

DICOM Correction Item

Correction Number	CP-324 (incorporates CP-304)
Log Summary: Expand definition of Coding Scheme Designator and Clarify Private Codes	
Type of Modification	Name of Standard
Clarification/Addition	PS 3.3, PS 3.6
<p>Rationale for Correction</p> <p>Coded values specified in the Code Sequence Macro are described by a Coding Scheme Designator (0008,0102). DICOM defines a list of coding scheme designator codes in Part 16, but these may not reflect the code schemes available to an implementer in preparing coded data, particularly local or private codes. Moreover, the identifiers in Part 16 can be formally scoped only for DICOM interchange, and although there is an attempt to keep them consistent with designators used elsewhere (e.g., in HL7), there may always be compatibility issues when documents are transcoded between DICOM and another standard format.</p> <p>This Change Proposal extends the ability of DICOM objects to reference external coding systems by using an externally registered formal identifier. This is essentially the same as extending the functionality of externally managed coded terminology to the Coding Scheme Designator itself. The change is effected by the addition of an optional sequence in the SOP Common Module. Each item in that sequence defines a value of the Coding Scheme Designator (as used in the SOP Instance) and maps it to a formal coding scheme identifier listed in an external registry. This sequence may also provide further identification for private or local code schemes.</p> <p>The principal registry envisioned at this time is maintained by HL7 for use in the HL7 Version 3 Coded Data (CD) datatype. This is the successor to Table 0396 in HL7 Version 2 used as the basis for Table 8-1 in Part 16. It uses OIDs as identifiers, which may be encoded in DICOM as UIDs. In fact, HL7 in its transition from v.2 to v.3 has changed from the use of brief textual Coding Scheme Designators to the use of OIDs as the normative requirement in the CD data elements; OIDs are required for every coding scheme used, including private or local code schemes.</p> <p>This proposal also establishes a UID for DICOM Controlled Terminology.</p> <p>This change is a step in the harmonization of DICOM capabilities with HL7 v.3. We do not require the use of OIDs, since they are only necessary when transcoding to an HL7 v.3 format (which are not yet in common use). Note we are not able to simply use OIDs as the Coding Scheme Designator, since the VR of (0008,0102) is SH, which limits it to 16 characters in length.</p> <p>DICOM currently has an attribute Private Coding Scheme Creator UID (0008,010C), which seems to identify the <i>organization</i> that created a coding scheme, but not the coding scheme itself. But Part 3 section 8.2 says it “may be used to more precisely identify a private (rather than a standard) coding scheme.” This implies that it might have been intended to actually identify the scheme, perhaps under the assumption that there is one scheme per organization. This proposal changes the name to simply Coding Scheme UID (0008,010C) and uses it to identify a coding scheme OID. And because the Coding Scheme Designator to UID mapping is now available in the SOP Common Module (encoded once per SOP Instance), it may be removed from the Code Sequence Macro (encoded once per Coded Entry Item).</p> <p>The Code Set Extension flag is therefore constrained to its use for flagging source application extension of the <i>Context Group</i>, and its second use for flagging extension of the Coding Scheme is retired.</p> <p>Further, a reference to a non-existent attribute Context Group Creator UID (0008,010E) is deleted.</p>	

Sections of documents affected

PS 3.3 Sections 8, C.12, and K

PS 3.6 Sections 6 and A

Correction Wording:

Modify PS 3.3 Section 8

8.2 Coding Scheme Designator, and Coding Scheme Version, ~~and Private Coding Scheme Creator UID~~

The attribute Coding Scheme Designator (0008,0102) identifies the coding scheme in which the code for a term is defined. **Standard coding scheme designators used in DICOM information interchange are listed in PS 3.16. Other coding scheme designators, for both private and public coding schemes, may be used. Further identification of the coding scheme designators used in a SOP Instance may be provided in the Coding Scheme Identification Sequence (0008,0110) (see Section C.12).**

- Notes:
1. Typical coding schemes used in DICOM include "DCM" for DICOM defined codes, "SNM3" for SNOMED version 3, "SRT" for SNOMED-RT, and "LN" for LOINC.
 2. Coding scheme designators beginning with "99" and the coding scheme designator "L" are defined in HL7 v.2 to be private or local coding schemes.
 - 3. Most IODs that define the use of coded terms provide for the use of private codes and coding schemes through replacement of Baseline Context Groups or extension of Defined Context Groups. Systems supporting such private code use must provide a mechanism for the configuration of sets of Coding Scheme Designator, Code Value, and Code Meaning to support interoperation of the private codes with other systems.**
 - 4. It is highly recommended that local or non-standard coding schemes be identified in the Coding Scheme Identification Sequence.**

~~If the Coding Scheme Designator (0008,0102) is not sufficient to identify the coding scheme uniquely and unambiguously, additional attributes may be required.~~

The attribute Coding Scheme Version (0008,0103) may be used to identify the version of a coding scheme **if necessary to resolve ambiguity in the Code Value (0008,0100) or Code Meaning (0008,0104), or if the Code Value does not appear in all versions of the Coding Scheme identified by the Coding Scheme Designator.**

~~The attribute Private Coding Scheme Creator UID (0008,010C) may be used to more precisely identify a private (rather than a standard) coding scheme.~~

~~Standard coding schemes are those that are listed in PS 3.16. That context group is based on a similar list in the HL7 and ASTM 2538 standards.~~

In previous ~~versions~~ **editions** of the DICOM Standard, a provisional Coding Scheme Identifier of "99SDM" was used for SNOMED codes that were used in DICOM. Consequently, when a Coding Scheme Designator (0008,0102) of "99SDM" is encountered, it shall be treated as equivalent to "SNM3" for the purpose of interpreting Code Value (0008,0100).

A Coding Scheme Designator (0008,0102) of "99SDM" or "SNM3" is defined to identify the SNOMED Version 3 Coding Scheme unambiguously, hence the condition for inclusion of Coding Scheme Version (0008,0103) is explicitly not satisfied.

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8.5 Context Group Version

Context Group Version (0008,0106) conveys the version (as a datetime value) of the Context Group identified by Context Identifier (0008,010F).

8.6 Context Identifier

The value of Context Identifier (0008,010F) identifies the Context Group defined by Mapping Resource (0008,0105) from which the values of Code Value (0008,0100) and Code Meaning (0008,0104) were selected, ~~or the Context Group defined by Mapping Resource (0008,0105) to which the Code Value (0008,0100) and Code Meaning (0008,0104) have been added as a private Context Group extension (see Section 8.7), by Context Group Creator UID (0008,010E).~~

Note: Privately defined Context Groups are not identified by Context Identifier and Mapping Resource.

8.7 Code Set Context Group Extensions

~~Code Set **Context Group** Extension Flag (0008,010B) may be used to designate a Code Value/Code Meaning pair as a **selection from a** private extension of a Coding Scheme or Context Group. **If the Context Group Extension Flag is present, and has a value of “Y”, Code Set Context Group** Extension Creator UID (0008,010D) ~~may~~ **shall** be used to identify the person or organization who created ~~an~~ **the** extension to ~~a~~ **the** Context Group ~~and/or Coding Scheme~~. Context Group Local Version (0008,0107) conveys an implementation-specific private version date/time of a Context Group that contains private ~~code set~~ extensions. See Section 8.8 of this Part for further definition.~~

- Notes:
1. These Attributes provide the means for users **implementations** to extend code sets conveniently, while preserving referential integrity with respect to the original Context Group Version. ~~These attributes also enable system administrators to track extensions so that they can be submitted to standards bodies as change proposals for controlled terminologies.~~
 2. The locally-defined (private) value of Context Group Local Version (0008,0107) typically would be a more recent date than the standard value of Context Group Version (0008,0106) specified in the standard message/terminology Mapping Resource that defines the Context Group.

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**Table 8.8-1 Common Attribute Set for Code Sequence Attributes
 (Invoked as “Code Sequence Macro”)**

Attribute Name	Tag	Type	Attribute Description
<i>BASIC CODED ENTRY ATTRIBUTES</i>			
Code Value	(0008,0100)	1C	See Section 8.1. Required if a sequence item is present.
Coding Scheme Designator	(0008,0102)	1C	See Section 8.2. Required if a sequence item is present.
Coding Scheme Version	(0008,0103)	1C	See Section 8.2. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.
Code Meaning	(0008,0104)	1C	See Section 8.3. Required if a sequence item is present.
<i>ENHANCED ENCODING MODE</i>			
Context Identifier	(0008,010F)	3	See Section 8.6.
Mapping Resource	(0008,0105)	1C	See Section 8.4. Required if Context Identifier (0008,010F) is present.
Context Group Version	(0008,0106)	1C	See Section 8.5. Required if Context Identifier (0008,010F) is present.

Code Set Context Group Extension Flag	(0008,010B)	3	<p>Code Set Extension Flag (0008,010B) Indicates whether the Code Value/Coding Scheme/Code Meaning pair encoded in Code Value (0008,0100) and Code Meaning (0008,0104) is selected from a private extension of a the Context Group identified in Context Identifier (0008,010F), and/or Coding Scheme. See Section 8.7 of this Part.</p> <p>Enumerated Values: "Y", "N"</p> <p>If Context Identifier (0008,010F) is present, then "Y" shall mean "The Code Value/Code Meaning pair is a private extension of the Context Group designated by Context Identifier (0008,010F)."</p> <p>If no value of Context Identifier (0008,010F) is present, then "Y" shall mean "The Code Value/Code Meaning pair is a private extension of the Coding Scheme designated by Coding Scheme Designator (0008,0102) and Coding Scheme Version (0008,0103)."</p>
Context Group Local Version	(0008,0107)	1C	<p>See Section 8.7. Required if the value of Code Set Context Group Extension Flag (0008,010B) is "Y".</p> <p>May also be present if the Context Group denoted by Context Identifier (0008,010F) contains private code set extensions.</p>
Private Coding Scheme Creator UID	(0008,010C)	3	<p>Private Coding Scheme Creator UID (0008,010C) identifies the organization that created and/or maintains the private Coding Scheme used, if any. See Section 8.2.</p>
Code Set Context Group Extension Creator UID	(0008,010D)	1C	<p>Code Set Extension Creator UID (0008,010D) Identifies the person or organization who created an extension to a the Coding Scheme or Context Group. See Section 8.7.</p> <p>Required if the value of Code Set Context Group Extension Flag (0008,010B) is "Y".</p>

Modify the SOP Common Module Table in PS 3.3 Section C.12

Table C.12-1
 SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
...			
Coding Scheme Identification Sequence	(0008,0110)	3	Sequence of items that map values of Coding Scheme Designator (0008,0102) to an external coding system registration, or to a private or local coding scheme. One or more items may be present in the sequence.
>Coding Scheme Designator	(0008,0102)	1	The value of a Coding Scheme Designator, used in this SOP Instance, which is being mapped.

<u>>Coding Scheme Registry</u>	(0008,0112)	1C	The name of the external registry where further definition of the identified coding scheme may be obtained. Required if coding scheme is registered. <u>Defined term: HL7</u>
<u>>Coding Scheme UID</u>	(0008,010C)	1C	The coding scheme UID identifier. Required if coding scheme is identified by an ISO 8824 object identifier compatible with the UI VR.
<u>>Coding Scheme External ID</u>	(0008,0114)	2C	The coding scheme identifier as defined in an external registry. Required if coding scheme is registered and Coding Scheme UID (0008,010C) is not present.
<u>>Coding Scheme Name</u>	(0008,0115)	3	The coding scheme full common name.
<u>>Coding Scheme Version</u>	(0008,0103)	3	The coding scheme version associated with the Coding Scheme Designator.
<u>>Responsible Organization</u>	(0008,0116)	3	Name of the organization responsible for the Coding Scheme. May include organizational contact information.

Modify the example SR content in PS 3.3 Section K to add Coding Scheme Identification Sequence and to remove Private Coding Scheme Creator UID (five occurrences)

SR Tree Depth	Nesting	Attribute	Tag	VR	VL (hex)	Value
...						
		Referring Physician's Name	(0008,0090)	PN	0014	Luke^Will^^Dr.^M.D.
		Coding Scheme Identification Sequence	(0008,0110)	SQ	fffffff	
	<u>%item</u>					
		Coding Scheme Designator	(0008,0102)	SH	000e	99STEIelsewhere
		Coding Scheme UID	(0008,010C)	UI	0010	1.2.3.4.6.7.8.91
		Responsible Organization	(0008,0116)	ST	0034	Informatics Dept St Elsewhere Hosp Boston, MA 02390
	<u>%enditem</u>					
	<u>%endseq</u>					
...						
	<u>>></u>	Private Coding Scheme Creator UID	(0008,010c)	UI	0010	1.2.3.4.6.7.8.91
...						

Modify Data Elements in PS 3.6 Section 6

(0008,010B)	Code Set Context Group Extension Flag	CS	1
(0008,010C)	Private Coding Scheme Creator UID	UI	1
(0008,010D)	Code Set Context Group Extension Creator UID	UI	1

Add Data Elements to PS 3.6 Section 6

(0008,0110)	<u>Coding Scheme Identification Sequence</u>	<u>SQ</u>	<u>1</u>
(0008,0112)	<u>Coding Scheme Registry</u>	<u>LO</u>	<u>1</u>
(0008,0114)	<u>Coding Scheme External ID</u>	<u>ST</u>	<u>1</u>
(0008,0115)	<u>Coding Scheme Name</u>	<u>ST</u>	<u>1</u>
(0008,0116)	<u>Responsible Organization</u>	<u>ST</u>	<u>1</u>

Add DICOM Controlled Terminology UID to PS 3.6 Annex A

**Table A-1
 UID VALUES**

UID Value	UID NAME	UID TYPE	Part
...			
<u>1.2.840.10008.2.16.4</u>	<u>DICOM Controlled Terminology</u>	<u>Coding Scheme</u>	<u>PS 3.16</u>
...			

Add Coding Scheme UID column to PS 3.16 Table 8-1

Table 8-1 Coding Schemes

Coding Scheme Designator	Coding Scheme UID	Description
...		
DCM	<u>1.2.840.10008.2.16.4</u>	DICOM <u>Controlled Terminology</u> ; PS 3.16 Content Mapping Resource, <u>Annex D</u> defined codes
...		