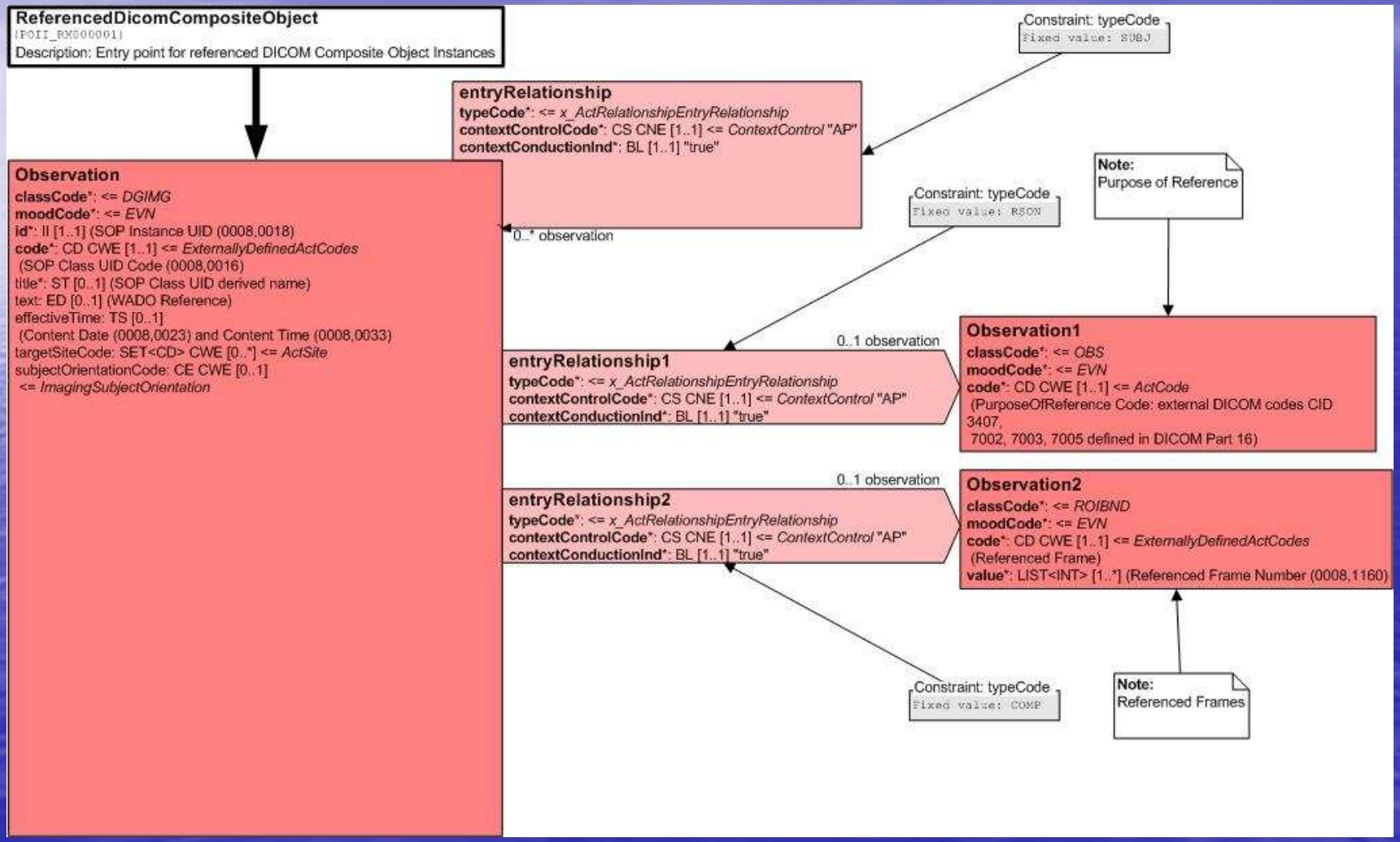
Referenced DICOM Study



HL7 DICOM Composite Object Reference Model (V3 Messages)



HL7 DICOM Composite Object Reference Model (Pattern for CDA "Entries")



Summary

- Enhanced reference mechanism is proposed to provide access to imaging and clinical information objects
  - Planned Submission: March 2006 HL7 Ballot Cycle
- Structured Representation of DICOM Composite Object References for:
  - CDA Release2 Documents
  - HL7 V3 Messages
- Focus is on cross-departmental and inter-hospital data exchange using DICOM and HL7
  - Access to relevant DICOM Images and Documents from HL7
  - Extends Access Mechanisms Specified in DICOM Supplement 101

Backup Slides

DICOM Model of the Real World: Modality-Information System Interface