

Integrating the Healthcare Enterprise



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IHE IT Infrastructure (ITI) Technical Framework Supplement

10

Sharing Value Sets (SVS)

15

Trial Implementation

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20 Date: August 10, 2010
Author: ITI Technical Committee
Email: iti@ihe.net

25 **Foreword**

This is a supplement to the IHE IT Infrastructure Technical Framework V7.0. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

30 This supplement is submitted for Trial Implementation as of August 10, 2010 and will be available for testing at subsequent IHE Connectathons. The supplement may be amended based on the results of testing. Following successful testing it will be incorporated into the IT Infrastructure Technical Framework. Comments are invited and may be submitted on the IHE forums at <http://forums.rsna.org/forumdisplay.php?f=198> or by email to iti@ihe.net.

35 This supplement describes changes to the existing technical framework documents and where indicated amends text by addition (**bold underline**) or removal (~~**bold strikethrough**~~), as well as addition of large new sections introduced by editor’s instructions to “add new text” or similar, which for readability are not bolded or underlined.

40 “Boxed” instructions like the sample below indicate to the Volume Editor how to integrate the relevant section(s) into the relevant Technical Framework volume:

<i>Replace Section X.X by the following:</i>
--

45 General information about IHE can be found at: www.ihe.net

Information about the IHE IT Infrastructure can be found at:

<http://www.ihe.net/Domains/index.cfm>

Information about the structure of IHE Technical Frameworks and Supplements can be found at: <http://www.ihe.net/About/process.cfm> and

50 <http://www.ihe.net/profiles/index.cfm>

The current version of the IHE Technical Framework can be found at:

http://www.ihe.net/Technical_Framework/index.cfm

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Introduction

95 The Sharing Value Sets (SVS) profile provides a means through which healthcare systems producing or consuming clinical or administrative data, such as diagnostic imaging equipment, laboratory reporting systems, primary care physician office EMR systems, or national healthcare record systems, can access value sets built from common, uniform nomenclatures managed centrally. Shared nomenclatures with specific derived value sets are essential to achieving semantic interoperability.

100 This profile describes network transactions for retrieving Value Sets 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 and associated value sets. It supports automated loading of Value Sets by Value Set Consumers, reducing the burden of manual configuration.

105 • A single value set can be retrieved based on an unique identifier value. This is aimed at meeting the needs of systems that are pre-configured to use specific value sets. These systems are often medical devices or specific applications with strictly controlled functions that should not be modified without careful review. This transaction does not include metadata content, and provides just the value set concept list as uniquely identified in the request.

110 • Multiple value sets can be retrieved based on metadata about the value sets. This is aimed at meeting the needs of systems and users that will be dynamically selecting value sets, and deciding which value sets should be used. It could also be used when creating new value sets based on the contents of existing value sets. This transaction supports a much richer selection criteria and provides metadata descriptions as well as the contents (an expanded lists of coded values) of all the value sets that meet those selection criteria.

115 Both transactions provide access to centrally managed value sets that have been assigned metadata, including identification as members of groups. The ability to identify groups of value sets is essential to achieving semantic interoperability and developing modular structures of electronic health records (EHR). Group identification can be used to identify, for example, all the value sets needed for a given purpose like filling in a particular kind of report.

125 Open Issues

None.

Closed Issues

130 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.

2. A mechanism will have to be set so that the user will know the expiration date since certain Expanded Value Sets are time-sensitive. The resolution is to have a

- 135 cache expiration hint in the Retrieve Value Set Response that will inform the user as to when a new retrieval may be necessary. The expiration information is present in the metadata for Retrieve Multiple Value Sets.
3. The ConceptList structure does not indicate changes between versions. To determine what has changed, two concept lists must be retrieved and compared.
 - 140 4. There are no notification messages. The HTTP caching mechanisms, plus schedule driven and out of band notifications like email or printed bulletins, are used by clients to keep value sets up-to-date. Is a section explaining the use of this in detail needed? Or does such implementation advice belong on an implementers wiki? No comments, so this will be managed by wiki.
 - 145 5. The HL7 CD datatype is used without further profiling or restriction. Should there be restrictions?

This could be a profiling of the ISO code datatype, or using the HL7 CE datatype. There are good arguments for both approaches. The suggestion accepted was to 1) add a format selection that enables us to update the transaction for different formats of codes and value sets, and 2) use the CE datatype initially. CE is constrained from CD, provides the code contents and equivalences only, and has well understood rules for transforming into the form needed in various CDA documents.
 - 150 6. There is a very similar work effort in process sponsored by the US National Cancer Institute and involving the Mayo organization. This effort is part of the LexBig project. We understand that that project will have another revision ready in the fall of 2010. We anticipate using the trial implementation period to work on understanding the implementation overlaps and reconcile differences. This may affect the Retrieve Multiple Value Sets transaction.
 - 155

Future Considerations

- 160 Future considerations for this profile are listed on the IHE wiki at:
http://wiki.ihe.net/index.php?title=SVS_Future_Considerations

Add the following to Section 3 Profile Abstract:

Profile Abstract

- 165 The Sharing Value Sets (SVS) profile provides a means through which healthcare systems producing or consuming 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 with specific derived value sets are essential to achieving semantic interoperability.
- 170 This profile describes Transactions for retrieving Value Sets 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 with specific derived value sets. It supports automated loading of Value Sets by Value Set Consumers, reducing the burden of manual configuration.

175

Glossary

Modify the following definitions in ITI TF-1: Glossary

180 **Globally Unique Identifier (GUID):** An identifier of an entity, such as persistent document, that has been generated by an algorithm guaranteeing its global uniqueness. **For more information please see ITI TF-2x: Appendix B discussion of OIDs and UUIDs.**

OID: Object Identifier. (See also 'Globally Unique Identifier'). **For more information please see ITI TF-2x: Appendix B discussion of OIDs and UUIDs.**

185 *Add the following to Section ITI TF-1: Glossary:*

Note that intensional and intension are spelled correctly. These are two uncommon words. They are not the same as the common words intentional and intention, despite being pronounced the same way.

190 **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.

195 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.

200 **Expanded 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 Expanded Value Set concepts are similar to the programming concepts of Class and Instance of Class. This may also be called a value set resolution or resolved value set.

Intensional Value Set – a set of concepts that is specified in terms of the “intension” of use, for example “all concepts that are children of this node in a tree of concepts”. Intensional value sets often have some kind of algorithmic basis for selection of concepts.

205 **Extensional Value Set** – a set of concepts that is specified in terms of a list of concepts. *(The definitions are based on HL7 Vocabulary terms).*

Volume 1 – Integration Profiles

210 *This section describes the changes required in Volume 1 of the Technical Framework that result from including this Integration Profile.*

1.7 History of Annual Changes

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

215 Added the Sharing Value Sets profile which provides two mechanisms for retrieving Value Sets from a Value Set Repository.

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

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.
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Add the following section to Section 2.2

2.2.21 Sharing Value Set Integration Profile (SVS)

225 The Sharing Value Sets (SVS) profile provides a means through which healthcare systems producing or consuming 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 with specific derived value sets are essential to achieving semantic interoperability.

230 This profile describes transactions for retrieving Value Sets 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 systems implementing a Value Set Consumer, reducing the burden of manual configuration.

The section shall be added to Vol 1

21 Sharing Value Sets Integration Profile (SVS)

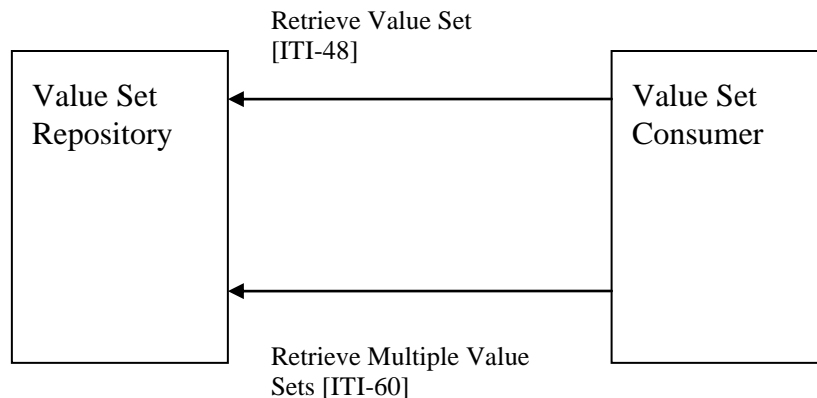
- 235 The Sharing Value Sets (SVS) profile provides a means through which healthcare systems producing clinical or administrative data, such as diagnostic imaging equipment, laboratory reporting systems, primary care physician office EMR systems, or national healthcare record systems, can receive a common, uniform nomenclature managed centrally. Shared nomenclatures are essential to achieving semantic interoperability.
- 240 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. This profile describes two Transactions for retrieving Value Sets from a Value Set Repository by a Value Set Consumer.
- 245
- A single value set can be retrieved based on an OID value. This is aimed at meeting the needs of systems that are pre-configured to use specific value sets. These systems are often medical devices with strictly controlled functions that should not be modified without careful review. This transaction does not include metadata content, and provides just the value set concept list as uniquely
- 250
- Multiple value sets can be retrieved based on metadata about the value sets. This is aimed at meeting the needs of systems and users that will be dynamically selecting value sets, deciding which value sets should be used, and creating new value sets based on the contents of existing value sets. This transaction supports a much richer selection criteria and provides metadata descriptions as well as the contents (expanded lists of coded values) of all the value sets that meet those
- 255
- criteria.

Both transactions provide access to centrally managed value sets that have been assigned metadata, including group identification. The ability to identify groups of value sets is

260 essential to achieving semantic interoperability and development of modular structures of electronic health records (EHR). Group identification can be used to identify, for example, all the value sets needed for a given purpose like filling in a particular kind of report.

21.1 Actors/ Transactions

- 265 **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).



270

Figure 21.1-1 SVS Actor Diagram

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 Table 21.2-1.

275

Table 21.1-1 SVS Integration Profile - Actors and Transactions

Actors	Transactions	Optionality	Section
Value Set Repository	Retrieve Value Set [ITI-48]	R	ITI TF-2b: 3.48
	Retrieve Multiple Value Sets [ITI-60]	R	ITI TF-2b:3.60
Value Set Consumer	Retrieve Value Set [ITI-48]	R	ITI TF-2b: 3.48
	Retrieve Multiple Value Sets [ITI-60]	O	ITI TF-2b:3.60

21.1.1 Assumptions and background information

280

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).

285

This profile will address a flat list of concept codes, one of the simplest examples of a Value Set being shown in Table 21.1.1-1: The provinces of Canada.

Table 21.1.1-1: 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

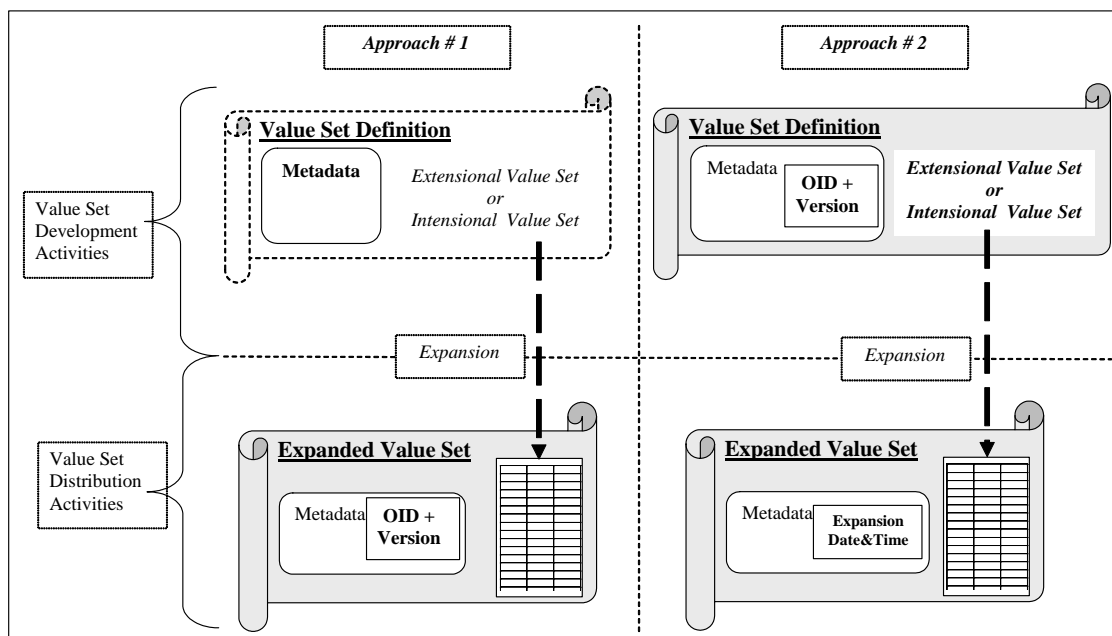
21.1.2 Value Set Unique ID and Value Set Version

290 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 an *Expanded Value Set* (an Expanded Value Set is a set of
concept representations that were in effect at a specific time for a particular version of a
Value Set definition. The *Value Set* (definition) and the *Expanded Value Set* concepts are
295 similar to the programming 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 Value Set.

The actual set of codes derived from this definition of a Value set is an *Expanded Value
Set*. SVS supports the sharing of Expanded Value Set with two different approaches to
300 their identification:

1. By unique identification of the Expanded Value Set itself, and no reference to the
definition that produced it. Such an Expanded Value Set carries its own unique
identifier (i.e. an OID and Version).
- 305 2. By reference to the Value Set definition (OID and Version) from which the
Expanded Value Set was derived. In this case specific Expanded Value sets
(derived from the same Value Set definition) are only distinguished by their
expansion date and time.



310 **Figure 21.1.2-1 The two approaches for identifying Value Sets**

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 the upcoming HL7 CTS2 specifications. It is important to note the complementary role of the HL7
 315 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 leaving the specification of the API to the Object Management Group. SVS
 320 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
 325 CTS and the CTS2 functional specification 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 CTS2 specification).

330 **Informative references:**

1. LexGrid 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.
 335 (see HL7 site for latest information)

21.1.3.1 Value Set Distribution Flow

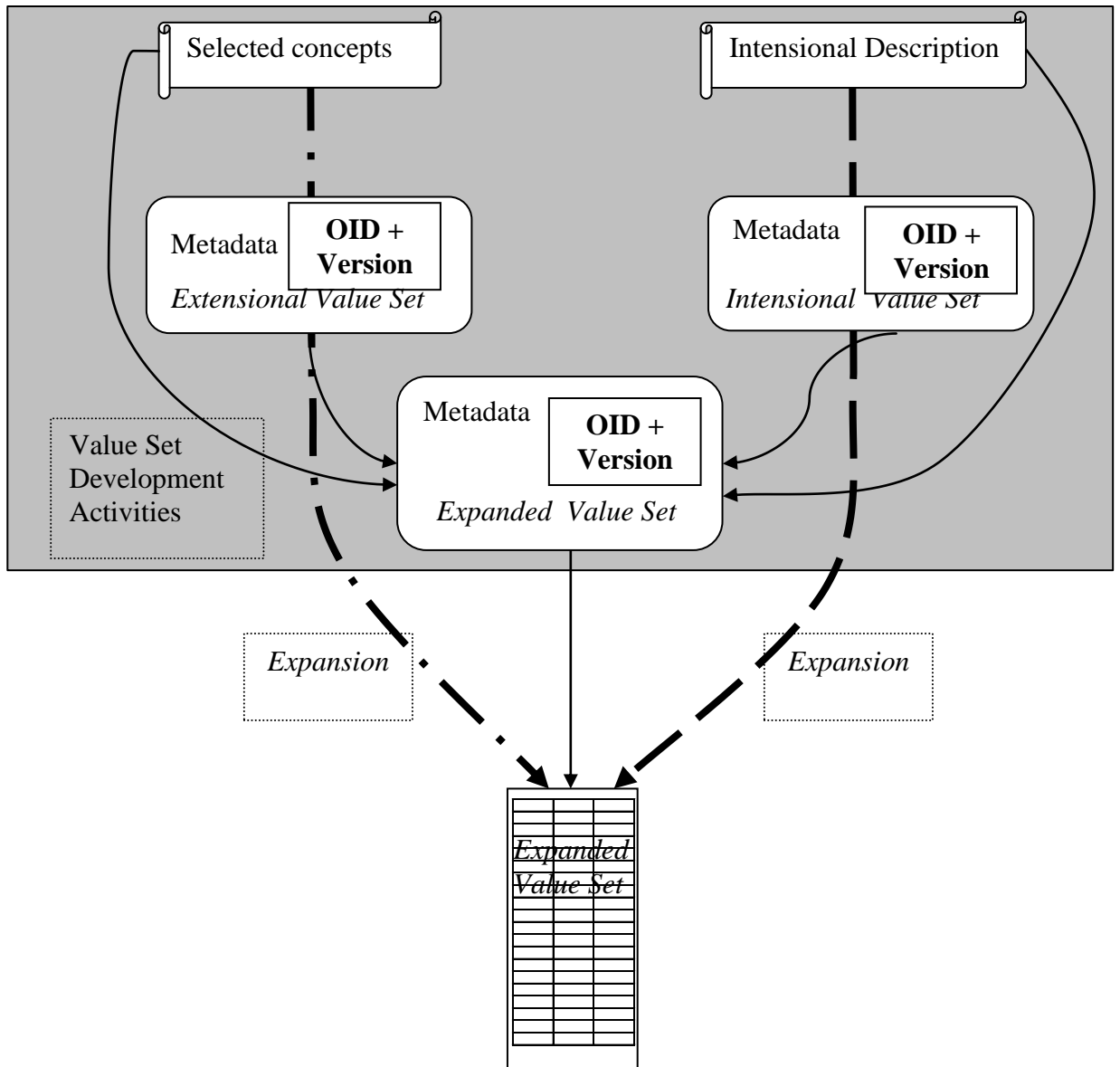
There are three types of value sets supported by the SVS Transactions:

1. Intensional Value Sets are defined in terms of algorithmic and other methods. These value sets can be supported by the Value Set Repository, but this profile does not provide a means to convey the intensional form. Instead, these value sets are described using the metadata, and the appropriate resulting expanded value set contents are returned along with the Intensional Value Set definition and expansion metadata. This profile specifies how these can be retrieved using the Retrieve Multiple Value Sets Transaction (ITI-60).
2. Extensional value sets are defined in terms of a list of concepts. As with intensional value sets, the definition and expansion metadata for these can be retrieved along with the appropriate expanded value set contents. This profile specifies how these can be retrieved using the Retrieve Multiple Value Sets Transaction (ITI-60).
3. Expanded Value Sets result from the expansion of any Value Set definition (e.g. Intensional or Extensional), but their definition metadata is not important to the Value Set Consumer, only an identified instantiation defined in terms of a list of specific codes from specific vocabularies is shared. This profile describes how these can be retrieved using either the retrieve multiple value sets transaction (ITI-60), or the Value Set Retrieve Transaction (ITI-48).

The developers of value sets may choose to work with one or more of these types, but the final consumers of value sets need to work with expanded value sets. There are efforts underway to develop standard methods for exchanging explicit definition of intensional and extensional value sets, but these are outside the scope of the SVS profile. SVS provides only a way to distribute value sets that have been expanded.

The SVS profile also restricts the complexity of the expanded value sets. At present, it only supports unstructured value sets that are a list of codes from coded terminologies. Other internal structures such as hierarchy are not defined. This meets the needs of most, but not all, value sets.

The process and rules associated with a value set expansion is not specified nor constrained by this profile. It is the responsibility of the value set developer or of the system supporting the SVS Repository actor to perform the appropriate expansions. If the value set developer defines their standard distribution format as the expanded form of the value set, they have the appropriate procedures for this expansion. Value set developers that do not have a procedure defined for distributing the expanded form will need to establish one in order to use the SVS profile.



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Figure 21.1.3.1-1 Development Flow for Value Sets

A value set developer that defines and publishes expanded value sets should also establish the proper identification that identifies either this expanded value set or the definition that resulted in this expanded value set. They also define metadata that describes the value set. (Value set group descriptions will be discussed later.) The metadata is listed below, and includes descriptive information, links to further explanatory material, effective dates, etc. The SVS profile provides two transactions for retrieving an expanded value set:

380

1. Retrieve Value Set – This is appropriate for rapid retrieval of expanded value sets. It retrieves the expanded value set based on having the OID for the value

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set pre-configured into the system requesting the value set. This transaction does not retrieve the expanded value set metadata nor the value set definition metadata. It only retrieves the list of codes for that expanded value set.

- 390 2. Retrieve Multiple Value Sets – This is appropriate for retrieval of value sets based on metadata contents. It can still retrieve value set expansion based on the value set OID, but can also retrieve value set expansions based on contents of descriptions, OIDs and versions, group labels, dates, etc. This form of retrieval provides both the expanded value set contents for the retrieved value sets and the metadata for the value set.
- 395 Value set developers that publish intensional and extensional value sets also defined OIDs for their value sets definitions. Note that a developer may publish multiple forms of related value sets, but will assign each form the proper OID. When publishing with SVS, the value set developer should provide an expanded form that should be provided along with the metadata.
- 400 The SVS profile provides one transaction for retrieving intensional and extensional value sets:
- 405 1. Retrieve Multiple Value Sets – This is appropriate for retrieval of value sets based on metadata contents, including value set OID, but can also be based on contents of descriptions, group labels, dates, etc. This form of retrieval provides both the expanded value set contents for the retrieved value sets and the metadata for the value set. Note that there are other standards efforts defining forms for intensional and extensional value sets. These other forms are intended for use by value set developers. SVS provides the expanded form primarily for value set consumers.
- 410 A value set user that receives an intensional or extensional value set must be aware that the expansion is only for representational uses. The other metadata, such as effective dates and the descriptive material, must be consulted to determine the proper use of the expanded form. In practice, value sets change slowly and there is usually time for human review and decision making about the use of the expanded form.
- 415 The SVS profile does not specify how or when this expansion should take place. That is the responsibility of the value set developers and server maintainers. In many cases, the value set developer will provide an expanded form together with effective dates so that the organizations involved can manage change easily.

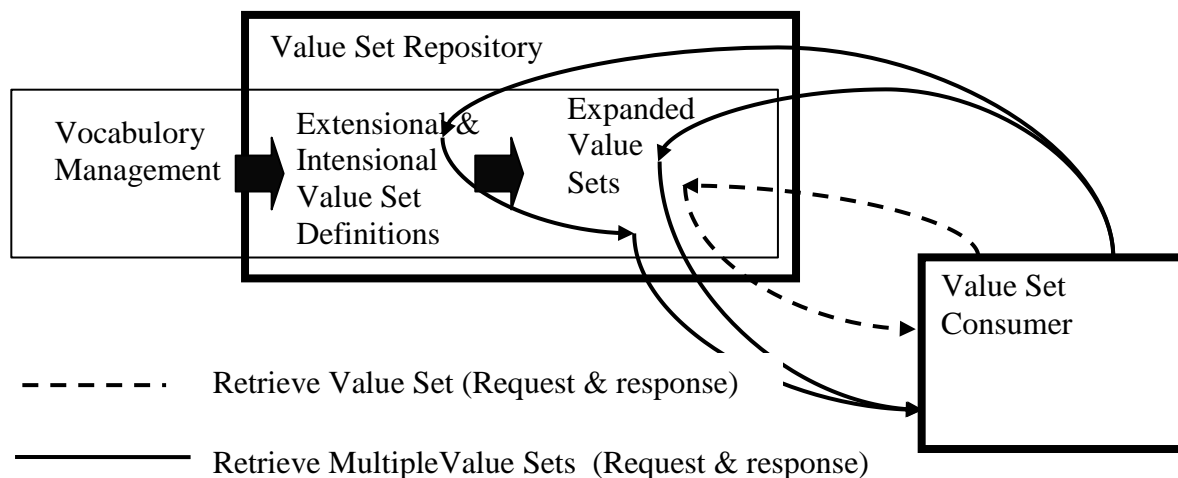


Figure 21.1.3.1-2 SVS Retrieve Transactions

21.1.3.2 Value Set Groups

425 Value sets are also described by various grouping and tagging mechanisms. These groupings may be defined in parallel by many different organizations. It is expected that each organization is creating groups for their own purpose. One organization may assign groups like “value sets associated with H1N1”, while another group may assign groups like “value sets associated with clinical trial xyz reports”, and a third may assign groups like “formulary for treatment of H1N1 influenza”. Each of these organizations may assign key words so that retrieval requests can find the relevant groups, and they may assign OIDs for these groups.

435 To simplify maintenance, SVS defines a list of group descriptions to be associated with each value set, rather than combining all the keywords and groups from different organizations into a single list. The retrieval transaction searches all of these descriptions when doing a retrieval based on group keyword or group OID.

440 An organization that is creating new groups can define a list of keywords and an OID for that group purpose. This group description can then be attached to each value set that should be a member of that group. If a value set needs to be removed from the group, then the attached description can be removed. This avoids accidental removal of keywords when multiple organizations have used the same keyword.

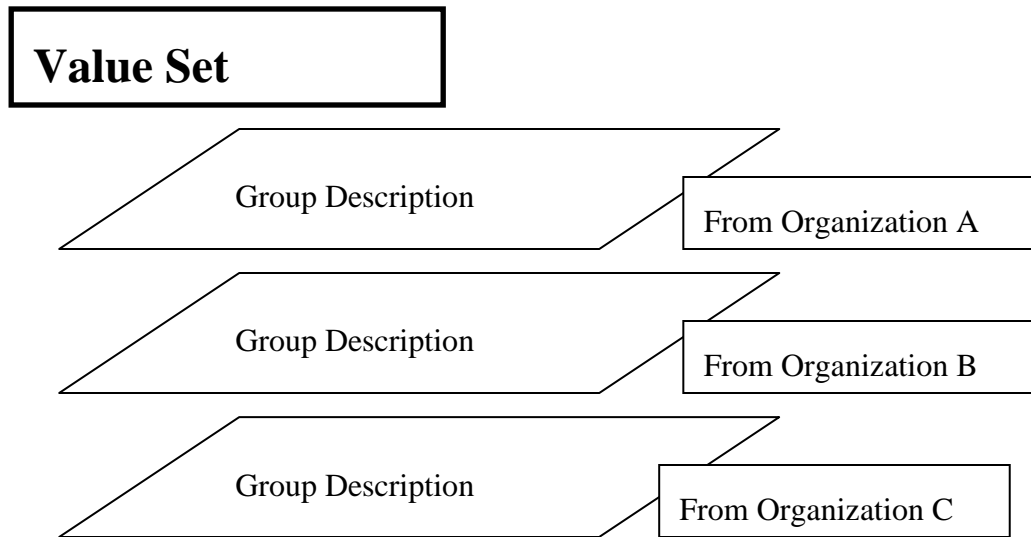


Figure 21.1.3.2-1 Group Descriptions for a Value Set

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21.1.3.3 Value Set Descriptive Metadata

A value set is described by metadata that includes the fields in Table 21.1.3.3.-1. For details on the metadata encoding, see ITI TF-2b: 3.60. Fields are mandatory or optional as shown in the table. Some of the metadata can be used as retrieval criteria for both the ITI-48 and ITI-60 transaction, some only for ITI-60, and some are only returned and cannot be used as retrieval criteria.

450

Table 21.1.3.3-1 Value Set Metadata Summary

Metadata Element	Description	Optionality	Selection Criteria for Transactions
Id	This is the unique identifier of the value set	Mandatory	ITI-48, ITI-60
DisplayName	This is the name of the value set	Mandatory	ITI-60
Source	This is the source of the value set, identifying the originator or publisher of the information	Mandatory	ITI-60
Purpose	Brief description about the general purpose of the value set	Optional	ITI-60
Definition	A text definition describing how concepts in the value set were selected	Optional	ITI-60

Metadata Element	Description	Optionality	Selection Criteria for Transactions
Source URI	Most sources also have a URL or document URI that provides further details regarding the value set.	Optional	-
Version	A string identifying the specific version of the value set.	Mandatory	ITI-48
Status	Active, Inactive, local extensions	Mandatory	-
Type	This describes the type of the value set: <ul style="list-style-type: none"> • Intensional, • Extensional, or • Expanded Note: This is the type of the value set in the repository. Value set retrieval will return a value set expansion.	Mandatory	-
Binding	Static or Dynamic	Optional	-
Effective Date	The date when the value set is expected to be effective	Optional	ITI-60
Expiration Date	The date when the value set is no longer expected to be used	Optional	ITI-60
Creation Date	The date of creation of the value set	Optional	ITI-60
Revision Date	The date of revision of the value set	Optional	ITI-60
Groups	The identifiers and keywords of the groups that include this value set. A group may also have an OID assigned.	Optional	ITI-60

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1. Status codes are determined by the Value Set developers. The suggested values shall be used if applicable.
2. The meaning of binding is not constrained by this Profile.

Some of these metadata fields can be specified as part of the selection criteria for retrieve multiple value sets. All of the available metadata is returned as the results from a retrieve multiple value sets. Metadata is not returned for the ITI-48 transaction.

460

This profile does not specify how the value set repository is maintained, how new value sets are added, or how existing values sets are updated.

21.2 SVS Integration Profile Options

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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.

470

Table 21.2-1 Sharing Value Sets - Actors and Options

Actor	Options	Vol & Section
-------	---------	---------------

Actor	Options	Vol & Section
Value Set Repository	Retrieve Multiple Value Sets	ITI TF-2b:3.60
Value Set Consumer	HTTP binding (see note)	ITI TF-2b: 3.48.5, ITI TF-2b: 3.60.5.2
	SOAP binding (see note)	ITI TF-2b: 3.48.5, ITI TF-2b: 3.60.5.1
	Retrieve Multiple Value Sets	ITI TF-2b:3.60

Note: A Value Set Consumer must support either the HTTP binding, the SOAP binding or both bindings. The Value Set Repository must support both bindings.

21.2.1 Retrieve Multiple Value Sets

475 Value Set Consumers and Repositories which support the Retrieve Multiple Value Sets Option shall support the Retrieve Multiple Value Sets [ITI-60] transaction.

21.3 SVS Process Flow

480 This section describes the process and information flow when a Value Set Consumer retrieves a Value Set from a Value Set Repository. There is no required order between the two transactions. The Value Set Consumer chooses whichever transactions and order are appropriate. The Value Set Consumer can use Retrieve Value Set ITI-48 to retrieve a single value set based upon a known value set OID. The Retrieve Multiple Value Sets ITI-60 can be used to retrieve all of the value sets that match a selection specification. The selection criteria for ITI-60 need not include a known value set OID.

485

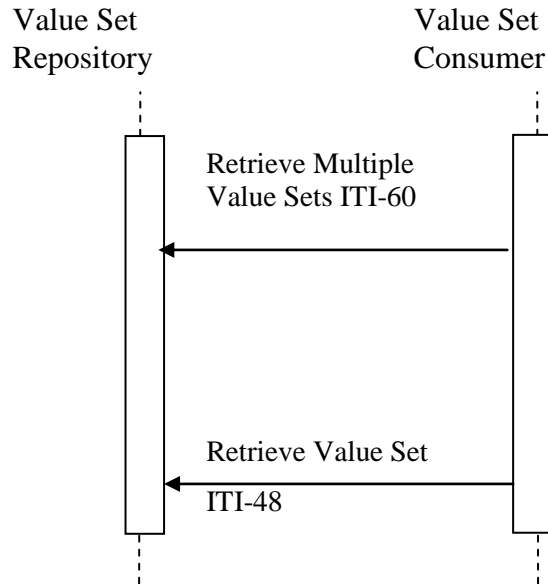


Figure 21.3-1. Basic Process Flow in SVS Profile

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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.

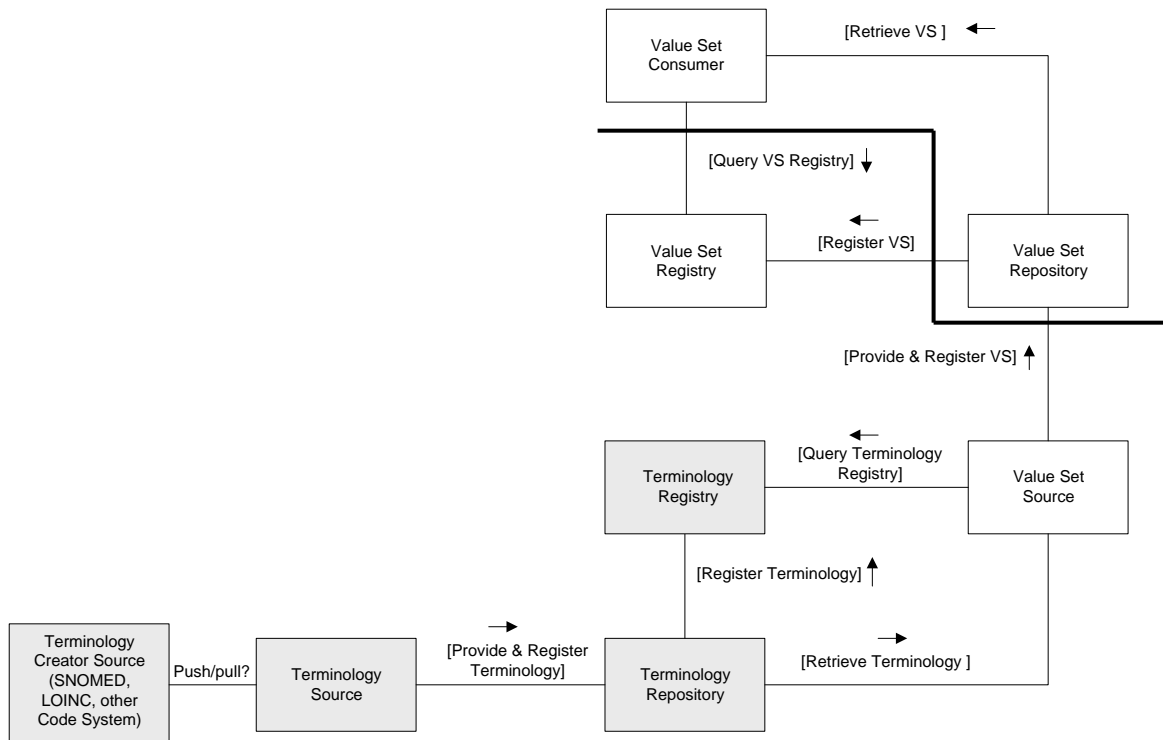
495

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 21.3.1-1, Overview of process flows** below, included for clarity’s sake:

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Figure 21.3.1-1 – Overview of the process flow

Figure 21.3.1-1 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.

510

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.

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.

515

21.3.2 Use Cases

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.

520

21.3.2.1 Distributing a consistent nomenclature in an XDS Affinity Domain

A common nomenclature is required in an XDS Affinity Domain for metadata elements such as classCode, confidentialityCode, eventCodeList, healthcareFacilityTypeCode,

525 practiceSettingCode, and typeCode. More detailed information about a possible
526 definition of an Affinity Domain can be found in the white paper **IHE IT Infrastructure**
527 **Technical Committee White Paper - Template for XDS Affinity Domain**
528 **Deployment Planning**, found on the **ihe.net**.

21.3.2.1.1 Current state

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

21.3.2.1.2 Desired state

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.

535 21.3.2.2 Updating terminology codes for a medical and billing across 536 systems

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

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

21.3.2.2.1 Current state

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

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).

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

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

560 Due to the full lack of encoding, two potentially undesirable outcomes can happen: either
561 the correct billing information will not reach the provider, or the medical information is
562 not machine processable and cannot be incorporated in other systems, with data mining
563 being compromised.

21.3.2.2.2 Desired state

565 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

570 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).

575 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 Workflow).

580 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.

21.3.2.3.2 Desired state

585 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.

590 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 Expanded Value Set from the Value Set Repository. The radiologist will see the images displayed according to the department’s hanging protocols.

595 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:

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

600

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.

21.3.2.4 Modification of a protocol code for a mammogram exam

605 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 (MAWF) from the Radiology Technical Framework, codes are used for:

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

615 The MAWF profile further states that a department or enterprise should define the code sets which are used by all of its systems in a common way, so 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. The lack of a common mechanism for distribution of code sets contributes to the development of local protocols like “*routine screening*”, “*magnification*”, “*CAD*”, that are understood by technologists or doctors, but
620 could not be applied to another department or enterprise, nor by the modality in the scope of an automated error correction.

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.

625 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

630 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 is 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
 635 for the radiologist. As it is, the technologist has to manually change the procedure.

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

640 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 Expanded Value Set.

An Expanded Value Set dedicated to mammography procedure codes is made available through the Value Set Repository.

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

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.

650

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

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
IHERADTF	MAWF0010	Mammary Ductogram, Multiple Ducts, right
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

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.

655

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).

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

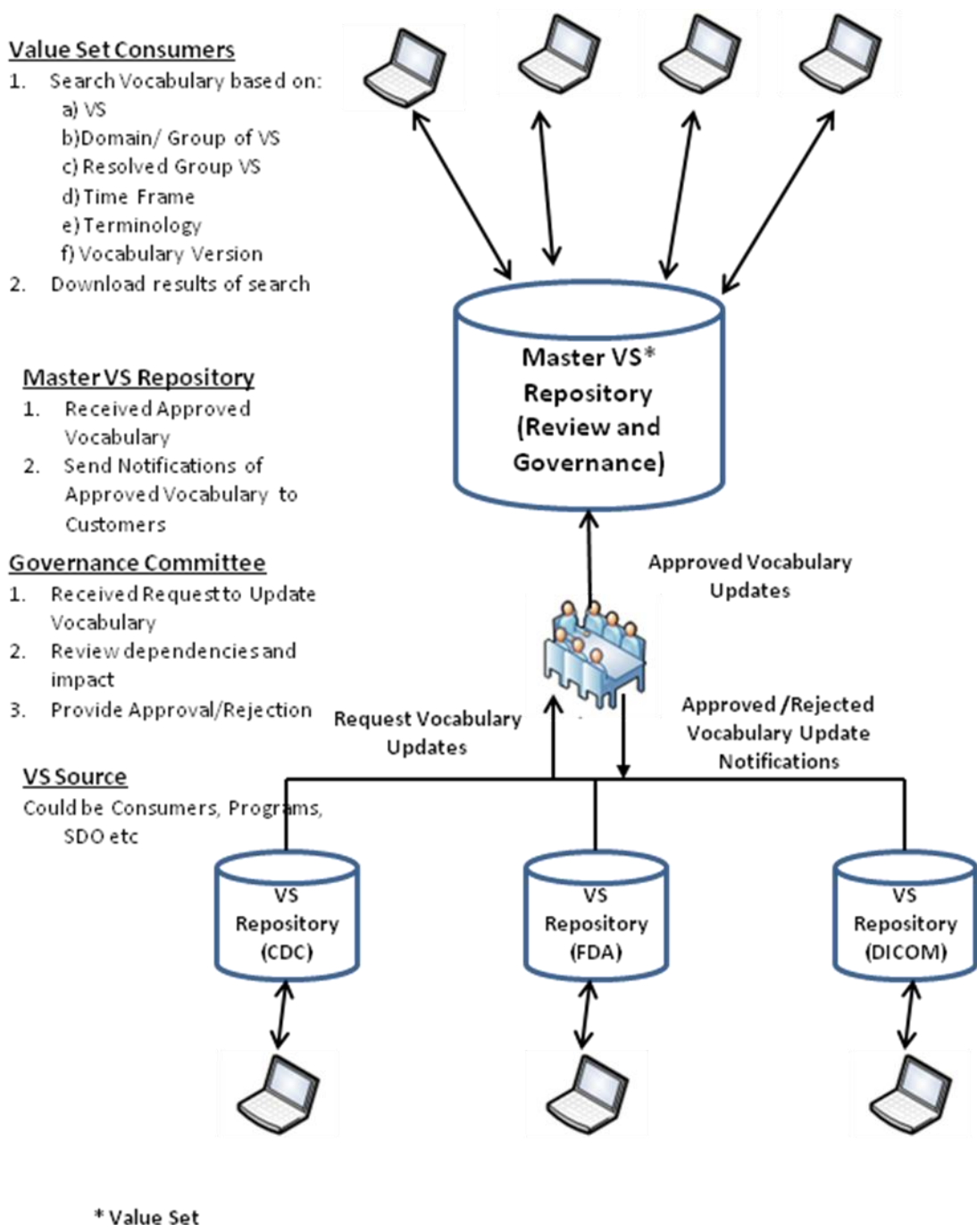
660 **21.3.2.5 Distributing Value Sets from SDOs and other master sources**

There is a bidirectional relationship between the users of terminologies, codes, and value sets at one end, and the standards development organizations (SDOs) and other developers of terminologies, codes, and value sets. The following diagram shows the process by which terminologies and value sets flow up to the value set consumers. The users' comments and new requirements flow back down to the sources of information.

665 At the top of this diagram, the value set consumers retrieve values sets from a master value set repository that they need for particular purposes. This could be done with the ITI-48 transaction when the consumer is configured with specific OID values for specific purposes. Often, there is a need to retrieve a group of value sets that share a common purpose, such as all of the value sets needed to populate a particular kind of report. These retrievals are performed using the ITI-60 retrieve multiple value sets transaction.

670 This master value set repository is subject to review and governance. The individual consumers have delegated responsibility for administering and maintaining the master value set repository to a coordinating organization. These organizations may be local, state, regional, or national organizations. They are typically not the developers of standard terminologies. The master repository organization serves an administrative and coordinating purpose to ensure that the releases of standard terminologies from SDOs do not interfere with daily operations of the value set consumers. They may also coordinate requests from value set consumers for new terminologies and value sets. There is a governance committee to coordinate these activities in both directions. These activities are important to the maintenance of the master value set repository. They are not described further as part of this profile.

680 The terminology developers typically release new terminologies and value sets on a regular schedule or at times matching their process. These notifications may be via bulletins, electronic notification, and other processes. They are not covered as part of this profile. The governance committee may choose to use ITI-60 as their method of retrieving copies of the SDO value sets, if the SDO has established a value set repository as part of their distribution process.



690

Figure 21.3.2.5-1 Relationship between Users and Developers of Value Sets

21.3.2.6 Obtaining value sets based upon metadata

695

There are often situations where notifications such as emails, bulletins, etc. contain descriptive information rather than a specific OID. Also, there are situations where

potentially useful value sets must be found based upon only a description. An example of this kind of use is:

- 700 1. A user needs all the value sets for stroke quality care measures from the US Joint Commission. These measures are identified by having a group name containing “stroke”. They plan to use this as the starting point for establishing triggers for decision support and data analytics application operating on data generated for the current year.
- 705 2. The user interacts with a Value Set Consumer to request value sets that have a group that includes “stroke”, a source that includes “Joint Commission” or “JCAHO”, and that are effective for the current year.
3. The Value Set Repository finds all the matching value sets and sends a response containing all the value sets and their descriptive metadata. Because there is also a European Joint Commission, this response includes some extras.
- 710 4. Client uses the complete metadata to eliminate the extras that are not relevant to the purpose.

21.4 SVS Security Considerations

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

720 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 ftp://ftp.ihe.net/IT_Infrastructure/iheityr6-2008-2009/Technical_Cmte/Profile_Work/SharingValueSets/. The nature of the Expanded 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 Expanded Value Sets. Another possible type of risk would be at the privacy and confidentiality level such as the interception of an Expanded Value Set containing confidential data. The profile will allow mitigation of those risks when needed in the following manner:

- 730 • 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 Expanded Value Set to authorized and authenticated nodes, while allowing unauthenticated network queries to other Expanded Value Sets.

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

735

- Given the wide variety of systems that will be retrieving Expanded 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.

740 **Appendix A Actor Summary Definitions**

Value Set Repository: actor whose role is to provide Expanded Value Sets and metadata describing these value sets.

Value Set Consumer: an actor who may

- 745
1. retrieve an Expanded Value Set based on its OID and possibly its version if the latter is available.
 2. retrieve metadata described a Value Set, together with the expanded value set that corresponds to its current meaning.

Appendix B Transaction Summary Definitions

750 **Retrieve Value Set:** The Value Set Consumer retrieves an Expanded Value Set from the Value Set Repository.

Retrieve Multiple Value Sets: The Value Set Consumer retrieves multiple value sets from the Value Set Repository. These retrieved value sets have metadata that matches retrieval selection criteria. The retrieved sets provide the full metadata describing the value set, and an expanded value set representation for that value set.

755

Volume 2b - Transactions

Add Sections 3.48

3.48 Retrieve Value Set

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

This transaction is used by the Value Set Consumer to retrieve an Expanded Value Set from the Value Set Repository. The Value Set Consumer has previously obtained the Expanded 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.

3.48.2 Use case roles

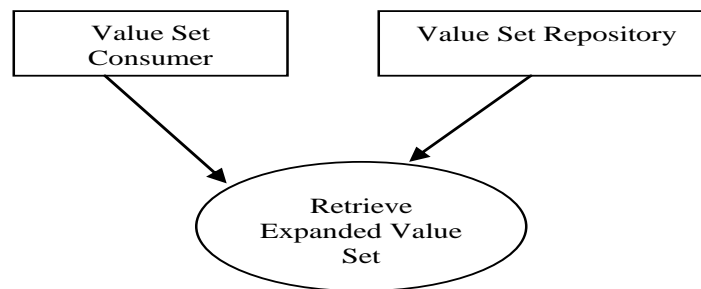


Figure 3.48.2: Use Case Roles

SVS Actors:

Actor: Value Set Consumer

Role: Obtains an Expanded Value Set

Actor: Value Set Repository

Role: Provides an Expanded Value Set

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

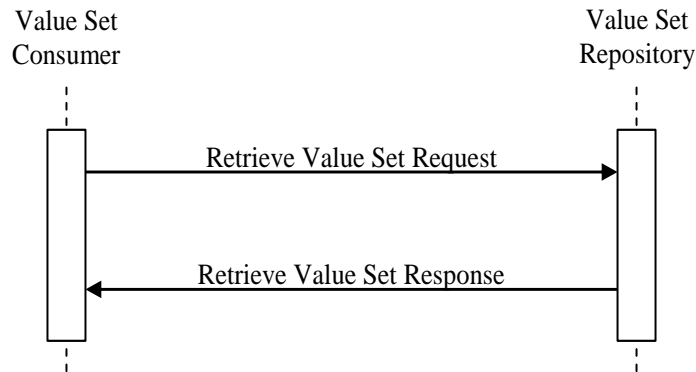


Figure 3.48.4-1: Interaction Diagram

3.48.4.1 Retrieve Value Set Request

3.48.4.1.1 Trigger Events

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:

- A required `id`, representing the Value Set OID that identifies the Expanded Value Set within the Repository.
- An optional `version` that identifies a specific version of the Expanded 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)

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

When receiving a Retrieve Value Set Request, a Value Set Repository shall generate a Retrieve Value Set Response containing the Expanded 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.

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

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 Expanded Value Set:

- 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.
- An optional `version` that shall be present if the Expanded 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.
- One or more `ConceptList`, which provides the Concepts of the Expanded Value Set. If there are multiple translations of the Value Set, each translation is returned as a separate `ConceptList`, where only the `displayName` of each Concept, and the language locale represented by `xml:lang` are different.

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

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

- A required `codeSystem` (the terminology the concept comes from)
- An optional `codeSystemVersion`. (the version of the terminology the concept comes from)

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

3.48.4.2.3 Expected Actions

A Value Set Repository shall return the Expanded 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 Expanded Value Set. If the Value Set Consumer did not request a specific language locale, the Value Set Repository shall return all known translations of the Expanded 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; the `displayName` may have a different value appropriate to the locale.

The Value Set Repository shall return the Expanded Value Set or an error code in case the Value Set could not be expanded. 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”.

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.

3.48.5 Protocol Requirements

The protocol for the Retrieve Value Set transaction describes two bindings. The first is 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
-----	----------------------

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:

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"

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"

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"

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.

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.
- An optional /ihe:RetrieveValueSetRequest/ihe:ValueSet@displayName attribute

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

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.

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

- a required /ihe:RetrieveValueSetResponse/ihe:ValueSet@id
attribute
- a required
/ihe:RetrieveValueSetResponse/ihe:ValueSet@displayName
attribute
- an optional
/ihe:RetrieveValueSetResponse/ihe:ValueSet@version
attribute
- 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
 - 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 CE data type.

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).

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

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 RetrieveMultipleValueSets 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).

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>

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.

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

The content of the HTTP response message shall be an XML encoded Expanded 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 Expanded 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

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).

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.

```
1.1.1.1.1.1 <?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
        s:mustUnderstand="1">urn:ihe:iti:2008:RetrieveValueSet</a:Action>
      <a:MessageID>urn:uuid:0fbfdced-6c01-4d09-a110-
        2201afedaa02</a:MessageID>
      <a:ReplyTo>

      <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
        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>
  </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.

```
<?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
      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-
      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"
        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"
            codeSystem="2.16.840.1.113883.6.5"/>
        </ConceptList>
      </ValueSet>
    </s:Body>
  </s:Envelope>
```



```
joint" codeSystem="2.16.840.1.113883.6.5"/>
  <Concept code="T-15420" displayName="Acromioclavicular
codeSystem="2.16.840.1.113883.6.5"/>
  <Concept code="T-15750" displayName="Ankle joint "
codeSystem="2.16.840.1.113883.6.5"/>
  <Concept code="T-280A0" displayName="Apex of Lung"
codeSystem="2.16.840.1.113883.6.5"/>
  <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"/>
  <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"/>
  <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"/>
  <Concept code="T-11501" displayName="Cervical spine"
codeSystem="2.16.840.1.113883.6.5"/>
  </ConceptList>
</ValueSet>
</RetrieveValueSetResponse>
</s:Body>
</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.

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.

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	<i>not specialized</i>
	EventOutcomeIndicator	M	<i>not specialized</i>
	EventTypeCode	M	EV("ITI-48", "IHE Transactions", "Retrieve Value Sets") or EV("ITI-60", "IHE Transactions", "Retrieve Multiple 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	Field Name	Opt	Value Constraints
	UserID	M	Repository HTTP or SOAP endpoint URI
	AlternativeUserID	U	<i>not specialized</i>
	UserName	U	<i>not specialized</i>
	UserIsRequestor	M	"false"
	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	Field Name	Opt	Value Constraints
	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	<i>not specialized</i>
	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	<i>not specialized</i>
	UserName	U	<i>not specialized</i>
	UserIsRequestor	M	"false"
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.

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

Value Set Instance (AuditMessage/ ParticipantObjectIdentification)	<i>ParticipantObjectTypeCode</i>	M	“2” (System)
	<i>ParticipantObjectTypeCodeRole</i>	M	“3” (Report)
	<i>ParticipantObjectDataLifeCycle</i>	U	<i>not specialized</i>
	<i>ParticipantObjectIDTypeCode</i>	M	EV(9, RFC-3881, “Report Number”)
	<i>ParticipantObjectSensitivity</i>	U	<i>not specialized</i>
	<i>ParticipantObjectID</i>	M	The value of <Value Set Unique ID>
	<i>ParticipantObjectName</i>	O	The value of <Value Set name>
	<i>ParticipantObjectQuery</i>	U	<i>not specialized</i>
<i>ParticipantObjectDetail</i>	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	<i>not specialized</i>
	EventOutcomeIndicator	M	<i>not specialized</i>
	EventTypeCode	M	EV(“ITI-48”, “IHE Transactions”, “Retrieve Value Sets”) or EV(“ITI-60”, “IHE Transactions”, “Retrieve Multiple 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	the process ID as used within the local operating system in the local system logs.
	AlternativeUserID	U	Repository HTTP or SOAP endpoint URI
	UserName	U	<i>not specialized</i>
	UserIsRequestor	M	“false”
	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.

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Destination <small>AuditMessage/ ActiveParticipant</small>	UserID	C	When WS-Addressing is used, the contents of the <ReplyTo/> field; otherwise not specialized
	AlternativeUserID	U	not specialized
	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 such as through XUA) <small>AuditMessage/ ActiveParticipant</small>	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	M	“false”
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.

Audit Source <small>AuditMessage/ AuditSourceIdentification</small>	<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 <small>(AuditMessage/ ParticipantObjectIdentification)</small>	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>	not specialized
	<i>ParticipantObjectDetail</i>	<i>M</i>	The value of <Value Set Version>

Add Section 3.60

3.60 Retrieve Multiple Value Sets

This section corresponds to Transaction ITI-60 of the IHE IT Infrastructure Technical Framework. The Value Set Consumer and Value Set Repository actors use transaction ITI-60.

Integration Profiles using this Transaction
Sharing Value Sets (SVS)

3.60.1 Scope

This transaction is used by the Value Set Consumer to retrieve Value Sets from the Value Set Repository.

3.60.2 Use case roles

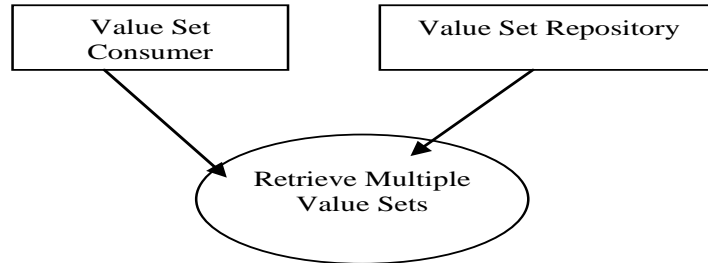


Figure 3.60.2: Use Case Roles

Actors:

Actor: Value Set Consumer

Role: Requests all Value Sets that match request parameters

Actor: Value Set Repository

Role: Provides matching Value Sets and associated metadata

3.60.3 Referenced Standards

The referenced standards are:

Table 3.60.3-1 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
POSIX 1003.2	IEEE Std 1003.2 IEEE Standard for Information Technology — Portable Operating System Interface (POSIX®) — Part 2: Shell and Utilities — Amendment 1: Batch Environment -Description

3.60.4 Interaction Diagram

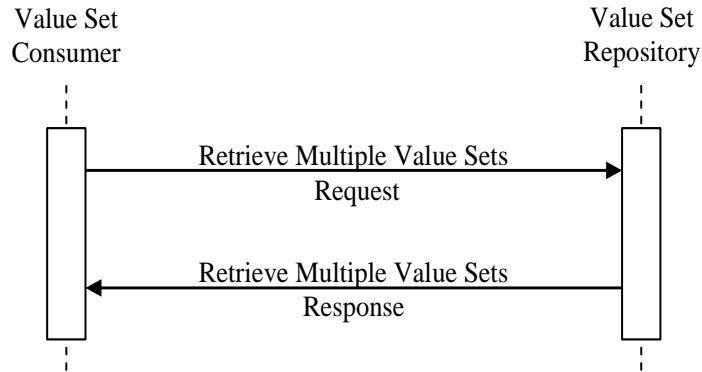


Figure 3.60.4-1: Interaction Diagram

3.60.4.1 Retrieve Multiple Value Sets Request

3.60.4.1.1 Trigger Events

The Value Set Consumer wants to retrieve value sets and has one or more element values to be matched in the metadata that describes value sets. This could be from pre-configuration or user input. The value sets that match these element values are needed for processing by the Value Set Consumer. The Value Set Consumer sends a Retrieve Multiple Value Sets Request to the Value Set Repository. Table 3.60.4.1.1-1 summarizes the metadata elements. See the schema for precise encoding details.

Table 3.60.4.1.1-1 Metadata Summary

Metadata Element	Description	Mandatory within Metadata returned	Usable as Selection Criterion
Id	This is the unique identifier of the value set	Mandatory	Y
displayName	This is the name of the value set	Mandatory	Y
Source	This is the source of the value set, identifying the originator or publisher of the information	Mandatory	Y
Purpose	Brief description about the general purpose of the value set	Optional	Y
Definition	A text definition describing how concepts in the value set were selected	Optional	Y

Metadata Element	Description	Mandatory within Metadata returned	Usable as Selection Criterion
Source URI	Most sources also have a URL or document URI that provides further details regarding the value set.	Optional	N
Version	A string identifying the specific version of the value set.	Mandatory	N
Status	Active, Inactive, local extensions	Mandatory	N
Type	This describes the type of the value set. It shall be: <ul style="list-style-type: none"> • Intensional, • Extensional, or • Expanded <p>Note: This is the type of the value set in the repository. The ConceptList that will also be returned is the current expansion of the value set.</p>	Mandatory	N
Binding	Shall be “Static” or “Dynamic”	Optional	N
Effective Date	The date when the value set is expected to be effective	Optional	Y
Expiration Date	The date when the value set is no longer expected to be used	Optional	Y
Creation Date	The date of creation of the value set	Optional	Y
Revision Date	The date of revision of the value set	Optional	Y
Group	The identifiers and keywords of the groups that include this value set. A group may also have an OID assigned.	Optional	Y

3.60.4.1.2 Message Semantics

The Retrieve Multiple Value Sets Request shall specify retrieval selection parameters as shown in the Table 3.60.4.1.2-1. It requests retrieval of all concept lists that have metadata matching the parameters used. At least one request parameter shall be provided.

Table 3.60.4.1.2-1 The Request Parameters in the RetrieveMultipleValueSets Request

Parameter	Parameter Format	Metadata Element	Match Type	Match Rules	Note
ID	OID	ID	OID	equals	
DisplayNameContains	string	Name	Regex	regex	POSIX rules
SourceContains	string	Source	Regex	regex	POSIX rules
PurposeContains	string	Purpose	Regex	regex	POSIX rules

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DefinitionContains	string	Definition	Regex	regex	POSIX rules
GroupContains	string	Group	Regex	regex	POSIX rules
GroupOID	OID	Group	OID	equals	Equality match for OID attribute of a Group element
EffectiveDateBefore	http-date	EffectiveDate	date	Before or equal	Date comparison to the day
EffectiveDateAfter	http-date	EffectiveDate	date	Equal or after	Date comparison to the day
ExpirationDateBefore	http-date	ExpirationDate	date	Before or equal	Date comparison to the day
ExpirationDateAfter	http-date	ExpirationDate	date	Equal or after	Date comparison to the day
CreationDateBefore	http-date	CreationDate	date	Before or equal	Date comparison to the day
CreationDateAfter	http-date	CreationDate	date	Equal or after	Date comparison to the day
RevisionDateBefore	http-date	RevisionDate	date	Before or equal	Date comparison to the day
RevisionDateAfter	http-date	RevisionDate	date	Equal or after	Date comparison to the day
Format	String	n/a	n/a	n/a	This specifies the format for the returned information. Shall be “CE-List” if present.

3.60.4.1.3 Expected Actions

The Value Set Repository shall perform matching in accordance with the rules in Table 3.60.4.1.2-1.

- Regex matches shall compare the contents of the referenced metadata field with the regex using the POSIX matching rules. If the regex matches the field, the value set matches.
- OID matching compares only for equal OIDs, ignoring leading zeroes.
- Date comparisons convert the argument into a date, and compare it with the dates in the metadata using a date comparison. Equality means the same day.

Any value set that matches all of the request parameters shall be included in the response.

Note: Multiple queries will sometimes be needed. Rather than specify a complex query mechanism, the Retrieve Multiple Value Sets request expects the client or user to locally eliminate any extra value sets and make additional queries. Value sets are relatively small and compress very well, so these extras are not a significant communications burden. Performing the final steps of selecting the value sets based on having the full metadata present locally allows a much richer and potentially interactive selection process. It also allows a simpler and more robust server.

3.60.4.2 Retrieve Multiple Value Sets Response

3.60.4.2.1 Trigger Events

This message will be triggered by completion of matching for a Retrieve Multiple Value Sets Request Message.

3.60.4.2.2 Message Semantics

The response shall be a Retrieve Multiple Value Sets Response as specified in the XML schema defining `RetrieveMultipleValueSetsResponse` which can be accessed on the IHE FTP site, see ITI TF-2x: Appendix W. The `RetrieveMultipleValueSetsResponse` element shall have one `DescribedValueSet` element for each matching value set found. If no matching elements are found, it shall be empty.

Each `DescribedValueSet` element contains:

- **An ID** attribute, a mandatory OID, the OID for this value set
- **A displayName** attribute, a mandatory string, the name of this value set
- **Source**, an optional string, the source organization for this value set
- **SourceURI**, an optional URI, a URI providing more description of this value set,
- **Purpose**, an optional string, a description of the intended use of this value set
- **Definition**, an optional string, a definition of the value set provided by the source
- **A version** attribute, a mandatory string, a version in the format used by the source,
- **Status**, an optional string, the status at time of retrieval (e.g., Active or Inactive)
- **Type**, a mandatory string, that indicates whether this is an intensional, extensional, or expanded value set.
- **Binding**, an optional string, either static or dynamic.
- **EffectiveDate**, an optional XML-date, the initial effective date for this value set
- **ExpirationDate**, an optional XML-date, the intended expiration date for this value set
- **CreationDate**, an optional XML-date, the creation date of this value set,
- **RevisionDate**, an optional XML-date, the revision date of this value set,
- Zero or more **Group** elements, where each **Group** element has
 - an optional **ID** attribute containing the OID for the group.
 - An optional **displayName** attribute, containing the name for the group,
 - An optional **sourceOrganization** attribute, containing the name of the organization that defined the group.
 - Zero or more **Keyword** elements that contain keywords associated with the group.
- One **ConceptList**, that contains

- One or more **Concept**, encoded using the HL7 CE datatype. These are the codes that are members of the expanded form of the value set.
- With an optional attribute **xml:lang** to indicate the language for the displayname for these concepts.

The ConceptList element and structure is the same in both the ITI-48 and ITI-60 transactions. The Identifier OID in the ITI-60 response is the OID used in the ITI-48 transaction when the value set is an expanded value set. It will not match in other cases.

A sample RetrieveMultipleValueSetsResponse is shown below:

```
<?xml version="1.0" encoding="UTF-8"?>
<RetrieveMultipleValueSetsResponse xmlns="urn:ihe:iti:svs:2008"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:ihe:iti:svs:2008:SVS.xsd">
  <DescribedValueSet ID="1.2.3" displayName="placeholder"
version="version1">
    <ConceptList xml:lang="en-US">
      <Concept code="code1" codeSystem="2.3.4"
codeSystemName="codeSystemName1" codeSystemVersion="codeSystemVersion1"
displayName="displayName1">
        </Concept>
      <Concept code="code7" codeSystem="2.3.4"
codeSystemName="codeSystemName1" codeSystemVersion="codeSystemVersion1"
displayName="displayName7">
        </Concept>
    </ConceptList>
    <Source>Codingsource</Source>
    <SourceURI>http://www.codingsource.com/placeholder</SourceURI>
    <Purpose>Purpose0</Purpose>
    <Definition>Definition0</Definition>
    <Type>Expanded</Type>
    <Binding>Static</Binding>
    <Status>Status0</Status>
    <EffectiveDate>2006-05-04</EffectiveDate>
    <ExpirationDate>2011-09-04</ExpirationDate>
    <CreationDate>2006-05-04</CreationDate>
    <RevisionDate>2006-05-04</RevisionDate>
    <Group ID="2.4.5" sourceOrganization="sourceOrganization1"
displayName="displayName15">
      <Keyword>Keyword0</Keyword>
      <Keyword>Keyword1</Keyword>
    </Group>
    <Group ID="2.4.54"
sourceOrganization="sourceOrganization3" displayName="displayName17">
      <Keyword>Keyword2</Keyword>
      <Keyword>Keyword3</Keyword>
    </Group>
  </DescribedValueSet>
</RetrieveMultipleValueSetsResponse>
```

3.60.5 Protocol Requirements

The protocol for the Retrieve Value Set transaction describes two bindings. The first is 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 3.60.5-1 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

3.60.5.1 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 RetrieveMultipleValueSets transaction presented in the order in which they would appear in the WSDL definition:

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:RetrieveMultipleValueSetsRequest”

The /definitions/message/part/@element attribute of the Retrieve Value Set Response message shall be defined as

“ihe:RetrieveMultipleValueSetsResponse”

The /definitions/portType/operation/input/@wsaw:Action attribute for the Retrieve Multiple Value Sets Request message shall be defined as

“urn:ihe:iti:2010:RetrieveMultipleValueSets”

The /definitions/portType/operation/output/@wsaw:Action attribute for the Retrieve Value Set Response message shall be defined as

“urn:ihe:iti:2010:RetrieveMultipleValueSetsResponse”

The

/definitions/binding/operation/soap12:operation/@soapAction attribute shall be defined as

“urn:ihe:iti:2010:RetrieveMultipleValueSets”

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.

Within the request message payload the

<ihe:RetrieveMultipleValueSetsRequest/> element is defined as:

- A optional `/ihe:RetrieveMultipleValueSetsRequest@ID` element 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.
- An optional `/ihe:RetrieveMultipleValueSetsRequest@DisplayNameContains` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@SourceContains` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@PurposeContains` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@DefinitionContains` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@GroupContains` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@GroupOID` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@EffectiveDateBefore` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@EffectiveDateAfter` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@ExpirationDateBefore` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@ExpirationDateAfter` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@CreationDateBefore` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@CreationDateAfter` element
- An optional `/ihe:RetrieveMultipleValueSetsRequest@RevisionDateBefore` element

- An optional
/ihe:RetrieveMultipleValueSetsRequest@RevisionDateAfter element

Value Set Repositories shall include within the response message payload for the SOAP Binding option the <ihe:RetrieveMultipleValueSetsResponse/> element which is described above in 3.60.4.2.2.

3.60.5.2 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. Each parameter to be used for selection shall be encoded as an HTTP Get parameter.

A sample URL for the HTTP binding for a query to retrieve all value sets for a reporting purpose, with either “stroke” or “JCAHO” in the value set name looks as follows:

```
https://example.com/RetrieveMultipleValueSets?DisplayNameContains="stroke|JCAHO"&PurposeContains="report"
```

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

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

The content of the HTTP response message shall be an XML encoded RetrieveMultipleValueSetsResponse, as described above in 3.60.4.2.2.

The Value Set Repository shall return an error code in case there are invalid request parameters. It shall return an HTTP status code of 404, with an HTTP Warning header containing warn-code of 111, and warn-text of “INV: Invalid search parameters”. See sections 10.4.5 and 14.46 of IETF RFC 2616 for more information. A search with valid request parameters that finds no matching value sets is not an error. It will return an empty QueryRetrievedValueSets

3.60.6 Security Requirements

The value sets do not contain personal information. In some cases, the value sets are created by standards organizations with the intention that they be or publicly shared. In other cases, there may be licensing or other proprietary restrictions on their disclosure. These licenses or restrictions are at the organizational level, not at the level of individual users. This greatly reduces the security needs and eliminates privacy concerns.

For further security considerations please consult ITI TF-1: Appendix G.

Audit trails shall be configurable to record access to a selected list of Value Sets. In most cases, there is no need to audit the value set request activity, but there may be some exceptional cases where auditing will be needed. See Section 3.48.6.1 for audit record recommendations in those cases.

This profile does not attempt to establish rules for managing security on proprietary value sets with licensing or access restrictions.

