DICOM Conformance Statement

AI-Rad Companion Organs RT VA6x

June 2024

SIEMENS Healthineers

1 Conformance Statement Overview

AI-Rad Companion Organs RT is a cloud-based/on-premises(edge) application, which communicates indirectly with other DICOM nodes since it makes use of the network services provided by teamplay DICOM Hub.

AI-Rad Companion Organs RT:

- Receives the input DICOM data from teamplay DICOM Hub using the configurable AET.
- Displays images to a user (browser-based viewer application).
- Calculates and generates organs at risk contouring results in a DICOM RT Structure Set (RTSS) format.
- Stores result DICOM data via teamplay DICOM Hub to one or several target DICOM node configured in teamplay DICOM Hub.

AI-Rad Companion Organs RT conforms to the DICOM Standard [2] and supports a subset of the storage SOP classes supported by teamplay DICOM Hub, as described in Table 1 - Network Services.

Please refer to the DICOM Conformance Statements of teamplay DICOM Hub[1] for further information on the provided network services.

NOTE: - This DICOM Conformance Statement is applicable for **AI-Rad Companion Organs RT** of version VA6x and later until superseded by a more recent document applicable to a more recent version.

Table 1: Network Services

SOP Classes	SOP Class UID	User of Service (SCU)		Provider of Service (SCP)	
Transfer					
		Create	**Send**	**Store**	**Display**
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	No	No[1]	No[1]	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	No	No[1]	No[1]	Yes
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	No[1]	No[1]	Yes

[1] Network communication is performed by teamplay DICOM hub. Please refer to the DICOM Conformance Statements of teamplay DICOM Hub [1] for further information.

Table 2: Media Services

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
N/A		

Table 3: Implementation Identifying Information

Name	Value
Implementation Class UID	1.3.12.2.1107.5.8.21[2]
Implementation Version Name	AI-Rad Companion[2]

[2] The implementation Class UID and Implementation Version name values are not specific to AI-Rad Companion Organs RT as the same value is used for all clinical applications available on AI-Rad Companion. Version information specific to AI-Rad Companion Organs RT can be found in the General Equipment Module(**Table 15**).

2 Table of Contents

3 Introduction

3.1 Revision History

Version	Date	Change
R1.0	01/07/2024	1) Device Serial Number -> Modified to have a meaningful number instead of random value 2) Series Description -> Refined the value so that it is consistent with other medical devices in AI-Rad Companion 3) Series Number -> Modified to have a value for this attribute instead of keeping it empty. 4) ROI Description ->New DICOM tag attribute to specify the guideline variant used to automatically contour the structure.

3.2 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

3.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between **AI-Rad Companion Organs RT** and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [2]. DICOM by itself does not guarantee interoperability.
The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.
This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

- The comparison of conformance statements is the first step towards assessing interconnectivity and interoperability between **AI-Rad Companion Organs RT** and other DICOM conformant equipment.
- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.
- Siemens Healthineers reserves the right to modify the design and specifications contained herein without prior notice. Please contact your local Siemens Healthineers representative for the most recent product information.

3.4 Definitions, Terms and Abbreviations

Definitions, terms, and abbreviations used in this document are defined within the different parts of the DICOM standard.

Additional Abbreviations and terms are as follows:

AE	DICOM Application Entity
AET	Application Entity Title
DICOM	Digital Imaging and Communications in Medicine
FSC	File Set Creator
FSR	File Set Reader
FSU	File Set Updater

IOD	DICOM Information Object Definition
ISO	International Standard Organization
N/A	Not Applicable
NEMA	National Electrical Manufacturers Association
ROI	Region Of Interest
RT	Radiation Therapy
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM Server)
SOP	DICOM Service-Object Pair
UID	Unique Identifier
UTF-8	Unicode Transformation Format-8
VR	Value Representation

3.5 References

[1] DICOM Conformance Statements of latest published version of teamplay DICOM Hub(starting with VD31A) – https://www.siemens-healthineers.com/en-in/services/it-standards/dicom-conformance-statements-digital-and-automation/teamplay
[2] NEMA PS3 / ISO 12052, Digital Imaging and Communications in Medicine (DICOM) Standard, National Electrical Manufacturers Association, Rosslyn, VA, USA (available free at https://www.dicomstandard.org/)
[3] AI-Rad Companion Data Privacy and Security White Paper – Based on on-demand request from the end users.
[4] Teamplay Data Privacy and Security White Paper – Based on on-demand request from the end users.

4 Networking

Please refer to the latest version of DICOM Conformance Statements of teamplay DICOM Hub [1] for further information on the provided networking capabilities for AI-Rad Companion Organs RT.

AI-Rad Companion Organs RT only supports subset of transfer syntaxes supported by teamplay and the following table lists the supported transfer syntaxes.

Table 4: Supported Image Encoding

Abstract Syntax		Transfer Syntax	
SOP Classes	**SOP Class UID**	**Name List**	**UID List**
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Big Endian	1.2.840.10008.1.2.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.90
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Big Endian	1.2.840.10008.1.2.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.90
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Big Endian	1.2.840.10008.1.2.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.90

5 Media Interchange

Please refer to the latest version of DICOM Conformance Statements of teamplay DICOM Hub [1] for further information on the provided Media Interchange for AI-Rad Companion Organs RT.

6 Transformations of DICOM to CDA

AI-Rad Companion Organs RT is not providing any means for transformations to CDA.

7 Support of Extended Character Sets

7.1 Character sets for AI-Rad Companion Organs RT

AI-Rad Companion Organs RT supports the presentation of the below character sets to the user without any font limitations/substitutions as defined in the tables in this section.

Table 5: Single-Byte Character Sets without Code Extension

Character Set Description	Defined Term	Character Set
Default repertoire	None	ISO 646
Latin alphabet No. 1	ISO_IR 100	Supplementary set
		ISO 646
Latin alphabet No. 2	ISO_IR 101	Supplementary set
		ISO 646
Latin alphabet No. 3	ISO_IR 109	Supplementary set
		ISO 646
Latin alphabet No. 4	ISO_IR 110	Supplementary set
		ISO 646
Latin alphabet No. 5	ISO_IR 148	Supplementary set
		ISO 646
Cyrillic	ISO_IR 144	Supplementary set
		ISO 646
Arabic	ISO_IR 127	Supplementary set
		ISO 646
Greek	ISO_IR 126	Supplementary set
		ISO 646
Hebrew	ISO_IR 138	Supplementary set
		ISO 646
Japanese	ISO_IR 13	JIS X 0201: Katakana
		JIS X 0201: Romaji
Thai	ISO_IR 166	TIS 620-253 (1990)
		ISO 646

Table 6: Single-Byte Characters Sets with Code Extension

Character Set Description	Defined Term	Standard for Code Extension	ESC sequence	Character Set
Default repertoire	ISO 2022 IR 6	ISO 2022	ESC 02/08 04/02	ISO 646
Latin alphabet No.1	ISO 2022 IR 100	ISO 2022	ESC 02/13 04/01	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO 646
Latin alphabet No.2	ISO 2022 IR 101	ISO 2022	ESC 02/13 04/02	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO 646
Latin alphabet No.3	ISO 2022 IR 109	ISO 2022	ESC 02/13 04/03	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO 646
Latin alphabet No. 4	ISO 2022 IR 110	ISO 2022	ESC 02/13 04/04	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO 646
Latin alphabet No. 5	ISO 2022 IR 148	ISO 2022	ESC 02/13 04/13	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO 646

Table 7: Multi-Byte Character Sets without Code Extension

Character Set Description	Defined Term	Character Set
Unicode	ISO_IR 192	Unicode in UTF-8
Chinese	GB18030	GB 18030-2000 (China Association for Standardization)

Table 8: Multi-Byte Character Sets with Code Extension

Character Set Description	Defined Term	Standard for Code Extension	ESC sequence	Character Set
Japanese	ISO 2022 IR 159	ISO 2022	ESC 02/04 02/08 04/04	JIS X 0212: Supplementary Kanji set
Korean	ISO 2022 IR 149	ISO 2022	ESC 02/04 02/09 04/03	KS X 1001: Hangul and Hanja

All SCS (Specific Character Sets) listed above are supported for incoming Data.

Three categories of character sets have to be differentiated because of their different encoding formats:

- Conventional ISO character sets: ISO_IR 6, ISO 2022 IR 6, ISO_IR 100, etc. → Encoded in ISO 2022
- ISO_IR 192 → Encoded in UTF-8
- GB18030 → Encoded in GB18030

It is not possible to recognize the following mismatches automatically on receiving or importing:

- An attribute value is encoded in ISO_IR 192 ← → (0008,0005) contains a conventional ISO character set as primary character set
- An attribute value is encoded in GB18030 ← → (0008,0005) contains a conventional ISO character set as primary character set
- An attribute value is encoded in ISO 2022 ← → (0008,0005) contains ISO_IR 192
- An attribute value is encoded in ISO 2022 ← → (0008,0005) contains GB18030

An IOD that contains one of the above mentioned inconsistencies does not conform to DICOM. As these kinds of inconsistencies cannot be recognized by the system, the IOD will not be rejected but the character data might be corrupted.

AI-Rad Companion Organs RT supports Kanji characters in the byte zone after 74 (79, 7A, 7B and 7C).

8 Attribute confidentiality profiles

8.1 De-identification

Please refer to the AI-Rad Companion Data Privacy and Security White Paper [3] for further information on the support of de-identification of attributes natively for AI-Rad Companion Cloud deployment. In case of edge (on-premises) deployment, no de-identification happens from teamplay.

AI-Rad Companion Organs RT does not support High privacy and Restrictive privacy levels. For more details on the privacy levels, please refer to the Teamplay Data Privacy and Security White Paper[4].

9 Security

9.1 Security Profiles

AI-Rad Companion Organs RT does not support any specific security measures.

9.2 Association Level Security

N/A

9.3 Application Level Security

N/A

10 Annexes

10.1 IOD Contents

10.1.1 Created SOP Instances

10.1.1.1 RT Structure Set Storage

Table 9: RT Structure Set IOD Modules

Information Entity	Module	Reference	Presence of Module
Patient	Patient Module	Table 10	ALWAYS
Study	General Study Module	Table 11	ALWAYS
	Patient Study Module	Table 12	ALWAYS
Series	RT Series Module	Table 13	ALWAYS
Frame of Reference	Frame of Reference Module	Table 14	ALWAYS
Equipment	General Equipment Module	Table 15	ALWAYS
Structure Set	Structure Set Module	Table 16	ALWAYS
	ROI Contour Module	Table 17	ALWAYS
	RT ROI Observations Module	Table 18	ALWAYS
	Approval Module	Table 19	ALWAYS
	SOP Common Module	Table 20	ALWAYS

The following Tables use a number of abbreviations. The abbreviations used in the “Presence” column are

- VNAP: Value is Not Always Present. Attribute is sent zero length if no value is present.
- ANAP: Attribute Not Always Present.
- ALWAYS: Attribute and Value are always present.
- EMPTY: Attribute is sent zero length.

The abbreviations used in the “Source” Column are

- USER: The attribute value is entered by the user.
- AUTO: The attribute value is generated by the system.
- CONFIG: The attribute value is obtained by configuration.
- COPIED: The attribute value is copied from source image.

Table 10 lists all Attributes that are supported in the Patient Module.

Table 10: Patient Module

Attribute	Tag	Source	Value	Presence	Comments
Patient`s Name	(0010,0010)	COPIED		VNAP	
Patient ID	(0010,0020)	COPIED		VNAP	
Patient`s Birth Date	(0010,0030)	COPIED		VNAP	
Patient`s Sex	(0010,0040)	COPIED		VNAP	

Table 11 lists all Attributes that are supported in the General Study Module

Table 11: General Study Module

Attribute	Tag	Source	Value	Presence	Comments
Study Date	(0008,0020)	COPIED		VNAP	
Study Time	(0008,0030)	COPIED		VNAP	
Accession Number	(0008,0050)	COPIED		VNAP	
Referring Physician's Name	(0008,0090)	COPIED		VNAP	
Study Description	(0008,1030)	COPIED		ANAP	
Study Instance UID	(0020,000D)	COPIED		ALWAYS	
Study ID	(0020,0010)	COPIED		VNAP	

Table 12 lists all Attributes that are supported in the Patient Study Module

Table 12: Patient Study Module

Attribute	Tag	Source	Value	Presence	Comments
Patient`s Age	(0010,1010)	COPIED		ANAP	

Table 13 lists all Attributes that are supported in the RT Series Module

Table 13: RT Series Module

Attribute	Tag	Source	Value	Presence	Comments
Series Date	(0008,0021)	AUTO	Date when series is created	ALWAYS	
Series Time	(0008,0031)	AUTO	Time when series is created	ALWAYS	
Modality	(0008,0060)	AUTO	RTSTRUCT	ALWAYS	
Series Description	(0008,103E)	AUTO	AIRC Organs RT - RTSTRUCT	ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
Operators' Name	(0008,1070)	AUTO	Name of the operator logged on to the system	ALWAYS	
Series Instance UID	(0020,000E)	AUTO	Unique identifier of the series.	ALWAYS	
Series Number	(0020,0011)	AUTO	Series Number in Source Image * 100	VNAP	

Table 14 lists all Attributes that are supported in the Frame of Reference Module

Table 14: Frame of Reference Module

Attribute	Tag	Source	Value	Presence	Comments
Frame of Reference UID	(0020,0052)	COPIED		ALWAYS	
Position Reference Indicator	(0020,1040)	AUTO		EMPTY	

Table 15 lists all Attributes that are supported in the General Equipment Module

Table 15: General Equipment Module

Attribute	Tag	Source	Value	Presence	Comments
Manufacturer	(0008,0070)	AUTO	Siemens Healthineers	ALWAYS	
Manufacturer's Model Name	(0008,1090)	AUTO	AI-Rad Companion Organs RT	ALWAYS	
Device Serial Number	(0018,1000)	AUTO	Concatenated string composed of :- AI-Rad Companion system IVK number and teamplay serial number. For example:- 11294418-670307	ALWAYS	
Software Versions	(0018,1020)	AUTO	VXXXX where XXXX indicates the used version of Organs RT. For Example:- VA50A.	ALWAYS	

Table 16 lists all Attributes that are supported in the Structure Set Module

Table 16: Structure Set Module

Attribute	Tag	Source	Value	Presence	Comments
Instance Number	(0020,0013)	AUTO	1	ALWAYS	Organs RT always generates only

Attribute	Tag	Source	Value	Presence	Comments
					one RTSS result object.
Structure Set Label	(3006,0002)	AUTO	StructureSet	ALWAYS	
Structure Set Name	(3006,0004)	AUTO	StructureSet	ALWAYS	
Structure Set Date	(3006,0008)	AUTO	Creation date of Structure Set	ALWAYS	
Structure Set Time	(3006,0009)	AUTO	Creation time of Structure Set	ALWAYS	
Referenced Frame of Reference Sequence	(3006,0010)	AUTO	Sequence describing Frames of Reference in which the ROIs are defined.	ALWAYS	
>Frame of Reference UID	(0020,0052)	COPIED		ALWAYS	
>RT Referenced Study Sequence	(3006,0012)	AUTO	Sequence of Studies containing Series to be referenced.	ALWAYS	
>>Referenced SOP Class UID	(0008,1150)	AUTO	SOP Class UID of the source image	ALWAYS	
>>Referenced SOP Instance UID	(0008,1155)	AUTO	SOP Instance UID of the source image	ALWAYS	
>>RT Referenced Series Sequence	(3006,0014)	AUTO	Sequence describing Series of images within the referenced Study that are used in defining the Structure Set.	ALWAYS	
>>>Series Instance UID	(0020,000E)	AUTO	Series Instance UID of the source image	ALWAYS	
>>>Contour Image Sequence	(3006,0016)	AUTO	Sequence of Items describing images in a given Series used in defining the Structure Set. One or more Items shall be included in this Sequence.	ALWAYS	
>>>>Referenced SOP Class UID	(0008,1150)	AUTO	SOP Class UID of all the images of the source series	ALWAYS	
>>>>Referenced SOP Instance UID	(0008,1155)	AUTO	SOP Instance UID of all the images of the source series	ALWAYS	
Structure Set ROI Sequence	(3006,0020)	AUTO	ROIs for current Structure Set.	ALWAYS	
>ROI Number	(3006,0022)	AUTO	Identification number of the ROI starting from 1.	ALWAYS	
>ROI Description	(3006, 0028)	CONFIG	For **CT Modality** - Name of the Guideline selected/mapped for each automatically contoured Organ. For Example – "RTOG".	ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
			For **Manual Organs and MR Modality** – This Dicom Tag shall not be present.		
>Referenced Frame of Reference UID	(3006,0024)	COPIED		ALWAYS	
>ROI Name	(3006,0026)	CONFIG	Name of the organs/structures as configured by the user in the system	ALWAYS	
>ROI Generation Algorithm	(3006,0036)	CONFIG	AUTOMATIC for organs which are contoured by the algorithm and chosen automatic by user. MANUAL for organs which are not contoured by the algorithm.	ALWAYS	

Table 17 lists all Attributes that are supported in the ROI Contour Module

Table 17: ROI Contour Module

Attribute	Tag	Source	Value	Presence	Comments
ROI Contour Sequence	(3006,0039)	AUTO	Sequence of Contour Sequences defining ROIs.	ALWAYS	
>ROI Display Color	(3006,002A)	CONFIG	RGB triplet color representation for ROI as configured by user to the organs/structures in the system.	ALWAYS	
>Contour Sequence	(3006,0040)	AUTO	Sequence of Contours defining ROI.	ALWAYS	
>>Contour Image Sequence	(3006,0016)	AUTO	Sequence of images containing the contour.	ALWAYS	
>>>Referenced SOP Class UID	(0008,1150)	AUTO	SOP Class UID of the image having the Contour Data	ALWAYS	
>>>Referenced SOP Instance UID	(0008,1155)	AUTO	SOP Instance UID of the image having the Contour Data.	ALWAYS	
>>Contour Geometric Type	(3006,0042)	AUTO	CLOSED_PLANAR	ALWAYS	
>>Number of Contour Points	(3006,0046)	AUTO	Number of points(triplets) in Contour Data (3006,0050)	ALWAYS	
>>Contour Number	(3006,0048)	AUTO	Identification number of the contour starting from 1.	ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
>>Contour Data	(3006,0050)	AUTO	Sequence of (x,y,z) triplets defining a contour which is result of the algorithm	ALWAYS	
>Referenced ROI Number	(3006,0084)	AUTO	Uniquely identifies the referenced ROI described in the Structure Set ROI Sequence	ALWAYS	

Table 18 lists all Attributes that are supported in the RT ROI Observations Module

Table 18: RT ROI Observations Module

Attribute	Tag	Source	Value	Presence	Comments
RT ROI Observations Sequence	(3006,0080)	AUTO	Sequence of observations related to ROIs	ALWAYS	
>Observation Number	(3006,0082)	AUTO	Identification number of the Observation.	ALWAYS	
>Referenced ROI Number	(3006,0084)	AUTO	Uniquely identifies the referenced ROI described in the Structure Set ROI Sequence.	ALWAYS	
>RT ROI Identification Code Sequence	(3006,0086)	AUTO	Sequence containing ROIs for each organ configured.	ALWAYS	
>>Code Value	(0008,0100)	CONFIG	Code Value of the organs/structures as defined/configured by the user in the system.	ALWAYS	
>>Code Scheme Designator	(0008,0102)	CONFIG	Coding Scheme of the organs/structures as defined/configured by the user in the system. E.g., FMA, Radlex	ALWAYS	
>>Code Scheme Version	(0008,0103)	CONFIG	Coding Version of the organs/structures as defined/configured by the user in the system.	ALWAYS	
>>Code Meaning	(0008,0104)	CONFIG	Code Meaning of the organs/structures as defined/configured by the user in the system.	ALWAYS	
>>Mapping Resource	(0008,0105)	AUTO	99VMS	ALWAYS	
>>Context Group Version	(0008,0106)	AUTO	20161209	ALWAYS	
>>Context Identifier	(0008,010F)	AUTO	VMS011	ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
>RT ROI Interpreted Type	(3006,00A4)	CONFIG	Type of ROI as configured by user to the organs/structures in the system.	ALWAYS	
>ROI Interpreter	(3006,00A6)	AUTO	Name of the interpreter logged on to the system	ALWAYS	

Table 19 lists all Attributes that are supported in the Approval Module

Table 19: Approval Module

Attribute	Tag	Source	Value	Presence	Comments
Approval Status	(300E,0002)	AUTO	UNAPPROVED	ALWAYS	

Table 20 lists all Attributes that are supported in the SOP Common Module

Table 20: SOP Common Module

Attribute	Tag	Source	Value	Presence	Comments
Specific Character Set	(0008,0005)	AUTO	ISO_IR 192	ALWAYS	
Instance Creation Date	(0008,0012)	AUTO	Date when series is created	ALWAYS	
Instance Creation Time	(0008,0013)	AUTO	Time when series is created	ALWAYS	
SOP Class UID	(0008,0016)	AUTO	1.2.840.10008.5.1.4.1.1.481.3	ALWAYS	
SOP Instance UID	(0008,0018)	AUTO	Unique Identifier of the instance	ALWAYS	
Timezone Offset from UTC	(0008,0201)	AUTO	Copied from the original image.	ALWAYS	

Table 21: Configuration Values

Attribute	User/System Generated	Default Value/s	Comments
ROI Name	User - If Organ Name provided in the configuration is modified OR New Organ is added in the Configuration System – If Organ Name provided in the configuration is not modified.	Organ Name in English for each organ/structure.	

Attribute	User/System Generated	Default Value/s	Comments
ROI Generation Algorithm	User - If the algorithm generation type provided in the configuration for automatically contoured organs is modified System - If the algorithm generation type provided in the configuration for automatically contoured organs is NOT modified OR If the algorithm generation type is not automatically contoured.	"Automatic" For automatically contoured organs else "Manual".	
ROI Display Color	User - If the Color provided for the organ in the configuration is modified System – If the Color provided in the configuration is not modified.	Random color generated by the system for each organ/structure	
Code Value	User – If new organ is added in the configuration. System – If the organ is already existing in the configuration	Values as defined in the Scheme Designator.	
Code Scheme Designator	User – If new organ is added in the configuration. System – If the organ is already existing in the configuration	Each Organ shall have one of them - FMA, Radlex, 99VMS_Structcode	
Code Scheme Version	User – If new organ is added in the configuration. System – If the organ is already existing in the configuration	Version w.r.to the Scheme Designator.	
Code Meaning	User – If new organ is added in the configuration. System – If the organ is already existing in the configuration	Values as defined in the Scheme Designator	
RT ROI Interpreted Type	User - If the Type provided for the organ in the configuration is modified. System – If the Type provided in the configuration is not modified.	Default Type appropriate to the organ.	

10.1.2 Usage of Attributes from Received IODs

AI-Rad Companion Organs RT only processes images having the following attributes for CT Image Storage:-

Table 22: CT Image Storage Dependent Attributes

Attribute	Tag	Value/s	Comments
Transfer Syntax UID	(0002,0010)	1.2.840.10008.1.2 1.2.840.10008.1.2.1	

Attribute	Tag	Value/s	Comments
		1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90	
Patient's Age	(0010,1010)	Must be >= 22 years	
Bits Allocated	(0028,0100)	Must be equal to 16	
Photometric Interpretation	(0028, 0004)	Must be equal to MONOCHROME2	
Image Orientation Patient	(0020, 0037)	Must be either 1\0\0\0\1\0(Head First Supine) Or -1\0\0\0\-1\0(Head First Prone)	
Slice Thickness	(0020, 0032)	Must be <= 5	Tag is of Image Position Patient since computation is done using the difference between the z value of Image Position Patient (0020,0032) of two consecutive slices
Samples per Pixel	(0028, 0002)	Must be equal to 1	
Matrix Size	(0028, 0010) * (0028, 0011)	Must be at least 512 * 512	Tag is of Rows * Columns
Rescale Slope	(0028, 1053)	Must be less than 5	
Gantry/Detector Tilt	(0018, 1120)	Must be equal to 0	

AI-Rad Companion Organs RT only processes images having the following attributes for MR Image Storage:

Table 23: MR Image Storage Dependent Attributes

Attribute	Tag	Value/s	Comments
Transfer Syntax UID	(0002,0010)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90	
Patient's Age	(0010,1010)	Must be >= 22 years	
Patient's Sex	(0010, 0040)	Must either be "Male" Or "Other"	
Image Orientation Patient	(0020, 0037)	Must be 1\0\0\0\1\0(Head First Supine)	
Pixel Spacing	(0028, 0030)	T2-Weigthed – Must be between 0.2 to 1.25 T1-Weigthed – Must be between 0.2 to 2	
Slice Thickness	(0018, 0050)	Must be <= 4	
Magnetic Field Strength	(0018, 0087)	Must be either 1.5 Or 3	

10.1.3 Attribute Mapping

N/A

10.1.4 Coerced/Modified Fields

N/A

10.2 Data Dictionary of Private Attributes

N/A

10.3 Coded Terminology and Templates

10.3.1 Context Groups

N/A

10.3.2 Template Specifications

N/A

10.3.3 Private Code definitions

AI-Rad Companion Organs RT uses following private codes.

Table 24: Context Identifiers for Context VMS011

Attribute	Tag	Source	Value	Presence	Comments
Mapping Resource	(0008,0105)	AUTO	99VMS	ALWAYS	
Context Group Version	(0008,0106)	AUTO	20161209	ALWAYS	
Context Identifier	(0008, 010F)	AUTO	VMS011	ALWAYS	

AI-Rad Companion Organs RT uses the private coding scheme designator 99VMS_STRUCTCODE to identify below structures(organs) in the system as mentioned in the following table:

Table 25: Organs referring private coding scheme

Organ Name	Code Value	Code Meaning
Group12: lymph nodes of the hepatoduodenal ligament (HDL)	LN_12_HDL	Lymph nodes in hepatoduodenal ligament
Hepatico-jejunal anastomosis	P1-5B858	Hepatojejunostomy
Pancreaticojejunal anastomosis	P1-5C83D	Pancreaticojejunostomy
Body	BODY	Body
CTV High Risk	CTV_High	Clinical Target Volume High Risk
CTV Intermediate Risk	CTV_Intermediate	Target Volume Intermediate Risk

Organ Name	Code Value	Code Meaning
CTV Low Risk	CTV_Low	Clinical Target Volume Low Risk
CTV Primary	CTVp	Primary Clinical Target Volume
GTV Nodal	GTVn	Nodal Gross Tumor Volume
GTV Primary	GTVp	Primary Gross Tumor Volume
ITV	ITV	Internal Target Volume
Metabolic Tumor Volume	MTV	Metabolic Tumor Volume
PRV	PRV	Planning Organ-at-Risk Volume
PTV High Risk	PTV_High	Planning Target Volume High Risk
PTV Intermediate Risk	PTV_Intermediate	Planning Target Volume Intermediate Risk
PTV Low Risk	PTV_Low	Planning Target Volume Low Risk
PTV Primary	PTVp	Primary Planning Target Volume
Level IVa Left: Lower jugular group	323946_L	Left Level IVa Set of lower jugular lymph nodes
Level IVa Right: Lower jugular group	323946_R	Right Level IVa Set of lower jugular lymph nodes
Level IVb Left: Medial supraclavicular group	LN_HN_IVB_L	Level IVb Left: Medial supraclavicular group
Level IVb Right: Medial supraclavicular group	LN_HN_IVB_R	Level IVb Right: Medial supraclavicular group
Level IVb: Medial supraclavicular group	LN_HN_IVB	Level IVb: Medial supraclavicular group
Level Vc Left: Lateral supraclavicular group	LN_HN_VC_L	Left Level Vc supraclavicular group
Level Vc Right: Lateral supraclavicular group	LN_HN_VC_R	Right Level Vc supraclavicular group
Level Vc: Lateral supraclavicular group	LN_HN_VC	Level Vc: Set of supraclavicular lymph nodes
Level VIa: Anterior jugular nodes	LN_HN_VIA	Level VIa: Anterior jugular nodes
Level VIb: Prelaryngeal, pretracheal, & paratracheal nodes	LN_HN_VIB	Level VIb: Prelaryngeal, pretracheal, & paratracheal nodes
Level VIIb Left: Retro-styloid nodes	LN_HN_VIIB_L	Level VIIb Left: Retro-styloid nodes
Level VIIb Right: Retro-styloid nodes	LN_HN_VIIB_R	Level VIIb Right: Retro-styloid nodes
Level VIIb: Retro-styloid nodes	LN_HN_VIIB	Level VIIb: Retro-styloid nodes
Parotid Glands	Parotids	Set of parotid glands
Submandibular Glands	Submandibular	Set of submandibular glands
Femurs	Femurs	Set of femurs
Bolus	Bolus	Bolus
Fixation	Fixation	Fixation
Irrad Volume	Irrad Volume	Irradiated Volume

Organ Name	Code Value	Code Meaning
Support	Support	Support
Treated Volume	Treated Volume	Treated Volume
Anal Sphincter Internal and External	AnalSphincters	Set of anal sphincters
Femoral Heads	FemoralHeads	Set of heads of femur
Femoral Necks	FemoralNecks	Set of neck of femur
Seminal Vesicle Proximal Part	SeminalVesProx	Proximal part of seminal vesicle
Great Vessels	GreatVessels	Great Vessels
LN Obturator Left	71830_L	Set of left obturator lymph nodes
LN Obturator Right	71830_R	Set of right obturator lymph nodes

10.4 Grayscale Image Consistency

N/A

10.5 Standard Extended / Specialized / Private SOP Classes

N/A

10.6 Private Transfer Syntaxes

N/A

Index of Tables

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