Digital Imaging and Communications in Medicine (DICOM)

Sup nnn - Extensible SR Storage SOP Class

DICOM Standards Committee - Working Group 6 - Base Standard

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Document History

Document Version	Date	Content
01	2015/01/14	First draft - converted from VP version of CP 1217

To Do

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Open Issues

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Closed Issues

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Scope and Field of Application

This Supplement add a new extensible IOD and SOP Class that allows new Content Item types to be used as they are added to the standard.

There is an increasing need for new Content Item types (such as SCOORD3D) and these are being added as needed to application-specific IODs and SOP Classes (such as the Colon CAD Supplement 126). There is a need for a generic IOD and SOP Class to allow new applications to make use of these in a general way, yet this conflicts with the requirement to be able to render all content.

A specific conformance requirement is specified, that the user be warned in there is content of a type that the rendering software does not recognize or understand.

This is consistent with the approach used in other extensible formats like PDF, in which software tools like Acrobat Reader warn about unrecognized content when faced with newer versions.

DICOM PS3.3 Information Object Definitions

A Composite Information Object Definitions (Normative)

Amend DICOM PS 3.3 - Information Object Definitions - Annex A - Composite Information Object Definitions (Normative), to add Extensible SR IOD Modules to A.1.4 Overview of the Composite IOD Module Content.

Amend DICOM PS 3.3 - Information Object Definitions - Annex A - Composite Information Object Definitions (Normative) as follows, to add a new Extensible SR IOD:

A.35.X Extensible SR IOD

A.35.X.1 Extensible SR IOD Description

The Extensible SR IOD is a superset of all SR IODs, which specifies support for all SR features defined currently in the standard and that may be added in the future. It is designed specifically to support the possibility of future extensions, and the corresponding SOP Class defined in PS3.4 has specific behavior defined for a recipient in the presence of unrecognized or unsupported extensions.

A.35.X.2 Extensible SR IOD Entity-Relationship Model

The E-R Model in Section A.1.2 applies to the Extensible SR IOD. The IEs at the level of the Image IE in Section A.1.2 are not components of the Extensible SR IOD. Table A.35.X-1 specifies the Modules of the Extensible SR IOD.

A.35.X.3 Extensible SR IOD Module Table

Table A.35.X-1. Extensible SR IOD Modules

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	Clinical Trial Subject	C.7.1.3	U
Study	General Study	C.7.2.1	M
	Patient Study	C.7.2.2	U
	Clinical Trial Study	C.7.2.3	U
Series	General Series	C.7.3.1	M
	Clinical Trial Series	C.7.3.2	U
Frame of Reference	Frame of Reference	C.7.4.1	U
	Synchronization	C.7.4.2	U
Equipment	General Equipment	C.7.5.1	M
Document	SR Document General	C.17.2	M
	SR Document Content	C.17.3	M
	SOP Common	C.12.1	M

A.35.13.3.1 Extensible SR IOD Content Constraints

A.35.13.3.1.1 Value Type

Value Type (0040,A040) in the Content Sequence (0040,A730) of the SR Document Content Module is constrained to any of the Enumerated Values defined in Section C.17.3.

A.35.13.3.1.2 Relationship Constraints

Relationships between content items in the content of this IOD may be conveyed either by-value or by-reference. Table A.35.13-2 specifies the relationship constraints of this IOD. See ??? for Relationship Type definitions.

Table A.35.13-2. Relationship Content Constraints for Comprehensive 3D SR IOD

Source Value Type	Relationship Type (Enumerated Values)	Target Value Type
CONTAINER	CONTAINS	any type.
any type	any type other than CONTAINS	any type.

Note

The lack of explicit constraints between value types and relationship types is necessary to support extensibility in unanticipated ways (e.g., to support new coordinate value types that may be selected from new composite object value types), but that does not mean that all possible combinations will make sense or be usable (e.g., HAS OBS CONTEXT with source and target value types of IMAGE).

Relationships by-reference to ancestor Content Items are forbidden in this IOD to prevent loops.

DICOM PS3.4 Service Class Specifications

B Storage Service Class (Normative)

Amend DICOM PS 3.4 - Service Class Specifications - Annex B - Storage Service Class (Normative) as follows:

B.5 Standard SOP Classes

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Table B.5-1. Standard SOP Classes

SOP Class Name	SOP Class UID	IOD Specification (defined in PS3.3)
...	...	...
Extensible SR Storage	**1.2.840.10008.5.1.4.1.1.88.xxx**	**Extensible SR IOD**
...	...	...

B.3.1.4 Related General SOP Classes (A-ASSOCIATE-RQ)

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Table B.3-3. Standard and Related General SOP Classes

SOP Class Name	Related General SOP Class Name
...	...
Basic Text SR	Enhanced SR
	Comprehensive SR
	Comprehensive 3D SR
	Extensible SR
Enhanced SR	Comprehensive SR
	Comprehensive 3D SR
	Extensible SR
Procedure Log	Enhanced SR
	Comprehensive SR
	Comprehensive 3D SR
	Extensible SR
X-Ray Radiation Dose SR	Enhanced SR
	Comprehensive SR
	Comprehensive 3D SR
	Extensible SR
Radiopharmaceutical Radiation Dose SR	Enhanced SR
	Comprehensive SR
	Comprehensive 3D SR
	Extensible SR
...	...

I Media Storage Service Class (Normative)

Amend DICOM PS 3.4 - Service Class Specifications - Annex I - Media Storage Service Class (Normative) as follows:

I.4 Media Storage Standard SOP Classes

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Table I.4-1. Media Storage Standard SOP Classes

SOP Class Name	SOP Class UID	IOD Specification (defined in PS3.3)
...	...	...
Extensible SR Storage	**1.2.840.10008.5.1.4.1.1.88.xxx**	**Extensible SR IOD**
...	...	...

O.2 Structured Reporting Storage SOP Class SCU and SCP Behavior

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O.2.2 Behavior of an SCP

An SCP intending to display or otherwise render a Structured Report shall convey its full meaning in an unambiguous manner**, except where described in Section O.2.2.2** .

Note

"Full meaning" includes not just the Content Tree (i.e., the Items of the Content Sequence), but all Attributes of the Data Set that are necessary to properly interpret the Structured Report. This includes those Attributes that set the initial Observation Context for the Content Tree, i.e., the patient, procedure, and observer identifiers, and the Completion status and Verification status of the Structured Report.

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O.2.2.2 Extensible SR SOP Classes

The concept of extensibility implies that a recipient may encounter Content Items, Value Types and Relationship Types that are unanticipated and unsupported and hence potentially unrenderable. Accordingly, since it may not be possible to render the entire content in an unambiguous manner because of unrecognized content, but a warning shall be conveyed in the rendering to indicate that unsupported content is present and that this may affect the meaning of the rendering.

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O.4 Conformance

In addition to the Conformance Statement requirements for the Storage Service Class specified in ???, the following additional requirements are specified for Structured Reporting Storage SOP Classes:

O.4.1 Conformance Statement for an SCU

The following shall be documented in the Conformance Statement of any implementation claiming conformance to the Structured Reporting Storage SOP Classes as an SCU:

- The Image or other composite object Storage SOP Classes that are also supported by the SCU and may be referenced by instances of Structured Reporting Storage SOP Class.
- The range of Value Types and Relationship Types that are supported by the SCU.
- The conditions under which a new SOP Instance UID is generated for an existing SR Document.

- If the implementation provides Query/Retrieve of Structured Reporting SOP Instances as an SCU, whether it supports the Optional Keys Concept Name Code Sequence or Content Template Sequence.

Note

The description of the Value Types and Relationship Types that are supported by the SCU is particularly important for the Extensible SR SOP Class.

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O.4.2 Conformance Statement for an SCP

The following shall be documented in the Conformance Statement of any implementation claiming conformance to the Structured Reporting Storage SOP Class as an SCP:

- For an SCP of a Structured Reporting Storage SOP Class that is displaying or otherwise rendering the structured report contained in a SOP Instance of the Class, the general form in which the structured report related Attributes are rendered.
- For an SCP of a Structured Reporting Storage SOP Class, the Image or other composite object Storage SOP Classes that are also supported by the SCP and may be referenced by instances of the Structured Reporting Storage SOP Class, and whether or not they will be displayed or otherwise rendered.
- For an SCP of a Structured Reporting Storage SOP Class that is displaying or otherwise rendering an image or other composite object referred to by a SOP Instance of the Class, the manner in which the structured report related Attributes (such as spatial co-ordinates and referenced presentation states) are used to influence the display of the image or object.
- If the implementation supports Query/Retrieve of Structured Reporting SOP Instances as an SCP, whether it supports the Optional Keys Concept Name Code Sequence or Content Template Sequence.

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O.4.2.2 Extensible SR SOP Class

The following shall be documented in the Conformance Statement of any implementation claiming conformance to the Extensible SR SOP Class as an SCP:

- **The behavior and warnings generated when encountering unsupported Content Items, Value Types and Relationship Types**

DICOM PS3.6 Data Dictionary

A Registry of DICOM Unique Identifiers (UIDs) (Normative)

Amend DICOM PS 3.6 - Data Dictionary - Annex A - Registry of DICOM Unique Identifiers (UIDs) as follows:

Table A-1. UID Values

UID Value	UID NAME	UID TYPE	Part
...	...	...	...
1.2.840.10008.5.1.4.1.1.88.xxx	**Extensible SR Storage SOP Class**	**SOP Class**	**PS 3.4**
...	...	...	...