

Integrating the Healthcare Enterprise



5

IHE IT Infrastructure (ITI) Technical Framework Supplement 2009-2010

10

Sharing Value Sets (SVS)

15

Trial Implementation Supplement
August 22, 2009

20 **1 Foreword**

Integrating the Healthcare Enterprise (IHE) is an initiative designed to stimulate the integration of the information systems that support modern healthcare institutions. Its fundamental objective is to ensure that in the care of patients all required information for medical decisions is both correct and available to healthcare professionals. The IHE initiative is both a process and a forum for encouraging integration efforts. It defines a technical framework for the implementation of established messaging standards to achieve specific clinical goals. It includes a rigorous testing process for the implementation of this framework. And it organizes educational sessions and exhibits at major meetings of medical professionals to demonstrate the benefits of this framework and encourage its adoption by industry and users.

The approach employed in the IHE initiative is not to define new integration standards, but rather to support the use of existing standards, HL7, DICOM, IETF, and others, as appropriate in their respective domains in an integrated manner, defining configuration choices when necessary. IHE maintain formal relationships with several standards bodies including HL7, DICOM and refers recommendations to them when clarifications or extensions to existing standards are necessary.

This initiative has numerous sponsors and supporting organizations in different medical specialty domains and geographical regions. In North America the primary sponsors are the Healthcare Information and Management Systems Society (HIMSS) and the Radiological Society of North America (RSNA). IHE Canada has also been formed. IHE Europe (IHE-EUR) is supported by a large coalition of organizations including the European Association of Radiology (EAR) and European Congress of Radiologists (ECR), the Coordination Committee of the Radiological and Electromedical Industries (COCIR), Deutsche Röntgengesellschaft (DRG), the EuroPACS Association, Groupement pour la Modernisation du Système d'Information Hospitalier (GMSIH), Société Française de Radiologie (SFR), Società Italiana di Radiologia Medica (SIRM), the European Institute for health Records (EuroRec), and the European Society of Cardiology (ESC). In Japan IHE-J is sponsored by the Ministry of Economy, Trade, and Industry (METI); the Ministry of Health, Labor, and Welfare; and MEDIS-DC; cooperating organizations include the Japan Industries Association of Radiological Systems (JIRA), the Japan Association of Healthcare Information Systems Industry (JAHIS), Japan Radiological Society (JRS), Japan Society of Radiological Technology (JSRT), and the Japan Association of Medical Informatics (JAMI). Other organizations representing healthcare professionals are invited to join in the expansion of the IHE process across disciplinary and geographic boundaries.

The IHE Technical Frameworks for the various domains (IT Infrastructure, Cardiology, Laboratory, Radiology, etc.) defines specific implementations of established standards to achieve integration goals that promote appropriate sharing of medical information to support optimal patient care. It is expanded annually, after a period of public review, and maintained regularly through the identification and correction of errata. The current version for these Technical Frameworks may be found at www.ihe.net/Technical_Framework.

- 65 The IHE Technical Framework identifies a subset of the functional components of the healthcare enterprise, called IHE Actors, and specifies their interactions in terms of a set of coordinated, standards-based transactions. It describes this body of transactions in progressively greater depth. The volume I provides a high-level view of IHE functionality, showing the transactions organized into functional units called Integration Profiles that highlight their capacity to address specific clinical needs. The subsequent volumes provide detailed technical descriptions of each IHE transaction.
- 70 This IHE IT Infrastructure Technical Framework Supplement is issued for Trial Implementation through April 2010.

Comments and change proposals arising from Trial Implementation may be submitted to <http://forums.rsna.org> under the forum:

75 ***“Integrating the Healthcare Enterprise”***

Select the sub-forum:

“IHE IT Infrastructure 2009-2010 Supplements for Trial Implementation”

- 80 The IHE IT Infrastructure Technical Committee will address these comments resulting from implementation, Connectathon testing, and demonstrations.

Contents

	1	Foreword.....	2
85		Contents	4
		Introduction.....	5
		Open Issues	5
		Closed Issues	5
		Future Considerations	5
90		Profile Abstract	6
		Glossary	7
		History of Annual Changes.....	8
		2.2.21 Sharing Value Set Integration Profile (SVS)	8
	21	Sharing Value Sets Integration Profile (SVS)	9
95		21.1 Actors/ Transactions.....	9
		21.1.1 Assumptions and background information.....	10
		21.1.2 Value Set Unique ID and Value Set Version	10
		21.1.3 The relationship between ITI SVS and CTS	11
		21.2 SVS Integration Profile Options	11
100		21.3 SVS Process Flow	12
		21.3.1 Overview of the entire process flow.....	12
		21.3.2 Use Cases	13
		21.4 SVS Security Considerations	19
	3.48	Retrieve Value Set.....	21
105		3.48.1 Scope	21
		3.48.2 Use case roles	21
		3.48.3 Referenced Standards	22
		3.48.4 Interaction Diagram.....	22
		3.48.5 Protocol Requirements	24
110		3.48.6 Security Requirements	29

Introduction

115 The Sharing Value Sets (SVS) profile provides a means through which healthcare systems producing clinical or administrative data, such as diagnostic imaging equipment, laboratory reporting systems, primary care physician office EMR systems, or national healthcare record systems, can receive a common, uniform nomenclature managed centrally. Shared nomenclatures are essential to achieving semantic interoperability.

This profile describes a mechanism of retrieving a Value Set from a Value Set Repository by a Value Set Consumer. A single Value Set Repository can be accessed by many Value Set Consumers, establishing a domain of consistent and uniform set of 120 nomenclatures. It supports automated loading of Value Sets by Value Set Consumers, reducing the burden of manual configuration.

Open Issues

None.

Closed Issues

- 125 1. The Value Set Retrieval mechanism is modeled after the Retrieve Document Set transaction in XDS. As the SVS profile is developing, a similar structure as XDS could be envisioned, eventually having a Value Set Registry. The standard ebXML RS (Registry Service) will not be used.
- 130 2. The mechanism of use within a healthcare facility versus the one used on a larger scale, such as using a National Terminology Server was discussed. A possible limiting factor in this case is the presence of Web Services across and within the healthcare enterprises. There should be no difference between the two settings, and that the Web Services burden is on the terminology server side, regardless of the mechanism used. In addition to the Web Services, the HTTP GET mechanism is as well an option.
- 135 3. The Web Services specifications are used according to *Appendix V* synchronous services interactions. If there is a change in *Appendix V*, then the basis of this profile will need to be re-assessed. This profile will not develop independently; it will defer to other mechanisms used in IHE. The asynchronous mode is not part of this profile.
- 140 4. A mechanism will have to be set so that the user will know the expiration date since certain Value Sets are time-sensitive. The resolution is to have a cache expiration hint in the Retrieve Value Set Response that will inform the user as to when a new retrieval may be necessary.

145 Future Considerations

Future considerations for this profile are listed on the IHE wiki at:

http://wiki.ihe.net/index.php?title=SVS_Future_Considerations

<i>Add the following to Section 3 Profile Abstract:</i>

Profile Abstract

- 150 The Sharing Value Sets (SVS) profile provides a means through which healthcare systems producing clinical or administrative data, such as diagnostic imaging equipment, laboratory reporting systems, primary care physician office EMR systems, or national healthcare record systems, can receive a common, uniform nomenclature managed centrally. Shared nomenclatures are essential to achieving semantic interoperability.
- 155 This profile describes a mechanism of retrieving a Value Set from a Value Set Repository by a Value Set Consumer. A single Value Set Repository can be accessed by many Value Set Consumers, establishing a domain of consistent and uniform set of nomenclatures. It supports automated loading of Value Sets by Value Set Consumers, reducing the burden of manual configuration.
- 160

Glossary

165 Add the following to Section ITI TF-1: Glossary:

OID - An OID is a unique identifier that follows the rules of ITU-T X.660, and is usually encoded following the rules of RFC-3641. One commonly used subset of the OID space is the UUID, which corresponds to the OID sub-hierarchy 2.25. UUIDs are a 128-bit value often represented as a hexadecimal string, but can also be represented as 2.25.value-in-decimal. OIDs may be registered. OIDs should not have semantic content. For more information please see ITI TF-2x: Appendix B discussion of OIDs and UUIDs.

Value Set – A uniquely identifiable set of valid concept representations where any concept representation can be tested to determine whether or not it is a member of the value set. A value set may be a simple flat list of concept codes drawn from a single code system, or it might be an unbounded hierarchical set of possibly post-coordinated expressions drawn from multiple code systems. Also known as a list of valid concept codes.

A valid concept is a concept that would be logically representative of the Value Set that it belongs to, for example for the Value Set “Colours of the rainbow”, “yellow” would be a valid concept.

Resolved Value Set – a set of concept representations that were in effect at a specific time for a particular version of a Value Set. See Value Set. The Value Set and the Resolved Value Set concepts are similar to the programming concepts of Class and Instance of Class.

185 *(The definitions are based on HL7 Vocabulary terms).*

Volume I – Integration Profiles

This section describes the changes required in Volume I of the Technical Framework that result from including this Integration Profile.

190 History of Annual Changes

Add the following bullet to the end of the bullet list in Section 1.7

Added the Sharing Value Sets profile which provides a mechanism of retrieving a Value Set from a Value Set Repository based on its unique identifier (Unique ID).

Add the following section to Table 2-1 Integration Profiles Dependencies in section 2.1

195

Sharing Value Sets	Audit Trail and Node Authentication	The Value Set Repository shall be grouped with a Secure Node actor/Secure Application	Required to manage audit trail of Value Sets sharing and node authentication.
--------------------	-------------------------------------	---	---

Add the following section to Section 2.2

2.2.21 Sharing Value Set Integration Profile (SVS)

200 The Sharing Value Sets (SVS) profile provides a means through which healthcare systems producing clinical or administrative data, such as diagnostic imaging equipment, laboratory reporting systems, primary care physician office EMR systems, or national healthcare record systems, can receive a common, uniform nomenclature managed centrally. Shared nomenclatures are essential to achieving semantic interoperability.

205 This profile describes a mechanism of retrieving a Value Set from a Value Set Repository by a Value Set Consumer. A single Value Set Repository can be accessed by many Value Set Consumers, establishing a domain of consistent and uniform set of nomenclatures. It supports automated loading of Value Sets by Value Set Consumers, reducing the burden of manual configuration.

210 *The section shall be added to Vol I*

4.2

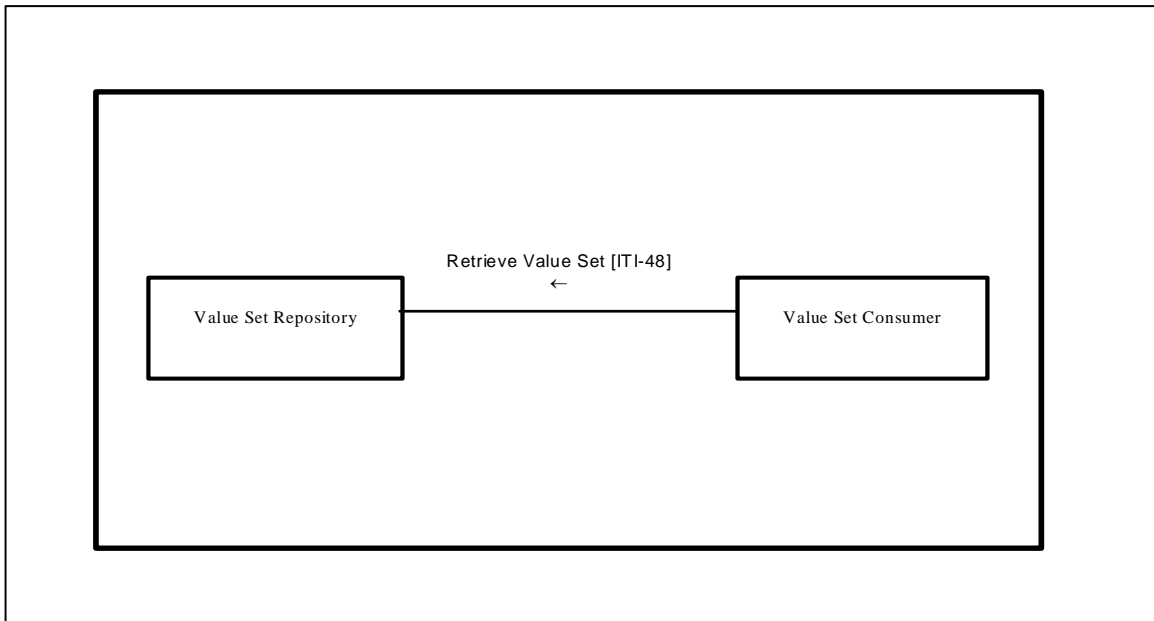
21 Sharing Value Sets Integration Profile (SVS)

215 The Sharing Value Sets (SVS) profile provides a means through which healthcare systems producing clinical or administrative data, such as diagnostic imaging equipment, laboratory reporting systems, primary care physician office EMR systems, or national healthcare record systems, can receive a common, uniform nomenclature managed centrally. Shared nomenclatures are essential to achieving semantic interoperability.

220 This profile describes a mechanism of retrieving a Value Set from a Value Set Repository by a Value Set Consumer. A single Value Set Repository can be accessed by many Value Set Consumers, establishing a domain of consistent and uniform set of nomenclatures. It supports automated loading of Value Sets by Value Set Consumers, reducing the burden of manual configuration.

21.1 Actors/ Transactions

225 **Figure 21.1-1** shows the actors directly involved in the SVS Integration Profile and the relevant transactions between them. Other actors that may be indirectly involved due to their participation in other related profiles are not necessarily shown. As well, the method for creating a Value Set is not covered by this profile (this subject will be addressed once the basic infrastructure is in place).



230

Figure 21.1-1 SVS Actor Diagram

235 **Table 21.1-1 SVS Integration Profile - Actors and Transactions** lists the transactions for each actor directly involved in the SVS Profile. In order to claim support of this Integration Profile, an implementation must perform the required transactions (labeled “R”). Transactions labeled “O” are optional. A complete list of options defined by this Integration Profile is listed in Section 21.2-1.

Table 21.1-1 SVS Integration Profile - Actors and Transactions

Actors	Transactions	Optionality	Section
ValueSet Repository	Retrieve Value Set [ITI-48]	R	ITI TF-2b: 3.48
ValueSet Consumer	Retrieve Value Set [ITI-48]	R	ITI TF-2b: 3.48

21.1.1 Assumptions and background information

- 240 A Value Set is a uniquely identifiable set of valid concept representations. A Value Set may be a simple flat list of concept codes drawn from a single code system, or it might be constituted by expressions drawn from multiple code systems (a code system is a system consisting of designations and meanings, for example LOINC, SNOMED-CT, ICD-10, or ISO 639 Language Codes).
- 245 This profile will address a flat list of concept codes, one of the simplest examples of a Value Set being shown in Table 21.1-1: The provinces of Canada.

Table 21.1-1: The provinces of Canada

Provinces of Canada ISO Code	Print Name
NL	Newfoundland
AB	Alberta
BC	British Columbia
SK	Saskatchewan
MB	Manitoba
ON	Ontario
QC	Quebec
NB	New Brunswick
NS	Nova Scotia
PE	Prince Edward Island

21.1.2 Value Set Unique ID and Value Set Version

- 250 A Value Set must be uniquely identified to allow various applications and users to recognize it. When a Value Set is retrieved, the application or the user is retrieving a particular instance of it, or a *Resolved Value Set* (a Resolved Value Set is a set of concept representations that were in effect at a specific time for a particular version of a Value Set. The *Value Set* and the *Resolved Value Set* concepts are similar to the programming
- 255 concepts of Class and Instance of Class.)

This profile uses the *Value Set Unique ID* (using an ISO OID), and the *Value Set Version* attributes to allow flexible handling of the identification of a *Resolved Value Set*. If each Resolved Value Set has its own OID, then its identifier is thus conveyed, and the Value Set Version has no meaning. If each Resolved Value Set is identified by a combination of a Value Set OID and its particular version, then the Resolved Value Set shall contain the Value Set OID and the Value Set Version.

To summarize, the Value Set to be retrieved has to have its own OID (Unique ID), and it has to be a flat list of codes. The Value Set version is optional but it must be returned to the Value Set Consumer if known.

21.1.3 The relationship between ITI SVS and CTS

The Value Set Repository actor can be supported by a system that implements a Terminology Server using the current HL7 CTS or, in the future, the upcoming HL7 CTS2 specifications. It is important to note the complementary role of the HL7 specification for CTS and CTS2, and that of the SVS Integration Profile. CTS defines an API (Application Programming Interface) supported by a terminology management service, and CTS2 defines the functionality supported by a terminology management service without prescribing a particular implementation. SVS defines the transmission protocols for a network access to a terminology server focused specifically on the distribution of Value Sets.

However there is functional consistency between SVS and CTS/CTS2. More specifically, all the properties of the Value Sets and concepts described in the Shared Value Sets Retrieve transaction are a subset of the properties defined in CTS (and the current draft of CTS2) for the same entities. Note that SVS supports the distribution of Value Sets containing concepts from multiple code systems (e.g DICOM and SNOMED issued) which is consistent with the CTS capabilities, but which was not supported in the CTS specifications (but is supported in the draft CTS2 specification).

Informative references:

1. HL7 Common Terminology Services.
<http://informatics.mayo.edu/LexGrid/downloads/CTS/specification/ctsspec/cts.htm>.
2. Common Terminology Services 2 (CTS 2). Service Functional Model Specification.
http://biomedgt.org/apelcore/index.php/HL7_Common_Terminology_Services_2_Service_Functional_Model_%28SFM%29

21.2 SVS Integration Profile Options

Options that may be selected for this Integration Profile are listed in the **Table 21.2-1 Sharing Value Sets - Actors and Options** along with the actors to which they apply. Dependencies between options when applicable are specified in notes. Note that the Value Set Consumer shall implement at least one of the two bindings listed as options in

the table. The Value Set Repository shall implement both bindings as specified in ITI TF-2b: 3.48.5.

300

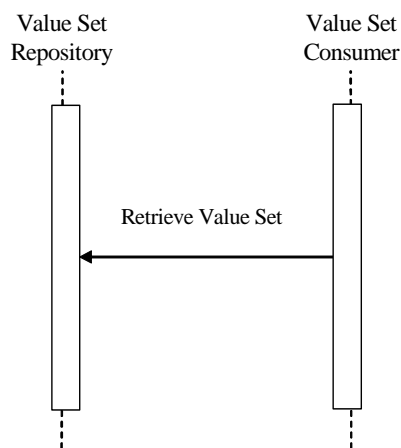
Table 21.2-1 Sharing Value Sets - Actors and Options

Actor	Options	Vol & Section
Value Set Repository	No options	
Value Set Consumer	HTTP binding SOAP binding	ITI TF-2b: 3.48.5

21.3 SVS Process Flow

This section describes the process and information flow when a Value Set Consumer will retrieve a Value Set from a Value Set Repository.

305



310

315

Figure 21.3-1. Basic Process Flow in SVS Profile

21.3.1 Overview of the entire process flow

This profile describes functionality in the context of the larger system of anticipated actors involved in the creation and management of Value Sets.

320

The creation of a Value Set is out of scope of this profile. It will be addressed in a later cycle, once the basic infrastructure of this profile is in place. For definition purposes, creating a Value Set means the creation of a Value Set out of a Code System(s), or having the user proposing values that s/he uses in their own system.

The complete process can be seen in **Figure 21.3.2-1, Overview of process flows** below, included for clarity's sake:

325

330

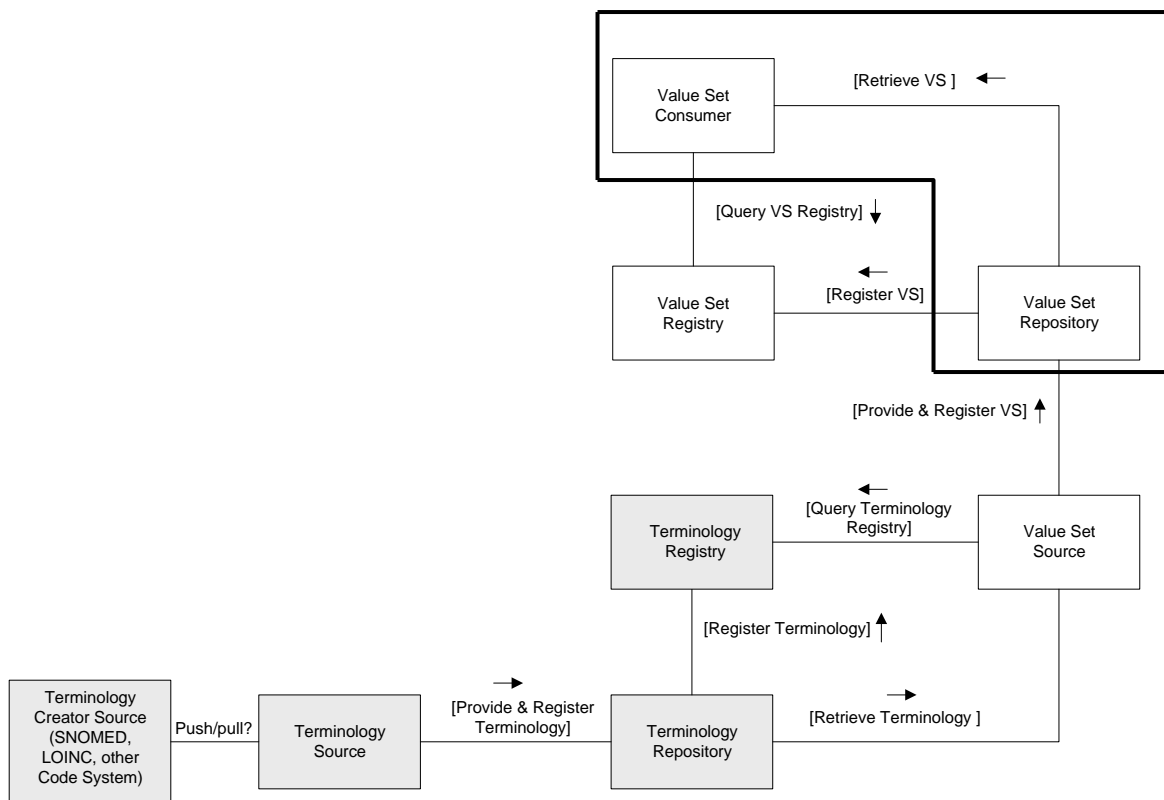


Figure 21.3-2 – Overview of the process flow

335

Figure 21.3-2 shows the Retrieve Value Set transaction in the context of the larger system of anticipated actors involved with the creation and management of Value Sets. This profile only addresses the actors and transactions outlined by the thick solid line.

The SVS profile addresses partly the semantic interoperability issue and assumes that a structure is already in place to provide the necessary context for the use of the Value Set.

340

While the representation of structure is out of scope of this profile, it must be recognized that it plays an important role in achieving semantic interoperability. The focus of the profile is to distribute a generalized and uniform nomenclature in order to populate the information model with the appropriate semantic content.

21.3.2 Use Cases

345

The following use cases indicate how this profile might be used by various disciplines.

Note: All the tables present in the use cases are examples only. IHE will not be responsible for updating these tables.

21.3.2.1 Distributing a consistent nomenclature in an XDS Affinity Domain

350 A common nomenclature is required in an XDS Affinity Domain for metadata elements such as classCode, confidentialityCode, eventCodeList, healthcareFacilityTypeCode, practiceSettingCode, and typeCode. More detailed information about a possible definition of an Affinity Domain can be found in the white paper **IHE IT Infrastructure Technical Committee White Paper - Template for XDS Affinity Domain Deployment Planning**, found on the **ihe.net**.

21.3.2.1.1 Current state

The nomenclature used in the Affinity Domain is being entered into systems manually, a time consuming task, potentially leading to errors.

21.3.2.1.2 Desired state

360 Each vendor's application would retrieve the necessary Value Sets used in a XDS Affinity Domain from a Value Set Repository, eliminating manual entry and improving accuracy.

21.3.2.2 Updating terminology codes for a medical and billing across systems

365 Standardized coding systems are essential for health insurance programs to ensure that these claims are processed in an orderly and consistent manner.

The CPT is a uniform coding system consisting of descriptive terms and identifying codes that are used primarily to identify medical services and procedures performed by physicians and other health care professionals (HCP), for billing public or private health insurance programs.

21.3.2.2.1 Current state

370 A patient is being referred by her PCP from a small healthcare facility to a large healthcare facility. She gets hospitalized and is being seen by a group of healthcare professionals: oncologists, laboratory practitioners, pharmacists, and nurses.

375 The patient's record will contain medical information from different healthcare information edge systems, such as an Electronic Medical Record system (EMR), a Laboratory Information System (LIS), and a Radiology Information System (RIS).

380 All systems need up-to-date CPT codes so that seamless flow of encoded information results. Currently the update is achieved via application-specific processes on a system by system basis, which increases the risk of error when updating Value Sets in multiple systems.

The Discharge Summary produced by the hospital lacks coded information about the care received due to the lack of a consistent and uniform nomenclature. The document is then published to a regional repository or saved on a portable media. The PCP can then retrieve it (via XDS or XDM, for example).

385 Due to the full lack of encoding, two potentially undesirable outcomes can happen: either the correct billing information will not reach the provider, or the medical information is

not machine processable and cannot be incorporated in other systems, with data mining being compromised.

21.3.2.2.2 Desired state

- 390 The hospital retrieves the significant CPT codes from the Value Set Repository so that all the applications are using the same nomenclature. This way, the medical and billing information will flow seamlessly, improving the quality of patient care.

21.3.2.3 Consistent Encoding Terms for anatomical regions in imaging

21.3.2.3.1 Current state

- 395 In hospital **A**, an imaging technologist is about to start a CT procedure. S/he chooses its protocol and estimates the body part s/he should be entering manually in the “*body part*” field present on the machine. The modality will over-ride the RIS information that the RIS administrator has configured for the CT exams, (or it might take the existing RIS information, depending on the vendor and on the implementation).

- 400 The study is sent to the healthcare facility **A** local PACS, and a manifest is sent to the XDS Repository **A**. Hospital **B** wishes to retrieve the study by querying the XDS Registry.

Alternatively, the patient will bring the study performed in hospital **A** on a CD to be imported into the local system of hospital **B** via IRWF (Import Reconciliation

- 405 Workflow).

The nomenclature used for “*body part*” in the RIS from hospital **A** is not consistent with the encoding chosen by the RIS in hospital **B**. The local PACS and RIS administrator need to place an order in the RIS, and manually reconcile the study so that it will have the same body part in order to ensure the same hanging protocols for the radiologists.

- 410 **21.3.2.3.2 Desired state**

In hospital **A**, an imaging technologist is about to start a CT procedure. S/he chooses the correct “*body part*” from the latest Value Set Anatomical Regions downloaded from the Value Set Repository. The study is sent to the local PACS of healthcare facility **A**, and a manifest is sent to the XDS Repository **A**. Hospital **B** wishes to retrieve the study.

- 415 Alternatively, the patient will bring the study performed in hospital **A** on a CD to be imported into the local system of hospital **B** via IRWF (Import Reconciliation Workflow). The nomenclature used for “*body part*” in the RIS from hospital **A** is consistent with the encoding chosen by the RIS in hospital **B** because hospital **B** has also downloaded the same Resolved Value Set from the Value Set Repository. The
- 420 radiologist will see the images displayed according to the department’s hanging protocols.

A set of flat list values that can be used for such purposes is DICOM Part 16, CID 4031 Common Anatomic Regions, of which an excerpt can be seen in Table 21.3.2.3.2-1: CID 4031 Common Anatomic Regions:

- 425

Table 21.3.2.3.2-1: CID 4031 Common Anatomic Regions

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
SRT	T-D4000	Abdomen
SRT	R-FAB57	Abdomen and Pelvis
SRT	T-15420	Acromioclavicular joint
SRT	T-15750	Ankle joint
SRT	T-280A0	Apex of Lung
SRT	T-D8200	Arm
SRT	T-60610	Bile duct
SRT	T-74000	Bladder
SRT	T-04000	Breast
SRT	T-26000	Bronchus
SRT	T-12770	Calcaneus
SRT	T-11501	Cervical spine

Note: Excerpt from the Context ID 4031 Common Anatomic Regions, Type: Extensible Version 20061023, DICOM Part 16, OID 1.2.840.10008.6.1.308.

430 **21.3.2.4 Modification of a protocol code for a mammogram exam**

Radiology departments or healthcare enterprises define local codes that are used in common by the systems in use, accordingly to the local policies and their workflow.

According to the Mammography Acquisition workflow profile, codes are used for:

- 435 • scheduling and driving modality behavior (Requested Procedure, Reason for Requested Procedure and Scheduled Protocols)
- documenting the images and the workflow status: codes for Performed Procedure, Performed Protocols, Views, etc. enable displays to present images in adequate hanging protocols
- 440 • enabling radiological staff to track performed work or chose the right billing code.

445 The profile further states that it important that a department or enterprise defines the code sets which are used by all of its systems in a common way, and that each relevant code set is available to each system with the same valid content. Each system needs to be configurable as to which code sets it uses. IHE Radiology does not (yet) defines a mechanism how to distribute code sets commonly in organizations.

This way of working contributes to the development of local protocols like “*routine screening*”, “*magnification*”, “*CAD*”, that are understood by technologists or doctors, but could not be applied to another department or enterprise, nor by the modality in the scope of an automated error correction.

450 Moreover, those codes are subject to be modified, removed, declared obsolete, or simply dropped. This situation is confusing since the RIS list of protocol codes cannot be fully reliable anymore.

455 Despite technical means defined in the *Scheduled Workflow* and *Mammography Acquisition Workflow Profiles*, variances in the way users and systems behave can lead to department inefficiencies, ambiguous data, special cases for automated billing, and less than optimal acquisition and reading environments.

21.3.2.4.1 Current state

460 A patient comes in for a scheduled standard screening mammogram. While the acquisition is processed, a suspicious lump is detected, and additional views are required, taken by the technologist. A diagnostic mammogram was performed instead of the simple routine screening that was scheduled. This information must be then communicated to the RIS, in order to change the billing codes and implicitly change the hanging protocol for the radiologist. As it is, the technologist has to manually change the procedure.

465 The procedure code will have to be corrected in the RIS post-examination so that the correct information is captured, both for display and for billing purposes.

21.3.2.4.2 Desired state

470 Changing a procedure code should be done directly from the modality, avoiding a subsequent intervention that can generate errors, misunderstandings, or discrepancies. SVS profile provides the modality with a mechanism for accessing a uniformed, centralized and dedicated Resolved Value Set.

A Resolved Value Set dedicated to mammography procedure codes is made available through the Value Set Repository.

The modality, acting as a Value Set Consumer, retrieves the Resolved Value Set commonly used by and defined for the mammography exams.

475 The correct type of the exam is processed (or at least provides the technologist the ability to choose the right item from this list).

The list proposed is a flat list, and is pending approval in the DICOM standard.

Table 21.3.2.4.2-1: Codes for Mammography Procedures

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
IHERADTF	MAWF0001	Screening Mammography, bilateral
IHERADTF	MAWF0002	Screening Mammography, left
IHERADTF	MAWF0003	Screening Mammography, right
IHERADTF	MAWF0004	Diagnostic Mammography, bilateral
IHERADTF	MAWF0005	Diagnostic Mammography, left
IHERADTF	MAWF0006	Diagnostic Mammography, right
IHERADTF	MAWF0007	Mammary Ductogram, Single Duct, left
IHERADTF	MAWF0008	Mammary Ductogram, Single Duct, right
IHERADTF	MAWF0009	Mammary Ductogram, Multiple Ducts, left
IHERADTF	MAWF0010	Mammary Ductogram, Multiple Ducts, right

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
IHERADTF	MAWF0011	Mammogram for marker placement, left
IHERADTF	MAWF0012	Mammogram for marker placement, right
IHERADTF	MAWF0013	Needle Localization, Image Guided, Mammography, left
IHERADTF	MAWF0014	Needle Localization, Image Guided, Mammography, right
IHERADTF	MAWF0015	Stereotactic Biopsy, Image Guidance, left
IHERADTF	MAWF0016	Stereotactic Biopsy, Image Guidance, right
IHERADTF	MAWF0017	Breast Specimen Mammography, left
IHERADTF	MAWF0018	Breast Specimen Mammography, right
IHERADTF	MAWF0019	Quality Control, Mammography
IHERADTF	MAWF0020	Additional Mammography Views

480

Note: These are provisional values, used as an example, whose inclusion in the DICOM Standard is currently requested (see RAD TF-1: B.2.ZA). IHE ITI is not responsible for updating these tables.

Table 21.3.2.4.2-2: Codes for Reasons for a Requested Procedure

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
Procedure type		
IHERADTF	MAWF0030	Recall for technical reasons
IHERADTF	MAWF0031	Recall for imaging findings
IHERADTF	MAWF0032	Recall for patient symptoms/ clinical findings
DCM	111416	Follow-up at short interval from prior study
SRT	R-42453	Screening (Note 1)
SRT	R-408C3	Diagnostic (Note 1)
SRT	A-04010	Implant (Note 1)

Note 1: These code values originate from DICOM CID 6061 (DICOM PS 3.16).

485

Note: These are provisional values, whose inclusion in the DICOM Standard is currently requested (see RAD TF-1: B.2.ZA)

21.4 SVS Security Considerations

490 The contents handled by the SVS profile are not patient specific, so there are no risks to
privacy. Some Resolved Value Sets are of little value to an attacker as they are public
tables of non-critical information (e.g. Resolved Value Sets used for coding of body parts
in medical exams). Other Resolved Value Sets might need protection against malicious
modification or interception.

495 The risks applicable to the SVS profile are discussed in the table “*Risks associated with
the profile SVS*” which is found on the IHE ftp site in site in
[ftp://ftp.ihe.net/IT_Infrastructure/iheityr6-2008-
2009/Technical_Cmte/Profile_Work/SharingValueSets/](ftp://ftp.ihe.net/IT_Infrastructure/iheityr6-2008-2009/Technical_Cmte/Profile_Work/SharingValueSets/). The nature of the Resolved
Value Set exchange determines the type or risk that can incur. For example there can be
integrity risks such as masquerade¹, or the modification of Resolved Value Sets.
Another possible type of risk would be at the privacy and confidentiality level such as
500 the interception of a Resolved Value Set containing confidential data. The profile will
allow mitigation of those risks when needed in the following manner:

- 505 • A Value Sets Repository shall be grouped with an ATNA Secure Node or
Secure Application. Since the Value Set Consumer is not required to be
grouped with the Secure Node or Secure Application, the Value Set
Repository shall support both secure and non-secure connections.
- Value Set Repositories shall be able to restrict access to a specific Resolved
Value Set to authorized and authenticated nodes, while allowing
unauthenticated network queries to other Resolved Value Sets.
- 510 • Given the wide variety of systems that will be retrieving Resolved Value Sets
(e.g. embedded medical device versus PACS) the profile does not mandate
that the Value Set Consumer be grouped with an ATNA Secure Node or a
Secure Application. Depending on local risk assessment, local policy may
mandate such grouping.
- 515 • IHE does require the ability to configure a Value Set Repository to be grouped
with a Secure Node or Secure Application².

¹A malicious server passing for the value set repository gives forged value sets.

² As a reminder, the grouping doesn't mandate the use of ATNA functionalities but only the capacity to activate them if needed.

<Appendix A> Actor Summary Definitions

Value Set Repository: actor whose role is to provide Resolved Value Sets

520 **Value Set Consumer:** an actor who retrieves Resolved Value Sets based on its OID and possibly its version if the latter is available.

<Appendix B> Transaction Summary Definitions

Retrieve Value Set: The Value Set Consumer retrieves a Resolved Value Set from the Value Set Repository.

525

Volume 2b - Transactions

Add Sections 3.48

3.48 Retrieve Value Set

530 This section corresponds to Transaction ITI-48 of the IHE IT Infrastructure Technical Framework. The Value Set Consumer and Value Set Repository actors use transaction ITI-48.

Integration Profiles using this Transaction
Sharing Value Sets (SVS)

3.48.1 Scope

535 This transaction is used by the Value Set Consumer to retrieve a Resolved Value Set from the Value Set Repository. The Value Set Consumer has previously obtained the Resolved Value Set OID by means outside of the scope of this transaction. ITI TF-2x: Appendix B has further information about obtaining and managing OIDs which are used as the Value Set Unique ID.

540 3.48.2 Use case roles

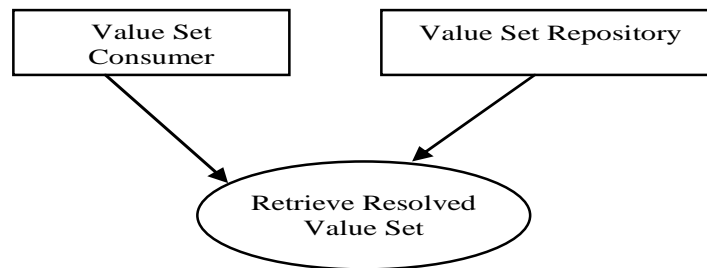


Figure 3.48.2: Use Case Roles

545 SVS Actors:

Actor: Value Set Consumer

Role: Obtains a Resolved Value Set

Actor: Value Set Repository

Role: Provides a Resolved Value Set

550

3.48.3 Referenced Standards

The referenced standard can be seen in *Table 3.48.3-1 Referenced Standards*.

Table 3.48.3-1 Referenced Standards

Appendix V	ITI TF-2x: Appendix V Web Services for IHE Transactions Contains references to all Web Services standards and requirements of use
HL7 v3 Data Type XML ITS	HL7 Version 3 Standard: XML Implementation Technology Specifications – Data Types, R1
HTTP 1.1	IETF RFC 2616: Hypertext Transfer Protocol – HTTP 1.1

3.48.4 Interaction Diagram

555

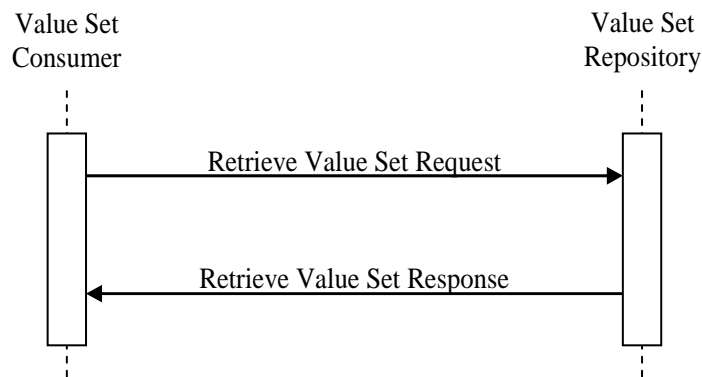


Figure 3.48.4-1: Interaction Diagram

3.48.4.1 Retrieve Value Set Request

3.48.4.1.1 Trigger Events

560 Having obtained the Value Set OID, the Value Set Consumer will send the Retrieve Value Set Request to the Value Set Repository.

3.48.4.1.2 Message Semantics

The Retrieve Value Set Request shall carry the following information:

565

- A required `id`, representing the Value Set OID that identifies the Resolved Value Set within the Repository.
- An optional `version` that identifies a specific version of the Resolved Value Set. If no version is specified, the Value Set Consumer is requesting the most recent version of the Value Set
- An optional `lang` parameter indicating the requested language locale for the `displayName` of the Value Set Concepts. (Note: in the SOAP binding, this parameter is represented via the `xml:lang` XML attribute)

570

ITI TF-2b: 3.48.5 describes the Web Services protocol requirements and the format of the message in full detail.

3.48.4.1.3 Expected Actions

575 When receiving a Retrieve Value Set Request, a Value Set Repository shall generate a Retrieve Value Set Response containing the Resolved Value Set that corresponds to the request parameters, or an error code if the Value Set could not be retrieved. If no version is specified in the Request, then the most recent version shall be returned.

580 The Value Set Repository shall support both the SOAP and HTTP bindings for this transaction. If the Value Set Consumer sends the request using the SOAP binding, the Value Set Repository shall respond using the SOAP binding. If the Value Set Consumer sends the request using the HTTP binding, the Value Set Repository shall respond using the HTTP binding.

3.48.4.2 Retrieve Value Set Response

585 3.48.4.2.1 Trigger Events

This message will be triggered by a Retrieve Value Set Request Message.

3.48.4.2.2 Message Semantics

The Retrieve Value Set Response Message shall carry the following information for the returned Resolved Value Set:

- 590 • A required `id`, representing the Value Set OID that identifies the Value Set within the Value Set Repository. This OID shall be the same as the Value Set OID in the received Retrieve Value Set Request Message.
- A required `displayName` that can be used for display purposes.
- 595 • An optional `version` that shall be present if the Resolved Value Set has a version, that identifies the specific version of the Value Set returned.
- An optional `cacheExpirationHint` indicating that the Value Set Consumer is not expected to change before this date and time. If the request and the response use the HTTP binding, this information shall be also present in the HTTP *Expire* header of the response. For details, please see Sec. 14.21 of IETF RFC2616.
- 600 • One or more `ConceptList`, which provides the Concepts of the Resolved Value Set. If there are multiple translations of the Value Set, each translation is returned as a separate list of `ConceptList`, where only the `displayName` of each `Concept`, and the language locale represented by `xml:lang` are different.
- 605

For each Value Set Concept, the following is returned. These requirements override the requirements of the HL7 schema rules for the CD data type where they conflict.

- A required `code` (a code that uniquely identifies a class or concept within the context of a code system)
- 610 • A required `displayName` (the name of the concept)
- A required `codeSystem`

- An optional `codeSystemVersion`.

Section 3.48.5 describes the Web Services requirements and the format of the message in full detail.

615 **3.48.4.2.3 Expected Actions**

A Value Set Repository shall return the Resolved Value Set indicated in the request.

If the Value Set Consumer requested a specific language locale, the Value Set Repository shall return only the requested translation of the Resolved Value Set. If the Value Set Consumer did not request a specific language locale, the Value Set Repository shall
 620 return all known translations of the Resolved Value Set. This is the only case where more than one `ConceptList` XML element shall be permitted. The `ConceptList` shall have the same code values for the Value Set in question (code and `codeSystem` shall have the same value); the `displayName` may have a different value appropriate to the locale.

The Value Set Repository shall return the Resolved Value Set or an error code in case the
 625 Value Set could not be resolved. The following error responses may be returned:

1. For the SOAP binding:

- a. A SOAP fault, whose code value is NAV, with the reason being: “Unknown value set”.
 - b. A SOAP fault, whose code value is VERUNK, with the reason being: “Version unknown”.
- 630

2. For the HTTP binding:

- a. An HTTP status code of 404, with an HTTP Warning header containing warn-code of 111, and warn-text of “NAV: Unknown value set”. See sections 10.4.5 and 14.46 of IETF RFC 2616 for more information.
 - b. An HTTP status code of 404, with an HTTP Warning header containing warn-code of 112, and warn-text of “VERUNK: Version unknown”. See sections 10.4.5 and 14.46 of IETF RFC 2616 for more information.
- 635

3.48.5 Protocol Requirements

The protocol for the Retrieve Value Set transaction describes two bindings. The first is
 640 based on SOAP 1.2, and the second is an HTTP binding. The relevant XML namespace definitions can be seen in *Table 3.48.5-1 WSDL Namespace Definitions*.

Table 3.48.5-1 WSDL Namespace Definitions

soap12	http://schemas.xmlsoap.org/wsdl/soap12/
wsaw	http://www.w3.org/2006/05/addressing/wsdl/
xsd	http://www.w3.org/2001/XMLSchema
ihe	urn:ihe:iti:svs:2008

645 **3.48.5.1 SOAP Binding**

Value Set Consumers which support the SOAP binding option shall follow the rules for Web Services transactions outlined in ITI TF-2x: Appendix V. These are the requirements for the Retrieve Value Set transaction presented in the order in which they would appear in the WSDL definition:

650 The following types shall be imported (xsd:import) in the /definitions/types section:

namespace="urn:ihe:iti:svs:2008", schema="SVS.xsd"

The /definitions/message/part/@element attribute of the Retrieve Value Set Request message shall be defined as "ihe:RetrieveValueSetRequest"

655 The /definitions/message/part/@element attribute of the Retrieve Value Set Response message shall be defined as "ihe:RetrieveValueSetResponse"

The /definitions/portType/operation/input/@wsaw:Action attribute for the Retrieve Value Set Request message shall be defined as "urn:ihe:iti:2008:RetrieveValueSet"

660 The /definitions/portType/operation/output/@wsaw:Action attribute for the Retrieve Value Set Response message shall be defined as "urn:ihe:iti:2008:RetrieveValueSetResponse"

The /definitions/binding/operation/soap12:operation/@soapAction attribute shall be defined as "urn:ihe:iti:2008:RetrieveValueSet"

665 These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in ITI TF-2b: 3.48.5.3 Sample SOAP Message.

670 Within the request message payload the <ihe:RetrieveValueSetRequest/> element is defined as:

- A required /ihe:RetrieveValueSetRequest/ihe:ValueSet element
- A required /ihe:RetrieveValueSetRequest/ihe:ValueSet@id attribute that contains the ID of the requested Value Set within the Value Set Repository. The Value Set ID shall be formatted as an ISO OID.
- 675 • An optional /ihe:RetrieveValueSetRequest/ihe:ValueSet@displayName attribute
- 680 • An optional /ihe:RetrieveValueSetRequest/ihe:ValueSet@version attribute.

- An optional `/ihe:RetrieveValueSetRequest/ihe:ValueSet+xml:lang` attribute.

685 Value Set Repositories shall include within the response message payload for the SOAP Binding option the `<ihe:RetrieveValueSetResponse/>` element which contains:

An optional `/ihe:RetrieveValueSetResponse@cacheExpirationHint` attribute, indicating that the Value Set Consumer should obtain a new copy before this date and time.

690

A required `/ihe:RetrieveValueSetResponse/ihe:ValueSet` element, containing

- a required `/ihe:RetrieveValueSetResponse/ihe:ValueSet@id` attribute

695

- a required `/ihe:RetrieveValueSetResponse/ihe:ValueSet@displayName` attribute

- a required `/ihe:RetrieveValueSetResponse/ihe:ValueSet@version` attribute

700

- one or more `/ihe:RetrieveValueSetResponse/ihe:ValueSet/ihe:ConceptList` element, containing:

- `/ihe:RetrieveValueSetResponse/ihe:ValueSet/ihe:ConceptList/xml:lang` attribute, representing the language locale of the Concept's display names

705

- one or more `/ihe:RetrieveValueSetResponse/ihe:ValueSet/ihe:ConceptList/ihe:Concept` elements, representing the concepts within the value set..

The `<ihe:Concept/>` element is defined as being of the HL7 V3 CD data type.

710 The only occurrence of more than one `ConceptList` element in a response message shall be for the purpose of returning multiple language representations of the same value set.

A full XML Schema Document for the SVS types is available on the IHE ftp site (see ITI TF-2x: Appendix W).

715 **3.48.5.2 HTTP Binding**

Value Set Consumers which support the HTTP Binding option shall use the GET method as defined in IETF RFC2616 for the Retrieve Value Set Request.

3.48.5.2.1 Request Parameters

720 There are three input parameters, to be provided as part of the URL in the GET request. The parameter values have identical meaning to the ones described in the SOAP binding. These are described in Table 3.48.5.2.1-1.

Table 3.48.5.2.1-1 – The Request Parameters in the GET request

Parameter	Optionality	Note
Id	Required	Unique identifier of the Value Set.
Version	Optional	The Value Set version.
lang	Optional	The language locale of the Value Set. If present, it shall be encoded as a string from the set of languages listed in IETF RFC3066 (identical to the values of xml:lang, described in the SOAP binding). If present, the Accept-Language field of the HTTP Header may also contain the same value (see section 14.4 of IETF RFC2616).

725 The full URL for the HTTP binding looks as follows:

<https://example.com/RetrieveValueSet?id=1.2.840.10008.6.1.308&version=20061023&lang=en-US>

730 Note: “en-US” will not match “en”. For applications that need a more sophisticated user sensitive language matching capability, omitting the lang parameter will return all languages so that the application can make a determination of which language best fits the current user.

3.48.5.2.2 HTTP Response

Value Set Repositories shall format the response to the HTTP GET operation as an HTTP response message as defined in IETF RFC2616.

735 The Content-Type field of the HTTP header shall be “text/xml” (see section 14.4 of IETF RFC2616).

740 The content of the HTTP response message shall be an XML encoded Resolved Value Set that complies with the SVS schema. The XML format shall be identical to the body of the SOAP response described in the SOAP binding. The Resolved Value Set shall correspond to the Values Set identified by the Value Set Unique ID in the *id* parameter, the Value Set Version in the *version* parameter, and the language in the *lang* parameter.

An informative WSDL file containing both SOAP and HTTP bindings for the Value Set Repository actor can be found on the IHE ftp site (see ITI TF-2x: Appendix W).

3.48.5.3 Sample SOAP Messages

745 The samples in the following two sections show a typical SOAP request and its corresponding SOAP response. The sample messages also show the WS-Addressing headers <Action/>, <MessageID/>, <ReplyTo/>...; these WS-Addressing headers are populated according to the W3C WS-Addressing standard.

All of the samples presented in this section are also available online on the IHE FTP site (see ITI TF-2x: Appendix W).

750 **3.48.5.3.1 Sample Retrieve Value Set SOAP Request**

Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.

```

755 1.1.1.1.1 <?xml version="1.0" encoding="UTF-8"?>
      <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
        xmlns:a="http://www.w3.org/2005/08/addressing">
        <s:Header>
          <a:Action
760      s:mustUnderstand="1">urn:ihe:iti:2008:RetrieveValueSet</a:Action>
          <a:MessageID>urn:uuid:0fbfdced-6c01-4d09-a110-
            2201afedaa02</a:MessageID>
          <a:ReplyTo>

765      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
            </a:ReplyTo>
          <a:To s:mustUnderstand="1">http://valuesetrepository/</a:To>
        </s:Header>
        <s:Body>
          <RetrieveValueSetRequest
770      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
            xmlns="urn:ihe:iti:svs:2008">
            <ValueSet id="1.2.840.10008.6.1.308" xml:lang="en-EN"/>
          </RetrieveValueSetRequest>
        </s:Body>
775      </s:Envelope>

```

3.48.5.3.2 Sample Retrieve Value Set SOAP Response

Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.

```

780 <?xml version="1.0" encoding="UTF-8"?>
      <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing"
        xmlns:s="http://www.w3.org/2003/05/soap-envelope">
        <s:Header>
          <a:Action
785      s:mustUnderstand="1">urn:ihe:iti:2008:RetrieveValueSetResponse</a:Action>
          <a:RelatesTo>urn:uuid:0fbfdced-6c01-4d09-a110-2201afedaa02</a:RelatesTo>
        </s:Header>
        <s:Body>
          <RetrieveValueSetResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-
790      instance"
            xmlns="urn:ihe:iti:svs:2008" cacheExpirationHint="2008-08-
              15T00:00:00-05:00">
            <ValueSet id="1.2.840.10008.6.1.308"
              displayName="Common Anatomic Regions Context ID 4031"
795      version="20061023">
              <ConceptList xml:lang="en-US">
                <Concept code="T-D4000" displayName="Abdomen"
              codeSystem="2.16.840.1.113883.6.5"/>
                <Concept code="R-FAB57" displayName="Abdomen and Pelvis"
800      codeSystem="2.16.840.1.113883.6.5"/>
                <Concept code="T-15420" displayName="Acromioclavicular
              joint" codeSystem="2.16.840.1.113883.6.5"/>
                <Concept code="T-15750" displayName="Ankle joint "
              codeSystem="2.16.840.1.113883.6.5"/>
805      <Concept code="T-280A0" displayName="Apex of Lung"
              codeSystem="2.16.840.1.113883.6.5"/>

```

```

810         <Concept code="T-D8200" displayName="Arm"
codeSystem="2.16.840.1.113883.6.5"/>
        <Concept code="T-60610" displayName="Bile Duct"
codeSystem="2.16.840.1.113883.6.5"/>
815         <Concept code="T-74000" displayName="Bladder"
codeSystem="2.16.840.1.113883.6.5"/>
        <Concept code="T-04000" displayName="Breast"
codeSystem="2.16.840.1.113883.6.5"/>
820         <Concept code="T-26000" displayName="Bronchus"
codeSystem="2.16.840.1.113883.6.5"/>
        <Concept code="T-12770" displayName="Calcaneus"
codeSystem="2.16.840.1.113883.6.5"/>
825         <Concept code="T-11501" displayName="Cervical spine"
codeSystem="2.16.840.1.113883.6.5"/>
        </ConceptList>
    </ValueSet>
</RetrieveValueSetResponse>
</s:Body>
825 </s:Envelope>

```

3.48.6 Security Requirements

For security considerations please consult ITI TF-1: 21.4,

Audit trails shall be configurable to record access to a selected list of Value Sets.

830 3.48.6.1 Audit Record Considerations

The Retrieve Value Set Transaction is an Import/Export event, as defined in *Table 3.48.6.1.1 Value Set Consumer audit message* and in *Table 3.48.6.1.2 Value Set Repository audit message*. The Actors involved in the transaction shall create audit data in conformance with DICOM (Supp 95) “Data Export” or “Data Import”, with the following exceptions.

835

3.48.6.1.1 Value Set Consumer audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"C" (Create) or "U" (Update)
	EventDateTime	M	not specialized
	EventOutcomeIndicator	M	not specialized
	EventTypeCode	M	EV("ITI-48", "IHE Transactions", "Retrieve Value Sets")
Source (Value Set Repository) (1)			
Human Requestor (0..n)			
Destination (Value Set Consumer) (1)			
Human Requestor (0..n)			
Audit Source (Value Set Consumer) (1)			
ValueSetInstance (1)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	SOAP endpoint URI
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	U	not specialized
	UserIsRequestor	M	"true"
	RoleIDCode	M	EV(110153, DCM, "Source")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address, as specified in RFC 3881.

Destination AuditMessage/ ActiveParticipant	UserID	C	When WS-Addressing is used: <ReplyTo/>
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	U	not specialized
	UserIsRequestor	M	"true"
	RoleIDCode	M	EV(110152, DCM, "Destination")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address, as specified in RFC 3881.
Human Requestor (if known) AuditMessage/ ActiveParticipant	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	M	"true"
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	NA	
	NetworkAccessPointID	NA	

Audit Source AuditMessage/ AuditSourceIdentification	AuditSourceID	U	Not specialized.
	AuditEnterpriseSiteID	U	not specialized
	AuditSourceTypeCode	U	not specialized

Value Set Instance (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	“2” (System)
	ParticipantObjectTypeCodeRole	M	“3” (Report)
	ParticipantObjectDataLifeCycle	U	not specialized
	ParticipantObjectIDTypeCode	M	EV(9, RFC-3881, “Report Number”)
	ParticipantObjectSensitivity	U	not specialized
	ParticipantObjectID	M	The value of <Value Set Unique ID>
	ParticipantObjectName	O	The value of <Value Set name>
	ParticipantObjectQuery	U	not specialized
	ParticipantObjectDetail	O	The value of <Value Set Version>

3.48.6.1.2 Value Set Repository audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110106, DCM, “Export”)
	EventActionCode	M	“R” (Read)
	EventDateTime	M	not specialized
	EventOutcomeIndicator	M	not specialized
	EventTypeCode	M	EV(“ITI-48”, “IHE Transactions”, “Retrieve Value Sets”)
Source (Value Set Repository) (1)			
Human Requestor (0..n)			
Destination (Value Set Consumer) (1)			
Human Requestor (0..n)			
Audit Source (Value Set Source) (1)			
ValueSetInstance (1)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	SOAP endpoint URI
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	U	not specialized
	UserIsRequestor	M	“true”
	RoleIDCode	M	EV(110153, DCM, “Source”)
	NetworkAccessPointTypeCode	M	“1” for machine (DNS) name, “2” for IP address
	NetworkAccessPointID	M	The machine name or IP address, as specified in RFC 3881.

Destination AuditMessage/ ActiveParticipant	UserID	C	When WS-Addressing is used: <ReplyTo/>
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	M	“true”

IHE ITI Technical Framework Supplement – Sharing Value Sets (SVS)

	RoleIDCode	M	EV(110152, DCM, “Destination”)
	NetworkAccessPointTypeCode	M	“1” for machine (DNS) name, “2” for IP address
	NetworkAccessPointID	M	The machine name or IP address, as specified in RFC 3881.
Human Requestor (if known such as through XUA) AuditMessage/ ActiveParticipant	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	M	“true”
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	NA	
NetworkAccessPointID	NA		

845

Audit Source AuditMessage/ AuditSourceIdentification	<i>AuditSourceID</i>	<i>U</i>	<i>Not specialized.</i>
	<i>AuditEnterpriseSiteID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditSourceTypeCode</i>	<i>U</i>	<i>not specialized</i>

Value Set Instance (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	“2” (System)
	ParticipantObjectTypeCodeRole	M	“3” (Report)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectIDTypeCode	M	EV(9, RFC-3881, “Report Number”)
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	ParticipantObjectID	M	The value of <Value Set Unique ID>
	<i>ParticipantObjectName</i>	<i>O</i>	The value of <Value Set name>
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>
<i>ParticipantObjectDetail</i>	<i>M</i>	The value of <Value Set Version>	