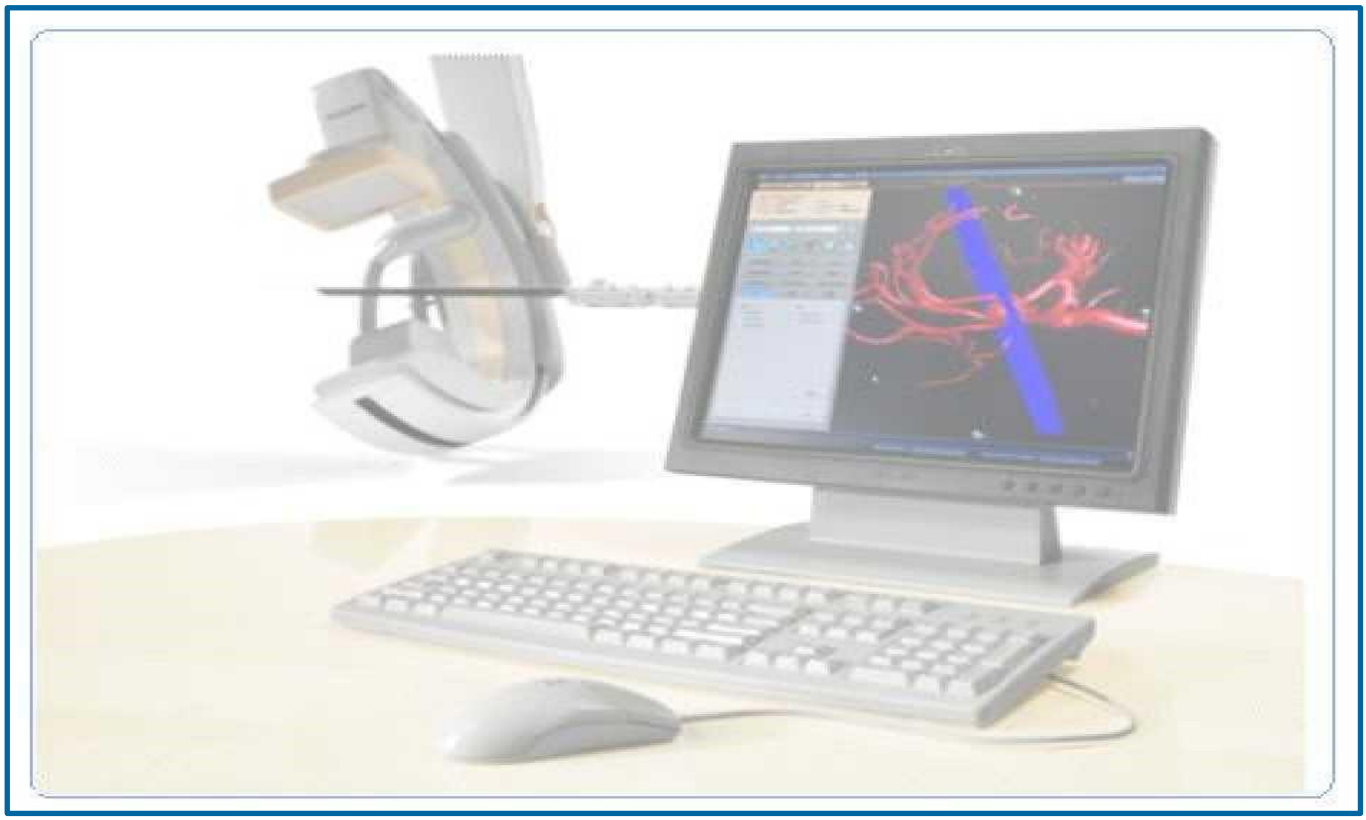
DICOM Conformance Statement

Application Annex:
HeartNavigator R3.4 on Interventional Workspot R1.8



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1. DICOM Conformance Statement Overview

For information about this section, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.

2. Contents

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3. Introduction

This DICOM Conformance Statement annex is applicable to HeartNavigator R3.4 hosted on Interventional Workspot, later referred to as HeartNavigator Application. HeartNavigator Application is a tool to assist cardiac surgeons and interventional cardiologist with the treatment of structural heart diseases using minimal invasive interventional techniques. It enables the use of previously acquired DICOM cardiac CT data of the patient in conjunction with the X-ray image data from the Philips Interventional X-ray system to perform the procedure.

In the procedure planning phase, the HeartNavigator Application provides the user with the means to:

- Identify and visualize relevant anatomical structures in the CT data.
- Plan and create an overview of optimal X-ray projection angles for use during the procedure.
- Evaluate the placement of the device.
- Create snapshots of the viewing area of the HeartNavigator Application for later use (e.g., reporting).

During the procedure, the HeartNavigator Application provides the user with the means to:

- Visualize the relevant anatomical structures in the CT data.
- Recall the planned X-ray projection angles on the Philips Interventional X-ray system.
- See the 3D visualization of the CT data overlaid with the live X-ray images from the Philips Interventional X-ray system.
- Create snapshots and movies of the viewing area of the HeartNavigator Application for later use (e.g., reporting)

HeartNavigator R3.4 includes the following workflows:

- TAVI (Transcatheter Aortic Valve Implementation)
- SHD (Structural Heart Disease)

The DICOM implementation described in this document is applicable for TAVI and SHD.

3.1. Revision History

The revision history provides dates and differences of the different releases.

Table 1: Revision History

Document Version	Date of Issue	Description of change
01	09-Feb-2023	First Release for HeartNavigator R3.4 on Interventional Workspot R1.8

3.2. Audience

This Conformance Statement is intended for:

- (Potential) customers
- System integrators of medical equipment
- Marketing staff interested in system functionality
- Software designers implementing DICOM interfaces

It is assumed that the reader is familiar with the DICOM standard.

3.3. Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2.
This DICOM Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

- **Interoperability**
  Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment.
  It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.

- **Validation**
  Philips equipment has been carefully tested to ensure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.
  Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- **New versions of the DICOM Standard**
  The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery. The user should ensure that any non-Philips provider linking to Philips equipment also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

3.4. Definitions, Terms and Abbreviations

Table 2: Definitions, Terms and Abbreviations

Abbreviation/Term	Explanation
DICOM	Digital Imaging and Communications in Medicine
IOD	Information Object Definition
IW	Interventional Workspot
NEMA	National Electrical Manufacturers Association
SHD	Structural Heart Disease
TAVI	Transcatheter Aortic Value Implementation
TAVR	Transcatheter Aortic Value Replacement
UID	Unique Identifier
VR	Value Representation

3.5. References

[DICOM] Digital Imaging and Communications in Medicine, Parts 1 - 22 (NEMA PS 3.1- PS 3.22),
National Electrical Manufacturers Association
1300 North 17th Street
Suite 900
Arlington, Virginia 22209
Internet: https://www.dicomstandard.org/current

4. Networking

For information about this section, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.

5. Media Interchange

For information about this section, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.

6. Support of Character Set

For information about this section, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.

7. Security

For information about this section, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.

8. Annexes of "HeartNavigator R3.4 Application"

8.1. IOD Contents

This section specifies each IOD accepted and / or created by HeartNavigator R3.4 application.

ACCEPTED The applicable IOD is accepted for storage in the repository of the hosting platform and supported for import in HeartNavigator Application for viewing and analysis.

CREATED The HeartNavigator Application supports generation of derived data by using the applicable IOD and is able to store this data in the repository of the hosting platform.

Table 3: List of Created SOP Classes

IOD		Supported	
Name	**UID**	**Accepted**	**Created**
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes*	Yes
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes***	Yes**
Multiframe True Color Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.4	No	Yes
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	No

***Note:** HeartNavigator only accepts XA runs that were received via Real Time Link connection during the Registration and Live tasks from the Philips Interventional X-Ray systems. Only these XA runs can be recalled when the study is imported again in the HeartNavigator TAVI and SHD workflows.*

*** Note: The following Secondary Capture Images can be created in the HeartNavigator applications:*

- *DICOM snapshots containing a screencapture of the Segmentation, Measurement, Planning, Registration or Live worksteps*
- *Report of the Measurement and Planning worksteps*
- *Session object with results of the several HeartNavigator worksteps (automatically created when the HeartNavigator application is closed.*

**** Only the Secondary Capture objects containing the HeartNavigator sessions information can be used as input. (DICOM snapshots and the measurement/planning report cannot be used as input).*

8.1.1. Acceptance Criteria

This section specifies the acceptance criteria applied by HeartNavigator Application to which a dataset should adhere before it can be imported into the application. This can be criteria on the highest level (e.g. data from a certain manufacturer or system model) or certain DICOM attributes mandatory to be present into the dataset holding a specific value. In case one or more Philips private attributes are required, then a list of supported Philips system models will be mentioned.

Table 4: Accepted System Models

Manufacturer	Modality	System Model Name(s)
Philips	CT	Brilliance scanners
		iCT scanners
		Ingenuity scanners
	XA	Allura
		Azurion
Siemens	CT	Definition
	CT	Sensation 16, 64 (32 channels)

Manufacturer	Modality	System Model Name(s)
General Electric	CT	Lightspeed 16, 16Pro, VCT Select (32), VCT (64)
Toshiba	CT	Aquilion One

Table 5: Accepted Transfer Syntaxes per IOD

For information about this Table, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.

Table 6: : Accepted Attribute Values for CT Image Storage SOP

Attribute Name	Attribute Number	Values/Comments
SOP Class UID	0008,0016	1.2.840.10008.5.1.4.1.1.2
Bits Allocated	0028,0100	16

The 3D volumetric CT datasets shall have the following characteristics:

1. The pixel spacing for each slice in both directions in the series is equal, i.e. square pixels (this is always the case for original datasets)
2. The series contains at least 4 slices (512x512 voxels of 2 bytes each) with a different slice location
3. All slices must have the same dimensions
4. The distance between all slices must be equal
5. In case the CT series contains only one volume (i.e. no multiphase volumes or volumes under different orientations) the user can select a volume to start the application with. In case the CT series is selected to start the application, the most recent / first volume is selected.
6. The CT series must be contrast enhanced (this is however not explicitly checked by HeartNavigator)

When using DERIVED DICOM data sets, the application may not work correctly. The end user is advised not to use this type of data sets via the Derived Dataset message; this message is only shown when no session data is available.

When using a data set with more than 1600 slices, the application may show reduced performance. The end user is advised not to use such large data sets via the Large Dataset message; this message is only shown when no session data is available.

8.1.2. Created SOP Instance

This section specifies each IOD created by this application.
This section specifies each IOD created. It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:
ALWAYS The module is always present
CONDITIONAL The module is used under specified condition

Abbreviations used in the Module table for the column "Presence of Value" are:
ALWAYS The attribute is always present with a value
EMPTY The attribute is always present without any value (attribute sent zero length)
VNAP The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP The attribute is present under specified condition – if present then it will always have a value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

8.1.2.1. List of Created SOP Classes

Table 7: List of Created SOP Classes

Name	UID
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
Multiframe True Color Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.4

8.1.2.1.1 X-Ray Angiographic Image Storage SOP Class

Table 8: IOD of Created X-Ray Angiographic Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS (The contents of this module is copied from the source CT study)
Study	General Study Module	ALWAYS (The contents of this module is copied from the source CT study)
	Patient Study Module	ALWAYS (The contents of this module is copied from the source CT study)
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Acquisition	General Acquisition Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Cine Module	ALWAYS
	Multi-Frame Module	ALWAYS
	Display Shutter Module	ALWAYS
	X-Ray Image Module	ALWAYS
	X-Ray Acquisition Module	ALWAYS
	X-Ray Table Module	ALWAYS
	XA Positioner Module	ALWAYS
	DX Detector Module	ALWAYS
	VOI LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Table 9: Patient Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Patient's Name	0010,0010	PN		VNAP	COPY	
Patient ID	0010,0020	LO		VNAP	COPY	
Patient's Birth Date	0010,0030	DA		VNAP	COPY	
Patient's Sex	0010,0040	CS		VNAP	COPY	

Table 10: General Study Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Study Date	0008,0020	DA		ALWAYS	COPY	

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Study Time	0008,0030	TM		ALWAYS	COPY	
Accession Number	0008,0050	SH		VNAP	COPY	
Referring Physician's Name	0008,0090	PN		VNAP	COPY	
Study Description	0008,1030	LO		VNAP	COPY	
Procedure Code Sequence	0008,1032	SQ		ANAP	COPY	
>Code Value	0008,0100	SH		ALWAYS	COPY	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	
>Code Meaning	0008,0104	LO		ALWAYS	COPY	
Name Of Physicians Reading Study	0008,1060	PN		VNAP	COPY	
Referenced Study Sequence	0008,1110	SQ		ANAP	COPY	
Study Instance UID	0020,000D	UI		ALWAYS	COPY	
Study ID	0020,0010	SH		VNAP	COPY	

Table 11: Patient Study Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Patient's Weight	0010,1030	DS		ALWAYS	COPY	
Patient's Age	0010,1010	AS		ANAP	COPY	
Patient's Size	0010,1020	DS		ANAP	COPY	

Table 12: General Series Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Series Date	0008,0021	DA		ALWAYS	COPY	
Series Time	0008,0031	TM		ALWAYS	COPY	
Modality	0008,0060	CS	XA	ALWAYS	FIXED	
Series Description	0008,103E	LO		VNAP	COPY	
Performing Physician's Name	0008,1050	PN		VNAP	COPY	
Related Series Sequence	0008,1250	SQ		VNAP	AUTO	
>Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ		VNAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	COPY	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	COPY	

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Performed Procedure Step ID	0040,0253	SH		ANAP	COPY	

Table 13: General Equipment Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	CONFIG	Configured Hospital Name
Manufacturer's Model Name	0008,1090	LO	HeartNavigator - SHD or HeartNavigator – TAVI	ALWAYS	AUTO	Value depends on the HeartNavigator workflow that has received the XA run.
Device Serial Number	0018,1000	LO		VNAP	AUTO	Mac address of Hospital NIC
Software Versions	0018,1020	LO	3.4.x.y	VNAP	AUTO	Where “x.y” is the detailed application SW version.

Table 14: General Acquisition Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Acquisition Date	0008,0022	DA		VNAP	COPY	
Acquisition Time	0008,0032	TM		VNAP	COPY	

Table 15: General Image Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Image Type	0008,0008	CS	ORIGINAL\ PRIMARY\ SINGLE PLANE	ALWAYS	COPY	ORIGINAL\ PRIMARY\ SINGLE PLANE
Content Date	0008,0023	DA		VNAP	COPY	
Content Time	0008,0033	TM		VNAP	COPY	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Patient Orientation	0020,0020	CS		ANAP	COPY	
Lossy Image Compression	0028,2110	CS		ANAP	COPY	
Icon Image Sequence	0088,0200	SQ		ALWAYS	AUTO	
>Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	
>Rows	0028,0010	US	128	ALWAYS	AUTO	
>Columns	0028,0011	US	128	ALWAYS	AUTO	
>Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	
>Bits Stored	0028,0101	US	8	ALWAYS	AUTO	
>High Bit	0028,0102	US	7	ALWAYS	AUTO	

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
>Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
>Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

Table 16: Image Pixel Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Samples per Pixel	0028,0002	US	1	ALWAYS	COPY	
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	COPY	
Rows	0028,0010	US		ALWAYS	COPY	
Columns	0028,0011	US		ALWAYS	COPY	
Bits Allocated	0028,0100	US	16	COPY	FIXED	
Bits Stored	0028,0101	US	16	COPY	FIXED	
High Bit	0028,0102	US	15	ALWAYS	COPY	
Pixel Representation	0028,0103	US	0	ALWAYS	COPY	
Pixel Data	7FE0,0010	OB/OW		ALWAYS	COPY	

Table 17: Cine Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Cine Rate	0018,0040	IS		ALWAYS	AUTO	
Frame Time	0018,1063	DS		ALWAYS	AUTO	

Table 18: Multi-Frame Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Number of Frames	0028,0008	IS		ALWAYS	AUTO	
Frame Increment Pointer	0028,0009	AT		ALWAYS	AUTO	

Table 19: Display Shutter Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Shutter Shape	0018,1600	CS		ALWAYS	COPY	
Shutter Left Vertical Edge	0018,1602	IS		ALWAYS	COPY	
Shutter Right Vertical Edge	0018,1604	IS		ALWAYS	COPY	
Shutter Upper Horizontal Edge	0018,1606	IS		ALWAYS	COPY	
Shutter Lower Horizontal Edge	0018,1608	IS		ALWAYS	COPY	

Table 20: X-Ray Image Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Image Type	0008,0008	CS		ALWAYS	COPY	ORIGINAL\ PRIMARY\ SINGLE PLANE
Samples per Pixel	0028,0002	US	1	ALWAYS	COPY	
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	COPY	
Frame Increment Pointer	0028,0009	AT	00181063	ALWAYS	COPY	
Bits Allocated	0028,0100	US	16	ALWAYS	COPY	
Bits Stored	0028,0101	US	16	ALWAYS	COPY	
High Bit	0028,0102	US	15	ALWAYS	COPY	
Pixel Representation	0028,0103	US	0	ALWAYS	COPY	
Pixel Intensity Relationship	0028,1040	CS	LIN	ALWAYS	COPY	
Lossy Image Compression	0028,2110	CS	00	ALWAYS	COPY	

Table 21: X-Ray Acquisition Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
KVP	0018,0060	DS		VNAP	COPY	
Exposure Time	0018,1150	IS		VNAP	COPY	
Radiation Setting	0018,1155	CS	SC	ANAP	COPY	
Imager Pixel Spacing	0018,1164	DS		ALWAYS	COPY	
Pixel Spacing	0028,0030	DS		ALWAYS	COPY	

Table 22: X-Ray Table Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Table Motion	0018,1134	CS	STATIC	VNAP	COPY	
Table Angle	0018,1138	DS		ANAP	COPY	

Table 23: XA Positioner Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Distance Source to Detector	0018,1110	DS		ALWAYS	COPY	
Distance Source to Patient	0018,1111	DS		ALWAYS	COPY	
Positioner Motion	0018,1500	CS		ALWAYS	COPY	
Positioner Primary Angle	0018,1510	DS		ALWAYS	COPY	
Positioner Secondary Angle	0018,1511	DS		ALWAYS	COPY	

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Positioner Primary Angle Increment	0018,1520	DS		ANAP	COPY	
Positioner Secondary Angle Increment	0018,1521	DS		ANAP	COPY	

Table 24: DX Detector Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Imager Pixel Spacing	0018,1164	DS		ALWAYS	COPY	
Pixel Spacing	0028,0030	DS		ANAP	COPY	

Table 25: VOI LUT Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Window Center	0028,1050	DS		ALWAYS	COPY	
Window Width	0028,1051	DS		ALWAYS	COPY	

Table 26: SOP Common Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Specific Character Set	0008,0005	CS		ANAP	AUTO	As supported by hosting platform
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.12.1	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

8.1.2.1.2 Secondary Capture Image Storage SOP Class

Table 27: IOD of Created Secondary Capture Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS (The contents of this module is copied from the source CT study)
Study	General Study Module	ALWAYS (The contents of this module is copied from the source CT study)
	Patient Study Module	ALWAYS (The contents of this module is copied from the source CT study)
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS

Information Entity	Module	Presence Of Module
	SC Image Module	CONDITIONAL (Not present in session objects)
	VOI LUT Module	CONDITIONAL (Not present in session objects)
	SOP Common Module	ALWAYS

Table 28: Patient Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Patient's Name	0010,0010	PN		VNAP	COPY	
Patient ID	0010,0020	LO		VNAP	COPY	
Patient's Birth Date	0010,0030	DA		VNAP	COPY	
Patient's Sex	0010,0040	CS		VNAP	COPY	

Table 29: General Study Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Study Date	0008,0020	DA		ALWAYS	COPY	
Study Time	0008,0030	TM		ALWAYS	COPY	
Accession Number	0008,0050	SH		VNAP	COPY	
Referring Physician's Name	0008,0090	PN		VNAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Procedure Code Sequence	0008,1032	SQ		ANAP	COPY	
>Code Value	0008,0100	SH		ALWAYS	COPY	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	
>Code Meaning	0008,0104	LO		ALWAYS	COPY	
Name Of Physicians Reading Study	0008,1060	PN		ANAP	COPY	
Referenced Study Sequence	0008,1110	SQ		ANAP	COPY	
Study Instance UID	0020,000D	UI		ALWAYS	COPY	
Study ID	0020,0010	SH		VNAP	COPY	

Table 30: Patient Study Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Patient's Weight	0010,1030	DS		ALWAYS	COPY	
Patient's Age	0010,1010	AS		ANAP	COPY	
Patient's Size	0010,1020	DS		ANAP	COPY	

Table 31: General Series Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Series Date	0008,0021	DA		ALWAYS	AUTO	

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Series Description	0008,103E	LO	Snapshot_Movie	ALWAYS	AUTO	In DICOM snapshot
			Session			In session object
			Planning and Measurement Report			In report
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS	XA	ALWAYS	AUTO	In snapshots and session objects
			DOC			In Report
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Related Series Sequence	0008,1250	SQ		VNAP	AUTO	
>Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ		VNAP	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	COPY	Not present in session object
Performed Procedure Step Start Time	0040,0245	TM		ANAP	COPY	Not present in session object
Performed Procedure Step ID	0040,0253	SH		ANAP	COPY	
Request Attribute Sequence	0040,0275	SQ		ANAP	COPY	
> Scheduled Procedure Step ID	0040,0009	SH		ANAP	COPY	
> Requested Procedure ID	0040,1001	SH		ANAP	COPY	

Table 32: General Equipment Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Manufacturer's Model Name	0008,1090	LO	HeartNavigator – TAVI or HeartNavigator - SHD	ALWAYS	AUTO	Value depends on the HeartNavigator workflow that has created the object.
Device Serial Number	0018,1000	LO		VNAP	AUTO	MAC address of hospital NIC

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Software Versions	0018,1020	LO	3.4.x.y	ALWAYS	AUTO	Where “x.y” is the detailed application SW version.

Table 33: SC Equipment Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Modality	0008,0060	CS	XA	ALWAYS	FIXED	In snapshots and session objects
Conversion Type	0008,0064	CS	WSD	ALWAYS	FIXED	

Table 34: General Image Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Image Type	0008,0008	CS	DERIVED\ SECONDARY	ALWAYS	AUTO	In snapshots
			DERIVED\ SECONDARY\ - SESSION - SEGMENTATION - VOLREF NONSEGMENTATION			In session objects
			DERIVED\SECONDARY\ REPORT			In report
Content Date	0008,0023	DA		ANAP	AUTO	Not present in session object
Content Time	0008,0033	TM		ANAP	AUTO	Not present in session object
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Patient Orientation	0020,0020	CS		VNAP	AUTO	

Table 35: Image Pixel Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Samples per Pixel	0028,0002	US	3	ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS	MONOCHROME1/ RGB	ALWAYS	AUTO	RGB is used in Snapshots and reports MONOCHROME 1 is used in session objects
Planar Configuration	0028,0006	US	0	ALWAYS	AUTO	Not present in session object
Rows	0028,0010	US		ALWAYS	AUTO	Value = 1 in session object
Columns	0028,0011	US		ALWAYS	AUTO	Value = 1 in session object
Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Bits Stored	0028,0101	US	8	ALWAYS	AUTO	
High Bit	0028,0102	US	7	ALWAYS	AUTO	
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

Table 36: SC Image Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Date of Secondary Capture	0018,1012	DA		ALWAYS	AUTO	Not present in session object
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	Not present in session object

Table 37: VOI LUT Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Window Center	0028,1050	DS		ALWAYS	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	

Table 38: SOP Common Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Specific Character Set	0008,0005	CS		ANAP	AUTO	As supported by hosting platform
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.2.1.3 Multi-frame True Color Secondary Capture Image Storage SOP Class

Table 39: IOD of Created Multi-frame True Color Secondary Capture Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS (The contents of this module is copied from the source CT study)
Study	General Study Module	ALWAYS (The contents of this module is copied from the source CT study)
	Patient Study Module	ALWAYS (The contents of this module is copied from the source CT study)
Series	General Series Module	ALWAYS
Frame of Reference	Frame of reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
	SC Equipment Module	ALWAYS

Information Entity	Module	Presence Of Module
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Cine Module	ALWAYS
	Multi-Frame Module	ALWAYS
	Multi-Frame Functional Groups Module	ALWAYS
	SC Image Module	ALWAYS
	SC Multi-frame Image Module	ALWAYS
	SOP Common Module	ALWAYS

Table 40: Patient Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Patient's Name	0010,0010	PN		VNAP	COPY	
Patient ID	0010,0020	LO		VNAP	COPY	
Patient's Birth Date	0010,0030	DA		VNAP	COPY	
Patient's Sex	0010,0040	CS		VNAP	COPY	
Reference Patient Sequence	0008,1120	SQ		ANAP	COPY	

Table 41: General Study Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Study Date	0008,0020	DA		ALWAYS	COPY	
Study Time	0008,0030	TM		ALWAYS	COPY	
Accession Number	0008,0050	SH		VNAP	COPY	
Referring Physician's Name	0008,0090	PN		VNAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Procedure Code Sequence	0008,1032	SQ		ANAP	COPY	
>Code Value	0008,0100	SH		ALWAYS	COPY	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	
>Code Meaning	0008,0104	LO		ALWAYS	COPY	
Name Of Physicians Reading Study	0008,1060	PN		ANAP	COPY	
Referenced Study Sequence	0008,1110	SQ		ANAP	COPY	
Study Instance UID	0020,000D	UI		ALWAYS	COPY	
Study ID	0020,0010	SH		VNAP	COPY	

Table 42: Patient Study Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Patient's Weight	0010,1030	DS		ALWAYS	COPY	
Patient's Age	0010,1010	AS		ANAP	COPY	
Patient's Size	0010,1020	DS		ANAP	COPY	

Table 43: General Series Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS	XA	ALWAYS	FIXED	
Series Description	0008,103E	LO	Snapshot_Movie	ALWAYS	AUTO	
Related Series Sequence	0008,1250	SQ		VNAP	AUTO	
>Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ		VNAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	COPY	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	COPY	
Performed Procedure Step ID	0040,0253	SH		ANAP	COPY	
Request Attribute Sequence	0040,0275	SQ		ANAP	COPY	

Table 44: Frame Of Reference Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Frame of Reference UID	0020,0052	UI		ALWAYS	COPY	
Position Reference Indicator	0020,1040	LO		VNAP	COPY	

Table 45: General Equipment Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	CONFIG	Configured Hospital Name
Manufacturer's Model Name	0008,1090	LO	HeartNavigator – TAVI or HeartNavigator - SHD	ALWAYS	AUTO	Value depends on the HeartNavigator workflow that has created the object.
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	MAC address of hospital NIC

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Software Versions	0018,1020	LO	3.4.x.y	ALWAYS	AUTO	Where “x.y” is the detailed application SW version.

Table 46: SC Equipment Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Modality	0008,0060	CS	XA	ALWAYS	FIXED	
Conversion Type	0008,0064	CS	WSD	ALWAYS	FIXED	

Table 47: General Image Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Image Type	0008,0008	CS	DERIVED\SECONDARY	ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	
Patient Orientation	0020,0020	CS		VNAP	AUTO	
Burned in Annotation	0028,0301	CS	YES	ALWAYS	AUTO	
Icon Image Sequence	0088,0200	SQ		ALWAYS	AUTO	
> Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	
> Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	
> Rows	0028,0010	US	128	ALWAYS	AUTO	
> Columns	0028,0011	US	128	ALWAYS	AUTO	
> Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	
> Bits Stored	0028,0101	US	8	ALWAYS	AUTO	
> High Bit	0028,0102	US	7	ALWAYS	AUTO	
> Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
> Pixel Data	7FE0,0010	OW/ OB		ALWAYS	AUTO	

Table 48: Image Pixel Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Samples per Pixel	0028,0002	US	3	ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS	RGB	ALWAYS	AUTO	
Planar Configuration	0028,0006	US	0	ALWAYS	AUTO	
Rows	0028,0010	US	1024	ALWAYS	AUTO	
Columns	0028,0011	US	1024	ALWAYS	AUTO	
Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	
Bits Stored	0028,0101	US	8	ALWAYS	AUTO	
High Bit	0028,0102	US	7	ALWAYS	AUTO	
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

Table 49: Cine Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Frame Time	0018,1063	DS		ALWAYS	AUTO	
Cine Rate	0018,0040	IS		ALWAYS	AUTO	

Table 50: Multi-Frame Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Number of Frames	0028,0008	IS		ALWAYS	AUTO	
Frame Increment Pointer	0028,0009	AT	00181063	ALWAYS	AUTO	

Table 51: Multi-Frame Functional Groups Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Number of Frames	0028,0008	IS		ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	

Table 52: SC Image Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Date of Secondary Capture	0018,1012	DA		ALWAYS	AUTO	
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	

Table 53: SC Multi-Frame Image Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Frame Increment Pointer	0028,0009	AT	00181063	ALWAYS	AUTO	
Burned In Annotation	0028,0301	CS	YES	ALWAYS	AUTO	

Table 54: SOP Common Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Specific Character Set	0008,0005	CS		ANAP	AUTO	As supported by hosting platform
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7.4	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

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